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 2021 - 30 April 2022
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 2021
AEMR end date	30 April 2022

I, Greg Johnson, 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 2021 to 30 April 2022 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	Greg Johnson
Title of authorising reporting officer	Environmental Sustainability Manager, Boral Cement
Signature of authorised reporting officer	
Date: 28 June 2022	

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	The applicant shall ensure that all necessary licences, permits & approvals are obtained & kept up to date throughout the life of the cement works. No condition of this consent removes the obligation for the Applicant to obtain, renew or comply with such licences….	Low to medium	1 relating PM10 HVAS missed samples due to wet weather 1 relating to failure to maintain plant and equipment (EPA Official Warning)	Section 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-compliant	Non-compliance with: ● potential for serious environmental consequences, but is unlikely to occur; or ● potential for moderate environmental consequences, but is likely to occur.
Low	Non-compliant	Non-compliance with: ● potential for moderate environmental consequences, but is unlikely to occur; or ● potential for low environmental consequences, but is likely to occur.
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (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. Cement products are transported to domestic customers (both internal to Boral companies, and external), by train and truck and historically to 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 Bluescope Steel in Port Kembla and historically international sources.

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 and mineral addition (limestone) 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. Prior to the introduction solid waste derived fuels, up to 225,000 tonnes per year of coal was 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 mainly from mines in the Illawarra area. As outlined in the table below the Works has approval to use standard fuels such as natural gas, fuel oil, diesel and coke fines to heat the kiln along with a number of non-standard fuels.

Fuel	Category	Tonnes Per Annum
Natural Gas, Fuel Oil, Diesel	Standard Fuel	No Limit
Coal	Standard Fuel	No Limit
Coke Fines	Standard Fuel	No Limit
HiCal50	Non-Standard Fuel	10,000

AKF1	Non-Standard Fuel	20,000	
AKF5	Non-Standard Fuel	30,000	≤ 100,000 combined
Wood Waste	Non-Standard Fuel	50,000	
RDF	Non-Standard Fuel	80,000	
Woodchip	Standard Fuel	50,000	

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.

Primarily the fuel mix is made up of coal, diesel (kiln start-up), a small amount of HiCal50 (carbon anode) and SWDFs. The business will be progressively increasing its use of SWDFs and other non-standard fuels to lower its reliance on coal and to reduce the embodied carbon in its cementitious products.

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 up to 40% of total fuel. During the reporting period, Boral has continued engagement with the DPIE and EPA on increasing this to the 50% approval with a number of PoPT with both Wood Waste and Refuse Derived fuels at the higher rate undertaken.

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

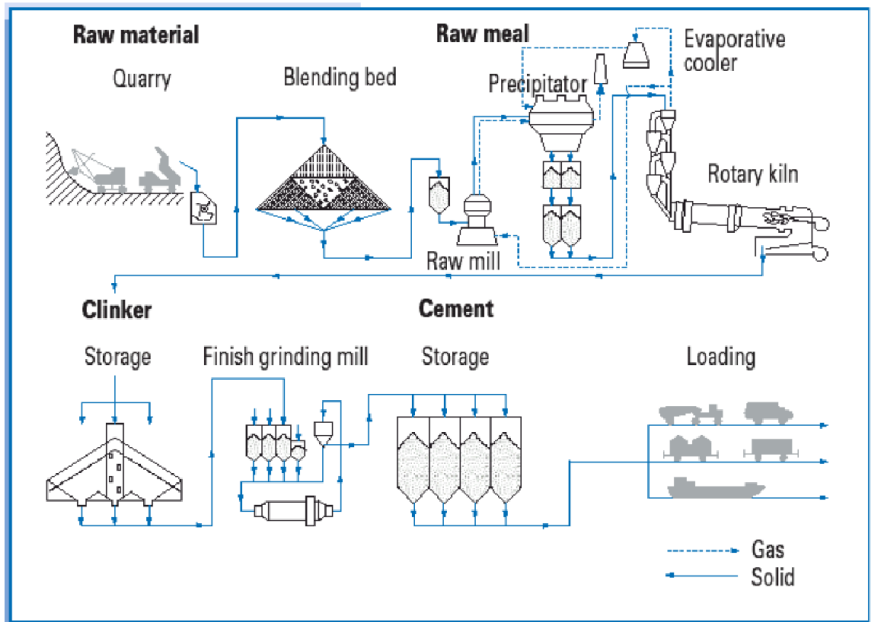
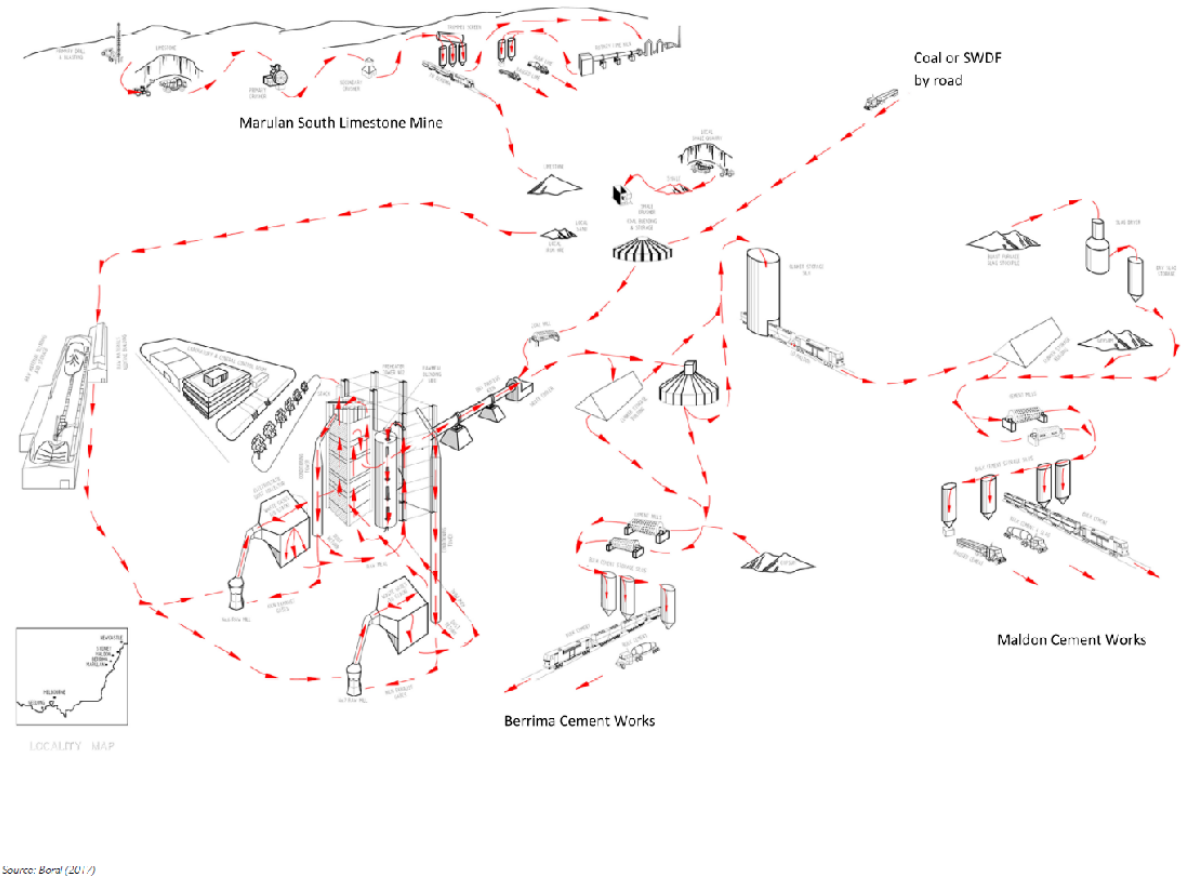


Figure 2 Process flow diagram



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
Greg Johnson	Environment and Sustainability Manager - Boral Cement	0401 893 420	greg.johnson@boral.com.au
Ben Williams	Environmental Business Partner – Boral Cement	0401 895 478	ben.williams@boral.com.au

3.3 Approvals

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

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

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

3.3.1 Consents

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

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

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

The development consent for Mill 7 has never been modified.

Subsequent modifications to the development consent for Kiln 6, approved by delegates of the NSW Minister for Planning, have allowed the trialling and use of certain non-standard fuels, the use of alternative 'low cost' raw materials in the manufacture of clinker (such as granulated blast furnace slag), the use of rail for coal deliveries, and the stockpiling of coal on the site. Table 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.~~ Note: 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.	~~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
MOD 10	SWDF Fuel storage shed extension	11 April 2019
MOD 11	Use of HiCal 50 during start-up conditions	25 October 2019
MOD 12	Isotainer handling and whole of site noise limit.	7 April 2020
MOD 13	Chloride Bypass System and approval to consume wood chips sourced from fire impacted plantation forestry operations as a standard fuel.	31 May 2021

3.3.2 Licenses

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.

On 18 December 2019, the EPL was amended to reflect the outcome of the Proof of Performance Trials to limit SWDF to 40% until further performance testing is undertaken at a higher rate. The amendment also included changes from MOD 11 which permitted HiCal 50 during start up conditions and to finalise the whole of site noise PRP and setting a single whole of site noise limit. This whole of site noise limit was then used to amend the consent noise limit during the MOD 12 assessment process.

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

The Annual Mining Lease Review for these licences is due annually for the previous Calendar year at the end of February. The 2021 report was submitted to the Resources Regulator on 28 February 2022.

3.4 Operations summary

Table 8 provides a summary of production at the Works for the 2021/22 reporting period (May 2021 and April 2022) compared to the previous 3 reporting periods.

Table 8 Production summary

Material	Approval limit	18/19 Reporting Period	19/20 Reporting Period	20/21 Reporting Period	21/22 Reporting Period
Limestone used	Nil	2,008,50	1,803,196	1,803,564	1,682,298
Shale used	Nil	201,990	142,586	145,521	156,944
Slag used	Nil	113,510	129,640		
Other Raw Materials			153,150		194,030
Gypsum used	Nil	81,250	70,276		
Coal used	Nil	208,610	184,446	176,070	169,388
SWDFs used	100,000 t	21,870	28,997	34,767	34,654
Clinker production	1,560,000 t	1,443,830	1,314,466	1,292,278	1,256,016
Cement production	1,560,000 t	1,209,500	1,104,195	1,043,993	1,087,963

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 2021/22 reporting period the Works produced 1,256,016 tonnes of clinker. Of this clinker, 1,087,963 tonnes of cement was produced on site. Clinker is also sent to Maldon and other customers.

Boral continued the use of SWDFs during the 2021/22 reporting period. A total of 34,654t of SWDF was consumed during the reporting period a similar volume to the previous reporting period.

The construction for the Chloride Bypass System (CBS) associated with MOD 13 commenced on 25 March 2022 after approval of the Construction Environmental Management Plan on 24 February 2022. Further details relating to the construction of the CBS is described in Section 3.5

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.

Boral undertook a review of the OEMP, and the sites Air Quality Management Plan & Noise Management Plan in April 2020 to reflect the recent Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020. A copy of the updated OEMP is available on the Boral Berrima Cement website along with the approval letter from the Department of Planning, Industry and the Environment.

https://www.boral.com.au/locations/boral-cement-works-berrima

The OEMP was determined to be fit for purpose for MOD 13 as operations are generally still in accordance with the associated plans. Condition 6.1, 6.1A and 6.1B required the CEMP to be updated to reflect the requirements of MOD 13.

The CEMP was approved on 24 February 2022 and the plan and approval letter is displayed on the Berrima Cement Website.

4 ACTIONS REQUIRED FROM PREVIOUS AEMR

The 2021 AEMR was submitted to the DPIE on 24 June 2021 with the DPIE completing their assessment on 13 July 2021. The Department considered that the Annual Report generally satisfied Conditions 7.3 and 6.3 of the approvals.

Note: The approval of the Annual Report by the Department is not an endorsement of the compliance status of the project.

Table 9 DPIE 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 10. Noise was monitored and reported against the Kiln 6 and Mill 7 contribution criteria in October 2021 (see Appendix A – *Berrima Cement Plant – Annual Environmental Noise Assessment 31 December 2021* (Recognition Research 2021)), with performance described in Table 11.

Boral manages noise on site in accordance with the *Berrima Cement Works – Noise Management Plan* (Boral 2018, updated April 2020), which describes the monitoring points, frequency and criteria.

The Executive Summary of the Annual Noise Assessment noted the following:

> *The Berrima Cement works of Boral Cement has a single noise limit condition of LA90,15-minute not to exceed 58 dBA at monitoring Location 20 in the Store Yard, as part of its Pollution Control Licence for the total site. To assess compliance with this condition, monitoring for total site emissions at Location 20 over a 14 day period was made in October to November 2021. The results of this monitoring have confirmed that total site emissions are in compliance with the licence condition.*
>
> *The single 15-minute period when that sound level limit was exceeded at the monitoring site was caused by a one or more train movements and associated noises close to the monitoring site during the period. Also, the long-term average sound level objective of LA90,period not to exceed 56 dBA was achieved and did not exceed 52 dBA.*
>
> *Sound levels of noise sources at the plant and environmental noise in the residential community affected by the noise emissions from the total site have been measured regularly since 2002. Monitoring of both site source sound levels and residential receiver sound levels on an annual basis since 2008 has confirmed that major site projects with noise level conditions were in compliance with their noise limit conditions at the time.*
>
> *The annual environmental noise assessment evaluates noise emission from the Cement Plant by the following methods:*

- *Monitoring of sound levels continuously at Location 20 over a two-week period for compliance assessment;*
- *comparative measurements around major plant sources of noise at over 300 of the same locations as in previous years, which have been assessed previously as in compliance with the limit conditions;*
- *calculation of the contribution sound levels at residential receiver locations from those source emission locations which are higher than in the past and comparison with a contribution objective;*
- *monitoring of sound levels in one residential receiver location with unattended monitoring over long-term periods of two weeks and attended monitoring at three residential receiver locations to compare with long-term averages from previous years and assess the audible acceptability of the received sound levels.*

- ***The finding of this 2021 annual environmental noise assessment is that total site noise emissions are considered to be in compliance with the licence condition.***
- ***It is also the finding of this assessment that the long-term average statistical sound levels have not increased and indicate that the Cement Plant is not increasing its emissions.***

Source	Sound Power Level – dB(A)	Sound Pressure Level dB(A)		
		Objective	Measured 2005	Measured 2021
Coal Mill and Clinker cooler fans	117	100 @ 3m	93 @ 2m	Coal mill wall vent 84 @ 2m, Courtyard cooler fans 85 to 93 @ 1m
New Radicon Cooler	103	92 @ 1m	81 @ 1m West 80 @ 2m East	79 to 99 @ 1m Area Average 93 @ 1m E side 85 @ 2.4m E
New Pre-heater fan FA249	97	89 @ 1m	77 @ 2m	75 to 83 @ 1m
New Baghouse fan FA250	102	94 @ 1m	82 @ 2m	80 to 88 @ 1m
Raw Mill 7 Building	117	100 @ 3m	Vents 83 to 86 @ 1m	Vents 79 to 84 @ 1m Roof 78 to 87 @1m

Figure 4 Kiln 6 – 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

Noise generated at the site must not exceed the noise limits at the times and location specified in Table 2 below.

Former Limits

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

New Limits (MOD 12) 7 April 2020

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

Location	Day[a] $L_{A90(15\ minute)}$	Evening[b] $L_{A90(15\ minute)}$	Night[c] $L_{A90(15\ minute)}$
The Noise Compliance Point (Point 20) – Store Yard Close	58	58	58

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)

K3.3A	Any new or upgrade development projects the subject of any modification to this consent must give consideration to the Project Specific Noise Levels identified in the document titled 'PRP-7 Response – Identifying Environmental Noise Objectives For Berrima Cement Plant' dated 27 March 2018, prepared by Recognition Research.
K3.4	All vehicles associated with the isotainer loading operations at the site must use a broad-band type reversing alarm instead of tonal beeper reversing alarm.

K3.5	The locomotive of the train transporting isotainers to the site must be relocated to the eastern end of the train as soon as practically possible after arrival during daytime to avoid such movements in evening or night-time periods.
K3.6	The applicant must implement best practice technology with respect to the isotainer reach stacker to reduce LAmax noise events.
K3.6A	A Noise Verification Report must be submitted to the satisfaction of the Planning Secretary at the following stages of the development: (a) prior to the commencement of construction of the chloride bypass system for Kiln 6 (b) within three months of the commencement of operation of the chloride bypass system
K3.6B	The Noise Verification Reports required by condition 3.6A must be prepared by a suitablyqualified and experienced acoustic consultant and include: (a) verification of compliance with noise limits specified in condition 3.3 in accordance with the Noise Policy for Industry (EPA, 2017) (b) a detailed analysis of annoying noise characteristics in accordance with Fact Sheet C of the Noise Policy for Industry (EPA, 2017) to confirm the plant and equipment associated with the chloride bypass system does not exhibit annoying noise characteristics
M2.1	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

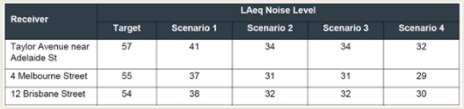
	e) at any time if construction noise is inaudible at the boundary of the site.
M2.2	Subject to compliance with the requirements of this consent, the cement works upgrade may be operated 24 hours per day, 7 days per week.
M2.3	[2]The Applicant shall design, construct, operate and maintain all new and 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] $L_{Aeq(15\ minute)}$ / Evening[b] $L_{Aeq(15\ minute)}$ / Night[c] $L_{Aeq(15\ minute)}$ 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	CBS construction commenced March 2022.	Construction is a short-term activity which cannot be used to establish long-term trends. The noise verification report required under K3.6A and K3.6B was completed to provide verification of compliance prior to construction. A follow up report is due three month after commencement of operation of the CBS.	CEMP was approved by DPIE to address construction specific management controls. The CBS construction works would be limited to daytime only within the hours nominated in the consent
K3.1A	CBS construction commenced March 2022	As above	The CEMP was approved by DPIE to address construction specific management controls. Section 8.4.5 of the CEMP addresses noise management and mitigation measures.
K3.1B	CBS construction commenced March 2022.	As above	The CEMP was approved by the DPIE to address construction specific controls.. The predicted construction noise levels were well below the targets nominated for all scenarios within the construction of the CBS • Scenario 1 - Civil works – Foundations and Concrete pads

			• Scenario 2 - Structure steel erection • Scenario 3 - Bag Filter / Dust Silo erection and installation • Scenario 4 - Dust transfer installation 
K3.2	The noise assessment and annual monitoring 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.	Over all, the sound levels associated with Kiln 6 sources were calculated to be less than the objective at Location 20.They are also considered to not exceed the contribution objectives at the nearest Residential receivers to the northern and southern sides of the plant, apart from those associated with new kiln shell cooler fans on the central pedestal of Kiln 6. Some closer-to-source location measured sound levels had increased however these were calculated to not exceed the previous objectives at the residential receiver locations. More distant measurements of the total emissions from the Kiln 6 are on the roof of the Control Building had not increase significantly from previous measurements which also indicates compliance with the objectives.	Existing management measures effectively contain noise levels below contribution criteria. However, Boral will consider the recommendations to review the plant item performance or maintenance of new kiln shed cooling fans, FA215 and FA250.
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.	As above	

K3.3A	Any new MOD must give consideration to the PSNL in the PRP dated March 2018	Condition requirement to give consideration	The Chloride By-Pass noise assessment took into consideration the PSNL.
K3.4	All vehicles associated with the isotainer operation must use a broad-band type reversing beeper alarm.	Broadband alarms installed. Site procedure prepared and incorporated into Noise Management Plan	Implemented
K3.5	Locomotive must be relocate to eastern end of train as soon as practical to avoid such movements at night	Site procedure prepared and incorporated into Noise Management Plan	Implemented
K3.6	Best practice technology implemented with respect to reach stacker to reduce noise events	Site procedure prepared and incorporated into Noise Management Plan. Operators trained.	Implemented
K3.6A	The verification report was finalised on 22 September 2021 prior to the commencement of construction of the CBS.	Operational noise targets were nominated for the modification (MOD 13) in accordance with the Consent Conditions. At the nominated Noise Compliance Point – Store Yard Close, clear compliance is achieved indicating that the noise contribution to the overall facility noise limit of 58 dB at this location will be minimal. At residences, consideration of the PSNLs of the PRP-7 Response Report is required. The PSNLs have been met by a minimum of 5 dB.	The verification report confirms that the CBS system will confirm to noise limits specified in K3.3
K3.6B	The verification was completed by John Sleeman at SLR and is a suitably qualified acoustic consultant.	Compliant	Compliant

M2.1	Although no construction activities are occurring in areas designated with Mill 7, the CBS construction for Kiln 6 commenced in March 2022	The CEMP controls for the CBS refer to the whole site to limit of cumulative impacts	CEMP was approved by DPIE to address construction specific management controls. The CBS construction works would be limited to daytime only within the hours nominated in the consent
M2.2	The noise assessment predicted and monitoring confirmed 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.	See Appendix 1 for Noise Assessment Report	Compliant
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.	See Appendix 1 for Noise Assessment Report	Compliant
M2.4	Monitoring has shown compliance with limits.	See Appendix 1 for Noise Assessment Report	Compliant
M2.5	Noise was measured at the following locations: ● 72 Taylor Avenue (near Adelaide St); ● 12 Brisbane Street; ● 4 Melbourne Street; ● Northern Boundary; and	See Appendix 1 for Noise Assessment Report	Compliant

	● 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)

Table 3.4: 2021 Annual Environmental Noise Assessment for Kiln 6 Upgrade -
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) $L_{Aeq,}$	Comments	Distance measured metres	Distance to Receivers Distance Attenuation to receiver Calculated LAEQ level at receiver distance only				
							Adelaide	Brisbane	Melbourne	South	Loc.20
Kiln 6 Upgrade						Objective	37	37	37	37	58
PHT L8 Top platform EL16 Gbox @ 1m to coupling SW side	2021	10:44 AM	21	83		1	666	754	745	1506	470
	2019			78	Source after directivity		72	74	77	72	72
Difference 2021 - 2017			*Difference*	5	Distance reduction		-56	-58	-57	-64	-53
					Calculated SPL without barriers		*15*	*17*	*20*	*8*	*18*
PHT L8 centre tower W side	2021	10:59 AM	16	78		5	656	748	725	1508	434
	2019			74	Source after directivity		68	68	68	68	68
Difference 2020 - 2019			*Difference*	5	Distance reduction		-42	-43	-43	-50	-39
					Calculated SPL without barriers		*25*	*24*	*25*	*18*	*29*
PHT L7 Alt Fuels 1m to base of Alt Fuel chute, 1m to bin W, 1m to W side of feeder	2021	11:20 AM	21	76	Distance	1	666	754	745	1506	438
	2018			70	Source after directivity		65	68	71	65	65
Difference 2020 - 2012			*Difference*	6	Distance reduction		-56	-58	-57	-64	-53
					Calculated SPL without barriers		*9*	*10*	*13*	*2*	*12*
EL13 platform SW side motor & EL & coupling @ 1m F48	2021	11:30 AM	30	83	Distance	1	666	754	745	1506	438
Difference 2021 - 2017	2017			78	Source after directivity		64	64	64	63	64
			Difference	5	Distance reduction		-56	-58	-57	-64	-53
					Calculated SPL without barriers		*8*	*7*	*7*	*-1*	*11*
PHT L6 RM silo above baghouse discharge @ 2m at base of stairs to EL, level with floor	2021	11:39 AM	30	83	Distance	2	692	782	765	1473	470
Difference 2021 - 2019	2019			79	Source after directivity		83	83	83	83	83
			Difference	4	Distance reduction		-51	-52	-52	-57	-47
					Calculated SPL without barriers		*32*	*31*	*32*	*26*	*36*
PHT Level 5 old NW corner @ 1m to stack	2021	12:10 PM	30	79	Distance	1	656	748	725	1508	434
	2019			74	Source after directivity		76	76	76	76	76
Difference 2021 - 2019			*Difference*	5	Distance reduction		-56	-57	-57	-64	-53
					Calculated SPL without barriers		*14*	*13*	*13*	*7*	*18*
ESP top NE corner at barrier F103	2021	12:30 PM	31	75	Distance	10	642	730	711	1485	417
	2016			70	Source after directivity		69	63	63	63	63
Difference 2021 - 2016			*Difference*	5	Distance reduction		-38	-37	-37	-43	-32
					Calculated SPL without barriers		*24*	*26*	*26*	*20*	*31*
PHT Level 2.5 by DC31 drives @ 0.6m	2021	12:42 PM	44	93	Distance	0.6	666	754	745	1506	438
	2015			86	Source after directivity		93	93	93	93	93
Difference 2021 - 2015			*Difference*	7	Distance reduction		-61	-62	-62	-68	-57
Air cannon operation included, normal is 82					*Calculated SPL without barriers*		*32*	*31*	*31*	*25*	*36*
PHT Level 2.25 centre	2021	12:48 PM	30	89	Distance	2	666	754	745	1506	438
	2020			80	Source after directivity		90	90	90	90	90
Difference 2021 - 2020			*Difference*	9	Distance reduction		-50	-52	-51	-58	-47
Air cannon event in period. LA90 86 less than in 2014					*Calculated SPL without barriers*		*39*	*38*	*38*	*32*	*43*
PHT Level 2 FA03 discharge @ 1.5m faces WSW F122	2021	12:54 PM	21	91	Distance	1.5	666	754	745	1506	438
	2014			85	Source after directivity		83	83	85	91	85
Difference 2021-2014			*Difference*	6	Distance reduction		-53	-54	-54	-60	-49
					Calculated SPL without barriers		*30*	*29*	*31*	*31*	*36*
PHT Level 2 FA65 inlet filter @ 1m in front F124	2021	12:56 PM	30	91	Distance	1	666	754	745	1506	438
	2014			84	Source after directivity		91	91	91	77	91
Difference 2021 - 2014			*Difference*	7	Distance reduction		-56	-58	-57	-64	-53
This source is not causing the sound level - it is other sources, lower than 2018					*Calculated SPL without barriers*		*34*	*33*	*33*	*14*	*38*
FA39 E side motor platform @ 0.82m to coupling cover	2021	2:08 PM	30	95	Distance	0.82	643	731	715	1512	425
	2019			91	Source after directivity		80	80	78	78	78
Difference 2021 - 2019			*Difference*	4	Distance reduction		-58	-59	-59	-65	-54
					Calculated SPL without barriers		*22*	*21*	*17*	*11*	*22*
FA39 S side @ columns 2.7m to bearing	2021	2:18 PM	33	87	Distance	2.7	643	731	715	1512	425
	2018			83	Source after directivity		61	61	61	87	60
Difference 2021 - 2018			*Difference*	4	Distance reduction		-43	-49	-43	-55	-44
					Calculated SPL without barriers		*14*	*12*	*13*	*32*	*16*
FA38 @ 3.9m to E side	2021	2:21 PM	30	89	Distance	3.9	645	730	713	1505	423
	2019			82	Source after directivity		75	75	75	67	75
Difference 2021 - 2019			*Difference*	7	Distance reduction		-44	-45	-45	-52	-41
Fan cover open.					*Calculated SPL without barriers*		*30*	*29*	*29*	*16*	*34*
FA38 motor platform W side @ 1m to coupling cover, 1.9m to casing, 0.7m to motor side	2021	2:26 PM	33	92	Distance	0.7	645	730	713	1505	423
	2019			86	Source after directivity		77	77	81	77	77
Difference 2021 - 2019			*Difference*	6	Distance reduction		-59	-60	-60	-67	-56
Fan cover open.					*Calculated SPL without barriers*		*18*	*17*	*21*	*11*	*22*

Figure 6 Measurement locations with increase in sound level >3 dB and calculated contribution at receivers (see pages 69-72-60 of Appendix 1 for full table)

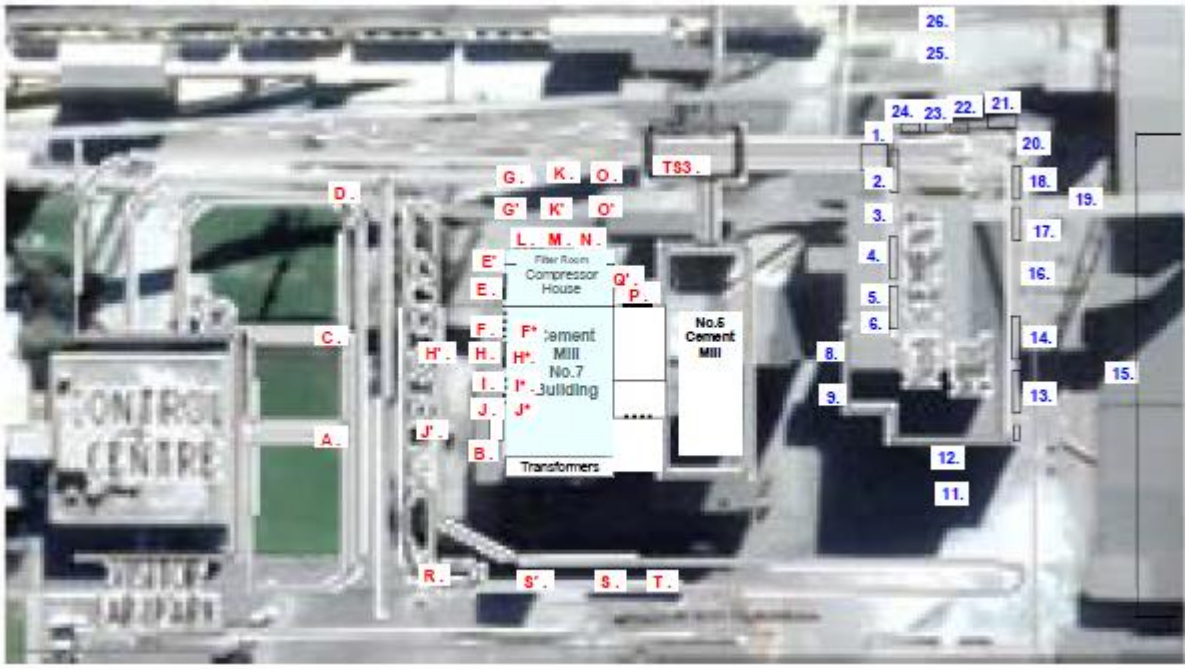


Figure 7 Kiln 6 and Cement Mill 7 noise measurement locations

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 2020), which is operated across the site.

During the reporting period the site continued the use of the trial real-time dust monitor which links directly to the control room along with the site Trigger Action Response Management Plan (TARP) for dust which the site monitors current and forecast weather to manage potentially dust generating activities on 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 stockpiles 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 windblown dust from trafficable areas;
- Modifying its activities such as loading, unloading and crushing of materials in open areas to minimise windblown 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; and
- Baghouses at key transfer points within the cement mill and raw material processing areas.

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 throughout the year showed no non-compliances with agreed standards.

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.

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.

During the reporting period the site received 5 complaints directly relating to dust concerns, this is significantly down on last year when 14 complaints were received. 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	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.

Discharges	
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/m³ (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)

Table 13: Response to air quality conditions

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/m_2/month (expressed as a 12-month rolling average). ● NEPM PM_{10} 24 hr standard of 50 $\mu g/m^3$. ● EPA TSP annual goal of 90 $\mu g/m^3$. 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**	Figure 8 shows the results of the analysis of the HVAS from May 2018 to April 2022. The trend during the year has been down. As can be seen, the current data shows that we remain below the EPA guideline of 4 g/m_2/month. Figure 9 shows the results of the analysis of the dust gauges located around the site and the New Berrima community from May 2018 to April 2022. As can be seen, the current data shows that we remain below the EPA guideline of 4 g/m_2/month. Boral Cement Berrima will continue to respond rapidly to, thoroughly investigate, and rectify any dust complaints received from the local community.	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. During 2020/21 the site commissioned the real-time dust monitor and embed the use of the new site Dust Trigger Action Response Plan. The data from the real time monitor is used as a management tool to notify staff when TARP triggers are met to enact the corresponding management response

	Yearly stack emission monitoring for Kiln 6 as required by the EPL was undertaken in July and November 2019 and February and April 2020. Figure 10 shows that the Works maintained emissions well under the EPA limits. 5 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.		
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 is maturing 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. During this reporting period Boral Cement has actively worked to reduce the generation of dust	Some of the unsealed roads on site have been sealed in the previous years and some have been closed off and recently re-vegetated. Two wheel wash stations were installed in 2016, one at the exit of a shale pad, the other at the end of Quarry Road.	Boral Cement continues to investigate opportunities to reduce fugitive dust throughout the site. Issues are managed through

	from vehicles and internal haul roads through implementation of the Dust Management Plan.	The wheel wash stations continue to be routinely used. Boral Cement operates a road sweeper and water carts to minimise traffic generated and windblown 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 windblown 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.	immediate corrective action and reporting through the incident management database SEQuence. The real-time dust monitor is an extra tool to alert the site to potential fugitive dust events that could impact the New Berrima village residents.
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 wasconducted by Ektimo October 2021 (x2), Nov 2021 and January 2022 in accordance with the sampling methods specified under EPL 1698. The reports demonstrated compliance with the emission limits for standard fuels for all monitoring parameters (see Figure 12).	No exceedances demonstrated for continuous particulate monitoring for Kiln 6 from May 2021 – April 2022 as demonstrated in Figure 10.	
M2.10	Ektimo monitored solid particle emissions from the Mill 7 stack in October 2021 in accordance with the sampling methods specified under EPL 1698. The report demonstrated compliance with the emission limit as shown in Figure 12.		

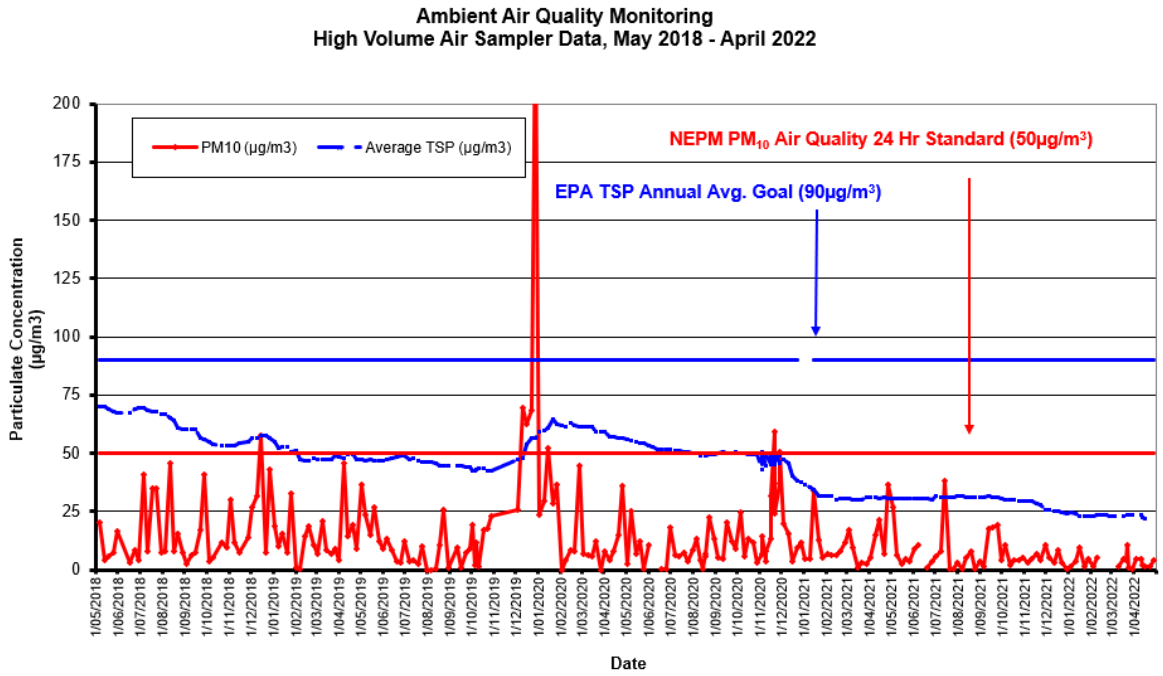


Figure 8 Ambient air quality monitoring May 2018 – April 2022

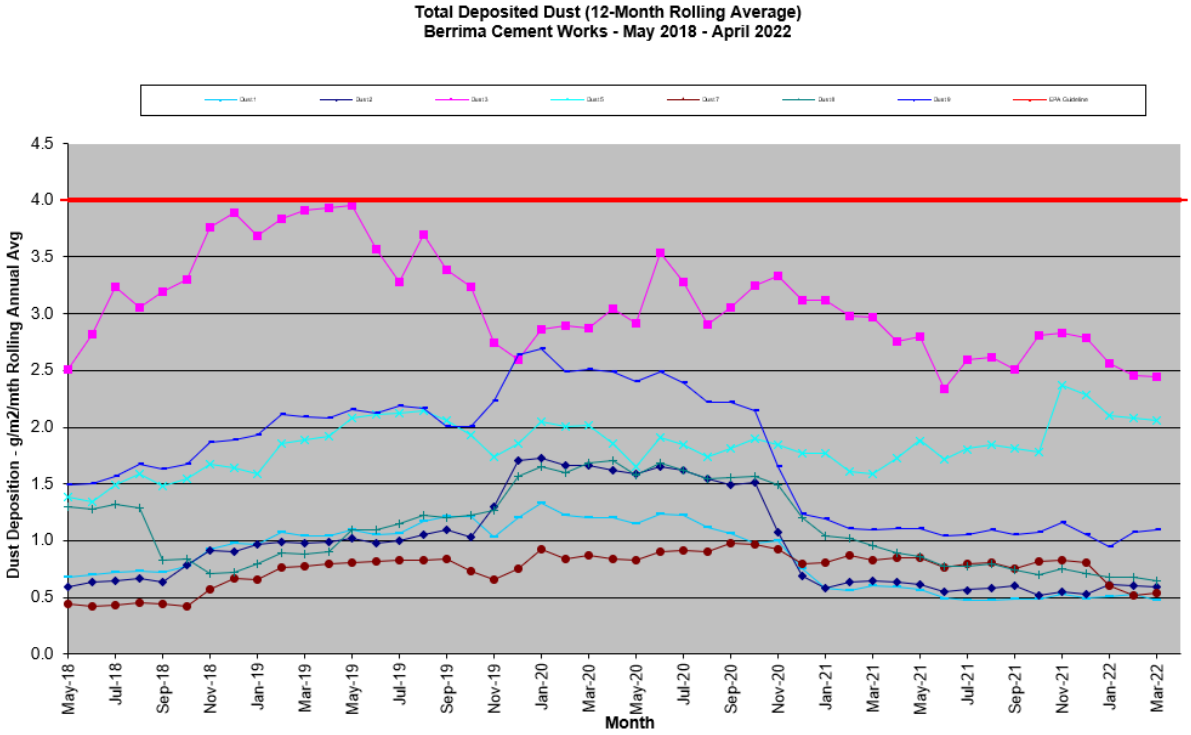
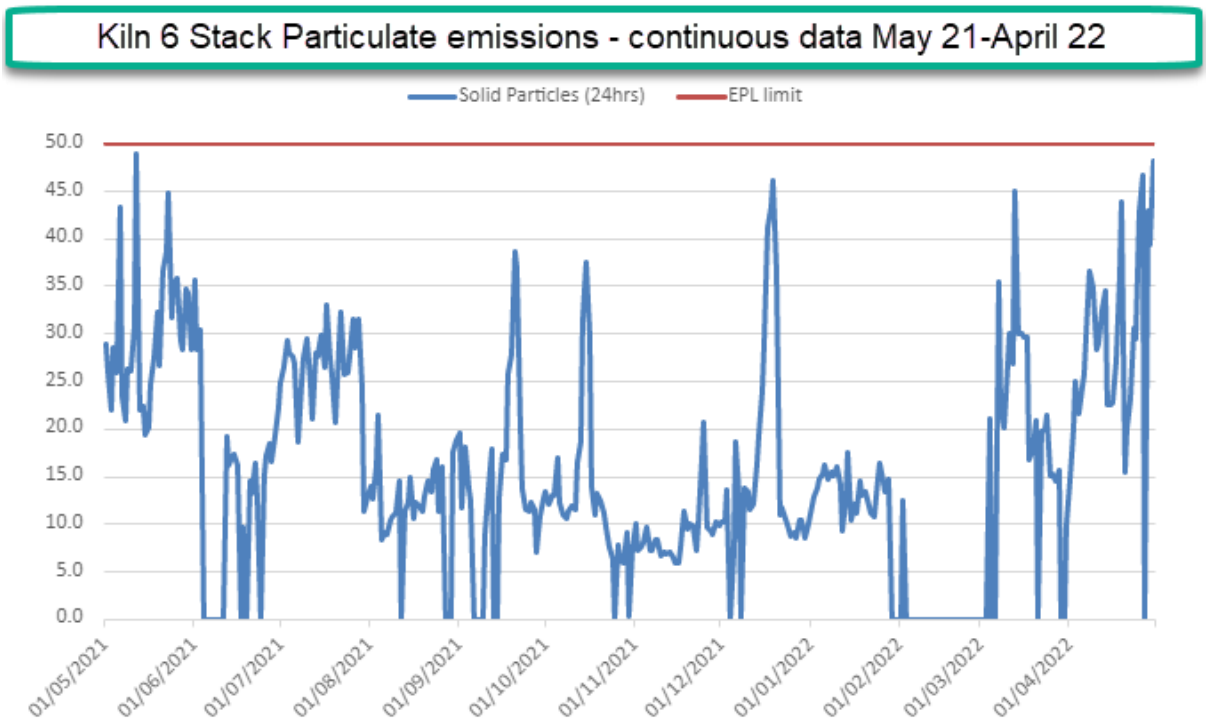
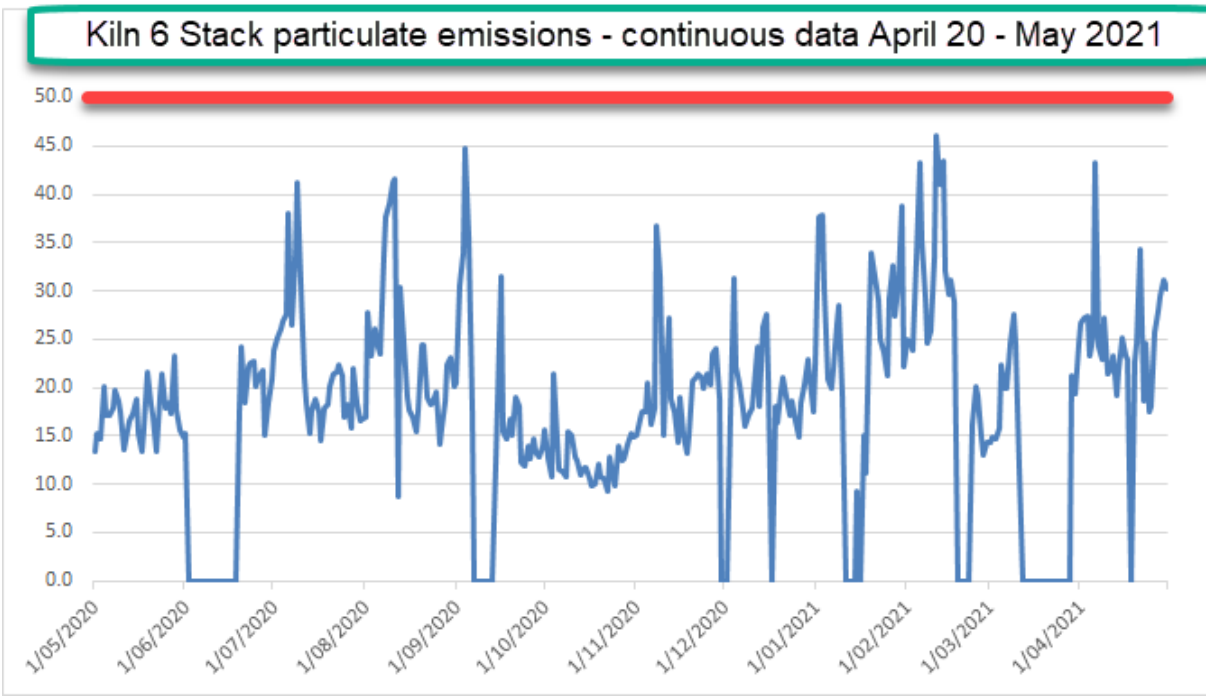


Figure 9 Total deposited dust (12-month rolling average) May 2018 – April 2022


Kiln 6 Stack Particulate emissions - continuous data May 21-April 22
Solid Particles (24hrs)
EPL limit
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
01/05/2021
01/06/2021
01/07/2021
01/08/2021
01/09/2021
01/10/2021
01/11/2021
01/12/2021
01/01/2022
01/02/2022
01/03/2022
01/04/2022


Kiln 6 Stack particulate emissions - continuous data April 20 - May 2021
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1/05/2020
1/06/2020
1/07/2020
1/08/2020
1/09/2020
1/10/2020
1/11/2020
1/12/2020
1/01/2021
1/02/2021
1/03/2021
1/04/2021

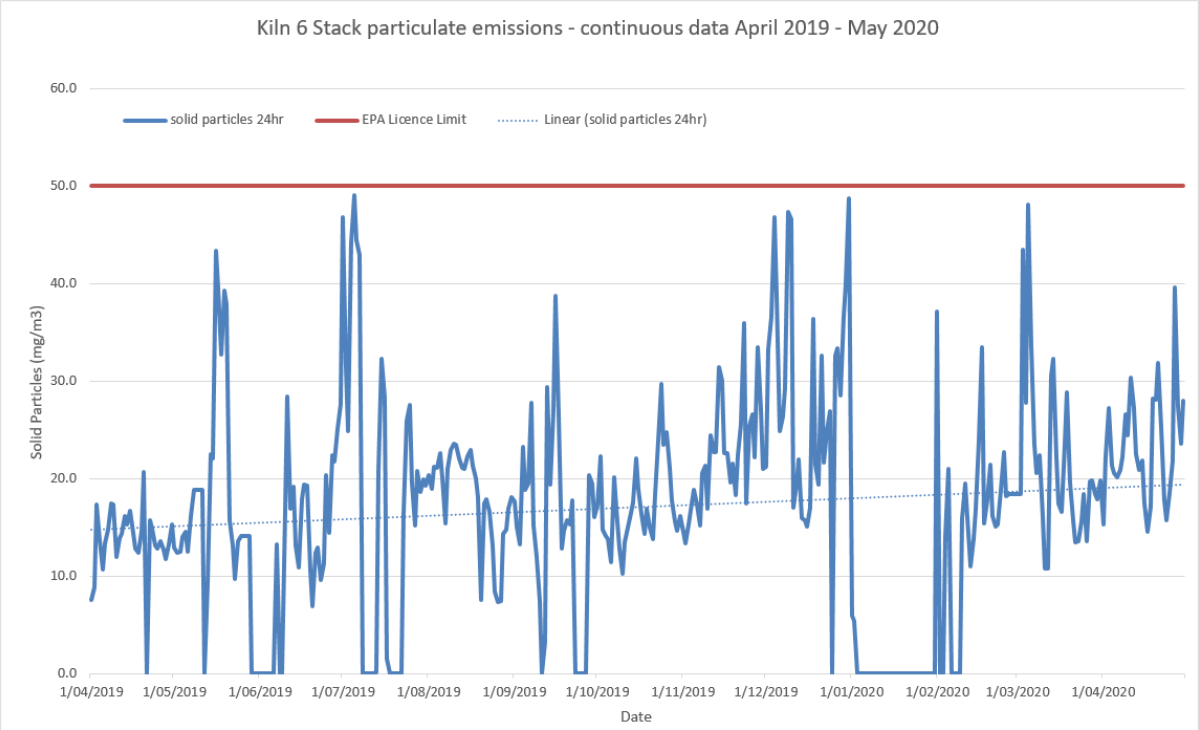


Figure 10 Continuous particulate monitoring for Kiln 6 April 2019 – May 2022

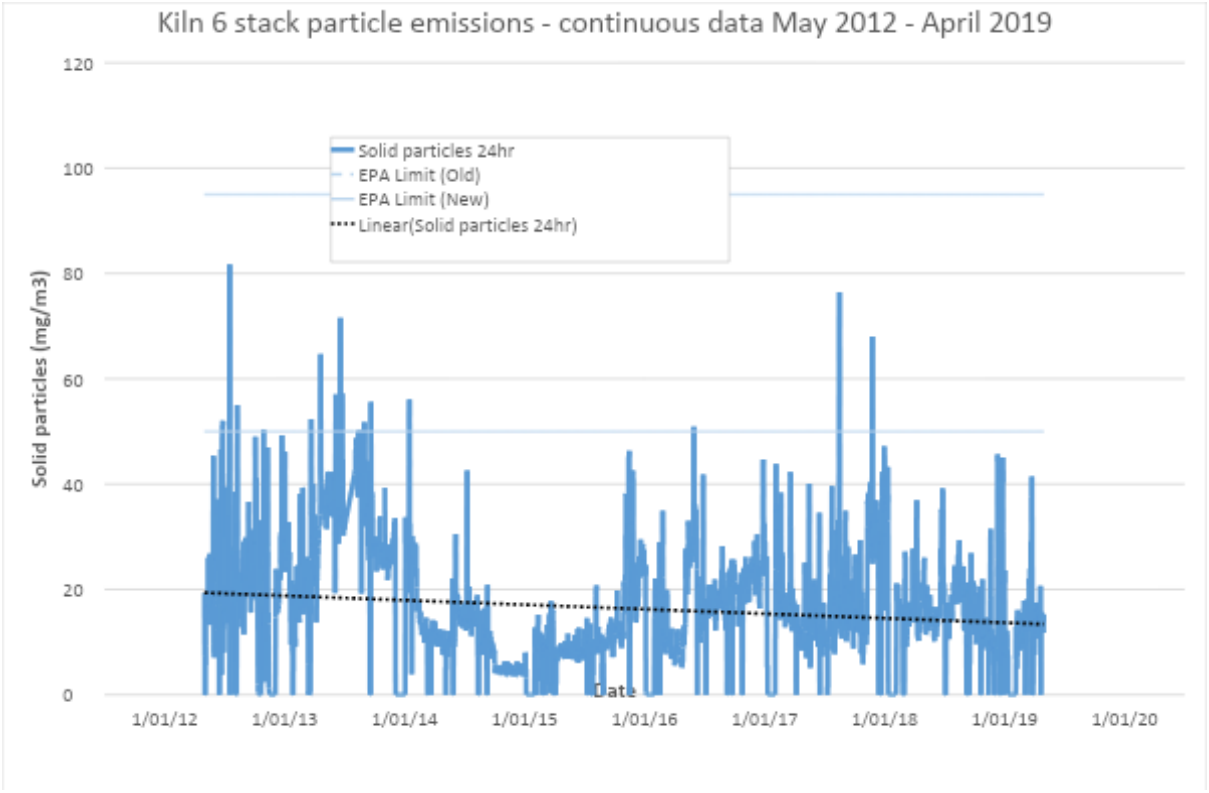


Figure 11 Continuous particulate monitoring for Kiln 6 May 2012 – April 2019

2021-2022 EPL 1698 Stack Testing Summary Results

2021-2022 EPL 1698 Stack Testing Annual Return Summary						
Report ID			R011682-1	R011836	R011867	R012341
Pollutant	**Unit of Measure**	**Licence Limit**	**Oct-2021**	**Oct-2021**	**Nov-2021**	**Jan-2022**
Vol flowrate	M3/sec		210	210	200	210
Velocity	m/s		29	30	29	29
Temp	C		111	111	110	121
NOx	**mg/m3**	**1250**	730	770	890	1100
Solid Particles	**mg/m3**	**50**	20	15	12	18
Moisture	%		13	13	14	13
Molecular wgt stack gases	g per g mole		30	30	30.4	30.1
Dry das density	kg/m3		1.42	1.42	1.44	1.42
Carbon dioxide	%		20.7	21.4	24.5	19.6
Oxygen (O2)	%		9	8.7	7.9	10.2
Type 1 & 2 aggregate	**mg/m3**	**0.5**	<0.031	<0.02	<0.023	<0.047
Cadmium	**mg/m3**	**0.05**	<0.0002	<0.0011	<0.00078	<0.00057
Mercury	**mg/m3**	**0.05**	0.0083	0.0075	0.0085	0.0093
Chlorine	**mg/m3**	**50**	<0.009	<0.007	<0.008	<0.01
Carbon monoxide	mg/m3		490	400	510	300
Dioxins & Furans	**ng/m3**	**0.1**	0.0029	0.00079	0.00036	0.00072
Chromium (hexavalent)	mg/m3		0.001	<0.0004	<0.0005	0.001
Hydrogen Chloride	**mg/m3**	**10**	0.17	0.23	0.14	0.42
Hydrogen fluoride	**mg/m3**	**1**	<0.02	<0.022	<0.02	0.063
Sulphur dioxide	**mg/m3**	**50**	<0.021	<0.01	<0.021	<0.02
Sulfuric mist (SO3)	**mg/m3**	**50**	0.5	0.038	3.1	1.9
VOC	**ppm**	**40**	2.3	2.1	3.1	1.2
Thallium	**mg/m3**	**0.05**	<0.0009	<0.001	<0.0009	<0.001

Figure 12 Stack testing license comparison tables

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 2020), 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 five overflow events during the reporting period.

Three of the conditions relate to construction, with the Chloride Bypass System commencing construction on 25 March 2022 after approval of the MOD 13 CEMP on 24 February 2022. Section 8.6 of the CEMP details specific water management protocols relating to the construction of the CBS.

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.

Above average rainfall was reported during the 2021/22 reporting period, with the site sourcing a large portion of its daily usage requirements from waters collected within the shale pit voids. The business will continue to prioritise waters harvested onsite, however as a large consumer of water this will require the Wingecarribee River to be the main source of water. In the longer term the aim will be to source waters from the former Berrima Colliery.

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	There were eight overflows from Lake Quality during the reporting period (05/05/21, 26/08/21,14/10/21,12/11/21, 22/11/21,10/12/21, 23/02/22, 08/03/22). Water was sampled at the overflow point (EPA Point 9), which had the following results: ● Biochemical oxygen demand (mg/L) – 2-4 ● (guideline: 20) ● Oil and grease (mg/L) – <5 for all samples (guideline: 10) ● pH – 7.9-8.3 ● Total suspended solids (mg/L) – 8-44 (guideline: 30-50) The results were within guideline values and were reported as part of the site POELA monthly reports.	The discharge water quality is similar to previous years, with eight overflow events for the year. The higher discharge events are a reflection on the wetter than average year and the several periods of substantial rain in short periods of time. No overflow events occurred after the commencement of construction of the CBS in March.	In order to ensure sufficient capacity in Lake Quality in the event of a rain event, water for production will primarily be taken from Lake Quality prior to extracting water from Wingecarribee River. The approved CEMP for MOD 13 details specific water management measures in Section 8.6 and specifically references *Managing Urban Stormwater – Soils and Construction Vol.1 (Landcom, 2004)* (the Blue Book)
K3.12	Construction vehicles exited the site via a wheel wash.	NA	
K3.13	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends. No overflow events have occurred since construction of the CBS commenced in March during the reporting period of the AEMR.	Refer to K3.11

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. There were eight overflows from Lake Quality during the reporting period (see K3.11). Water was sampled at the overflow point (EPA Point 9), which had the following results: ● Biochemical oxygen demand (mg/L) – 2-4 ● (guideline: 20) ● Oil and grease (mg/L) – <5 for all samples (guideline: 10) ● pH – 7.9-8.3 ● Total suspended solids (mg/L) – 8- 44 (guideline: 30-50) The results were within guideline values and were reported as part of the site POELA monthly reports.	The water in Lake Quality is reused in site processes and the lake only overflows during heavy rainfall. There were eight overflow events during the reporting period. Sampling demonstrated that water quality met the typical NSW discharge criteria. .	*Berrima Cement Works – Water Management Plan* (Boral 2020) is implemented at the Works, which includes the Kiln 6 area and is reviewed every three years or after an incident and is revised/improved as deficiencies become apparent.
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 2020) 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.	No overflow events have occurred since construction of the CBS commenced in March during the reporting period of the AEMR
M2.13	Refer to K3.12.	Construction is a short-term activity which cannot be used to establish trends.	No overflow events have occurred since construction of the CBS commenced in March during the reporting period of the AEMR
M2.14	Refer to K3.11.	Construction is a short-term activity which cannot be used to establish trends.	No overflow events have occurred since construction of the CBS commenced in March during the reporting period of the AEMR

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, which are relevant to the construction of the Chloride Bypass Facility as part of MOD 13. The Construction Environmental Management Plan – Chloride Bypass System was approved on 24 February 2022 and details specific traffic management protocols in Appendix D. The Construction Traffic Management Plan aims to prevent incidents and queuing on public roads. No community complaints were received regarding construction or operational 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 was approved as an Appendix of the CEMP for the CBS facility on 24 February 2022 .
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 was approved as an Appendix of the CEMP for the CBS facility on 24 February 2022
K3.16A	34 654 tonnes of SWDF were used in the reporting period, at the time of writing the levy has yet to be paid to Council. The levy payable should = (Reporting Year SWDF tonnes x 0.04) x 2.6 Invoice cannot be issued by Council until Annual Report completed.	SWDF vehicles travel 2km from the highway to the site entrance and return to the highway. Based on 21869t in 2018/19 a levy of $2274.31 was payable. Based on 28997t in 2019/20 a levy of $3015.69 was payable. Based on 34767t on 2020/21 a levy of $3615.78 is payable Based on 34654t on 2021/22 a levy of $3,604.02 is payable	2018/19 and 2019/20 has been paid, awaiting invoices to be issued for 20/21 and 21/22.
M2.15	NA	NA	NA

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.	NA
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.

Section 8.2 of the Chloride Bypass System CEMP details the Construction and Demolition Waste Management Plan. This was approved on 24 February 2022.

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 2020), which describes recycling and disposal requirements for the different waste categories generated and used on site.

During the reporting period the site have changed their bulk skip bin supplier. These skip bins are taken to the Resource Co alternative fuel facility in Wetherill Park which in turn sort out the biomass to product SWDFs back to our site at Berrima.

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	Except for raw materials and SWDF non-standard fuels and HiCal 50 approved in EPL 1698 no waste generated outside the Works was received at the 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).	Boral undertook a review of the OEMP, to reflect the recent Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020. The CEMP was updated in response to MOD 13 to include the construction of the CBS and was approved on 24 February 2022.
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.	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).	Boral undertook a review of the OEMP, to reflect the recent Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020. The CEMP was updated in response to MOD 13 to include the construction of the CBS and was approved on 24 February 2022.

M2.18	Landfilling of waste is prevented by crushing and recycling old refractory bricks through the kiln.	No waste materials are disposed on site.	
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.	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.
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	Boral undertook a review of the OEMP, and the to reflect the recent Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the

		fuels prior to their use at the site (approval letter received from DPE on 21/05/2018).	Department on 5 June 2020 and approved on the 29 June 2020.
K3.17C	There has been no generation of wastes from the use of the SWDF non-standard fuels. No wastes can be generated when consumed in the kiln as any ash forms part of the clinker product. Minor spillages near the shed entrance are either swept into the shed or if contaminated with other materials such as aggregates etc this material is swept up and placed into the site skip bins used for other site waste. These skip bins are sent to Resource Co who intern make SWDF to supply to site.	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.

The EPA updated the licence to reflect these changes in December 2019.

During the reporting period SWDF usage stayed relatively stable going from 34 767t to 34 654t. 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 50 Storage and Handling Procedure', Version 3 dated 27 March 2019; and
- The 'Hi Cal 50 (Carbon anode ex-Hydro Kurri Kurri) Recovered Resource Specification Version 3 dated 27 March 2019

During the 2019/20 reporting period (October 2019) MOD 11 was approved to permit the use of Hi Cal 50 during start up conditions. The site consumed 2951t of Hi Cal during the 2021/22 reporting period.

An audit report on non-standard fuels was undertaken by Robert Byrnes of International Environmental Consultants in late 2021. The audit report was submitted to the Major Project Portal on February 2022. The audit found no non-compliances and had four recommendations relating to NSF. DPIE have requested a status update on the recommendations as below

- Electrostatic Precipitator reliability and performance review was submitted with the Proof of Performance Trial (PoPT) for the SWDF on 30 March 2022. (see K25-K27 comments in Table 22).
- The NEPM goal for PM10 of 50 µg/m3 has been adopted in monthly POELA reports and this audit report (see Figure 8).
- All new suppliers of NSF are subjected to the same QA/QC management and reporting structure (see K1.4H comments in Table 22).
- The OEMP will be updated to incorporate MOD 14 when approved. As of the date of this report, MOD 14 has not been approved. It is expected to be approved in the next reporting period and the OEMP will be updated (see Section 8)

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>
</table>

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

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 and the Group 1 Non-Standard Fuel, Hi Cal 50, 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.
K1.4J	Hi Cal 50 must only be used in Kiln 6 when lended with coal to create a homogenous blend. The concentration of Hi Cal 50 in the blend must not exceed 4%.
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.
K3.24A	The temperature requirement of Condition 3.24(b) does not apply to the Group 1 Non-Standard Fuel Hi Cal 50, when Hi Cal 50 is blended with coal in accordance with the requirements of condition 1.4J.
K3.24B	Notwithstanding Condition 3.24A, the feed rate of the Group 1 Non-Standard Fuel, Hi Cal 50, must not exceed 400kg/hr when the temperature is below 300^0C at the outlet of the preheater strings.
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.

K7.3A	In each Annual Management Report submitted after the First Year Monitoring and Modelling Assessment Report required in accordance with condition 7.6 has been submitted, the applicant shall include details of the use of all Non-Standard fuels at the development including but not limited to: a) the nature, quantity and quality of Non-Standard Fuels used at the development b) details of any fuels that did not meed the Fuel Specification, including the source of the fuels and how the rejected fuels were managed or disposed of; c) a review of the results of the Non-Standard Fuels Tracking Program and Non-Standard Fuels Quality Control Management Procedures; and d) the results of all monitoring undertaken in accordance with the requirements of this consent and an assessment of these monitoring results, including comparison of stack emissions against the concentration limits set in condition 3.10.
K7.6	One year after the commencement of the use of Non-Standard Fuels in accordance with this consent, the Applicant shall prepare a First-Year Monitoring and Modelling Assessment Report. The Report shall be submitted to the Secretary, the NSW Department of Health and the EPA not more than 15 months after the commencement of the use of Non-Standard Fuels in accordance with this consent.

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. Usage has increase from 21 809t in 2018/19 28 997t in 2019/20 34 767t in 2020/21 34 654t in 2021/22	Boral undertook a review of the OEMP, and the to reflect the recent Mod 11 and 12 to the consent and changes to the EPL completed by the EPA on 18 December 2019. These were submitted to the Department on 5 June 2020 and approved on the 29 June 2020.
K1.4B	Less than 200t of AKF 5 was received, stored or used at the site during the reporting year as part of the tyre chip trial.	NA	
K1.4C	Compliance was confirmed in the 2007-2008 AEMR.	The site will be recommenced the use of HiCal50 in 2020/21	
K1.4CA	Boral commenced tyre chip trial in January 2022.	Trials are one-off events that do not display reportable trends.	The trial is ongoing with an aim to determine if the existing feeding infrastructure developed for MOD 9 is sufficient or if modification for storage and feeding is required.
K1.4D	No non-standard fuels, apart from the approved HiCal 50, were used during start-up or shut-down conditions.	Apart from HiCal 50, 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	Modification 11 was approved on 25 October 2020 which permits 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.	NA	Manage as per approved HiCal50 Storage and Handling Procedure and Hi Cal 50 Recovered 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.	NA	NA
K1.4H	Boral provided in writing to the Secretary on that a new Group 2 SWDF supplier had implemented appropriate quality control and quality assurance procedures with correspondence from DPIE acknowledging receipt of review.		Boral will continue to review suppliers prior to the receipt of the first batch SWDFs from a particular supplier. A new additional wood waste SWDF supplier was introduced during the reporting period.
K1.4I	Operational procedures were submitted as part of the PoPT plan process.		
K1.4J	HiCal will be blended within the coal blending plant when in use.		
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.		
K3.23	The first Tracking Program report will be submitted within two weeks of the first quarterly stack test post PoPT trial approval then every six months following receipt of stack test results.	The six-monthly report was submitted in October 2021	The second report for the reporting period is currently being prepared.
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 originally was completed during the 2019/20 reporting period.	Further PoPT undertaken increasing to 50%.
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 limiting to 40%) of SWDF approved by the Secretary on 23/4/2019.	On 8 October 2021 Boral met with the EPA, including representatives of their air branch to discuss the POPTs. Three PoPT were completed The submission of the PoPTs was provided on 31 March 2022 and a response to a RfI was provided on 12 May 2022. Further PoPT to be completed in June/July 2022 to finalise request to 50%.

K3.28	The continual use of SWDF was approved by the Secretary on 23/4/2019.		
K3.24B	HiCal is used at the approved rate.		
K7.3A	SWDFs were is use during the reporting period. This material came from the three approved suppliers. Two Wood Waste and one Refuse Derived Fuel. A total of 34654t was used during the reporting period. Weekly meetings are held with suppliers to provide updates on operational demands and to review quality and the contracted specifications. All material met the consented specification during the reporting year. 1 out of the 2 six monthly non-standard fuel tracking program reports were submitted for the reporting period with the final report to be completed shortly. An independent 3rd party audit was undertaken on QC management procedures of all suppliers in April 2021, with no non-compliances raised. Table 12 under section 5.3 summarises stack emission test results against the licence limits. All stack tests undertaken during 2021/22 were compliant with licence limits.		
K7.6	A first year assessment report was submitted in November 2019 to the DPIE.		

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. 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.

5 community complaints were received during the reporting period, four of which were made directly through to the site and one via the EPA Pollution Line. The four directly reported complaints related to dust generation and deposition. These were addressed individually with each complainant.

The Community Liaison Group (CLG) was re-established during the 2019/20 reporting period with the members endorsed by the DPIE on 30 August 2019.

Two CLG meetings were held during the reporting period on 5 August 2021 and 1 April 2022. A whole of community meeting was held in Mittagong on 30 November 2021.

Details of these meetings are held on the (**www.boral.com.au/berrimacement**) website.

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 (**www.boral.com.au/berrimacement**)	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 (**www.boral.com.au/berrimacement**)	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 1/05/2021 – 30/04/2022 is provided in Appendix 2. There were 5 complaints, each of which related to dust.	The number of complaints are lower than the last two years.	Boral will continue to implement the Operational Environmental Management Plan to prevent nuisance impacts on neighbouring properties and implement the real-time dust monitor.

K5.4	The community liaison committee (CLC) was originally established in April 2004. Since 2010, the CLC was converted to public meetings, including invitations to the CLC members, as, at the time the CLC format proved unsuccessful in communicating meeting contents and outcomes to the broader community. In 2019/20 the Community Liaison Group was re-established. In 2021/22 the Community Liaison Group met twice. One whole community meeting was held during this reporting period. 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: (**www.boral.com.au/berrimacement**)	The aim is for the CLG to meet quarterly and there will be one whole of community meeting held annually.	The CLG only met twice during the reporting period due to COVID disruptions and restrictions. One whole of community meeting held in the reporting period.
K5.5	The Berrima Cement Management Team is represented by the Site Operations Manager and the Environmental Sustainability Manager, together with Boral's Stakeholder Relations Manager - Southern Region (NSW/VIC/TAS/SA), and a representative from Boral Cement's Group Engineering Team. Minutes from the CLG meetings have been posted on the website.	Boral has historically, and will continue to, respond to requests from CLG members and post the meeting minutes on the website.	Boral will continue to respond to requests from CLG 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.

2020 Audit

During November 2020 Robert Byrnes from International Environmental Consultants undertook the three yearly audit. This was finalised on 3 February 2021. This audit was undertaken as per condition 4.5 of DA401-11-2002i and condition 3.3 of DA85-4-2005i.

The DPIE accepted the audit report on 11 March 2021, and requested that an update be provided in the next AEMR and future AEMRs until actions are completed. The audit report is also available on the Berrima Cement webpage.

Boral has reviewed the audit report and believed it complied with the requirements of the audit conditions.

The audit identified 5 non-compliances through the 3-year period which related to Condition 1.6, which is a general condition requiring the operations meet all other statutory obligations. These non-compliances all related to reported non-compliances to the EPA under EPL 1698 which were all appropriately reported and addressed at the time. These are outlined in Table 3.1 of the audit report and reproduced below.

Table 3.1 – Compliance Status Summary

Instrument	Condition	Year of Non-Compliance	Details
DA401-11-2002i	1.6	2019, 2020	Five Non-compliances with EPL conditions in relation to monitoring and emissions (as outlined in below)
EPL1698	L3.3	2018	Cadmium and Thallium exceedance of limits
	L3.3	2018	Solid particles exceedance of limits
	L3.3	2018	Hydrogen Chloride exceedance of limits
	M2.2	2019	HVAS failure to run on 4 occasions
	O2.1	2019	Failure of bag house filtration system resulting in excessive dust emissions. EPA infringement notice issued

The 2018 non-compliances were during the Solid Waste Derived Fuels Proof of Performance Trials, were of short duration and addressed at the time as part of the commissioning process.

Regarding the HVAS failure, as per the EPL the HVAS it is required to run every 6 days. On occasion it can fail to run due to power interruptions, programming failures or equipment failure. During the reporting period of 2019 this occurred on four occasions. These instances were beyond the control of the site. As a corrective action the site undertakes additional testing to make up for missed events. To reflect this approach the site Air Quality Management Plan was updated in June 2020 with the following:

'As with any type of monitoring equipment there is potential for failure to run. Should a sample not be collected due to equipment error and unintentional human error, this would not be considered a non-compliant event and an additional day will be added to make up for the missed sample.'

The baghouse failure incident resulted in a Penalty Infringement of $15000. Boral addressed this issue at the time of the event. The community were appropriately consulted, improvements made to the baghouse and a real-time dust monitor installed along with the implementation of a Trigger Action Response Plan (TARP) to reduce the risk of dust emissions on the community of New Berrima.

The audit identified the following recommendations:

1) Consideration should be given to either amalgamating the two current consents as they both have elements that overlap or updating the Cement Mill 7 consent to align with DA 401-11-2002-i-MOD12
2) The noise assessment criteria contained in the Cement Mill 7 Consent DA 401-11- 2002-I needs to be updated to align with the EPL and DA 401-11-2002-i-MOD12.
3) Bank erosion on the main batter slopes of the shale quarry should be corrected and the drainage system on the banks re-established.
4) Seek approval from Wingecarribee Shire Council to reinstate the truck warning signage on Taylor Road.

Boral took on these recommendations, and made the following comments and proposed to undertake the following to address the recommendations.

- Cement Mill 7 consent alignment – Boral will request a Modification to the current noise condition to align to DA 401-11-2002-I and EPL 1698. We will aim to undertake this by August 2021.
    - June 2022 update – We are still aiming to submit by August 2022.

- Bank erosion on main batter – this is an ongoing maintenance issue and will continually be addressed operationally as required.
    - June 2022 update – This continues to monitored. Higher than average rainfall during the reporting period has highlighted the ongoing need to manage.
- Signage – Truck warning. Boral will request the Council to reinstate truck warning signage on Taylor Avenue.
    - June 2021 update: A request was made to Council on 26 February 2021. A subsequent inspection identified that a warning sign is in place. This action is now closed.

7 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

There were two non-compliances reported during the reporting period relating to non-compliances within sites Environmental Protection Licence 1698 conditions.

See details of non-compliance submitted to the EPA below.

HVAS Sampling Non-compliance

Licence condition number not complied with ▼
M2.2 Point 18

Summary of particulars of the non-compliance ▼
Monitoring frequency for PM10 is required every 6 days which total 61 samples per annum. Only 59 samples collected due to extreme rain event in February 2022 impacting access to units over four weeks.
Further details on particulars of non-compliance, if required ▼
The approved Air Quality Management Plan details that additional sampling can be undertaken if samples are missed due to equipment failure etc. While additional samples were collected, it was not possible to meet make up for all missed samples.
Number of times occurred ▼
2
Date(s) when the non-compliance occurred, if applicable ▼
February 2022
Cause of non-compliance ▼
Extreme wet weather restricted access to the HVAS monitoring units. Additional make up sampling, did not make up for all missed samples as the service provider did not have sufficient resources to complete by end of reporting period.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance ▼
No adverse impacts for missing samples. Due to the extreme wet weather at the time there was very little fugitive dust generating activities.
Action taken or that will be taken to prevent a recurrence of the non-compliance ▼
The approved Air Quality Management Plan already details that additional sampling can be undertaken to make up for missed samples due to equipment failure etc. Due to resourcing constraints not all could be caught up.
Uploaded Document Name ▼
Uploaded Document Description ▼

Open door near TS-03 – Failure to Maintain Plant and Equipment

Licence condition number not complied with ▼
O2.1
Summary of particulars of the non-compliance ▼
Open door/hatch near TS-03 and dust collector unable to close due to build up of cement dust. Fugitive dust released through open door when dust collector 102 fan failed.
Further details on particulars of non-compliance, if required ▼
Incident identified after a call to the EPA hotline Incident report provided to EPA and DPIE on 21 March 2022 EPA issued Official Caution (Notice 3502373) issued 23/04/2022
Number of times occurred ▼
1
Date(s) when the non-compliance occurred, if applicable ▼
21 February to 23 February 2022
Cause of non-compliance ▼

DC102 fan failed leading to dust released through open door/hatch. Door could not be closed properly due to previous build up of cement.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance ▼
See Incident Report attached
Action taken or that will be taken to prevent a recurrence of the non-compliance ▼
See Incident Report attached
Uploaded Document Name ▼
20220321 Boral Berrima Cement TS03 Incident Report Final.pdf
Uploaded Document Description ▼
Boral Berrima Cement TS03 Incident Report

There was one regulatory notice during the reporting period which related to the Open door near TS-03 which resulted in a dust emission when a baghouse dust collector fan failed within the enclosure from 21 to 23 February 2022. To summarise;

- the alleged clinker dust emission was reported by a complainant to the Environment Protection Authority (EPA);
- Boral provided an initial response to the EPA advising of a failed fan and open doors at the top of TS03 and real-time dust monitoring results at the time did not trigger the sites dust Trigger Action Response Plan i.e. no off site impacts;
- An incident report was provided to DPIE and the EPA as per Schedule 2 Condition 7.2 of DA 401-11-2002-I and R3.3 within EPL1698 on 21 March 2022,
- An Official Caution (Notice Number 3502373) was issued by the NSW EPA for a non-compliance of EPL1698 Condition O2.1 Maintenance of Plant and Equipment

Workers were reminded by toolbox talk on 11 and 12 May 2022 of the importance of reporting and promptly repairing any failures, blockages or controls which are or could lead to the release of dust into the environment.

8 ACTIVITIES TO BE COMPLETED DURING THE NEXT REPORTING PERIOD

During the 2022-23 reporting period, in addition to the annual kiln shutdowns, the following projects will be undertaken or be progressed:

- Continue the installation of the Chloride By-pass. Aim to commission in May 2023.
- Finalise high-rate Proof of Performance Trials for Wood Waste and Refuse Derived Fuels to enable SWDF percentage usage to consented 50% of total fuel by mass.
- Continue approval process and procurement process to install a pilot carbon capture system pilot scale carbon capture and use project to improve the quality of recycled concrete, masonry and steel slag aggregates as part of a $2.4m grant from the Federal Government Carbon Capture, Use and Storage Development Fund.
- Continue with MOD 14 application for a new entrance road and an increase in SWDF
- Finalise the AKF5 (tyre chip trial) report.
- Update the OEMP to reflect recent Modifications to the consent.

APPENDIX 1 – ANNUAL ENVIRONMENTAL NOISE ASSESSMENT (SEE ATTACHED)

APPENDIX 2 – COMMUNITY COMPLAINTS REGISTER APRIL 2021-MAY 2022

DATE	COMPLAINT ADDRESS	HOW REPORTED	ACTION
13/12/2021	Brisbane Street, New Berrima	E-mailed Boral Website	Dust on car, voucher provided
15/12/2021	Brisbane Street, New Berrima	Rang Gabriel	Dust on car, voucher provided
17/12/2021	Melbourne Street, New Berrima	Rang Reception	Dust on car, voucher provided
23/01/2022	Taylor Avenue, New Berrima	Emailed the Boral communications centre team.	Dust on car
24/02/2022	Anonymous	Environmental Pollution Line	Visible dust plume from a broken fan on conveyor TS-03. See Section 7 of FY22 AEMR for more details. Toolbox talk given to staff to emphasise the importance of reporting and promptly repairing any failure of plant which could lead to dust in the environment