Boral Cement Limited

Berrima Works

Air Quality Management Plan (Appendix 4 of OEMP)

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Version History:

Version	Date	By Whom	Description of Changes
1	30 November 2007	Grant Williams	Original version
2	7 October 2008	Grant Williams	Update to include requirements of Boral Cement corporate procedure, include NSF requirements.
3	September 2011	Alex Wnorowski	Global revision and formatting change
4	September 2014	Michael Curley	3-yearly review
5	April 2018	Todoroski Air Sciences	Update to include new requirements from Modification 9 consent
6	28 April 2020	Greg Johnson	Update to include outcomes of PoPT, inclusion of a trial real-time dust monitor and reference to the Dust TARP, Modification 11 consent (Use of HiCal 50) and MOD 12 (Isotainer and Whole of Site Noise Limits).
7	12 May 2023	Sharon Makin	Update to include new requirements from Modification 15 consent

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1. PURPOSE

Many activities at the Berrima Cement Works (the Works) generate point source and fugitive air emissions. These activities include grinding and crushing of materials, loading and unloading of freight wagons, truck movements, adding and subtracting from the raw material stockpiles, burning of clinker, cement milling, and product despatch (clinker and cement). The storage of certain non-standard fuels (NSF), solid waste derived fuels (SWDF) or alternative raw materials (ARM) can result in the emissions of odours.

The purpose of the Air Quality Management Plan (the Plan) is to ensure that all personnel are aware of their obligations relating to air quality, such as site emission limits, and are able to apply appropriate controls and management techniques for the operation of the Works to control and minimise fugitive dust, odours, point source emissions and minimise the impact of emissions on the local community and the environment.

The Plan forms part of the Operation Environmental Management Plan (OEMP).

The Plan also enables compliance with the conditions specified in the development approvals (DAs) for Kiln 6 (DA No. 401-11-2002-i) and Cement Mill 7 (DA No. 85-4-2005-i), including the consolidated DA for modifications 1 to 15 to DA No. 401-11-2002-i (MOD 15 consent); and Environmental Protection License 1698 (EPL).

2. SCOPE

Requirements

The Plan addresses the following air quality related matters:

1. Identification of all possible gas and dust emission sources;
2. Control of potential emissions;
3. Planning for minimal environmental impact from emissions;
4. Compliance with environmental legislative requirements;
5. Promotion of employee and community environmental awareness;
6. Compliance with all relevant legislative requirements;
7. Compliance with Boral OHS Procedures; and
8. Describing procedures for dealing with non-compliance, if identified.

Air quality related conditions in the consolidated consent and the section of the Plan where they are addressed are shown in Table 1.

Table 1 Air quality related consent conditions

Condition	Requirement	Section
3.7	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.	CMT-ENV-001 Berrima Dust Management Plan
3.7A	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.	CMT-ENV-001 Berrima Dust Management Plan
3.8	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.	CMT-ENV-001 Berrima Dust Management Plan
3.9	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.	CMT-ENV-001 Berrima Dust Management Plan
3.10	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.	Work instructions (not attached to Plan)
4.1B	Prior to the commencement of the use of Non-Standard Fuels in accordance with this consent, the Applicant shall develop and implement an Ambient Air Quality Monitoring Program in consultation with, and to meet the requirements of, the Secretary and the EPA. The monitoring program shall be consistent with the EPA's *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*, shall monitor fugitive emission form site works, and be designed to generate sufficient information to meet the requirements of this consent. The ambient monitoring program shall include: a) appropriately located ambient air quality monitoring station/s designed to obtain representative air quality data; b) monitoring of TSP, PM10 and PM2.5 and other listed	4.1B(a): 5.2 (Monitoring/discharge locations and Figure 2) 4.1B(b): 5.2 (Monitoring schedule) 4.1B(c): 5.2 (Monitoring schedule) 4.1B(d): 5.2 (Monitoring schedule) 4.1B(e): 5.2

	pollutants; c) sampling at a continuous or other appropriately justified frequency (to be agreed with the EPA); d) sampling over an appropriate period (to be agreed with the EPA); and e) generation of suitable continuously sampled meteorological data including wind speed, wind direction, temperature, and variability of wind direction (sigma theta) in general accordance with the current Australian Standard/s. The Applicant must ensure the ambient air monitoring program is underway prior to the PoP Trials starting. The continuation of ambient monitoring may be reviewed after analysis of at least one year's ambient monitoring data.	(Monitoring schedule)
6.3A	Prior to the receipt of any Non-Standard Fuels, the Applicant shall update the OEMP required by condition 6.3 of this consent to include the following: c) the environmental monitoring requirements outlined in the EPL and under conditions 4.1A, 4.1B and 4.1C of this consent; and d) an updated Air Quality Management Plan, as required by condition 6.4A of this consent.	6.3A(c): 5.2 6.3A(d): this revised Plan
6.4(b)	…an **Air Quality Management Plan** to outline measures to minimise and manage any impacts from the operation of the cement works upgrade on local air quality. The Plan shall address the requirements of the EPA, should there be any. The Plan shall include, but not necessarily be limited to: i. identification of all major sources of particulate and gaseous air pollutants that may be emitted as result of the operation of the cement works upgrade, including identification of the major components and quantities of these emissions; ii. monitoring of particulate and gaseous emissions from the cement works upgrade, in accordance with any requirements of the EPA; iii. procedures for the minimisation of particulate and gaseous emissions from the cement works upgrade, and the reduction of these emissions over time, where appropriate; iv. protocols for regular maintenance of process equipment to minimise the potential for dust emissions; v. measures to consider and manage the cumulative impact of operating both kilns simultaneously; and vi. description of procedures to be undertaken if any non-compliance is detected.	6.4(b)(i): 5.1 (Emission sources), Table 4 6.4(b)(ii): 5.2 (Monitoring/discharge locations and Figure 2), 5.2 (Stack emission limits), 5.2 (Monitoring requirements) 6.4(b)(iii): 5.2 (Air quality management controls) 6.4(b)(iv): Work instructions not attached to this Plan 6.4(b)(v): 5.2 (Air quality management controls), dust management plan 6.4(b)(vi): 7 (Incident reporting), OEMP (pollution incident response management plan, emergency plan, Section 6.2)

6.4A	As part of the updated OEMP required under condition 6.3A of this consent, the Applicant shall provide an updated Air Quality Management Plan prepared in consultation with the EPA. The updated plan shall be prepared by a suitably qualified and experienced person and shall: a) verify whether the development is complying with the air quality criteria specified in the EPL, and identify the additional measures to be implemented to ensure compliance should any non-compliance be detected; b) validate that the performance of the project reflects the assumptions, estimates and conclusions made in the Human Health Risk Assessment and Air Quality Impact Assessment submitted with MOD 9; c) provide details of any complaints received relating to air quality generated by the development, and action taken to respond to those complaints; d) include ambient monitoring of emissions from the development, including PM2.5 and PM10; e) include stack emissions monitoring at Kiln 6, including for each pollutant considered and assessed as a part of the Human Health Risk Assessment and Air Quality Impact Assessment submitted with MOD 9. The pollutants shall include but not be restricted to individual VOCs, heavy metals, dioxins and PAHs; f) include an ambient air monitoring program; and g) include details of all proposed emission control measures.	This version review incorporates the PoPT outcomes. 6.4A(a): POPT final report accepted see attachment 3 which approved continual use. Additional measures outlined under 'Proof of performance trials' compliance will be verified, and this Plan updated, after monitoring results from the proof of performance trials are analysed 6.4A(b): assumptions in the MOD 9 environmental assessment documents was validated by the independent audit dated 31 October 2019, 6.4A(c): 7 (Pollution complaints) and Section 5.3 of OEMP 6.4A(d): 5.2 (Monitoring/discharge locations and Figure 2) 6.4A(e): 5.2 (Stack emission limits), 5.2 (Monitoring requirements) 6.4A(f): 5.2 (Monitoring/discharge locations and Figure 2) 6.4A(g): 5.2 (Air quality management controls), dust management plan

Proof of performance trials

As per conditions 3.25 – 3.28 of the MOD 9 consent, a proof of performance trial (PoP) was to be undertaken for the burning of SWDF. The use of SWDF was not to be permitted (outside of the approved PoP Trials) until such time as the Secretary indicated in writing that they were satisfied with the results for an individual SWDF. The SWDF PoPT commenced in August 2018 and ran until April 2019.

On 23 April 2019 the Secretary approved the Proof of Performance Trial Consolidated Six Month Report for Solid Waste Derived Fuels prepared by Boral Cement dated 28 February 2019 which demonstrated the suitability of the ongoing use of SWDF in Kiln 6, 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 3 months for the first 12 months of use of SWDF. The monitored pollutants must be consistent with the requirements of the 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 emission limits for the facility, to the satisfaction of the secretary.

d) periodic measurements of HCl taken every 3 months until such time the Secretary agrees the accuracy of the HCl CEMs is confirmed through successful calibration audits undertaken in accordance with USEPA Performance Specification 18.

The EPA licence was amended on 18 December 2019 to reflect the fuel limitation to 40%, as a percentage total of fuel until such time further testing is undertaken.

On Friday 23 February 2022 Boral submitted the final Proof of Performance Trial reports to the DPE to increase SWDF usage permitted to 50%. On 8 December 2022 the Secretary and EPA acknowledged that the PoP trials and stack tests demonstrate compliance with the consent and environment protection licence conditions under high feed rate conditions (>40% and <50%) with the Secretary approving the increase of the SWDF feed rate in Kiln 6 from 40% to a maximum of 50%.

No other changes were required in regards to emission limits or changes to fuel specifications.

Fuel types

Along with standard fuels Natural Gas, Fuel Oil, Diesel, Coal and Coke Fines, Boral is currently approved to use Group 1 non-standard fuels; AKF5 (used and unwanted tyres), HiCal 50 (spend aluminium electrode) and AKF1 (liquid oily residues comprising of recovered oil from the treatment of wash waters, oils, dewatered sludges and grease trap emulsions) and Group 2 non-standard fuels SWDF (Solid waste derived fuel including wood waste and refuse derived fuel).

The consent, as modified, only permits the use of the standard and non-standard

fuels outlined in Condition 1.4A Table 1. The consent does not approve the establishment of a protocol for general use of Non-standard Fuels other than those permitted.

Table 1 – Permitted Fuels for use in upgraded Kiln 6

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

Along with annual tonnage limits per annum, there are also restriction on Non-standard Fuel storage, use during Kiln start-up and feed rates. These include:

- Only Standard Fuels and Group 1 Non-Standard Fuel, Hi Cal 50, are permitted to be used at the development during start-up and shutdown
- Non-standard fuel are not permitted to be stored at the site for longer than 3 months, except with the written permission of the Secretary.
- Hi Cal 50 must only be use in Kiln 6 when blended with coal to create a homogenous blend. The concentration of Hi Cal 50 in the coal blend must not exceed 4%.
- The feed rate of Hi Cal 50, must not exceed 400kg per hour when the temperature is below 300 degrees C at the outlet of the preheater strings.

3. DEFINITIONS

Table 2 Definitions

Term	Definition
CEMS	Continuous Emission Monitoring System
DA	Development Approval - a consent issued by the Department of Planning and Environment, detailing site-specific construction and operational conditions that Boral Cement must comply with
DPE	NSW Department of Planning and Environment

OEH	NSW Office of Environment and Heritage
EPA	NSW Environment Protection Authority
EPL	The site-specific Environment Protection Licence (No 1698) issued and managed by the EPA
Greenhouse gases	Greenhouse gases are the gases present in the atmosphere which reduce the loss of heat into space and therefore contribute to rise of global temperatures through the greenhouse effect. The six greenhouse gases covered under the Kyoto Protocol are carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons and perfluorocarbons. The main greenhouse gas from cement manufacture is CO_2
HVAS	High volume air sampler
NSF	Non-Standard Fuels i.e. any fuel that does not meet the criteria for Standard Fuel (approved NSFs are Hi-Cal 50, AKF1, AKF5 and SWDF)
SWDF	Solid waste derived fuels (includes wood waste and RDF)
Wood waste	Organic fibrous wood residues and natural wood wastes that result from the processing of waste
RDF	Refuse derived fuel – A fuel produced by processing the residues of waste by sorting and shredding (particle size reduction), dehydrating (moisture removal), and removal of recyclable and hazardous materials
OEMP	Operation environmental management plan
$PM_{2.5}$	Particulate matter of 2.5 micrometers or less in diameter
PM_{10}	Particulate matter of 10 micrometers or less in diameter
TARP	Trigger Action Response Plan
TSP	Total suspended particulates

4. ROLES AND RESPONSIBILITIES

In addition to specific responsibilities listed in the procedures in Section 7, the general responsibilities in Table 3 apply.

Table 3 Responsibilities

Role	Responsibility
Employees	Responsible for ensuring that the atmospheric emission goals in their work area are achieved. This includes: ➢ observing any air emission control instructions and procedures that apply to their work, including the Berrima Dust TARP; ➢ taking action to prevent or minimise air emission incidents; ➢ identifying and reporting air emission incidents; and ➢ monitoring and controlling air emissions to ensure emissions are maintained within defined limits.
Team Leaders / Front Line Supervisors	Responsible for the prevention of emissions to air arising from work methods and the working environment. This includes: ➢ identifying, reducing and preventing emissions to air; ➢ monitoring operations and maintenance work to ensure emissions to air are maintained within approved levels; ➢ initiating preventative actions with respect to air emissions exceedances and fugitive dust as per the Berrima Dust TARP ; ➢ identifying, reporting and recording air emissions incidents; and ➢ initiating corrective actions to overcome air emissions breaches.
Production Manager / Technical Manager	Responsibility and authority to ensure that the site environmental air emission objectives are achieved. This includes: ➢ ensuring staff are trained and updated on air emission awareness, responsibilities, instructions and procedures; ➢ ensuring air emission incidents are investigated and corrective and preventative action taken; ➢ ensuring operations comply with DA and EPL conditions, and relevant legislative requirements; ➢ ensuring periodic emission monitoring is carried out and that the results comply with the emission limits for the site ➢ reviewing operations and implementing strategies to reduce fugitive and point source air emissions from the works as per the Berrima Dust TARP; and ➢ developing and implementing contingency plans to respond to air emission incidents and minimise fugitive and point source air emissions.

	➢ handling air emission complaints received,
HSE Advisor or designated Environmental Representative	Responsibility for environmental compliance and further improvement. This includes: ➢ monitoring compliance with DA, EPL and site procedures; ➢ reporting outcomes of compliance monitoring and identify opportunities for improvement; ➢ reviewing periodic emission monitoring to ensure results comply with the emission limits for the site; ➢ ensuring appropriate corrective actions and management plans are updated and implemented if emissions are found to be exceeding the limits; and ➢ review complaints, investigations and corrective actions, observing and reporting trends.
Site Operations Manager	➢ approving any communications to external parties on air emission generating activities before their release; and ➢ ensuring all personnel are aware of EPL, DA and other regulatory requirements relating to plant operation and environmental performance relating to emissions to air, including the Berrima Dust TARP

5. PROCESS

5.1 MANUFACTURING OPERATIONS – POTENTIAL EMISSION SOURCES

Cement is produced at the Works by the dry process in No. 6 Kiln (see Figure 1 for process schematics). The sequence of operations at the Works with respect to their air emission potential is described in Table 4.

Subject to compliance with the conditions of the DAs and EPA Environment Protection Licence, Kiln 6 and Cement Mill 7 can be operated 24 hours per day, seven days per week.

Table 4 Sequence of operations

Operation	Description	Potential for Emissions
Unloading of limestone	Limestone/limestone-yellow shale mixture from Marulan Limestone Mine is transported to the works by rail. The limestone is unloaded and taken by conveyor belt to the	Minor fugitive dust emissions

Operation	Description	Potential for Emissions
	pre-blend heaps. The conveying system is enclosed and the transfer points are fitted with dust collection systems.	
Quarrying	Blue shale is excavated using a bulldozer.	Minor fugitive dust emissions
Additive raw material delivery, storage and transfer	The additive materials such as blue shale, yellow shale, iron source materials and gypsum for cement production are delivered to the works by road. They are stockpiled on site in open stockpiles and/or on the Shale Pad. The various materials are transferred to the Shale Pad or Shale Crusher by road transport and/or front end loaders. The Shale Pad area is bunded and covered. The area is swept to remove spilt material.	Significant fugitive dust emissions
Coal delivery and storage	Raw coal is delivered by road and unloaded through a hopper for transfer to the raw coal blending system. When coal shed is full, excess coal is stored in an open stockpile. The raw coal is wet and the transfer system and coal blending is enclosed.	Very minor fugitive dust emissions
SWDF storage, handling and feeding system	SWDF delivered to site in covered vehicles to designated storage building.	Minor fugitive odour emissions
AKF5 storage pad	AKF5 is delivered directly into designated ground bins and moved by loader to feed hopper (stage 1) or directly into hopper (stage 2). Site water cart used to control potential fugitive dust from vehicle movements.	Minor fugitive dust emissions
Additive raw material crushing	The additive materials, blue shale, yellow shale, iron source materials are crushed in the Shale Crusher and transferred to the Proportioning Bins. The crusher is fitted with a dust collection system and conveying system is enclosed and the transfer points are fitted with dust collection systems.	Minor fugitive dust emissions
Preblending	The limestone from rail deliveries is laid down in a series of windrows on the preblend heap. These windrows form layers that help to reduce the effect of any variations in the limestone quality. One heap is being built	None

Operation	Description	Potential for Emissions
	while the other is being reclaimed. The operation is contained in a building.	
Reclaiming	The preblend heaps are reclaimed by the reclaimer. The reclaimer scrapes limestone from the face of the heap across all the layers laid down during the build of the heap. This further reduces any effects of variation in limestone quality. The operation is contained in a building.	None
Proportioning of raw materials	During the reclaiming of the limestone from the preblend heap the other raw materials are added from bins in careful controlled proportions to adjust the chemistry of the mixture to ensure that the finished clinker will have the right quality. The operation is contained in a building.	None
Grinding of raw materials	The mixture of raw materials is ground up finely in the raw mills to make raw meal. Hot air from the kiln is drawn through the mills to dry the raw materials. The raw milling is to help the raw materials mix properly and make the mixture easy to burn in the kiln. The operation is contained in a building.	None
Homogenising	The raw meal is stored in the homogenising silo. The homogenising silo mixes the raw meal, reducing any variations in the chemistry raw meal.	None
Burning	The raw meal is fed to the preheater tower. As the raw meal is heated in the preheater tower and kiln, carbon dioxide (CO2) is liberated from the limestone. In the hottest part of the kiln, the burning zone, chemical reactions take place, which convert the raw meal into “clinker”. Hot gases from the preheater system are quenched in the conditioning towers and then used to dry the raw materials in the raw mills. The gases from the raw mills are de-dusted in either an electrostatic precipitator of bag filter.	Point source emissions of atmospheric pollutants. Significant emissions of greenhouse gases.
Cooling	The hot clinker that is formed in pieces about the size of large marbles is passed through the cooler where air cools the clinker. The hot air from the cooler is recycled to burn the fuel in the kiln. This helps reduce the amount of	Point source emissions of atmospheric pollutants.

Operation	Description	Potential for Emissions
	fuel needed. Excess cooling air is cooled in an air-to-air heat exchanger then de-dusted in a bag filter.	
Clinker transfer to storage	Clinker is transferred from the clinker cooler to storage in bucket conveyors. The transfer system is enclosed and the transfer points are fitted with dust collection systems.	Minor fugitive dust emissions
Clinker storage	Clinker is tipped from the bucket conveyor to the storage areas, the Mole or the A Frame. The Mole is fitted with a de-dusting system. The A Frame has no de-dusting system.	Point source emissions of atmospheric pollutants. Minor fugitive dust emissions
Clinker transfer to milling/despatch	Clinker from Mole and A Frame are transferred to the cement mill feed hoppers or the clinker despatch silo by a conveyor system. The transfer system is enclosed and the transfer points are fitted with dust collection systems. The road despatch silo is fitted with a telescopic chute that had eliminated dust during loading.	Minor fugitive dust emissions
Clinker despatch	Clinker is stored in the despatch silo prior to loading and despatch. Clinker is despatched by road trucks or by rail bulk wagons. Trucks and rail wagons are fitted with covers to prevent fugitive emissions during transport. The clinker despatch silo and load out points have de-dusting systems.	Point source emissions of atmospheric pollutants. Minor fugitive dust emissions
Finished cement grinding	The cooled clinker together with a small amount of gypsum to control how fast the cement sets is ground in the cement mills to make the finished product cement. Other additives can be mixed with the clinker to make different types of cement. The cement mills and separators are fitted with dust collections systems.	Point source emissions of atmospheric pollutants.
Cement storage and despatch	The ground cement is stored in silos until required by our customers. Cement is despatched by road bulk trucks or by rail bulk wagons to other despatch depots.	Point source emissions of atmospheric

Operation	Description	Potential for Emissions
	The storage silos and load out points are fitted with de-dusting systems.	pollutants.

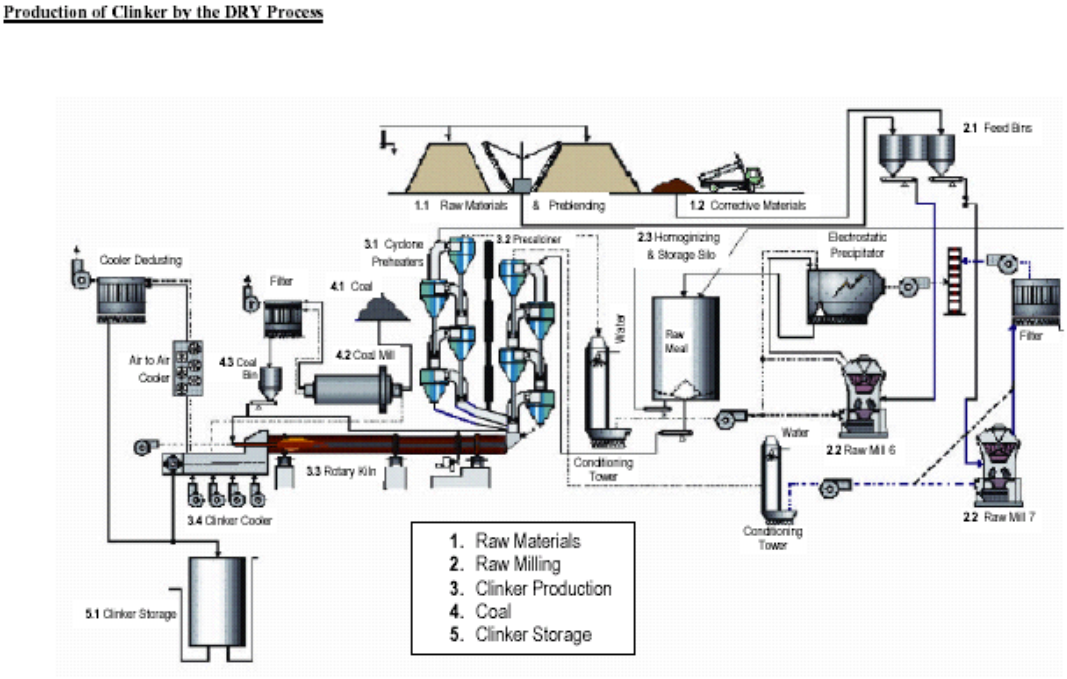

Figure 1 Clinker Manufacturing Process

Emission sources

The emission sources used for modelling in the MOD 9 application are summarised in Attachment 1.

5.2 EMISSION LIMITS & EMISSION MONITORING

Air Quality Monitoring

The following monitoring occurs at the Works:

- Fugitive dust emissions: nine dust deposition gauges have been installed around the boundary.
- Isokinetic stack monitoring program to measure emissions at point sources (stacks).
- Continuous emission monitoring (CEM) for particulate in the kiln stack.
- Ambient air quality monitoring using a HVAS to measure PM_{10}, TSP and heavy metals.
- Ambient air quality monitoring to measure $PM_{2.5}$.
- Meteorological monitoring.

All monitoring is undertaken in accordance with methods described in Australian Standards and the NSW Approved Methods by qualified persons trained in emission monitoring procedures.

In addition to the above, the site, also uses a real-time continuous dust monitoring equipment as a management tool incorporated in the Berrima Dust TARP for the site to identify nuisance dust that may be impacting residents of New Berrima.

Monitoring Schedule

The environmental dust monitoring program is conducted continually with the deposition gauges being changed monthly by an independent service provider (ALS).

Samples from the HVAS are collected every 6 days by an independent service provider (ALS). Sampling will continue until instructed otherwise by the EPA. Material collected on the filters is analysed for PM_{10}, TSP and a range of heavy metal contaminants in the TSP matter.

Note: 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.

Meteorological monitoring is conducted continually and record the following parameters; rainfall, temperature at 2m and 10m, wind speed and wind direction at 10m, solar radiation at 10m and barometric pressure.

Particulate, NOx, SOx, VOCs, CO, CO2, HCL and O2 in the kiln stack is being monitored continuously, with raw data sent to Central Control Room.

Data from the continuous emission monitoring system (CEMS) are recorded by Control Room and by equipment provider, Ecotech who also provides monthly reports.

The isokinetic stack sampling program is conducted according to the requirements of the DA and EPL – once a year for standard fuels and since the commencement of the NSF program, quarterly in the first year, twice a year in the second year. Further schedule will be agreed upon a review of monitoring results.

The continuous dust monitor, is connected directly to the control room. As per the Berrima Dust TARP, the operators monitor dust results and where required notify Managers/Supervisors of real-time alerts. This monitor is a management tool, not a compliance tool, to assist operations to identify potential dust events or conditions that could lead to nuisance dust complaints from residents within New Berrima.

In addition to the above on going monitoring, Condition 1.4 BA and 1.4 BB of Modification 15 Conditions of Consent requires air emission stack testing once commencement of the use of AKF5 as a fuel.

"1.4BA Notwithstanding condition 1.4B of this consent, the Applicant must undertake an air emissions stack test within three months of the commencement of use of AKF5 as a fuel in Kiln 6, or as otherwise agreed to by the Planning Secretary. The Applicant must:
a) carry out the air emissions stack test to the satisfaction of the Planning Secretary;
b) undertake the air emissions stack test at a high feed rate of 4.5 tonnes per hour of AKF5, or as otherwise approved by the EPA;
c) engage a suitably qualified and experienced person(s) to carry out the air emissions stack test;
d) notify the Planning Secretary and EPA prior to the commencement of the air emissions stack test; and
e) report the outcomes of the trial and stack test to the Planning Secretary and the EPA within one month of the conclusion of the test period, unless otherwise agreed by the Planning Secretary.

1.4BB The air emissions stack test report required by condition 1.4BA must include the following information:
a) the dates and times when the air emissions stack test was carried out;
b) the rates of feed of AKF5 during the air emissions stack test;
c) the results of the air emissions stack test, including identification of any non-compliance
with the conditions of this consent and the EPL; and
d) details of additional measures to be implemented to address any non-compliance

Monitoring / Discharge Locations

The point source monitoring locations at the Works are described in Table 5.

EPA ID No:	Type of Monitoring Point	Type of Discharge Point	Description of Location
2	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	No.6 Kiln Stack on map entitled Site Environmental Layout - Drawing 40405 Rev C, dated 14 March 2006, provided to the EPA on 15 March 2006.
4	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	No.6 Cement Mill Stack on map entitled Site Environmental Layout - Drawing 40405 Rev C, dated 14 March 2006, provided to the EPA on 15 March 2006.
5	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	No.6 Kiln Cooler Stack on map entitled Site Environmental Layout - Drawing 40405 Rev C, dated 14 March 2006, provided to the EPA on 15 March 2006.
7	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	No.5 Cement Mill Stack on map entitled Site Environmental Layout - Drawing 40405 Rev C, dated March 2006, provided to the EPA on 15 March 2006. This Mill has not been in service in several years so currently no emissions are being measures at that source.
10	Discharge to air Air emissions monitoring	Discharge to air Air emissions monitoring	No.7 Cement Mill Stack on map entitled Site Environmental Layout, Drawing 40405 Rev C, dated 14 March 2006, provided to the EPA on 15 March 2006.
11	Dust Monitoring	Fugitive	Dust deposition gauge labelled as 1 in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.
12	Dust Monitoring	Fugitive	Dust deposition gauge labelled as 2 in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.
13	Dust Monitoring	Fugitive	Dust deposition gauge labelled as 3 in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.

EPA ID No:	Type of Monitoring Point	Type of Discharge Point	Description of Location
14	Dust Monitoring	Fugitive	Dust deposition gauge labelled as 5 in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.
15	Dust Monitoring	Fugitive	Dust deposition gauge labelled as 7 in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.
16	Dust Monitoring	Fugitive	Dust deposition gauge labelled as 8 in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.
17	Dust Monitoring	Fugitive	Dust deposition gauge labelled as 9 in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.
18	Ambient air quality monitoring - high volume air sampler or equivalent	Fugitive	High volume air sampler or equivalent located on the south eastern side of the works and labelled HVAS in aerial photograph of Boral Cement Berrima premises attached to Boral letter dated 28 September 2012 and held on EPA file LIC06/331-27.

Current locations of the dust deposition gauges are shown on Figure 2.

The ambient air monitoring station is located to the west of the Works in a location approved by the EPA.

As required by the NSW *Protection of Environment Legislation Amendment Act 2011*, the monitoring data are provided on the Work's website. The summary report is updated each month with all new results received in the preceding month and uploaded by the 10th working day of the next month.

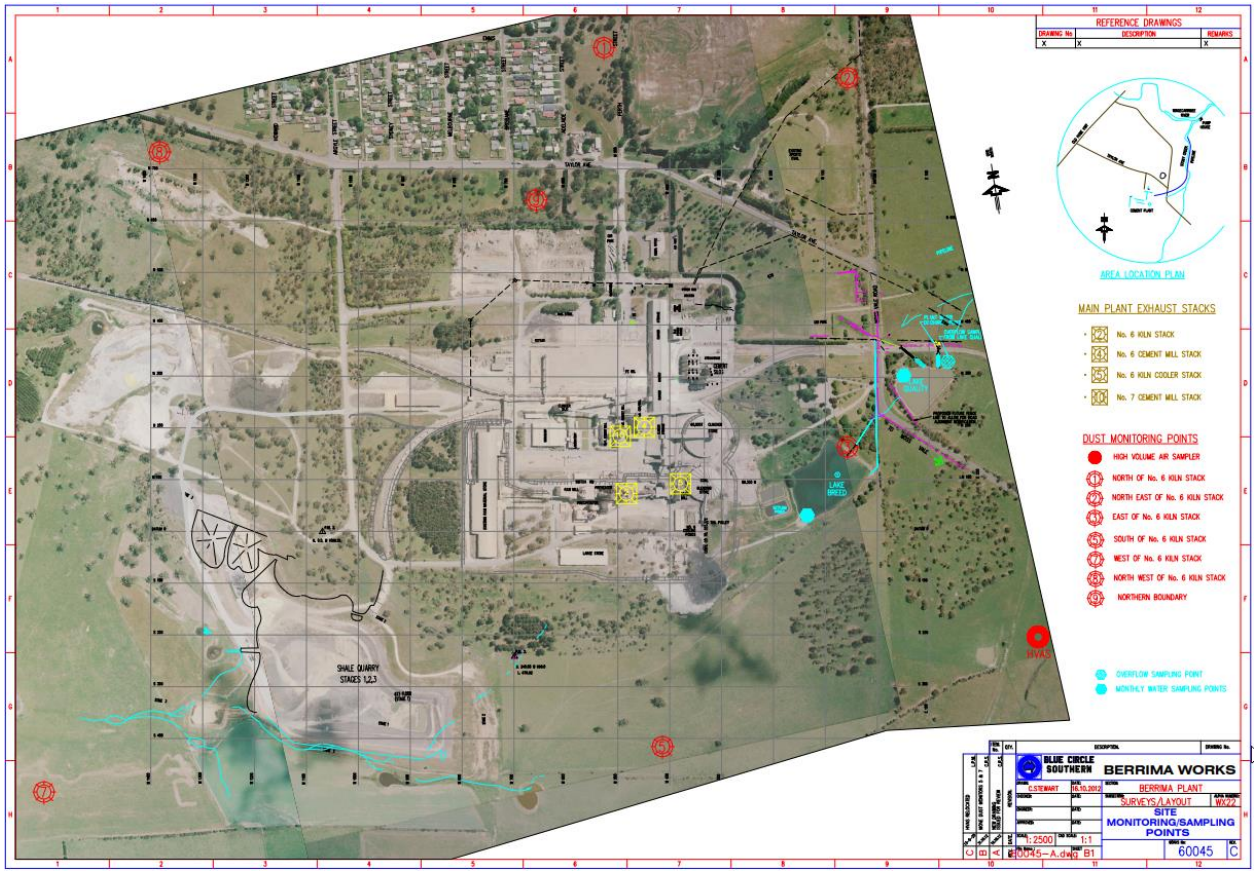

Figure 2 Monitoring and sampling points

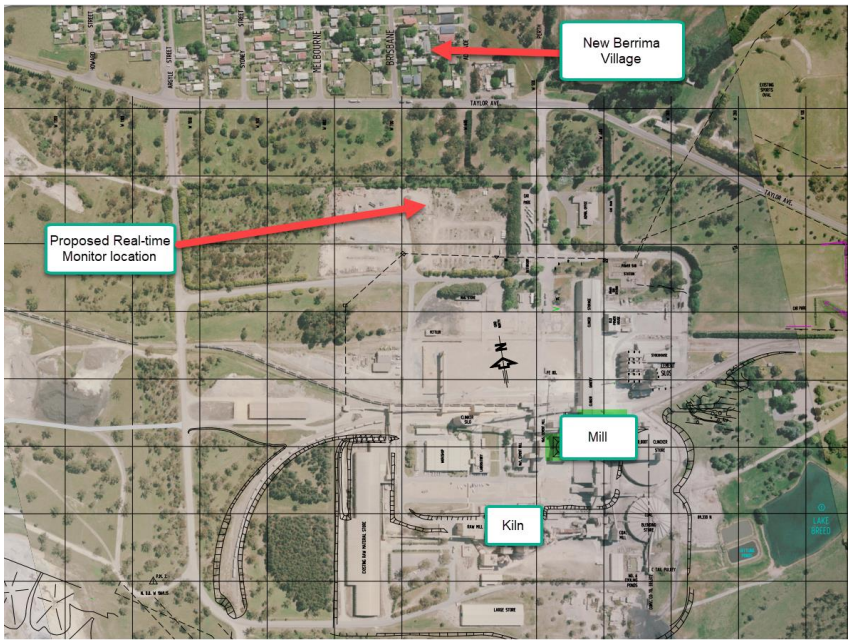

Figure 3 – Trial real-time dust monitor location

Stack Emission Limits

For each monitoring/discharge point the concentrations of pollutants must not exceed the limits in Table 6, as specified in the EPL.

Table 5 Emission limits

Emission Point	Pollutant/Parameter	Units of measure	100 percentile concentration limit	Averaging period
No. 6 Kiln stack	Mercury	mg/m^3	0.05	1 hour*
	Type 1 and Type 2	mg/m^3	0.5	1 hour*
	Solid particles	mg/m^3	50	24 hour
	Nitrogen Oxides	mg/m^3	1000 & 1250	24 hour & 1 hour respectively
	During production of off-white clinker (inc. 24hr transition period before and after)	mg/m^3	1250	24 hour
	During production of off-white clinker (inc. 24hr transition period before and after)	mg/m^3	1550	1 hour
	Cadmium+Thallium	mg/m^3	0.05	1 hour*
	Chlorine	mg/m^3	50	1 hour block
	Dioxin & Furans	ng/m^3	0.1	6-8 hours
	Hydrogen chloride	mg/m^3	10	1 hour*
	Hydrogen fluoride	mg/m^3	1	1 hour*
	Sulphur dioxide	mg/m^3	50	1 hour block
	Sulfuric acid mist and sulfur trioxide	mg/m^3	50	1 hour*
	Volatile organic compounds	mg/m^3	40	1 hour rolling
No. 6 Cement Mill stack	Solid particles	mg/m^3	100	As per test method
No. 6 Kiln Cooler stack	Solid particles	mg/m^3	100	As per test method
No. 5 Cement Mill stack	Solid particles	mg/m^3	100	As per test method

No. 7 Cement Mill stack	Solid particles	mg/m^3	20	As per test method

Notes:
Type 1 and Type 2 substances are defined as an aggregate of Sb, As, Be, Cd, Cr, Co, Pb, Mn, Hg, Ni, Se, Sn and V.
Reference conditions = Dry, 273K, 101.3kPa
* or the minimum sampling period specified in the relevant test method, whichever is greater.

Limits specified in the table above apply to the burning of all fuels, that is: coal, coke fines, natural gas, fuel oil, diesel and Non-Standard fuels.

Monitoring at Point 2 (Kiln No. 6) will be in accordance with the standard fuel monitoring requirements in the table at Condition E2.3 of the EPL until the commencement of the use of non-standard fuels.

The feed rate of HiCal 50 must not exceed 400kg per hour when the temperature is below 300^0C at the outlet of the preheater strings and must only be used when blended with coal to make a homogenous blend where the concentration of coal must not exceed 4. This is reflected in the latest EPL variation 18/12/19.

Table 6 Temperature limit

Point	Parameter	Units of Measure	Limit	Averaging Period
19	Temperature	^{0}C	850	Instantaneous

Monitoring Requirements

Emissions to air from Kiln 6 must be monitored at the frequency shown in Table 8 using the specified sampling method.

Table 7 Kiln 6 monitoring frequency

Pollutant/Parameter	**Units of measure**	**Frequency**	**Sampling Method**
Cadmium (Cd)	mg/m^3	Special Frequency 1	TM-12, 13 & 14
Carbon dioxide	%	Special Frequency 1 and Continuous	TM-24, CEM-3 & Procedure 1*
Carbon monoxide	%	Special Frequency 1 and Continuous	TM32, CEM-4 & Procedure 1*
Chlorine	mg/m^3	Special Frequency 1	TM-7
Chromium 6 (Cr 6+)	mg/m^3	Special Frequency 1	OM-4
Dioxins & Furans	ng/m^3	Special Frequency 1	TM-18
Dry gas density	kg/m^3	Special Frequency 1	TM-23
Hydrogen chloride	mg/m^3	Special Frequency 1 and Continuous	TM-8, PS-18 & Procedure 6*
Hydrogen fluoride	mg/m^3	Special Frequency 1	TM-9
Mercury (Hg)	mg/m^3	Special Frequency 1	TM-12, 13 & 14
Moisture content	%	Special Frequency 1	TM-22
Stack gas molecular weight	g/g-mole	Special Frequency 1	TM-23
Nitrogen Oxides (as NO_2)	mg/m^3	Special Frequency 1 and Continuous	TM-11, CEM-2 & Procedure 1*
Oxygen (O_2)	%	Special Frequency 1 and Continuous	TM-25, CEM-3 & Procedure 1*
Solid Particles	mg/m^3	Special Frequency 1 and Continuous	TM-15, PS-11 & Procedure 2^
Sulphur dioxide	mg/m^3	Special Frequency 1 and Continuous	TM-4, CEM-2 & Procedure 1*
Sulphuric acid mist and/or sulphur trioxide	mg/m^3	Special Frequency 1	TM-3
Temperature	^{0}C	Special Frequency 1 and Continuous	TM-2
Thallium	mg/m^3	Special Frequency 1	TM-12, 13 & 14

Pollutant/Parameter	Units of measure	Frequency	Sampling Method
Type 1 and Type 2	mg/m^3	Special Frequency 1	TM-12, 13 & 14
Velocity	m/s	Special Frequency 1 and Continuous	TM-2 & CEM-6
VOC	ppm	Special Frequency 1 and Continuous	TM-34 & CEM-8
Volumetric flow rate	m^3/s	Special Frequency 1 and Continuous	TM-2 & CEM-6

Notes:
Type 1 and Type 2 substances are defined as an aggregate of Sb, As, Be, Cd, Cr, Co, Pb, Mn, Hg, Ni, Se, Sn and V.
Volatile organic compounds may be replaced by Total organic carbon (TOC) or other equivalents as agreed by the EPA.
Special frequency 1 is defined as a round of air emission monitoring (for each of the pollutant/ parameter nominated for a discharge point) conducted:

- every 3 months for a minimum of 12 months following the successful completion of the PoP Trials;
- then every 6 months thereafter (following approval from the EPA)

* Procedure 1 Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determination, US EPA.
^ Procedure 2 Quality Assurance Requirements for Particulate Matter Continuous Emission Monitoring Systems at Stationary Sources, US EPA.

The Boral Cement Limited Work Instruction WI-09-01.47 – No. 6 Kiln document provides further detail on the continuous monitoring of temperature and fuel feed rate.

For the stack monitoring points, frequency and the specified sampling method is outlined in Table 9.

Table 8 Stack monitoring frequency

Emission Point	Pollutant/Parameter	Units of measure	Frequency	Sampling Method
No. 6 Cement Mill stack	Solid particles	mg/m^3	Yearly	TM-15
No. 6 Kiln Cooler stack	Solid particles	mg/m^3	Yearly	TM-15
No. 5 Cement Mill stack	Solid particles	mg/m^3	Yearly	TM-15
No. 7 Cement Mill stack	Solid particles	mg/m^3	Yearly	TM-15

Air Quality Management Controls

Design

As a general principle, Boral Cement adopts the best practicable technology when designing new and when upgrading existing plant and equipment.

In addition, Boral Cement applies general principles of emission control and management in the design process.

Dust nuisance, which can be a major problem in the cement industry, is managed according to **CMT-ENV-001** ***Berrima Dust Management Plan and the Berrima draft Dust TARP***.

Measures that are being implemented or considered for the reduction of emissions to air from the Works include:

For thermal processing equipment

- selection of dry precalciner process technology to reduce fuel use;
- use of high efficiency spray system quench technology in conditioning towers to minimise the formation of dioxins and furans;
- selection of NOx reduction burners/precalciner technology to reduce emissions of NOx;
- selection and installation of bag filters and other dust control devises to reduce solid particulate emissions; and
- selection of technology to reduce the emissions of other air contaminants.

For materials handling, crushing and preparation equipment

- installation of dust control equipment such as bag filters to reduce solid particulate emissions;
- design of conveyors to minimise drop-height at chutes and the number of transfer points to reduce dust emissions; and
- enclosing the equipment to contain emissions.

Stockpiles, roads

- use of barriers/wind breaks to minimise wind pick up;
- stockpile locations selected to minimise wind pick of dust; and
- use of water carts and dust control chemicals to prevent dust emissions.

Buffer Zone and Screening

The Works are located in a rural environment. There are significant distances between the plant and potentially affected residences except for New Berrima village directly north of the Works and in the path of prevailing southerlies.

Boral Cement has undertaken a vegetation programme on the site. This programme will be continued and assists in containing fugitive emissions on site and the impact of emissions on potentially affected residences.

6. BASELINE DATA

The results of ongoing ambient air quality monitoring will continue to be published on Boral's Environmental Reporting site at https://www.boral.com.au/our-commitment/environmental-reporting.

7. IMPLEMENTATION, COMPLIANCE & TRAINING REQUIREMENTS

Training

Through delivery of an appropriate training program, staff are provided information regarding a number of issues, including:

- The potential for emissions from the various operations and the relevant operating and licence limits;
- The control technologies used to ensure emissions are maintained below the operating and licence limits;
- Action to be taken when emissions exceed the operating and licence limits; and
- The notification procedures when licence limits are breached.

Further information can be found in the Boral Cement's Corporate SOP No. **CEM-ENV-005** ***Environmental Training***.

Incident reporting

Incidents and non-conformances are managed in accordance with the emergency plan and pollution incident response management plan (attached to the OEMP) and safety management system (the system is on the Boral Cement intranet).

See Section 6 Incident and Non-Conformance Response within the Berrima OEMP.

Pollution complaints

Boral Cement will record water pollution related complaints in accordance with Condition M6 of the EPL and the complaints and dispute resolution procedure in Section 5.3 of the OEMP.

Reporting

Boral Cement has various reporting and record keeping requirements defined in the DAs and the EPL. Condition 7.3 of the consolidated consent requires preparation of an annual environmental management report (AEMR) and Condition R1 of the EPL requires preparation of an annual return. Refer to sections 5.2.1 and 5.2.2 of the OEMP for details.

Record Keeping

All records associated with the Non-Standard Fuel Program are to be maintained for a minimum of four years and be available for inspection by EPA and/or DoP&E if requested. The process data recording system has three backup systems to minimise the risk of data loss.

- Record keeping is undertaken in accordance with Site Procedure **SP05-01-01 *Document Control – Electronic Data***.

- Boral Cement maintains a document storage system named WizBiz to facilitate effective management and document control over controlled documents.

- Boral Cement currently use SIMs* software to record HSE incidents on site, with any actions arising that are tracked until progressed and closed.

  *Note: As at October 2019 Boral Cement still uses SIMs, however will be transitioning to a new provider (SEQuence) over the 2020 calendar year.

All records are to be kept for the time periods required by statutory timeframes and/or Boral policies (Refer to Boral HSEQ Group Standard GRP-HSEQ-2-04-Document Control and Records Management.

8. LEGAL REFERENCES

The business has access to the applicable legislation relevant to the OEMP via the Boral Group Standards GRP-HSEQ-1-04 Legal and Other Requirements.

Attachment 1 – emission estimations used in MOD 9 application

Source: Air Quality Professionals 2015 *Boral Cement Berrima Works – Use of Solid Waste Derived Fuels in Kiln 6 – Air Quality Impact Assessment.* Report prepared for Boral Cement Limited.

Table 1.1 No.6 Kiln stack mass emission rates for dispersion modelling for NOx, TSP and NMHC (non-methane hydrocarbons) (24-hour average, continuous emissions)

	Units	NO	NO_2	TSP	NMHC
Specified emission concentration	24-hour average, mg/Nm^3 at 10% O_2	648	6.5	50	64.3
Peak-to-mean ratio to calculate equivalent near worst-case 1-hour average for dispersion model		1.20	1.39	1.37	1.37
Representative emission concentration, 1-hour basis	1-hour average, mg/Nm^3 at 10% O_2	778	8.9	68.5	88.1
Gas flow rate	Nm^3/s 10% O_2	200	200	200	200
Mass emission rate	g/s	156	1.78	13.7	17.6

Table 1.2 No. 6 Kiln stack emission rates for heavy metals and trace pollutant modelling (continuous emissions)

Contaminant	Assumed emission concentration for dispersion model, mg/Nm^3 (10% O_2)	Calculated emission rate (g/s) with gas flow rate of 200 Nm^3/s (10% O_2)
Sulfur dioxide	50	10
Sulfuric acid mist and/or sulfur trioxide	100	20
Arsenic	0.006	0.0012
Beryllium	0.006	0.0012
Cadmium	0.025	0.005
Cobalt	0.015	0.003
Chromium	0.04	0.008
Copper	0.13	0.026
Mercury	0.05	0.01
Manganese	0.71	0.142
Nickel	0.078	0.0156
Lead	0.06	0.012
Antimony	0.15	0.03
Selenium	0.029	0.0058
Thallium	0.025	0.005
Vanadium	0.024	0.0048
Tin	0.06	0.012
Hexavalent chromium	0.025	0.005
Chlorine	200	40
Hydrogen chloride	10	2
Hydrogen fluoride	1	0.2
PAHs as BaP-TEQ	0.000068 (68 ng/Nm^3)	1.36×10^{-5}
Dioxins and Furans as I-TEQ	0.0000001 (0.1 ng/Nm^3)	2×10^{-8}

Table 1.3 Cooler stack and cement mills TSP emission rates for pollutant modelling (continuous emissions)

Source	Assumed TSP emission concentration for dispersion model, mg/Nm³ (see text for explanation of basis of assumptions)	Average flow rate from annual campaign testing, Nm³/min	Calculated TSP emission rate (g/s)
Kiln 6 Cooler	39	2562	1.7
Cement Mill 6	42	1314	0.92
Cement Mill 7	20	815	0.27

Table 1.4 No.6 Kiln and cement mills PM_{10} and $PM_{2.5}$ emission rates for pollutant modelling (continuous emissions)

Source	TSP emission rate, g/s	Percent of TSP that is PM_{10}	Percent of TSP that is $PM_{2.5}$	PM_{10} emission rate, g/s	$PM_{2.5}$ emission rate, g/s
Kiln 6 Stack	13.7	70%	33%	9.6 (35 kg/hr)	4.5 (16 kg/hr)
Kiln 6 Cooler	1.7	76%	40%	1.3	0.68
Cement Mill 6	0.92	100%	40%	0.92	0.37
Cement Mill 7	0.27	100%	40%	0.27	0.11

Modelled dust sources and their emissions were:

- Vehicle generated dust
    - TSP – 4.23 kg/vehicle kilometre travelled
    - PM_{10} – 1.25 kg/vehicle kilometre travelled
- Movement and dumping of materials
    - Transfer points – 0.355 kg/hr TSP, 0.167 kg/hr PM_{10}
    - Excavators, shovels, front end loaders – 6.11 kg/hr TSP, 2.62 kg/hr PM_{10}
- Crushing
    - TSP – 0.11 kg/hr
    - PM_{10} – 0.011 kg/hr

Attachment 2 – Site Air Emission Register

Site	Berrima Works	***Last Updated***	May 2023

Air Emission Source	***Pollutant of Concern***	***What are the Control Measures in place?***	***Status***
Limestone unloading	Fugitive dust (nuisance)	Wetting of material during loading at Marulan, partial enclosure of unloading operation, stopping of unloading operations during high winds	Review opportunity to de-dust unloading hopper.
Limestone transfer	Fugitive dust (nuisance)	System is enclosed, dust collection on transfer points.	On-going maintenance of dust collection systems to maintain low emissions.
Blue Shale Quarrying	Fugitive dust (nuisance)	Low speed operation with low dust emissions. Stopping operations during adverse weather conditions (high winds).	Ensure contractor stops operations during adverse weather.
Additive Raw Material Delivery, Storage and Transfer	Fugitive dust (nuisance)	Watering of unpaved road, use of dust control chemicals, sweeping of paved areas, stopping operations during adverse weather conditions (high winds).	Spray system to reduce fugitive dust emission being designed for Shale pad, reviewing use of dust control chemicals on uncovered stockpiles.

Air Emission Source	*Pollutant of Concern*	*What are the Control Measures in place?*	*Status*
Additive Raw Material Crushing	Dust (nuisance)	Dust collection system installed on crusher. Conveyor system enclosed and transfer points fitted with dust collection systems.	Review use of water sprays to reduce fugitive dust emissions from crusher feed hopper.
Preblending	Dust (nuisance)	Operation enclosed in building	Ensure doors are kept closed to prevent dust emission to external.
Reclaiming	Dust (nuisance)	Operation enclosed in building	Ensure doors are kept closed to prevent dust emission to external.
Proportioning of Raw Materials	Dust (nuisance)	Operation enclosed in building. Conveyor system enclosed and transfer points fitted with dust collection systems.	Ensure doors are kept closed to prevent dust emission to external.
Grinding of Raw Materials	Dust (nuisance)	Operation enclosed in building	Ensure doors are kept closed to prevent dust emission to external.
Homogenising	Dust (nuisance)	Dry homogenising silo is fitted with dust collection system.	On-going maintenance of dust collection systems to maintain low emissions.
Burning	Solid particulates, NOx, SOx, CO, acid gases (HCl, HF, H_2SO_4) VOC's, heavy metals, dioxin and furans, PAH's, PCB's, greenhouse gases	Electrostatic precipitator and bag filter for solid particulate, heavy metals, conditioning towers for dioxins and furans, low NOx technology for NOx, precalciner technology for PAH's, PCB, GHG emissions, acid gases, VOC's.	On-going maintenance of dust collection systems to maintain low emissions.

Air Emission Source	*Pollutant of Concern*	*What are the Control Measures in place?*	*Status*
Cooling	Dust (nuisance)	Bag filter	On-going maintenance of dust collection systems to maintain low emissions.
Clinker Transfer and Storage	Dust (nuisance)	Bag filters	Ensure doors are kept closed to prevent dust emission to external.
Clinker Transfer and Despatch	Dust (nuisance)	Conveyor system enclosed and transfer points fitted with dust collection systems. Rail load out point fitted with dust collector Road load out point fitted with a telescopic chute.	Road load out point had no dust collection and used to be a major fugitive dust emission source. It has now been equipped with a telescopic chute and changed from a major fugitive dust source to negligible.
Finished Cement Grinding	Dust (nuisance)	Bag filters	On-going maintenance of dust collection systems to maintain low emissions.
Cement Storage and Despatch	Dust (nuisance)	Bag filters	On-going maintenance of dust collection systems to maintain low emissions.
Raw Coal Delivery and Storage	Dust (nuisance)	Coal is wet, system is enclosed	Dust emissions negligible.
SWDF storage, handling and feeding system	Odour	Keep storage area enclosed	
SWDF storage, handling and feeding system	Dust (nuisance)	All transfers, handling and storage undertaken within enclosed shed	Dust emissions are negligible

Air Emission Source	*Pollutant of Concern*	*What are the Control Measures in place?*	*Status*
AKF5 Storage, handling and feeding system	Dust (nuisance)	Stabilised road, roofed storage, water cart used to dampen traffic areas as required.	Minimal dust, managed as part of day to day fugitive dust control.
HiCal Storage and Handling	Dust (Nuisance)	Tarped storage within shale pit.	Refer to DPE and EPA approved 190524 HiCal 50 Storage and Handling Procedure V4.

Attachment 3 – NSW Department of Planning and Environment Proof of Performance Ongoing Use

NSW GOVERNMENT | Planning & Environment

Contact Name: Sally Munk
Number: 02 9274 6431
Email: sally.munk@planning.nsw.gov.au

Mr Greg Johnson
Environmental Sustainability Manager
Boral Cement
Level 3, 40 Mount Street
NORTH SYDNEY NSW 2060

Dear Mr Johnson

Boral Cement, Berrima - Proof of Performance Trial Report for the use of SWDF (DA 401-11-2002-i)

I refer to your letter dated 28 February 2019 seeking approval of the final consolidated Proof of Performance Trial (POPT) Report for the use of Solid Waste Derived Fuels (SWDF) in Kiln 6 at the Boral Cement Works at Berrima in accordance with Condition 3.27 of the consent (DA 201-11-2002-1, as modified).

The Department has reviewed the POPT Report, supporting continuous emissions monitoring system (CEMS) data and the additional information provided on 1 April 2019 in consultation with the Environment Protection Authority (EPA). A copy of the EPA's comments is attached.

The 'Proof of Performance Trial Consolidated Six Month Report for Solid Waste Derived Fuels', Version 1, prepared by Boral Cement Limited dated 28 February 2019, is approved and demonstrates the suitability of the ongoing use of SWDF in Kiln 6, 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 USEPA Performance Specification 18.

As previously stated in the Department's letter dated 4 April 2019, Boral must ensure the community is kept up to date on activities at the Berrima Cement site, in particular, the use SWDF in Kiln 6. In accordance with Condition 5.4 of the consent, the Community Liaison Group must have access to all monitoring data, reporting and tracking and audit reports required by the consent, including the additional monitoring data and reporting required above.

Boral is also reminded of its obligations under Conditions 4.6 of the consent for an independent audit of the use of SWDF at the development within 12 months of the receipt of the first load of SWDF. The feed rate of SWDF may be increased to 50% as a percentage of total fuel subject to the approval of the monitoring reports required in (c) above and the independent audit required by Condition 4.6, subject to the approval of the Secretary.

Pursuant to Condition 6.3A of the consent, Boral is requested to confirm whether the Operational Environmental Management Plan requires updating following completion of the POPTs. Any amendments required must be submitted to the Secretary for review and approval.

Should you have any queries in relation to this matter, please contact Sally Munk, Principal Planning Officer, on the above contact details.

Yours sincerely

C. Ritchie 23/4/19

Chris Ritchie
Director, Industry Assessments
as delegate of the Planning Secretary

cc. William Dove, Environment Protection Authority

Department of Planning and Environment
320 Pitt Street Sydney 2000 | GPO Box 39 Sydney 2001 | planning.nsw.gov.au

Attachment 4 – Berrima Dust Trigger Action Response Plan (TARP) – note subject to change

TARP - Trigger Action Response Plan - Dust

TARP Site	Berrima Cement Works	Date	30 September 2019
Document ID	Dust TARP	Version	1
Description	Dust TARP Actions Matrix for Berrima Cement. This TARP documents the actions required to maintain operations to limit dust emissions and stipulates the responsible person for different scenarios. Note: * Wind speed & PM10 Trigger limits for the trial real time dust monitor are subject to change as the business monitors the effectiveness of the unit as a dust management tool.		

			Normal State Trial real time monitor – 15min average PM10 <30ug/m3* Wind direction not from S/SW Forecast windspeed calm* No visual emissions	Level 1 Triggers – Potential Risk Trial real time monitor - 2 consecutive 15min Av PM10 >30ug/m3 but < 50ug/m3* Forecast or actual wind direction from S/SW Forecast or windspeed calm-10km/hr* Unusual fugitive or point source emissions	Level 2 Triggers – Moderate Risk Trial real time monitor – 2 consecutive 15 min av PM10 >50ug/m3 but <70ug/m3* Kiln 6 real-time stack emission >50ug/m3 15min Wind from S/SW Forecast or actual Windspeed 10km/h – 20km/hr* Visual fugitive and point emissions >10m <50m from source	Level 3 Triggers – High Risk Trial real time monitor – 2 Consecutive 15min av PM10 >70ug/m3* Kiln 6 real-time stack emission >50ug/m3 24hr average Wind from S/SW Actual Windspeed >20km/hr* Inversion/Fog/light rain Visual fugitive or point emissions travelling > 50m from source or staying suspended in air
General Conditions			• Reasonably expected conditions in day to day operations. • No cause for action, routine dust management to be continued.	• Change from normal indicating potential risk • Not considered serious in nature, act as an alert and requires monitoring • Minor visual fugitive emissions <10m from source or unusual point source emissions	• Moderate risk of offsite dust impact occurring • Remedial action requires planning and execution	• High risk of offsite dust related impacts occurring with subsequent validated community complaints • A situation has occurred that poses an immediate risk and remedial action to be undertaken which may include ceasing certain activities or operations
Response Actions/ Controls	Operations/Production/Technical Manager		Actions Normal State: • Daily monitoring of weather via BOM. • Ensure real-time monitors in working order	Actions for any Level 1 Triggers • Daily monitoring of weather via BOM. • Alert Frontline Supervisors of potential and actual wind towards village and dust risks • Monitor weather and potential activities scheduled • Ensure real-time monitors are in working order & Investigate potential risk alerts	Actions for any Level 2 Triggers • Daily and continual monitoring of weather via BOM. • Alert Frontline Supervisors of actual wind towards village and dust risks • Discuss planned potential dust generating activities, consider & implement controls, consider delaying or reducing raw material handling • Ensure real-time monitors are in working order, investigate real-time alert sources, initiate actions to control, log alerts within SIMs • Monitor any Kiln stack emissions over 50ug/m3 to ensure daily average below 50ug/m3	Actions for any Level 3 Triggers • Daily and continual monitoring of weather via BOM. • Alert Frontline Supervisors of actual wind towards village and dust risks • Identify source(s) of dust, where reasonably practicable cease dust generating process or activity pending further controls • Monitor weather and potential activities scheduled • Ensure real-time monitors are in working order, Investigate real-time alert sources, initiate actions to control, log alerts within SIMs • In consultation with Env Mgr notify the EPA consider enacting the PIRMP • Respond promptly to any community complaint
	Name/s	Contact No.				
	Frontline Supervisors		Actions Normal State: • Monitor weather conditions throughout day • Ensure preventative controls for fugitive activities are being initiated • Continue preventative and predictive maintenance of dust control equipment • Ensure SWMS/Take 5's assess the risk and control of fugitive dust	Actions for any Level 1 Triggers • Alert employees and contractors of potential and actual wind towards village and dust risks • Ensure preventative controls for fugitive activities are being initiated • Investigate potential risk real-time alerts • Address any unusual fugitive or point source emissions and log within SIMs	Actions for any Level 2 Triggers • Alert employees and contractors of actual wind towards village and dust risks • Ensure preventative controls for fugitive activities are being initiated • Investigate real-time alert sources, initiate actions to control, log within SIMs • Address any unusual fugitive or point source emissions and log within SIMs	Actions for any Level 3 Triggers • Consider directing employees and contractors to cease dust generating activities • Ensure preventative controls for fugitive activities are being initiated • Investigate real-time alert sources, initiate actions to control, log within SIMs • Address any unusual fugitive or point source emissions and log within SIMs
	Name/s	Contact No.				
	Control Room/ Employees		Actions Normal State: • Implement and adhere to dust mitigation strategies eg water carts, wheel wash,	Actions for any Level 1 Triggers • Notify Manager/Supervisor of real-time alert	Actions for any Level 2 Triggers • Notify Manager/Supervisor of real-time alert	Actions for any Level 3 Triggers • Notify Manager/Supervisor of real-time alerts
	Name/s	Contact No.				
			vehicle speed, product handling, door closed • SWMS/Take 5's assess the risk and control of fugitive dust	• Notify Manager/Supervisor of any unusual fugitive or point source dust emissions • Implement and adhere to dust mitigation strategies eg water carts, wheel wash, vehicle speed, product handling, doors closed • SWMS/Take 5's assess the risk and control of fugitive dust	• Notify Manager/Supervisor of any unusual fugitive or point source dust emissions, cease activities if excessively dusty • Implement and adhere to dust mitigation strategies e.g. water carts, wheel wash, vehicle speed, product handling, doors closed • SWMS/Take 5's assess the heightened risk and control of fugitive dust	• Notify Manager/Supervisor of any unusual fugitive or point source dust emissions, cease activities that are excessively dusty or directed to cease. • Implement and adhere to dust mitigation strategies eg water carts, wheel wash, vehicle speed, product handling, doors closed • SWMS/Take 5's assess the heightened risk and control of fugitive dust
	Environmental Manager		Actions Normal State:	for Level 1 Triggers ▪ Review unusual fugitive and point source triggers	for any Level 2 Triggers ▪ Post event undertake review of PIRMP ▪ Undertake investigation of trigger	for any Level 3 Triggers ▪ Notify the EPA and consider enacting the PIRMP ▪ Post event undertake review of PIRMP ▪ Undertake investigation of trigger
	Name/s	Contact No.				