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31 October 2016

Mr Gerard Hocking
Senior Marine Adviser
Environment Protection Authority
Regulation and Compliance Division
GPO Box 2607
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Dear Gerard

**October 2016 quarterly update
Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Program (EIP):
01 January 2016 – 30 October 2017**

I refer to Adelaide Brighton Cement's Environmental Improvement Program. As required, I provide the October 2016 quarterly update report (attached).

Yours sincerely

Tim Radimissis
Compliance Manager SA Operations

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Program (EIP) 1 January 2016 – 30 October 2017

October 2016 quarterly update

Compliance Action	Description	Actions and outcomes
1	<p><i>By 30 September 2016, ABC will complete a 'Stack Emission Improvement Study' of all its 4A and 4B Stack emission control equipment - to be undertaken by FLS (global cement industry technical experts). The study will include a desk top study, industry benchmarking assessment of the best available emissions reduction techniques and a review of the current process both during operational and shutdown phases (planned shutdown March 2016).</i></p> <p><i>A final report which will table options to reduce stack emissions will be submitted to the EPA for assessment. The options contained in the report will include the following:</i></p> <p><i>a) The expected reduction in particulate emissions of each option;</i></p> <p><i>b) The annualised total mass emissions and short term variability projected using the different options; and</i></p> <p><i>c) The projected reduction in emissions under both stable and unstable operations for each option</i></p>	<p>On 30 September 2016, ABC completed a 'Stack Emission Improvement Study' of its 4A and 4B stack emission control equipment which was undertaken by FLSmidth (global cement industry technical experts).</p> <p>The study included a desk top study, industry benchmarking assessment of the best available emissions reduction techniques and a review of the current process both during operational and shutdown phases.</p> <p>A final report with options to reduce stack emissions was submitted to the EPA for assessment.</p> <p>The final report includes:</p> <ul style="list-style-type: none"> • The expected reduction in particulate emissions of each option; • The annualised total mass emissions and short term variability projected using the different options; and • The projected site reduction in emissions under both stable and unstable operations for each option
4	<p><i>By 3 March 2016, ABC will have completed a trial of new filter bag technology in the Cooler Bag filtering process. The intent is to optimise bag life and Cooler Bag performance associated with the 4A Stack gas stream by a noticeable percentage. An analysis report detailing the effectiveness of the trial actions (bag life performance) will be provided to the EPA for assessment.</i></p>	<p>During the March 2016 shutdown, a new type of filter bag was installed as a trial in the Cooler Bag house of Kiln 4 (280 bags were trialled in one of the six cells/chambers). The new bag type was chosen based on the findings of a 12 month investigation. The new bag features a heavier weave and a reinforced cuff that is predicted to greatly increase the lifespan of the bags and therefore the performance of the bag filter in reducing emissions.</p> <p>Assessment of the performance of the new bags (undertaken during recent unscheduled maintenance shutdowns) have indicated significantly improved performance as predicted. The wear rate has been far less than that of the previous new bags used. As a result, a further 280 of the new bag type were installed in another chamber during the quarter and the remaining chambers will be fitted during available shutdown opportunities.</p>

Adelaide Brighton Cement Ltd (ABC) Environmental Improvement Program (EIP) 1 January 2016 – 30 October 2017

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6	<i>By 30 April 2016, Adelaide Brighton Cement Ltd will have optimised the performance of its Electrostatic Precipitators(ESP's). This action will reduce stack particulate emissions across variable plant operating conditions</i>	Further to the actions undertaken and reported for quarter one in 2016, improvements made to the 4A Bypass gas conditioning system have had a marked effect on improving the performance of the Bypass Electrostatic Precipitator which forms part of the 4A stack stream. Subsequently, emission peaks for the 4A stream have sustained an average baseline emission reduction which has been maintained
8 and 12	<p><i>By 30 June 2016, ABC will have a dedicated water truck/cart and will have commenced applying dust suppressant/sealing agents (typically green) in real-time, to all external raw material stockpiles and unsealed access areas whenever they are being worked or used. This action item will assist in reducing fugitive particulate emissions from these sources.</i></p> <p><i>Commencing 1 January 2016 Adelaide Brighton Cement Ltd will apply, using a dedicated water truck/cart, a road stabilisation agent to all unsealed surfaces around the site, as required, to ensure fugitive dust is minimised from these areas (this may be more frequently undertaken in warm and/or windy conditions).</i></p>	Since January 2016 a dedicated water cart has been used to apply dust suppressant and unsealed road sealing agents (typically green) in real-time, to all external raw material stockpiles and unsealed access areas whenever they are being worked or used.
9	<i>Commencing on 1 January 2016, ABC will have a preventative maintenance and cladding replacement program for the main Clinker Storage Gantry. Actions outlined in the maintenance and replacement program will be carried out continuously throughout this EIP. This action item will assist in reducing fugitive particulate emissions from this source.</i>	<p>A quarterly monthly preventative maintenance program, which includes a comprehensive internal and external inspection and subsequent action plan, has been implemented. The Gantry is under negative pressure due to a large dust collector and any sealing of openings helps to reduce fugitive dust escaping the building.</p> <p>In quarter one of 2016, the sealing of the eaves and cladding on western side (Victoria Road) of the Gantry using a crane was completed after an inspection.</p> <p>In the second quarter of 2016 an inspection identified an opening on the north west side on the Gantry, directly adjacent the eaves and was subsequently sealed.</p> <p>In the third quarter of 2016 an inspection identified an opening in the eve on the east side of Gantry. The job has been scheduled for repair.</p>

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Compliance Action	Description	Actions and outcomes
<p align="center">13</p>	<p><i>From 31 January 2016, and to be continued throughout this EIP, ABC, will undertake a Noise Impact Mapping/ Modelling Program. The modelling program will be undertaken by acoustic consultants employed by ABC, who will manage and complete the modelling program in addition to the current noise monitoring program that has been in progress for the last four years. The Program will continue to inform noise abatement actions to be undertaken on site.</i></p> <p><i>Regular reports from monitoring and modelling undertaken will be provided to the EPA for assessment within one calendar month of any such report being received by ABC from the acoustic consultants. Noise abatement actions to be implemented will be agreed by the EPA, be reasonable and practical and ensure the best possible outcomes for the adjacent community.</i></p>	<p>A comprehensive noise mapping and model was developed and submitted to EPA (ref: 50B-15-0069-TRP-472941-3). The model was based on sound pressure measurements and surveys of all primary noise emitting sources (mechanical plant and equipment) on-site. Noise prediction was carried out using the validated SoundPlan acoustic modelling software and assessed against the EPA 2007 Noise Policy.</p> <p>The model is based on both worst case scenario meteorological conditions (5 m/s wind in the direction of the adjacent community) and under neutral (no wind) conditions to ensure maximum community impacts are captured. The model was calibrated/validated against actual readings taken late at night to ensure minimal traffic impacts on the measurements at a series of noise sensitive residential locations.</p> <p>The model can be used both as a predictive tool and will be updated as noise abatement projects are implemented.</p> <p>During quarter three of 2016, a compressive night time noise study was conducted and completed by Vipac Engineering (ref: 50B-16-0068-DPR-799861-3) to identify the next phase of noise abatement projects for the site. The report was submitted to the EPA and subsequently approved.</p> <p>Key findings and recommendations include:</p> <ul style="list-style-type: none"> • Noise abatement of two dust collector fans on level 3 on the west side of the plant, adjacent Victoria Road • Refurbishment and harmonisation of the sites three largest plant fans is scheduled for the March 2017 major shutdown. <p>A summary of all noise report findings was sent to Community Liaison Group members prior to the 26 September 2016 quarterly meeting and discussed at the meeting.</p>
<p align="center">15</p>	<p><i>By 31 October 2017, ABC will replace all required personal access (PA) doors site wide. PA doors are to be of a self-closing and self-sealing design. This action will assist in reducing fugitive particulate emissions from buildings and reduce noise in dust sensitive areas containing fire alarm sensors.</i></p>	<p>A comprehensive inspection, maintenance and replacement program is in place. In quarter 1 of 2016, 23 new doors were replaced. The new doors are self closing and sealing, contain a rubber flange at bottom for high wear areas as required (prevents damage when opening and closing), prevent alarms going off from load centres (dust ingress) and fugitive dust escaping buildings. Additionally, all major site doors are locked and controlled under a Shift Supervisor's master key.</p> <p>Existing doors are regularly inspected and maintained by site personnel.</p>

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<p align="center">16</p>	<p><i>By 30 November 2016, ABC will ensure a vibration study/impact assessment is undertaken in the adjacent community to determine affected areas and any associated impacts. The outcome of the study will be an action plan to determine vibration impacts associated with plant operations. The action plan will be submitted to the EPA for assessment by 31 December 2016.</i></p>	<p>Leading independent external consultant firm, Resonate, has been engaged to initiate and manage this program. During the March 2016 plant shutdown and post shutdown, three ground vibration monitors were placed along the ABC boundary on Victoria Road and in the plant to determine activities/vibration with plant off and on.</p> <p>The report identified “vibrations from traffic on nearby roads and other activities are generally higher than the vibrations likely attributable to ABC. Vibration levels of these transient events, such as traffic etc. are likely to have a higher impact when they occur than the baseline vibration levels which are attributable to ABC plant.”. However further residential measurements were recommended. The report was submitted to the EPA for consideration (ref: A15623RP3).</p> <p>The second phase of the project included an independent community survey of the adjacent neighbourhood and technical assessment to identify the subsequent residential properties to be tested for ground vibrations. The Community Liaison Group resident members, in conjunction with ABC and the consultants, developed the scope of the survey questionnaires and subsequent information that was provided to local residents. The report was submitted to the EPA and the Community Liaison Group (ref: A15623RP4) for assessment.</p> <p>Six cross sectional residential properties adjacent the main plant are currently being monitored for vibrations levels.</p>
<p align="center">17</p>	<p><i>From 31 January 2016 and continuing through to 31 October 2017 ABC, will implement and undertake a site greening/earth-care program. Plantings of native trees and shrubs will be undertaken in the following areas:</i></p> <ul style="list-style-type: none"> • <i>Southern area of the site adjacent to Cement Mill 1 Gantry and on the river side of railway line;</i> • <i>Schroder Park extension area (most southern end of plant);</i> • <i>Victoria Road, adjacent to the Limestone Reclaimer Shed; and</i> • <i>Along the western boundary of the main limestone stockpile at north end of site.</i> 	<p>In quarter three of 2016, greening/earth-care work was implemented along the western boundary of the main limestone stockpile area, along Elder road.</p> <p>The works have included:</p> <ul style="list-style-type: none"> • Planting of approximately 50 mature trees and 100 large scrubs; • The installation of approximately 150 metres of green shade cloth on the fencing – wind break/fugitive dust suppressant; and • Repair of fencing along Elder Road.