Boral Cement Limited

Berrima Cement Works

Annual Environmental Management Review

Development Consents Addressed:	Development Consent No. 401-11-2002-i (Kiln 6) Development Consent No. 85-4-2005-i (Mill 7)
Review Period:	1 May 2018 - 30 April 2019
Approved By:	Environmental Manager - Cement

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1 ANNUAL REVIEW INFORMATION

Table 1 AEMR authorisation

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	1 May 2018
AEMR end date	30 April 2019

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 1 May 2018 to 30 April 2019 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, Boral Cement
Signature of authorised reporting officer	
Date	29 June 2019

2 STATEMENT OF COMPLIANCE

This annual environmental management review (AEMR) summarises compliance with the following development consents applicable to the Berrima Cement Works (the Works):

- 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).

It has been prepared in accordance with the *Post-approval requirements for State significant mining developments Annual Review Guideline* (NSW Government 2015) (the Guideline).

The compliance status of the Works is shown in Table 2.

Table 2: Statement of compliance

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

Table 3 summarises non-compliances with the development consents, based on the key in Table 4.

Table 3 Non-compliances

Relevant approval	Condition	Condition summary	Compliance status	Comment	Where addressed in AEMR?
Air Quality Discharge	1.6	…..ensure that the Development complies with all load limits, air emission limits and air quality monitoring requirement as specified in the EPL for the site	Low	Two non-compliance events related to emission limits noted during the Proof of Performance Trials	7 Incidents and Non-compliances

Table 4 Compliance status key for Table 3

Risk level	Code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.
Medium	Non-	Non-compliance with:

	compliant	● potential for serious environmental consequences, but is unlikely to occur; or ● potential for moderate environmental consequences, but is likely to occur.
Low	Non-compliant	Non-compliance with: ● potential for moderate environmental consequences, but is unlikely to occur; or ● potential for low environmental consequences, but is likely to occur.
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (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) (Figure 1). 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 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, 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).

Refer to the process flow diagrams in Figure 2 and Figure 3.

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 has been sourced from 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.

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). 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 in October 2016. 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.

Commencing in August 2018 the Works commenced the use of SWDFs, with a Proof of Performance Trial undertaken as required as per the consent. The PoPT six monthly report was approved by both the EPA and the Secretary on 23/04/2019 which permitted the continued use of SWDFs upto 40% of total fuel.

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 km east of the Hume Highway. The village of New Berrima was initially developed by Boral Cement's predecessors to provide housing for employees of the Works.

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 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.

Figure 1 Location and monitoring points

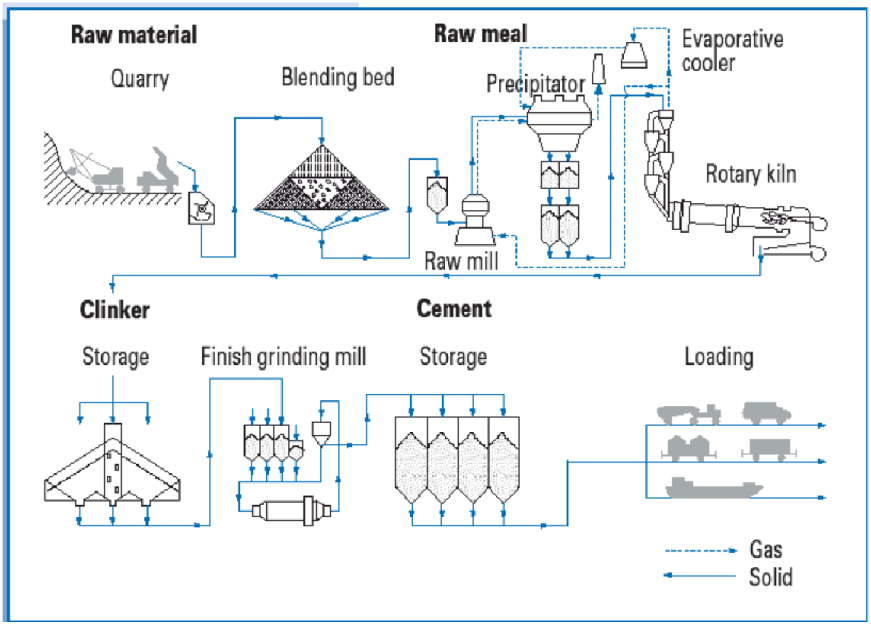
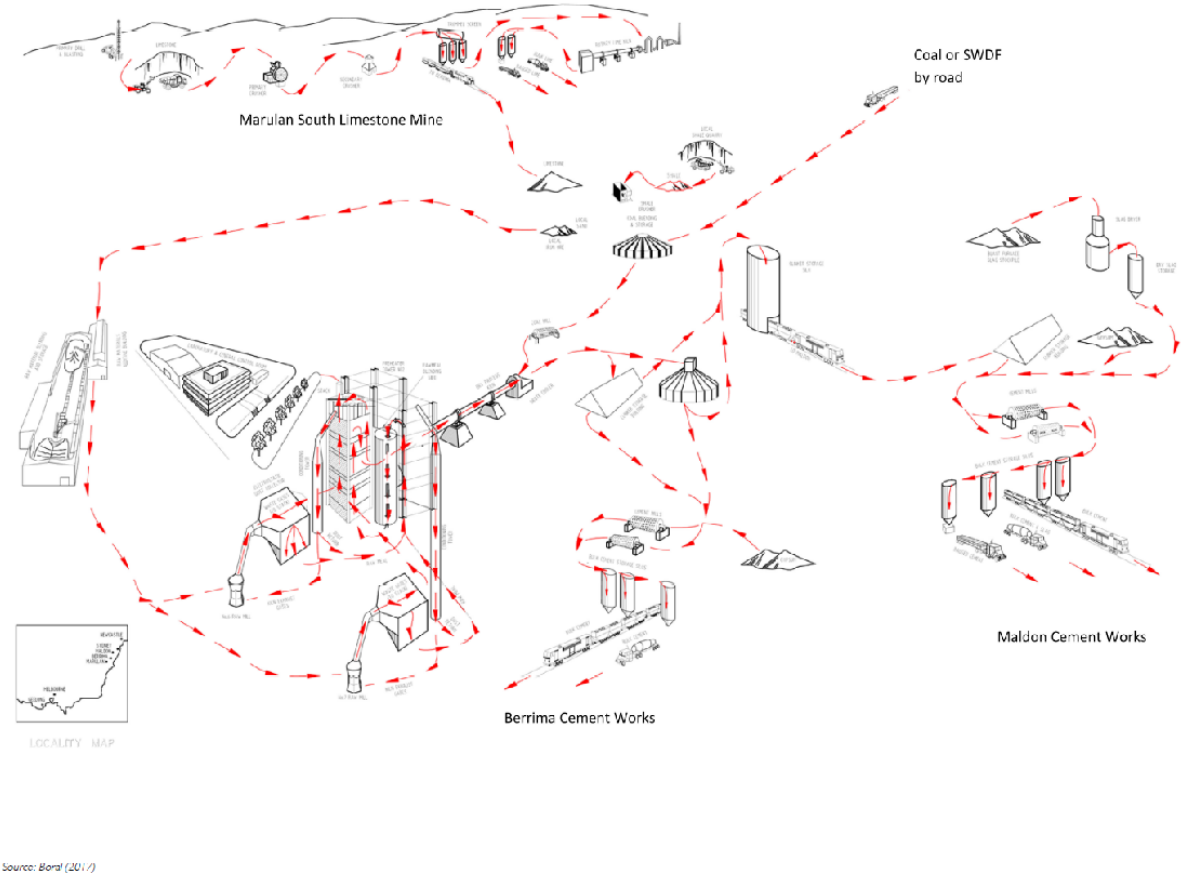


Figure 2 Process flow diagram



Source: Boral (2017)

Figure 3 Process flow diagram incorporating receipt of materials and dispatch of products

3.2 Key personnel

Details of key personnel who are responsible for environmental management at the Works are provided in Table 5.

Table 5 Key personnel responsible for environmental management

Name	Role	Phone number	Email address
Dean Beltrame	Operations Manager (NSW) Boral Cement	(02) 4860 2222	Dean.beltrame@boral.com.au
Edward Richardson	HSE Advisor - Berrima Cement Works	0401 894 518	edward.richardson@boral.com.au
Greg Johnson	Environment and Sustainability Manager - Boral Cement	0401 893 420	greg.johnson@boral.com.au
Belinda Prideaux	Environmental Manager-Boral Cement	0401 893 359	belinda.prideaux@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*.

3.3.1Consents

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 6 outlines the various modifications to the development consent.

Table 6 Approvals for Kiln 6

Application	Description	Date approved
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.

3.3.2Licenses

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 23 December 2016.

The Works also operates under a ML and six MPLs as summarised in Table 7.

Table 7 Mining leases

Mining title	Purpose	Expiry date
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 8 provides a summary of production at the Works for the 2019 reporting period (May 2018 and April 2019) compared to the 2017 and 2018 reporting periods.

Table 8 Production summary (annual financial year)

Material	Approval limit	15/16 FY	16/17 FY	17/18 FY	18/19 FY
Limestone used	Nil	1,766,790 t	1,918,289 t	1,873,921c	2,008,504
Shale used	Nil	312,337 t	308,199 t	278,720	201,997
Slag used	Nil	154,596 t	123,128 t	71,676	113,519
Gypsum used	Nil	81,140 t	76,864 t	82,901	81,259
Coal used	Nil	224,211 t	222,586 t	225,891	208,610
SWDFs used	100,000 t	Nil	Nil	Nil	21,870
Clinker production	1,560,000 t	1,440,097 t	1,484,700 t	1,470,989	1,443,836
Cement production	1,560,000 t	1,252,733 t	1,185,461 t	1,264,081	1,209,508

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 2019 reporting period the Works produced 1,443,83 tonnes of clinker. Of this clinker, 1,209,50 tonnes of cement was produced.

Boral commenced usage of SWDFs in 2019 return period. During this time Boral carried out proof of performance (PoP) trials of for wood waste and refuse derived fuels in accordance with Condition 3.25 of DA 401-11-2002-i. The related PoP trial plans had been submitted to EPA on 19 April 2018 for consultation and EPA replied with feedback on 14 May 2018. Boral revised the plans with the feedback and submitted these to DPE and EPA on 18 May 2018 for approval. During the POP trial period all reports were submitted for review by the regulatory parties as agreed to in the above mentioned plans.

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.

Berrima Cement Works – Operational Environmental Management Plan (Boral 2018) (OEMP) and subordinate plans received their three yearly review and were revised in accordance with conditions 6.3A and 6.4A of DA 401-11-2002-i. The OEMP was submitted to DPE for approval on 5 April 2018, and received approval in a letter dated 21 May 2018.

4 ACTIONS REQUIRED FROM PREVIOUS AEMR

There were no actions identified by the DPE after submitting the LY2018 AEMR. Actions specified in previous AEMR have been completed.

Table 9 DPE requested actions from previous AEMR

Action required from previous AEMRs	Action taken	Where discussed in AEMR
Nil	-	-

5 ENVIRONMENTAL PERFORMANCE

5.1 Overview

This section 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 and comprises 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 11. Noise was monitored and reported against the Kiln 6 and Mill 7 contribution criteria in September and October 2017 (see Appendix A – *Berrima Cement Plant – Annual Environmental Noise Assessment June-July 2018* (Recognition Research 2018)), with performance described in Table 12.

Boral manages noise on site in accordance with the *Berrima Cement Works – Noise Management Plan* (Boral 2018), 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 4). 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).

The noise sources at Kiln 6 produced more noise in 2018 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 and cleaning/replacing silencers.

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.

Noise from construction of the SWDF facility was managed in accordance with the noise management measures in *Berrima Solid Waste Derived Fuels Project – Construction Environmental Management Plan* (Boral 2017) (CEMP). No construction noise related community complaints were received during the reporting period.

Source	Sound Power Level – dB(A)	Sound Pressure Level dB(A)		
		Objective	Measured 2005	Measured 2017
Coal Mill and Clinker cooler fans	117	100 @ 3m	93 @ 2m	Coal mill wall vent 77 @ 2m, Courtyard cooler fans 89 to 94 @ 1m
New Radicon Cooler	103	92 @ 1m	81 @ 1m West 80 @ 2m East	85 to 95 @ 1m Area Average 93 @ 1m
New Pre-heater fan FA249	97	89 @ 1m	77 @ 2m	75 to 82 @ 1m
New Baghouse fan FA250	102	94 @ 1m	82 @ 2m	79 to 85 @ 1m
Raw Mill 7 Building	117	100 @ 3m	Vents 83 to 86 @ 1m	Vents 80 to 82 @ 1m Roof 80 to 92 @1m

Figure 4 Kiln 6 Upgrade plant items and objective sound power levels and sound pressure levels required to achieve compliance with objective 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	15	20	21
	Total	**26**	**31**	**31**
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	9	16	16
	Total	**21**	**30**	**31**

Figure 5 Cement Mill 7 predicted contribution levels at receivers for 2007 sound levels

Table 10: Noise conditions

Number	Condition
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 5dB(A) to the predicted level before comparing to the construction NML
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.
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.
K3.3	[2]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[a] $L_{Aeq(15\ minute)}$	Evening[b] $L_{Aeq(15\ minute)}$	Night[c] $L_{Aeq(15\ minute)}$
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 7:00am 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.

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

[2]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[a] $L_{Aeq(16\ minute)}$	Evening[b] $L_{Aeq(16\ minute)}$	Night[c] $L_{Aeq(16\ minute)}$
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 7.00am 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 10.00[pm to 7.00am Monday to Saturday and 10.00pm to 8.00am on Sundays and public holidays.

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

[3]The maximum allowable noise contributions identified in condition 2.3 apply under all meteorological conditions, except:

a) during wind speeds greater than 3ms-1 measured at 10 metres above ground level; or

	b) during temperature inversion conditions of greater than 3oC/100m and wind speeds of greater than 2ms-1 measured at 10 metres above ground. (Footnote: 3 Incorporates an EPA General Term of Approval (L4.4))
M2.5	[4]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.

Note: (K = Kiln 6, M = Mill 7)

Table 11: Response to noise conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.1	Construction of the SWDF facility only took place during the hours specified in this condition.	Construction is a short-term activity which can not be used to establish trends.	The noise management measures in the CEMP were, and will continue to be, implemented during construction of the SWDF facility.
K3.1A	The noise management measures in the CEMP were, and will continue to be, implemented during construction of the SWDF facility. No construction related noise complaints were received during the reporting period.	Construction is a short-term activity which cannot be used to establish trends.	The noise management measures in the CEMP were, and will continue to be, implemented during construction of the SWDF facility.
K3.1B	The noise management measures in the CEMP were, and will continue to be, implemented during construction of the SWDF facility. No construction related noise complaints were received during the reporting period.	Construction is a short-term activity which cannot be used to establish trends.	The noise management measures in the CEMP were, and will continue to be, implemented during construction of the SWDF facility.
K3.2	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 4).	The noise sources at Kiln 6 produced more noise in 2017 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 4). 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 consider the recommendations of the noise report to clean, replace or install silencers.
K3.3	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: ● 4 Melbourne Street – this location is an interface area between industrial and residential land uses and is heavily influenced by local road noise during the day and noise from the Hume Freeway at night. The long term average maximum night time L_{A90} is 43 dBA, and the 2017 average was 42 dBA. Kiln 6 noise levels are below the contribution criteria. ● Chelsey Park Farm and Candowie Farm – noise was not measured at these receivers as the residences have been demolished and the properties are being	Existing management measures effectively contain noise levels below contribution criteria. However, Boral will consider the recommendations of the noise report to clean, replace or install silencers.

		developed for industrial uses.	
M2.1	Construction of the SWDF facility only took place during the hours specified in this condition.	Construction is a short-term activity which can not be used to establish trends.	The noise management measures in the CEMP were, and will continue to be, implemented during construction of the SWDF facility.
M2.2	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).	Sound power levels near Mill 7 varied compared to those from previous years with several exceedances of contribution criteria. However, the exceedances were attributed to noise contributions from adjacent plant and noise levels from Mill 7 were below contribution criteria (Figure 5).	Existing management measures effectively contain noise levels below contribution criteria.
M2.3	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.	The sound levels were mostly the same or less than results for previous years, or within measurement variation error (+/- 2 to 3dB). 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. Measurement locations near Mill 7 with sound levels 3 dB above previous sound levels are in Figure 6, which shows predicted contribution sound levels at receivers based on distance attenuation. The locations in Figure 6 are shown in Figure 7. It is shown that potential exceedances are attributable to contributions from other plant at the site; not only from Mill 7. Note: noise was not measured at Candowie Farm as the residence has been demolished and the property is being developed for industrial uses.	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.
M2.4	Figure 5 shows that noise levels from Mill 7 are predicted to be below contribution levels at receivers during worst case weather conditions.	The sound levels were mostly the same or less than results for previous years, or within measurement variation error (+/- 2 to 3 dB). 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.	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.
M2.5	Noise was measured at the following locations: ● 72 Taylor Avenue (near Adelaide St); ● 12 Brisbane Street; ● 4 Melbourne Street; ● Northern Boundary; and	Trends in noise monitoring results are addressed above.	Noise will continue to be monitored at the specified locations.

	• Store Yard (close).		
M2.6	Section 11 of the INP provides the following alternate methods for determining compliance: 1. measuring existing noise levels with and without the premises operating; 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 3. using an accepted noise model calibrated for the particular locality and source. Method 2 was used for Mill 7.	This method has been used in previous AEMRs for the site with the results accepted by DP&E.	No management measures required.

Note: (K = Kiln 6, M = Mill 7)

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

Location	Year	Time	Period sec	Sound Level dB(A) $L_{AEQ,T}$	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	Argyle	South
						Objective Night	40	40	40	40	37
CM7											
A Top of stairs S	2018	02:43 PM	76	73	Distance	25	546	636	628	791	1615
	2010			69	Source after DIR		57	60	64	68	60
Difference 2018 - 2010			*Difference*	4	Distance reduction		-27	-28	-26	-30	-36
					Calculated SPL without barriers		*30*	*32*	*36*	*38*	*24*
Noise is from other sources, not just CM7											
D At corner N of Admin	2018	02:49 PM	62	75	Distance	23	514	611	615	781	1664
	2010			67	Source after DIR		75	75	75	75	50
Difference 2018 - 2010			*Difference*	8	Distance reduction		-27	-28	-29	-31	-37
					Calculated SPL without barriers		*48*	*47*	*47*	*44*	*13*
Noise is from other sources, not just CM7											
E Compressor room door @ 1m	2018	03:02 PM	65	72	Distance	1	546	636	628	791	1615
	2017			69	Source after DIR		60	63	67	69	63
Difference 2018 - 2017			*Difference*	3	Distance reduction		-55	-56	-56	-58	-64
					Calculated SPL without barriers		*6*	*7*	*11*	*11*	*-1*
Noise is from other sources, not just CM7											
G - Line N side of transfer house 13.5m to it, in-line W edge CM7	2018	03:22 PM	73	74	Distance	13.5	517	611	610	773	1647
	2011			68	Source after DIR		74	74	74	74	41
Difference 2017 - 2011			*Difference*	7	Distance reduction		-32	-33	-33	-35	-42
					Calculated SPL without barriers		*43*	*41*	*41*	*39*	*-1*
Noise is from other sources, including CM6, not just CM7											
H W roller door @ 1m	2018	02:58 PM	61	81	Distance	1	551	641	633	796	1610
	2011			77	Source after DIR		68	71	71	74	71
Difference 2017 - 2011			*Difference*	4	Distance reduction		-55	-56	-56	-58	-64
					Calculated SPL without barriers		*13*	*15*	*15*	*16*	*7*
Increase may be related to door open 100mm at bottom											
K Line level with G 13.5m to building, centre of compressor house	2018	03:21 PM	63	74	Distance	13.5	517	611	610	773	1647
	2011			68	Source after DIR		74	74	74	74	42
Difference 2017 - 2011			*Difference*	6	Distance reduction		-32	-33	-33	-35	-42
					Calculated SPL without barriers		*42*	*41*	*41*	*39*	*0*
Noise is from other sources, not just CM7											
L N wall vent W side @ 1m	2018	03:05 PM	61	74	Distance	1	517	611	610	773	1647
	2012			70	Source after DIR		74	74	74	72	48
Difference 2018 - 2012			*Difference*	4	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		*19*	*18*	*18*	*14*	*-16*
Reason for change not clear, likely to be other sources											
M Between wall vents @ 1m to wall	2018	03:07 PM	62	77	Distance	1	517	611	610	773	1647
	2012			70	Source after DIR		77	77	77	75	49
Difference 2018 - 2012			*Difference*	7	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		*23*	*21*	*21*	*17*	*-16*
Reason for change not clear, likely to be other sources											
N Wall vents N wall E side @ 1m	2018	03:09 PM	63	73	Distance	1	517	611	610	773	1647
	2011			67	Source after DIR		73	73	73	71	47
Difference 2017 - 2011			*Difference*	6	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		*19*	*17*	*17*	*13*	*-18*
No change since 2013 but influenced by FA502 and dependent on other sources e.g. K6											
O Line E side of Comp House 13.5m to control point	2018	03:18 PM	87	76	Distance	13.5	517	611	610	773	1647
	2011			67	Source after DIR		75	75	75	72	43
Difference 2018 - 2011			*Difference*	8	Distance reduction		-32	-33	-33	-35	-42
					Calculated SPL without barriers		*44*	*42*	*42*	*37*	*1*
Noise is from other sources, not just CM7											
P 1m N roll door CM7	2018	03:14 PM	63	82	Distance	1	528	625	620	783	1637
	2011			76	Source after DIR		82	82	82	78	46
Difference 2017 - 2011			*Difference*	5	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		*27*	*26*	*26*	*20*	*-18*

Table 3.8: Boral Cement Berrima Works 2018 Annual Environmental Noise Assessment for CM7 Project -
Measurement locations with increase in sound level > 3 dB and calculated contribution sound level at receivers

Location	Year	Time	Period sec	Sound Level dB(A) $L_{Aeq,t}$	Comments	Distance measured metres	Distance to Receivers				
							Distance Attenuation to receiver				
							Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	Argyle	South
						Objective Night	40	40	40	40	37
CM6											
2 Front of Roller Door @ 1m	2018	03:29 PM	62	89	Distance	1	532	633	639	813	1668
	2017			79	Source after DIR		71	73	77	79	77
Difference 2018 - 2017			Difference	10	Distance reduction		-39	-41	-41	-43	-43
Significant barriers to each location					Calculated SPL without barriers		32	32	36	36	34
14 CM6 E side centre door @ 1m	2018	03:57 PM	64	80	Distance	1	541	653	658	833	1660
	2012			74	Source after DIR		58	56	52	47	57
Difference 2018 - 2012			Difference	6	Distance reduction		-56	-56	-56	-58	-64
					Calculated SPL without barriers		4	0	-4	-12	-7
Significant barriers also to each receiver. Probably influenced by the open door at position 17											
15 2m from Clinker Building opp 13 & 14, 10.7m to CM6	2018	04:20 PM	42	76	Distance	10.7	541	653	658	833	1660
	2016			73	Source after DIR		54	51	47	42	52
Difference 2018 - 2016			Difference	-6	Distance reduction		-34	-36	-36	-38	-44
					Calculated SPL without barriers		20	15	12	4	8
Significant barriers also to each receiver. Probably influenced by the open door at position 17											
16 E wall centre @ 2m	2018	03:58 PM	61	80	Distance	2	541	653	658	833	1660
	2016			73	Source after DIR		57	54	51	45	56
Difference 2018 - 2016			Difference	7	Distance reduction		-49	-50	-50	-52	-58
					Calculated SPL without barriers		8	4	0	-7	-3
Significant barriers also to each receiver. Probably influenced by the open door at position 17											
17 E roll door opp Mill - door open	2018	04:00 PM	62	86	Distance	1	541	653	658	833	1660
	2013			78	Source after DIR		70	67	63	57	69
Difference 2018 - 2013			Difference	22	Distance reduction		-56	-56	-56	-58	-64
					Calculated SPL without barriers		16	11	7	-1	4
Significant barriers also to each receiver. also influenced by the open door at position 17											
18 Door opp Comp Room @ 1m	2018	04:02 PM	62	81	Distance	1	536	648	653	828	1665
	2016			76	Source after DIR		57	54	50	44	55
Difference 2018 - 2016			Difference	-6	Distance reduction		-55	-56	-56	-58	-64
					Calculated SPL without barriers		3	-2	-6	-14	-9
Significant barriers also to each receiver. also influenced by the open door at position 17											
19 Clinker Building @ 2m opp 18, 11m to CM6	2018	04:19 PM	34	79	Distance	11	536	648	653	828	1665
	2016			72	Source after DIR		55	53	49	43	54
Difference 2018 - 2016			Difference	7	Distance reduction		-34	-35	-36	-38	-44
					Calculated SPL without barriers		22	17	13	6	11
Significant barriers also to each receiver. also influenced by the open door at position 17											
20 Man door @ 1m - open 100mm	2018	04:06 PM	48	78	Distance	1	539	631	644	817	1672
	2016			76	Source after DIR		59	57	57	54	59
Difference 2018 - 2016			Difference	0	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		5	1	0	-4	-5
Significant barriers also to each receiver. also influenced by the open door at position 17											
21 1m Outside vent fan filter louvre	2018	04:10 PM	32	76	Distance	1	525	626	639	812	1677
	2016			72	Source after DIR		76	76	76	74	57
Difference 2018 - 2016			Difference	4	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		22	20	20	16	-6
22 E side N wall vent @ 1m	2018	04:11 PM	51	84	Distance	1	525	626	639	812	1677
	2013			81	Source after DIR		76	76	76	74	57
Difference 2018 - 2013			Difference	3	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		22	20	20	16	-6
24 W side N wall vent @ 1m	2018	04:14 PM	35	82	Distance	1	525	626	639	812	1677
	2015			78	Source after DIR		82	82	82	80	63
Difference 2018 - 2015			Difference	3	Distance reduction		-54	-56	-56	-58	-64
					Calculated SPL without barriers		27	26	26	22	-2

Figure 6 Measurement locations with increase in sound level >3 dB and calculated contribution at receivers

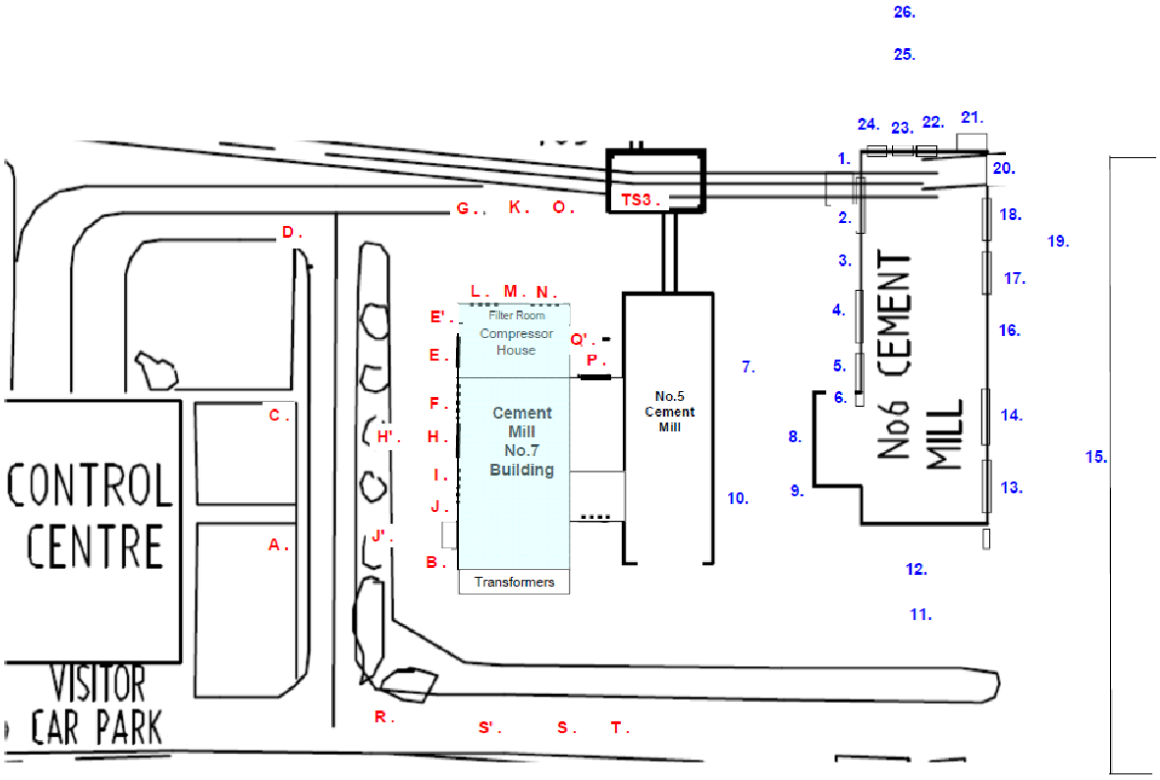


Figure 7 Mill 7 noise measurement locations

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 *Berrima Cement Works – Dust Management Plan* (Boral 2018), which is operated across the site.

Table 13 sets out the relevant air quality conditions for the site within the two development consents. Table 14 sets 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. The continuous monitoring data of particles (Kiln 6) showed compliance with agreed standards. The specialised testing of Kiln 6 and Mill 7 in Aug 2018 showed a non compliance with agreed standards which is discussed in section & of this report.

Boral Cement maintains a dust deposition monitoring program, currently consisting of seven dust deposition gauges and one high volume air sampler (HVAS) 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. The HVAS was relocated in January 2018 as it was located within a construction zone for the realignment of Moss Vale Road. The EPA was notified of the requirement to relocate the HVAS.

As discussed in the body of this section, average dust deposition data for dust gauges for the reporting period have values well below the EPA guideline of 4g/m2/month. These results confirm that the current dust control measures on site are generally working well.

Twenty nine complaints were received from the community in relation to the deposition of dust on vehicles and properties. One Complaint was received about weeds on the rail line. All the complainants were contacted after the complaints were received. Further details are provided in Appendix 2 Complaints Summary.

Table 12: Air quality conditions

Number	Condition
K3.7	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.
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.
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.
M2.7 Dust Emissions	[5]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))
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.
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.
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.
K3.10A	Deleted
M2.10 Discharge Limits	[6] 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 20mg/m^3 (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))

Note: (K = Kiln 6, M = Mill 7)

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.7	**Dust monitoring** There are seven dust monitoring gauges and one HVAS around the perimeter of the site and in New Berrima. The locations of the gauges are shown on Figure 1. Samples are collected from the dust gauges each month and each week for the HVAS. The samples are assessed for compliance against the dust deposition and total suspended particulates (TSP) guidelines in *Approved Methods and Guidance for Analysis for the Modelling and Assessment of Air Pollutants in NSW* (DEC 2005) and *National Environment Protection Measure for Ambient Air Quality* (NEPC 1998) PM_{10} guideline. As there is no emission limit specified in the Licence, the following guidelines have been adopted: ● EPA dust deposition guideline of 4 g/m2/month (expressed as a 12-month rolling average). ● NEPM PM_{10} 24 hr standard of 50 µg/m^3. ● EPA TSP annual goal of 90 µg/m^3. As can be seen in figure 8 and 9, the dust gauges and HVAS have values below the guidelines for the reporting period. **Stack emissions** Yearly stack emission monitoring for Kiln 6 as required by the EPL was undertaken in Aug 2018. Figure 10 shows that the Works maintained emissions well under the EPA limits. Twenty nine 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 2.	Figure 8 shows the results of the analysis of the HVAS from January 2014 to April 2019. As can be seen, the current data shows that we remain below the EPA guideline of 4 g/m2/month. Figure 9 shows the results of the analysis of the dust gauges located around the site and the New Berrima community from May 2014 to March 2019. As can be seen, the current data shows that we remain below the EPA guideline of 4 g/m2/month. Note that Dust Gauges 4 and 6 were removed by agreement in 2013. 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.	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.
K3.7A	See K3.7 above under Dust monitoring.	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. The site's re-vegetation program included planting in the areas surrounding the stockpiles to create a windbreak and a dust screen.	
K3.8	No complaints were received during this period and no related issues arose during this period.	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 Cement Works – Traffic Management Plan* (Boral 2017) includes requirements for all drivers of heavy vehicles on site to ensure they cover their loads and prevent spillages.	
K3.9	See K3.7 above under Dust monitoring.	Some of the unsealed roads on site have been sealed in the	Boral Cement continues to

	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.	previous years and some have been closed off and recently re-vegetated. Two wheel wash stations were installed in 2016, 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. 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 to ensure sweepers are working efficiently. Boral Cement modified its activities such as loading, unloading and crushing of materials in open areas to minimise wind blown dust. Actions included the use of a water cart, stopping or postponing the activities until wind subsides, modifying the process to take place under cover where possible, etc.	investigate opportunities to reduce fugitive dust throughout the site. Issues are managed through immediate corrective action and reporting through the incident management database SIMS.
M2.7	Covered under KK3.7 and K3.7A		
M2.8	Covered under K3.8		
M2.9	Covered under K3.9		
K3.10	Stack emission monitoring for Kiln 6 for standard fuels was conducted by Ektimoin August 2018 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 Figure 12). Stack Testing for the non standard fuels POP trial was conducted in the return periodCopies of the annual stack testing reports are in appendices 3 and 4.	No exceedances demonstrated for continuous particulate monitoring for Kiln 6 from May 2018 – April 2019 as demonstrated in Figure 10. A summary of continuous particulate monitoring data for Kiln 6 since 2012 is shown in Figure 11 displaying long term trends. One exceedance for solid particulates was found during the POP testing the exceedance is explained in section 7 of this report.	
M2.10	Ektimo monitored solid particle emissions from the Mill 7 stack on 12 July 2017 in accordance with the sampling methods specified under EPL 1698. The report demonstrated compliance with the emission limit as shown in Figure 12.		

Table 13: Response to air quality conditions

Note: (K = Kiln 6, M = Mill 7)

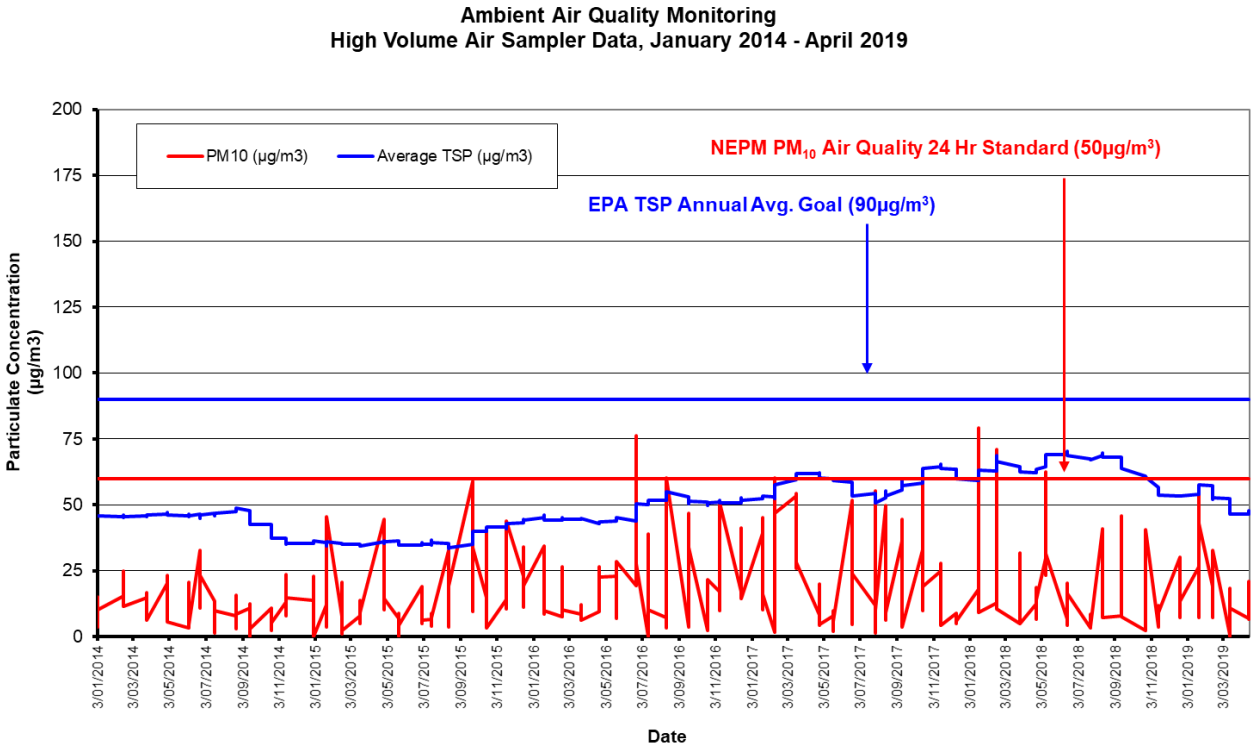


Figure 8 Ambient air quality monitoring January 2014 – April 2018

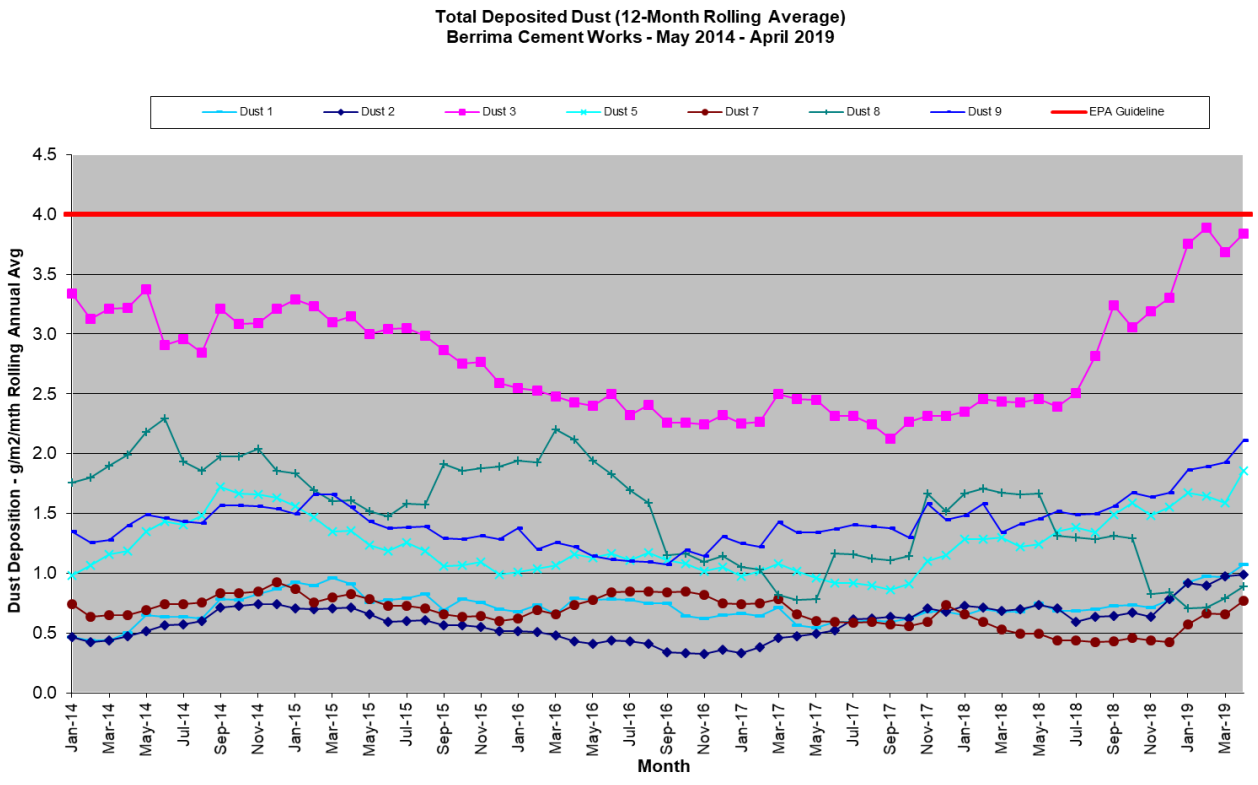


Figure 9 Total deposited dust (12-month rolling average) May 2014 – April 2018

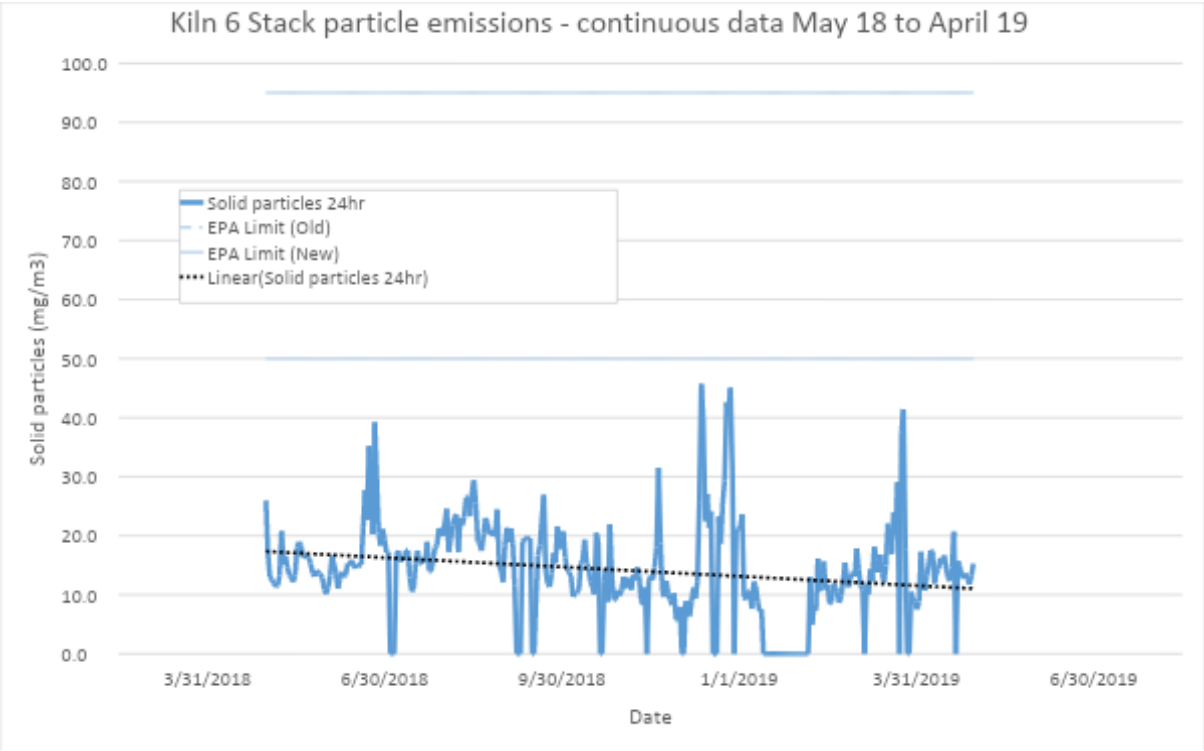


Figure 10 Continuous particulate monitoring for Kiln 6 May 2017 – April 2018

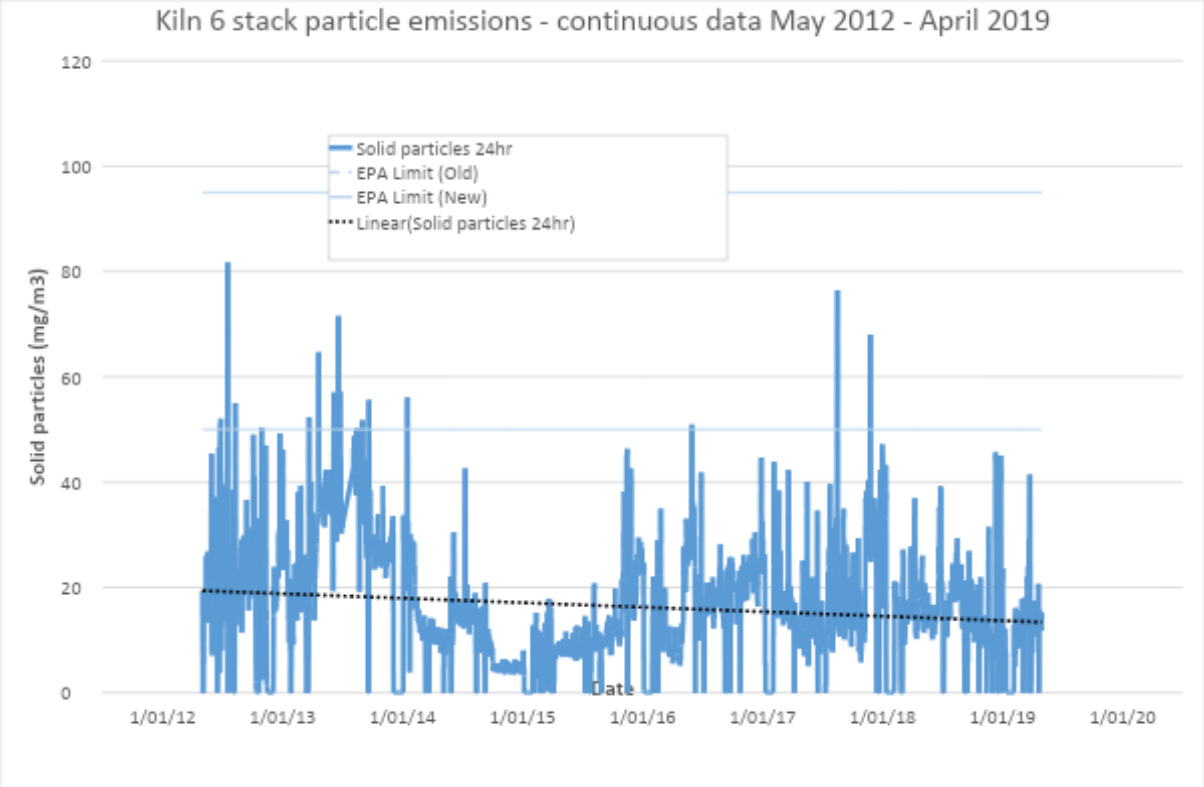


Figure 11 Continuous particulate monitoring for Kiln 6 May 2012 – April 2018

EPA	Parameter	Units	Detected values 18-23 July 2018	Detected values (corrected to 10% O_2)
EPA 2 - Kiln Stack No. 6	Mercury	mg/m^3	0.011	**0.011**
	Cadmium	mg/m^3	<0.0003	**<0.0003**
	Type 1 & 2 substances in aggregate	mg/m^3	<0.04	**<0.04**
	Copper	mg/m^3	0.0009	**0.00087**
	Thallium	mg/m^3	0.0016	**0.0015**
	Zinc	mg/m^3	0.0027	**0.0026**
	Solid particles	mg/m^3	21	**21**
	Coarse particulates	mg/m^3	7.6	**7.6**
	PM_{10} (by PSA)	mg/m^3	14	**13**
	$PM_{2.5}$ (by PSA)	mg/m^3	5.3	**5.3**
	Nitrogen oxides	mg/m^3	1200	**1200**
	Carbon dioxide	%	19.2	**NA**
	Oxygen	%	9.9	**NA**
	Carbon monoxide	mg/m^3	230	**230**
	Total fluoride	mg/m^3	<0.02	**<0.02**
	Chlorine	mg/m^3	<0.01	**<0.009**
	Hydrogen chloride	mg/m^3	<0.02	**<0.02**
	Sulfur trioxide and/or sulfuric acid (as SO_3)	mg/m^3	<0.02	**<0.02**
	Sulfur dioxide	mg/m^3	<0.02	**<0.02**
	Hexavalent chromium	mg/m^3	<0.001	**<0.001**
	Total VOC (as n-propane)	mg/m^3	<0.2	**<0.2**
	Dioxins & furans ()-TEQ middle bound)	ng/m^3	0.00051	**0.00055**
	PAHs (BaP-TEQ middle bound)	ng/m^3	17	**18**
EPA 4 - Cement Mill Stack No.6 (Duct 1)	Solid particles	mg/m^3	1.9	**NA**
EPA 4 - Cement Mill Stack No.6 (Duct 2)	Solid particles	mg/m^3	7.1	**NA**
EPA 5 - Kiln Cooler Stack No. 6	Solid particles	mg/m^3	<2	**NA**
EPA 10 - Cement Mill Stack No. 7	Solid particles	mg/m^3	16	**NA**

Note: This is the comparison table from the Annual Compliance Stack testing so it does not show the data from the POP trial testing that has already been provided through the trial reporting, Boral would like to note that there were two exceedances of the license limit during this period a Solid Particulate reading of 650mg/m3 and Cadmium 0.21mg/m3 both are noted in section 7 Non Compliances.

Figure 12 Stack testing license comparison table

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 14. The consents refer to EPL 1698, however, there are no water discharge limits in the EPL.

Table 16 sets 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 *Berrima Cement Works – Water Management Plan* (Boral 2018), 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 two overflow events during the reporting period.

Three of the conditions relate to construction, with the SWDF facility partially built during the reporting period. It is demonstrated in Table 15 that the overall water management performance of the site is good. 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 14: Soils and water quality conditions

Number	Condition
K3.11 Construction Soil and Water Management	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.
K3.12	All construction vehicles exiting the site, having had access to unpaved areas, shall depart via a wheel-wash facility.
K3.13	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.
K3.14 Water Discharge Limits	The Applicant shall ensure that all surface water discharges from the site comply with the: a) discharge limits (both volume and quality) set for the development in any EPL; or b) relevant provisions of the POEO Act.
M2.11 Water Quality Impacts	[7]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))
M2.12 Erosion and Sediment Control	All construction vehicles exiting the site, having had access to unpaved areas, shall depart via a wheel-wash facility.
M2.13	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.
M2.14 Site Drainage and Stormwater	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.

Note: (K = Kiln 6, M = Mill 7)

Table 15: Response to soils and water quality conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.11	Construction of the SWDF facility (adjacent to Kiln 6) occurred in the existing Kiln 6 catchment. Run off from the construction site flowed to the Kiln 6 settling ponds, which overflow to the detention basin (Lake Breed) which functions as water detention, filtration and biological treatment. Lake Breed overflows to Lake Quality which is a large storage and settling basin. Water only overflows from Lake Quality to Stony Creek during relatively high and sustained rainfall or large storms. There was two overflows from Lake Quality during the reporting period (31/12/2018, 08/04/19). Water was sampled at the overflow point (EPA Point 9), which had the following results: ● Biochemical oxygen demand (mg/L) – <2 (guideline: 20) ● Oil and grease (mg/L) – <5 (guideline: 10) ● pH – 8.8, 7.4 ● Total suspended solids (mg/L) – 24, 30 (guideline: 30-50) The results were within guideline values apart from pH, which was slightly elevated.	Construction is a short-term activity which cannot be used to establish trends.	The CEMP will continue to be implemented during the remaining construction of the SWDF facility.
K3.12	Construction vehicles exited the site via a wheel wash.	Existing site wheel wash used where necessary. No significant sediment tracking observed from construction activities. Aggregate used to stabilised disturbed ground during construction.	The CEMP will continue to be implemented during the remaining construction of the SWDF facility.
K3.13	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends.	The CEMP will continue to be implemented during the remaining construction of the SWDF facility.
K3.14	No water volume and quality discharge limits are specified in EPL 1698 and water was not regarded as a project risk (SLR 2015). Notwithstanding, the EPL requires monitoring at the Lake Quality overflow point during overflows.	The water in Lake Quality is reused in site processes and the lake only overflows during heavy rainfall. There was one overflow during the reporting period and sampling demonstrated that water quality met the typical NSW discharge criteria. Occasionally, an exceedance of pH may occur in the overflow due to alkaline nature of raw	*Berrima Cement Works – Water Management Plan* (Boral 2018) is implemented at the Works, which includes the Kiln 6 area and is reviewed every three years or after an

	There was two overflows from Lake Quality during the reporting period (31/12/2018, 08/04/19). Water was sampled at the overflow point (EPA Point 9), which had the following results: ● Biochemical oxygen demand (mg/L) – <2 (guideline: 20) ● Oil and grease (mg/L) – <5 (guideline: 10) ● pH – 8.8, 7.4 ● Total suspended solids (mg/L) – 24, 30 (guideline: 30-50) The results were within guideline values apart from pH, which was slightly elevated.	materials and products handled on site.	incident and is revised/improved as deficiencies become apparent.
M2.11	No water volume and quality discharge limits are specified in EPL 1698.	Refer to K3.14.	*Berrima Cement Works – Water Management Plan* (Boral 2018) 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.
M2.12	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends.	The CEMP will continue to be implemented during the remaining construction of the SWDF facility.
M2.13	Refer to K3.12.	Construction is a short-term activity which cannot be used to establish trends.	The CEMP will continue to be implemented during the remaining construction of the SWDF facility.
M2.14	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends.	The CEMP will continue to be implemented during the remaining construction of the SWDF facility.

Note: (K = Kiln 6, M = Mill 7)

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 17.

Table 18 summarises 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, with most of the SWDF facility constructed during the reporting period. The *Berrima Solid Waste Derived Fuels Project – Construction Traffic Management Plan* (Boral 2017) was implemented to prevent incidents and queuing on public roads. No community complaints were received regarding construction traffic.

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, have not historically, and continue 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 16: Traffic and transport conditions

Number	Condition
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.
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.
K 3.16A 3.16B 3.16C 3.16D 3.16E Port Kembla Coal Haulage Campaigns Deleted.	
K3.16A	The Applicant shall pay a road maintenance levy to Council of 4 cents/tonne/km for the transport of SWDF.
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.
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.
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.

Note: (K = Kiln 6, M = Mill 7)

Table 17: Response to traffic and transport conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.15	Only a small workforce was required to construct the alternative waste facility with employees travelling to site from different directions. Therefore, a bus service was not implemented for construction during this reporting period as it was not required nor practical.	Construction timeframes are short and no performance trends can be established.	The Construction Traffic Management Plan will continue to be implemented for the duration of construction of the alternative waste facility.
K3.16	No construction vehicles stood or parked on public roads or footpaths as there is sufficient room on roads within the site and parking areas to accommodate vehicles. Employee car parking was extended three years ago. The employee car park has unused capacity.	Construction timeframes are short and no performance trends can be established.	The Construction Traffic Management Plan will continue to be implemented for the duration of construction of the alternative waste facility.
K3.16A	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.
M2.15	Only a small workforce was required to construct the alternative waste facility with employees travelling to site from different directions. Therefore, a bus service was not implemented for construction during this reporting period as it was not required nor practical.	Construction timeframes are short and no performance trends can be established.	The Construction Traffic Management Plan will continue to be implemented for the duration of construction of the alternative waste facility.
M2.16	No construction vehicles stood or parked on public roads or footpaths as there is sufficient room on roads within the site and parking areas to accommodate vehicles. Employee car parking was extended three years ago. The employee car park has unused capacity.	Construction timeframes are short and no performance trends can be established.	The Construction Traffic Management Plan will continue to be implemented for the duration of construction of the alternative waste facility.
M2.17	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.

Note: (K = Kiln 6, M = Mill 7)

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 19. 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 20 sets 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 *Berrima Cement Works – Waste Management Plan* (Boral 2018), which describes recycling and disposal requirements for the different waste categories generated and used on site.

The waste conditions and the EPL 1698 specifically detail what wastes can be received on site for storage, treatment, processing, reprocessing or disposal such as granulated blast furnace slag (slag). These conditions exclude non-standard fuels approved for use at Kiln 6.

Table 18: Waste conditions

Number	Condition
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.
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	[8]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))
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.
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.
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.
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.
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 a accordance with the NSW EPA's Waste Classification Guidelines.

Note: (K = Kiln 6, M = Mill 7)

Table 19: Response to waste conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.17	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 was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).	The Operational Environmental Management Plan was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).
K3.17A	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 Operational Environmental Management Plan was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).
M2.18	Landfilling of waste is prevented by crushing and recycling old refractory bricks through the kiln.	No waste materials.	
K3.17AB	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 desired outcomes.
K3.17AC	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 desired outcomes.
K3.17AD	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_2/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 desired outcomes.
K3.17AE	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. Use of GBFS in subsequent periods has been: ● 2013: 11,426 t ● 2014: 6,893 t	Boral has been using less GBFS than the approved rate of 150,000 tonnes per annum.	Current management measures for the use of GBFS are achieving desired outcomes.

	• 2015: 83497 t • 2016: 76255 t • 2017: 47,944 t		
K3.17B	No AKF1 or other Group A wastes were stored on site during the reporting period.	The Operational Environmental Management Plan was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).	The Operational Environmental Management Plan was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).
K3.17C	Use of waste derived non-standard fuels at the site has not commenced.	Wastes generated from the use of nonstandard fuels on site will be classified using the NSW EPA's Waste Classification Guidelines in accordance with EPL Condition L4.2.	Wastes generated from the use of nonstandard fuels on site will be classified using the NSW EPA's Waste Classification Guidelines in accordance with EPL Condition L4.2.

Note: (K = Kiln 6, M = Mill 7)

5.7 Non-standard fuels

The non-standard fuels consent requirements for Kiln 6 are in conditions 3.20 to 3.28 of Development Consent No. 401-11-2002-i, which are replicated in Table 21 and considered in Table 22. 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.

In August 2018 Boral Cement commenced the use of Solid Waste Derived Fuels (SWDF) including Wood Waste (WW) and Refuse Derived Fuels (RDF). As per condition 3.25 a Proof of Performance Trial was undertaken with the six month report submitted to the Department for approval on 28 February 2018.

On the 23 April 2019 the Secretary approved the ongoing use of SWDF subject to:

a) limiting the amount of SWDF to be fired in Kiln 6 to 40%, as a percentage of total fuel,
b) periodic stack testing being undertaken every three months for the first 12 months of use of SWDF. The monitored pollutants must be consistent with the requirements of the Environment Protection Licence (EPL 1698)
c) provision of a monitoring report that outlines the results of the quarterly stack testing required in (b) above and provides an assessment of compliance against the air emissions limits for the facility, to the satisfaction of the Secretary
d) periodic measurements of hydrogen chloride (HCl) taken every three months until such time the Secretary agrees the accuracy of the HCl CEMS is confirmed through successful calibration audits undertaken in accordance with the USEPA Performance Specification 18.

On the 16 November 2018 Boral sought approval from the Department to store up to 17 500t of carbon anode material (Hi Cal 50), sourced from the former Hydro Aluminium Kurri Kurri smelter for a period of 36 months. The Department reviewed the request and the additional information provided in consultation with the EPA and on 4 April 2019 confirmed approval of:

- the ‘Hi Cal 59 Storage and Handling Procedure’, Version 3dated 27 March 2019 and
- the ‘Hi Cal 50 (Carbon anode ex-Hydro Kurri Kurri) Recovered Resource Specification Version 3 dated 27 March 2019

Boral Cement are currently preparing a modification to permit the use of HiCal 50 during start up conditions and will not recommence use until such time as this modification is approved or an alternative method to consume in the kiln is developed.

Table 20: Non-standard fuels conditions

<table>
<tr><th>Number</th><th>Condition</th></tr>
<tr><td>K1.4A Use of non standard fuels</td><td>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
<table>
<tr><th>Fuel</th><th>Category</th><th colspan="2">Tonnes per annum</th></tr>
<tr><td>Natural Gas, Fuel Oil, Diesel</td><td>Standard Fuel</td><td colspan="2">No limits</td></tr>
<tr><td>Coal</td><td>Standard Fuel</td><td colspan="2">No Limit</td></tr>
<tr><td>Coke Fines</td><td>Standard Fuel</td><td colspan="2">No Limit</td></tr>
<tr><td>Hi Cal 50</td><td>Non-Standard Fuel</td><td colspan="2">10,000</td></tr>
<tr><td>AKF1</td><td>Non-Standard Fuel</td><td colspan="2">20,000</td></tr>
<tr><td>AKF5</td><td>Non-Standard Fuel</td><td>30,000</td><td rowspan="3">≤100,000 combined</td></tr>
<tr><td>Wood Waste</td><td>Non-Standard Fuel</td><td>50,000</td></tr>
<tr><td>RDF</td><td>Non-Standard Fuel</td><td>80,000</td></tr>
</table>
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.</td></tr>
<tr><td>K1.4B</td><td>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.</td></tr>
<tr><td>K1.4C</td><td>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:

a) 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;

b) 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

c) 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.</td></tr>
</table>

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

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.
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.
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.
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; NSW Government Department of Planning and Environment 13 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.
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.
K3.25	The Applicant must undertake PoP trials for the burning of SWDF. The maximum length of the trial will be eight months. At least one month prior to the PoP trials, the Applicant shall submit a detailed plan(s) for the PoP trials, to the satisfaction of the Secretary. The plan(s) must be prepared for the co-incineration of each permitted SWDF and be prepared in consultation with the EPA. The plan(s) must, as a minimum: a) verify the residence time, the minimum temperature and the oxygen content of the exhaust gas which will be achieved during normal operation and under the most unfavourable operating condition anticipated;

	b) establish all criteria for operation, control and management of the abatement equipment to ensure compliance with the emission limit values specified in the EPL; c) assess the performance of any monitors on the abatement system and establish a maintenance and calibration program for each monitor; d) establish criteria for the control of all alternative fuel input including the maximum flow and maximum calorific value; e) confirm that all measurement equipment of devices (including thermocouples) used for the purpose of establishing compliance with this approval have been subjected, in situ, to normal operating temperatures to prove their operation under such conditions; f) detail procedures for testing the performance of all major process components and emission control systems associated with the processing and burning of SWDF; and g) address all relevant requirements of the EPL for the project.
K3.26	The PoP trials shall: a) be carried out in accordance with a detailed PoP plan(s) approved by the Secretary; b) be undertaken by a suitably qualified and experienced person(s); c) test performance of all major process components including emission control systems using no SWDF, and representative fuels containing SWDF designed to cover the range of materials and compositions of SWDF; d) identify changes to the Kiln 6 emission control system that may be necessary to achieve compliance with the consent and the EPL; and e) demonstrate compliance with the relevant requirements of the EPL, development consent and relevant environmental and safety criteria.
K3.27	The Applicant is to report on each PoP trial to the Secretary and EPA. The reports shall be submitted at: a) monthly intervals during the PoP trial. The information to be contained in these reports is to be determined in consultation with the EPA as part of the PoP Trial Plan required under condition 3.25; and b) six months after the commencement of the PoP trial. The six month report shall contain but not be limited to the following information: i. the total quantity of SWDF used during the previous six months; ii. the dates and times when the trial commenced and will conclude; iii. the results of stack emissions testing for the analytes and properties specified in any relevant trial plan and baseline emissions for comparison, where applicable; iv. all monitoring data collected for the project during the previous six months; v. identification of any non-compliance with the conditions of this consent and the EPL; vi. details of additional measures to be implemented to address any non-compliance; and vii. an assessment of the suitability of the SWDF for ongoing use. Copies of the POP Trial Reports shall be made available to the public upon request.
K3.28	Use of SWDF is not permitted (outside of the approved PoP trials) until such time as the Secretary has indicated in writing that it is satisfied with the results of the six month PoP trial report specified under condition 3.27 b) for an individual SWDF.

Note: (K = Kiln 6, M = Mill 7)

Table 21: Response to non-standard fuels conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K1.4A	The majority of fuel consumed was coal. Small amounts of diesel are used during kiln start-ups. The site commenced the use of SWDF's in August 2018.	SWDF are now in use.	The OEMP was updated in April 2018 in accordance with Condition 6.7 to incorporate measures for management of nonstandard fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).
K1.4B	No AKF 5 was received, stored or used at the site during the reporting year.	NA	
K1.4C	Compliance was confirmed in the 2007-2008 AEMR.	The site will be recommencing the use of HiCal50 when the current modification is approved.	
K1.4CA	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.
K1.4D	No non-standard fuels were used during start-up or shut-down conditions.	SWDF are currently the only non-standard fuels in use. These are fed into the Calciner and are easily removed during start-up and shut down conditions	A modification has been submitted to permit the use of HiCal50 when blended with coal at 4% HiCal 50 to 96% coal during start-up and shut down conditions.
K1.4E	Written approval from the Secretary received (4/4/2019) to store up to 17 500t of HiCal 50 for three years.	The site is currently receiving and storing HiCal 50 on site from Kurri Kurri. The campaign to bring in from Kurri Kurri is likely to end by October 2019.	Manage as per approved HiCal50 Storage and Handling Procedure nd Hi Cal 50 Rescovered Resource Specification.
K1.4F	All non-standard fuels received and used at site are tested to ensure compliance with approved specifications.		
K1.4G	Boral provided and had approved from the Secretary their own procedures for the Group 1 HiCal 50 Specification and Storage procedures as Boral are processing and testing for supply.	Boral Recycling on behalf of Boral Cement are processing the Group 1 HiCal50 ex-Hydro Kurri Kurri to the approved HiCal50 specification and procedures.	
K1.4H	Boral provided in writing to the Secretary on 6/7/2018 and 17/8/2018 that the Group 2 SWDF suppliers had implemented appropriate quality control and quality assurance procedures.		Boral will continue to review suppliers prior to the receipt of the first batch SWDFs from a particular supplier.
K1.4I	Operational procedures were submitted as part of the PoPT plan process.		

K3.20	HiCal50 specification was approved on 4/4/2019. PoPT for SWDF including specification approved 28/8/2018.		
K3.21	All non-standard fuels have met the specified non standard fuel specifications.	The review of results is undertaken on a routine basis.	
K3.22	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&E by email on 2 March 2003. The procedure addresses all requirements of Condition 3.22.	The re-commencement of Non-standard fuels commenced in late August 2018 as part of a PoPT program and was approved for ongoing use on 23/4/2019	
K3.23	The first Tracking Program report will be submitted within two weeks of the first quarterly stack test post PoPT trial approval.		The first tracking program report to be synchronized with the first quarterly stack test. This report will be submitted within two weeks of the stack test being finalised.
K3.24	This is complied with.		
K3.25	PoPT plan was approved in consultation with the EPA		
K3.26	The PoPT was approved by the DPE 28/8/2018	PoPT was completed during the reporting period.	
K3.27	All PoPT monthly reports and the six monthly report were submitted to the Secretary and the EPA. The reports are available on request.	The PoPT six month report was accepted and approved by the DPE with continual use (with conditions) of SWDF approved by the Secretary on 23/4/2019.	
K3.28	The continual use of SWDF was approved by the Secretary on 23/4/2019.		

Note: (K = Kiln 6, M = Mill 7)

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 23.

Compliance with the construction requirements of the second Kiln 6 pre-heat tower was demonstrated in previous AEMRs. It is demonstrated in Table 24 that the community has not historically lodged complaints about the visual amenity of the site and this continues for the current reporting period.

Table 22: Visual amenity conditions

Number	Condition
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.
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.
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.
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.

Note: (K = Kiln 6, M = Mill 7)

Table 23: Response to visual amenity conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K3.18 Visual Amenity Impacts	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.	A minimum amount of lights must be on during nigh time for safety, however, management measures are implemented to prevent significant light spill from the site.
K3.19	Compliance with this condition has been confirmed previously.	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.	Planting of trees for visual screening is effectively shielding the tower from sensitive receivers – this screening will become more effective as plantings mature.
K3.19A	Managed by the site EMP	No community complaints were received in relation to stockpiling	N/A
M2.19 Visual Amenity	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.	A minimum amount of lights must be on during nigh time for safety, however, management measures are implemented to prevent significant light spill from the site.

Note: (K = Kiln 6, M = Mill 7)

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. Construction of the SWDF facility had not concluded during the reporting period and no rehabilitation was undertaken. Areas disturbed during construction of the SWDF facility are being rehabilitated in accordance with *Construction Environmental Management Plan – Solid Waste Derived Fuels Project* (Boral 2017).

5.10 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 (Table 25). Performance for both consents are reported under the conditions for Kiln 6 in Table 26 because the conditions are the largely the same in both consents.

30 community complaints were received during the reporting period, 29 of which related to dust generation and deposition and the other was in regards to weeds on the rail line. Two community meetings were held during the reporting period, one on the 2nd August 2018 and 6th December 2018.

Table 24: Community conditions

Number	Condition
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.
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.

Note: (K = Kiln 6, M = Mill 7)

Table 25: Response to community conditions

Condition / EIS prediction	Performance during reporting period	Trend / management implications	Implemented / proposed management actions
K5.1	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 https://www.boral.com.au/our-commitment/environmental-reporting The site's environmental management plans and some previous AEMRs are available at https://www.boral.com.au/locations/boral-cement-works-berrima	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.
K5.2	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 https://www.boral.com.au/locations/boral-cement-works-berrima	Boral historically and continues to provide contact information on signs and on the site's website.	Boral will continue to make information available on request at the site and on the site's website.
K5.3	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 15/05/2017 – 29/04/2018 is provided in Appendix 2. There were 20 complaints, each of which related to dust.	The number of complaints were slightly higher than the average of 20 per year between 2008 to 2018, and as for last year they were all in regard to dust with the exception of one.	Boral will continue to implement the Operational Environmental Management Plan to prevent nuisance impacts on neighbouring properties.
K5.4	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. 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. One community meeting was held during this reporting	The CLC has historically, and will continue to, meet up to twice per year in a public meeting format.	The CLC will continue to meet up to twice per year in a public meeting format.

	period, on 27 July 2017. 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: https://www.boral.com.au/locations/boral-cement-works-berrima		
K5.5	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. No CLC members requested the presence of technical specialists at meetings or site inspections during the reporting period. Minutes from the July 2017 meeting have been posted on the website and no recommendations were received from CLC members during the reporting period.	Boral has historically, and will continue to, respond to requests from CLC members and post the meeting minutes on the website.	Boral will continue to respond to requests from CLC members and post the meeting minutes on the website.

Note: (K = Kiln 6, M = Mill 7)

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

Somerset Risk Management audited the site against the development consents, statement of environmental effects for Cement Mill 7, statement of environmental effects for Kiln 6, EPL and management plans in November 2017. The audit determined there were no major or minor non-conformances with the approval and management documents during the previous three years.

The audit findings are summarised below.

- All mandatory licenses, permits and approvals for Berrima Cement Works were current.
- The EPL was in place for the site with reporting through to the EPA. On the 20th September 2012, the Boral Cement Works blast furnace slag alternative raw material exemption 2012 commenced and is valid until 20th September 2016 unless revoked or amended by the EPA in writing at an earlier date.
- Since the 2008 K6 Compliance Audit, Boral Cement Ltd has submitted a further 3 annual AEMR's to the Director-General with a copy to the EPA and Wingecarribee Council for the following reporting periods: 1/5/14 – 30/4/15; 1/5/15 – 30/4/16 and 1/5/16 – 30/4/17.
- The SRM Auditor observed the 2016-2017 AEMR had been prepared by an independent Contractor from EMM Consulting Pty Ltd. Nevertheless, SRM"s Auditor could not confirm whether all the new Conditions of Consent raised in MOD 9 for Kiln 6 had been reviewed, assessed, verified and reported for compliance within their AEMR 2016-2017 combined Report. The Auditor noted MOD 9 had only been referenced in 3 sections of their Report pages 11, 12 and 13.

- All Boral's external reporting obligations have been met on time or approved extended time, including the annual report to EPA and the AEMR to DP&E.
- Since the 2014 CM7 Compliance Audit, Boral Cement Ltd has not received any requests from the DP&E to send additional information for the AEMR. No other requests had been submitted to Boral for K6.
- Environmental improvement initiatives included:
    - Dust minimisation and spillage reductions resultant from sealing quarry road, installing 2-wheel wash facilities, and improving external coal stockpiling.
    - Nuisance noise issues have been addressed by several fixes that included closing doors/openings, installing new doors, fixing enclosures, installing noise silencers on blasters and selected fans.
    - Boral Cement Berrima site had completed planting over 12,000 seedlings before the PRP Re-Vegetation Licence deadline.

In relation to the finding about the 2016-2017 AEMR, it is noted the AEMR considered the previous year's environment performance of the site and, therefore, the SWDF components of the consent were not relevant as they were not being used at that time. Further, the AEMR was accepted by DPE.

7 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

One of the requirements of the Proof of Performance Trials was to report on any non-compliant emissions or events and measures that will be undertaken to address these events.

During the first six months of the PoPt there were three elevated results recorded above the Environmental Protection Licence emission limits. Two of there were recorded during stack emission tests and one via the CEMS operational monitoring. A summary of these events is outlined in the Note on **Figure 12**. Only Events 1 and 2 were considered a non-compliance.

Table 26: Summary of Non-compliant Results

Event	Date	Duration	Parameter	Testing	Limit mg/m3	Result mg/m3	Compliance	Cause
1	20/09/18	6 min	Solid Particulates	Stack	50	670	No	Coal surge
				Continuous		22.9	Yes 24hr	
			Cadmium and Thallium	Stack	0.05	0.21	No	
2	19/11/18	4 hours	HCl	Continuous	10 hourly av.	14.5	No	Water supply
3	10/12/18	NA	Solid Particulates	Stack	50	67*	Results compromised*	NA
				Continuous		<50	Yes	

*See Event 3 description

Event 1 – Electrostatic Precipitator Trip

On the 20 September 2018 during a high rate trial of RDF a stack test was scheduled to monitor the emission performance. During this high rate trial there was a trip of the Electrostatic Precipitator (ESP) due to elevated CO levels.

The ESP is the main item of pollution control equipment that is used to minimise particulate emissions. Within the ESP CO is continuously monitored as elevated readings could create an explosive risk/event.

As a result of the CO trip of the ESP the particulates during the high rate trial stack testing along with Cadmium and Thallium were found to be elevated. As this trip was only temporary (approximately 6 minutes), the 24 hour continuous monitor of particulates for the day was recorded at 22.9 mg/Nm3 which was well below the licence limit. As stack testing requires collected filters to be sent for laboratory analysis and subsequent reporting, results for this test were not received by Boral until 16 October 2018.

A review of the cause of the trip was determined to be the existing coal feeding system and not the RDF fuel in itself. This system, which was installed in 2004, was designed to deliver larger quantities of coal into the kiln. With the reduction in the volumes of coal required to be fed into the kiln when running the RDF/WW at high rates, the coal feeding system was operating at a low relative turndown rate for the design of the equipment and this resulted in some surging of pulverised coal feed to the pre-calciner. The pulverised coal surges produced spikes of CO which were enough to trigger the tripping of the ESP.

This event was not foreseen and is a good example of why the site was undertaking the Proof of Performance Trial at various rates to test our current processes.

To minimise the risk of elevated CO tripping the ESP in future, Boral will control the rate of RDF/WW usage to ensure that the pulverised coal feeder to the pre-calciner operates at a level necessary to avoid pulverised coal surging. Subsequent high rate trial stack tests using this approach with WW on 27 September confirmed the ability to run without tripping the ESP with resultant emissions well within licence limits.

A further two rounds of stack testing trials were undertaken on each of the WW, RDF and WW/RDF blends post the event at the new rate. These were part of our other PoPT high rate trials and demonstrated that under normal operating conditions the emissions are well within our licence limits.

Additionally the site is investigating options to modify or replace the existing pre-calciner coal feeder to provide for greater turndown in pulverised coal feed rate.

Event 2 – HCl Elevated Results

On the 22 November 2018, Boral Cement notified the EPA and the DPE (23/11/2018) of a recorded Hydrogen Chloride (HCl) licence exceedance from the kiln stack (Point 2) during evening operations on the 19 November 2018.

An incident report was submitted on 13 December 2018 and generally followed the requirements in Condition R3.3 within EPL 1698 and also satisfied the reporting requirements within DA 401_11_2002i for Kiln 6. The elevated results were recorded by the continuous monitor and not via stack emission tests.

It is important to note that this event was not a result of the type of fuel in use at the time.

Relevant Background Information

Boral Cement under EPL 1698 is required to monitor for a number of pollutants, including Hydrogen Chloride, on a continuous basis. This is in addition to stack emission sampling undertaken as per the Proof of Performance Trials and periodic sampling as per Special Frequency 1.

HCl is monitored continuously as per Performance Specification 18 – Performance Specifications and Test Procedures for Hydrogen Chloride Continuous Emission Monitoring Systems at Stationary Sources and Procedure 6 Quality Assurance Requirements for Gaseous Hydrogen Chloride (HCl) Continuous Emission Monitoring Systems used for Compliance Determination at Stationary Sources, USEPA.

The continuous monitoring system (sourced from Ecotech) was installed in August 2018 as part of the non-standard fuels monitoring requirements.

HCl stack emission sampling is still conducted as per Special Frequency 1 with results for HCl prior to the inclusion of Wood Waste Derived Fuel and Refuse Derived Fuel tabled below. Note that the HCl limit prior to Mod 9 was 100mg/m3, and was changed in 2016 to 10mg/m3.

The current limit of 10mg/m3 was agreed with the EPA in 2016 based on historical stack emission monitoring and not continuous monitoring. It is worthy to note that within Schedule 3 of *The Protection of the Environment Operations (Clean Air) Regulation 2010* there is currently no standards of concentration defined for Hydrogen Chloride for Cement or lime production, however within Schedule 4 for general activities and plants the limits for Group 5 or 6 plants are 100mg/m3.

All pollution control equipment, including water supply pumps and valves are inspected and checked as per a preventative maintenance program every 3 months (May 2018 and August 2018 completed work orders attached) with the November inspection scheduled during the week of the failure.

a) <u>The cause, time and duration of the event</u>

On the 19 November 2018 at 21:00 hours the Hydrogen Chloride analyser within the Kiln Stack (EPL Point 2) started reading an hourly average over the licence limit of 10mg/m3. The elevated readings continued for a period of 4 hours with the maximum hourly average recorded at 14.5mg/m3. At the same time the temperature in the stack was averaging 152^{o}C, where the normal average of the stack is between 100-110^{o}C.

Plant operators identified the fault of the elevated temperature to a reduced water supply to the conditioning tower. A bypass valve for the water pump was opening at lower pressure leading water to return to the tank and not reaching the conditioning tower. Water supply was rectified in the short term by switching on the back up pump.

It is believed that the elevated HCl result was a result of the higher temperature in the stack. We are currently working with the equipment supplier (Ecotech) to undertake further Interference Tests (Performance Standard 18 and Procedure 6) as compounds such as CO_2, CO, formaldehyde, methane and water are known potentially to interfere with HCl monitoring accuracy.

b) <u>The type, volume and concentration of every pollutant discharged as a result of the event</u>;

Other than HCl no other parameters were exceeded and the temperature was below limits required for the baghouse. A summary of the CEMs data (graph form) for the period one hour before and after HCl exceedance can be found in Appendix 9.

Event 3 – Erroneous Particulate Exceedance

On 10 December 2018 the site ran a high rate RDF trial. On Thursday 7 February 2019 the stack test report from Ektimo indicated total particulate results for the test undertaken on the 10 December 2018 were elevated, however they believed this to be an erroneous result. Boral agree with Ektimo and do not believe this result to be valid given the consistency of the continuous particulate monitoring data and all the previous PoPT test results. The continuous solid particulate monitor trend results for the date of 10/12/18 were reported in the January RDF PoPt Monthly report and are attached in Appendix 10.

Within their report Ektimo noted (report R006906): '*Results for concentrations and mass emission rates of solid particles, fine particulates and coarse particulates may have been compromised. These gravimetric results appear possibly erroneously high due to incompatibility with simultaneously collected (and calibrated) continuous particulate monitor data. Typically closer consistency between the continuous particulate monitor data and the gravimetric results has been observed throughout this project. Submission of the filters for destructive particle size analysis has restricted the possibility for further investigation into this inconsistency.'*

During the SWDF PoPT's

8 ACTIVITIES TO BE COMPLETED DURING THE NEXT REPORTING PERIOD

During the 2018-19 reporting period, in addition to the annual kiln shutdowns, the following projects will be undertaken or be progressed:

- Potential upgrades to bulk fuel storages will be investigated.
- Erosion and sediment controls will be reviewed and upgraded as part of the scheduled mining expansion within the mining lease boundary.
- A review of site Dust Management exploring improvement strategies
- Schedule to repair and improve all dust collectors on site.
- Replacing off doors on all storage sheds that are not in good shape
- Continue to maintain all wheel wash stations replacement of a water cart

APPENDIX 1 – ANNUAL ENVIRONMENTAL NOISE ASSESSMENT

APPENDIX 2 – COMMUNITY COMPLAINTS REGISTER APRIL 2018

APPENDIX 3 – ANNUAL TESTING COMPLIANCE REPORT

APPENDIX 4 – ANNUAL EMISSION TESTING NPI REPORT