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## Berrima Cement Works

Annual Environmental Management Report

Prepared by Boral Cement Limited | 26 June 2017

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# 1 Annual Review information

**Table 1.1 AEMR authorisation**

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Name of operation	Berrima Cement Works
Name of operator	Boral Cement Limited
Development consent no.	Development Consent No. 401-11-2002-i (Kiln 6) Development Consent No. 85-4-2005-i (Mill 7)
Name of holder of development consents	Boral Cement Limited
AEMR start date	29 June 2016
AEMR end date	28 June 2017

**I, Belinda Prideaux, certify that this audit report is a true and accurate record of the compliance status of the Berrima Cement Works for the period 29 June 2016 to 28 June 2017 and that I am authorised to make this statement on behalf of Boral Cement Limited.**

*Note.*

- a) *The AEMR is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual \$250,000.*
- b) *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/ information/ documents – maximum penalty 2 years imprisonment of \$22,000, or both).*

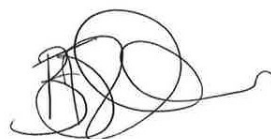
**Name of authorised reporting officer**

**Belinda Prideaux**

**Title of authorising reporting officer**

**Environmental Manager - Cement**

**Signature of authorised reporting officer**



**Date**

**30 June 2017**

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## 2 Statement of compliance

This annual environmental management report (AEMR) has been prepared to provide a summary of compliance with the two development consents applicable to the Berrima Cement Works (the Works), as follows:

- Development Consent No. DA 401-11-2002-i - approved in 2003 to upgrade and increase the capacity of Kiln 6 at the Works; and
- Development Consent No. DA 85-4-2005-i - approved in 2005 for the establishment and operation of a new cement mill (Mill 7).

This AEMR incorporates two separate AEMRs required by the development consents into one report in accordance with a request from the NSW Department of Environment and Planning (DPE) dated 5 August 2016 in response to the AEMRs provided for the 2016 reporting period. It also has been prepared in accordance with the *Post-approval requirements for State significant mining developments Annual Review Guideline* (NSW Government 2015) (the Guideline) as per DPE's request dated 5 August 2016.

Table 2.1 provides a statement of compliance with the two development consents.

**Table 2.1 Statement of compliance**

<b>Were all conditions of the relevant development consents complied with?</b>	
Development Consent No. No. 401-11-2002-i (Kiln 6)	YES
Development Consent No. No. 85-4-2005-i (Mill 7)	YES

Table 2.2 provides details on non-compliances identified with the development consents. The compliance status for Table 2.2 is based on the key provided in Table 2.3.

**Table 2.2 Non-compliances**

<b>Relevant approval</b>	<b>Condition no.</b>	<b>Condition description (summary)</b>	<b>Compliance status</b>	<b>Comment</b>	<b>Where addressed in AEMR</b>
No non compliances to report					

**Table 2.3 Compliance status key for Table 2.2**

<b>Risk level</b>	<b>Colour code</b>	<b>Description</b>
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.
Medium	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>
Low	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>
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (eg submitting a report to government later than required under approval conditions).

## 3 Introduction

### 3.1 Overview

Boral Cement Limited (Boral Cement) operates the Works off Taylor Road, New Berrima, in the Wingecarribee Local Government Area (LGA). The Works was built in 1929 and has operated continuously ever since predominantly on the basis of continuing use rights and two development consents issued under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

The location of the Works in its regional context can be seen in Figure 3.1. The location of the Works in its local context can be seen in Figure 3.2.

The Works produces cement products (cement and clinker) for sale in NSW, the ACT and for export. The Works has approval to produce up to 1.56 million tonnes per annum (tpa) of cement products which has historically represented approximately 60% of cement sold for building and construction in NSW. Cement products are transported to domestic customers (both internal to Boral companies or external), by train and truck and international customers through Port Kembla. Clinker is also transported to Boral Cement's Maldon Cement Works by rail which also produces cement products, including premixed dry concrete.

The Works operates 24 hours per day, 365, six days per year, including various maintenance periods.

Operational infrastructure includes one kiln (Kiln 6) and two cement mills (Mill 6 and 7), and storage and stockpiling facilities.

The main raw material inputs to the production of cement and clinker are limestone, sourced from Boral Cement's Marulan South Limestone Mine (transported via rail), and shale, sourced both on site at a shale quarry or from off-site, and from steel slag from BlueScope Steel in Port Kembla, and granulated blast furnace slag from Japan.

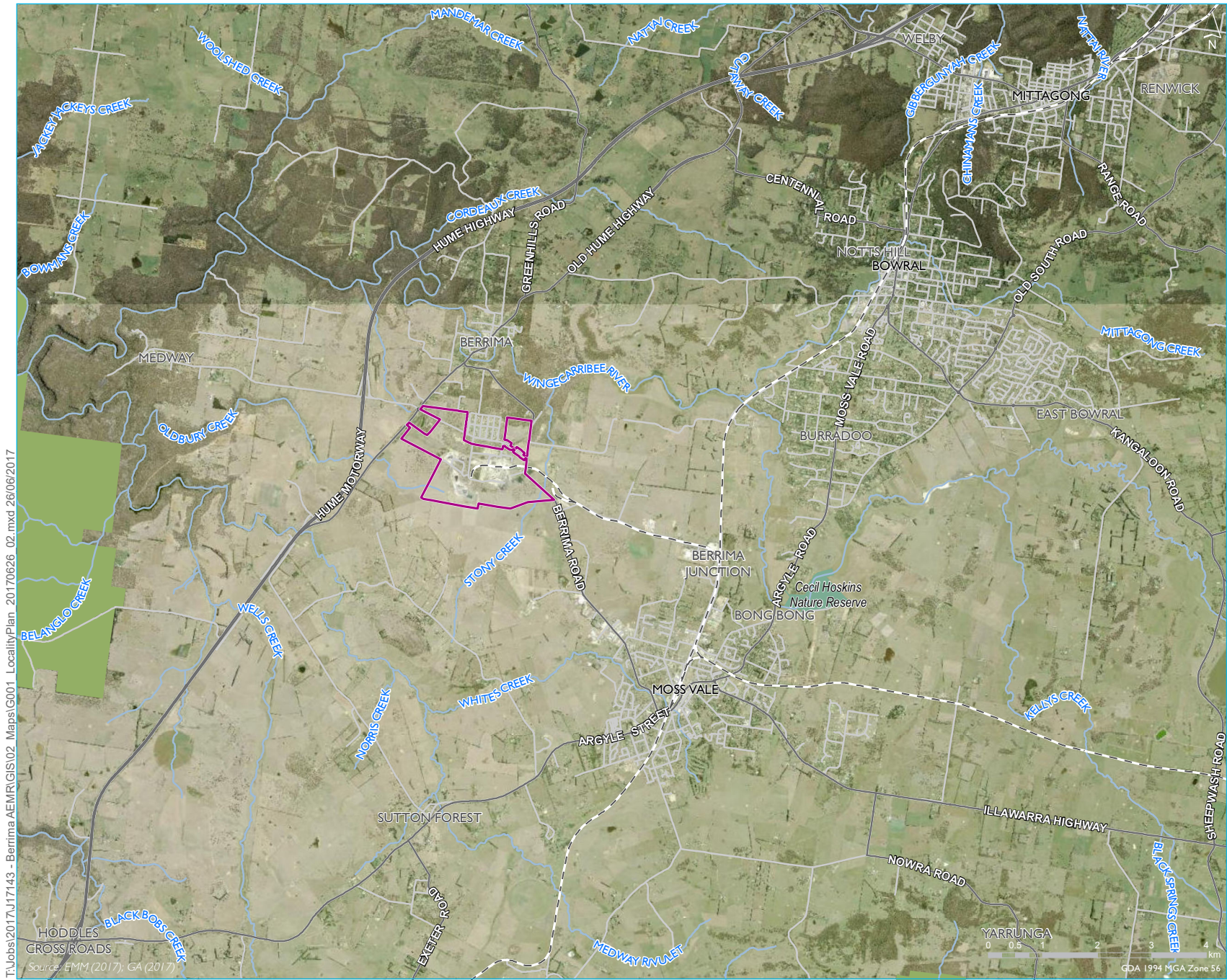
The limestone, shale and slag are blended together, ground into a fine powder (also known as a meal) and fused at a very high temperatures (up to 1,500 degrees Celsius (°C)) in the kiln (Kiln 6). The fused material is called clinker.

Clinker is either stored ready for reclamation or distribution to customers by road and rail transport, or is mixed with gypsum into one of two cement mills (Mill 6 and 7), where it is crushed to produce cement. It is then fed into cement silos from where it is despatched by either road tanker or rail tanker/wagon for delivery to Boral Cement's customers (internal Boral customers or external).

Figure 3.3 illustrates a process flow diagram of operating process at the Works.

Cement manufacture is an energy intensive process due to the high temperatures required for the production of clinker. Up to 225,000 tonnes per year of coal is generally used to heat the kiln. Up until 2013 coal was sourced from the nearby Medway Colliery (also known as the Berrima Colliery) but since the colliery's closure, coal is currently sourced from other mines in the Illawarra area. The Works also has approval to use other standard fuels such as natural gas, fuel oil, diesel and coke fines to heat the kiln. With the exception of diesel, which is used to start up the kiln, none of these standard fuels are currently being used.





T:\Jobs\2017\117143 - Berrima AEMR\GIS\02 Maps\G001 LocalityPlan\_20170626 02.mxd 26/06/2017  
 Source: EMM (2017), GA (2017)

- KEY**
- Development consent boundary
  - Main road
  - Local road
  - Watercourse
  - Rail line
  - NPWS reserve
  - State forest

The site in its regional context

Berrima Cement Works  
 Annual Environmental  
 Management Report  
 Figure 3.1







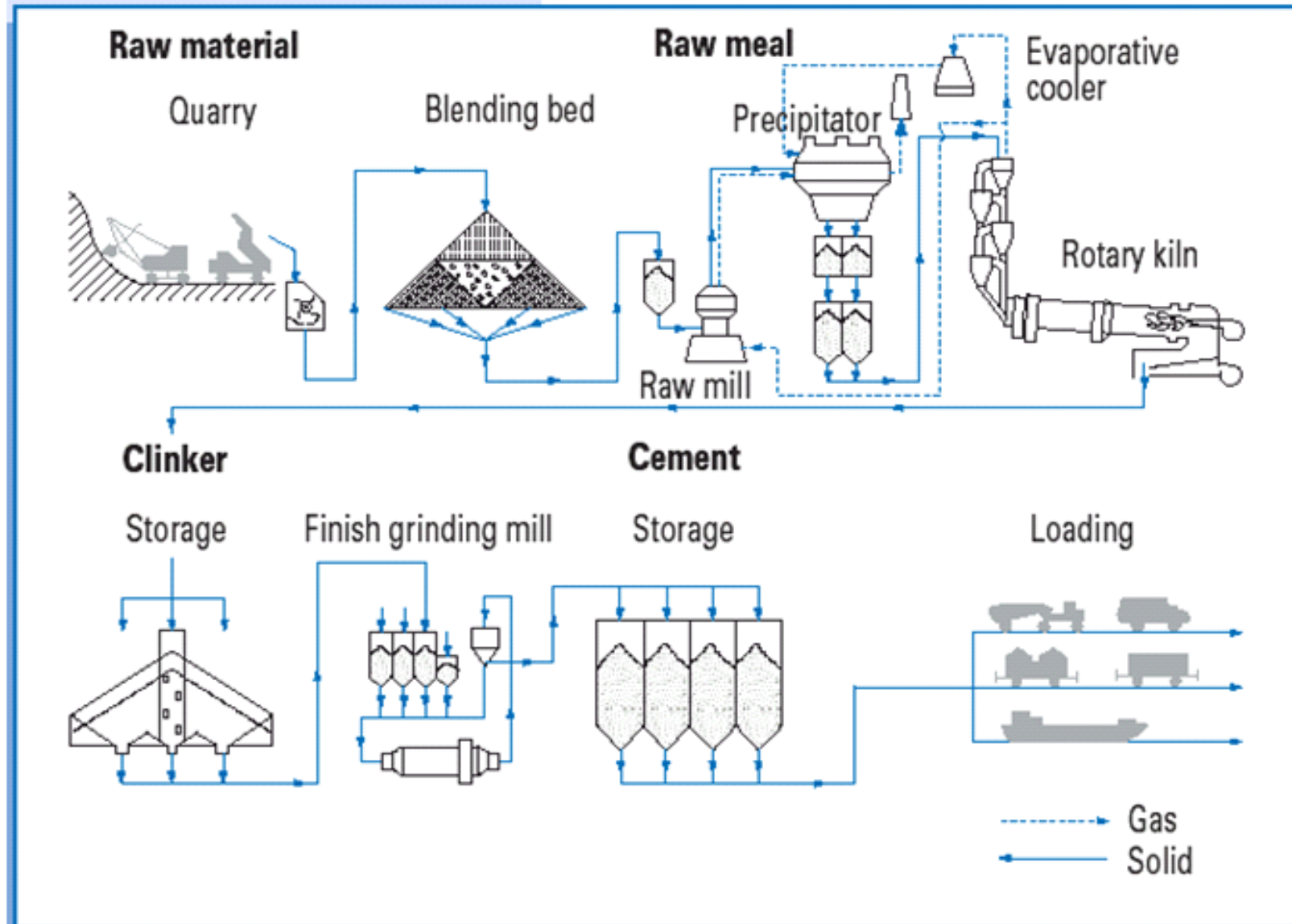
- KEY**
- Dust deposition gauge
  - Development consent boundary
  - Main road
  - Local road
  - Watercourse
  - - Rail line

The site in its local context

Berrima Cement Works  
 Annual Environmental  
 Management Report  
 Figure 3.2



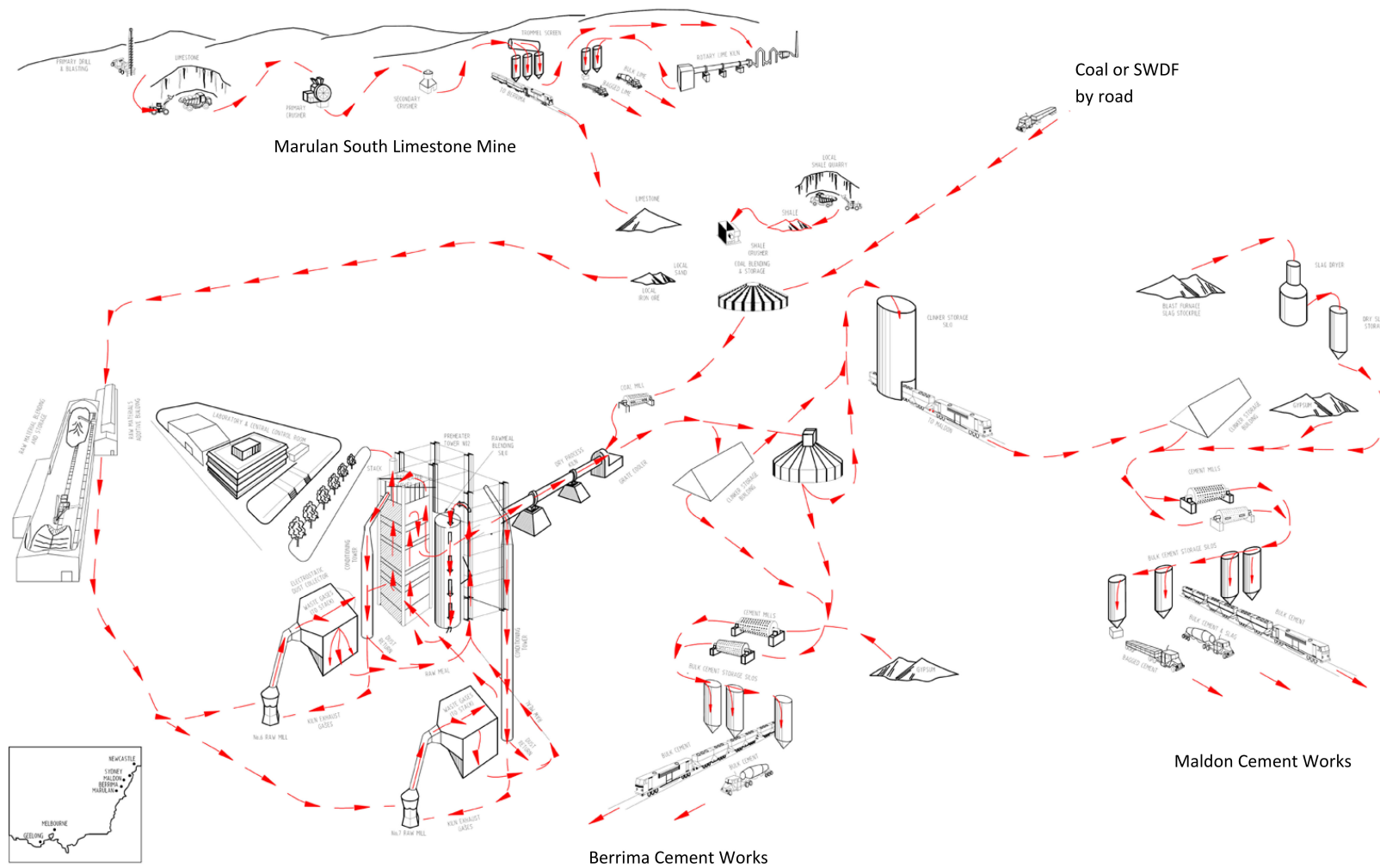




Source: Boral (2017)

Process flow diagram

Berrima Cement Works  
Annual Environmental  
Management Report  
Figure 3.3



LOCALITY MAP

Process flow diagram incorporating receipt of materials and dispatch of products

The Works has approval to use 30,000 tpa of non-standard fuels in the kiln, including 10,000 tpa of Hi Cal 50 (carbon anode dust), 20,000 tpa of AKF 1 (liquid oily residues) and 30,000 tpa of AKF 5 (used tyres). In October 2016, Boral Cement received approval to use of additional of non-standard fuels (also referred to as solid waste derived fuels (SWDF)) as an energy source at the Works. SWDFs used include wood waste and refuse derived fuel (RDF) which are combustible materials recovered and processed from waste streams, such as papers, cardboards, packaging, and construction and demolition materials. The consent for Kiln 6 now allows the use of up to 100,000 tpa of AKF5, wood waste and RDF.

Figure 3.4 illustrates a process flow diagram of the Works incorporating the receipt of limestone, coal and SWDF and shale from within the site of the Works for the production of clinker, and the distribution of clinker and cement products from the Works by road and rail.

The Works supports a direct workforce of 130 employees, a further 20 in engineering and procurement, as well as many indirect jobs in the region through logistics, contractors and suppliers.

The Works is located on a 149 hectare (ha) site immediately south of the village of New Berrima and approximately 2.5 kilometres (km) east of the Hume Highway (refer to Figure 3.1). The village of New Berrima was initially developed by Boral Cement's predecessors to provide housing for employees of the Plant.

The Works is the most physically dominating feature of the New Berrima area, being roughly equivalent in size to the adjacent village, with the tallest structure on the site being a pre-heater tower, which is approximately 85 metres (m) high. The closest residential dwellings in the village of New Berrima are approximately 650 m north of Kiln 6.

The site is zoned IN3 Heavy Industrial in the *Wingecarribee Local Environmental Plan 2010*.

## 3.2 Key personnel

Details of key personnel who are responsible for environmental management at the Works are provided in Table 3.1.

**Table 3.1** Details of key personnel responsible for environmental management

Name	Role	Phone number	Email address
Stuart Hutchings	Operations Manager (NSW) Boral Cement	(02) 4860 2222	Stuart.Hutchings@boral.com.au
Belinda Prideaux	Environmental Manager - Cement Boral Cement	(02) 4820 3048	Belinda.Prideaux@boral.com.au
Michael Curley	HSE Manager - Berrima Cement Boral Cement	(02) 4860 2351	Michael.Curley@boral.com.au

## 3.3 Approvals

The Works operates under a combination of continuing use rights and two development consents under the EP&A Act. It also operates under an environment protection licence (EPL) issued under the NSW *Protection of the Environment Operations Act 1997* (POEO Act).

Water used at the Works is drawn from the Wingecarribee River which is regulated by five mining purpose leases (MPLs) issued under the NSW *Mining Act 1906*. In addition, one MPL regulates the provision of power to the Works.

Shale used at the Works is extracted from a quarry on the site which is regulated under a mining lease (ML) issued under the NSW *Mining Act 1992*.

### 3.3.1 Consents

The Works operates under a combination of continuing use rights and the following two development consents approved by the NSW Minister for Planning:

- Development Consent No. DA 401-11-2002-i - approved in 2003 to upgrade and increase the capacity of Kiln 6 at the Works; and
- Development Consent No. DA 85-4-2005-i - approved in 2005 for the establishment and operation of a new cement mill (Mill 7).

Continuing existing use rights are available to the Works given it commenced operations in 1929, before any planning approvals were required.

The development consent for Mill 7 has never been modified.

Subsequent modifications to the development consent for Kiln 6, approved by delegates of the NSW Minister for Planning, have allowed the trialling and use of certain non-standard fuels, the use of alternative 'low cost' raw materials in the manufacture of clinker (such as granulated blast furnace slag), the use of rail for coal deliveries, and the stockpiling of coal on the site. Table 3.2 outlines the various modifications to the development consent.

**Table 3.2 Approvals for Kiln 6**

<b>Application</b>	<b>Description</b>	<b>Date approved</b>
DA 401-11-2002-i	Upgrade of Kiln 6 to allow for burning of non-standard fuels, installation of continuous monitoring equipment, increase in Kiln 6 output, upgrade of coal mill capacity and intermittent use of Kiln 5.	12 May 2003
MOD 1	Use of non-standard fuels, including used tyres, liquid oil residues and spent aluminium electrode carbon.	26 September 2005
MOD 2	Removal of prohibition on the acceptance of materials classified as hazardous waste under the EPA's waste guidelines.	22 September 2006
MOD 3	Small scale trial use of tyre chips over a six month period.	13 February 2007
MOD 4	Increase in usage of coal fines from 1.5 tonnes per hour (tph) to 10 tph.	8 May 2008
MOD 5	Approval to use rail for coal deliveries.	31 August 2009
MOD 6	Stockpiling of coal from Berrima Colliery for sale and transport to Port Kembla.	20 June 2012
MOD 7	Trial and use of granulated blast furnace slag as a raw material additive, not exceeding 150,000 tpa.	16 April 2012
MOD 8	Administrative changes to align consent and EPL conditions.	5 August 2012
MOD 9	The use of up to 100,000 tpa of SWDF as a non-standard fuel for Kiln 6, including the construction of a fuel storage and kiln feeding system, and the deletion of conditions relating to MOD 6.	5 October 2016

In August 2007, the use of non-standard fuels at the facility (approved under MOD 1) was suspended by the EPA. The suspension was lifted in December 2008.

As part of MOD 9, conditions relating to MOD 6 (the stockpiling of coal from Berrima Colliery for sale and transport to Port Kembla) were deleted.

### 3.3.2 Licences

The Works operates under EPL 1968 issued by the EPA which has been subject to numerous variations. The EPL permits the following scheduled activities listed in Schedule 1 of the POEO Act:

- cement or lime works;
- extractive activities; and
- resource recovery.

There has been no variation or amendment to the EPL since 14 July 2015.

The Works also operates under a ML and six MPLs as summarised in Table 3.3.

**Table 3.3 Mining leases**

<b>Mining title</b>	<b>Purpose</b>	<b>Expiry date</b>
ML 1723	Extraction of blue shale from the quarry and rehabilitation of previously disturbed land.	18 December 2036
MPL 559	Water supply access.	20 September 2028
MPL 592	Water supply access.	20 September 2028
MPL 622	Water supply access.	20 September 2028
MPL 623	Water supply access.	20 September 2028
MPL 628	Power supply.	20 September 2028
MPL 654	Water supply access.	20 September 2028

### 3.4 Operations summary

Table 3.4 provides a summary of production at the Works for the 2017 reporting period (May 2016 and April 2017) compared to the 2015 and 2016 reporting periods.

**Table 3.4 Production summary (Annual Financial Year)**

Please note that the following figures are annual financial year production numbers.

	<b>Approval limit</b>	<b>2014/15 FY</b>	<b>2015/16FY</b>	<b>2016/17 FY</b>
Limestone used	Nil	1,779,419 t	1,766,790 t	1,918,289 t
Shale used	Nil	340,862 t	312,337 t	308,199 t
Slag used	Nil	70,034 t	154,596 t	123,128 t
Gypsum used	Nil	70,810 t	81,140 t	76,864 t
Coal used	Nil	248,201 t	224,211 t	222,586 t
SWDFs used	100,000 t	Nil	Nil	Nil
Clinker production	1,560,000 t	1,392,037 t	1,440,097 t	1,484,700 t
Cement production	1,560,000 t	1,099,024 t	1,252,733 t	1,185,461 t

Coal is predominantly used as a fuel for the kiln at the Works. However, small amounts of diesel are used during kiln start-ups.

The Works is approved to produce up to 1.56 Mtpa of cement products. In the 2017 reporting period the Works produced 1,486,418 tonnes of clinker. Of this clinker, 1,167,323 tonnes of cement was produced.

Note that no non-standard fuels or SWDFs were used at the Works from the time MOD 9 was approved and the end of the reporting period dated 28 June 2017. Construction activities are underway at the Works to progress the use of non-standard fuels for Kiln 6.

### 3.5 Environmental management

The Guideline requires that AEMRs focus on the environmental outcomes of a reporting period that are intended by the relevant approval. As such, this AEMR addresses the outcomes of the relevant conditions of the development consents rather than focus on management plans and monitoring data. Notwithstanding this, addressing environmental outcomes is a result of analysing monitoring data, and this has been undertaken in this AMER, particularly for key environmental areas at the Works, including air quality and noise.

### 3.6 Next reporting period

During the 2017-18 reporting period, in addition to the annual kiln shutdowns, the following projects will be undertaken or are in progress;

- The Works will be undertaking construction activities to progress the use of non-standard fuels for Kiln 6.
- The Works commenced a project aimed at improving the effectiveness of the dust collectors. Boral engaged a consultant to review the capacity and efficiency of the dust collection systems at the site with an aim to improving reliability and reduce and eliminate dust emissions at the site. This has a number of important benefits:
  - Dust collectors working effectively will improve the working conditions for employees.
  - They will reduce the cleaning burden on the industrial cleaning group and minimise waste.
  - For our neighbours and the community, reducing spillage and dust issues will minimise the impact on the local village.

In the first instance, our expert consultants have recently spent a number of days on site reviewing the dust collectors on site. Their report will form the basis for the development of an action plan for dust collector improvements at Berrima.

- The 3000T clinker silo has recently been refurbished. This means that from an environmental perspective there are less dust emissions from the silo.
- All existing environmental management plans will be reviewed in 2017.
- An independent audit of the development consents for Kiln 6 and Mill 7 will be undertaken later in 2017.
- A Traffic Management Plan has been prepared and is currently in the process of being published.
- In addition, Wingecarribee Council is about to start a major road project east of the site which will see improvements to rail operations. This will necessitate the relocation of the high-volume air sampler. This operation is currently under review





## 4 Actions required from previous AEMRs

In response to the AEMRs prepared for the development consents for Kiln 6 and Mill 7 (Development Consent No. DA 401-11-2002-i and DA 85-4-2005i respectfully) for the 2016 reporting period, DPE required three actions be undertaken by 31 August 2016. In addition, DPE made four recommendations regarding environmental management for the 2017 reporting period.

Details on the three actions required by DPE for the 2016 reporting period are provided in Table 4.1. Details on the four recommendations made by DPE for environmental management for the 2017 reporting period are provided in table 4.2.

**Table 4.1 Actions from previous AEMRs**

Action required from previous AEMRs	Action taken by Boral Cement	Where discussed in AEMR
Include noise monitoring results and interpretation of these results as required by Condition 3.5 and 2.5 of the approval for Kiln 6 Upgrade Project and Cement Mill 7 Project respectively.	Boral updated the AEMRs for the development consents for Kiln 6 and Mill 7 to incorporate the noise monitoring results and interpretation of these results for the Works. The updated reports were submitted on 30 August 2016.	Noise monitoring results and an interpretation of these results for this reporting period are provided in Appendix A. These are summarised in Section 5.2.
Provide more detailed interpretation of the data in the Kiln 6 Upgrade AEMR for key monitoring parameters including dust deposition, continuous particulate emissions and lake quality overflow events.	Boral updated the AEMR for the development consent for Kiln 6 to incorporate more detailed interpretation of the data for key monitoring parameters. The updated reports were submitted on 30 August 2016.	Interpretation of the data for key monitoring parameters for this reporting period are provided in Appendix B and C. These are summarised in Sections 5.3 and 5.4.
All personal details of the complainant (including name and contact details) are omitted from the complaints register in the AEMR, unless the complainants have requested for it to be included.	Boral updated the AEMR for the development consent for Kiln 6 to omit personal details from the complaints register in Attachment 7. The updated reports were submitted on 30 August 2016.	The complaints register for the 2017 reporting period (see Appendix E) does not include personal details of complainants.

**Table 4.2 Recommendations from previous AEMRs**

Recommendations from required from previous AEMRs	Action taken by Boral Cement	Where discussed in AEMR
Provide additional detail of measures being undertaken to address key environmental management targets, in particular the measures being undertaken to further reduce noise emissions by implementing noise attenuators and other measures where technically and economically feasible.	Previous actions had addressed noise issues (impeller replacement and Precip Fan roller doors). The 2016 noise report shows that the sight remains in compliance with noise conditions. Activities throughout the year focused on preventative maintenance.	See Section 5.2

**Table 4.2 Recommendations from previous AEMRs**

Recommendations from required from previous AEMRs	Action taken by Boral Cement	Where discussed in AEMR
<p>Consider combining both AEMRs into one report for the site. The Department has published the <i>Post-approval requirements for State significant mining developments Annual Review Guideline</i> (2015) (the Guideline). While referencing mining operations, it provides a good indication of the standard and general content of AEMRs expected by the Department. It is recommended that the guideline is considered in the preparation of all future AEMRs. Note that the guideline states that 'where there is any inconsistency between the post approval guidelines and the conditions placed on an operation's approval, the condition will prevail'.</p>	<p>This AEMR incorporates the AEMRs required for the development consents for Kiln 6 and Mill 7 into the one report. In addition, this AEMR has been prepared in accordance with the Guideline as requested by DPE.</p>	<p>N/A</p>
<p>It is requested that the information on the website is reviewed to ensure that the most up to date information is provided.</p>	<p>The website has been updated with all relevant information as at June 2017.</p>	<p>N/A</p>
<p>A copy of the complaints register should be made available and kept up to date on the company's website.</p>	<p>Boral is in the process of putting their up-to-date complaints register on their website as at June 2017</p>	<p>N/A</p>

## 5 Environmental performance

### 5.1 Overview

This chapter reports performance against the environmental performance conditions in Development Consent No. 401-11-2002-i (Kiln 6) and Development Consent No. 85-4-2005-i (Mill 7). It is divided into sections based on the environmental matters in the consents which comprise a conditions table and Boral's reporting against the conditions.

### 5.2 Noise

The consent requirements for noise for Kiln 6 are in conditions 3.1 to 3.3 of Development Consent No. 401-11-2002-i and for Mill 7 in conditions 2.1 to 2.6 of Development Consent No. 85-4-2005-i, which are replicated in Table 5.1. Noise was monitored and reported against the Kiln 6 and Mill 7 contribution criteria in July and August 2016 (see Appendix A), with performance described in Table 5.2 below.

Boral manages noise on site in accordance with the Noise Management Plan, which describes the monitoring points, frequency and criteria.

The monitoring results were analysed as follows to determine the contributions from the project components:

- Kiln 6 – noise was measured near sources at the kiln and compared to allowable (objective) sound pressure levels for the kiln (Figure 5.1). The objective sound levels were calculated for the original environmental impact assessment and represent the maximum noise level that can be generated at the kiln before contribution criteria for receivers are exceeded.
- Mill 7 – noise was measured near sources at the mill and entered into a computer noise model, which predicted the mill's noise contribution at receivers assuming attenuation of the noise over distance (Figure 5.2).

The noise sources at Kiln 6 produced more noise in 2016 than they did in 2005 but overall remain below the objective sound pressure levels. Measures are recommended to further reduce noise, such as closing inspection hatches when not in use.

Sound power levels near Mill 7 varied compared to those from previous years with a number of exceedances of contribution criteria. However, the exceedances are attributed to noise contributions from adjacent plant and noise levels from Mill 7 are below contribution criteria.

Operations at Kiln 6 and Mill 7 complied with the noise contribution consent conditions during the reporting period.

Source	Sound Power Level – dB(A)	Sound Pressure Level dB(A)		
		Objective	Measured 2005	Measured 2016
Coal Mill and Clinker cooler fans	117	100 @ 3m	93 @ 2m	Coal mill wall vent 82 @ 2m, Courtyard cooler fans 85 to 93 @ 1m
New Radicon Cooler	103	92 @ 1m	81 @ 1m West 80 @ 2m East	90 to 95 @ 1m 86 @ 2m rear
New Pre-heater fan FA249	97	89 @ 1m	77 @ 2m	74 to 84 @ 1m
New Baghouse fan FA250	102	94 @ 1m	82 @ 2m	80 to 84 @ 1m
Raw Mill 7 Building	117	100 @ 3m	Vents 83 to 86 @ 1m	Vents 81 to 85 @ 1m Roof 80 to 89 @ 1m

Figure 5.1 Kiln 6 upgrade plant items and objective sound power levels and sound pressure levels required to achieve compliance with objective sound levels (Hatch 2016)

Receiver	Source	Predicted sound level – dB(A)		
		Wind 0 m/s Lapse 0°C/100m	Wind 3 m/s Lapse 0°C/100m	Wind 2 m/s Lapse 3°C/100m
Adelaide Street	Mill Room northern wall	23	29	29
	BE Tower northern wall	22	25	26
	Compressor room vents	<u>15</u>	<u>20</u>	<u>21</u>
	<b>Total</b>	<b>26</b>	<b>31</b>	<b>31</b>
Argyle Street	Western wall Mill room	17	28	28
	Western Roll door Mill room	14	25	26
	Western Wall vents I & J	13	19	20
	Western Wall BE Tower	10	17	17
	Western Roll door compressor room	<u>9</u>	<u>15</u>	<u>16</u>
	<b>Total</b>	<b>21</b>	<b>30</b>	<b>31</b>

Figure 5.2 Mill 7 predicted sound contributions at receivers

**Table 5.1 Noise conditions**

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**(K = Kiln 6, M = Mill 7)**

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**K3.1 Noise** Construction activities associated with the cement works upgrade shall only be carried out:

- a) between 7:00 am and 6:00 pm, Monday to Friday inclusive, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site;
  - b) between 7:00 am and 1:00 pm on Saturdays, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site;
  - c) at no time on Sundays or public holidays, during periods when the cement works is shutdown, and construction noise is audible at the boundary of the site;
  - d) at any time during periods in which the cement works is in operation; and
  - e) at any time if construction noise is inaudible at the boundary of the site.
- 

**K3.1A** The Development shall be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009). All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the CEMP.

Note: The Interim Construction Noise Guideline identifies 'particularly annoying' activities that require the addition of 5 dB(A) to the predicted level before comparing to the construction NML

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**K3.1B** Where Feasible and Reasonable, operation noise mitigation measures shall be implemented at the start of Construction (or at other times during construction) to minimise construction noise impacts.

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**M2.1 Noise Impacts** Construction activities associated with the cement works upgrade shall only be carried out:

- a) between 7:00 am and 6:00 pm, Monday to Friday inclusive, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site;
  - b) between 7:00 am and 1:00 pm on Saturdays, during periods in which the cement works is shut-down, and construction noise is audible at the boundary of the site;
  - c) at no time on Sundays or public holidays, during periods when the cement works is shut-down, and construction noise is audible at the boundary of the site;
  - d) at any time during periods in which the cement works is in operation; and
  - e) at any time if construction noise is inaudible at the boundary of the site.
- 

**K3.2 Operational Noise** Subject to compliance with the requirements of this consent, the cement works upgrade may be operated 24 hours per day, 7 days per week.

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**Table 5.1 Noise conditions**

**K3.3** <sup>2</sup>The Applicant shall design, construct, operate and maintain all new and upgraded components forming part of the cement works upgrade to ensure that for each receiver location listed in Table 2 below, the noise level at each receiver location does not exceed the maximum allowable noise contribution limit at the receiver location specified.

**Table 2 – Maximum Allowable Noise Contribution Limit (dB(A))**

Receiver Location	Day <sup>a</sup> LAeq(15 minute)	Evening <sup>b</sup> LAeq(15 minute)	Night <sup>c</sup> LAeq(15 minute)
4 Melbourne Street	37	37	37
Chelsey Park Farm	30	30	30
Candowie Farm	37	37	37

a. Day is defined as the period from 7:00 am to 6:00 pm Monday to Saturday and 8:00 am to 6:00 pm on Sundays and public holidays.

b. Evening is defined as the period from 6:00 pm to 10:00 pm.

c. Night is defined as the period from 10:00 pm to 7:00 am Monday to Saturday and 10:00 pm to 8:00 am on Sundays and public holidays.

Note: Noise contributions specified in Table 2 are to be interpreted as contributions from the new and upgraded components forming part of cement works upgrade only and not as noise limits for the site as a whole. (Footnote: 2 Incorporates EPA General Terms of Approval (L6.1 and L6.2))

**K3.4 K3.5 K3.6 Deleted**

**M2.2** Subject to compliance with the requirements of this consent, the cement works upgrade may be operated 24 hours per day, 7 days per week.

**M2.3** <sup>2</sup>The Applicant shall design, construct, operate and maintain all new and upgraded components forming part of the cement works upgrade to ensure that for each receiver location listed in Table 1 below, the noise level at each receiver location does not exceed the maximum allowable noise contribution limit at the receiver location specified.

**Table 1 – Maximum Allowable Noise Contribution Limit (dB(A))**

Receiver Location	Day <sup>a</sup> LAeq(16 minute)	Evening <sup>b</sup> LAeq(16 minute)	Night <sup>c</sup> LAeq(16 minute)
Adelaide Street, near Taylor Avenue, New Berrima	43	43	40
Argyle Street, near Taylor Avenue, New Berrima	43	43	40
Candowie Farm House	43	43	40

a. Day is defined as the period from 7.00 am to 6.00 pm Monday to Saturday and 8.00 am to 6.00 pm on Sundays and public holidays.

b. Evening is defined as the period from 6.00 pm to 10.00 pm.

c. Night is defined as the period from 10.00 pm to 7.00 am Monday to Saturday and 10.00 pm to 8.00 am on Sundays and public holidays.

**Table 5.1 Noise conditions**

Note: Noise contributions specified in Table 1 are to be interpreted as contributions from the new and upgraded components forming part of cement works upgrade only and not as noise limits for the site as a whole. (Footnote: 2 Incorporates EPA General Terms of Approval (L4.1 and L4.2))

**M2.4** <sup>3</sup>The maximum allowable noise contributions identified in condition 2.3 apply under all meteorological conditions, except:

- a) during wind speeds greater than 3 ms<sup>-1</sup> measured at 10 metres above ground level; or
- b) during temperature inversion conditions of greater than 3oC/100 m and wind speeds of greater than 2 ms<sup>-1</sup> measured at 10 metres above ground.

(Footnote: 3 Incorporates an EPA General Term of Approval (L4.4))

**M2.5** <sup>4</sup>For the purpose of assessment of noise contributions specified under condition 2.3, noise from the cement works upgrade shall be:

- a) measured at the most affected point on or within the receptor site boundary or at the most affected point within 30m of the dwelling (rural situations), where the dwelling is more than 30m from the property boundary; and
- b) where applicable, subject to the modification factors provided in Section 4 of the New South Wales Industrial Noise Policy (EPA, 2000).

(Footnote: 4 Incorporates an EPA General Term of Approval (L4.3))

**M2.6** Notwithstanding condition 2.5 of this consent, should direct measurement of noise from the site be impractical, the Applicant may employ an alternative noise assessment method deemed acceptable by the EPA (refer to Section 11 of the New South Wales Industrial Noise Policy (EPA, 2000)). Details of such an alternative noise assessment method accepted by the EPA shall be submitted to the Director-General prior to the implementation of the assessment method.

**Table 5.2 Response to noise conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.1</b>	There was no construction activity during the reporting period.	N/A	N/A
<b>K3.1A</b>	There was no construction activity during the reporting period.	N/A	N/A
<b>K3.1B</b>	There was no construction activity during the reporting period.	N/A	N/A

**Table 5.2 Response to noise conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.2</b>	The noise assessment demonstrated that Kiln 6 operated within the objectives required to achieve contribution criteria during the reporting period and should be allowed to continue operating 24 hours/day, 7 days/week (Figure 5.1).	The noise sources at Kiln 6 produced more noise in 2016 than they did in 2005 but overall remain below the objective sound pressure levels. One exception is the new radicon cooler, which generated slightly more noise than the objective (Figure 5.1). However, the contribution of this component to the overall noise generated by Kiln 6 was not enough to result in an exceedance of criteria.  Increases of more than 7 dBA would be required to lead to potential exceedances of criteria.	Existing management measures effectively contain noise levels below contribution criteria. However, Boral will ensure inspection hatches are closed when not in use and applying cladding/noise absorbing material in certain areas.
<b>K3.3</b>	The noise assessment demonstrated that Kiln 6 operated within the objectives required to achieve contribution criteria at the residential locations during the reporting period.	Trends at the receivers are: <ul style="list-style-type: none"> <li>• 4 Melbourne Street – this location is an interface area between industrial and residential land uses and is heavily influenced by road noise. The long term average noise level is 46 dBA, which is above the recommended maximum noise level of 45 dBA. However, Kiln 6 noise levels are below the contribution criteria.</li> <li>• Chelsey Park Farm and Candowie Farm – noise was not measured at these receivers as the residences have been demolished and the properties are being developed for industrial uses.</li> </ul>	Existing management measures effectively contain noise levels below contribution criteria. However, Boral will ensure inspection hatches are closed when not in use and apply cladding/noise absorbing material in certain areas.
<b>M2.1</b>	There was no construction activity during the reporting period.	N/A	N/A
<b>M2.2</b>	The noise assessment predicted that Mill 7 operated within the contribution criteria during the reporting period and should be allowed to continue operating 24 hours/day, 7 days/week (Figure 5.2).	Sound power levels near Mill 7 varied compared to those from previous years with a number of exceedances of contribution criteria. However, the exceedances are attributed to noise contributions from adjacent plant and noise levels from Mill 7 are below contribution criteria (Figure 5.2).	Existing management measures effectively contain noise levels below contribution criteria.



**Table 5.2 Response to noise conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>M2.3</b>	The noise assessment predicted that Mill 7 operated within the contribution criteria at the residential locations during the reporting period, including for the worst case weather scenario.	<p>The sound levels were mostly the same or less than results for previous years, or within measurement variation error (+/- 2 to 3 dB).</p> <p>Some Mill 7 locations had higher sound levels compared to 2012 or earlier measurements. Where levels were higher they were mostly considered to be not caused by Mill 7 emissions.</p> <p>Measurement locations near Mill 7 with sound levels 3 dB above previous sound levels are in Figure 5.3, which shows predicted contribution sound levels at receivers based on distance attenuation. The locations in Figure 5.3 are shown in Figure 5.4. It is shown in Figure 5.3 that potential exceedances are attributable to contributions from other plant at the site; not only from Mill 7.</p> <p>Note: noise was not measured at Candowie Farm as the residence has been demolished and the property is being developed for industrial uses.</p>	Existing management measures effectively contain noise levels below contribution criteria. However, Boral will ensure inspection hatches are closed when not in use and apply cladding/noise absorbing material in certain areas.
<b>M2.4</b>	Figure 5.2 shows that noise levels from Mill 7 are predicted to be below contribution levels at receivers during worst case weather conditions.	<p>The sound levels were mostly the same or less than results for previous years, or within measurement variation error (+/- 2 to 3 dB).</p> <p>Some Mill 7 locations had higher sound levels compared to 2012 or earlier measurements. Where levels were higher they were mostly considered to be not caused by Mill 7 emissions.</p>	Existing management measures effectively contain noise levels below contribution criteria. However, Boral will ensure inspection hatches are closed when not in use and apply cladding/noise absorbing material in certain areas.
<b>M2.5</b>	The Adelaide Street monitoring was conducted at a property at the intersection of Adelaide Street and Taylor Avenue (Figure 5.5). Attended monitoring was conducted at Argyle Street near the intersection with Taylor Avenue.	Trends in noise monitoring results are addressed above.	Noise will continue to be monitored at the specified locations.
<b>M2.6</b>	Section 11 of the INP provides the following alternate methods for determining compliance:	This method has been used in previous AEMRs for the site with the results accepted by DP&E.	No management measures required.

**Table 5.2      Response to noise conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
	<ol style="list-style-type: none"> <li>1. measuring existing noise levels with and without the premises operating;</li> <li>2. measuring the noise emissions from each of the premises at reference locations and then calculating the noise-emission levels back to the receiver; and</li> <li>3. using an accepted noise model calibrated for the particular locality and source.</li> </ol> <p>Method 2 was used for Mill 7.</p>		

Location	Year	Time	Period d:h:m:s	Sound Level dB(A) L <sub>eq</sub>	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAeq level at receiver distance only				
Adelaide	Brisbane	Melbourne	Argyle	South							
<b>CM7</b>						Objective Night	40	40	40	40	37
CM7 D At corner N of Admin F 541	2016	4:29 PM	0d 00:00:30	72	Distance	25	617	611	610	778	541
	2010			67	Source after DfR		72	72	72	72	38
			Difference	5	Distance reduction		-25	-28	-28	-30	-27
					Calculated SPL without barriers		48	45	45	42	11
					Noise is from other sources, not just CM7						
CM7 H W roller door @ 1m F545	2016	4:33 PM	0d 00:00:30	81	Distance	1	648	638	628	791	1616
	2011			77	Source after DfR		84	87	70	72	88
			Difference	4	Distance reduction		-85	-56	-55	-58	-54
					Calculated SPL without barriers		10	11	14	14	4
CM7 M Between wall vents @ 1m to wall F552	2016	4:39 PM	0d 00:00:30	71	Distance	1	617	611	610	778	1647
	2011			67	Source after DfR		71	71	71	87	38
			Difference	4	Distance reduction		-84	-56	-55	-58	-54
					Calculated SPL without barriers		17	16	16	9	-27
CM7 G - Line N side of transfer house 13.5m to R, in-line W edge CM7	2016	4:41 PM	0d 00:01:09	76	Distance	13.5	617	611	610	778	1647
	2011			68	Source after DfR		76	76	76	72	38
			Difference	7	Distance reduction		-32	-33	-33	-35	-42
					Calculated SPL without barriers		43	42	42	37	-3
					No change since 2013 but influenced by F502 and dependent on other sources e.g. K5						
CM7 K Line level with G centre of compressor house F555	2016	#####	4:42 PM	72	Distance	13.5	617	611	610	778	1647
	2011			68	Source after DfR		72	72	72	71	38
			Difference	4	Distance reduction		-32	-33	-33	-35	-42
					Calculated SPL without barriers		40	39	39	36	-4
CM7 O Line E side of Comp House 13.5m to control point F556	2016	#####	4:43 PM	78	Distance	13.5	617	611	610	778	1647
	2011			67	Source after DfR		78	78	78	72	38
			Difference	11	Distance reduction		-32	-33	-33	-35	-42
					Calculated SPL without barriers		42	40	40	37	-3
CM7 K' 6.9m from centre of N wall comp house F558	2016	#####	4:45 PM	74	Distance	6.5	617	611	610	778	1647
	2012			69	Source after DfR		74	74	74	72	38
			Difference	5	Distance reduction		-37	-39	-39	-41	-48
					Calculated SPL without barriers		36	35	35	31	-9
CM7 P 1m N roll door CM7 F560	2016	4:47 PM	0d 00:00:32	81	Distance	1	628	626	620	780	1637
	2011			76	Source after DfR		81	81	81	80	48
			Difference	5	Distance reduction		-84	-56	-55	-58	-54
					Calculated SPL without barriers		27	25	25	22	-19
CM7 Q 1m E man-door CM7 Comp. House F561	2016	4:48 PM	0d 00:00:31	78	Distance	1	628	626	620	780	1637
	2011			68	Source after DfR		87	84	82	58	82
			Difference	10	Distance reduction		-84	-56	-55	-58	-54
					Calculated SPL without barriers		13	8	6	2	-2

Figure 5.3 Measurement locations with increase in sound level >3 dB and calculated contribution sound level at receivers

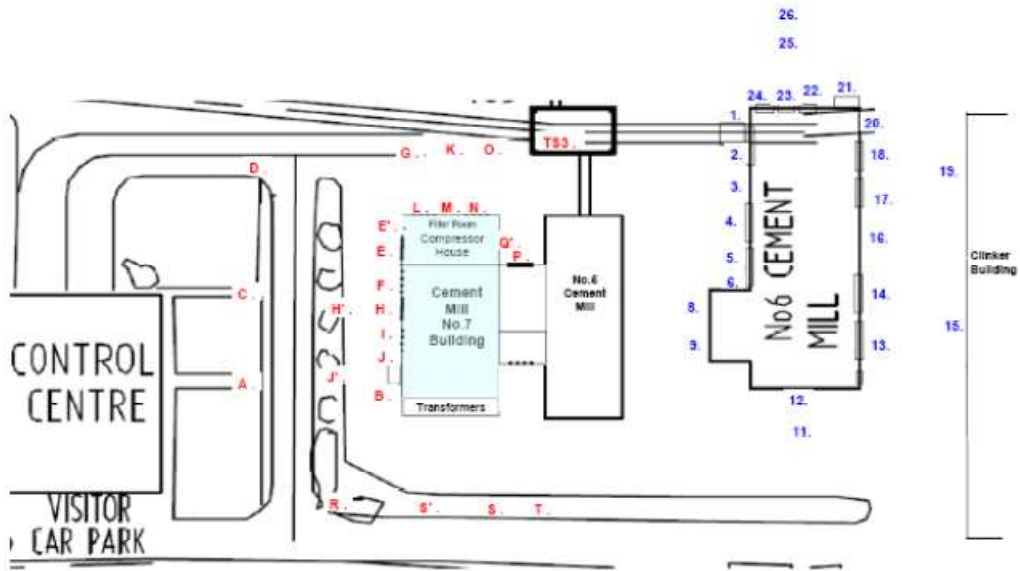


Figure 3.7: Blue Circle Southern Cement Berrima CM7 Noise Assessment - Plan view of external measurement locations around Cement Mill No.7 and Cement Mill No.6

2016 figures.xls

Figure 5.4 Mill 7 noise measurement locations



Figure 5.5 Long term and residential monitoring locations

### 5.3 Air quality

Boral Cement is acutely aware that elevated fugitive dust emissions from the site can occur and to combat this has active dust management controls in place as set out in the Dust Management Plan, which is operated across the site.

Table 5.3 sets out the relevant air quality conditions for the site within the two development consents. Table 5.4 below set out the site's performance during the past year relating to air quality and the key management measures that are used to minimise dust being generated and leaving the site which include:

- controlling dust from stock piles using methods including the compaction of stockpile batters (being pushed up with a loader), wetting down with a water cart in dry weather conditions and stopping loading/unloading operations in high winds;
- controlling vehicles (ensuring they are covered and have used wheel washes for example);
- revegetating areas and planting trees to act as wind breaks;
- sealing roads or closing off unused roads;
- using a road sweeper and water carts to minimise traffic generated and wind blown dust from trafficable areas; and
- modifying its activities such as loading, unloading and crushing of materials in open areas to minimise wind blown dust by the use of a water carts, stopping or postponing the activities during times of high wind, modifying the process to take place under cover where possible.

In addition to controlling fugitive dust emissions by implementing the actions outlined above, Boral Cement operates its plant to ensure point source emissions meet required standards. Both the continuous monitoring data of particles (Kiln 6) and specialised testing of Kiln 6 and Mill 7 in July/August 2016 showed compliance with agreed standards both over the 2016-17 reporting year and consistently over the last 5 years. Further details are given below in Table 5.4.

Boral Cement maintains a dust deposition monitoring program, currently consisting of seven dust deposition gauges located around the perimeter of the site. Samples are collected from each gauge on a monthly basis to assess compliance against the EPA's dust deposition guidelines.

As discussed in the body of this section, average dust deposition data for all seven current dust gauges for the reporting period have values well below the EPA guideline of 4 g/m<sup>2</sup>/month, with only one location (Gauge 3) above 2 g/m<sup>2</sup>/month, and Gauge 3 did not exceed 2.5 g/m<sup>2</sup>/month. These results confirm that the current dust control measures on site are generally working well.

A total of 16 complaints were received from the community in relation to the deposition of dust on vehicles and properties. All the complainants were contacted after the complaints were received. Further details are provided in Appendix E - Complaints Summary.

**Table 5.3**      **Air quality conditions**

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**(K = Kiln 6, M = Mill 7)**

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**K3.7 Dust Minimisation** The Applicant shall design, construct, operate and maintain the cement works upgrade in a manner that minimises dust emissions from the site and complies with the EPL.

**K3.7A** The Applicant shall apply all reasonable and feasible measures to minimise the generation of dust from coal stockpiles, including but not necessarily limited to:

- a) compaction of stockpile batters to minimise pick up of dust;
- b) installation of water sprays or use of a water cart to keep stockpile surfaces wet, if dust is being generated; and
- c) cessation of stockpile generation during periods of high wind, if dust generation cannot be controlled.

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**K3.8** The Applicant shall take all practicable measures to ensure that all vehicles entering or leaving the site and carrying a load that may generate dust are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times.

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**K3.9** All trafficable areas and vehicle manoeuvring areas on the site shall be maintained in a condition that will minimise the generation or emission of wind blown or traffic generated dust from the site at all times.

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**M2.7 Dust Emissions**<sup>5</sup> The Applicant shall design, construct, operate and maintain the cement works upgrade in a manner that minimises dust emissions from the site. The raw material storage bunker associated with the cement works upgrade shall be maintained in a condition that effectively eliminates wind generated dust emissions. Dust collection systems shall be provided to all potential sources of dust production associated with the cement works upgrade. (Footnote: 5 Incorporates EPA General Terms of Approval (O2.1 and O2.2))

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**M2.8** The Applicant shall take all practicable measures to ensure that all vehicles entering or leaving the site and carrying a load that may generate dust are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times.

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**M2.9** All trafficable areas and vehicle manoeuvring areas associated with the cement works upgrade shall be maintained in a condition that will minimise the generation or emission of wind blown or traffic generated dust from the site at all times.

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**K3.10 Air Quality Discharges** The Applicant shall install and operate equipment in line with best practice to ensure that the Development complies with all load limits, air emission limits and air quality monitoring requirements as specified in the EPL for the site.

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**K3.10A Deleted**

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**M2.10 Discharge Limits**<sup>6</sup> The Applicant shall design, construct, operate and maintain the cement works upgrade to ensure that total solid particle emission from the exhaust stack on Cement Mill No.7 (EPA Identification Point 10) does not exceed 20 mg/m<sup>3</sup> (100% concentration limit). The concentration limit specified above is based on 101.3 kPa, 273 K, dry reference conditions and shall be determined in accordance with the monitoring requirements described under condition 3.1. To avoid any doubt, this condition does not authorise the discharge or emission of any other pollutants. (Footnote: 6 Incorporates EPA General Terms of Approval (P1.1, L2.1 and L2.2))

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**Table 5.4 Response to air quality conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.7</b>	<p><b>Dust monitoring</b></p> <p>Seven (7) dust monitoring gauges are located around the perimeter of the site and the New Berrima community. The locations of the gauges are shown on Figure 3.2.</p> <p>Samples are collected from each gauge on a monthly basis to assess compliance against the dust deposition guidelines detailed in the Approved Methods and Guidance for Analysis for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2005). As there is no emission limit specified in the Licence, the EPA dust deposition guideline of 4 g/m<sup>2</sup>/month (expressed as a 12-month rolling average) has been adopted for the Site.</p> <p>As can be seen in Figure 5.2, average dust deposition data for all seven current dust gauges for the reporting period have values below the EPA guideline of 4 g/m<sup>2</sup>/month, with only one location (gauge 3) above 2 g/m<sup>2</sup>/month, and Gauge 3 did not exceed 2.5 g/m<sup>2</sup>/month.</p> <p><b>Stack Emissions</b></p> <p>For the EPL year 1 April 2016 to the 30 May 2017, stack emission monitoring data for Kiln 6 also shows that the Works maintained emissions well under the EPA limit for the whole year as seen in Figure 5.4.</p> <p>Periods where emissions were zero correspond with Kiln outages. For example, the majority of January 2017 was the FY17 Kiln overhaul project.</p> <p>A total of 16 complaints were received from the community in relation to the deposition of dust on vehicles and properties. The complainants were contacted after the complaints were received. Further details are provided in Appendix E -Complaints Summary.</p>	<p>The graph in Figure 5.3 shows the results of the analysis of the dust gauges located around the site and the New Berrima community from January 2011-April 2017. As can be seen, the current data shows that we remain below the EPA guideline of 4 g/m<sup>2</sup>/month. Note that Dust Gauges 4 and 6 were removed by agreement in 2013.</p> <p>Long term continuous stack emission monitoring of particle emission for Kiln 6 (see Figure 5.5) shows particulates have been continuously within EPA Standards since a single exceedance in June 2013.</p> <p>Boral Cement Berrima will continue to respond rapidly to, thoroughly investigate, and rectify any dust complaints received from the local community. Increased focus on door closures, hazard reporting and preventative maintenance remains key to minimising dust impacts internally and externally.</p>	<p>Dust control is a fundamental part of the operational management of this site. Dust is controlled through the implementation of the Dust Management Plan. As sound control measures are in place and this is supported by monitoring data, these operations will continue.</p>



**Table 5.4**      **Response to air quality conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.7A</b>	See K3.7 above under 'Dust Monitoring'.	<p>Reasonable and feasible measures are being implemented to minimise fugitive dust from coal stockpiles. This includes compaction of stockpile batters (being pushed up with a loader), wetting down with a water cart in dry weather conditions and stopping loading/unloading operations in high winds.</p> <p>The site's re-vegetation program included planting in the areas surrounding the stockpiles to create a windbreak and a dust screen.</p>	
<b>K3.8</b>	No complaints were received during this period and no related issues arose during this period.	<p>All transport contractors are made aware of this requirement during site inductions. Section 3 of the Driver Code of Conduct – Truck and Heavy Vehicles Operator, which is part of the Berrima Traffic Management Plan (Boral Cement Berrima, reviewed in September 2014) includes requirements for all drivers of heavy vehicles on site to ensure they cover their loads and prevent spillages.</p>	

**Table 5.4 Response to air quality conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.9</b>	<p>See K3.7 above under 'Dust Monitoring'.</p> <p>During this reporting period Boral Cement has actively worked to reduce the generation of dust from vehicles and internal haul roads through implementation of the Dust Management Plan.</p>	<p>Some of the unsealed roads on site have been sealed in the previous years and some have been closed off and recently re-vegetated. Two wheel wash stations were installed in the previous reporting period, one at the exit of a shale pad, the other at the end of Quarry Road. The wheel wash stations continue to be routinely used.</p> <p>Boral Cement operates a road sweeper and water carts to minimise traffic generated and wind blown dust from trafficable areas and vehicle manoeuvring areas. Mechanical sweepers undergo regular maintenance programs, to ensure sweepers are working efficiently.</p> <p>Boral Cement modified its activities such as loading, unloading and crushing of materials in open areas to minimise wind blown dust. Actions include the use of a water cart, stopping or postponing the activities until the windy conditions subside, modifying the process to take place under cover where possible, etc.</p>	<p>Boral Cement continues to investigate opportunities to reduce Fugitive Dust throughout the site. Issues are managed through immediate corrective action and reporting through the Incident Management Database SIMS.</p>
<b>M2.7</b>	Covered under KK3.7 and K3.7A		
<b>M2.8</b>	Covered under K3.8		
<b>M2.9</b>	Covered under K3.9		

**Table 5.4 Response to air quality conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions																										
<b>K3.10</b>	<p>Stack emission monitoring for Kiln 6 for standard fuels was conducted by Ektimo in July and August 2016 in accordance with the sampling methods specified under EPL 1698. The report demonstrated compliance with the emission limits for standard fuels for all monitoring parameters (see the table below).</p> <p>No non-standard fuels were used during this reporting period so no non-standard fuels stack testing was required.</p> <p>Copies of the annual stack testing reports for 2017 are provided as Appendices B and C.</p> <p><b>Kiln 6 Stack Emission Monitoring Results - Standard Fuels</b></p> <table border="1" data-bbox="338 874 987 1074"> <thead> <tr> <th>EPA Identification Point</th> <th>Pollutant</th> <th>Units of Measure</th> <th>Emission Limit</th> <th>Stack Test 2016</th> </tr> </thead> <tbody> <tr> <td rowspan="5">2 – Main Exhaust Stack Kiln No 6</td> <td>Cadmium</td> <td>mgm<sup>-3</sup></td> <td>0.1</td> <td>&lt;0.0003</td> </tr> <tr> <td>Mercury</td> <td>mgm<sup>-3</sup></td> <td>0.1</td> <td>0.014</td> </tr> <tr> <td>Hazardous substances</td> <td>mgm<sup>-3</sup></td> <td>1.0</td> <td>&lt;0.0049</td> </tr> <tr> <td>Nitrogen oxides</td> <td>mgm<sup>-3</sup></td> <td>1000</td> <td>830</td> </tr> <tr> <td>Solid particles</td> <td>mgm<sup>-3</sup></td> <td>95</td> <td>21</td> </tr> </tbody> </table>	EPA Identification Point	Pollutant	Units of Measure	Emission Limit	Stack Test 2016	2 – Main Exhaust Stack Kiln No 6	Cadmium	mgm <sup>-3</sup>	0.1	<0.0003	Mercury	mgm <sup>-3</sup>	0.1	0.014	Hazardous substances	mgm <sup>-3</sup>	1.0	<0.0049	Nitrogen oxides	mgm <sup>-3</sup>	1000	830	Solid particles	mgm <sup>-3</sup>	95	21	<p>A summary of continuous particulate monitoring data for Kiln 6 since 2012 is presented below in Figure 5.5.</p> <p>This long term continuous stack emission monitoring of particle emission (shows particulate levels have been continuously within EPA standards since a single exceedance in June 2013).</p>	
EPA Identification Point	Pollutant	Units of Measure	Emission Limit	Stack Test 2016																									
2 – Main Exhaust Stack Kiln No 6	Cadmium	mgm <sup>-3</sup>	0.1	<0.0003																									
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	Nitrogen oxides	mgm <sup>-3</sup>	1000	830																									
	Solid particles	mgm <sup>-3</sup>	95	21																									
	<p>The summary of stack monitoring data for Kiln 6 since 2003 is presented in graphs Appendix D i/ii</p>																												
	<p><b>Continuous Emissions Monitoring</b></p> <p>A summary of continuous particulate monitoring data for Kiln 6 from May 2016 to April 2017 is presented below. The Works was in compliance with the licence limit for continuous monitoring of solid particles (for standard fuels) in the whole reporting period. The kiln operated for a total of 7,681.8 hours during this reporting period.</p>																												

**Table 5.4 Response to air quality conditions**

**Approval criteria / EIS prediction**                      **Performance during the reporting period**                      **Trend / key management implications**                      **Implemented / proposed management actions**

**Kiln 6 Stack Emission Monitoring Results – Solid particles (24hr average)**

EPA Identification Point	Pollutant	Units of Measure	Emission Limit	Range	Annual Average
2 – Main Exhaust Stack Kiln No 6	Solid particles (24-hr average)	mgm <sup>-3</sup>	95	0 – 50.0	18.5

**M2.10**

Stack emission monitoring of solid particles for Mill 7 was conducted by Ektimo in July and August 2016 in accordance with the sampling methods specified under EPL 1698. The report demonstrated compliance with the emission limit as shown in the table below.

Copies of the annual stack testing reports for 2017 are provided as Appendices B and C.

**Cement Mill 7 - Stack Emission Monitoring Results – Solid particles**

EPA Identification Point	Pollutant	Units of Measure	Emission Limit	Range	Average
EPA 10: No 7 Cement Mill Stack	Solid particles	mgm <sup>-3</sup>	20	<2 – 3.9	≤2.7

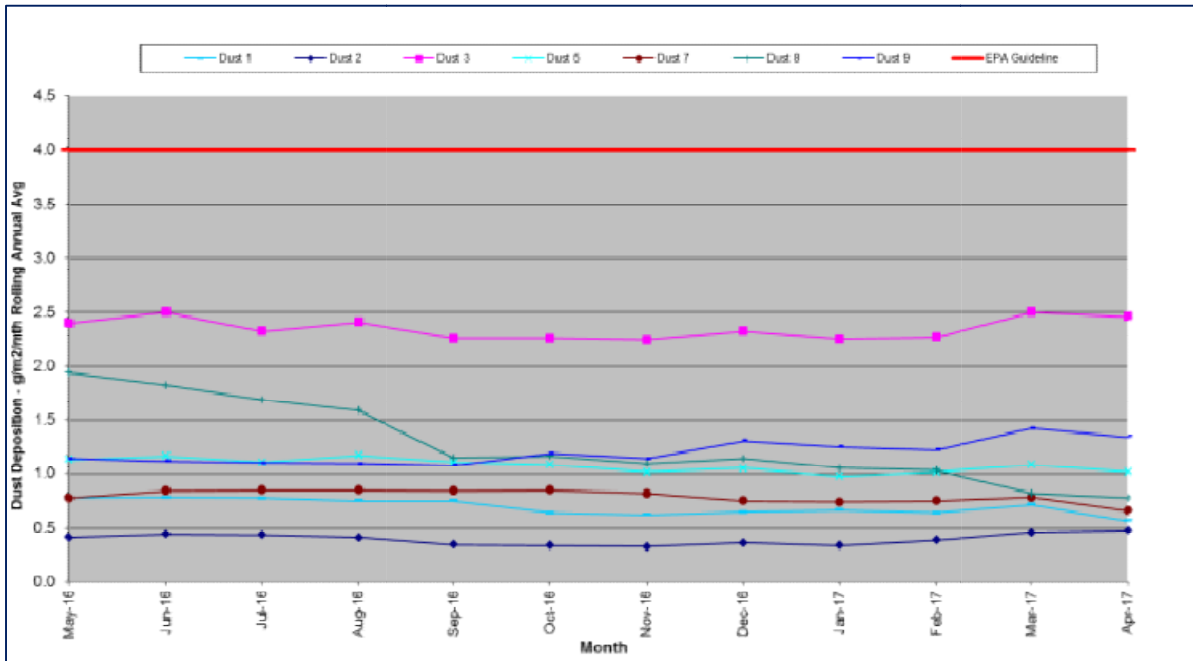


Figure 5.6 Total dust deposition (12 month rolling average) Berrima Cement Works – May 2016 to April 2017

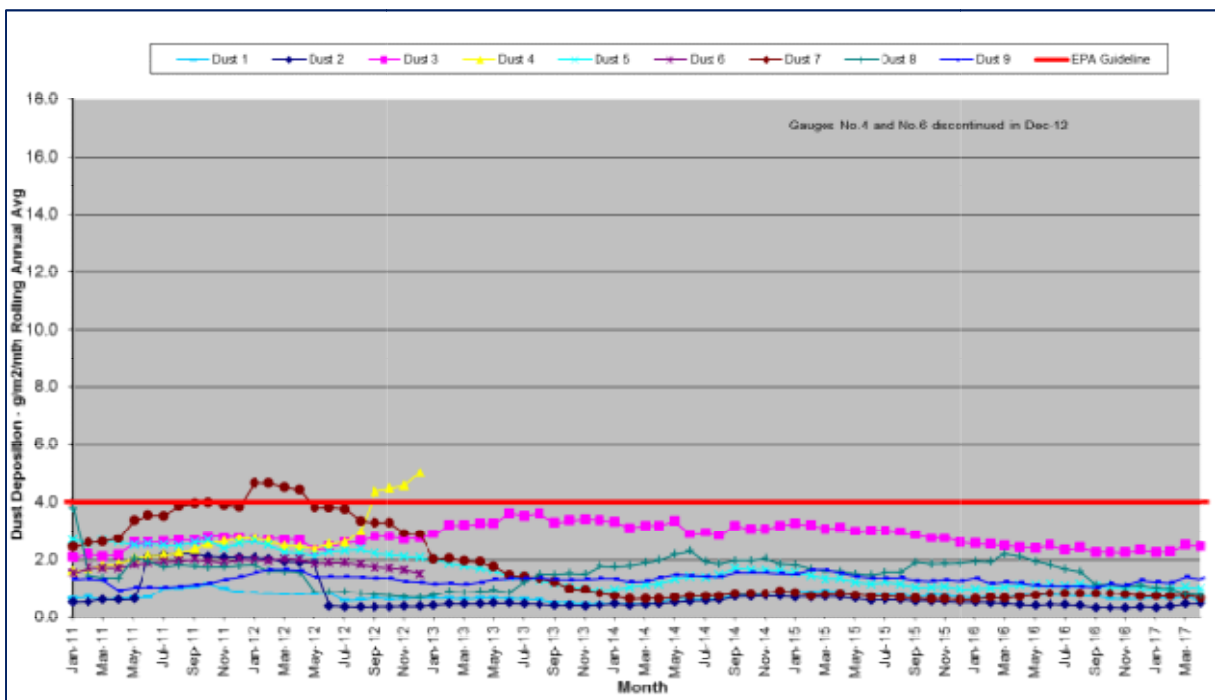
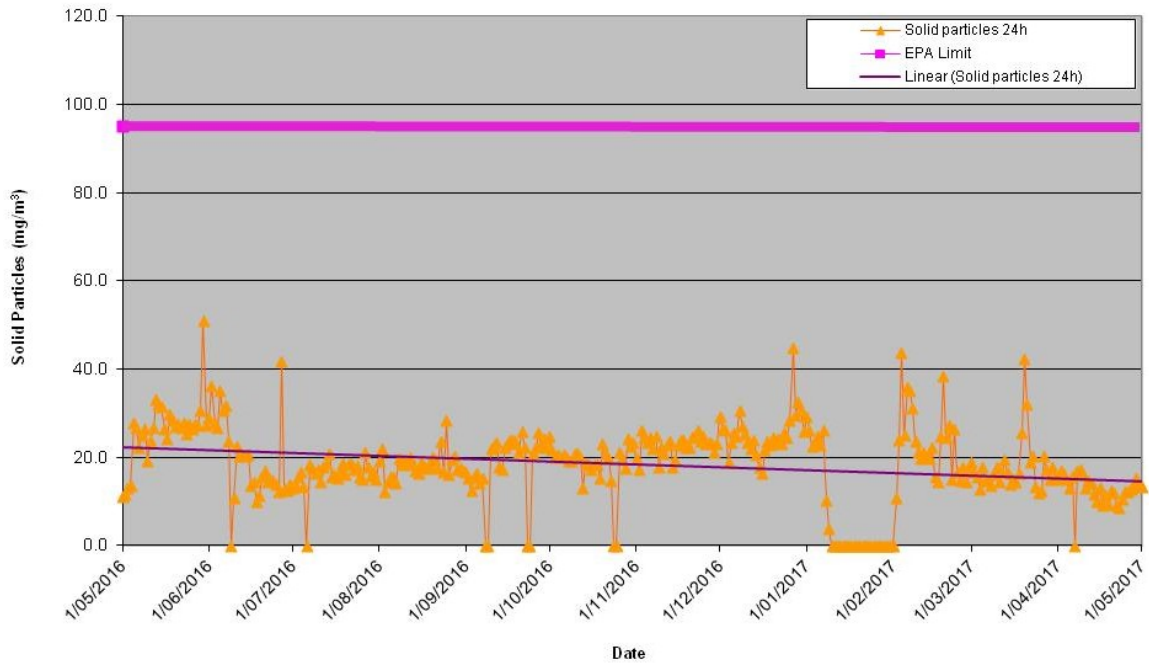
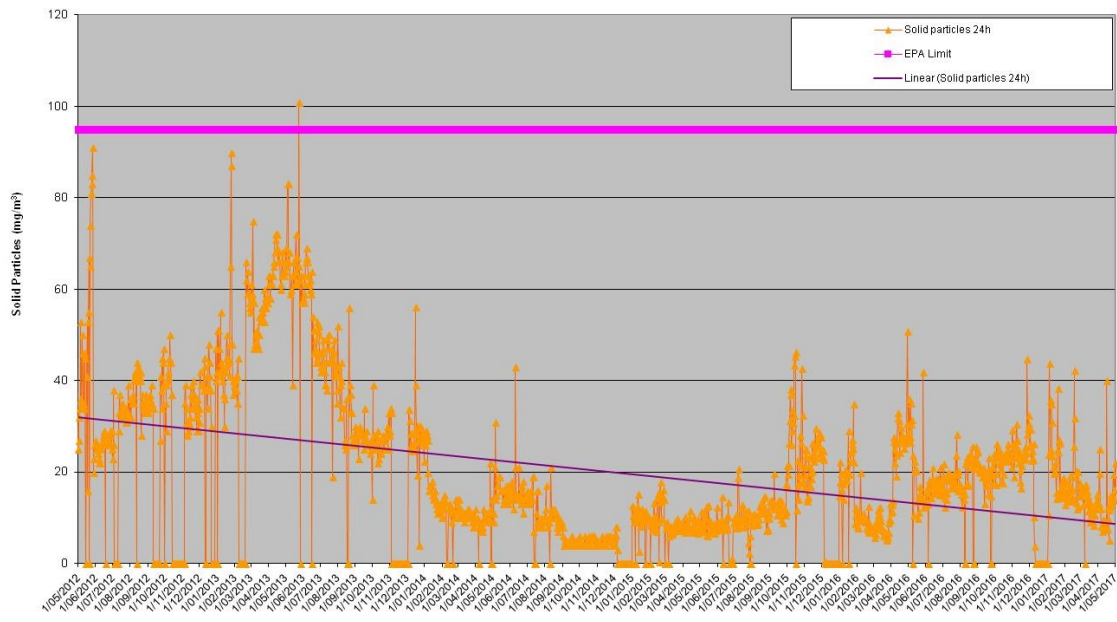


Figure 5.7 Total dust deposition (12 month rolling average) Berrima Cement Works – January 2011 to April 2017



**Figure 5.8** Kiln 6 stack particle emissions – continuous data May 2016 to April 2017



**Figure 5.9** Kiln 6 stack particle emissions – continuous data May 2012 to April 2017

## 5.4 Soils and water quality

The consent requirements for soils and water quality for Kiln 6 are in conditions 3.11 to 3.14 of Development Consent No. 401-11-2002-i and for Mill 7 in conditions 2.11 to 2.14 of Development Consent No. 85-4-2005-i, which are replicated in Table 5.5. The consents refer to EPL 1698, however, there are no water discharge limits in the EPL.

Table 5.6 below set out the site's performance during the past year relating to soils and water quality and the key management measures that are used at the site.

Boral manages water on site in accordance with the Water Management Plan, which describes the monitoring points, frequency and parameters. Storm water and residual process water from all areas of the Works (including Kiln 6 and Mill 7) is harvested and used on site with water quality in the storages (Lake Quality and Lake Breed) tested monthly, and water quality in the receiving waterway (Wingecarribee River) tested every three months. Water is only discharged from site during very heavy rainfall, with eight overflows during the reporting period.

Three of the conditions relate to construction, however, there was no construction during the reporting period. It is demonstrated in Table 5.6 that the overall water management performance of the site is good and that water quality results were in line with and in some instances better than historical results (see also figures 10 to 13). This indicates that the water management performance at Kiln 6 and Mill 7 is also good and that the conditions have been complied with during the reporting period.



**Table 5.5 Soils and water quality conditions**

<b>(K = Kiln 6, M = Mill 7)</b>	
<b>K3.11 Construction Soil and Water Management</b>	Soil and water management measures consistent with Managing Urban Stormwater – Soils and Construction Vol.1 (Landcom, 2004) (the Blue Book) shall be employed during construction of the Development to minimise soil erosion and the discharge of sediment and other pollutants to land and/or waters.
<b>K3.12</b>	All construction vehicles exiting the site, having had access to unpaved areas, shall depart via a wheel-wash facility.
<b>K3.13</b>	All erosion and sedimentation controls required as part of this consent shall be maintained for the duration of the construction works, and until such time as all ground disturbed by the construction works, has been stabilised and rehabilitated so that it no longer acts as a source of sediment.
<b>K3.14 Water Discharge Limits</b>	The Applicant shall ensure that all surface water discharges from the site comply with the: <ul style="list-style-type: none"> <li>a) discharge limits (both volume and quality) set for the development in any EPL; or</li> <li>b) relevant provisions of the POEO Act.</li> </ul>
<b>M2.11 Water Quality Impacts</b>	<sup>7</sup> Except as may be expressly provided by a licence under the Protection of the Environment Operations Act 1997 in relation to the cement works upgrade, section 120 of that Act (pollution of waters) shall be complied with in, and in connection with, the carrying out of the cement works upgrade. (Footnote 7: 7 Incorporates an EPA General Term of Approval (L1.1))
<b>M2.12 Erosion and Sediment Control</b>	All construction vehicles exiting the site, having had access to unpaved areas, shall depart via a wheel-wash facility.
<b>M2.13</b>	All erosion and sedimentation controls required as part of this consent shall be maintained for the duration of the construction works, and until such time as all ground disturbed by the construction works, has been stabilised and rehabilitated so that it no longer acts as a source of sediment.
<b>M2.14 Site Drainage and Stormwater</b>	The Applicant shall ensure that the cement works upgrade does not lead to an increase in the volume or flow rate of stormwater leaving the site over and above pre-development flow conditions.

**Table 5.6 Response to soils and water quality**

<b>Approval criteria / EIS prediction</b>	<b>Performance during the reporting period</b>	<b>Trend / key management implications</b>	<b>Implemented / proposed management actions</b>
<b>K3.11</b>	There was no construction activity during the reporting period.	N/A	N/A
<b>K3.12</b>	There was no construction activity during the reporting period.	N/A	N/A
<b>K3.13</b>	There was no construction activity during the reporting period.	N/A	N/A

**Table 5.6**      **Response to soils and water quality**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.14</b>	No water volume and quality discharge limits are specified in EPL 1698 and water was not regarded as a project risk (SLR 2015).	<p>Boral monitors overflows from Lake Quality, which receives stormwater from the site, for the parameters in figures 10 to 13. The water is reused in site processes and the lake only overflows during heavy rainfall. There were eight overflows during the reporting period and figures 10 to 13 demonstrate that water quality was in line with and in some instances better than historical results.</p> <p>Lake Quality's overflow generally meets the typical NSW discharge criteria. Occasionally, an exceedance of pH may occur in the overflow due to alkaline nature of raw materials and products handled on site.</p>	A Water Management Plan is implemented at the Works, which includes the Kiln 6 area and is reviewed every three years or after an incident and is revised/improved as deficiencies become apparent.
<b>M2.11</b>	No water volume and quality discharge limits are specified in EPL 1698.	<p>Boral monitors overflows from Lake Quality, which receives stormwater from the site, for the parameters in figures 10 to 13. The water is reused in site processes and the lake only overflows during heavy rainfall. There were eight overflows during the reporting period and figures 10 to 13 demonstrate that water quality was in line with and in some instances better than historical results.</p> <p>Lake Quality's overflow generally meets the typical NSW discharge criteria. Occasionally, an exceedance of pH may occur in the overflow due to alkaline nature of raw materials and products handled on site.</p>	A Water Management Plan is implemented at the Works, which includes the Mill 7 area and is reviewed every three years or after an incident and is revised/improved as deficiencies become apparent.

**Table 5.6**      **Response to soils and water quality**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>M2.12</b>	There was no construction activity during the reporting period.	N/A	N/A
<b>M2.13</b>	There was no construction activity during the reporting period.	N/A	N/A
<b>M2.14</b>	Compliance with this condition was established in the 2008 AEMR. Boral Cement harvests rainwater from the site catchment for operational use, which reduces stormwater leaving the site.		

## Lake Quality Overflow Events, 2010-2017

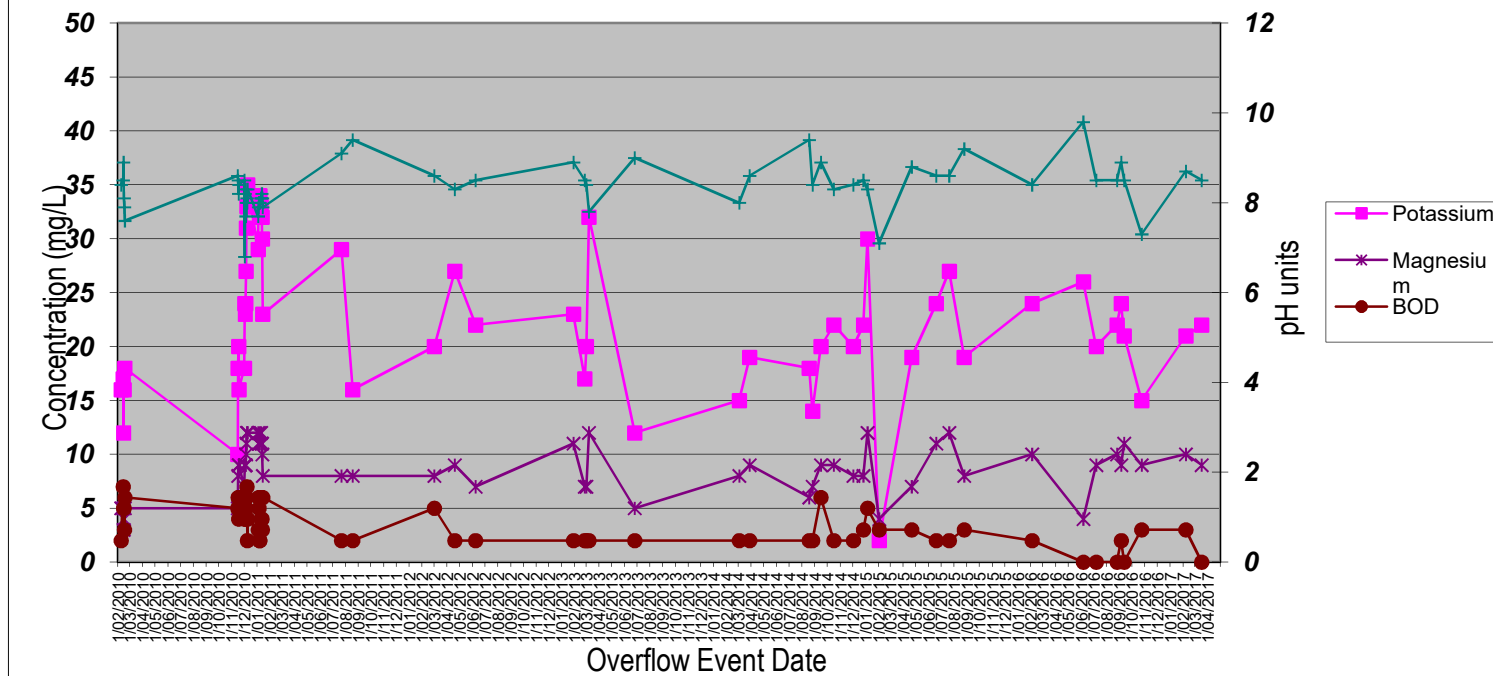


Figure 5.10 Lake Quality potassium, magnesium and biological oxygen demand results during overflows

### Lake Quality Overflow Events, 2010-2017

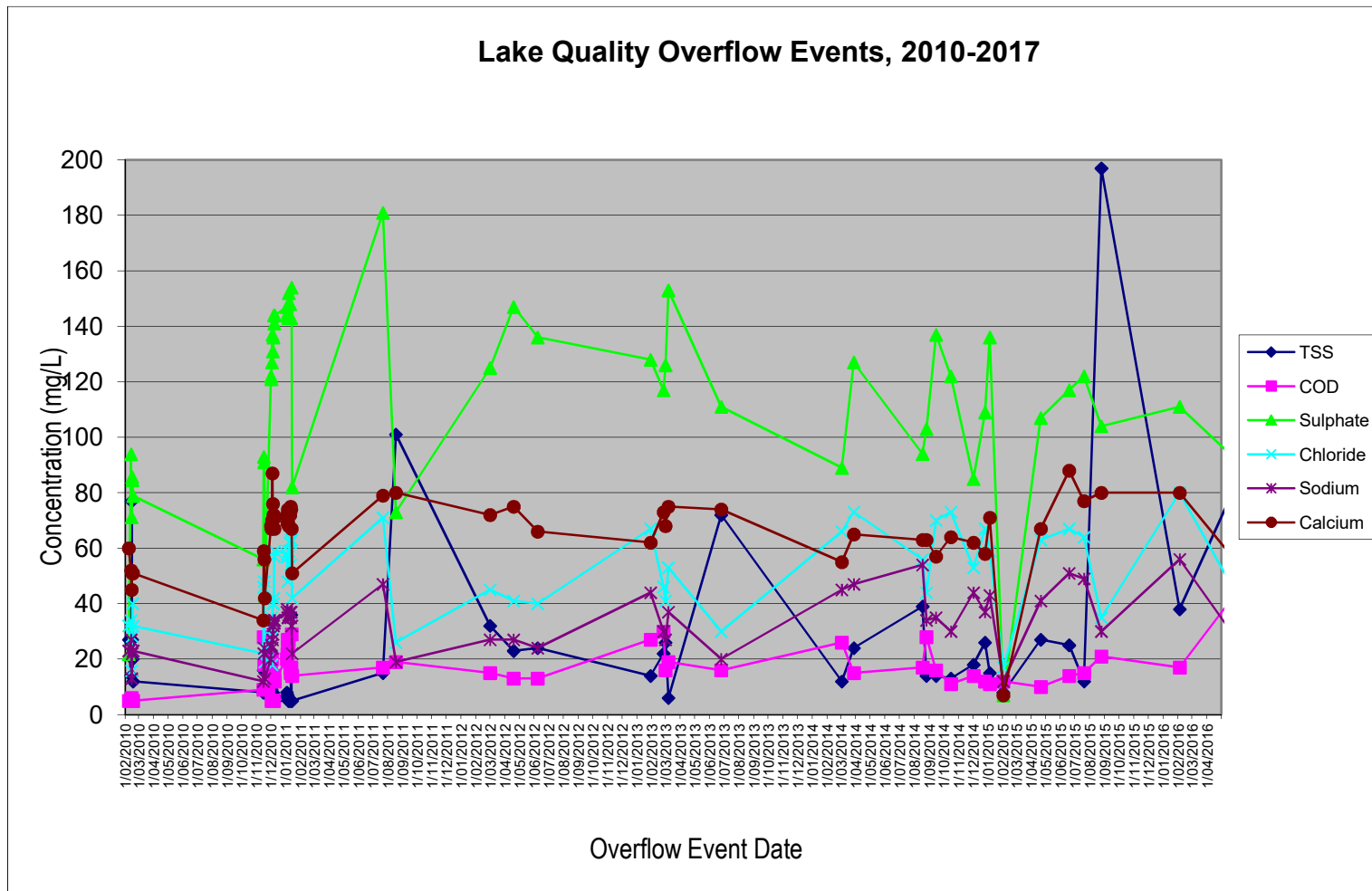


Figure 5.11 Lake Quality total suspended solids, chemical oxygen demand, sulphate and chloride results during overflows

### Attachment No 6 (c) Lake Quality Overflow Events, 2010-2017

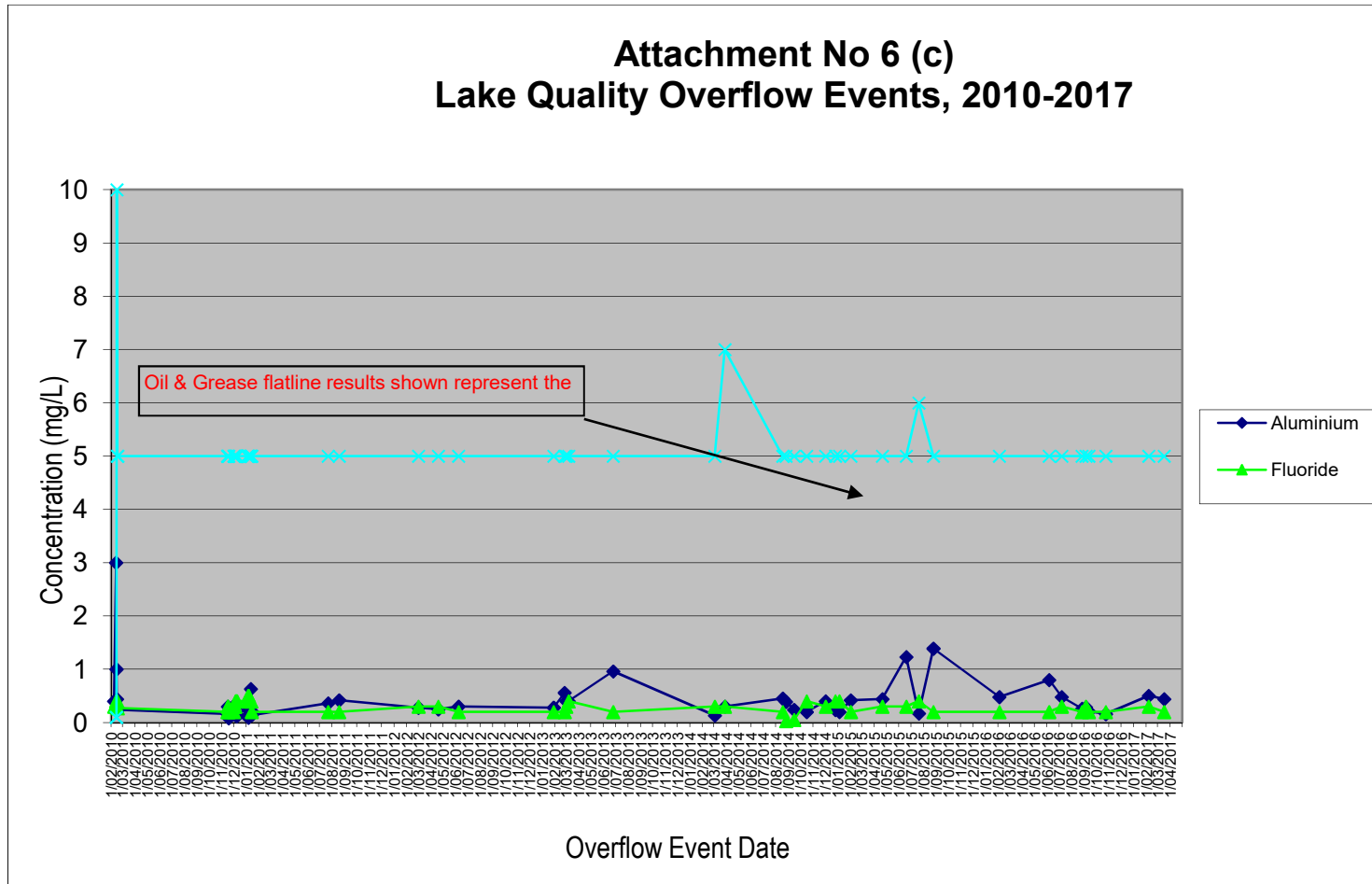


Figure 5.12 Lake Quality aluminium and fluoride results during overflows

### Attachment No 6 (d) Lake Quality Overflow Events, 2010-2017

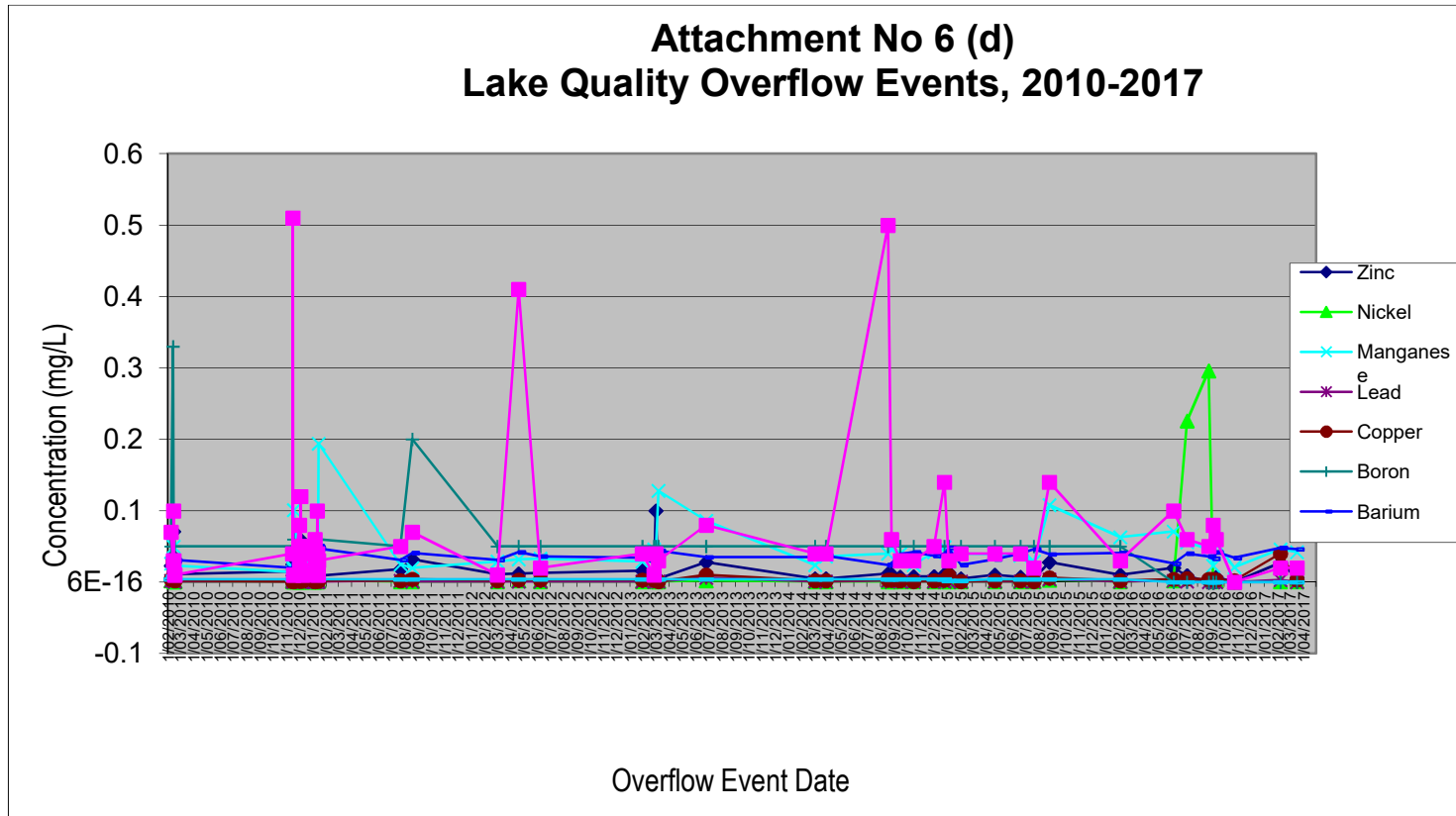


Figure 5.13 Lake Quality zinc, nickel, manganese, lead, copper and boron results during overflows



## 5.5 Traffic and transport

The requirements for traffic and transport for Kiln 6 are in conditions 3.15 to 3.16A of Development Consent No. 401-11-2002-i and for Mill 7 in conditions 2.15 to 2.17 of Development Consent No. 85-4-2005-i, which are replicated in Table 5.7.

Table 5.8 below set out the site's performance during the past year relating to traffic and transport and the key management measures that are used at the site.

Boral manages traffic on site in accordance with the Traffic Management Plan.

Four of the conditions relate to construction, however, there was no construction during the reporting period (Table 5.8). Two of the conditions relate to parking provision and truck queuing. Sufficient car parking has historically, and continues to be, provided to accommodate employee and visitor vehicles on site without the need to park on surrounding public roads. Deliveries of fuel and ingredient materials for Kiln 6, and ingredient materials for Mill 7, has not historically, and continues to not, require queuing of trucks along Taylor Avenue. Therefore, operations at Kiln 6 and Mill 7 complied with the traffic and transport consent conditions during the reporting period.

**Table 5.7 Traffic and transport conditions**

**(K = Kiln 6, M = Mill 7)**

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**K3.15 Traffic and Transport Impacts** The Applicant shall establish a bus transport system generally consistent with that identified in section 6.9 of the SEE to transport construction employees to and from the site during the construction period.

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**K3.16** The Applicant shall ensure that vehicles associated with the cement works upgrade do not stand or park on any public road or footpath adjacent to the site. Measures provided by the Applicant shall include sufficient parking for all employees and contractors during construction and operation of the cement works upgrade and management measures to ensure that heavy vehicles entering the site are not permitted to queue on Taylor Avenue at any time.

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**K 3.16A 3.16B 3.16C 3.16D 3.16E Port Kembla Coal Haulage Campaigns Deleted**

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**K3.16A** The Applicant shall pay a road maintenance levy to Council of 4 cents/tonne/km for the transport of SWDF.

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**M2.15 Traffic and Transport Impacts** The Applicant shall establish a bus transport system generally consistent with that identified in section 6.6.7 of the SEE referred to in condition 1.2b to transport construction employees to and from the site during the construction period.

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**M2.16** The Applicant shall ensure that vehicles associated with the cement works upgrade do not stand or park on any public road or footpath adjacent to the site. Measures provided by the Applicant shall include sufficient on-site parking for all employees and contractors during construction and operation of the cement works upgrade and management measures to ensure that heavy vehicles entering the site are not permitted to queue on Taylor Avenue at any time.

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**M2.17** The Applicant shall install an advance warning signage along Taylor Avenue to advise vehicles approaching the entrance to the site of turning truck traffic in the area. This signage is to be installed prior to the commencement of operations of the cement works upgrade. Details of the design and installation of this signage are to be provided to the satisfaction of the Director-General prior to the commencement of operations at the cement works upgrade.

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**Table 5.8 Response to traffic and transport conditions**

<b>Approval criteria / EIS prediction</b>	<b>Performance during the reporting period</b>	<b>Trend / key management implications</b>	<b>Implemented / proposed management actions</b>
<b>K3.15</b>	This condition refers to construction rather than the ongoing operation and therefore does not apply to this reporting period. Compliance has been demonstrated in the previous AEMRs.	Construction timeframes are short and no performance trends can be established.	No ongoing management required.
<b>K3.16</b>	Construction activities were completed prior to the commencement of this reporting period and therefore are not applicable. Employee car parking was extended 2 years ago. Employee car park has additional/unused capacity. Queuing has not been an issue/ has not been observed		
<b>K3.16A</b>	As no non-standard fuels including SWDF were used in the reporting period, no levy was payable.	Payment of the levy will commence once non-standard fuels start being received at the site.	Payment of the levy will commence once non-standard fuels start being received at the site.
<b>M2.15</b>	This condition refers to construction rather than the ongoing operation and therefore does not apply to this reporting period. Compliance has been demonstrated in the previous AEMRs.	Construction timeframes are short and no performance trends can be established.	No ongoing management required.
<b>M2.16</b>	Construction activities were completed prior to the commencement of this reporting period and therefore are not applicable. . Employee car parking was extended 2 years ago. Employee car park has additional/unused capacity. Queuing has not been an issue/ has not been observed		
<b>M2.17</b>	As previously reported, warning signage was installed along Taylor Avenue.	This was a one-off activity with no associated trends.	Signs will be replaced if damaged or defaced.

## 5.6 Waste management

The consent requirements relating to waste management for Kiln 6 are in conditions 3.17 to 3.17C of Development Consent No. 401-11-2002-i and for Mill 7 in Condition 2.18 of Development Consent No. 85-4-2005-i, which are replicated in Table 5.9. The consents refer to EPL 1698, which provides waste requirements in conditions L4, O5, O6.1/2/3/4/5/6/7, E3 and E4.

Table 5.10 below set out the site's performance during the past year relating to waste management and the key management measures that are used at the site.

Boral manages waste on site in accordance with the Waste Management Plan which describes recycling and disposal requirements for the different waste categories generated and used on site. This document and the Operation Environmental Management Plan have not yet been updated in accordance with Condition 6.7 to incorporate measures for management of non-standard fuels, as use of these fuels has not recommenced.

Most of the waste conditions in Development Consent No. 401-11-2002-i relate to use of non-standard fuels, however, as described above and in Table 5.10 their use has not recommenced. Most of the other conditions relate to the use of granulated blast furnace slag (slag), with compliance demonstrated in previous AEMRs.

**Table 5.9 Waste conditions**

**(K = Kiln 6, M = Mill 7)**

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**K3.17 Waste Management Impacts** Except as otherwise permitted by this consent and a licence issued under the Protection of the Environment Operations Act 1997 the Applicant shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing or disposal, or any waste generated at the site to be disposed of at the site.

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**K3.17A** Condition 3.17 of this consent only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require a licence under the Protection of the Environment Operations Act 1997 (POEO Act), and does not include:

- a) any Non-Standard Fuels approved for use at the upgraded Kiln 6 under this consent;
  - b) any material normally brought to the site for the purpose of cement clinker production (as detailed in the documents listed under condition 1.2 of this consent);
  - c) any material normally recycled or reused within the cement works; and
  - d) any material that is subject to a specific waste recovery exemption (RRE) issued by the EPA to exempt that material from the specific clauses of the Protection of the Environment(Waste) Regulation 2005.
- 

**M2.18 Waste Management Impacts** <sup>8</sup>The Applicant shall not cause, permit or allow any waste generated outside Cement Mill 7 to be received at Cement Mill 7 for storage, treatment, processing, reprocessing or disposal, or any waste generated at Cement Mill 7 to be disposed of at Cement Mill 7, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997. This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an environment protection licence under the Protection of the Environment Operations Act 1997. (Footnote 8: 8 Incorporates an EPA General Term of Approval (L3.1 and L3.2))

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**K3.17AB Alternative Raw material Trial - Granulated Blast Furnace Slag (GBFS)** Prior to the receipt of GBFS on-site, the Applicant must obtain a specific waste Resource Recovery Exemption (RRE) for GBFS from the EPA.

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**K3.17AC GBFS Trial Requirements** Provided that the specific waste RRE is obtained for GBFS, the Applicant shall trial the use of up to 3,000 tonnes of GBFS as an alternate raw material in Kiln 6. The Applicant shall:

- a) undertake the trial over a continuous 3 day period, unless otherwise agreed in writing by the Secretary;
  - b) conduct stack testing of all relevant air emissions and trace elements, to the satisfaction of the EPA; and
  - c) use quality controlled GBFS only.
-

**Table 5.9 Waste conditions**

**(K = Kiln 6, M = Mill 7)**

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**K3.17AD GBFS Trial Verification Report** Within 1 month of the completion of the GBFS trial, the Applicant shall prepare and submit a Verification Report to the Department to the satisfaction of the Director-General and the EPA.

The Verification Report shall include:

- (a) stack emissions monitoring data measured for the duration of the trial;
- (b) copies of all analytical test reports for all substances sampled and tested;
- (c) a comparison of monitoring results from the trial with the relevant EPA standards and requirements, as determined by the EPA.

---

**K3.17AE** Provided the results of stack testing for the GBFS trial confirm that the air pollutants emitted from the cement Kiln 6 meet the relevant EPA standards and requirements, the Applicant may commence full-scale usage of GBFS as a raw material additive in Kiln 6 at a maximum usage rate that is determined in writing by the Secretary in consultation with the EPA.

Note: the Applicant must not commence full-scale usage of GBFS as a raw material additive in Kiln 6 until it has received written approval from the Secretary. In addition, the maximum usage rate per annum of GBFS in cement Kiln 6 must not exceed 150,000 tonnes per annum.

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**K3.17B** Except as provided by any condition of a licence under the Protection of the Environment Operations Act 1997, only the following 'Group A' waste may be stored at the site:

- a) AKF1.

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**K3.17C** Except as provided by the condition of a licence under the Protection of the Environment Operations Act 1997, the Applicant must assess, classify and dispose of all wastes generated as a result of the use of Non-Standard Fuels in accordance with the NSW EPA's Waste Classification Guidelines.

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**Table 5.10 Response to waste conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.17</b>	No waste generated outside the Works was received at the site during the reporting period. Receipt of waste derived non-standard fuels permitted to be accepted at the site has not commenced.	The site has not historically received waste from offsite as truck loads are inspected at the gate in accordance with the Waste Management Plan. The Operational Environmental Management Plan will be updated in accordance with Condition 6.7 to incorporate measures for management of non-standard fuels prior to their use at the site.	The Waste Management Plan currently prohibits the acceptance of waste from offsite. This and the Operational Environmental Management Plan will be updated in accordance with Condition 6.7 to incorporate measures for management of non-standard fuels prior to their use at the site.
<b>K3.17A</b>	As described above and prohibited by Condition L4.1 of the EPL, no waste generated outside the Works was received at the site during the reporting period. Receipt of waste derived non-standard fuels permitted to be accepted at the site has not commenced.	The site has not historically received waste from offsite as truck loads are inspected at the gate in accordance with Condition L4.1 of the EPL and the Waste Management Plan.	The Waste Management Plan currently prohibits the acceptance of waste from offsite. This and the Operational Environmental Management Plan will be updated in accordance with Condition 6.7 to incorporate measures for management of non-standard fuels prior to their use at the site.
<b>M2.18</b>	Old refractory bricks are crushed and recycled back through the kiln to prevent the need for waste to be sent off site to landfill.	No waste materials	
<b>K3.17AB</b>	The site-specific resource recovery exemption for full-scale GBFS use was issued by EPA on 19 September 2012.	The use of GBFS since 2012 has not resulted in an increase in stack emissions (see responses to air quality).	Current management measures for the use of GBFS are achieving good outcomes.
<b>K3.17AC</b>	Compliance with this condition was detailed in the AEMR for 2013 – the trial was conducted between 14-16 May 2012 with stack testing on 15 May, the use of quality controlled GBFS and provision of a report on 13 July 2013.	The use of GBFS since 2012 has not resulted in an increase in stack emissions (see responses to air quality).	Current management measures for the use of GBFS are achieving good outcomes.
<b>K3.17AD</b>	Compliance with this condition was detailed in the AEMR for 2013 – the verification report was provided on 13 July 2013 which reported that there were no stack contributions from the GBFS, coal use decreased and CO <sub>2</sub> /CO emissions decreased.	The use of GBFS since 2012 has not resulted in an increase in stack emissions (see responses to air quality).	Current management measures for the use of GBFS are achieving good outcomes.



**Table 5.10**      **Response to waste conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.17AE</b>	<p>Compliance with this condition was detailed in the AEMR for 2013 – the Secretary approved the ongoing use of GBFS in a letter dated 7 September 2012.</p> <p>Use of GBFS in subsequent periods has been:</p> <ul style="list-style-type: none"> <li>• 2013: 11,426 t</li> <li>• 2014: 6,893 t</li> <li>• 2015: 83497</li> <li>• 2016: 76255</li> </ul>	<p>Boral has been using less GBFS than the approved rate of 150,000 tonnes per annum.</p>	<p>Current management measures for the use of GBFS are achieving good outcomes.</p>
<b>K3.17B</b>	<p>No AKF1 or other Group A wastes were stored on site during the reporting period.</p>	<p>The Operational Environmental Management Plan will be updated in accordance with Condition 6.7 to incorporate measures for management of non-standard fuels prior to their use at the site.</p>	<p>The Operational Environmental Management Plan will be updated in accordance with Condition 6.7 to incorporate measures for management of non-standard fuels prior to their use at the site.</p>
<b>K3.17C</b>	<p>Use of waste derived non-standard fuels at the site has not commenced.</p>	<p>Wastes generated as a result of the use of non-standard fuels on site will be classified using the NSW EPA’s <i>Waste Classification Guidelines</i> in accordance with EPL Condition L4.2.</p>	<p>Wastes generated as a result of the use of non-standard fuels on site will be classified using the NSW EPA’s <i>Waste Classification Guidelines</i> in accordance with EPL Condition L4.2.</p>

## 5.7 Non-standard fuels

The non-standard fuels consent requirements for Kiln 6 are in conditions 3.17 to 3.17C of Development Consent No. 401-11-2002-i, which are replicated in Table 5.11. The consent refers to EPL 1698, which provides non-standard fuel requirements in conditions O5, O6.1/2/3/4/5/6/7 and E4.

As described in Section 5.5, Boral Cement has not recommenced receiving, storing and using waste derived non-standard fuels at the site. The Operation Environmental Management Plan and Waste Management Plan will be updated in accordance with Condition 6.7 to incorporate measures for management of non-standard fuels prior to their receipt, storage and use at the site.

**Table 5.11 Non-standard fuels conditions**

(K = Kiln 6, M = Mill 7)

K1.4A Use of non standard fuels Subject to meeting the requirements of this consent, and the requirements of a licence issued under the Protection of the Environment Operations Act 1997 for the site, the following fuels are permitted to be received at the site for use at the upgraded Kiln 6 development at the quantities, firing rates and proportions specified in Table 1.

**Table 1 – Permitted Fuels for use in upgraded Kiln 6**

Fuel	Category	Tonnes per annum	
Natural Gas, Fuel Oil, Diesel	Standard Fuel	No limits	
Coal	Standard Fuel	No Limit	
Coke Fines	Standard Fuel	No Limit	
Hi Cal 50	Non-Standard Fuel	10,000	
AKF1	Non-Standard Fuel	20,000	
AKF5	Non-Standard Fuel	30,000	≤100,000 combined
Wood Waste	Non-Standard Fuel	50,000	
RDF	Non-Standard Fuel	80,000	

Note: The consent, as modified, permits only the use of the fuels listed above at the specified quantities. The use of any additional fuels would be the subject of appropriate assessment and determination under the Act. This consent, as modified, does NOT approve the establishment of a protocol for general use of Non-Standard Fuels.

**K1.4B** AKF5 is approved for use at the development under this consent subject to the necessary approvals under the Act being obtained for storage facilities and kiln feeding infrastructure. No AKF5 is permitted to be received at the site until the necessary storage facilities and kiln feeding infrastructure have been constructed in accordance with any such approvals. Storage of AKF5 must be in accordance with Fire & Rescue NSW (Fire Safety Branch) Guidelines for Bulk Storage of Rubber Tyres.

If the Applicant proposes to exceed the stockpile sizes and heights within the above Guidelines, the Applicant must obtain written approval from Fire and Rescue NSW, to the satisfaction of the Secretary.

**K1.4C** Hi Cal 50 and AKF1 are approved for use at the development under this consent subject to the detailed design for any necessary storage facilities and kiln feeding infrastructure being approved to the Secretary. In particular, the detailed design shall:

- demonstrate that the storage facilities would be appropriately bunded in accordance with the relevant Australian Standards, especially Australian Standard AS1940-2004 (for AKF1, this would include having a minimum capacity sufficient to accommodate catastrophic failure of the tank and that adequate measures are in place to ensure a catastrophic failure of a tanker during transfer was adequately contained to ensure no off-site discharge);
- include appropriate measures to ensure liquids draining from the bund (and other containment areas) are kept separate and adequately treated prior to discharge to the onsite stormwater management system, and demonstrate that these measures were developed in consultation with the Sydney Catchment Authority and Wingecarribee Shire Council; and
- include a Fire Safety Study prepared in accordance with the Department’s guideline Hazardous Industry Planning Advisory Paper No. 2: Fire Safety Study and in consultation with Fire and Rescue NSW. A construction certificate must not be issued in relation to any necessary storage facilities and kiln feeding infrastructure until the Secretary has approved the detailed design parameters. No Hi Cal 50 or AKF1 is permitted to be received at the site under this consent until any necessary storage facilities and kiln feeding infrastructure have been constructed in accordance with the detailed design parameters approved by the Secretary.

**Table 5.11 Non-standard fuels conditions**

**(K = Kiln 6, M = Mill 7)**

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**K1.4CA** Notwithstanding condition 1.4C of this consent, the Applicant is permitted to undertake a single trial of chipped tyres in the development, ahead of the construction of storage facilities and kiln feeding infrastructure for AKF5, provided that the trial meets the following requirements:

- a) no more than 205 tonnes of 2" chipped tyres is to be received at the site for the trial;
- b) the trial shall be conducted over no more than six months from the date of first receipt of the trial materials, after which any remaining trial materials shall be removed from the site to a facility lawfully permitted to accept the materials;
- c) the trial shall be undertaken for the purpose of investigating design and operational aspects; of the full-scale use of AKF5;
- d) the trial shall be undertaken in full compliance with the environmental performance standards stipulated in this consent, and the requirements of the Environmental Protection Licence for the site;
- e) the Applicant shall consult with and meet the requirements of the EPA with respect to undertaking the trial, and shall not commence the trial without the prior written approval of the EPA;
- f) trial materials shall be stored in an area that is sealed, or otherwise treated to the satisfaction of the Secretary, and away from all potential ignition sources;
- g) the Applicant shall notify Fire and Rescue NSW prior to the receipt of trial materials on the site, and address any requirements with respect to the safe storage of the trial materials;
- h) the Applicant shall notify the Secretary, the EPA and the Community Liaison Group prior to the commencement of the trial; and
- i) the Applicant shall report the status and outcomes of the trial to the Secretary and the EPA on a monthly basis from the date that trial materials are first received on the site until conclusion of the trial.

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**K1.4D** Only Standard Fuels are permitted to be used at the development during start-up and shut-down.

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**K1.4E** Non-Standard Fuels are not permitted to be stored at the site for longer than 3 months, except with the written permission of the Secretary.

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**K1.4F** No Non-Standard Fuel is permitted to be received at, or used at the development, unless it complies with:

- a) the handling, transporting, sampling, analysis and quality control requirements of this consent;
- b) any requirements of a licence issued under the Protection of the Environment Operations Act 1997 for the site; and
- c) the fuel specification for that specific fuel.

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**K1.4G** Prior to the receipt of the first batch of a Group 1 Non-Standard Fuel from a particular supplier, the Applicant shall certify in writing to the Secretary that the supplier has implemented appropriate quality control and quality assurance procedures to ensure the Applicant's responsibilities under this consent can be met. At the request of the Secretary, the Applicant shall forward a copy of the supplier's quality control and quality assurance procedures to the Department demonstrating how those procedures cause the Applicant to meet the requirements of this consent.

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**Table 5.11 Non-standard fuels conditions**

**(K = Kiln 6, M = Mill 7)**

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**K1.4H** Prior to the receipt of the first batch of a Group 2 Non-Standard Fuel from a particular supplier, the Applicant shall certify in writing to the Secretary that the supplier has met the pre-qualification requirements set out in the approved Quality Assurance and Control Procedure for Receipt and NSW Government Department of Planning and Environment 8.

Use of Solid Waste Derived Fuels (Appendix 1 of this consent) and that the Applicant's responsibilities under this consent can be met. At the request of the Secretary, the Applicant shall forward a copy of the supplier's quality control and quality assurance procedures to the Department demonstrating how those procedures cause the Applicant to meet the requirements of this consent.

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**K1.4I** Prior to the receipt of the first batch of SWDF the Applicant shall develop and submit operational procedures for co-firing SWDF to ensure that the temperature of gas generated in the process is raised to a minimum temperature of 8500C for a minimum of two seconds. Operational procedures must include interlocks in the process control system.

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**K3.20 Non-Standard Fuel Specifications** For each Group 1 or Group 2 Non-Standard Fuel approved for use at the development the Applicant shall provide a fuel specification, to be approved by the Secretary and the EPA prior to the use of that Non-Standard Fuel at the development under this consent. The Non-Standard Fuel specification shall include, but not be limited to, the minimum calorific value and the maximum quantity of all relevant pollutants, particularly the listed pollutants.

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**K3.21** Based on the Non-Standard Fuel specification specified in condition 3.20 the following Non-Standard Fuel specification criteria are required to be met:

- a) deleted MOD-109-9-2006-i;
- b) for Hi CAL 50 a mercury specification no greater than 1 mg/kg and a cadmium specification no greater than 10 mg/kg;
- c) for AKF1 a mercury specification no greater than 2 mg/kg and a cadmium specification no greater than 5 mg/kg;
- d) organohalogen compounds, expressed as chlorine, in any Non-Standard Fuel not to exceed 1% by weight; and
- e) the waste materials to be used as Non-Standard Fuels must not be diluted or blended to meet any of the fuel specification requirements.

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**K3.22 Non-Standard Fuels Pollution Tracking** Prior to the use of any Group 1 or Group 2 Non-Standard Fuels at the development in accordance with this consent, the Applicant shall implement a Tracking Program that meets the requirements of the Secretary. The Tracking Program shall include, but not be limited to, the identification and recording of the following information in accordance with the time periods specified in condition 3.23:

a) batch analyses of Non-Standard Fuels received at the development as provided by the suppliers, and the results of any check analyses carried out by the Applicant as part of the quality control management procedures required under condition 6.7 and condition 6.8 of this consent;

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- b) a mass inventory of each listed pollutant entering the process in raw materials, conventional fuels and Non-Standard Fuels, with particular attention to, but not limited to chlorine, mercury, cadmium and chromium;
  - c) emission factors for each listed pollutant calculated from inputs, outputs, and measured air emissions, variance in the emissions factors from period to period and an assessment with regards to the reasons for any such variance; and
  - d) any adjustments that may be necessary to Non-Standard Fuel specifications arising from the Tracking Program analysis.
-

**Table 5.11 Non-standard fuels conditions**

(K = Kiln 6, M = Mill 7)

**K3.23** The Applicant shall submit a Report that details and assesses the results of the Tracking Program prescribed in condition 3.22 of this consent to the Secretary. The Report shall be submitted to the Secretary:

- a) every three months in the first year of operation using Non-Standard Fuels under this consent, (to be synchronised with stack monitoring); and
- b) thereafter every six months, or as otherwise agreed to by the Secretary.

**K3.24 Process Parameters** The Applicant shall cease to burn Non-Standard Fuels in Kiln 6 if:

- a) the temperature is below 8500C in the zone where Non-Standard Fuels are fired or in the vicinity of the pre-calciner; or
- b) the temperature is below 3000C at the outlet of the preheater strings.

**Table 5.12 Response to non-standard fuels conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K1.4A</b>	Total fuel used in the kiln during the reporting period was 223,989 tonnes of coal.  Small amounts of diesel are used during kiln start-ups.  None of the other fuels in this condition were received, stored or used during this reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K1.4B</b>	No AKF 5 was received, stored or used at the site during the reporting year.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K1.4C</b>	Compliance was confirmed in the 2007-2008 AEMR.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.

**Table 5.12 Response to non-standard fuels conditions**

<b>Approval criteria / EIS prediction</b>	<b>Performance during the reporting period</b>	<b>Trend / key management implications</b>	<b>Implemented / proposed management actions</b>
<b>K1.4CA</b>	Boral did not conduct any tyre trials in the reporting period.	Trials are one-off events that do not display reportable trends.	No trials were conducted and no associated management actions were required.
<b>K1.4D</b>	No non-standard fuels were received, stored or used during the reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K1.4E</b>	No AKF1 and no AKF5 are currently stored on site.  DP&E approved (by letter dated 11 February 2009) the ongoing storage of the existing Hi Cal 50/60 stockpile, however this material is no longer used at this site.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K1.4F</b>	No non-standard fuels were received, stored or used during the reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K1.4G</b>	No non-standard fuels were received, stored or used during the reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K1.4H</b>	No non-standard fuels were received, stored or used during the reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K1.4I</b>	No non-standard fuels were received, stored or used during the reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.



**Table 5.12 Response to non-standard fuels conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.20</b>	The proposed fuel specifications for AFK1, Hi Cal 50 and AFK5 were previously provided to both DP&E and DECC for review and approval. DP&E delegated authority for approving the specifications to DECC. DECC approved all three fuel specifications on 17/08/2006. Non-standard fuels were not used during this reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K3.21</b>	No non-standard fuels were received, stored or used during the reporting period.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K3.22</b>	<p>The Non-Standard Fuels pollutant tracking procedure (SP10-01-10 Non-Standard Fuels Pollutant Tracking Procedure) was issued on 1 March 2003 and a copy was provided to DP&amp;E by email on 2 March 2003. The procedure addresses all requirements of Condition 3.22. The procedure has not been recently reviewed as the site has not yet re-commenced the non-standard fuels programme. A review will take place prior to any the use of non-standard fuels recommences.</p> <p>No non-standard fuels were received, stored or used during the reporting period.</p>	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.
<b>K3.23</b>	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.
<b>K3.24</b>	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.	The use of waste derived non-standard fuels has not recommenced and no management measures are necessary.	The use of waste derived non-standard fuels has not recommenced and there are no trends to report.

## 5.8 Visual Amenity

The visual amenity consent requirements for Kiln 6 are in conditions 3.18 to 3.19A of Development Consent No. 401-11-2002-i and for Mill 7 in Condition 2.19 of Development Consent No. 85-4-2005-i, which are replicated in Table 5.13.

Compliance with the construction requirements of the second Kiln 6 pre-heat tower was demonstrated in previous AEMRs. It is demonstrated in Table 5.14 that the community has not historically lodged complaints about the visual amenity of the site and this continues for the current reporting period.

**Table 5.13 Visual Amenity conditions**

**(K = Kiln 6, M = Mill 7)**

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**K3.18 Visual Amenity Impacts** The Applicant shall ensure that all external lighting associated with the cement works upgrade, and including those lights already erected, is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding properties or roadways. The lighting shall be the minimum level of illumination necessary and shall comply with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.

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**K3.19** The second pre-heater tower shall be designed, constructed, operated and maintained in a manner that minimises the visual impact to surrounding properties and roadways.

Note: The second pre-heater tower shall be built in a manner consistent with that described in the additional information provided (identified in condition 1.2 f)). This includes using the building materials identified and minimising the height of the pre-heater tower.

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**K3.19A** Operational stockpiling of RDF in the external bale material storage area (identified on Drawing No.GE-B-2278-01 Revision DP, dated 15 January 2015) is limited to periods of extended kiln downtime for maintenance or repair only. RDF for stockpiling must be delivered in plastic wrapped 1 cubic metre bales. Stockpiles must not exceed a maximum height of five metres.

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**M2.19 Visual Amenity Impacts** The Applicant shall ensure that all external lighting associated with the cement works upgrade, and including those lights already erected, is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding properties or roadways. The lighting shall be the minimum level of illumination necessary and shall comply with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.

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**Table 5.14 Response to visual amenity conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K3.18</b>	Provision of lighting at the Berrima Cement Works complies with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.	No community complaints regarding light spill have been received during the reporting period – the community has not previously complained about light spill from the site.	Management measures are sufficient to keep light spill from the site within acceptable limits – a minimum amount of lights must be on during nigh time for safety.
<b>K3.19</b>	Compliance with this condition has been confirmed previously.	No community complaints regarding visual amenity have been received during the reporting period – the community has not previously complained about the visual impact of the site.	Planting of trees for visual screening is effectively shielding the tower from sensitive receivers – this screening will become more effective as plantings mature.
<b>K3.19A</b>	No operational stockpiling of RDF has occurred during this reporting period.	No community complaints were received as no storage occurred on site in this year.	N/A
<b>M2.19</b>	Provision of lighting at the Berrima Cement Works complies with AS 4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.	No community complaints regarding light spill have been received during the reporting period – the community has not previously complained about light spill from the site.	Management measures are sufficient to keep light spill from the site within acceptable limits – a minimum amount of lights must be on during nigh time for safety.

## 5.9 Rehabilitation

The Guideline requirement for reporting on rehabilitation activities focuses on mining, however, Development Consent No. 401-11-2002-i and Development Consent No. 85-4-2005-i relate to activities in a cement production facility. Notwithstanding, such a facility requires periodic rehabilitation associated with construction and demolition. There were no construction and demolition activities at the Works during the reporting period and no rehabilitation was required.



## 6 Community

The community relations conditions for Kiln 6 are in conditions 5.1 to 5.5 of Development Consent No. 401-11-2002-i and in conditions 4.1 to 4.3 of Development Consent No. 85-4-2005-i for Mill 7. Performance for both consents are reported under the conditions for Kiln 6 in Table 6.2 because the conditions are the largely the same in both consents.

Sixteen community complaints were received during the reporting period, each of which related to dust generation and deposition. Two community meetings were held during the reporting period, one on 2 June 2016 and the other on 10 November 2016.





## Table 6.1 Community conditions

(K = Kiln 6, M = Mill 7)

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**K5.1** Subject to confidentiality, the Applicant shall make all documents required under this consent available for public inspection upon request. This shall include provision of all documents at the site for inspection by visitors, and in an appropriate electronic format on the Applicant's internet site, should one exist.

**K5.2** Prior to the commencement of construction for the cement works upgrade, the Applicant shall ensure that the following are available for community complaints for the life of the cement works upgrade (including construction and operation):

- a) a telephone number on which complaints about operations on the site may be registered;
- b) a postal address to which written complaints may be sent; and
- c) an email address to which electronic complaints may be transmitted, should the Applicant have email capabilities.

The telephone number, the postal address and the email address shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public. These details shall also be provided on the Applicant's internet site, should one exist.

**K5.3** The Applicant shall record details of all complaints received through the means listed under condition 5.2 of this consent in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:

- a) the date and time, where relevant, of the complaint;
- b) the means by which the complaint was made (telephone, mail or email);
- c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
- d) the nature of the complaint;
- e) any action(s) taken by the Applicant in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the Applicant in relation to the complaint, the reason(s) why no action was taken. The Complaints Register shall be made available for inspection by the EPA or the Secretary upon request.

**K5.4** Prior to the use of Non-Standard Fuels at the development the Applicant shall establish a Community Liaison Group that has access to all environmental management plans and monitoring data, environmental reporting and tracking and audit reports required by this consent. The Group shall: a) be comprised of the following, whose appointment has been approved by the Secretary: i) 1 or 2 representatives from the Applicant, including the person responsible for environmental management at the development; ii) 1 representative from Council; and iii) 3 or 4 representatives from the local community. b) be chaired by a representative agreed to by the Group and approved by the Secretary; c) meet a minimum of once in every 6 month period; and d) review and provide advice on the environmental performance of the development, including providing comment where necessary on any environmental management plans, monitoring results, audit reports, or complaints.

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**Table 6.1 Community conditions**

(K = Kiln 6, M = Mill 7)

**K5.5** The Applicant shall at its own expense: a) ensure that 1 or 2 of its representatives attend the Group’s meetings; b) provide the Group with regular information on the environmental management and performance of the development; c) provide access to independent scientific/technical support to assist member in understanding and interpreting information provided, if requested; d) provide meeting facilities for the Group, where necessary; e) arrange site inspections for the Group, if requested; f) take minutes of the Group’s meetings and make these minutes available to the public for inspection within 14 days of the Group meeting, or as agreed to by the Group; g) respond to any advice or recommendations the Group may have in relation to the environmental management or performance of the development; and h) maintain a record and a copy of the minutes of each Group meeting, and any responses to the Group’s recommendations, to be provided to the Secretary upon request.

Note: The above condition’s also cover all elements of conditions 4.1 to 4.3 of the conditions set out for the development on Cement Mills 7.

**Table 6.2 Response to community conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<b>K5.1</b>	Development Consent No. 401-11-2002-i, Development Consent No. 85-4-2005-i and EPL 1698 are available for inspection on request at the Berrima Cement Works. Current environmental monitoring data under the EPL is available at <a href="http://www.boral.com.au/article/nsw_poela_environmental_reporting.asp">http://www.boral.com.au/article/nsw_poela_environmental_reporting.asp</a> The site’s environmental management plans and some previous AEMRs are available at <a href="http://www.boral.com.au/article/berrima_cement_environment.asp">http://www.boral.com.au/article/berrima_cement_environment.asp</a>	Boral historically and continues to make information available on request at the site and on the site’s website.	Boral will continue to make information available on request at the site and on the site’s website.
<b>K5.2</b>	Berrima Cement Plant’s complaints procedures are documented in the operational environmental management plan and subordinate plans. Contact details for Boral Cement Berrima are included on all site entrance signage, and include a telephone number, postal address and email address. Additionally, contact details are provided on the website <a href="http://www.boral.com.au/article/berrima_cement_contacts.asp">http://www.boral.com.au/article/berrima_cement_contacts.asp</a>	Boral historically and continues to provide contact information on signs and on the site’s website.	Boral will continue to make contact information available on signs and on the site’s website.
<b>K5.3</b>	Berrima Cement Plant’s complaints procedures are documented in the Operation Environmental Management Plan and subordinate plans. A summary of all complaints (by type) received during this reporting period of May 2016 – April 2017 is provided in Appendix. There were 16 complaints, each of which related to dust.	Historical data regarding complaints (total; air quality ; noise) is shown below in Figures 6.1-6.3. 2016-17 total numbers of 16 were below the average of 20/year in the 2008-09 - 2016-17 period.	

**Table 6.2 Response to community conditions**

Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented / proposed management actions
<p><b>K5.4</b></p>	<p>The community liaison committee (CLC) was established in April 2004. Since 2010, including the current reporting period, the CLC was converted to public meetings, including invitations to the CLC members, as the CLC format proved unsuccessful in communicating meeting contents and outcomes to the broader community.</p> <p>Although Boral Cement has not operated the non standard fuels program during this reporting period it is committed to continuing its liaison with the community and the CLC process.</p> <p>Two community meetings were held during this reporting period, on 2 June 2016 and 10 November 2016.</p> <p>Notes of meetings and copies of presentations made at the community meetings are sent to all meeting participants and are displayed in the community section of the Berrima website:  <a href="http://www.boral.com.au/article/berrima_cement_our_community.asp">http://www.boral.com.au/article/berrima_cement_our_community.asp</a></p>	<p>The CLC has historically, and will continue to, meet up to twice per year in a public meeting format.</p>	<p>The CLC will continue to meet up to twice per year in a public meeting format.</p>
<p><b>K5.5</b></p>	<p>The Berrima Cement Management Team is represented by the Site Operations Manager and the HSE Advisor, together with Boral’s Stakeholder Relations Manager - Southern Region (NSW/VIC/TAS/SA), and a representative from Boral Cement’s Group Engineering Team and Delta Mining on behalf of the Berrima Colliery.</p> <p>No CLC members requested the presence of technical specialists at meetings or site inspections during the reporting period. Minutes from the June 2016 meeting have been posted on the website and no recommendations were received from CLC members during the reporting period.</p>	<p>Boral has historically, and will continue to, respond to requests from CLC members and post the meeting minutes on the website.</p>	<p>Boral will continue to respond to requests from CLC members and post the meeting minutes on the website.</p>

*Note: The above responses to conditions also cover the conditions 4.1 to 4.3 of the conditions set out for the development on Cement Mills 7.*

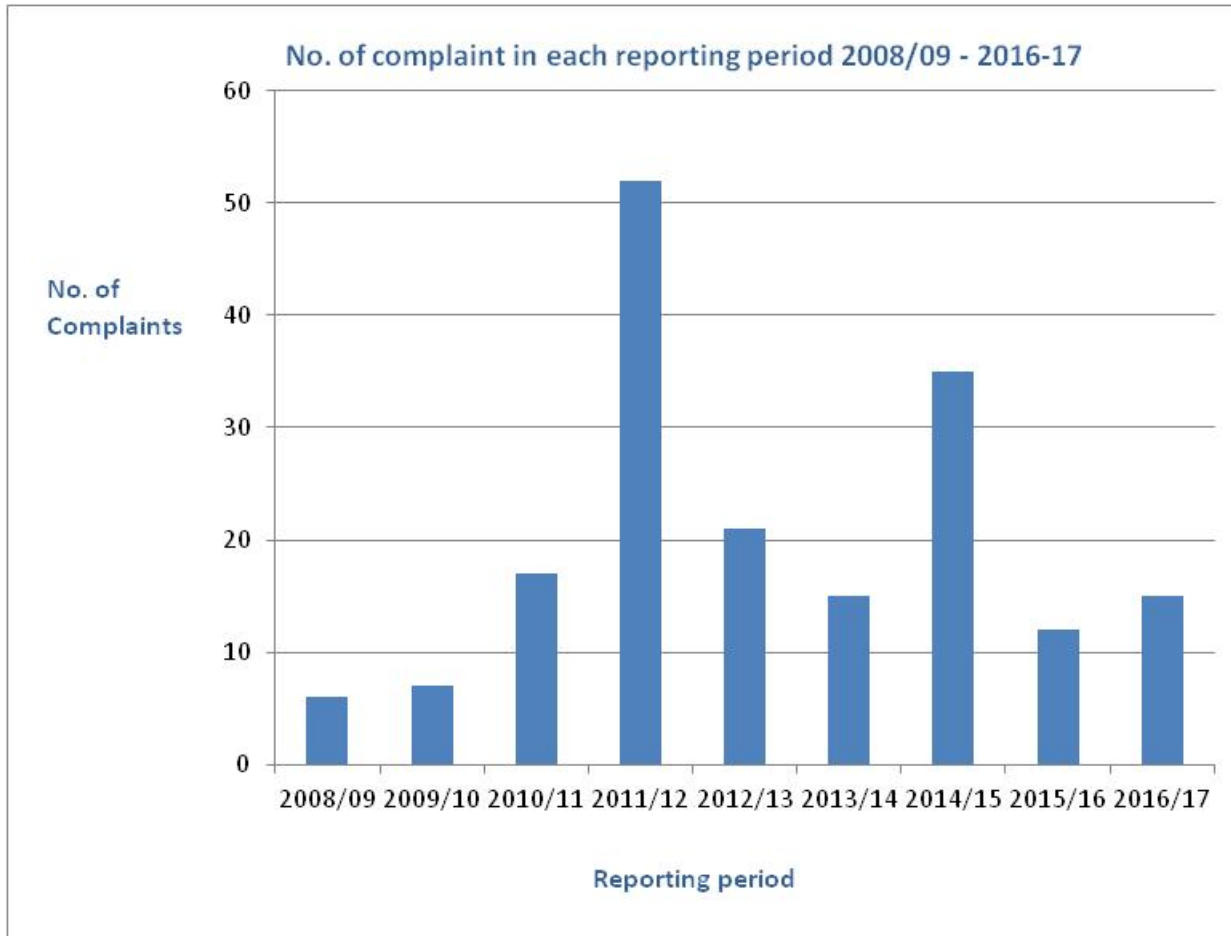


Figure 6.1 Complain numbers per annum 2008/2009 to 2016/2017

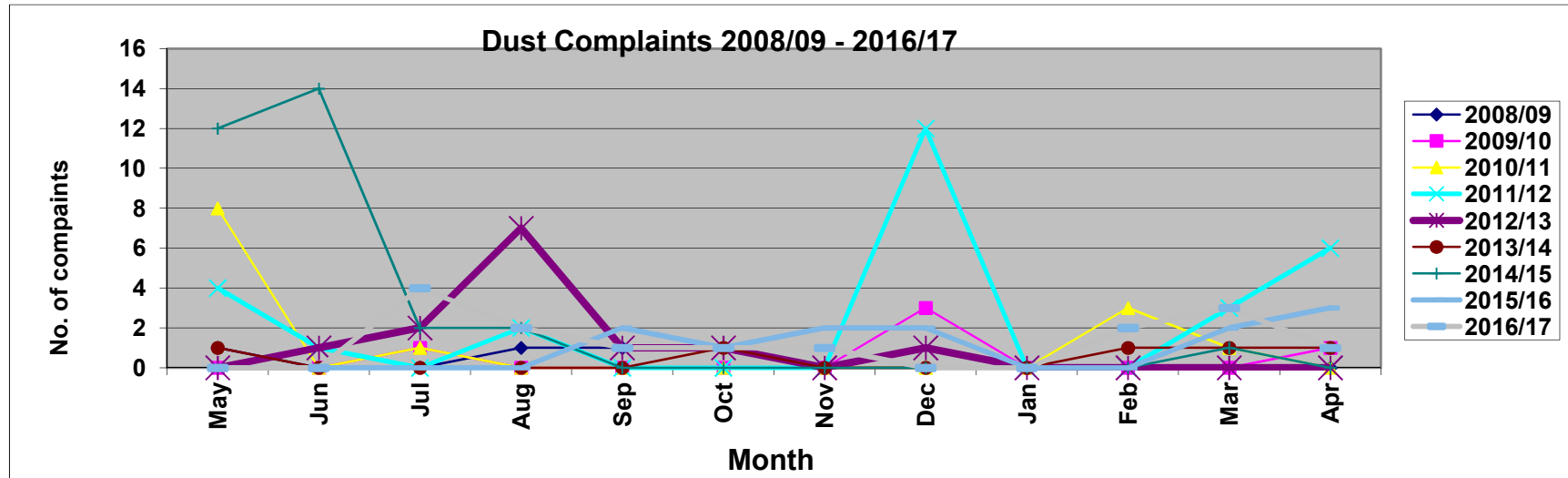


Figure 6.2 Dust complaint numbers by month 2008/2009 to 2016/2017

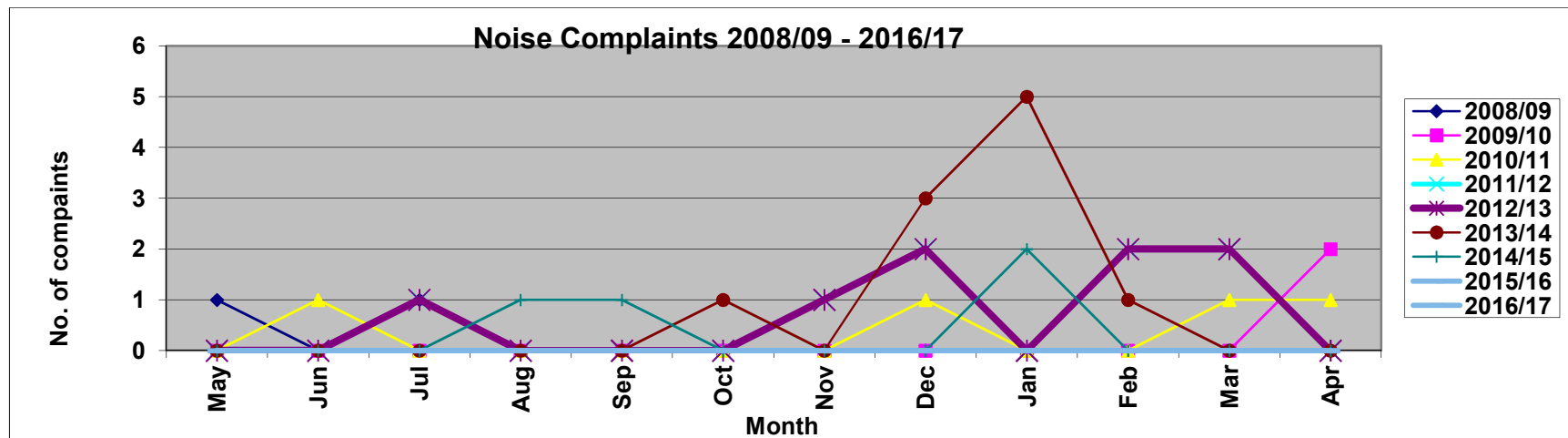


Figure 6.3 Noise complaint numbers by month 2008/2009 to 2016/2017



## 7 Independent audit

Condition 4.5 of the Kiln 6 development consent and Condition 3.3 of Cement Mill 7 development consent require Boral Cement to audit the site once every three years. Both conditions are nearly identical and the audit is undertaken as a single operation. Condition 4.5 of the Kiln 6 development consent states:

Within three years of the commencement of operation of the cement works upgrade, and every three years thereafter or as otherwise required by the Director-General, the Applicant shall commission an independent person or team to undertake an Environmental Audit of the cement works upgrade. The independent person or team shall be approved by the Director-General, prior to the commencement of the Audit. An Environmental Audit Report shall be submitted for comment to the Director-General, the EPA and Council, within one month of the completion of the Audit. The Audit shall:

- be carried out in accordance with ISO 14010 - Guidelines and General Principles for Environmental Auditing and ISO 14011 - Procedures for Environmental Auditing;
- assess compliance with the requirements of this consent, and other licences and approvals that apply to the cement works upgrade;
- assess the cement works upgrade operations against the predictions made and conclusions drawn in the SEE and other documents listed under conditions 1.2a to 1.2q inclusive; and
- review the effectiveness of the environmental management of the cement works upgrade, including any environmental impact mitigation works.

The Secretary may, having considered any submission made by the EPA and/or Council in response to the Environmental Audit Report, require the Applicant to undertake works to address the findings or recommendations presented in the Report. Any such works shall be completed within such time as the Director-General may agree.'

The above wording is replicated in Condition 3.3 of the Mill 7 development consent.

The last three yearly independent audit was conducted by an independent auditor (Somerset Risk Management) in November 2014. The report was submitted to DP&. The next audit is due later in 2017 (in the 2018 reporting period).

## 8 Incidents and non-compliances during the reporting period

No non-compliances or reportable incidents occurred during the 2016-2017 period as confirmed by this review.







## 9 Activities to be completed in the next reporting period

Boral Cement plans the following activities in the next reporting period, 2017-2018:

- All existing environmental management plans will be reviewed in 2017.
- An independent audit of the development consents for Kiln 6 and Mill 7 will be undertaken later in 2017.
- A Traffic Management Plan has been prepared and is currently in the process of being published.
- In addition, Wingecarribee Council is about to start a major road project east of the site which will see improvements to rail operations. This will necessitate the relocation of the high-volume air sampler. This is currently under review with the objective of having the sampler relocated by the end of the next reporting period.



## Appendix A

### Annual environmental noise assessment report Berrima 2016

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Boral Cement

Annual Environmental Noise  
Assessment - July and August 2016

For

Berrima Cement Plant

H344733-00000-007-120-0008

Rev. 0

7 October 2016

## Boral Cement Berrima Cement Plant

### Annual Environmental Noise Assessment - July and August 2016

7 /10/2016	0	Final Draft	C. Tickell	G. Paicu		
<b>Date</b>	<b>Rev.</b>	<b>Status</b>	<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>	<b>Approved By</b>
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## Executive Summary

Sound levels at the Boral Cement Berrima Cement Plant have been monitored on regular occasions since 2002. The monitoring undertaken has occurred around noise sources at the plant and in the adjoining residential community. Monitoring has been undertaken to assess environmental noise sources and the noise received at the residential locations.

Licence conditions for noise are in place for the Kiln 6 Upgrade plant items and the No.7 Cement Mill. These licence conditions require contribution sound levels from these items in the residential areas to be less than noted values in the Licence conditions.

Assessment of compliance of these licenced plant items has been undertaken following commissioning of each plant and the reports of compliance accepted by the DECC at the time of the assessment. Subsequent annual monitoring of noise emissions from those plant items, including in 2016, has indicated that emission sound levels of these plant items have not changed significantly. Although some plant items have increased sound levels, the effect of their contribution at residential receiver locations is minor and calculated to not exceed objectives. This indicates that both plants remain in compliance with their licence conditions and have done so since commissioning.

Some sources with higher emissions than previously measured are recommended for review of their condition. This includes

- the grate cooler fans and their inlet silencers
- the Radicon Cooler fans on most levels.
- RM7 Roof magnetite impact plate cover and bucket elevator acoustic cladding
- FA252 discharge grill cleaning
- FA210 inlet silencer
- Raw meal silo baghouse DC30 discharge
- DC70 FA03 discharge tone at 63 Hz

These sources are not expected to cause noise objectives to be exceeded.

It is the assessment of this study that the plant is in compliance with its licence conditions for noise.

Environmental sound levels in the community exposed to noise from the plant have been monitored and assessed, as in past reviews. Sound levels at all locations are in a similar range to those measured in the past and do not indicate any significant change or increase has occurred over the time of monitoring since 2002. Sound levels at some locations have increased slightly while others remained the same. Boundary sound levels remained the same for the period measured but were up to 10 dB higher when winds were in the south-eastern quadrant.

Changes in sound levels between Kiln operating and non-operating periods during previous surveys have indicated that plant operation caused very little change in sound levels at residential receiver locations and could not be identified as significant. Periods of non-operation of the kiln caused reduction in ambient  $L_{A90,15\text{-minute}}$  sound levels at the

Store Yard Close location but were not measured during residential receiver monitoring. Non-operation of Cement Mill 7 at times did not appear to change sound levels at residential receivers compared to operating periods.

Road traffic noise remains the major source of noise intrusion at the residential receiver locations. Road surface conditions remain similar to 2013 in the main residential part of New Berrima and improvements to road surface and road edge conditions to reduce holes and bumps would significantly reduce the intrusive noise in residential receivers along and close to Taylor Avenue. Such treatment is beyond the responsibility of the Cement Plant.

## **1. Introduction**

Boral Cement Limited operates a cement works at New Berrima, near Berrima and Moss Vale in the Southern Highlands region of New South Wales. In 2003, approval was granted to construct and operate an upgrade to Kiln 6 at the Site. In 2005, approval was granted to construct and operate Cement Mill No.7 at the site. Both of these developments had conditions of approval which included contribution noise objectives for different receiver areas in the adjacent residential and rural areas. Demonstration of compliance with these contribution objectives was also required as a condition of approval. Contribution noise objectives for the rest of the Berrima cement works are not included in the current Pollution Control Licence for the site. Figure 1.1 shows an aerial view of the cement works and surrounding area, with the location of Kiln 6 and Cement Mill No.7 indicated. Figure 1.2 shows an aerial view of the immediate plant locality with boundary environmental noise monitoring locations shown. Figure 1.3 shows a site plan of the works.

Reports of compliance assessment of the two items of plant were provided in 2005 for Kiln 6 Upgrade and in 2007 for Cement Mill No.7. Noise monitoring of environmental noise and source noise is undertaken regularly in the neighbourhood of the plant and on site. Annual reporting of compliance assessments for the two projects has been made since 2007.

For this 2016 annual noise compliance assessment, measurements of sound levels at the site and in residential areas of New Berrima were obtained in July and August 2016. During this period, the Kiln was not operating from 8 to 10 August while Raw Mill No. 7 was idle for four days and Cement Mill No. 7 was idle for a number of days and nights. Figure 1.4 shows periods when the major plant items were idle.

Measurements were not taken at previously measured locations of Chesley Park Farm and Candowie Farm as these have been demolished and become industrial project sites and access is not provided. An additional monitoring location near the south-eastern boundary was included as a reference for later assessments if the proposed railway for Hume Coal, which passes along the southern boundary, is built.

This report provides an assessment of compliance of the current operation of Kiln 6 Upgrade and Cement Mill 7, as identified from measurements taken in 2016. Results are also, compared to those taken in 2005, and 2006 to 2015.

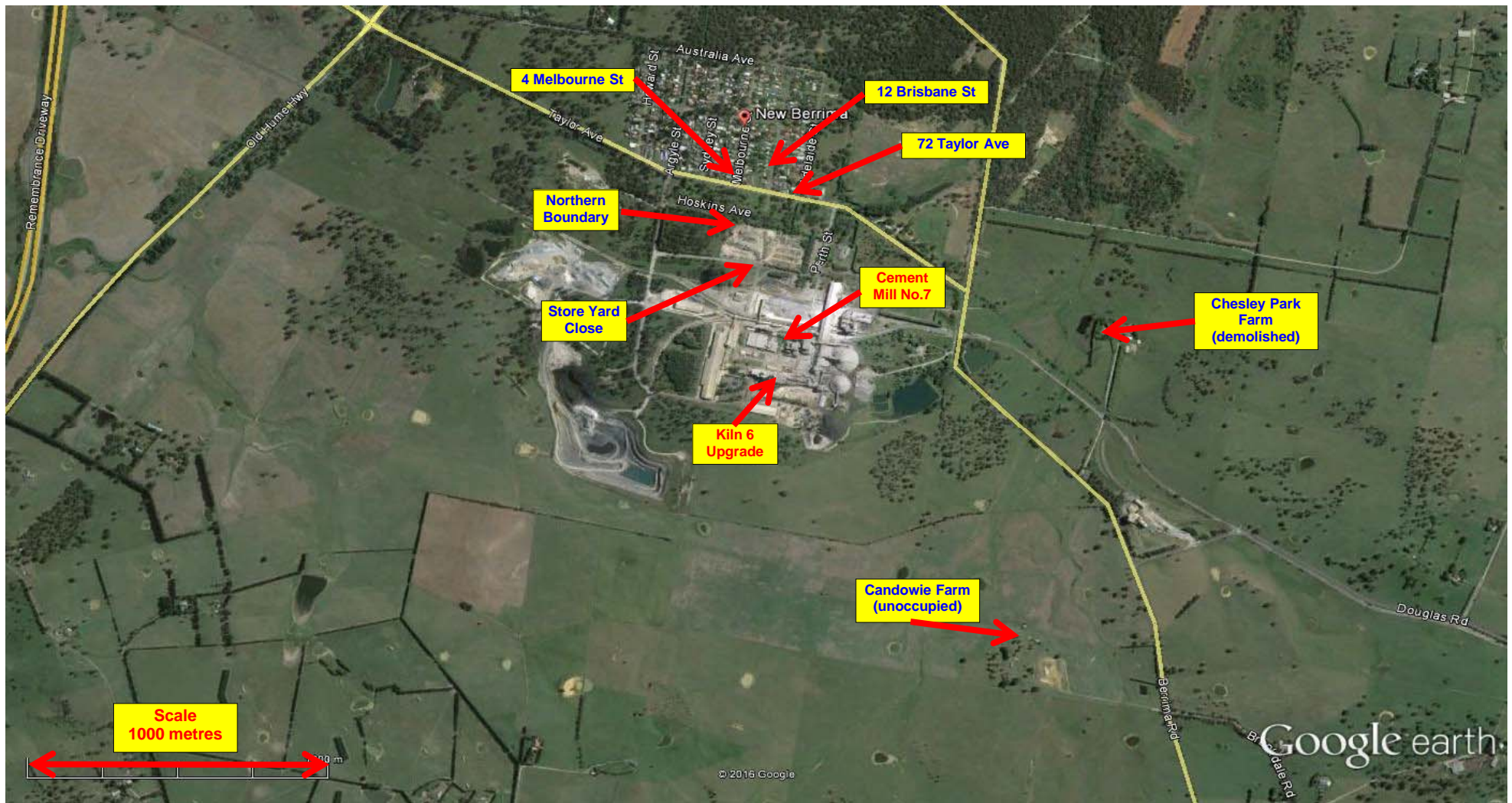


Figure 1.1: Boral Cement - Berrima Cement Works - Aerial view of site, surrounds and residential logger monitoring locations



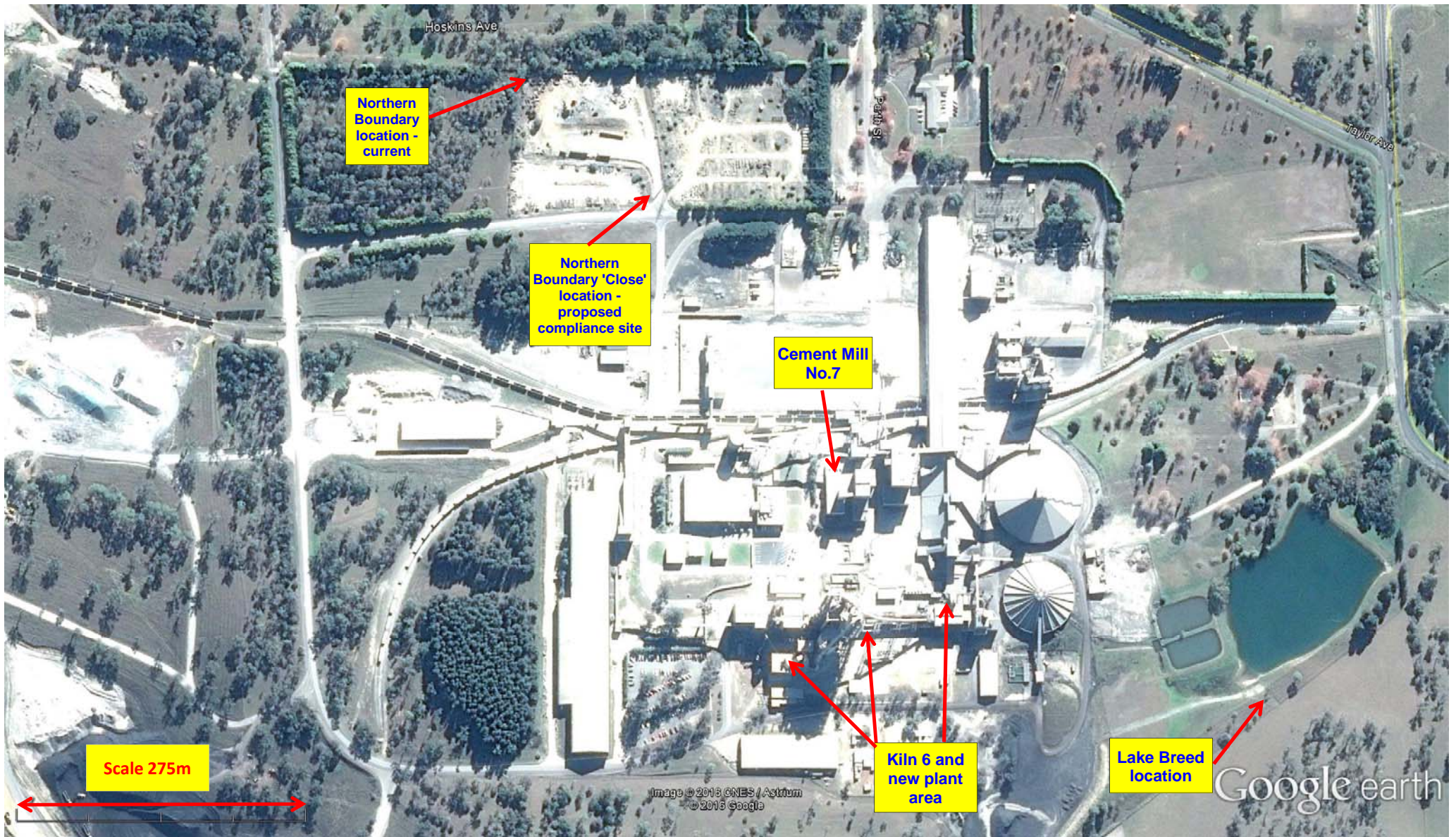
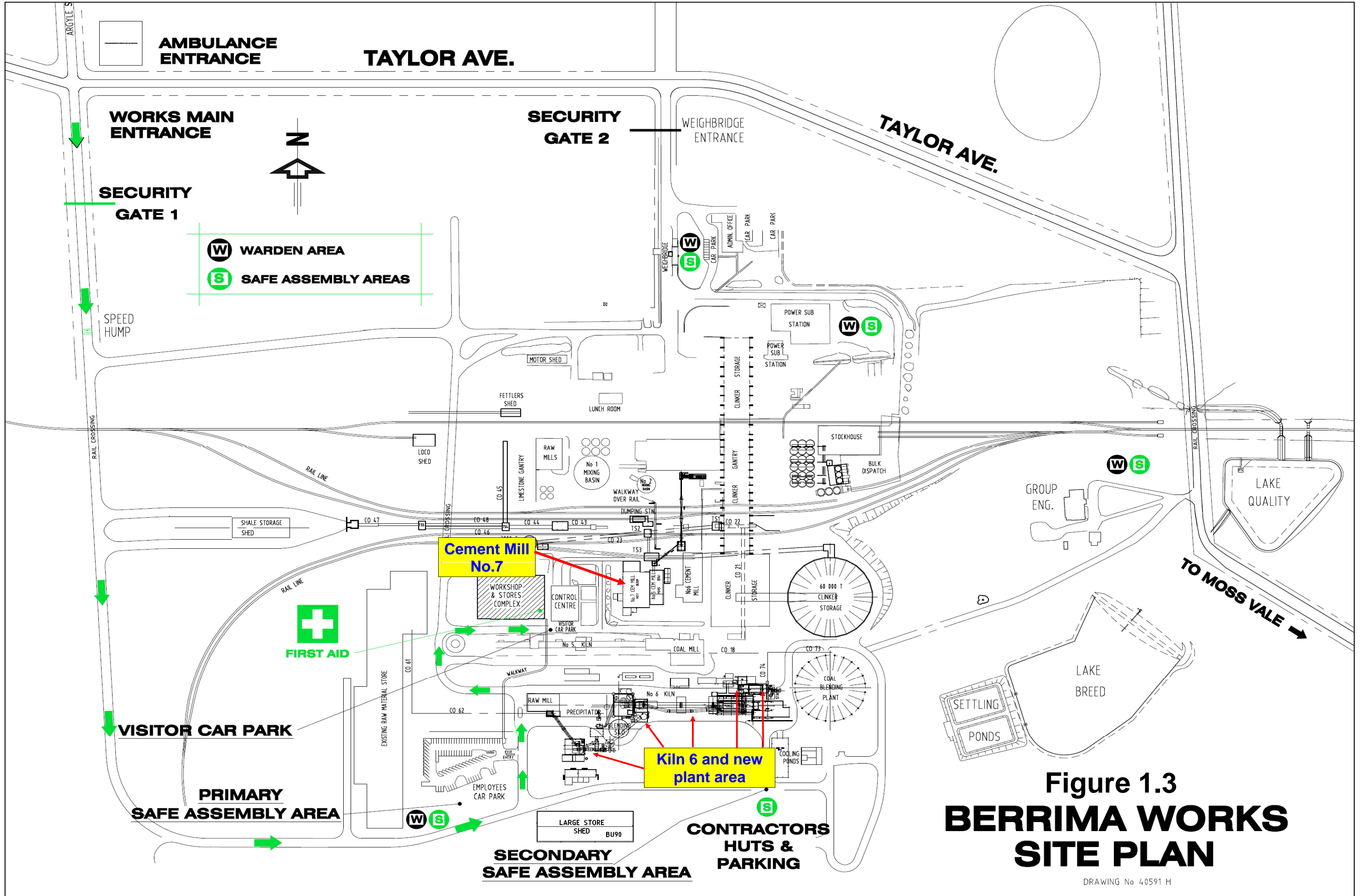


Figure 1.2: Boral Cement - Berrima Cement Works - Aerial view of plant site and monitoring sites for 2016, including proposed compliance site

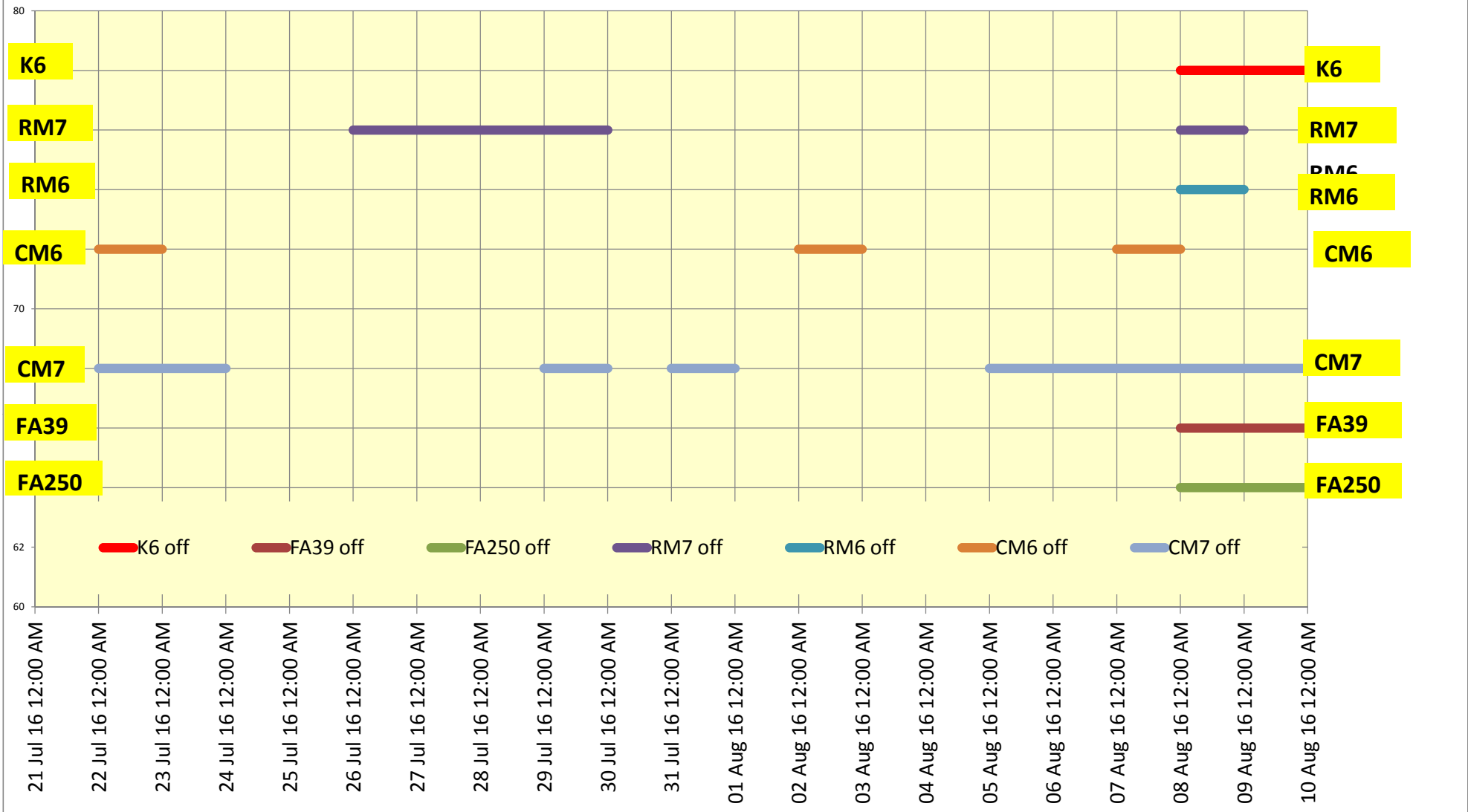




**Figure 1.3**  
**BERRIMA WORKS**  
**SITE PLAN**

DRAWING No 40591 H

**Figure 1.4: Boral Cement Berrima Annual Noise Assessment 2016 - Major Plant Item Idle Times**  
*Note Time on graph is when plant item is idle*





**2. Contribution sound level objectives and method of measurement and assessment**

**2.1 Contribution sound level objectives**

Each project was given contribution objective sound levels for the residential receiver locations. These were as follows:

**Table 2.1 – Kiln 6 Upgrade Maximum Allowable Noise Contribution Limit dBA**

Receiver Location	Day <sup>a</sup> L <sub>Aeq</sub> (15 minute)	Evening <sup>b</sup> L <sub>Aeq</sub> (15 minute)	Night <sup>c</sup> L <sub>Aeq</sub> (15 minute)
4 Melbourne Street	37	37	37
Chesley Park Farm*	30	30	30
Candowie Farm*	37	37	37

**Table 2.2 Cement Mill No.7 Maximum allowable noise contribution limit dBA**

Receiver Location	Day <sup>a</sup> L <sub>Aeq</sub> (15 minute)	Evening <sup>b</sup> L <sub>Aeq</sub> (15 minute)	Night <sup>c</sup> L <sub>Aeq</sub> (15 minute)
Adelaide Street, near Taylor Avenue	43	43	40
Argyle Street, near Taylor Avenue	43	43	40
Candowie Farm House*	43	43	40

a. Day is defined as the period from 7:00am to 6:00pm Monday to Saturday and 8:00am to 6:00pm on Sundays and public holidays.

b. Evening is defined as the period from 6:00pm to 10:00pm.

c. Night is defined as the period from 10:00pm to 7:00am Monday to Saturday and 10:00pm to 8:00am on Sundays and public holidays

These levels are to be considered as the contributions from the new plant associated with Kiln 6 or Cement Mill No. 7, and do not apply to the noise emissions from the rest of the plant at Berrima.

In 2015 Chesley Park Farm was acquired by Austral Bricks for their proposed development and the residence demolished. This effectively removed the assessment location as there was no receiver and no access available to the site. Similarly, Candowie Farm access is no longer available as it is no longer apparently occupied as a residence, the land having been acquired for a future industrial development. This location has also been effectively removed from the assessment.

## 2.2 Method of measurement and assessment Kiln 6 Upgrade

The environmental impact assessment reports for each major plant item provided allowable sound power levels for each major source required to ensure the contribution sound level objective was achieved. From these calculated sound power levels, allowable sound pressure levels at different locations and distances from each major source in each plant area were also calculated. The measured sound levels from the operating individual sources were then compared with the calculated allowable sound levels. If the measured sound levels were less than the allowable sound levels, then compliance was achieved. These measurements were reported in the nominated compliance reports for each plant item.

For Kiln 6 Upgrade, sound power levels and associated sound pressure levels of the new sources were identified as required in the noise impact assessment. These are given in Table 2.3 below. In the compliance assessment report for the Upgrade, the measured sound levels were compared with the objective sound levels. These are also shown in Table 2.3.

**Table 2.3: Kiln 6 Upgrade Plant Items and Objective Sound Power Levels and Sound Pressure Levels required to achieve compliance with objective sound levels**

Source	Sound Power Level – dB(A)	Sound Pressure Level dB(A)		
		Objective	Measured 2005	Measured 2016
Coal Mill and Clinker cooler fans	117	100 @ 3m	93 @ 2m	Coal mill wall vent 82 @ 2m,  Courtyard cooler fans 85 to 93 @ 1m
New Radicon Cooler	103	92 @ 1m	81 @ 1m West 80 @ 2m East	90 to 95 @ 1m 86 @ 2m rear
New Pre-heater fan FA249	97	89 @ 1m	77 @ 2m	74 to 84 @ 1m
New Baghouse fan FA250	102	94 @ 1m	82 @ 2m	80 to 84 @ 1m
Raw Mill 7 Building	117	100 @ 3m	Vents 83 to 86 @ 1m	Vents 81 to 85 @ 1m  Roof 80 to 89 @1m

This comparison showed in 2005 that the noise emissions for the Kiln 6 Upgrade items were well below the objectives required to achieve compliance.

Comparison of current measured sound levels at the same or similar locations, with those measured for the compliance assessment, will be sufficient to indicate if the contribution objectives are currently being achieved. Results for 2016, some shown above, are similar to previous and lower than the objective maximum levels for all except the Radicon cooler, indicating compliance levels are being achieved.

Increases of more than 7 dBA would be required to indicate potential non-compliance with the licence conditions. Radicon cooler sound levels vary depending on load and sometimes in the past have exceeded the objective by 4 to 5 dB. Current exceedance of the 92 dBA at 1m objective is 3 dB. Calculations (shown later in Table 3.3) indicate that this does not cause exceedance of receiver objectives.

### Cement Mill No.7

Assessment of compliance for Cement Mill No.7 was made by measuring the noise emissions from the building and then calculating the contributions from these at the relevant residential receiver locations, using a recognised computer noise model. Three different meteorological conditions were used in the modelling. The results of these predictions are given in Table 2.4 below. The DECCW considered this approach a good example of a method to assess contributions from new noise sources in the presence of a relatively high background sound level.

**Table 2.4: Cement Mill No.7 Predicted Contribution Levels at receivers for 2007 sound levels**

Receiver	Source	Predicted sound level – dB(A)			
		Weather Condition	Wind 0 m/s Lapse 0°C/100m	Wind 3 m/s Lapse 0°C/100m	Wind 2 m/s Lapse 3°C/100m
Adelaide Street	Mill Room northern wall		23	29	29
	BE Tower northern wall		22	25	26
	Compressor room vents		<u>15</u>	<u>20</u>	<u>21</u>
	<b>Total</b>		<b>26</b>	<b>31</b>	<b>31</b>
Argyle Street	Western wall Mill room		17	28	28
	Western Roll door Mill room		14	25	26
	Western Wall vents I & J		13	19	20
	Western Wall BE Tower		10	17	17
	Western Roll door compressor room		<u>9</u>	<u>16</u>	<u>16</u>
	<b>Total</b>		<b>21</b>	<b>30</b>	<b>31</b>

The Candowie Farm calculations provided in previous years are no longer relevant as the residence is apparently no longer used and is part of an industrial zone.

As with the Kiln 6 Upgrade items measurements, comparison of current measured sound levels at the same or similar locations, with those measured for the compliance assessment, will be sufficient to indicate if the contribution objectives are currently being achieved. Increases of more than 9 dBA would be required to indicate potential non-compliance with the licence conditions.

Results from 2016 shown later in Section 3, again indicate that compliance is being achieved by Cement Mill 7.

#### **2016 site source measurements**

Measurements were taken on 21 July and 10 August 2016 at the same locations as in previous years around each of the major noise sources associated with the upgraded or new plant items. These are compared with previously measured sound levels and described in Section 3. If the measured sound levels are more than 3 dB above the previously measured sound levels, then they are screened to assess their potential contribution and compliance with the objectives of the licence. Some measurements were also taken on 9 June during a period when the Kiln and associated plant (Raw Mills 6 and 7, fans FA38, FA249, FA250 and others) were off, but Cement Mill No.7 was operating. These results are also described in Section 3.

#### **2016 receiver and boundary monitoring**

As well as the site noise source monitoring, environmental receiver sound levels are measured. The latest set of measurements was done between 21 July and 10 August 2016.

Results of long-term unattended receiver environmental noise monitoring have also been collated for monitoring undertaken at regular intervals since 2002. Comparison of these results will also indicate if there are any trends in receiver location sound levels occurring over the monitoring period since 2002.

Chesley Park monitor location was removed in the 2015 survey as the property had been sold and was demolished. There appear to be no other relevant residential locations east of the Cement Plant. The Candowie residential site is also no longer occupied as a residence and appears to be used as an industrial or commercial site. These locations and potential receivers will continue to be reviewed annually in case additional receivers are located east of the plant.

An additional monitoring location near the south-eastern boundary by Lake Breed was added for 2016 as a reference for later assessments if the proposed railway for Hume Coal, which passes along the southern boundary and is shown in Figure 2.1, is ever built.

### **2.3 PRP-7 2011**

Under the 2011 Environment Protection Licence, a pollution reduction program was requested by the EPA to calculate Project Specific Noise Levels (PSNLs) for the plant, according to the NSW Industrial Noise Policy. Measurements of background sound levels were obtained in the same residential receiver locations as used in this 2013 compliance assessment, when the plant was not operating in June and July 2011. PSNLs were



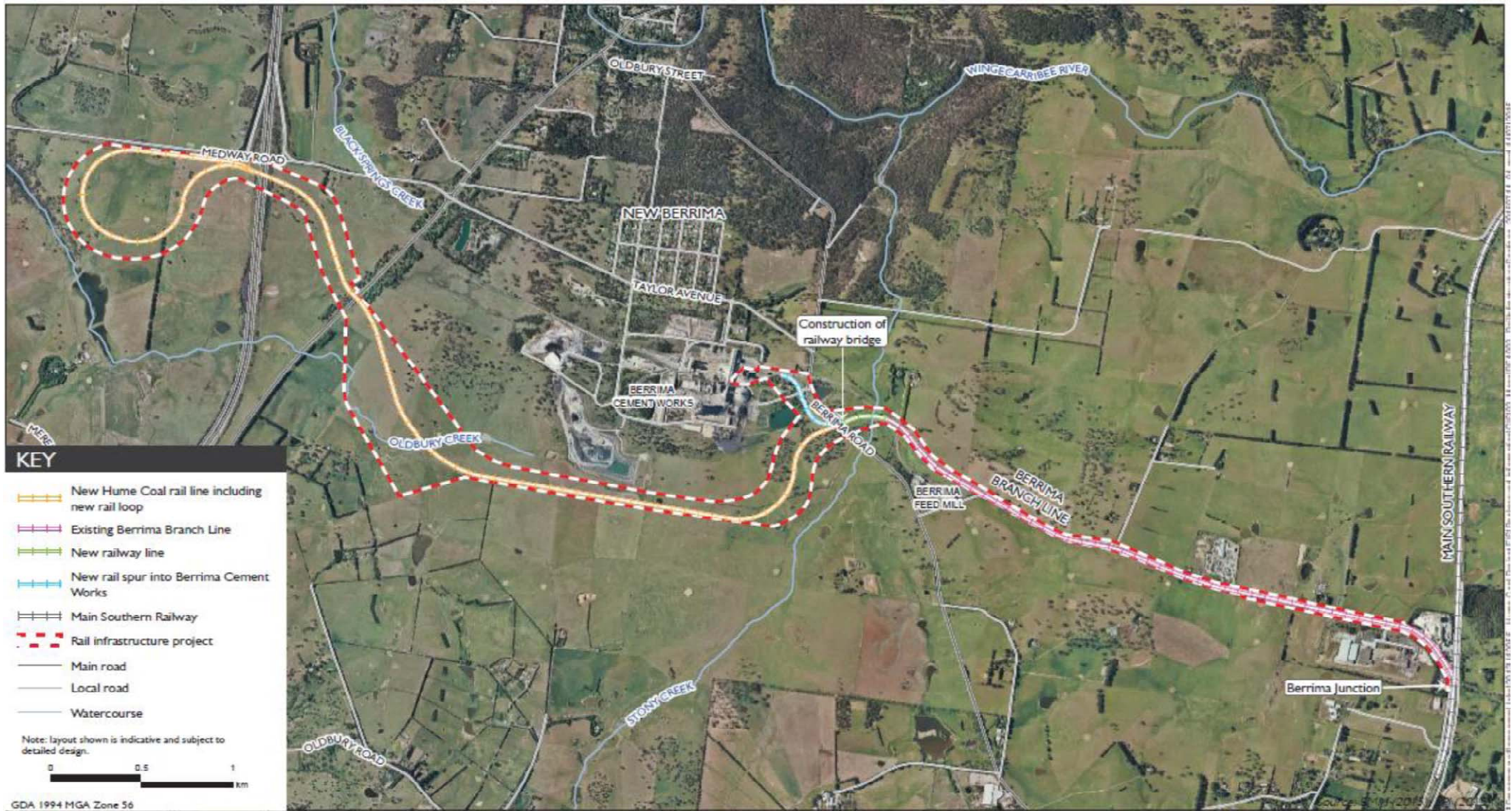


Figure 2.1: Extract from Hume Coal Berrima Rail Project EIS showing proposed rail route on the southern side of the Cement Plant

calculated and submitted with a report to the EPA. These were given as  $L_{Aeq,15-min.}$ ,  $L_{A90,15-min.}$  and  $L_{A01,1-min.}$  contribution sound levels at the receiver locations. Values for these are shown in Table 2.5 as follows:

**Table 2.5: Recommended PSNLs calculated for representative receiver locations**

Receiver location	Period	Recommended PSNL $L_{Aeq,period}$	Inferred Recommended Average $L_{A90,period}$	Recommended PSNL for Night-time $L_{A01,1-min}$
Taylor Avenue near Adelaide St	Day	48	43	58
	Evening	44	39	
	Night	43	38	
4 Melbourne St	Day	46	41	56
	Evening	42	37	
	Night	40	35	
Chesley Park Farm	Day	49	44	54
	Evening	45	40	
	Night	40	35	
12 Brisbane St	Day	51	46	56
	Evening	45	40	
	Night	40	35	
Northern Boundary	Night			60

The PRP has yet to be finalised or included in Licence conditions. As part of the PRP response, it has been proposed that a new monitoring location be placed at the “Store Yard Close” location. This is proposed to replace all other monitoring and have an objective of  $L_{A90,period}$  of 56 dBA averaged over 7 days, or  $L_{A90,15-minutes}$  of 58 dBA. This objective is based on  $L_{A90,15-minute}$  averages to avoid variability occurring with passing traffic outside and inside the plant which occurs with  $L_{Aeq,15-minute}$  values. This objective is yet to be agreed with the NSW EPA. The Chesley Park Farm location is no longer relevant given there is no longer a residence at the location.

The new Stores Yard Close location is proposed to enable measurement of only Cement Plant noise emissions. Other residential and boundary locations receive noise immission from other sources as well, especially road traffic, which confound the measurement results if they were used to assess the Cement Plant. Results from this new location were commenced in 2015 and are included in this 2016 assessment. The location is shown in Figure 1.2.

### 3. Measured sound levels in 2016 compared to previous measurements

#### 3.1 Kiln 6 area sound levels

The plan view of the Kiln 6 area and upgrade plant items are shown in Figure 3.1. Figures 3.2 to 3.4 show measurement locations around the Kiln and upgrade items area.

Sound levels measured at locations around Kiln 6 Upgrade plant items are shown summarised in Table 3.1. Table 3.2 also compares the results of sound levels measured at the same location on previous occasions from 2010 to 2015 and shows the calculated differences.

If the 2016 sound level exceeds the previous sound levels by more than 3dB, the cell difference in Table 3.2 is highlighted pink. A value of 3 dB difference is taken to be indicative of a potentially significant change in emission, as less than this is within measurement error or variation expected from location or source load differences.

The tables also have a column for comments, about major sources or where there is a difference which is an increase of more than 3 dB from previous measurements, and why this might have occurred.

For RM7, external sound levels were similar to those measured in previous years with no significant increases noted. Sound levels were higher near the baghouse area from the high-pitch sound of squeaking screw conveyors in the base of the baghouse hopper. Internal locations had similar sound levels to those of previous years. The roof platform lower level had higher sound levels in some locations than in 2014 and some previous years (but not 2013), but not the upper platform. This is considered to be related to the noise from the magnet separator, caused by impacts on a diverter plate. This may be related to flowrate. A cover plate on the northern side of this separator was open slightly (10mm) at the top having not been bolted shut. Improvements to reduce the noise emission from this area have been advised. Sound levels on the southern side of the upper roof platform were higher than in 2010 because the noise cladding has been removed from around the access hatch to the bucket elevator.

Sound levels around fan FA250 were higher than in previous years because of the squealing noise from the hopper screw conveyors. These were up to 13 dB higher than some previous years. The fan FA252 had a clogged discharge grill and cleaning of this would reduce the load on the fan and reduce the sound level.

Sound levels along the southern roadway 50 to 60m from the kiln and northern roadway at 13m from the kiln and buildings had not changed significantly from previous measurements. Sound levels opposite FA39 were 2 to 7 dB lower than in the past, the fan and motor having been replaced earlier in 2016. This will reduce noise emissions from the fan motors and ductwork towards the residential areas of New Berrima.

For the Coal Mill area, sound levels were generally similar to the past. The coal mill drive motor room doorway was open during the measurements (as shown in Figure 3.5), but the sound levels were not significantly higher than other locations along the coal mill wall.



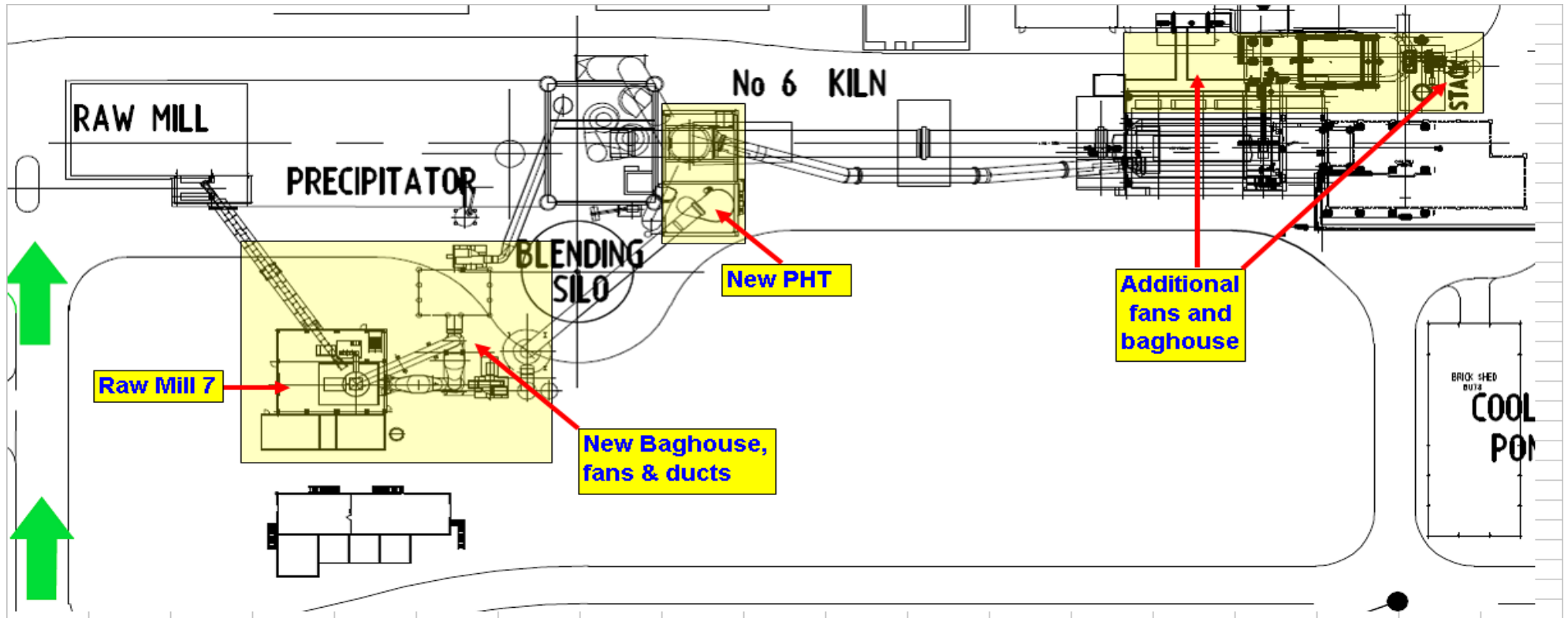
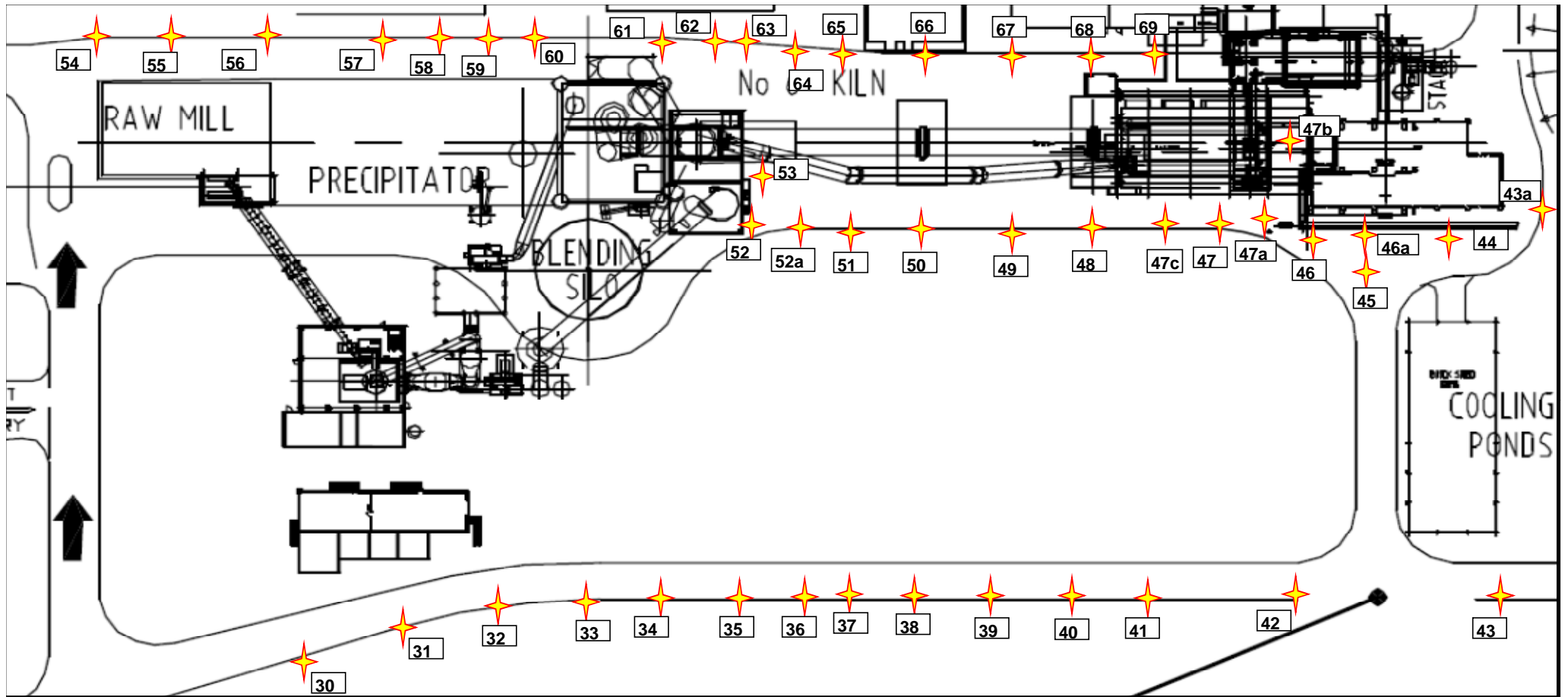


Figure 3.1: Kiln 6 Upgrade - location of new plant items





**Figure 3.2: Boral Cement Berrima - Noise Assessment - Measurement locations for Kiln 6 & RM7**

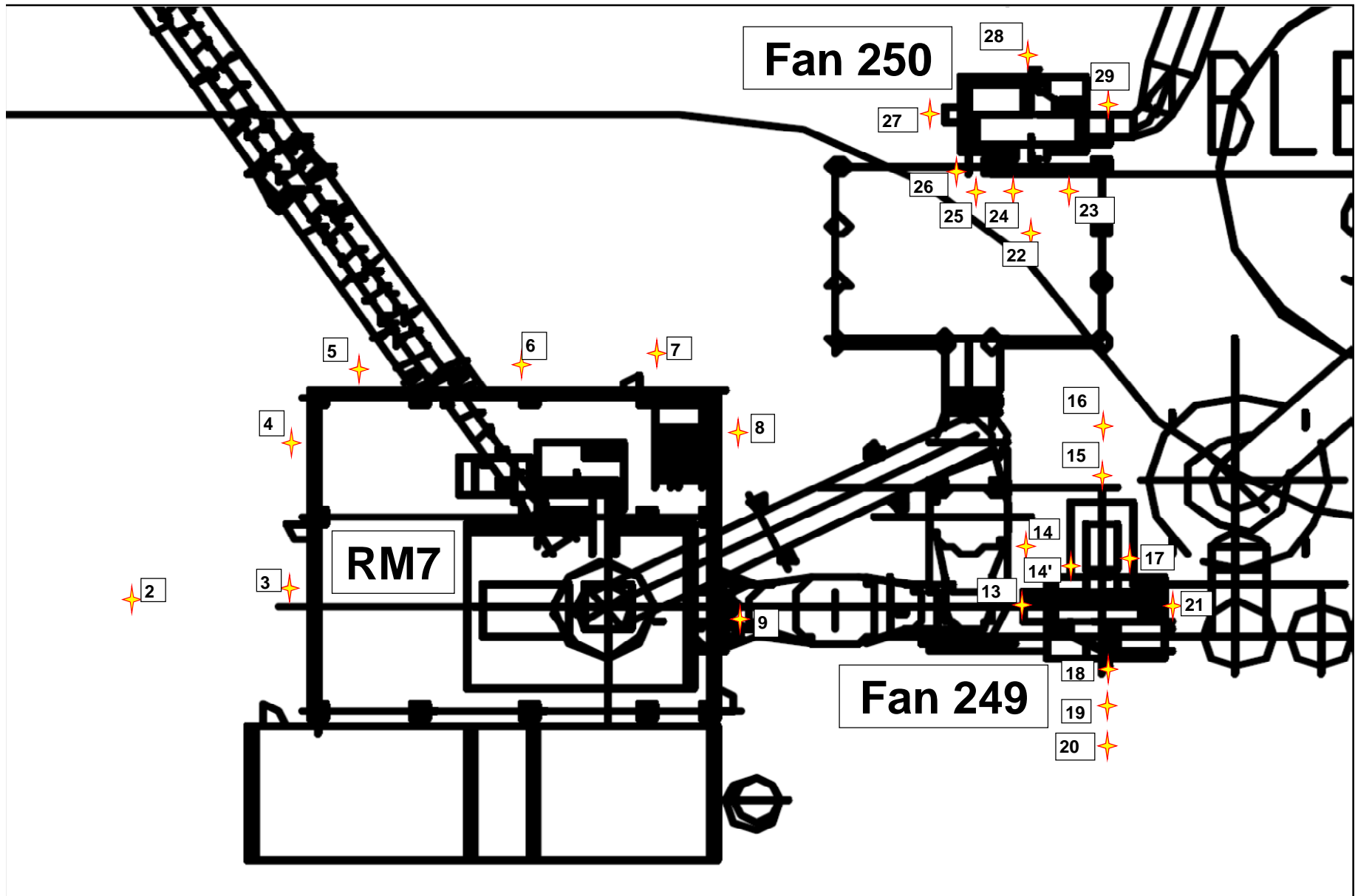


Figure 3.4: Boral Cement Berrima - Noise Assessment - Measurement locations RM7