Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Tarmac Cement and Lime Limited

Tunstead Cement and Lime works
Wormhill
Buxton
Derbyshire
SK17 8TG

Variation number

EPR/XP3532DP/V002

Permit number

EPR/XP3532DP

Tunstead Cement and Lime works
Permit number EPR/XP3532DP

Introductory note

This introductory note does not form a part of the notice.

Under the Environmental Permitting (England & Wales) Regulations 2010 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. All the conditions of the permit have been varied and are subject to the right of appeal.

Brief description of the changes introduced by this variation notice:

This is an Environment Agency initiated variation and consolidation – consolidating previous variations of environmental permit EPR/XP3532DP. This variation incorporates a number of changes as a result of:

- a statutory review of permits in the Cement and Lime sector
- the incorporation of legislative changes following the publication of "Best Available Techniques (BAT) conclusions" for the production of cement, lime and magnesium oxide – published 9 April 2013.

Concurrent with this permit review we have considered requests for derogation from the Operator relating to BAT Conclusions 18 and 48. We have granted the derogation requests and include the derogations and the reasons for granting them in an Annex to the permit, as required by Article 15(4) of IED.

Brief description of the process:

Tunstead Cement and Lime works (the Installation) is operated by Tarmac Cement and Lime Limited and is located approximately 3km east of Buxton, Derbyshire, at grid reference SK09627555. The installation comprises two adjacent working quarries, Tunstead Quarry and Old Moor quarry; the cement and lime manufacturing facilities are located within Tunstead Quarry. Old Moor Quarry lies within the Peak District National Park, the boundary of which skirts the installation to the south west of Tunstead Quarry.

The main activities taking place at the installation are the production of cement and lime which are listed activities under 'The Environmental Permitting (England and Wales) Regulations 2010':

Section 3.1 part A(1)(a) Producing cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day.
Section 3.1 part A(1)(b) Producing lime or magnesium oxide in kilns with a production capacity of more than 50 tonnes per day.

The purpose of the operations carried out at this installation is to produce limestone (calcium carbonate), lime (calcium oxide), ground lime, hydrated lime (calcium hydroxide), milk of Lime (a calcium hydroxide suspension) and Portland cement.

Cement clinker production capacity is permitted to around 2 million tonnes per annum, on one operational pre-calciner kiln and a second pre-calciner kiln which is permitted but not yet built. Permitted lime production is just less than 1 million tonnes per annum.

The installation includes:

- The quarries and associated activities except drilling and blasting;
- All raw material handling and raw meal preparation operations;
- All associated fuel handling and storage operations;
- All clinker manufacturing, handling, grinding, storage, import and export operations;
- All cement handling, storage and bagging operations.
- All lime manufacturing and associated activities, including handling, hydrating, grinding, storage and bagging.

A range of fuels are permitted for use in cement manufacture: fossil fuels, including Coal and Petcoke, and non-hazardous Waste Derived Fuels (WDFs) of which a comprehensive list is included in table S2.1 of this permit. The lime kilns are all fuelled by natural gas only.

An on-site power generation facility is permitted to be built on site. This will consist of four 8MWe gas engines and will fall under the following listed activity by aggregation:

> Section 1.1 A (1) (a) – Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts.

Raw Materials Preparation and Handling
Limestone, from Tunstead quarry or Old Moor quarry, is transported to either the primary gyratory crusher or the No. 3 unit impact crusher for size reduction. Further stone preparation steps include screening and washing, depending on where the stone is to be used, with bulk storage in dedicated stockpiles. Raw materials imported to site for cement production are brought in by road and tipped into the enclosed Raw Material Store for bulk storage.

The No. 2 unit crusher washes and screens the limestone, and from here the stone fractions are either dispatched offsite or fed to the roadstone or lime kiln plants. The slurry from the stone washing is fed to deep cone thickener tanks to produce a thicker slurry (with a solids content of around 71%) for use in the cement making process.

Lime Production
The Installation operates up to five shaft kilns, although eight exist at the site, and a Maerz (parallel flow regenerative or PFRK) fine lime kiln. The kilns are all fuelled by natural gas to heat the limestone to >1000^{o}C in order to calcine the material (drive off carbon dioxide) and produce lime. The shaft kilns vent via two bag filters to two stacks (emission points A1 and A2), and the Maerz kiln vents via a bag filter to a single stack (emission point A19). There are no additional startup or standby fuels.

There are three hydration units incorporating six hydrators where lime is fed into each unit at a controlled rate along with water and additives. The lime reacts with the water and forms calcium hydroxide (hydrated lime) with the release of heat. The heat is used to drive off the water and form a fine dry powder.

There are facilities for grinding and screening the lime, as well as bagging operations, which are for both hydrated lime and lime. Solid lime products are dispatched by road, in bulk by road tanker or in bags.

Ground lime can be mixed with controlled quantities of water to produce of milk of lime (lime slaking), a liquid product known as Kalic, which is dispatched by road in bulk or IBCs.

Wastes from the lime production process are either used in the cement process or sent off-site to a permitted mining waste or waste operation site for disposal.

Lime can be imported by road from the sister site Hindlow Quarry for further processing.

Cement Clinker Production
From bulk storage, the raw materials (limestone, clay slurry, imported iron ore, marl, shale, silica sand and recycle lime products) are extracted, weighed and conveyed to the raw mills, where they are ground and dried using hot air from the clinker cooler and preheater, to produce kiln raw meal. The gases are then released to air via the kiln's bag filters and the raw meal is pneumatically/mechanically conveyed to silos for intermediate storage.

The raw meal is then mechanically conveyed to each of the pre-heater systems (consisting of four-stage pre-heaters operating at temperatures in excess of 850^{o}C) where the hot kiln exit gases are used to heat the incoming raw meal. The preheated raw meal passes through the in-line calciners (ILCs) prior to entering one of the two rotary cement kilns. The material moves slowly through the kilns, reaching a final temperature of about 1400^{o}C at the front combustion zone, by which point the material are converted into clinker. The rated production capacities are 2250 and 3300 tonnes of clinker per day for kilns K1 and K2 respectively.

Coal and petcoke are finely milled in the coal mills and dried using heat from the kilns exhaust gases before being injected into the kiln main burner and calciner. The milled coal/petcoke and WDFs are blown into the front end of the kilns producing a flame temperature of about 2000^{o}C. WDFs and coal are also burnt in the ILCs.

The hot clinker exits the kiln and is rapidly cooled in the clinker coolers using air, some of which is then used in the raw mill to dry raw meal and as preheated process air, with the remainder released to air via bag filter dust abatement. Cooled clinker is then transported for intermediate storage to clinker silos. Clinker can also be dispatched directly (without milling operations) for processing elsewhere. Clinker may also be imported to the site.

Cement Production
Cooled clinker is milled with gypsum, recovered gypsum, limestone and other materials to produce cement. The cement is stored in silos or pneumatically conveyed to the rail and Bagging Plant silos. Cement can be bagged for sale to customers, or exported from site in bulk by rail and road or used in the on-site Ready-mix concrete plant.

Emissions

Emissions to air: the main emissions from the lime kilns are oxides of nitrogen (NOx), carbon monoxide (CO), particulate matter (PM) and sulphur dioxide (SO_2). The main air emissions from the cement kiln are NOx, CO, SO_2, PM, hydrogen chloride (HCl), total organic carbon (TOC) and ammonia (NH_3). Emission monitors continuously measure the concentrations of these parameters prior to release from the cement kiln main stacks. Selective Non-Catalytic Reduction (SNCR) NOx abatement by aqueous ammonia is installed on the preheater of the existing cement kiln and included in the design of the new kiln (unbuilt), with a backup system of urea prills. Bag filters are used to abate PM from all emission points except the lime hydrators, which use mop scrubbers.

Emissions to water: there are three permitted discharges to controlled water, from two settlement ponds and a tank, which allow infiltration to underlying strata. There are no direct discharges to surface water or sewer from the site.

Process waste materials are sent off site for further recovery/recycling or disposal. The cement plant does not produce waste dusts, such as cement kiln dust (CKD) or bypass dust (BPD).

There are a number of sensitive ecological receptors close to the installation, with two Special Areas of Conservation (SAC) and one Special Protection Area (SPA) sites within 10km, and 6 Sites of Special Scientific Interest (SSSI) within 2km. The installation overlies a principal aquifer.

The installation operates a documented Business Management System, which is certified as conforming to ISO14001.

The cement kilns are deemed waste co-incineration plants under chapter IV of the Industrial Emission Directive (IED) due to the use of waste-derived fuels. IED requirements are applied through this permit.

This permit does not cover the Ready mix concrete plant on site, which is regulated by the Local Authority under a separate permit.

The schedules specify the changes made to the permit.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	**Date**	**Comments**
Application BK9504 (EPR/BK9504IM/A001)	Received 15/08/01	Applicant – Buxton Lime Industries Ltd.
Additional Information	Received 28/02/02	Response to Schedule 4 notice issued 20/12/01
Permit BK9504 (EPR/BK9504IM) determined	Effective 28/03/03	Permit issued to **Buxton Lime Industries Ltd.**
Environment Agency variation EPR/BK9504IM/V002	Effective 10/03/06	Variation to correct permit errors
Application for variation EPR/BK9504IM/V003	Duly made 13/03/06	
Variation EPR/BK9504/V003 determined	Effective 31/08/06	Use of tyre chips as a waste derived fuel
Application for transfer EPR/XP3534UY/T001	Duly made 23/03/07	
Transfer EPR/XP3534UY/T001 determined	Effective 17/05/07	Permit transferred from Buxton Lime Industries Ltd to **Tarmac t/a Buxton Lime and Cement**
Application for variation EPR/XP3534UY/V002	Duly made 07/05/07	
Variation EPR/XP3534/V002 determined.	Effective 05/11/07	Use of Meat and Bone Meal as a waste derived fuel
Application for variation EPR/XP3534UY/V003	Duly Made 11/09/08	
Additional information	Received 18/12/08, 23/12/08, 06/02/09	
Variation EPR/XP3534UY/V003 determined	Effective 27/02/09	Install new Maerz kiln to replace old rotary lime kilns
Application for variation EPR/XP3534UY/V004	Duly Made 23/04/09	New cement plant, kiln K2, and power plant
Additional information	Received 15/07/09	(Existing and new plant)
Additional information	Received 28/07/09	(Met data for air quality modelling)
Additional information	Received 23/10/09	(BAT Options appraisal)
Additional information	Received 27/11/09	(acid and nutrient nitrogen deposition for air quality modelling)
Additional information	Received 07/12/09	(existing chromium and arsenic emissions for EPAQS assessment)
Additional information	Received 30/04/10	(acid and nutrient nitrogen deposition isopleths)
Additional information	Received 10/05/10	(revised acid and nutrient nitrogen deposition isopleths)
Additional information	Received 16/06/10	(revised emissions modelling)
Additional information	Dated 06/07/10	Letter informing of revised emission gas flow rates
Variation EPR/XP3534UY/V004 Not issued separately but as part of V006	Decision made 01/06/10	
Application for variation EPR/XP3534UY/V005	Duly made 04/02/10	
Additional information	Received 07/04/10	
Variation EPR/XP3534UY/V005 determined	Effective 28/04/10	Use of Calfuel (solid recovered fuel) as a waste derived fuel
Environment Agency variation EPR/XP3534UY/V006	Effective 20/08/10	Agency initiated variation following the Cement and Lime sector permit review 2010

Status log of the permit		
Description	**Date**	**Comments**
Environment Agency variation EPR/XP3534UY/V007	Effective 13/07/12	Agency initiated variation to make a number of minor revision to the permit
Application for variation EPR/XP3534UY/V008	Duly made 10/09/13	Application to change company name and registered office address
Variation EPR/XP3534UY/V008 determined	Effective 22/11/13	New operator name **Lafarge Tarmac Trading Limited**
Application for variation EPR/XP3534UY/V009	Duly made 14/03/14	Application received 10 February 2014
Regulation 60 Notice	Issued 25/04/14	Notice issued to Lafarge Tarmac Trading Limited
Variation EPR/XP3534UY/V009 determined	Effective 19/05/14	SNCR on kiln K1 and use of WTRG in the main burner
Application for variation EPR/XP3534UY/V010	Duly made 28/10/14	Application received 24 September 2014
Response to Regulation 60 Notice	Received 08/01/15	Additional information received on 03/07/15, 28/11/16 and 17/02/17; Derogation information received on 30/10/15, 05/11/15, 09/12/15, 21/03/16, 30/09/16 and 02/12/16;
Variation EPR/XP3534UY/V010 determined	Effective 19/01/15	MPA code of Practice: to add list of waste codes suitable in principle, remove Group III metals specification in fuels and consolidate waste derived fuels naming.
Application for variation EPR/XP3534UY/V011	Duly made 23/10/15	Notification of change in company name
Variation EPR/XP3534UY/V011 determined	Effective 08/01/16	Name changed to **Tarmac Trading Limited**
Application for transfer EPR/XP3532DP/T001	Duly made 06/09/16	Application to transfer the permit in full to Tarmac Cement and Lime Limited.
Transfer EPR/XP3532DP/T001 determined	Effective 13/09/16	Permit transferred from Tarmac Trading Limited to **Tarmac Cement and Lime Limited**
Additional information	Received 19/10/16	New operator taking ownership of responses made to Regulation 60 Notice submitted by previous operator
Environment Agency variation and consolidation EPR/XP3532DP/V002 (PAS billing reference MP3036DF)	Effective xx/mm/17	Environment Agency initiated variation and consolidation following the Cement and Lime Sector permit review.

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2010

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2010 varies and consolidates

Permit number

EPR/XP3532DP

Issued to

Tarmac Cement and Lime Limited ("the operator")

whose registered office is

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

company registration number 00066558

to operate a regulated facility at

Tunstead Cement and Lime works
Wormhill
Buxton
Derbyshire
SK17 8TG

to the extent set out in the schedules.

The notice shall take effect from DD/MM/2017

Name	Date
[name of authorised person] **Type name, signature not needed**	**[DD/MM/YYYY]**

Authorised on behalf of the Environment Agency

Schedule 1

All conditions have been varied by the consolidated permit as a result of an Environment Agency initiated variation.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number

EPR/XP3532DP

This is the consolidated permit referred to in the variation and consolidation notice for Environment Agency led variation EPR/XP3532DP/V002 authorising,

Tarmac Cement and Lime Limited ("the operator"),

whose registered office is

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

company registration number 00066558

to operate an installation at

Tunstead Cement and Lime works
Wormhill
Buxton
Derbyshire
SK17 8TG

to the extent authorised by and subject to the conditions of this permit.

Name	Date
[name of authorised person]	**[DD/MM/YYYY]**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.1.4 The operator shall comply with the MPA Code of Practice dated October 2014.

1.2 Energy efficiency

1.2.1 The operator shall:

(a) take appropriate measures to ensure that energy is recovered with a high level of energy efficiency and energy is used efficiently in the activities.

(b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and

(c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;

(b) maintain records of raw materials and water used in the activities;

(c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

(d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.1.2 Activity AR13 (schedule 1, table S1.1) shall not commence operation until the operator has obtained an effective Chapter III Large Combustion Plant environmental permit, to incorporate the requirements of Annex V Part 2 of the IED, or confirmed that the gas engines are each <15MWth input and therefore do not fall under chapter III of the IED.

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan , and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.4 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.1;

(b) it conforms to the description in the documentation supplied by the producer and holder; and

(c) it having been separately collected for recycling, it is subsequently unsuitable for recovery by recycling.

2.3.5 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:

(a) the nature of the process producing the waste;

(b) the composition of the waste;

(c) the handling requirements of the waste;

(d) the hazardous property associated with the waste, if applicable; and

(e) the waste code of the waste.

2.3.6 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.3.7 All waste derived fuels used at the installation are subject to the following conditions:

(a) No radioactive materials or radioactive wastes (as defined by sections 1 and 2 of the Radioactive Substances Act 1993) shall be included.

(b) No substances with PCB concentrations greater than 10mg/kg shall be included.

(c) No substances with PCP concentrations greater than 100mg/kg shall be included.

(d) No pharmaceutical products, pesticide products, biocide products and iodine compounds shall be included except as constituents of other materials and at levels that are minimised as far as reasonably practicable.

(e) No dioxins or furans shall be included except as constituents of other materials and at levels that are minimised as far as reasonably practicable.

(f) No medical/clinical waste shall be included

2.3.8 The operator shall obtain prior written approval from the Environment Agency for each feasibility trial of a Waste Derived Fuel (WDF) not listed in Table S2.1. Any such feasibility trials will be limited to a maximum of 100 tonnes of the fuel and a maximum duration of 14 days

2.3.9 Waste materials, not listed in table S2.1, shall not be used as raw materials in the process except with the prior written approval of the Environment Agency, and shall be subject to the specification in table S2.1 of schedule 2 or otherwise agreed in writing with the Environment Agency.

2.3.10 The operator shall ensure that prior to accepting waste derived fuels subject to condition 2.3.3 at the site, it has obtained sufficient information about the wastes to be burned as fuel to demonstrate compliance with the characteristics described in condition 2.3.3.

2.3.11 The operator shall take representative samples of all waste derived fuels delivered to the site unless otherwise agreed in writing with the Environment Agency and test a representative selection of these samples to verify conformity with the information obtained as required by condition 2.3.10. These samples shall be retained for inspection by the Environment Agency for a period of at least 1 month after the material is burned and results of any analysis made of such samples will be retained for at least 2 years after the material is burned.

2.3.12 For activities AR1 and AR2 (schedule 1, table S1.1) waste derived fuels shall not be burned, or shall cease to be burned, if:

(a) the kiln is in start-up (as agreed in writing with the Environment Agency); or

(b) the kiln is in the process of shutting down (as agreed in writing with the Environment Agency); or

(c) raw meal feed rate is less than 140 tonnes/hr; or

(d) the fourth stage cyclone exit temperature is below or falls below 835^{o}C when using non-hazardous waste, or hazardous waste where the content of halogenated organic substances (as chlorine) does not exceed 1%; or

(e) any continuous emission limit value in schedule 3 table S3.1 is exceeded due to disturbances or failures of the abatement systems, other than under “Chapter IV abnormal operating conditions”; or

(f) monitoring results required to demonstrate compliance with any continuous emission limit value in schedule 3, table S3.1 are unavailable other than under “Chapter IV abnormal operating conditions”.

2.3.13 The operator shall record the beginning and end of each period of “Chapter IV abnormal operating conditions”, and shall restore normal operation of the failed equipment or replace the failed equipment as rapidly as possible.

2.3.14 Where, during “Chapter IV abnormal operating conditions”, any of the following situations arise, the operator shall, as soon as is practicable, cease the burning of waste derived fuels until normal operation can be restored:

(a) continuous measurement shows that an emission exceeds any emission limit value in schedule 3 table S3.1 due to disturbances or failures of the abatement systems, or continuous emission monitor(s) for a total of four hours uninterrupted duration;

(b) the cumulative duration of “Chapter IV abnormal operating conditions” periods over one calendar year exceeds 60 hours on each kiln.

2.3.15 The operator shall interpret the end of the period of “Chapter IV abnormal operating conditions” as the earliest of the following:

(a) when the failed equipment is repaired and brought back into normal operation;

(b) when the operator initiates a shut down of the waste derived fuels, as described in the application or as agreed in writing with the Environment Agency;

(c) when a period of four hours has elapsed from the start of the “Chapter IV abnormal operating conditions”;

(d) when, in any calendar year, an aggregated period of 60 hours “Chapter IV abnormal operating conditions” has been reached for a given kiln.

2.3.16 Hazardous waste shall not be mixed, either with a different category of hazardous waste or with other waste, substances or materials, unless it is authorised by schedule 1 table S1.1 and appropriate measures are taken.

2.4 Improvement programme

2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.5 Pre-operational conditions

2.5.1 The operations specified in schedule 1 table S1.4A shall not commence until the measures specified in that table have been completed.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2, and S3.3.

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.1.3 Where a substance is specified in schedule 3 table S3.3 but no limit is set for it, the concentration of such substance in emissions to water from the relevant emission point shall be no greater than the background concentration.

3.1.4 Total annual emissions from the emission points set out in schedule 3 tables S3.1, S3.2, and S3.3 of a substance listed in schedule 3 table S3.4 shall not exceed the relevant limit in table S3.4.

3.1.5 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.3.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) point source emissions specified in tables S3.1, S3.2, and S3.3;

(b) ambient air monitoring specified in table S3.5;

(c) process monitoring specified in table S3.6;

3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency. Newly installed CEMs, or CEMs replacing existing CEMs, shall have MCERTS certification and have an MCERTS certified range which is not greater than 1.5 times the daily emission limit value (ELV) specified in schedule 3 table S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges.

3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.2 and S3.3 unless otherwise agreed in writing by the Environment Agency.

3.5.5 For activities AR1 and AR2, where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1; the Continuous Emission Monitors shall be used such that;

(a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages:

- Ammonia 40 %
- Carbon monoxide 10%
- Sulphur dioxide 20%
- Oxides of nitrogen (NO & NO2 expressed as NO2) 20%
- Particulate matter 30%
- Total organic carbon (TOC) 30%

- Hydrogen chloride 40%

(b) valid half-hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.5.5 (a);

(c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete half-hour period, the half-hourly average shall in any case be considered valid if measurements are available for a minimum of 20 minutes during the half-hour period. The number of half-hourly averages so validated shall not exceed 5 per day;

(d) daily average values shall be determined as the average of all the valid half-hourly average values within a calendar day. The daily average value shall be considered valid if no more than five half-hourly average values in any day have been determined not to be valid;

(e) no more than ten daily average values per year shall be determined not to be valid.

3.5.6 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1:

(a) a QAL2 test as specified in BS EN 14181 shall be performed at least every three years or whenever there are significant changes to either the process, the fuel used or to the CEMs themselves;

(b) an Annual Surveillance Test (AST) shall be performed at least annually, as specified within BS EN 14181;

(c) the operator shall have a procedure to apply the QAL3 requirements of BS EN 14181

3.6 Fire prevention

3.6.1 The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.

3.6.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;

(b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;

(b) the annual production /treatment data set out in schedule 4 table S4.2; and

(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

(d) the functioning and monitoring of the plant involved with the burning of waste derived fuels, in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Chapter IV of the Industrial Emissions Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED

4.2.3 Within 1 month of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4 table S4.1;

(b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4 ; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.2.6 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency, using the form specified by the Environment Agency for the purpose, the information specified on the form, relating to the types of waste Alternative Raw Materials and waste-derived fuels that the Operator has used in that quarter

4.3 Notifications

4.3.1 In the event:

(a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

(i) inform the Environment Agency,

(ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

(iii) take the measures necessary to prevent further possible incidents or accidents;

(b) of a breach of any permit condition the operator must immediately—

(i) inform the Environment Agency, and

(ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;

(c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) any change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:

(a) a decision by the Secretary of State not to re-certify the agreement;

(b) a decision by either the operator or the Secretary of State to terminate the agreement; and

(c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “immediately”, in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity**	**Limits of specified activity**
Cement-related activities:			
AR1, AR2	Section 3.1 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.	Kilns K1 and K2 From the transport of raw materials and fuels from bulk storage, the preparation (including blending of raw materials listed in table S2.1, in order to produce raw meal) and feeding of all materials into the kiln systems K1 and K2, through to discharge of cooled clinker to clinker storage. Includes emissions to air from the main stack and other process vents and associated abatement.
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 and associated abatement.
AR4	Section 3.1 Part B(a)	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	Section 3.1 Part 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 and bagging of cement, through to storage and loading for dispatch by road, including associated releases to air.
Lime-related activities:			
AR6 – AR10	Section 3.1 Part A(1)(b)	Producing lime in shaft kilns 1 – 8 with a production capacity of more than 50 tonnes per day. Maximum of five kilns permitted to operate at any one time.	From bulk storage of lime kiln feed stone, any preparation then feed of limestone and fuel into the kilns, through to intermediate storage of lime product prior to further processing or dispatch by road. Includes releases to air from stack and process vents and associated abatement
AR11	Section 3.1 Part A(1)(b)	Producing lime in the parallel flow regenerative (PFRK) kiln with a production capacity of more than 50 tonnes per day	From bulk storage of lime kiln feed stone, screening, washing and feed of limestone and fuel into the kiln, through to intermediate storage of lime product prior to further processing or dispatch by road. Includes associated releases to air from the main stack and other process vents and abatement.
A12	Section 3.1 Part B(c)	Slaking lime for the purposes of making calcium hydroxide.	From lime storage to the production of dry calcium hydroxide and milk of lime by hydration (including the addition of any additives), and the associated

Table S1.1 activities			
Activity reference	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity**	**Limits of specified activity**
			releases to air from the stacks and other process vents.
Other activities:			
AR13	Section 1.1 Part A(1)(a)	Burning any fuel in an appliance with a rated thermal input of 50 or more MW	From the receipt of natural gas to the generation of electrical power in four 8MWe gas engines (with an aggregated thermal input greater than 50MWth) for use on-site.
	Directly Associated Activity		
AR14	Raw materials storage and handling	Raw materials receipt, transport, preliminary preparation and bulk storage	From the recovery of limestone from the quarry floors, the crushing, washing and screening, and the receipt on site of other raw materials including alternative raw materials, through to bulk storage.
AR15	Fuels storage and handling	Delivery and bulk storage of fuels	Offloading of waste-derived and fossil fuels, and transfer to bulk storage
AR16	Clinker and lime import	Bulk import of cement clinker by road and rail, and lime by road	Offloading of cement clinker and lime imported to site by road and rail and transfer to storage.
AR17	Waste storage and handling	Waste storage and handling	From waste generation arising from cement and lime processes, handling, storage and monitoring through to dispatch off site.
AR18	Lime storage and milling	Lime product handling, storage and milling	Milling of lime, including addition of grinding aids, and associated releases to air.
A19	Lime products handling, storage, packing and dispatch	All lime, hydrated lime and milk of lime blending, packing and loading.	From receipt of lime products from the kilns, mills and hydrators through storage, bagging and loading to the dispatch offsite by road, including associated air releases.
AR20	Water discharge to controlled water	Discharge of site drainage and process water from settlement lagoons	Collection and treatment of surface water drainage and process water, including reuse in site activities, through to discharge to groundwater by infiltration from settlement lagoons.

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application BK9504IM (EPR/BK9504IM/A001)	The response to questions 2.1and 2.3 in the Application.	15/08/2001
Schedule 4 Response	The response to schedule 4 notice dated 05/02/2002	05/02/2002
Application for tyre chip variation EPR/BK9504IM/V003	The response to questions given in section C2.1, C2.3, C2.4 and C2.10 of the application for this variation.	13/03/2006
Application for MBM variation EPR/XP3534UY/V002	The response to questions given in section C2.1, C2.3, C2.4 and C2.10 of the application for this variation.	07/05/2007
Application for Maerz kiln EPR/XP3534UY/V003	Sections 2.1, 2.2 and 2.3 of the Application (report 49306597).	29/08/2008
Application for cement kiln K2 EPR/XP3534UY/V004	Sections 2, 3, and 6 of Application to vary PPC Permit ref XP3534UY.	23/03/2009

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Additional information (distinguishing existing and new plant associated to K2 Cement Kiln).	All.	15/07/2009
Additional Information (BAT Options Appraisal).	All.	23/10/2009
Application to burn Calfuel EPR/XP3534UY/V005	Sections 4, 5, 6 and 7 of Application	04/02/2010
Additional information (revised emissions modelling).	All.	16/06/2010
Letter informing of revised emission gas flow rates.	All.	06/07/2010
Technical Evaluation of the burning of Calfuel as a Cement Fuel.	All.	27/07/2011
Application EPR/XP3534UY/V009 for SNCR at Cement Kiln K1 and use of WTRG in the main burner.	The response to Qu 3 Operating techniques, given in Part C3 of the application form. Includes Table 3a – Technical Standards Application Supporting Information dated February 2014	10/02/2014
Application for variation EPR/XP3534UY/V010 to adopt the procedures outlined in the Code of Practice dated October 2014.	The response to question 3 Operating techniques, given in Part C3 of the application form. Includes Table 3 – Technical Standards The following sections of the supporting information document "Application for a Normal Variation to allow the addition of the MPA Code of Practice for the use of Waste Materials in Cement Manufacture" dated 11th September 2014: C3 section 1 – Types of wastes accepted, C3 section 3 – Operating Techniques	24/09/14 and 9/10/14
Response to Regulation 60(1) Notice dated 25/04/14 requiring information	In relation to the IED Best Available Techniques, the details submitted against CLM BAT conclusion numbers 1 – 54 [excluding responses to BATCs 17, 18, 23, 29, 37-39, 46, 49, and 51].	08/01/15
	Additional information provided against the IED Best Available Techniques, the details submitted against CLM BAT conclusion numbers 9, 10, 11, 12, 13, 26, 29, 32, 42, 50, and 52.	03/07/15
	In relation to the IED Best Available techniques, the details submitted against CLM BAT conclusion numbers 17 and 18.	30/09/16
	In relation to the IED Best Available techniques, the details submitted against CLM BAT conclusion numbers 1, 11, 12, 16, 18, 19, 24, 42, 45, 50.	28/11/16
	In relation to the IED Best Available techniques, the details submitted against CLM BAT conclusion number 16 and 18.	17/02/17

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC6	Following commissioning of cement kiln K2, the Operator shall supply a commissioning report detailing performance against the plan submitted in accordance with pre-operational measure PO3, table S1.4. The report shall include: • A demonstration that the plant complies in full with the requirements of ch IV of the IED; • Details of any abnormal waste generated as a result of commissioning; • Details of any modifications made to the process during commissioning that change the details included in the application. • A full record of monitored emissions from the installation during commissioning. Where emissions exceed stated limits, the reasons for this should be stated and what action was taken to correct matters. • Evidence that emissions comply with all relevant BAT-AELs; • A report on the noise assessment carried out.	Within 4 months of the end of commissioning of cement kiln K2
IC7	The Operator shall carry out an assessment of the impact of emissions to air of Arsenic and Chromium (VI) having regard to the 2009 report of the Expert Panel on Air Quality Standards – Guidelines for Metal and Metalloids in Ambient Air for the Protection of Human Health. The assessment shall predict the impact of Arsenic and Chromium (VI) against the guidelines through the use of emissions monitoring data during the first year of operation and air dispersion modelling. A report on the assessment shall be submitted to the Environment Agency.	Within 15 months of the commencement of clinker production on cement kiln K2
IC14	The operator shall investigate the feasibility of installing monitoring access to and/or modifying the ductwork of dust emission points A30 to A50 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^3. 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,	31/0717
IC15	The operator shall provide a report summarising an investigation into the factors affecting the uncertainty of TOC measurements from PFRK kilns. The investigation shall consider the practical application of the relevant standard when dealing with cyclical process associated with PFRK operation. Where appropriate, the operator may undertake stack sampling outside normal compliance testing to further the investigation. The final report may suggest adjustments to the method to ensure uncertainties can be minimised.	31/0717
IC16	The operator shall submit a report to the Environment Agency (for approval in writing) detailing progress towards compliance with BAT conclusion 18, which sets a BAT-AEL for dust emissions from cooling and milling processes abated by fabric filters of <10mg/Nm^3 (daily average or average over the sampling period), for which a derogation has been requested and granted at emission reference A21, the K1 clinker cooler. The report shall include, but not be limited to, the following: 1. current performance of the A21 bag filter against the BAT-AEL; 2. the intention to make further investment (if required) to achieve compliance; 3. any alterations to the initial plan, together with proposals for amended timescales.	31/03/18
IC17	The Operator shall undertake a geochemical assessment of the impacts from lagoon water infiltration at emission points W1, W2 and W3 as it infiltrates through the unsaturated zone, and any impacts / potential impacts upon the quality of underlying groundwater. The assessment shall include, but not be limited to, either of the following: • groundwater quality sampling with analysis for pH, conductivity, major ions, hardness, alkalinity and nitrate, OR	30/09/18

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	• review equivalent data (not older than 2010) with a minimum of 6 samples taken over a 12 month period and including samples from each season of the calendar year, for the parameters listed above. If the assessment indicates that an impact on groundwater may occur, then the report shall propose further improvement works (such as hydrogeological risk assessments and/or a scheme to treat lagoon water) to be implemented within 12 months (or other timescale as proposed within the report). A report detailing the findings of the assessment shall be submitted to the Environment Agency for written approval.	

Table S1.4A Pre-operational measures	
Reference	**Pre-operational measures**
PO1	For activity AR2 (cement kiln K2 and associated plant), the Operator shall provide a report detailing the storage and containment measures in place for the storage and containment of aqueous Ammonia for Cement Kiln K2, for approval in writing by the Environment Agency. The report shall confirm compliance in accordance with current and best practice design standards in order to demonstrate emissions are prevented, and where not practicable, minimised.
PO2	For activity AR2, the operator shall submit written proposals for a commissioning programme for Cement Kiln K2 (for approval in writing by the Environment Agency) to include, but not be limited to: • Monitoring of process parameters in accordance with IED chapter IV article 50. • Monitoring of any abnormal waste generated during commissioning. • A noise survey in accordance with the criteria specified within BS4142. • Testing of associated new plant (as identified within additional information dated 15/07/2010).
PO3	For activity AR13, the operator shall submit written proposals for a commissioning programme for the power plant (for approval in writing by the Environment Agency) to include, but not be limited to: • Monitoring of process parameters in accordance Table S3.2. • A noise survey in accordance with the criteria specified within BS4142.
PO4	Prior to commissioning of AR2, the operator shall consider the existing impact assessment / air dispersion modelling report for the Installation, and confirm the following in writing to the Environment Agency: • That the clinker production rates, effective volumetric flow rates and emission rates used in the modelling reflect current maximum or any future planned increased clinker production, volumetric flow and emission rates. • The maximum total annual emissions of oxides of nitrogen, ammonia and sulphur dioxide modelled. • That the assessments were undertaken using uncorrected emission data (rather than emissions data calculated to standardised reference conditions and before IED chapter IV confidence correction was applied). • That the sensitive receptors and other factors such as environmental standards / targets, as included within the dispersion modelling report, remain relevant. Where any of the above identify variances to the conditions used within the impact assessment / air dispersion modelling, then the Operator shall undertake a new impact assessment / air dispersion modelling for all emissions to air from the Installation (as listed within tables S3.1 and S3.2) in order to confirm all impacts as acceptable. The Environment Agency may revise the limits within table S3.1 and/or impose annual limits following completion of this improvement condition.

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels			
Raw materials and fuel description	**Specification**		
Alternative Raw Materials			
Wastes used as raw materials (not as fuels)	Minimum Mineral Content	At least 80% dry weight (w/w)	
	Organic Materials	Organic Materials as measured by net CV should be <10MJ/kg	
	Mercury	≤ 2 ppm	
	TOC/VOC	≤ 5000 mg/kg as organic hydrocarbon	
	No materials which are defined as carcinogens for the purposes of the COSHH Regulations 2002 (as amended) shall be used.		
EWC Numbers (excluding domestic municipal wastes)			
01 Wastes resulting from exploration, mining, quarrying, physical and chemical treatment of minerals	wastes from mineral metalliferous excavation		01 01 01
	wastes from mineral non-metalliferous excavation		01 01 02
	waste gravel and crushed rocks other than those mentioned in 01 04 07		01 04 08
	waste sand and clays		01 04 09
	wastes from stone cutting and sawing other than those mentioned in 01 04 07		01 04 13
02 Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	soil from cleaning and washing beet		02 04 01
	off-specification calcium carbonate		02 04 02
03 Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	lime mud waste		03 03 09
04 Wastes from the leather, fur and textile industries	liming waste		04 01 02
06 Wastes from inorganic chemical processes	calcium-based reaction wastes other than those mentioned in 06 09 03		06 09 04
	calcium-based reaction wastes from titanium dioxide production		06 11 01
10 Wastes from thermal processes	bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)		10 01 01
	Coal fly ash		10 01 02
	fly ash from peat and untreated wood		10 01 03
	calcium-based reaction wastes from flue-gas desulphurisation in solid form		10 01 05
	calcium-based reaction wastes from flue-gas desulphurisation in sludge form		10 01 07

Table S2.1 Raw materials and fuels		
Raw materials and fuel description	**Specification**	
	bottom ash, slag and boiler dust from co-incineration other than those mentioned in 10 01 14	10 01 15
	fly ash from co-incineration containing hazardous substances	10 01 16*
	Fly ash from co-incineration other than those mentioned in 10 01 16	10 01 17
	Mill scales	10 02 10
	sludges and filter cakes from gas treatment containing hazardous substances.	10 02 13*
	casting cores and moulds which have not undergone pouring other than those mentioned in 10 09 05	10 09 06
	Casting cores and moulds which have undergone pouring other than those mentioned in 10 09 07	10 09 08
	casting cores and moulds which have not undergone pouring, other than those mentioned in 10 10 05	10 10 06
	casting cores and moulds which have undergone pouring, other than those mentioned in 10 10 07	10 10 08
	Waste glass-based fibrous materials	10 11 03
	Discarded moulds	10 12 06
	waste ceramics, bricks, tiles and construction products (after thermal processing)	10 12 08
	waste preparation mixture before thermal processing	10 13 01
	wastes from calcination and hydration of lime	10 13 04
	Particulates and dust (except 10 13 12 and 10 13 13)	10 13 06
	Wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10	10 13 11
	Solid wastes from gas treatment containing hazardous substances	10 13 12*
	Solid wastes from gas treatment other than those mentioned in 10 13 12	10 13 13
	Waste concrete and concrete sludge	10 13 14
16 Wastes not otherwise specified in the list	Spent catalysts containing transition metals or transition metal compounds not otherwise specified	16 08 03
	Spent fluid catalytic cracking catalysts (except 16 08 07)	16 08 04

Table S2.1 Raw materials and fuels		
Raw materials and fuel description	**Specification**	
	spent catalysts contaminated with hazardous substances	16 08 07*
17 Construction and demolition wastes (including excavated soil from contaminated sites)	concrete	17 01 01
	bricks	17 01 02
	tiles and ceramics	17 01 03
	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06*.	17 01 07
	soil and stones other than those mentioned in 17 05 03	17 05 04
	dredging spoil other than those mentioned in 17 05 05	17 05 06
	track ballast other than those mentioned in 17 05 07	17 05 08
	Gypsum-based construction materials other than those mentioned in 17 08 01	17 08 02
19 Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use	Aqueous liquid wastes from gas treatment and other aqueous liquid wastes	19 01 06*
	Fly ash containing hazardous substances	19 01 13*
	Premixed wastes composed only of non-hazardous wastes	19 02 03
	Premixed wastes composed of at least one hazardous waste	19 02 04*
	Sludges from treatment of urban waste water	19 08 05
	Sludges from water clarification	19 09 02
	minerals (for example sand, stones)	19 12 09
	Other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances	19 12 11*
	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	19 12 12
Fuels (including Waste Derived Fuels)		
Gas oil	Sulphur Content ≤0.1% by weight (w/w)	
Coal	Sulphur Content ≤5.0% by weight (w/w)	
Petcoke	Sulphur Content ≤8.0% by weight (w/w)	
Coal / Petcoke mix	Sulphur Content ≤5.5% by weight (w/w)	
Waste generated on-site in connection with the handling and storing of waste derived fuels	Burnt with chipped tyres at a rate that constitutes less than 1.0% by mass of the chipped tyre feed rate.	
New waste derived fuel for feasibility trials	Specification to be agreed in writing with the Environment Agency.	

Table S2.1 Raw materials and fuels		
Raw materials and fuel description	**Specification**	
Chipped Tyres	EWC Number	16 01 03
	Gross CV	15 – 40 MJ/kg
	Sulphur	≤2.0%
Meat & Bone Meal (MBM)	EWC Number	02 02 03
	Gross CV	10 – 40 MJ/kg
	Sulphur	≤2.0%
	Chlorine	≤2.0%
Solid Recovered Fuel (SRF)	Gross CV	10 – 40 MJ/kg
	Sulphur	≤2.0%
	Chlorine	≤2.0%
	Total Fluorine, Bromine & Iodine	≤1.5%
	Mercury	≤10 mg/kg
	Total Group II Metals (Cd + Tl)	≤30 mg/kg
Waste Liquid Fuels (WLF)	Gross CV	10 – 42 MJ/kg
	Sulphur	≤2.0%
	Chlorine	≤2.0%
	Total Fluorine, Bromine & Iodine	≤1.5%
	Mercury	≤20 mg/kg
	Total Group II Metals (Cd + Tl)	≤40 mg/kg
Processed Sewage Pellets (PSP)	Gross CV	10 – 40 MJ/kg
	Sulphur	≤2.0%
	Chlorine	≤2.0%
	Mercury	≤10 mg/kg
	Total Group II Metals (Cd + Tl)	≤30 mg/kg
Recovered Fuel Oil (RFO)	Gross CV	30 – 48 MJ/kg
	Sulphur	≤2.0%
	Chlorine	≤2.0%
	Mercury	≤20 mg/kg
	Total Group II Metals (Cd + Tl)	≤40 mg/kg
Wood	Gross CV	10 – 40 MJ/kg
	Sulphur	≤2.0%
	Chlorine	≤2.0%
	Total Fluorine, Bromine & Iodine	≤1.5%
	Mercury	≤10 mg/kg

Table S2.1 Raw materials and fuels		
Raw materials and fuel description	**Specification**	
	Total Group II Metals (Cd + Tl)	≤30 mg/kg
EWC Numbers (excluding domestic municipal wastes)		
02 Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	Waste plastics (except packaging)	02 01 04
	Wastes from forestry	02 01 07
	materials unsuitable for consumption or processing	02 02 03
03 Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard	Waste bark and cork	03 01 01
	Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04	03 01 05
	Waste bark and wood	03 03 01
	De-inking sludges from paper recycling	03 03 05
	Mechanically separated rejects from pulping of waste paper and cardboard	03 03 07
	Wastes from sorting of paper and cardboard destined for recycling	03 03 08
	Fibre rejects, fibre-, filler- and coating-sludges from mechanical separation	03 03 10
04 Wastes from the leather, fur and textile industries	Wastes from dressing and finishing	04 01 09
	Wastes from composite materials (impregnated textile, elastomer, plastomer)	04 02 09
	Wastes from unprocessed textile fibres	04 02 21
	Wastes from processed textile fibres	04 02 22
07 Wastes from organic chemical processes	Waste plastic	07 02 13
09 Wastes from the photographic industry	Photographic film and paper free of silver or silver compounds	09 01 08
12 Wastes from shaping and physical and mechanical surface treatment of metals and plastics	Plastic shavings and turnings	12 01 05
15 Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	Paper and cardboard packaging	15 01 01
	Plastic packaging	15 01 02
	Wooden packaging	15 01 03
	Composite packaging	15 01 05
	Mixed packaging	15 01 06
	Textile packaging	15 01 09
16 Wastes not otherwise specified in the list	End-of-Life Tyres	16 01 03
	Plastic	16 01 19
	Wood	17 02 01

Table S2.1 Raw materials and fuels		
Raw materials and fuel description	**Specification**	
17 Construction and demolition wastes (including excavated soil from contaminated sites)	Plastic	17 02 03
19 Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use	Combustible waste other than those in 19 02 08* and 19 02 09*	19 02 10
	Sludges from treatment of urban waste water	19 08 05
	Paper and cardboard	19 12 01
	Plastic and rubber	19 12 04
	Wood other than mentioned in 19 12 06	19 12 07
	Textiles	19 12 08
	Combustible waste (refuse-derived fuel)	19 12 10
	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	19 12 12
20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	Paper and cardboard	20 01 01
	Clothes	20 01 10
	Textiles	20 01 11
	Wood other than that mentioned in 20 01 37	20 01 38
	Plastics	20 01 39

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements for kiln exhausts						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A20	Cement plant K1, main stack	Particulate matter	Until 9/4/2017 20 mg/Nm^3	Daily average	Continuous measurement	BS EN 14181
			From 9/4/2017 10 mg/Nm^3			
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	450 mg/Nm^3			
		Sulphur dioxide (SO_2)	100 mg/Nm^3			
		Carbon monoxide (CO)	3,000 mg/Nm^3			
		Total Organic Carbon (TOC)	Until 9/4/2017 110 mg/Nm^3			
			From 9/4/2017 100 mg/Nm^3			
		Hydrogen chloride (HCl)	10 mg/Nm^3			
		Total ammonia (NH_3)	40 mg/Nm^3			
			50 mg/Nm^3	Hourly average		
			7 mg/Nm^3	Annual average		
		Hydrogen fluoride (HF)	1 mg/Nm3	Average value over minimum 1-hour period	Six monthly periodic monitoring	ISO 15713
		Cadmium (Cd) & thallium (Tl) and their compounds (total)	0.05 mg/Nm^3	Average value over minimum 30 minute, maximum 8 hour period		BS EN 14385
		Mercury (Hg) and its compounds	0.05 mg/Nm^3			BS EN 13211
		Group III metals and their compounds (total)	0.5 mg/Nm^3			BS EN 14385
		Dioxins / furans (I-TEQ)	0.1 ng/m^3	Average value over sample period of between 6 and 8 hours		BS EN 1948 Parts 1, 2 & 3
		Dioxins / furans (WHO-TEQ Humans/Mammals /fish/birds)	No limit set			
		PCBs [Dioxin-like PCBs (WHO-TEQ Humans /Mammals/fish/ birds)]	No limit set			BS EN 1948-4
		PAHs Specific individual poly-cyclic aromatic hydrocarbons	No limit set			BS ISO 11338-1,2

Table S3.1 Point source emissions to air – emission limits and monitoring requirements for kiln exhausts						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A24	Cement plant K2 main stack serving preheater raw mill, and clinker cooler	Particulate matter	10 mg/Nm^3	Daily average	Continuous measurement	BS EN 14181
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	350 mg/Nm^3			
		Sulphur dioxide	100 mg/Nm^3			
		Carbon monoxide	2,200 mg/Nm^3			
		Total Organic Carbon	100 mg/Nm^3			
		Hydrogen chloride	10 mg/Nm^3			
		Total ammonia	40 mg/Nm^3			
			50 mg/Nm^3	Hourly average		
			7 mg/Nm^3	Annual average		
		Hydrogen fluoride	1 mg/Nm3	Average value over minimum 1-hour period	Six monthly periodic monitoring	ISO 15713
		Cadmium (Cd) & thallium (Tl) and their compounds (total)	0.05 mg/Nm^3	Average value over minimum 30 minute, maximum 8 hour period		BS EN 14385
		Mercury (Hg) and its compounds	0.05 mg/Nm^3			BS EN 13211
		Group III metals and their compounds (total)	0.5 mg/Nm^3			BS EN 14385
		Dioxins / furans (I-TEQ)	0.1 ng/m^3	Average value over sample period of between 6 and 8 hours		BS EN 1948 Parts 1, 2 & 3
		Dioxins / furans (WHO-TEQ Humans/Mammals /fish/birds)	No limit set			
		PCBs [Dioxin-like PCBs (WHO-TEQ Humans /Mammals/fish/ birds)]	No limit set			BS EN 1948-4
		PAHs Specific individual poly-cyclic aromatic hydrocarbons	No limit set			BS ISO 11338-1,2
A1, A2	Lime shaft kilns' bag filter	Particulate matter	Until 9/4/2017 20 mg/Nm^3	Average value over minimum 30 minute period	Six monthly periodic	BS EN 13284-1
			From 9/4/2017 10 mg/Nm^3			
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	150 mg/Nm^3			BS EN 14792
		Sulphur dioxide	200 mg/Nm^3			BS EN 14791
		Carbon monoxide	From 9/4/2017 9,000 mg/Nm^3			BS EN 15058

Table S3.1 Point source emissions to air – emission limits and monitoring requirements for kiln exhausts						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
		PCDD/F	From 9/4/2017 0.1 ng PCDD/F I-TEQ/Nm^3	Average value over sampling period of 6-8 hours	Annual	BS EN 1948 Parts 1, 2 & 3 or as agreed in writing with the EA
A19	Maerz lime kiln bag filter	Particulate matter	Until 9/4/2017 20 mg/Nm^3	Daily average	Continuous	BS EN 15267-3
			From 9/4/2017 10 mg/Nm^3	Average value over minimum 30 minute period	Six monthly	BS EN 13284-1
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	150 mg/Nm^3			BS EN 14792
		Sulphur dioxide (SO_2)	50 mg/Nm^3			BS EN 14791
		Carbon monoxide (CO)	From 9/4/2017 500 mg/Nm^3			BS EN 15058
		Total organic carbon (TOC)	From 9/4/2017 30 mg/Nm^3		Annual	BS EN 12619
		PCDD/F	From 9/4/2017 0.1 ng PCDD/F I-TEQ/Nm^3	Average value over sampling period of 6-8 hours	Annual	BS EN 1948 Parts 1, 2 & 3 or as agreed in writing with the EA

Table S3.2 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
A12 – A17	Lime hydrators, No.s 1 - 6	Particulate matter	Until 9/4/2017 100 mg/Nm^3	Average value over minimum 30 minute period	Six monthly	BS EN 13284-1
			From 9/4/2017 20 mg/Nm^3			
A21	Cement Plant K1 clinker cooler		Until 9/4/2017 30 mg/Nm^3	Daily average	Continuous	BS EN 15267-3
			From 9/4/2017 20 mg/Nm^3			
			From 1/6/2019 10 mg/Nm^3			
A22	Cement Plant K1 coal mill		Until 9/4/2017 30 mg/Nm^3			
			From 9/4/2017 10 mg/Nm^3	Average value over minimum 30 minute period	Six monthly	BS EN 13284-1
A23	Cement plant K1 cement mill		Until 9/4/2017 30 mg/Nm^3	Daily average	Continuous	BS EN 15267-3
			From 9/4/2017 10 mg/Nm^3	Average value over minimum 30 minute period	Six monthly	BS EN 13284-1

Table S3.2 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
A25	Cement plant K2 coal mill	Particulate matter	10 mg/Nm^3	Average value over minimum 30 minute period	Quarterly in first year of operation then six monthly	BS EN 13284-1
A26	Cement plant K2 cement mill		10 mg/Nm^3		Quarterly in first year of operation then six monthly	
A27 A-D	Gas engines A-D	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	250 mg/Nm^3		Quarterly in first year of operation then annually	BS EN 14792
		Carbon monoxide	400 mg/Nm^3		Six monthly	BS EN 15058
A28	Lopulco Mill LM12 bag filter	Particulate matter	From 9/4/2017 10 mg/Nm^3		Annually	BS EN 13284-1
A29	Lopulco Mill LM16 bag filter					
A30	Picking House bag filter	Particulate matter	From 9/4/2017 10 mg/Nm^3	-	In accordance with a maintenance management system or other monitoring as agreed in writing by the Environment Agency. Note 1	Permanent sampling access not required
A31	Lime Handling Plant bag filter					
A32	No 1 & 2 Lime conveyors bag filter					
A33	T2 crusher & screen dust unit					
A34	Webster Griffin Bagger unit					
A35	FGD Plant A bag filter					
A36	FGD Plant B bag filter					
A37	Raw material conveyor filter (321.250)					
A38	Raw material feed belt filter					
A39	Elevator head filter					
A40	Raw materials, marl & shale silos filter					
A41	Raw coal & petcoke filter					
A42	Clinker to cement mill filter					

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference Period	Monitoring frequency	Monitoring standard or method
A43	Cement mill separator filter	Particulate matter	From 9/4/2017 10 mg/Nm^3	-	In accordance with a maintenance management system or other monitoring as agreed in writing by the Environment Agency. Note 1	Permanent sampling access not required
A44	Top clinker silo filter					
A45	Head of clinker conveyor filter					
A46	Gypsum grade additives filter					
A47	Tail end of clinker conveyor filter					
A48	Rail silo 1 filter					
A49	Rail silo 2 filter					
A50	Rail silo middle filter					
All other channelled dust emissions abated by filters	Dusty operations such as crushing, conveying, material handling, silos	Particulate matter	From 9/4/2017 10 mg/Nm^3	-	In accordance with a maintenance management system	Permanent sampling access not required

Note 1 Monitoring frequency and monitoring method subject to change following the completion of improvement condition IC14.

Table S3.3 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements[Note 1]

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1	Bold Venture settlement pond at SK08787661	Suspended Solids	50 mg/Nm^3	Spot sample	Weekly if discharging for >12 hours per week	BS EN 872
		Oil or Grease	None Visible			Visual check
		pH	7 – 9			BS EN ISO 10523:2012
W2	B Pond settlement pond at SK09607530	Suspended Solids	50 mg/Nm^3	Spot sample		BS EN 872
		Oil or Grease	None Visible			Visual check
		pH	7 – 9			BS EN ISO 10523:2012
W3	Overflow pipe from the settlement tank for the vehicle wash at SK09807540	Suspended Solids	50 mg/Nm^3	Spot sample		BS EN 872
		Oil or Grease	None Visible			Visual check
		pH	7 – 9			BS EN ISO 10523:2012

Note 1: monitoring requirements to be reviewed following improvement condition IC16

Table S3.4 Annual Limits		
Substance	**Medium**	**Limit (including unit)**
Oxides of nitrogen	Air	-
Ammonia		-

Table S3.5 Ambient air monitoring requirements				
Location or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Installation	Wind speed	Each working day	-	Records to be kept for a minimum period of 1 year
	Wind direction			
	Daily rainfall			

Table S3.6 Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Kilns K1 and K2	Fuels usage	Monthly	As agreed in writing with the EA	
	Waste-derived fuels usage			
	Relative thermal input of Waste-derived fuels			
	Ammonia usage	Continuous		
	Fourth stage cyclone exit temperature (°C)		Traceable to National Standards	
	Raw meal feed rate (t/hr)			
	Fuels feed rate (t/hr)			
A20, A24	Temperature		Traceable to National Standards	
	Pressure			
	Oxygen		BS EN 14181	
	Water vapour			
A19, A22, A23, A25, A26	Particulates	Continuous	indicative	From 09/04/17

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Emissions to air Parameters as required by condition 3.5.1.	A20, A21, A24	Monthly summary of continuous monitoring reported quarterly	1 January Note 1
	A22, A25, A26, A27A-D	Quarterly extractive monitoring reported every 6 months	
	A1, A2, A12 – A17, A19, A20, A23, A24, A27A-D	6 monthly extractive monitoring reported every 6 months	
	A1, A2, A19, A28 – A50	Annual extractive monitoring reported annually	
Process monitoring Parameters as required by condition 3.5.1	Ammonia usage	Quarterly	1 January
	Fuels usage		
	Waste-derived fuels usage		
	Relative thermal input of Waste-derived fuels		
Alternative Raw materials and waste derived fuel usage As required by condition 4.2.6	A20, A24	Quarterly	1 January
Functioning and monitoring of the plant involved in the burning of waste derived fuels, as required by condition 4.2.2		Annually	1 January

Note 1: for emission points A30 – A50, the first period begins 9 April 2017, and thereafter is 1 January.

Table S4.2: Annual production/treatment	
Parameter	**Units**
On site electrical energy used within the installation	kWhrs
Electrical energy produced by the installation (power plant)	kWhrs
Power plant operational hours	Hours

Table S4.3 Performance parameters		
Parameter	**Frequency of assessment**	**Units**
SNCR – annual ammonia consumption (K1 & K2)	Annually	Tonnes
Raw mills non-operational (K1 & K2)	Annually	hours

Table S4.4 Reporting forms		
Media/parameter	**Reporting format**	**Date of form**
Air	Form Air1, Air2, Air3 and Air4 or other form as agreed in writing by the Environment Agency	DD/MM/YY
SNCR – Ammonia and urea usage	Ammonia/urea Usage form or other form as agreed in writing by the Environment Agency	DD/MM/YY
Power plant utilisation	Power Utilisation form or other form as agreed in writing by the Environment Agency	DD/MM/YY
Fuel Usage summary and relative thermal input	Form Fuel Usage or other form as agreed in writing by the Environment Agency	DD/MM/YY
Alternative Raw Materials usage	Form ARM usage1 or other form as agreed in writing by the Environment Agency	January 2015
Waste Derived fuels usage	Form WDF usage1 or other form as agreed in writing by the Environment Agency	January 2015
Total Annual Emissions		

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	**EPR/XP3532DP**
Name of operator	**Tarmac Cement and Lime Limited**
Location of Facility	**Tunstead Cement and Lime works**
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

"*abatement equipment*" means that equipment dedicated to the removal of polluting substances from releases from the installation to air or water media.

"*accident*" means an accident that may result in pollution.

"*annual average*" means the average of all daily averages in a calendar year.

"*annually*" means once every year.

"*application*" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"*authorised officer*" means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"*background concentration*" means such concentration of that substance as is present in:

- for emissions to surface water, the surface water quality up-gradient of the site; or
- for emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge.

"*CEM"* means Continuous Emission Monitor.

"Chapter IV abnormal operating conditions" means any technically unavoidable stoppages, disturbances, or failures of the abatement plant or the measurement devices, during which the concentrations in the discharges into air or waste water of the regulated substances may exceed the normal emission limit values.

"Chipped tyres" means both chipped and granulate tyre or rubber conveyor belt derived material.

"*Climate Change Agreement*" means an agreement made between the Secretary of State and the operator, either directly or through the offices of any association of which he is a member, in which he agrees to secure energy efficiency improvements as set out in a plan agreed with the Secretary of State in that agreement in return for a discount from the amount he would otherwise pay as a Climate Change Levy.

"*Commissioning*" relates to the period after construction has been completed or when a modification has been made to the plant or the raw materials when the Permitted installation process is being tested and modified to operate according to its design.

"*corrected"* monitoring data shall take account of confidence intervals in condition 3.5.5.

"*COSHH Regulations 2002 (as amended)*" means the Control of Substances Hazardous to Human Health Regulations 2002 (as amended) (SI 2002 No.2677).

"*daily*" means a 24 hour period commencing at 12:00 hrs (either midday or midnight as agreed in writing with the EA).

"*daily average"* for releases of substances to air means the average of valid half-hourly averages over consecutive discrete period of 24 hours commencing at a time agreed in writing with the Environment Agency during normal operation.

"*dioxin and furans"* means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

"*disposal*" means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"ELV" means emission limit value.

"*emissions to land*" includes emissions to groundwater.

"*emissions of substances not controlled by emission limits*" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit.

"*EP Regulations*" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"*EWC code"* means the code number from the European Waste Catalogue.

"*groundwater*" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"*Group I metals*" means mercury (Hg).

"Group II Metals" means Cadmium (Cd) and Thallium (Tl).

"Group III Metals" means Antimony (Sb), Arsenic (As), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Manganese (Mn), Nickel (Ni), & Vanadium (V).

"*half-hour or half-hourly*" means a 30 minute period commencing on the hour or at half past the hour.

"*Hazardous property*" has the meaning in Annex lll of the Waste Framework Directive.

"*Hazardous waste*" has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 (as amended).

"*hourly*" means a 60 minute period commencing on the hour.

"*Industrial Emissions Directive*" or "*IED*" means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

"ISO" means International Standards Organisation.

"Kiln flush" refers to kiln upset due to a surge of feed material into the kiln which passes through without reacting fully.

"*Kiln shut down*"

> Cement: kiln shutdown is defined as when the plant is being returned to a non-operational state and no waste is being burned. Emission limit values do not apply during shutdown once the feed rate is below 140 tonne per hour.
>
> Lime Kilns: shutdown is defined as when the plant is being returned to a non-operational state and no fuel is being burned. Emission limit values do not apply during shutdown once normal gas firing/patterns are stopped.

"Kiln Start Up"

> Cement kiln start up: This means, from the time when raw meal is introduced into the kiln to the time the feed rate has reached 140 tonne per hour and the kiln is stable, or as otherwise agreed in writing by the Agency.
>
> On commencing kiln operation, the first continuous monitoring daily average can be calculated from the 24 hour period starting from the time that kiln start-up has completed. Subsequent daily averages will be based on a 24 hour period commencing 12 noon/midnight.
>
> Lime Maerz kiln start up: this means, from the time when gas is introduced into the kiln to the time the kiln production rate reaches 200 tonne per day and the kiln is stable on normal gas firing patterns/cycles, or as otherwise agreed in writing with the Agency. ELVs do not apply until start up is complete.
>
> Lime shaft kilns: this means, from the time when gas is introduced into the kiln to the time the kiln production rate has reached 180 tonne per day and the kiln is stable on normal gas firing patterns/cycles, or as otherwise agreed in writing with the Agency. ELVs do not apply until start up is complete.

"Lime" also called "*quicklime"* or "*burned lime"* is calcium oxide (CaO) produced by the decarbonisation of limestone ($CaCO_3$).

"Lime products" is a term which covers quicklime and slaked lime.

"*List of Wastes*" means the list of wastes established by Commission Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste, as amended from time to time.

"MBM" means Meat and Bone Meal. MBM is classified as a non-hazardous waste by the EWC Code 02 02 03, defined as "Wastes from the preparation and processing of meat, fish and other foods of animal origin" and the sub-clause "Materials unsuitable for consumption or processing". MBM cannot contain raw or unprocessed meat, bones or animal parts, or any other waste of agricultural, horticultural or industrial origin.

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"monitoring" includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.

"*MPA Code of Practice*" means the MPA Code of Practice for the use of waste materials in Cement and Dolomitic Lime Manufacture – dated October 2014

"*oxides of nitrogen (NO_x)*" means nitric oxide (NO) plus nitrogen dioxide (NO_2) expressed as NO_2

"PAH" means Poly-cyclic aromatic hydrocarbon, and comprises 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, Dibenzo[ah]anthracene, Dibenzo[a,i]pyrene, Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene

"PCB" means Polychlorinated Biphenyl. Dioxin-like PCBs are the non-ortho and mono-ortho PCBs listed in the table below,

"PCP" means Pentachlorophenol,

"permitted installation" means the activities and the limits to those activities described in Table S1.1 of this Permit.

"*quarter*" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"quarterly periodic monitoring" for reporting/sampling means after/during each 3 month period, January to March; April to June; July to September and October to December and, when sampling, with at least 2 months between each sampling date.

"*Recovery*" means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"six monthly periodic monitoring" means periodic monitoring in each 6 month period (January-June & July – December) with at least 4 months between sampling dates.

"Slaked lime" is produced by reacting or 'slaking' quicklime with water and consists mainly of calcium hydroxide ($Ca(OH)_2$). Slaked lime includes hydrated lime (dry calcium hydroxide powder) and milk of lime (dispersion of calcium hydroxide particles in water).

"*SSSI*" means a site of special scientific interest designated under the Wildlife and Countryside Act 1981 being a site in the UK which is of particular importance because of its geology, topography, or ecology.

"*thermal input"* refers to the combined pre-calciner and main kiln burner fuel inputs.

"TOC" means Total Organic Carbon. In respect of releases to air, this means the gaseous and vaporous organic substances, expressed as TOC.

"*Un-corrected"* monitoring data shall not take account of confidence intervals in condition 3.5.5.

"*Waste code*" means the six digit code referable to a type of waste in accordance with the List of Wastes and in relation to hazardous waste, includes the asterisk.

"*Waste Framework Directive*" or "*WFD*" means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste

"*year*" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

(a) in relation to emissions from cement kilns, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 10% dry for all fuels;

(b) in relation to emissions from lime kilns, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 11% dry for all fuels;

(c) in relation to emissions from combustion processes from other sources, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels; and

(d) in relation to emissions from non-combustion sources, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with no correction required for oxygen.

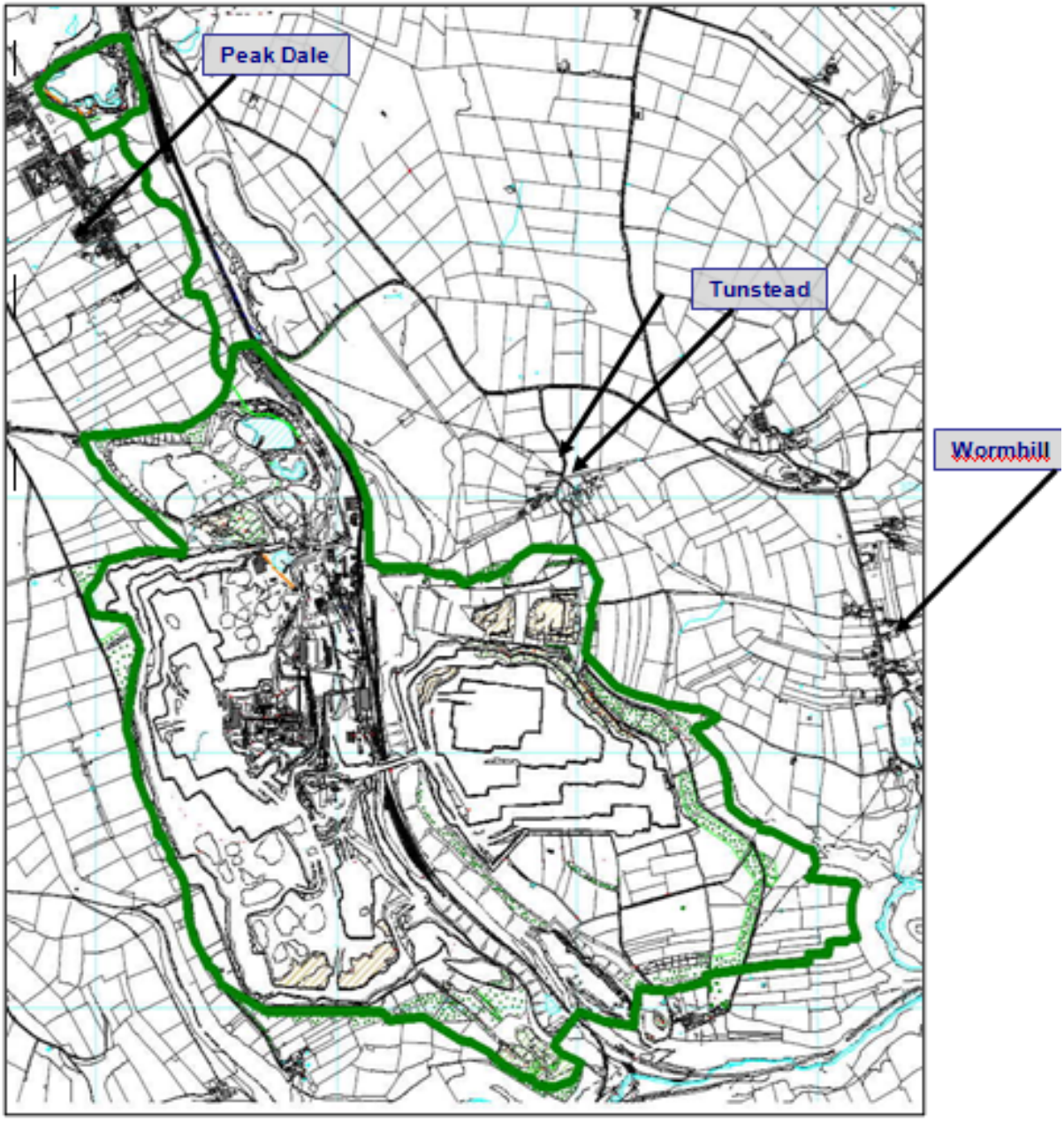
(e) in relation to emissions from lime hydrating plants, no correction is required for temperature, pressure, oxygen or water vapour content.

For dioxins/furans and dioxin-like PCBs the determination of the toxic equivalence concentration (I-TEQ, & WHO-TEQ for dioxins/furans, WHO-TEQ for dioxin-like PCBs) stated as a release limit and/ or reporting requirement, the mass concentrations of the following congeners have to be multiplied with their respective toxic equivalence factors before summing.

TEF schemes for dioxins and furans				
Congener	**I-TEF(1990)**	**WHO-TEF (1997/8)**		
		Humans / Mammals	**Fish**	**Birds**
Dioxins				
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	0.5	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.001	<0.001
OCDD	0.001	0.0001	-	-
Furans				
2,3,7,8-TCDF	0.1	0.1	0.05	1
1,2,3,7,8-PeCDF	0.05	0.05	0.05	0.1
2,3,4,7,8-PeCDF	0.5	0.5	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8_HpCDF	0.01	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.01
OCDF	0.001	0.0001	0.0001	0.0001

TEF schemes for dioxin-like PCBs			
Congener	**WHO-TEF (1997/8)**		
	Humans / mammals	**Fish**	**Birds**
Non-ortho PCBs			
3,4,4',5-TCB (81)	0.0001	0.0005	0.1
3,3',4,4'-TCB (77)	0.0001	0.0001	0.05
3,3',4,4',5 - PeCB (126)	0.1	0.005	0.1
3,3',4,4',5,5'-HxCB(169)	0.01	0.00005	0.001
Mono-ortho PCBs			
2,3,3',4,4'-PeCB (105)	0.0001	<0.000005	0.0001
2,3,4,4',5-PeCB (114)	0.0005	<0.000005	0.0001
2,3',4,4',5-PeCB (118)	0.0001	<0.000005	0.00001
2',3,4,4',5-PeCB (123)	0.0001	<0.000005	0.00001
2,3,3',4,4',5-HxCB (156)	0.0005	<0.000005	0.0001
2,3,3',4,4',5'-HxCB (157)	0.0005	<0.000005	0.0001
2,3',4,4',5,5'-HxCB (167)	0.00001	<0.000005	0.00001
2,3,3',4,4',5,5'-HpCB (189)	0.0001	<0.000005	0.00001

Schedule 7 – Site plan



END OF PERMIT

Annex to conditions – Derogation under Industrial Emissions Directive

Derogation under Article 15(4) of Industrial Emissions Directive

DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

<table>
<tr><td>Operating techniques</td><td>We have considered the Operator's proposed techniques and its comparison against other relevant techniques as described in best available techniques (BAT) conclusions (BATc) for the production of cement, lime and magnesium oxide and detailed in document reference 2013/163/EU. Our full reasoning is given in our decision document that accompanies the permit determination.</td></tr>
<tr><td></td><td>The operator has been granted a derogation from BAT 18 'Dust emissions from cooling and milling processes' which sets a BAT-AEL of <10-20mg/Nm^3 (daily average or average over the sampling period) where the lower limit applies to bag filters. The derogation request was made on the basis of the technical characteristics of the plant, specifically the general investment cycle for this type of installation and the practicability of interrupting the activity so as to install improved emission control. The derogation is time limited, to 31 May 2019, two years and 2 months beyond the compliance date.
<table>
<tr><th>BAT conclusion</th><th>Associated BAT-AEL</th><th>Derogation until</th><th>ELV during derogation period</th><th>Previous ELV</th></tr>
<tr><td>18</td><td><10 mg/Nm^3</td><td>31 May 2019</td><td>20 mg/Nm^3</td><td>30 mg/Nm^3</td></tr>
</table>
The Operator's request considered 8 options for achieving compliance with the BAT-AEL. They proposed to continue using the cooler bag filter with a 2 step approach to compliance; step 1 is to improve the existing filter performance through reducing the air flow and optimising the process and maintenance. If this does not achieve compliance, step 2 will be undertaken; extend or replace the bag filter. The Operator proposed that the ELV is reduced from 30 to 20mg/Nm^3 for the derogation period.

We have considered the operators justification for departure from the guidance and accept it in the following respects and for the following reasons;

1) The operator has supplied a valid derogation request against the BAT conclusion 18. The derogation request is based on the technical characteristics of the plant; complete replacement of a relatively new piece of plant would result in significant write-off costs. Maintenance and installation work needs to be carried out during the annual shutdown to avoid incurring the substantial costs of loss of production.

2) The operator has described 8 relevant options for achieving the BAT-AEL and justified the screening out of 5 options. Three options were taken forward for cost benefit analysis. The Operator proposes to improve the existing bag filter unit performance through reducing the air flow to the filter and optimising the process and maintenance (step 1). The time limited derogation is requested to 31 May 2019 to allow a year for step 1, plus a further year to allow for installation of a new bag filter should performance not consistently meet the BAT-AEL.

3) The operator has demonstrated that the costs of achieving the BAT-AEL by April 2017 are disproportionate to the environment benefits, and that these are linked to the technical characteristics of the plant. The costs of meeting the BAT-AEL on time are significantly higher than the environmental benefits of doing so in comparison to the proposed derogation option. There are no other options which show the benefits outweighing the costs even under sensitivity testing.

4) The derogation request is to delay compliance with the BAT-AEL until 31 May 2019. During this period the ELV will reduce from 30 to 20 mg/Nm^3. The environmental</td></tr>
</table>

impacts (estimated as an additional 15 tonne of particulates over 2 years) of allowing the derogation are assessed as not significant.

5) The proposed derogation, timescale and associated ELVs have been accepted in principle. However, we will set an improvement condition to require the Operator to report, in early 2018 following a full operating campaign, on their assessment of compliance of emissions at A21 and their intention to make further investment.

The operator has been granted a derogation; from BAT 48 which sets a BAT-AEL for lime kiln carbon monoxide (CO) emissions of <500mg/Nm^3 (daily average or average over the sampling period). The derogation is until the next permit review, ie not time limited.

BAT conclusion	Associated BAT-AEL	Derogation until	ELV during derogation period	Previous ELV
48	<500 mg/Nm^3	Next permit review	9000 mg/Nm^3	none

The proposed techniques will result in emissions for which the appropriate emission limit is less stringent than that associated with the best available techniques as described in BAT conclusions. The achievement of BAT emission levels by April 2017 would lead to disproportionately higher costs compared to the environmental benefits due to the technical characteristics of the plant.

We have considered the operators justification for departure from the guidance and accept it in the following respects and for the following reasons;

1) Tarmac Cement and Lime Limited (TCL) have demonstrated that their derogation is based on the unique technical characteristics of their shaft lime kilns, which have an inherently high level of CO emission due to their design. These lime kilns are unique in Europe. They were built in the 1930s as coal-fired Mixed Feed Shaft kilns (MFSK) but converted to natural gas in the 1970s. They do not fall under any of the BREF descriptions for specific kiln types and have therefore, by default, been categorised as “Other Shaft Kilns” (OSK) to which the BAT-AEL applies. The BAT-AEL does not apply to MFSKs, because they are recognised in the BREF as having inherently high CO emissions.

2) TCL have minimised CO emissions from these kilns over the past 8 years. The techniques listed in the BAT conclusions for reducing CO emissions are the selection of raw materials and the use of process optimisation techniques, both of which have already been fully applied. CO emissions cannot be reduced further to meet the CO BAT-AEL due to the inherent design of the shaft kilns.

3) Compliance with the BAT-AEL can be achieved only by installing a thermal oxidiser, (abatement equipment which is not described as a potential BAT), or by completely replacing the kilns with new ones of a different design, for which the costs would be disproportionately higher than the environmental benefits.

4) Air dispersion modelling has confirmed that, even if all 5 shaft kilns are operating simultaneously, there will not be any exceedences of Air Quality Standards set for the protection of human health and the environment.

5) To date, CO has not been controlled by an emission limit in the permit. We are setting a limit of 9,000 mg/Nm^3 with this variation to ensure that TCL continue to optimise the current process and do not introduce any changes that would substantially increase CO emissions above the current levels.