

## **Environment Agency**

### **Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2010 (as amended)**

#### **decision document recording our decision-making process following review of a permit**

The Permit number is: EPR/BL1029IP  
The Operator is: Cemex UK Cement limited  
The Installation is: South Ferriby Cement Plant  
This Variation Notice number is: EPR/BL1029IP/007

Consultation commenced on: 3 March 2017  
Consultation ends/ended on: 31 March 2017

#### **What this document is about**

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication by the European Commission of updated decisions on BAT conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the production of Cement, Lime and Magnesium Oxide industry sector published on 9th April 2013 in the Official Journal of the European Union . Where appropriate, we also considered other relevant BAT Conclusions published prior to this date but not previously included in a permit review for the Installation. In this decision document, we set out the reasoning for the consolidated variation notice.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions (BATc) for production of Cement, Lime and Magnesium oxide as detailed in document reference 2013/163/EU. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. Where this has not already been done, it also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions and any changes to the operation of the installation.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

## **How this document is structured**

1. Our proposed decision
2. How we reached our decision
3. The legal framework
4. Annex 1– Review of operating techniques within the Installation against BAT Conclusions.
5. Annex 2 – Review and assessment of derogation request(s) made by the operator in relation to BAT Conclusions which include an Associated Emission Level (AEL) value.
6. Annex 3 – Improvement Conditions
7. Annex 4 – Consultation responses
8. Annex 5 – Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

# 1 Our decision

The Variation Notice to the Operator will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice that updates the whole permit..

As part of our proposed decision we have decided to grant the Operator's request for a derogation from the requirements of BAT Conclusion 21 as identified in the production of cement, lime and magnesium oxide BAT Conclusions document. The way we assessed the Operator's requests for derogation and how we subsequently arrived at our conclusion is recorded in Annex 2 to this document.

We consider that, in reaching our decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our Permit template provides two or more options.

## 2 How we reached our decision

### 2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 1 May 2014 requiring the Operator to provide information to demonstrate where the operation of their installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Notice required that where the revised standards are not currently met, the operator should provide information that

- Describes the techniques that will be implemented before 9 April 2017, which will then ensure that operations meet the revised standard, or
- justifies why standards will not be met by 9 April 2017, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 60 Notice required that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 60 Notice response from the Operator was received on 27 May 2015.

We considered that the response did not contain sufficient information for us to commence determination of the permit review. We therefore issued a further information request to the Operator. Suitable further information was provided by the Operator on 17 August 2015.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that determination.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

## 2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous experience in the regulation of the installation we have no reason to consider that the operator will not be able to comply with the techniques and standards described in the BAT Conclusions.

## 2.3 Requests for Further Information during determination

Although we were able to consider the Regulation 60 Notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment.

In addition to the responses to our further information requests, we received additional information during the determination from Cemex UK Limited regarding the derogation request on the 14 July 2016, 8 December 2016 and 23 December 2016. We made a copy of this information available to the public in the same way as the responses to our information requests.

# 3 The legal framework

The Consolidated Variation Notice will be issued, under Regulations 18 and 20 of the EPR The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

## **Annex 1: decision checklist regarding relevant BAT Conclusions**

BAT Conclusions for the production of cement, lime and magnesium oxide, were published by the European Commission on 9 April 2013. There are 69 BAT Conclusions; 1 and 2 are generally applicable, 3 – 29 apply to the cement industry, 30 – 54 apply to the lime industry, and 55 – 69 apply to the production of magnesium oxide. This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the Consolidated Variation Notice

The overall status of compliance with the BAT conclusion is indicated in the table as

- NA Not Applicable
- CC Currently Compliant – We have reviewed the information available to us and considered that it provides sufficient evidence show the operator is currently complaint with the BAT conclusion and have no reason this will change before the implementation date.
- FC Compliant in the future (within 4 years of publication of BAT conclusions) - We have reviewed the information available to us and considered that it provides sufficient evidence show the operator has suitable plans in place to ensure they will be complaint with the BAT conclusion by the implementation date.
- NC Not Compliant

BAT C No	Summary of BAT Conclusion requirement for production of cement, Lime and magnesium oxide	Status NA/ C / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
1	In order to improve the overall environmental performance of the plants/installations producing cement, lime and magnesium oxide, production BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the listed features.	<b>CC</b>	An Accredited EMS system is in place.
2	In order to reduce/minimise noise emissions during the manufacturing processes for cement, lime and magnesium oxide, BAT is to use a combination of the listed techniques.	<b>CC</b>	The operations at Cemex UK Limited use a combination of the noise reduction and management techniques described above along with ongoing noise and vibration management plan to minimise noise. Complaints are investigated by the operator and reports supplied to the EA.
3	In order to reduce all kiln emissions and use energy efficiently, BAT is to achieve a smooth and stable kiln process, operating close to the process parameter set points by using the listed techniques.	<b>CC</b>	The kilns are operated using a modern computer based control system updated in 2014 following the 2013 flood. Solid fuel feed systems all use modern gravimetric techniques to ensure the process is optimised, emissions are reduced and energy is used efficiently. Kiln operations are covered by site management systems and various parameters will be taken into consideration, such as temperature and pressure, to monitor and maintain smooth and stable operations.
4	In order to prevent and/or reduce emissions, BAT is to carry out a careful selection and control of all substances entering the kiln.  Particulate matter (PM), Oxides of Nitrogen (NO <sub>x</sub> ), Sulphur Dioxide (SO <sub>2</sub> ), Carbon Monoxide (CO), Dioxins and Furans (PCDD/F), Hydrogen Chloride (HCl), Total	<b>CC</b>	The use of natural raw materials are dependent on the local sources available. Alternative raw materials, their selection and the way they are fed to the kiln are covered by the procedures explained in BAT Conclusion 11.  A risk assessment process that includes a mass balance approach is available for any new material to ensure emissions are reduced and managed, including those mentioned in BAT 24 to 28, i.e. TOC, HCl, HF, dioxins and metals. In addition quality management and management of change systems are



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	organic carbon (TOC), Hydrogen Fluoride (HF), Ammonia (NH <sub>3</sub> )		implemented at Cemex UK Limited to manage kiln inputs to minimise and prevent emissions.
5	<p>BAT is to carry out monitoring and measurement of process parameters and emissions on a regular basis and to monitor emissions in accordance with the relevant EN standards or, if EN standards are not available, ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality, including the following:</p> <ul style="list-style-type: none"> <li>a. Continuous measurements of process parameters demonstrating the process stability, such as temperature, O<sub>2</sub> content, pressure and flowrate.</li> <li>b. Monitoring and stabilising critical process parameters, i.e. homogenous raw material mix and fuel feed, regular dosage and excess oxygen</li> <li>c. Continuous measurements of NH<sub>3</sub> emissions when SNCR is applied</li> <li>d. Continuous measurements of dust, NO<sub>x</sub> , SO<sub>x</sub> , and CO emissions</li> <li>e. Periodic measurements of PCDD/F and metal emissions</li> </ul>	<b>FC</b>	<ul style="list-style-type: none"> <li>a) South Ferriby works utilises, monitors and controls the process via numerous process monitoring techniques including temperature, pressure, oxygen and flow rate. These are linked and provide continuous signals to the plant SCADA control system.</li> <li>b) Consistent quality control procedures are applied to ensure homogenous raw material mix by the use of performance monitoring against targets for each process stage. In turn raw material feed and fuels are controlled and delivered via calibrated feed devices. Excess oxygen is monitored as described in (a) above</li> <li>c) Urea is used at South Ferriby. Permit requires continuous measurement of ammonia.</li> <li>d) Continuous measurements of NO<sub>x</sub>, SO<sub>x</sub> and CO are measured utilizing certified analysers (MCERTs), these in turn are calibrated to the CEN standard BS EN14181 (1), calibrations performed by an accredited testing organisation, employing certified Engineers in accordance with ISO17025, after calibration ongoing CEM quality control is provided by the plants trained and competent personnel following the QAL 3 requirements of BS EN 14181. Continuous measurement or periodic measurements of dust are undertaken as defined by the permit.</li> <li>e). Testing for PCDD/F and metals are performed by an accredited testing organisation, employing certified Engineers in accordance with ISO17025.</li> </ul>

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	<p>f. Continuous or periodic measurements of HCl, HF and TOC emissions. Continuous or periodic measurements of dust</p>		<p>f) Continuous measurements of HCl and TOC are measured utilizing certified analysers (MCERTs), these in turn are calibrated to the CEN standard BS EN14181(1), calibrations performed by an accredited testing organisation, employing certified Engineers in accordance with ISO17025, after calibration ongoing CEM quality control is provided by the plants trained and competent personnel following the QAL 3 requirements of BS EN 14181. South Ferriby works has agreement to monitor HF periodically with testing being performed by an accredited testing organisation, employing certified Engineers in accordance with ISO17025.</p> <p>g) South Ferriby works has agreement to monitor dust from non-kiln sources periodically with testing being performed by an accredited testing organisation, employing certified Engineers in accordance with ISO17025. Scheduled periodic monitoring is undertaken on channelled dust flow points if below 10,000Nm<sup>3</sup>/hr. A list of all channelled dust emission points was provided which identified 3 points greater than 10,000 Nm<sup>3</sup>/hr.</p>
6	In order to reduce energy consumption, BAT is to use a dry process kiln with multistage preheating and precalcination.	<b>NA</b>	This BAT conclusion is only applicable to new plants and major upgrades. Nevertheless, cement production is energy intensive and South Ferriby works work to minimise energy consumption. Should Cemex UK Limited carry out a major upgrade of the kiln any cost effective opportunities to reduce energy consumption towards the BAT associated energy level would be assessed as part of an upgrade project
7	In order to reduce/minimise thermal energy consumption, BAT is to use a combination of the listed techniques.	<b>CC</b>	The operator listed the approach they take against the techniques a-f in BATC7. The responses indicate compliance with the requirement to reduce/minimise thermal energy consumption. The South Ferriby plant utilises Lepol kilns and does not operate a bypass system so 7f is not applicable.

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8	In order to reduce primary energy consumption, BAT is to consider the reduction of the clinker content of cement and cement products.	<b>CC</b>	In the UK clinker substitution is largely achieved through the use of additions such as GGBS and PFA at the concrete plant in combination with CEM I cement in the production of ready mixed concrete. South Ferriby works does produce some CEM II products although the proportion is dictated by commercial demands.
9	In order to reduce primary energy consumption, BAT is to consider cogeneration/combined heat and power plants.	<b>CC</b>	<p>CEMEX South Ferriby has considered co-generation and CHP options and as yet none have been identified as being viable for various reasons. Whilst South Ferriby's semi- dry process eliminates larger scale power generation from waste heat recovery (WHR), smaller scale technologies have also been considered in the form of Organic Rankine Cycle technologies (ORC's). With a 'claimed' ability to enable power generation from lower grade heat streams, this technology has now been considered in some detail by a number of solution providers.</p> <p>Implementation of Article 14 of the Energy Efficient Directive requires (under certain circumstances) an operator to undertake additional assessment if substantial refurbishments take place.</p>
10	In order to reduce/minimise electrical energy consumption, BAT is to use one or a combination of the listed techniques.	<b>CC</b>	<p>The operator listed the approach they take against the techniques a-e in BATC7.</p> <ul style="list-style-type: none"> <li>a) Power management systems are used, such as load management, and power factor correction systems to minimise loss.</li> <li>b) Variable speed drives are utilised in numerous parts of the process such as cooler fans, alternative fuels conveying systems and other conveying systems. All new plant is assessed to identify if variable speed drives are appropriate. There is a significant investment programme already in place for variable speed drives.</li> </ul>

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			<p>c) Continuous monitoring of electrical energy use is undertaken with improved sub metering, the majority of which is automated in key high usage areas. This ensures ancillary equipment is not left running unnecessarily. All plant areas have KPI"s and reporting requirements to aid identification of potential areas for improvement and these are reviewed monthly and reported internally for benchmarking. Management of change systems are implemented at South Ferriby works to manage kiln inputs to minimise electrical energy use. Project planning systems also address energy efficiency measures during design.</p> <p>d) A new compressor system and ring main has been installed following the flood in 2013.South Ferriby works has a service contract with a compressed air specialist to manage this system. This service includes biannual audits to ensure the compressed air system is operating at maximum efficiency. The service includes remote monitoring to minimise leaks and improve efficiency.</p> <p>e) Process optimisation assessments are undertaken at least annually and inspections are routinely undertaken during mill maintenance stops. These have identified initiatives such as mill charge optimisation, grinding performance, media levels and use of grinding aids to maximise grinding with minimal power and to reduce kWh per tonne of production. South Ferriby is progressing ISO50001 to assist in process management of energy use. The energy system includes the establishment of energy targets and continual improvement.</p>
11	In order to guarantee the characteristics of the wastes to be used as fuels and/or raw materials in a cement kiln and reduce	<b>CC</b>	The use of waste materials as fuels and/or raw materials within the cement manufacturing process is managed and controlled by procedures within the environmental management system. Procedures for the introduction of waste

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	<p>emissions, BAT is to apply the listed techniques:</p> <ul style="list-style-type: none"> <li>- Apply QA systems to guarantee the characteristics of wastes and to analyse any waste that is to be used as a raw material or fuel for constant quality, physical criteria, chemical criteria</li> <li>- Control the amount of relevant parameters for any waste that is to be used as raw material or fuel</li> <li>- Apply QA systems for each waste load.</li> </ul>		<p>materials ensure that the characteristics of the materials are analysed prior to use and are appropriate for the specific process. This initial investigation will examine the chemistry of the material and predict its potential behaviour and impact; physical properties will be assessed to identify the most appropriate feed &amp; substitution rates, input locations, and feed methods. The initial assessment will also consider the suppliers' abilities for consistency of quality, supply and performance.</p> <p>The specification of the waste material will be agreed prior to acceptance and monitored regularly during use. Procedures for the use of waste materials are implemented to control use as fuel or raw materials. Compliance with the requirements of the Environmental Permit and the MPA Code of Practice for the use of waste materials will ensure that regulatory obligations are met and communicated appropriately.</p> <p>South Ferriby works has agreements in place with the EA for the frequency of waste fuel analysis.</p> <p>South Ferriby site implement an Environmental management system that includes quality assurance systems for the characteristics of wastes to be used as fuels and/or raw materials.</p> <p>No waste stream specific details have been provided as part of the Reg60 response but this area has been subject of inspector review in the past and is considered acceptable.</p>
12	In order to ensure appropriate treatment of the wastes used as fuel and/or raw materials in the kiln, BAT is to use the listed techniques.	<b>CC</b>	The operator listed the approach they take against the techniques a-f in BATC12. The responses indicate compliance with the requirement ensure appropriate treatment of the wastes.

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13	BAT is to apply safety management for the storage, handling and feeding of hazardous waste materials, such as using a risk-based approach according to the source and type of waste, for the labelling, checking, sampling and testing of waste to be handled.	<b>CC</b>	<p>The operator states “the implementation of the MPA code of practice for the use of waste materials ensures a through, detailed risk assessment approach is applied to all wastes, both fuels and raw materials.” This covers all new materials or changes in waste supplier.</p> <p>Prior to the MPA fuel or raw material changes were covered by EA permitting processes and included a risk assessment undertaken by the operators. Where hazardous waste materials are used as fuel or raw materials, appropriate consideration of the characteristics, source, type, chemical and physical properties of the material will be applied to ensure all appropriate controls are identified and implemented.</p>
14	In order to minimise/prevent diffuse dust emissions from dusty operations, BAT is to use one or a combination of the listed techniques.	<b>CC</b>	The operator listed the approach they take against the techniques b-j in BATC14. The responses indicate compliance with the requirement to minimise/prevent diffuse dust emissions from dusty operations.
15	In order to minimise/prevent diffuse dust emissions from bulk storage areas, BAT is to use one or a combination of the listed techniques.	<b>N/A</b>	Bulk materials are stored in buildings or covered bays. There are no open stockpiles at the South Ferriby works. Water sprays are not considered necessary but all roads used by lorries are concreted and routinely cleaned. As there are no external stockpiles this BATC can be considered as not applicable.
16	In order to reduce channelled dust emissions, BAT is to apply a maintenance management system which especially addresses the performance of filters applied to dusty operations, other than those from kiln firing,	<b>CC</b>	The operator has confirmed that fabric filters are used and are subject to annual inspection and maintenance processes. There is a statement that replacement filters are designed to be less than 10mg/Nm <sup>3</sup> . Large volume plant (<10,000Nm <sup>3</sup> /hr ) will have relevant periodic compliance monitoring checks. Indicative monitoring of larger sources is now a requirement.

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	cooling and main milling processes. Taking this management system into account, BAT is to use dry flue-gas cleaning with a filter. BAT-AEL <10 mg/Nm <sup>3</sup>		
17	In order to reduce dust emissions from flue-gases of kiln firing processes, BAT is to use dry flue-gas cleaning with a filter. BAT-AEL <10-20 mg/Nm <sup>3</sup> (daily average)	<b>FC</b>	The kilns at Cemex UK limited utilise ESP (Electrostatic precipitators). The operator initially requested a derogation as part of the regulation 60 notice reply. This request was subsequently withdrawn on the 2 March 2016 as the operator now considers that they can achieve the limit of 20mg/Nm <sup>3</sup> .
18	In order to reduce dust emissions from the flue-gases of cooling and milling processes, BAT is to use dry flue-gas cleaning with a filter.  BAT-AEL <10-20 mg/Nm <sup>3</sup> (daily average or periodic)	<b>FC</b>	The kilns utilise ESP on the coolers and have shown compliance with the revised BAT-AEL of 20mg/Nm <sup>3</sup> . The operator has not requested any derogation. Control options have been considered and implemented to improve emission abatement from other significant non-kiln sources namely cement mill 3 and 4, coal mill 1 and 2, double rotators 1 and 2 and the chalk crusher. Upon reassessment of the capabilities of the existing plant a derogation request was submitted on 14 July 2016 for Cement mill 3 and 4 and Double rotator 1 and 2 to retain existing ELV of 30 mg/Nm <sup>3</sup> until the equipment can be replaced in line with a phased programme. After replacement the ELV will be tighter to meet the BAT-AEL of 10mg/Nm <sup>3</sup> . The derogation was approved with details contained in annex 2.
19	In order to reduce the emissions of NOx from the flue-gases of kiln firing and/or preheating/ precalcining processes, BAT is to use one or a combination of the listed techniques.	<b>FC</b>	The operator uses a low primary air, low NOx burner which utilises swirl air to reduce the intensity of flame temperature which in turn reduces thermal NOx contributions from the process. Kiln process variables are also closely monitored. Urea prills addition system is available if needed. Compliance with the 800mg/Nm <sup>3</sup> level is considered to be a challenge by the operator but previous records show that compliance is possible. The utilisation of waste

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	BAT-AEL (Lepol kilns) 400-800 mg/Nm <sup>3</sup> (daily average)		derived fuels has been shown to reduce NOx emissions and the operator has stated they wish to increase the use of waste derived fuels as a further route to reduce NOx emissions Refer to key issues section below
20	<p>When SNCR is used, BAT is to achieve efficient NOx reduction, while keeping the ammonia slip as low as possible, by using the listed technique.</p> <p>Ammonia slip BAT-AEL &lt;30-50 mg/Nm<sup>3</sup> (daily average)</p>	<b>FC</b>	The operator requested an ammonia ELV of 80mg/Nm <sup>3</sup> based on the outcome of a trial to establish the background level of ammonia without the SNCR (in this case urea prill addition). The degree of ammonia slip is likely to be below the BAT-AEL but as only the total emission can be measured an improvement condition has been drafted requiring the operator to model the impacts of NH <sub>3</sub> releases and measure NH <sub>3</sub> levels under a variety of operational conditions.
21	<p>In order to reduce/minimise the emissions of SOx from the flue-gases of kiln firing and/or preheating/precalcining processes, BAT is to use one of the listed techniques.</p> <p>BAT-AEL &lt;50-400 mg/Nm<sup>3</sup></p>	<b>FC</b>	<p>The operator has shown that it cannot achieve compliance with the BAT-AEL level of 400mg/Nm<sup>3</sup> and has requested a derogation from this BAT-AEL. Refer annex 2.</p> <p>The derogation has been granted at a level of 800 mg/Nm<sup>3</sup> compared to the existing ELV of 1000mg/Nm<sup>3</sup>.</p>
22	<p>In order to reduce SO<sub>2</sub> emissions from the kiln, BAT is to optimise the raw milling processes.</p> <p>(no BAT-AEL)</p>	<b>N/A</b>	The kiln layout at South Ferriby (use of Lepol kilns) means that the installation does not use kiln exhaust gases in the raw milling process.
23	In order to minimise the frequency of CO trips and keep their total duration to below 30 minutes annually, when using electrostatic	<b>CC</b>	CO is continuously monitored as the kilns use ESP as abatement. Monitors have a rapid response time to ensure CO does not build up to dangerous levels within the ESP. Computer control systems monitor the combustion process to reduce peaks. Existing maintenance techniques such as water



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	precipitators (ESPs) or hybrid filters, BAT is to use the listed techniques in combination. (no BAT-AEL)		jetting are employed to reduce the possibility of surges of material in the kilns which can lead to CO peaks.
24	In order to keep the emissions of TOC from the flue-gases of the kiln firing processes low, BAT is to avoid feeding raw materials with a high content of volatile organic compounds (VOC) into the kiln system via the raw material feeding route.  no BAT-AEL	<b>CC</b>	The operator employs a risk assessment process to establish and assess the impacts of raw materials with a high content of volatile organic compounds into the kiln system. Previous permit conditions also limit the organic component in raw materials to 5000 mg/kg as organic hydrocarbon as well as restraining the CV value to less than 10Mj/kg.  As the installation is a co-incinerator the special provisions in the Annex vi apply. Chapter iv (IED) allows cement co-incinerators to request derogations away from the TOC value of 10mg/Nm <sup>3</sup> where TOC and SO <sub>2</sub> do not result from the co-incineration of waste. Proof was not provided as part of the Reg60 response but has been previously supplied as part of the WID implementation.  Previous monitoring show typical emission below the existing ELV of 20mg/Nm <sup>3</sup> .
25	In order to prevent/reduce the emissions of HCl from flue-gases of the kiln firing processes, BAT is to use one or a combination of the listed primary techniques.  BAT-AEL <10 mg/Nm <sup>3</sup>	<b>CC</b>	A combination of raw material and fuel input control combined with the addition of lime as part of the SO <sub>2</sub> reduction programme combine to minimise HCl releases. Typical releases are below the 10mg/Nm <sup>3</sup> limit

BAT C No	Summary of BAT Conclusion requirement for production of cement, Lime and magnesium oxide	Status NA/ C / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
26	In order to prevent/reduce the emissions of HF from the flue-gases of the kiln firing processes, BAT is to use one or a combination of the listed primary techniques. BAT-AEL <1mg/Nm <sup>3</sup>	<b>CC</b>	HF emissions are inherently low in the manufacture of cement. Cemex UK limited employ primary abatement techniques such as raw material and fuels input controls.
27	In order to prevent emissions of PCDD/F or to keep the emissions of PCDD/F from the flue-gases of the kiln firing processes low, BAT is to use one or a combination of the listed techniques.	<b>CC</b>	<p>The operator described the techniques employed to prevent emissions of PCDD/F and these are considered in line with the techniques listed in the BAT conclusions.</p> <p>Emissions of PCDD/F are considered to be BAT in there prevention via the following approaches:</p> <ul style="list-style-type: none"> <li>a). Inputs to the kiln system are monitored for inputs for quality and environmental reasons, internal limitations to the process balance are set.</li> <li>b). Chlorine cycles are monitored within the process as these can cause significant production issues and as such chlorine input is internally regulated to prevent high levels.</li> <li>c). As above.</li> <li>d). fuels containing halogenated chlorine above 1% are not utilised at the South Ferriby installation .</li> <li>e). Quick cooling of kiln gases occurs as part of the inherent process of Lepol kilns.</li> <li>f). No waste is burnt on start up or shut down of the kiln system.</li> </ul> <p>Historic results show that the ELV has been complied with since 2005.</p>

BAT C No	Summary of BAT Conclusion requirement for production of cement, Lime and magnesium oxide	Status NA/ C / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
28	In order to minimise the emissions of metals from the flue-gases of the kiln firing processes, BAT is to use one or a combination of the listed techniques.	<b>CC</b>	The operator listed the approach they take to minimise the emissions of metals against the techniques a-c in BATC28. The responses indicate compliance with the requirement to minimise emissions of metals. There is a good compliance with previous ELV's which are unchanged as a result of the BATC.
29	In order to reduce solid waste from the cement manufacturing process along with raw material savings, BAT is to: - reuse collected dusts within the process, wherever practicable utilise these dusts in other commercial products, when possible	<b>CC</b>	The operator described the methods employed for reusing solid wastes within the works. Excess CKD has been handled offsite using different techniques including soil stabilisers and fertilisers. The kiln does not operate a alkali bypass system and does not produce Bypass Dust (BPD)



## Key Issues

Where relevant and appropriate, we have incorporated the techniques described by the Operator in their Regulation 60 Notice response as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the Consolidated Variation Notice.

We have reviewed the limits and monitoring requirements for all emissions at the installation to ensure that they are in accordance with the requirements of the BATCs. We considered all emission points, many fairly small and not listed in the permit.

The Operator provided a list of all channelled dust emissions, with an indication of volumetric flow rate. The general approach is that dust emissions >10,000 Nm<sup>3</sup>/h are listed individually, have a dust limit applied (in accordance with the BAT-AEL for the type of abatement) with a monitoring requirement to demonstrate compliance. Dust emissions <10,000 Nm<sup>3</sup>/h, which are deemed “small sources” by the BATCs, are included as group.

Section 1 covers emission limits and section 2 covers monitoring.

### 1. Emission limit changes: BATc 16 - 28

Changes to some emission limits and the introduction of new ones are required to ensure compliance with the BAT Conclusions. All the new and revised limits apply from 9 April 2017, the compliance date.

The following table provides an overview of emission limits within permit tables S3.1 and S3.2, with changes highlighted in bold text:

#### Overview of changes to emission limit values

Parameter	ELVs (mg/Nm <sup>3</sup> )		BAT-AEL mg/Nm <sup>3</sup>
	Previously: (Variation V006)	New Limit: (Variation V007)	
<b>Kiln emissions K2, K3 (permit table S3.1):</b>			
<b>Dust (ESP)</b>	30	<b>20</b>	<10-20
NOx	800	800 ( <b>500</b> )	<400–800
CO	700	700	-
SOx	1000	<b>800</b>	<50 - 400
Ammonia slip	-	<b>80</b>	<30 - 50
<b>TOC</b>	20	<b>20</b>	-
HCl, HF	10, 1	10, 1	<10, <1
Metals – Gp I, II	0.05	0.05	<0.05
Metals – Gp III	0.5	0.5	<0.5
Dioxin & furans PCDD/F	0.1	0.1ng/Nm <sup>3</sup>	<0.05-0.1 ng/Nm <sup>3</sup>
<b>BATC 16, 17 Non-kiln dust emissions (permit table S3.2):</b>			
<b>A8, A9 Clinker cooler</b>	30	<b>20</b>	<10-20
<b>A1 chalk crusher</b>	50	<b>10</b>	<10

<b>A2, A3 Double bag rotators</b>	50	<b>50 (1)</b>	<10
<b>A4, A5 Coal mills</b>	30	<b>10</b>	<10
<b>A10, A11 Cement mills</b>	30	<b>30 (1)</b>	<10
<b>A12, A13, A14</b>	N/A	<b>10</b>	<10
<b>All other channelled dust emissions abated by fabric filters (&lt;10,000Nm<sup>3</sup>/hr)</b>	No previous limit	<b>10</b>	<10

(1) subject to derogation – phased replacement of fabric filters after which the ELV will become 10mg/Nm<sup>3</sup>

**a. Dust limits (BATCs 16, 17, 18):**

Cemex UK Limited supplied a list of channelled dust emissions of which 12 are >10,000Nm<sup>3</sup>/hr, most already listed in the permit. There are three new dust emission sources to be listed in the permit as a result of the permit review A12, A13, A14.

**BATC16:** Emission points <10,000Nm<sup>3</sup>/hr, and therefore deemed “small source” emissions by the BAT Conclusions; with BAT identified as utilising fabric filters. The abated emissions are now included in the permit as a new emission group “*all other channelled dust emissions abated by fabric filters*” and the BAT-AEL is applied as a dust limit of 10 mg/Nm<sup>3</sup> (in accordance with BATC 16).

BATCs 17 and 18 contain a composite BAT-AEL: <10 – 20 mg/Nm<sup>3</sup>, with a footnote “*when applying fabric filters or new or upgraded ESPs, the lower level is achieved*”. In line with this, we have applied a limit of 10mg/Nm<sup>3</sup> to emissions from mills and crushers which are abated by bag filters, and a limit of 20mg/Nm<sup>3</sup> to such emissions abated by (existing) ESPs (except where subject to derogation – A2,A3, A10, A11).

**BATC17:** kiln emissions, are abated by ESP and the BAT-AEL of 20mg/Nm<sup>3</sup> has been applied. Historic monitoring results indicate that the emissions can comply with the new limit.

**BATC18** clinker cooler emissions, at A8 and A9 are abated by ESP so the dust limits are reduced from 30 to 20 mg/Nm<sup>3</sup>. The operator has stated that an improved maintenance programme should be sufficient to meet the new standard.

All other emission points greater than 10,000 Nm<sup>3</sup>/hr including cement mills, clinker import and packing are abated by bag filters so the dust limits are reduced from 30mg/Nm<sup>3</sup> to 10 mg/Nm<sup>3</sup>. The operator has stated that an improved maintenance programme should be sufficient to meet the new standard.

All emission limits apply for the specified monitoring reference period – **see section 2 below**, regarding detail of monitoring of these emissions.

**b. Oxides of Sulphur SOx (BATC 21)**

Cemex UK Limited have requested a derogation from the BAT-AEL levels of 400mg/Nm<sup>3</sup> as compared to the existing limit of 1000mg/Nm<sup>3</sup>. The derogation request has been granted at a level of 800mg/Nm<sup>3</sup> as outlined in annex 2.

**c. CO (BATC 23)**

BATC 23 does not set a BAT-AEL for emissions of CO. Existing CO limits are considered appropriate and are retained.

**d. TOC (BATC 24):**

There is no BAT-AEL for TOC; instead IED Annex VI applies. We have retained the existing ELV.

All other kiln parameters (HCl, HF, Gp I, II & III metals and dioxins/furans PCDD/F) have existing limits which are in line with the BAT-AEL, so these limits are retained unchanged.

**e. Nox:**

The BAT-AEL for NO<sub>x</sub> allows up to 800mg/Nm<sup>3</sup> for Lepol kilns. IED chapter vi (special provisions for cement kilns) set a 800mg/Nm<sup>3</sup> NO<sub>x</sub> limit for Lepol kilns until 1/1/2016 after which it should be converted to 500mg/Nm<sup>3</sup>. Due to a combination of site specific elements: kiln flooding, sulphur reduction trials, increasing of waste derived fuels and fitting of an SNCR system the limit of 500mg/Nm<sup>3</sup> will be applied from 1/12/2017 to ensure a more sustainable compliance with the tighter limit.

**2. Monitoring: BATC 5**

The basis for choosing a frequency and method (continuous or periodic) of monitoring of emissions included reference to the BATC, an assessment of the mass of release, potential impacts, previous compliance history and process variability. The results are summarised here and reflect the permit conditions.

The length of sampling period can vary from ½ hour to 6-8 hours depending on the sampling strategy and standard used. For compliance purposes the selection of sampling period reflects the likelihood of variance, potential impacts, the frequency of sampling and the expected concentration. In general terms smaller releases with limited potential for impact have sampling frequencies as low as ½ hour. Larger releases, or where compliance is based on infrequent sampling, have a longer sampling period to allow it to be more representative.

Referring to BATC 5c-g, there are some specific regulatory requirements defined for monitoring of kiln processes, which also fall under IED ch IV and Annex VI as waste is co-incinerated. For non-kiln activities, there are no specific monitoring requirements other than the statement “continuous or periodic” for dust emissions. Each emission point has been assessed to decide if it should be monitored continuously or periodically, and if the latter, the frequency of sampling has been decided based upon risks posed. We have taken into account the history of compliance as well as the scale and impact of a potential release in setting the monitoring requirements.

**a. Kiln parameters - all (BATC 5c, d, e and f):**

The type of monitoring (continuous/periodic), the reference period and frequency of monitoring of the kiln emissions are all unchanged from the previous variation for all parameters. As waste fuels are burned, the permit implements the requirements of IED Annex VI and these are in line with the requirements of BATC 5. No changes to kiln monitoring are required in order to comply with the BATCs.

**b. Non-kiln dust (BATC 5g):**

We are retaining the requirement for periodic monitoring on the clinker cooler (A8, A9) which is abated with ESP. Although this is considered a significant releases monitoring returns have shown compliance with a 20mg/Nm<sup>3</sup> limit. However, there will be an added requirement to maintain indicative monitoring.

BATC 5 allows for continuous or periodic monitoring of dust from non-kiln activities. We are changing the required monitoring on the cement and coal mills from continuous to periodic. The mills all fitted with bag filters and the volumetric releases are relatively small (and smaller in size than the regulated lime kilns on which dust is monitored periodically) and consequently pose a lower risk. We are setting a frequency of 6 monthly for the mills. Where continuous monitors have been previously available these will be used for indicative performance of the abatement plant, and establish any performance problems. Environmental protection will be maintained as this variation reduces the ELV for releases from all mills to 10mg/m<sup>3</sup>. Historic monitoring data indicates that emissions can meet the 10mg/Nm<sup>3</sup> limit. A review of the data indicated that there has not been 100% compliance with the new tighter ELV. The increase in frequency of bag maintenance identified by the operator will be required to ensure ongoing compliance with the new limit.

The periodic dust monitoring has a reference period of 30 minutes (minimum). This is considered to be an appropriate minimum period for these emissions.

For the “small sources” emission group “all other channelled dust emissions abated by fabric filters”, we are requiring a performance check based on a maintenance management system, as allowed by BAT 5g. Periodic monitoring is not required to demonstrate compliance with the new 10mg/Nm<sup>3</sup>.

Emission point	Parameter	Type of monitoring	Frequency	Reference period
A6, A7. (Main stack for both kilns)	Dust, NOx, SO <sub>2</sub> , CO, TOC, HCl, ammonia	continuous	-	Daily average
	HF	periodic	6 monthly	Min 1 hour
	metals	periodic	6 monthly	Min 30 min
	PCDD/F	periodic	6 monthly	6 – 8 hour
<b>A8, A9 Clinker cooler</b>	particulates	<b>periodic</b>	<b>6 monthly</b>	<b>Min 30min</b>
<b>A1 chalk crusher</b>	particulates	<b>periodic</b>	<b>Annual</b>	<b>Min 30min</b>
<b>A2, A3 Double bag rotators</b>	particulates	<b>periodic</b>	<b>6 monthly</b>	<b>Min 30min</b>
<b>A4, A5 Coal mills</b>	particulates	<b>periodic</b>	<b>6 monthly</b>	<b>Min 30min</b>
<b>A10, A11 Cement mills</b>	particulates	<b>periodic</b>	<b>6 monthly</b>	<b>Min 30min</b>
<b>A12, A13, A14</b>	particulates	<b>periodic</b>	<b>Annual</b>	<b>Min 30min</b>
<b>All other channelled dust emissions abated by fabric filters (&lt;10,000Nm<sup>3</sup>/hr)</b>	particulates	<b>Maintenance schedule</b>		

We have set monitoring methods according to our monitoring guidance note, M2

**c. Table S3.5 Process Monitoring requirements**



This table has been updated from previous variations to remove parameters which we no longer require to be reported (electricity and water usage) and add in Raw meal and Fuels feed rate (both in t/hr) which is required in line with BATC 5b. The table now includes the indicative dust monitoring on mills, and continuous monitoring of the kilns' emissions for temperature, pressure, oxygen and water vapour to demonstrate process stability and to allow monitoring correction to reference conditions, in line with BATC 5a.

### **Other Monitoring aspects**

#### **Reference conditions:**

The reference conditions for reporting measured emissions from non-combustion sources has been changed by the BATCs from no correction required for temperature, pressure, oxygen or water vapour content, to reporting dry at Standard Temperature and Pressure (STP) with no correction for oxygen. The Schedule 6 interpretation has been updated for this change.

#### **Site condition report**

Although the reviewed site condition report contained most of the information required we would recommend that some limited additional baseline data is collected to supplement the Baseline report, particularly if these areas are used for activities involving or for the storage of potential pollutants.

## **Annex 2: Assessment, determination and decision where an application(s) for Derogation from BAT Conclusions with associated emission levels (AEL) has been requested.**

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

'By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

(a) the geographical location or the local environmental conditions of the installation concerned; or

(b) the technical characteristics of the installation concerned.

The competent authority shall document in an annex to the permit conditions the reasons for the application of the first subparagraph including the result of the assessment and the justification for the conditions imposed. '

A summary of any derogations granted is also recorded in Annex 1 of the Consolidated Variation Notice in accordance with the requirement of IED Article 15(4) as described above.

As part of their Regulation 60 Notice response, the operator has requested a derogation from compliance with the AEL values included in the following BAT Conclusion as detailed below.

Cemex UK Limited requested a derogation from BATC 21 and BATC17.

- BATC 21 refers to the BAT-AEL for kiln emissions for Sulphur Dioxide (SO<sub>2</sub>) from kilns K2 and K3. The BAT-AEL for cement kilns is in the range of 50-400mg/Nm<sup>3</sup> (daily average) with the operator requesting a derogation from this to a value of 600mg/Nm<sup>3</sup> until the next permit review. The basis for the request was the grounds of the technical configuration of the kiln types and the geographical link to the raw materials used.
- BATC 17 Dust emission from milling processes specifically double rotators 1 and 2 and cement mills 3 and 4. The BAT-AEL for rotators and mills abated with fabric filters is <10mg/Nm<sup>3</sup> with the operator requesting to maintain the existing limits of 50mg/Nm<sup>3</sup> and 30mg/Nm<sup>3</sup> respectively. The request was to allow a phased replacement of the fabric filters with new units capable of meeting the new <10mg/Nm<sup>3</sup> limit. The justification for the request was on technical grounds linked to the general investment cycle of the industry and specifically to align with the kiln down times.

Although information was provided in their response to allow us to commence assessment of the derogation request it was insufficient to enable us to complete the determination and further information was requested and subsequently supplied on 14 July 2016 (detailed arguments and CBA), 8 December 2016 (SO<sub>2</sub> data) and 23 December 2016 (SO<sub>2</sub> input profile).

On review and assessment of this information we have decided to grant the derogation requested by the operator in respect to the AEL values described in BAT Conclusion 18 and 21 but have included other Emission Limit Values in the Consolidated Variation Notice that will ensure suitable protection of the environment.

### **Derogation request against BATC 21 - Kiln emission of Sulphur Dioxide**

As part of their response they stated that the reason for their derogation request was that the technical characteristics of the Lepol kilns, combined with the sulphur content of the available raw materials made it disproportionately costly to comply with the BAT-AEL compared to the environmental impacts.

The way in which we have considered, assessed and determined the derogation request is detailed in the section below.

The Operator requested a derogation from BAT 21, production of Cement, Lime and magnesium oxide BAT Conclusions on the basis of technical characteristics, namely *the configuration of the plant on a given site, making it more technically difficult and costly to comply* and the geographical location aspect of effectively being restricted to using local raw materials.

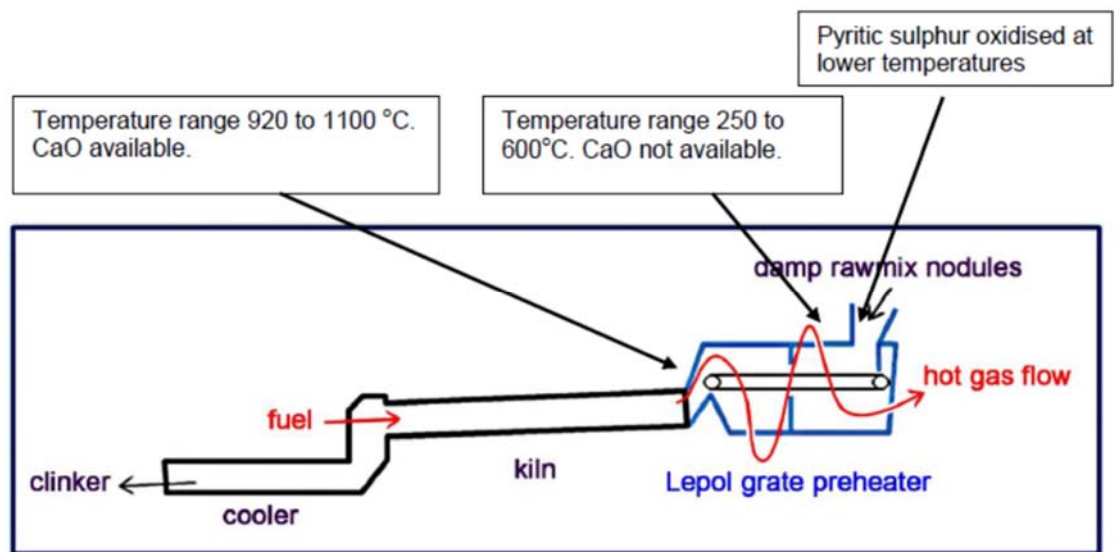
The Operator's application considered 5 options for meeting the BAT-AEL. They have proposed to operate at a lower ELV for SO<sub>2</sub> of 600mg/Nm<sup>3</sup> a drop from 1000mg/Nm<sup>3</sup> but compared to a BAT-AEL of 400mg/Nm<sup>3</sup>. The reduction would be achieved by replacement of petcoke with lower sulphur coal, increased use of waste derived fuels and ongoing activated lime injection. The operator rejected other viable options including the addition of wet scrubbers and the construction of a new cement kiln and rejected all the other options.

The Environment Agency has reviewed the application and concluded

The operator has a valid derogation request against the BAT conclusions 21. The derogation request is based on the technical characteristics of the plant, specifically the configuration of the Lepol kilns making it more technically difficult to comply with the BAT-AEL. The geographical location impacts and recent investment in techniques to abate or reduce Sulphur at source were also considered as suitable arguments to proceed with a derogation review. The operator has described 5 relevant options for achieving the BAT-AEL and justified the screening out 2 options; replacement of raw materials and site closure until a scrubber was fitted. 3 options were taken forward to conduct a cost benefit analysis including; fitting a wet scrubbing system, building a new cement plant and the operator preferred option of continuing the use of lime absorbent and managing fuel Sulphur content as a means of enabling a reduction in the ELV from 1000mg/Nm<sup>3</sup> to 600mg/Nm<sup>3</sup>. The derogation would continue until the next permit review in line with the BREF timetable.

- The derogation request is based on a number of criteria; the geographical location, local environmental conditions and the technical characteristics of the plant. Although the operator did not present the kiln design as a criteria for consideration under article 15(4) the nature of the Lepol grate kilns used at South Ferriby are relevant to the scale of SO<sub>2</sub> emissions. South Ferriby is the only installation in England to use Lepol kilns in this configuration. This and the other options were considered in turn with the following outcomes:

- Technical: “the configuration of the plant on a given site, making it more technically difficult and costly to comply”. The most common method of clinker production in the UK is the dry process/pre-heater with rotary kiln. This method will capture a high proportion of free sulphur in the sulphate form in clinker. The Lepol kilns used at South Ferriby have a more limited contact time so less free sulphur is absorbed into the clinker with consequently more released as SO<sub>2</sub>. The Kimmeridge clay available at South Ferriby is the primary source of the pyritic sulphur and is intimately mixed with the limestone raw material. This raw material, is heated up slowly on the Lepol grate in the temperature range of 250°C to 600°C. As the sulphur is not in sulphate form it is oxidised to SO<sub>2</sub> and there is only a limited opportunity for this SO<sub>2</sub> to react with the Calcium oxide (CaO) to form calcium sulphate (CaSo<sub>4</sub>) due to the formation of CaO at temperatures above 920°C. Scrubbing does occur further into the Lepol grate after the majority of the sulphur from the clay has been oxidised and released. This plant configuration meets the technical criteria for article 15(4).



- Figure 1 Layout of lepol kilns
- Geographical location: The operator highlights that the reason why they cannot meet the 400mg/Nm<sup>3</sup> limit is due to the high sulphur in the raw materials. Clinker manufacture requires both chalk and clay from the local quarry. Replacement of this material with offsite sources would require significant infrastructure changes, planning permission and increased costs. Historically the installation was sited to take advantage the local raw materials and investment was made on that basis. It is considered that this is also a justification to progress the derogation under article 15(4).
- Technical: Recent history of investment has been made that has reduced levels of SO<sub>2</sub> released. The operator identified recent investment including the addition of lime as an SO<sub>2</sub> absorber (£0.25m) and the increased use of waste fuels (with a lower Sulphur content than petcoke) and associated improved burner unit (£5m). These investments contributed to the voluntary reduction of ELVs in 2010 from 1750mg/Nm<sup>3</sup> to 1000mg/Nm<sup>3</sup>. Following from the flooding in 2013 there has been additional investment in the use of waste derived fuels, including the adoption of the Waste Code of Practice (COP) and infrastructure changes all leading to a reduction in the use of coal and petcoke. Although the investment has not been made primarily to reduce SO<sub>2</sub> (except for the lime injection) the changes have resulted in a significant

reduction in SO<sub>2</sub> emissions. Although not strong, this request was considered as an acceptable additional criteria under Article 15(4) for progression to review of derogation. However, it must be noted that as the primary source of SO<sub>2</sub> is the raw materials then this justification would be insufficient on its own.

- Technical criteria: The operator claims that the plant layout is such that the lack of space around the installations would make it very difficult to install abatement plant. The operator provided some information to substantiate this claim. The operator highlighted the difficulty as a result of the proximity of the roads, main buildings and existing plant layout. Additionally the operator highlighted the time required for planning permission. A comparison to other installations at different locations would indicate that this site does not have issues significantly greater than them. On this basis the technical criteria associated with layout was not accepted.
- Local environmental conditions: The operator highlighted that recent flooding of the site (2013) has significantly affected any future investment at South Ferriby as this has to take into consideration the increased potential risk of flooding. This will include compliance with planning and insurance conditions requiring extra investment to ensure assets are 'more' flood resilient in a high flood risk area, thus increasing costs compared to other sites. No specific evidence has been provided to support this claim but the balance of probability is that cost will be increased. It is a fact that other cement manufacturers do not face the risk of flooding associated with this site. However, as other installations (not cement) also have to plan for flooding issues this on its own is not considered adequate justification to progress an article 15(4) derogation request.
- The operator has referred to the BAT Conclusions and addressed all reasonable options for achieving the BAT AEL. The operator is proposing not to conduct a cost effectiveness assessment of one option for achieving the BAT AEL and has adequately justified this decision. The operator identified that replacement of the raw material (thus reducing Sulphur inputs) is not a practical option due to planning permission, costs and infrastructure changes needed. The nearest alternative source of limestone was identified and the costs associated with obtaining, transporting and installing the infrastructure were estimated and presented. The operator also identified the ongoing work to reduce other sulphur inputs from fuels (replacing petcoke) and the increased use of low sulphur waste derived fuels. Lime absorption would also continue but cannot be guaranteed to meet the BAT-AEL levels so was not taken forward.

There is an option that has a central NPV higher than that of the proposed derogation. This is the option of meeting BAT in 2020, assuming the lower rate of landfill tax applies and that the derogation ELV is 800mg/Nm<sup>3</sup> rather than 600mg/Nm<sup>3</sup>. However the level of uncertainty in this analysis is significant and the most conclusive statement that can be made about the findings of the CBA is that it is more likely than not that the costs of this option are lower than the environmental benefits compared to the proposed derogation. This means there is a reasonable risk that the costs are in fact higher than the environmental benefits compared to the proposed derogation. The presence of this risk suggests that to turn down the derogation application would not be a proportionate response to the evidence and so the conclusion is that the operator has provided a good argument that the increased costs linked to the technical characteristics are disproportionate for achieving the BAT AEL.

The proposed derogation includes a reduction in emission limit, ongoing optimisation of lime addition and reduction in fuel Sulphur. All of these would be expected to reduce ground level impact compared to current levels. Modelling indicates that environmental impacts below the current levels are not significant. There has been no history of complaints regarding SO<sub>2</sub>. The use of an ELV of 600mg/Nm<sup>3</sup> as requested by the operator is considered very optimistic as such the CBA and impact assessment were also undertaken for and ELV of 800 mg/Nm<sup>3</sup>.

- The operator supplied estimates of annual emissions of Sulphur dioxide from the activity that were in the region of 2566 tonnes per year and these would reduce to around 1026 tonnes/year if the BAT-AEL was met. The proposed derogation limit of 600mg/Nm<sup>3</sup> from April 2017 would mean a reduction to 1540 tonnes per year. The impact of not meeting the BAT-AEL by April 2017 compared to the derogation end date (next permit review – estimated as 2021) would be an extra 514 tonnes/year of SO<sub>2</sub> released for 5 years or 2570 tonnes in total. For comparison the Pollution inventory threshold level is 150 tonnes/year.
- The operator provided emissions monitoring data as part of the derogation request. This data showed that compliance with a 600mg/Nm<sup>3</sup> limit data would indeed be very challenging. The operator has proposed moving from petcoke to coal, increasing the use of waste derived fuels and ongoing with ammonia injection. For comparison an impact assessment was also carried out using 800mg/Nm<sup>3</sup> as an ELV to understand the impacts on the CBA and the Environment impacts.

The derogation request has to take into account all viable options and compare them to establish if the proposed option would result in disproportionate costs vs environmental impact. By setting an ELV of 800mg/Nm<sup>3</sup>, higher than the 600mg/Nm<sup>3</sup> request, it is considered an appropriate balance between driving environmental improvement and maintaining environmental protection.

The Environment Agency is therefore minded to allow this derogation request subject to an improvement condition to track progress in the development of measures to reduce SO<sub>2</sub> emissions to below 600mg/Nm<sup>3</sup>

- The operator shall submit four annual reports commencing on the 1 December 2017 detailing the steps they have undertaken to reduce emissions of sulphur dioxide under normal operating conditions to below 600mg/Nm<sup>3</sup>. The report shall identify the actions taken, results and conclusions drawn from any trials involving changing fuel sources, operating techniques, reducing sulphur content in raw materials and any abatement methods employed.

#### **Derogation request against BATC 18 – Dust emission from mills**

As part of their response they stated that the reason for their derogation request to allow a phased replacement of the fabric filters with new units capable of meeting the new <10mg/Nm<sup>3</sup> limit. The justification for the request was on technical grounds linked to the general investment cycle of the industry and specifically to align with the kiln down times.

The way in which we have considered, assessed and determined the derogation request is detailed in the section below.

The Operator requested a time limited derogation from BAT 18, associated with dust emissions from the flue-gases of cooling and milling processes as described in the BAT Conclusions for the Production of Cement, lime and magnesium oxide, implementation date 9th April 2017. The derogation request was on the on the basis of the technical characteristics of the plants specifically the general investment cycle and the timing of installation of abatement plant linked to the kiln run times.

The derogations for four emission point have been considered together as they form part of a phased replacement of fabric filters on two rotators and two cement mills which we have considered together because the technical criteria for allowing the derogation are linked.

The Operator's application considered 3 techniques for meeting the BAT-AEL. They have proposed to retain existing ELV for particulate matter (PM) on four release points; Double rotator 1 and 2 and Cement Mills 3 and 4 until new bag filter abatement plant are fitted after which the BAT AEL of 10mg/Nm<sup>3</sup> will be achieved. The operator rejected all the other options. The phased approach to replacing existing bag filters is outlined below:

Emission point	Current limit	Emission point BATAEL Compliance date
Double Rotator 1	50mg/Nm <sup>3</sup>	10 mg/Nm <sup>3</sup> limit from 30 October 2019
Double Rotator 2	50mg/Nm <sup>3</sup>	10 mg/Nm <sup>3</sup> limit from 30 April 2021
Cement Mill 3	30mg/Nm <sup>3</sup>	10 mg/Nm <sup>3</sup> limit from 30 October 2019
Cement Mill 4	30mg/Nm <sup>3</sup>	10 mg/Nm <sup>3</sup> limit from 30 April 2020

The Environment Agency has reviewed the application and concluded

- The operator has supplied a valid derogation request against the BAT conclusions 18. The derogation request is based on technical characteristics specifically the investment cycle and the practicality of replacing 4 bag filtration systems. The operator has described three relevant techniques for achieving the BAT-AEL and justified the screening out two of them. Two options were taken forward to conduct a cost benefit analysis. The derogation request included a proposal to retain the existing ELV of 50mg/Nm<sup>3</sup>, for 2 separators and 30mg/Nm<sup>3</sup> for 2 cement mills until a range of dates commencing April 2019 to October 2020 according to a supplied schedule of works. After this date the operator has proposed that the fitting of new bag filtration systems to all four points will be completed and the BAT-AEL levels of 10mg/Nm<sup>3</sup> would be met.
- That the operator has provided a credible argument that the increased costs linked to the technical characteristics are disproportionate for achieving the BAT AEL. The operator supplied 4 valid CBA analysis, one for each of the fabric filters subject to the derogation. Taken individually they show the costs are disproportionate to the environmental benefits. The data was combined into a single CBA which also confirmed that the costs were disproportionate. The CBA shows that the option of achieving BAT on time has significantly higher costs than environmental benefits in comparison to the proposed derogation option

- The operator has demonstrated that the costs of achieving the BAT-AEL by April 2017 are disproportionate to the environmental benefits. The environmental impacts of the current releases are not considered significant and the phased introduction of new abatement equipment will result in significant reductions from over 45 tonnes per year to 6 tonnes by 2021.
- There is no requirement for an additional improvement condition as the operator has provided a timeline and commitment for the introduction of new abatement plant as part of the derogation request.

The Environment Agency is therefore minded to allow this derogation request.



### Annex 3: Improvement Conditions

Based on the information in the Operator's Regulation 60 Notice response and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These improvement conditions are set out below - justifications for them is provided at the relevant section of the decision document (Annex 1 or Annex 2).

We also consider that we need to set improvement conditions relating to changes in the permit not arising from the review of compliance with BAT conclusions. The justifications for these are provided in Annex 5 of this decision document.

Previously completed improvement conditions are recorded below but removed from the permit to improve clarity. The numbering format has been retained to ensure consistency in record keeping.

Reference	Requirement	Date
IC1	<p>Before the permanent burning of Climafuel at an increased thermal substitution rate of up to 60% is carried out a trial shall be conducted to demonstrate that any proposed increase in the use of Climafuel does not cause any significant environmental harm when compared with burning traditional fuels.</p> <p>The trials shall follow a demonstration programme for the work set out in an Application for a Variation under IPPC to burn Climafuel submitted to the Environment Agency on 18 March 2008. The Application for a Variation under IPPC to burn Climafuel includes a provision for the full reporting of monitoring data from the trials.</p>	complete
IC2	<p>The Operator shall produce and submit a project plan setting out how releases of SO<sub>2</sub> in the exhaust gases from the two kilns will be minimised and at least reduced to less than 400mg/m<sup>3</sup> as a daily average by the target date of 30 June 2015.</p> <p>The project plan will be based on consideration of costs and benefits of all relevant options and using appraisal methodology H1 or equivalent.</p>	complete
IC3	<p>The Operator shall assess and submit a report on the impacts of the ammonia emissions from the kiln stacks, in particular on non-statutory sites such as local wildlife sites, and SSSIs within 2km of the installation and Natura 2000 and Ramsar habitat sites within 10km of the installation.</p> <p>The assessment shall cover both background NH<sub>3</sub> emissions and the maximum ammonia slip when SNCR is optimised for NO<sub>x</sub> abatement.</p>	complete
IC4	<p>The operator shall produce and submit a project plan setting out how releases of particulates in exhaust gases from the kilns will be minimised and at least reduced to &lt;10 – 20mg/m<sup>3</sup> as a daily average by the target date of 30 June 2014.</p> <p>The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.</p>	complete
IC5	<p>The operator shall produce and submit a project plan setting out how releases of particulates from all significant non-kiln sources will be minimised and at least reduced to &lt;10 – 20mg/m<sup>3</sup> as a daily average by the target date of 30 June 2014.</p> <p>The project plan will be based on consideration of costs and benefits of all relevant options and using options appraisal methodology H1 or equivalent.</p>	complete

## New Improvement conditions:

### **IC06: Ammonia ELV and associated environmental impact assessment**

BAT conclusion 20 includes a BAT-AEL for ammonia slip when using SNCR of <30 – 50 mg/Nm<sup>3</sup>. We are therefore required to set an ELV for ammonia, which, since slip cannot be measured directly, must be for total ammonia (background plus slip). The operator proposed an ammonia ELV of 80mg/Nm<sup>3</sup> daily average. The Critical Level for lichens and bryophytes (1µg/m<sup>3</sup>) has been identified as potentially relevant for the site. An improvement condition is required to confirm the applicability of an assessment against 3µg/m<sup>3</sup> and if needed rework the impact assessment using the tighter critical level value of 1µg/m<sup>3</sup>.

IC06	<p>The operator shall submit an updated report on ammonia emissions (considering both ammonia slip and background ammonia) from the Installation. The report shall include the following:-</p> <ul style="list-style-type: none"><li>• An updated impact assessment for Ammonia. The assessment shall consider the default environmental standard of 1µg/m<sup>3</sup> unless appropriate justification can be provided for using the less stringent value of 3µg/m<sup>3</sup> (according to features present within such conservation site).</li></ul> <p>The report shall confirm that the current ELV for ammonia (stated within table S3.1) remains appropriate (considering the revised impact assessment, ambient ammonia and slippage levels), or shall propose an alternative ELV (complying with all BAT-AELs) for approval in writing by the Environment Agency.</p>	01/10/18
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IC07: Installing monitoring access for A12, A13, A14. These are new emission points greater than 10,000Nm<sup>3</sup>/hr flow. The operator provided some information that these point may not be suitable for monitoring and additional justification is required

IC07	<p>The operator shall investigate the feasibility of installing monitoring access to and/or modifying the ductwork of dust emission points A12, A13 and A14 to enable MCERTS monitoring of emissions to be carried out at each point. The operator shall assess each emission point and produce a risk-based plan of modifications with the aim of ensuring that MCERTS monitoring can be carried out. The plan shall prioritise the larger and more significant dust emission points. For any emission points where MCERTS monitoring is not proposed, the operator shall provide justification for why and propose an alternative means for demonstrating compliance with the limit of 10 mg/Nm<sup>3</sup>.</p> <p>A report detailing the assessment of each dust emission, the plan for modifications, timescales and any alternative compliance assessments shall be submitted to the Environment Agency for written approval. The plan shall be implemented upon approval by the Environment Agency,</p>	30/11/17
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IC08 Improvement condition linked to the Sulphur dioxide derogation request. The operator outlined some plans on how to reduce emissions of Sulphur dioxide from 100mg/Nm<sup>3</sup> to 600mg/Nm<sup>3</sup> as part of the derogation request. However, the derogation process highlighted the degree of uncertainty in the ability to meet such a reduction. The final derogation allowed an ELV of 800mg/Nm<sup>3</sup> which was considered to have a higher likelihood of achievement. The improvement condition is to ensure the operator continues with planned efforts to minimise SO<sub>2</sub> releases to below 600mg/Nm<sup>3</sup>.

IC08	The operator shall submit four annual reports commencing on the 1 December 2017 detailing the steps they have undertaken to reduce emissions of Sulphur dioxide under normal operating conditions to below 600mg/Nm <sup>3</sup> . The report shall identify the actions taken, results and conclusions drawn from any trials involving changing fuel sources, operating techniques, reducing sulphur content in raw materials and any abatement methods employed.	01/12/20
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IC09 The Site condition report has been reviewed and although it contains a significant amount of relevant information there are a small number of points that should be addressed. The recommendation is that that some limited additional baseline data is collected to supplement the Baseline report, particularly if certain have been used for activities involving or for the storage of potential pollutants

IC09	<p>The operator shall submit an targeted site condition report to the Environment Agency, which provides a baseline report in line with the requirements of IED article 22(2).</p> <p>The revised report should:</p> <ul style="list-style-type: none"> <li>• Include an updated Conceptual Site Model and Source Pathway Receptor assessment, provided within the PPC application site report;</li> <li>• Ensure intrusive investigation and sampling includes all potential hazardous substances at the site;</li> </ul> <p>Include information on the concentrations in soil and groundwater of the hazardous substances used, produced or released by the installation</p>	31/03/18
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#### Annex 4: Advertising and Consultation on the draft decision

This section reports on the outcome of the public consultation on our draft decision carried out between 3 March and 31<sup>st</sup> March 2017

The draft decision record and associated draft Consolidated Variation Notice was published and made available to view on .Gov website between the dates detailed above.

Summary of responses to consultation and the way in which we have taken these into account in the determination process.

<i>Responses received</i>
<i>Mineral Products Association – received 31<sup>st</sup> March 2017.</i>
<i>Brief summary of issues raised</i>
1) <i>Inclusion of Fire Prevention Plan conditions</i> 2) <i>Requirement for ongoing monitoring of PCBs and PAHs</i> 3) <i>Changes to Activities listed in Table S1.1 and associated fees</i> 4) <i>Calibration of CEMs at low emission levels</i>
<i>Summary of actions taken or show how this has been covered</i>
<b><u>Inclusion of Fire Prevention Plan conditions</u></b> <p>The requirement to include the FPP condition is in line with the National Environment Agency approach for Installations. As part of this requirement the Environment Agency has included FPP conditions within permits during such permit review. <i>The FPP condition included within the permit states that the operator will need to produce an FPP when requested to do so by the EA.</i></p> <p>The installation both stores waste and utilises various wastes as waste derived fuels.</p>
<b><u>Ongoing monitoring of PCBs and PAHs</u></b> <p>This requirement was implemented as part of the Waste Incineration Directive in order to gather information for on PCBs and PAHs, to which limited data was available. The Waste Incineration Directive was subsequently superseded by the Industrial Emissions Directive, during the consultation of which this specific point was previously raised (16.4).</p> <p>16.4 - the Regulations laid before Parliament and the National Assembly for Wales are such that PCB and PAH monitoring at the same frequency as the Directive requires for dioxins and furans remains obligatory <u>except where the regulator is satisfied that the requirement can be lowered or dispensed with</u>. Regulators will be expected to consider data already acquired, along with other information about the operation, in reaching a view on whether to lower or dispense with the requirement in each case.</p> <p>As the EA has not conducted an assessment of the data that has been collected and as such is not satisfied that the requirement can be lowered or dispensed with. An assessment is planned during the Q1-Q2 (April – September) 2017. This assessment will include collating the acquired data for previous monitoring returns, consider the variability and possible future impacts of differing fuels and raw materials and a comparison to any relevant</p>

Environmental standards. The paper produced from this will be subject to consultation with PHE and other relevant regulators.

**Changes to Listed Activities listed in Table S1.1 and associated fees**

The changes in the activity schedules have been done in accordance with changes made to the Environmental Permitting Regulations (2013) to ensure that the permit reflects listed activities in line with the regulations.

Any permit review includes an evaluation of activity references and the relevant costs.

The charge for the site will be made against the current Environment Agency's charging scheme to which all Installation permits are charged against.

**Deadline for improvement condition relating to monitoring of greater than 10,000Nm<sup>3</sup>/hr sources.**

The purpose of the improvement condition is to establish which emission point can effectively be monitored, possibly due to restrictions in sampling positions. The IC requires a review of the sampling points but not the implementation of changes as it is expected that these changes could take longer than the date specified in the IC. Operators may request changes to these dates if there is sufficient reason to justify it. In this case the operator has separately requested this change and the date has been changed to 30/11/2017.

## **Annex 5: Review and assessment of changes that are not part of the BAT Conclusions derived permit review.**

### **1. Introductory Note**

The installation description has been updated to a consistent format applied across the cement and lime sector. We have included additional information such as the installation NGR, kiln production capacity, details of process wastes and emissions to air and water, and local sensitive receptors.

### **2. Permit conditions**

#### **Condition 2.3.16**

This is a new standard template condition for all sites using waste.

#### **Condition 3.5.5(a) Ammonia confidence levels**

A confidence level of 40% for continuous monitoring of ammonia has been set based on guidance from EA monitoring teams. This value could be lower depending on the techniques employed. However, as we gather more information on the continuous monitoring of ammonia on cement works, the % uncertainty figure may be reduced.

#### **Section 3.6 Fire Prevention conditions**

Conditions 3.6.1 & 2 are now standard template conditions for all installations that store combustible wastes. New installations storing combustible wastes are required to have an FPP in place. For existing installations, there is no automatic requirement to submit an FPP when a permit is varied or as a result of a permit review, however an FPP will be required under certain conditions, eg if there is a fire at the installation, or a change on site which increases the risk of a fire.

### **3. Schedule 1 Changes to Table S1.1**

We have reviewed Table S1.1 for all CLM sector permits, to ensure these accurately reflect the activities on each site.

We have reviewed and revised Hope cement works Table S1.1, specifically:

- Amended the kiln activity description to reflect EPR Sch 1 activity wording,
- Revised the listed activities, to include additional part A(2) and (B) activities,
- Added Directly Associated Activities (DAAs) to ensure that all activities (listed and non-listed) at the installation are included,
- Amended the Limits of Specified Activity for all activities to ensure they are clearly defined,
- Assigned Activity Reference numbers to listed and directly associated activities.

The amended Table S1.1 is reproduced below with new and revised text identified by shaded sections:

<b>Table S1.1 activities</b>			
<b>Activity reference</b>	<b>Activity listed in Schedule 1 of the EP Regulations</b>	<b>Description of specified activity</b>	<b>Limits of specified activity</b>
AR1-AR2	Section 3.1 Part A(1)(a)	Producing cement clinker in rotary kilns with a production capacity exceeding 500	Kilns No.2 and No.3 From the transport of raw materials and fuels from bulk

<b>Table S1.1 activities</b>			
<b>Activity reference</b>	<b>Activity listed in Schedule 1 of the EP Regulations</b>	<b>Description of specified activity</b>	<b>Limits of specified activity</b>
		tonnes per day or in other kilns with a production capacity exceeding 50 tonnes per day.	storage, the preparation (including blending of raw materials specified within table S2.1 in order to produce raw meal) and feeding of all materials into the kiln systems, through to discharge of cooled clinker to the clinker store. Includes emissions to air from the main stack and other process vents.
AR3	Section 3.1 Part A(2)(a)	Grinding cement clinker	The transport of clinker, including imported clinker, from clinker storage and handling of raw materials from bulk storage, through milling and blending to storage of cement, including emissions to air from the mill stacks and other process vents.
AR4	<b>Section 3.1 part B (a)</b>	Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.	Storage and dispatch of cement clinker and cement in bulk by road or rail.
AR5	<b>Section 3.1 part B (b)</b>	Blending cement in bulk or using cement in bulk other than at a construction site, including the bagging of cement and cement mixtures, the batching of ready-mixed concrete and the manufacture of concrete blocks and other cement products.	Blending of cement products
<b>Directly Associated Activity</b>			
AR6	Raw materials storage and handling	Raw materials receipt, transport, preliminary preparation and bulk storage	From the recovery of receipt of raw materials via conveyor, and the receipt on site of other raw materials, including alternative raw materials, through to bulk storage.
AR7	Fuels storage and handling	Delivery and bulk storage of fuels	Offloading of waste-derived and fossil fuels, and transfer to bulk storage
AR8	Clinker import	Bulk import of cement clinker by road and rail	Offloading of cement clinker imported to site by road and rail and transfer to the clinker stores.

<b>Table S1.1 activities</b>			
<b>Activity reference</b>	<b>Activity listed in Schedule 1 of the EP Regulations</b>	<b>Description of specified activity</b>	<b>Limits of specified activity</b>
AR9	Waste storage and handling	Waste storage and handling	From waste generation, storage and monitoring through to dispatch off site.
AR10	Water discharge to controlled water	Management of site drainage and process water.	From collection of surface water drainage including reuse within site activities through to discharge to controlled waters

**Listed Activities – producing clinker and grinding clinker:**

Until this review, Cement and Lime permits listed the activity Section 3.1 Part A(1)(a) as **producing and grinding cement clinker** in accordance with the Environmental Permitting Regulations 2010, which stated the following:

- Part A(1)** (a) *Producing cement clinker or producing and grinding cement clinker.*  
(b) *Producing lime—*  
(i) *in kilns or other furnaces with a production capacity of more than 50 tonnes per day;*  
or  
(ii) *if the activity is likely to involve the heating in any 12-month period of 5,000 or more tonnes of calcium carbonate or calcium magnesium carbonate or both in aggregate.*
- Part A(2)** (a) *Unless falling with Part A(1) of this Section, grinding cement clinker.*  
(b) *Unless falling within Part A(1) of Section 2.1 or 2.2, grinding metallurgical slag in plant with a grinding capacity of more than 250,000 tonnes in any 12-month period.*
- Part B** (a) *Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.*  
(b) *Blending cement in bulk or using cement in bulk other than at a construction site, including the bagging of cement and cement mixtures, the batching of ready-mixed concrete and the manufacture of concrete blocks and other cement products.*

Under the EPR 2010, the activity 3.1 **A(2)(a)** covers only the grinding of cement clinker where this is undertaken at a different location from that of clinker production. In 2013, the Regulations were amended and moved the activity of grinding cement clinker to Section 3.1 Part **A(2)(a)** regardless of where the grinding takes place; .

- Part A(1)** (a) *Producing cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other kilns with a production capacity exceeding 50 tonnes per day.*  
(b) *Producing lime or magnesium oxide in kilns with a production capacity of more than 50 tonnes per day.*
- Part A(2)** (a) *Grinding cement clinker*  
(b) *Activities deleted by EPR amendment SI 2013 No. 390.*
- Part B** (a) *Storing, loading or unloading cement or cement clinker in bulk prior to further transportation in bulk.*  
(b) *Blending cement in bulk or using cement in bulk other than at a construction site, including the bagging of cement and cement mixtures, the batching of ready-mixed concrete and the manufacture of concrete blocks and other cement products.*

In Cemex UK Limited previous permit, although cement milling was included on a separate row in table S1.1, it was still part of the listed activity S3.1 A(1)(a). Table S1.1 has been revised to reflect the legislative changes; the 3.1A(1)(a) activity



covers producing cement clinker only and an additional activity 3.1A(2)(a) has been included to cover all grinding activities.

We are assigning **one** A(2) activity (reference AR3), for clinker grinding at this installation, to cover all cement mills processing clinker manufactured on site and imported. The Regulations do not define capacity or aggregation rules for 3.1A(2)(a) and having consulted EA permitting guidance, including RGN2 Appendix 2, we consider that multiple cement mills do not operate entirely independently and we can therefore regard them as one activity, incurring one part A(2) fee. Regarding each mill as a separate A(2) activity would increase charges per site in a manner disproportionate with the regulatory effort required.

There is however, one 3.1A(1)(a) activity for each kiln with a production capacity above the listed threshold of 500 t/d.

An additional part B activity is now included (activity AR3) for Storing, loading or unloading cement in bulk following the Regulations' amendment. This covers bulk storage of clinker and cement and loading into road and rail tankers (bulk transport). This activity is not covered by any other activity (listed or directly associated) following amendments to the Regs and is listed as a part B in its own right.

**Other changes to Table S1.1:**

Previously Tbl S1.1 contained only two DAAs; for cement storage, blending, packing & loading (now a part B activity), and for waste storage and handling. In line with our RGN2 guidance, the following activities have been included as DAAs, in order to ensure all appropriate activities at the installation are covered:

- Raw materials storage and handling,
- Fuels storage and handling (fossil and Waste derived),
- Clinker import,
- Discharge to controlled waters, including drainage and ponds.

We have revised the Limits of Specified Activity descriptions, to ensure that the activities are clearly defined.

**4. Schedule 3 Emissions**

**Table S3.1 TOC ELV:**

The BAT conclusions do not include a BAT-AEL for TOC emissions, instead Annex VI of IED applies. This prescribes a limit of 10 mg/Nm<sup>3</sup> and allows for a derogation from this where TOC emissions do not result from the co-incineration of waste. Cemex UK Limited ELV has been 20 mg/Nm<sup>3</sup> since WID was implemented in November 2005. This has been retained.

**Table S3.1 Requirement for ongoing monitoring of Dioxins, Dioxin like PCB and PAH.**

Air Emission Limit Values - Article 7 (d) Dioxins. The WID requires dioxins to be reported using the I-TEQ reporting convention to assess compliance against an emission limit of 0.1ng I-TEQ / Nm<sup>3</sup>. The UK's independent health advisory committee, Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT), has adopted the World Health Authority (WHO) toxicity equivalence factors (TEF) for both dioxins and dioxin-like PCBs in their recent review of Tolerable Daily Intake (TDI) criteria.

The Government is of the opinion that, in addition to the requirements of the WID, the WHO-TEF values for both dioxins and dioxin-like PCBs should be specified for

monitoring and reporting purposes. This will enable evaluation of exposure to dioxins and dioxin-like PCBs to be made using the revised TDI recommended by COT. Regulators will, therefore, set dioxin emission limits using on I-TEF (1990) values but with additional monitoring/reporting requirements for dioxins and dioxin-like PCBs using WHO-TEF (1997/98) factors as shown in the permit.

Article 7(5) (WID) allows Member States to set emission limits for other pollutants including polycyclic aromatic hydrocarbons (PAHs). There is lack of monitoring data on the release of PAHs from incinerators on which to base such limits or even to decide if a limit is required. The Waste Incineration directions thus require the regulators to impose monitoring requirements in the permits but not to set a limit. Once sufficient data is available, a decision can be made on the future of this requirement. The following PAHs should be monitored and results reported on the same frequency as for dioxins and dioxin-like PCBs.

Polycyclic Aromatic Hydrocarbons (PAHs) to be monitored:

Anthanthrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo(b)naph(2,1-d)thiophene, Benzo(c)phenanthrene, Benzo[ghi]perylene, Benzo[a]pyrene, Cholanthrene, Chrysene, Cyclopenta(c,d)pyrene, Dibenz[a,h]anthracene, Dibenz[a,i]pyrene, Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene.

This requirement for ongoing measurement of PAH will be reviewed in 2017.

#### **5. Schedule 6 Interpretation**

Schedule 6 has been revised to remove interpretations which are no longer relevant, amend existing and introduce new ones. The monitoring reference conditions are updated in line with the BAT conclusions (refer Key Issues section)

**Chapter IV abnormal operating conditions:** “abnormal operating conditions” has been prefixed with “chapter IV” to emphasise that these conditions relate to specific circumstances outlined in IED ch IV, for plants burning waste derived fuels. Prior to IED, this was termed “WID abnormal operating conditions”.

**Management System:** the guidance previously referenced, the EA’s Horizontal guidance Note H6, Environmental Management systems, has now been withdrawn. The .gov.uk website provides guidelines on what a management system should cover when operating a regulated industry.

<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits> It is no longer considered necessary to define management system in the interpretation section. The EMS system has also been reviewed as part of the BATC1.

**Chipped tyres:** included to clarify that this type of WDF includes shredded rubber conveyor belts.

**Kiln shut down:** this is revised to include an Operator-agreed feed rate in tonnes per hour.

**Kiln start up:** this is revised in line with current definition for start up, removing reference to use of WDFs to determine end of start up, and instead including an agreed threshold figure of raw meal feed into the kiln. We are now allowing an option to calculate the first daily average emission value using the 24 hour period after the end of kiln start up (ie when the kiln reaches a pre-determined feed rate). This is to avoid the anomaly which allowed for a daily average emission to be calculated from only a few hours of data if start up was achieved late in a 24 hour period, when

emissions may still be higher than typical. Emissions may take a while to stabilise as feeding of WDFs can only commence after start up is complete. Higher emissions initially are compensated for over a 24 hour period, with lower emissions once kiln stability is established, however this cannot be the case if only a few hours are used to derive a 24 hour period, leading to possible compliance issues.

Table 2.1 Fuels Sulphur content. The existing permit includes a limit of sulphur content for coal at <2.3% (w/w) and for petcoke <7% (w/w). This has been changed to Solid fossil fuels with a sulphur content <7% (w/w). The operator has requested this change to allow flexibility in its investigation of alternative fuel sources to aid in the reduction of Sulphur emissions. Historically this installation has used a high % of petcoke and replacement of this with other fuels has seen a reduction in SO<sub>2</sub> emission.