Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016 (as amended)

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

The Permit number is:	EPR/BX0334ID
The Operator is:	British Sugar PLC
The Installation is:	Cantley Sugar Factory
This Variation Notice number is:	EPR/BX0334ID/V010

What this document is about

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

We have reviewed the permit for this installation against the BAT Conclusions for the Food, Drink and Milk Industries published on 4th December 2019 in the Official Journal of the European Union. In this decision document, we set out the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position.

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

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

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

How this document is structured

1. Our decision
2. How we reached our decision
3. The legal framework
4. Annex 1 – Review of operating techniques within the Installation against BAT Conclusions.
5. Annex 2 – Review and assessment of changes that are not part of the BAT Conclusions derived permit review
6. Annex 3 – Improvement Conditions
7. Annex 4 – Pre-operational Conditions

1 Our decision

We have decided to issue the Variation Notice to the Operator. This will allow the Operator to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice that updates the whole permit.

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

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

2 How we reached our decision

2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under Regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a Regulation 61 Notice) on 08/06/2022 requiring the Operator to provide information to demonstrate where the operation of their installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

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

- describes the techniques that will be implemented before 4 December 2023, which will then ensure that operations meet the revised standards, or
- justifies why standards will not be met by 4 December 2023, and confirmation of the date when the operation of those processes will cease within the Installation or an explanation of why the revised BAT standards are not applicable to those processes, or
- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised BAT standards described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT-AEL) described in the BAT Conclusions Document, the Regulation 61 Notice required that the Operator make a formal request for derogation from compliance with that BAT-AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61 Notice response from the Operator was received on 07/10/2022.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 61 Notice response that appears to be confidential in relation to any party.

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

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

2.3 Requests for further information during determination

We have addressed any other key issues for the sector as part of this review process.

3 The legal framework

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

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

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

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

Annex 1: decision checklist regarding relevant BAT Conclusions

BAT Conclusions for the Food, Drink and Milk Industries, were published by the European Commission on 4 December 2019.

There are 37 BAT Conclusions.

BAT 1 – 15 are General BAT Conclusions (Narrative BAT) applicable to all relevant Food, Drink and Milk Installations in scope.

BAT 16 – 37 are sector-specific BAT Conclusions, including Best Available Techniques Associated Emissions Levels (BAT-AELs) and Associated Environmental Performance Levels (BAT-AEPLs):

BAT 16 & 17	BAT Conclusions for Animal Feed
BAT 18 – 20	BAT Conclusions for Brewing
BAT 21 – 23	BAT Conclusions for Dairies
BAT 24	BAT Conclusions for Ethanol Production
BAT 25 & 26	BAT Conclusions for Fish and Shellfish Processing
BAT 27	BAT Conclusions for Fruit and Vegetable Processing
BAT 28	BAT Conclusions for Grain Milling
BAT 29	BAT Conclusions for Meat Processing
BAT 30 – 32	BAT Conclusions for Oilseed Processing and Vegetable Oil Refining
BAT 33	BAT Conclusions for Soft Drinks and Nectar/Fruit Juice Processed from Fruit and Vegetables
BAT 34	BAT Conclusions for Starch Production
BAT 35 – 37	BAT Conclusions for Sugar Manufacturing

This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the Consolidated Variation Notice.

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

NA – Not Applicable
CC – Currently Compliant
FC – Compliant in the future (within 4 years of publication of BAT Conclusions)
NC – Not Compliant

BATC No.	Summary of BAT Conclusion requirement for Food, Drink and Milk Industries	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
GENERAL BAT CONCLUSIONS (BAT 1-15)			
1	**Environmental Management System - Improve overall environmental performance.** Implement an EMS that incorporates all the features as described within BATc 1.	**CC**	The operator has provided information to support compliance with BATc 1. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 1. The operator has an EMS externally accredited to the ISO14001 standard.
2	**EMS Inventory of inputs & outputs. Increase resource efficiency and reduce emissions.** Establish, maintain and regularly review (including when a significant change occurs) an inventory of water, energy and raw materials consumption as well as of waste water and waste gas streams, as part of the environmental management system (see BAT 1), that incorporates all of the features as detailed within the BATCs.	**CC**	The operator has provided information to support compliance with BATc 2. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 2. The operator has an EMS externally accredited to the ISO14001 standard.
3	**Monitoring key process parameters at key locations for emissions to water.** For relevant emissions to water as identified by the inventory of waste water streams (see BAT 2), BAT is to monitor key process parameters (e.g. continuous monitoring of waste water flow, pH and temperature) at key locations (e.g. at the inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	**CC**	The operator has provided information to support compliance with BATc 3. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 3. The operator ensures that key process parameters are monitored on the site's wastewater plant. This includes all incoming feeds, intermediate and outlets from the plant. All data collected from the wastewater treatment plant is fed back to the sites distribution control system (DCS). Data is collected from the wastewater treatment plant and pulled in the Factory Technical Database (FTR), enabling the plant performance to be effectively managed.

<table>
<tr><th>BATC No.</th><th>Summary of BAT Conclusion requirement for Food, Drink and Milk Industries</th><th>Status NA/ CC / FC / NC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>4</td><td>Monitoring emissions to water to the required frequencies and standards.
BAT is to monitor emissions to water with at least the frequency given [refer to BAT 4 table in BATc] and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</td><td>FC</td><td>The operator proposed the following frequency for monitoring:
Table 1: Wastewater monitoring scheduel – current as defined in permit and proposed<table><tr><th>Parameter</th><th>Current Sampling Schedule</th><th>Proposed Sampling Scheduele</th></tr><tr><td>BOD</td><td>Weekly</td><td>Weekly</td></tr><tr><td>COD</td><td>Daily</td><td>Daily</td></tr><tr><td>TSS</td><td>Daily</td><td>Daily</td></tr><tr><td>TN</td><td>None</td><td>3 times per week</td></tr><tr><td>TP</td><td>None</td><td>3 times per week</td></tr><tr><td>NH3</td><td>Daily</td><td>Daily</td></tr><tr><td>Temp</td><td>Daily</td><td>Daily</td></tr><tr><td>Chloride</td><td>None</td><td>Monthly</td></tr><tr><td>Phosphate</td><td>None</td><td>3 times per week</td></tr></table>British Sugar currently monitors COD and not TOC.
A reduced frequency is only acceptable where an operator can demonstrate that their effluent is suitably stable.
In this case, we have applied the requirements as per BATc4.</td></tr>
<tr><td>5</td><td>Monitoring channelled emissions to air to the required frequencies and standards.
BAT is to monitor channelled emissions to air with at least the frequency given and in accordance with EN standards.</td><td>FC</td><td>The operator will monitored the appropriate parameters to the appropriate frequency and monitoring standards as set out in BATc 5. We have implemented the following monitoring in the permit from issue.

Dryer 2 emission point A55:
NOx – Monthly – BS EN 14792
CO – Monthly – BS EN 15058
Particulate Matter – Monthly – BS EN 13284-1
$PM_{2.5}$ and PM_{10} – Annually – EN ISO 23210
TVOC – Annually – BS EN 12619
Pellet Coolers A56 & A57 and Nuisance dust filter vent
Particulate matter – Annually – BS EN 13284-1
Dryer 1 - emission point A54 will not operate post 03/12/2023, the dryer and all monitoring has been removed from the permit.</td></tr>
</table>

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6	**Energy Efficiency** In order to increase energy efficiency, BAT is to use an energy efficiency plan (BAT 6a) and an appropriate combination of the common techniques listed in technique 6b within the table in the BATc.	**CC**	The operator has provided information to support compliance with BATc 6. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 6. The operator has an Energy Efficiency Plan which is externally accredited to the ISO150001 standard, and they closely monitor the energy usage throughout the manufacturing process. The operator also implements the following techniques at site: • Burner regulation and control – control computer is used to optimise the combustion process of the ICL Boiler. • Co-generation – the site operates a CHP, a natural gas boiler, and coal boiler; steam generated goes through a steam turbine before being utilised in the manufacturing process. • Heat recovery is used throughout the sugar manufacturing process. • Lighting – programme to implement LED lighting. • Boiler blowdown is minimised – the boiler is made up with high quality de-ionised water and boiler drum conductivity is monitored. • Steam distribution systems – the use of low-grade vapours within the multiple effect evaporator steam distribution system is prioritised to maximise energy efficiency. • Boiler feed water is preheated and site boilers have economisers. • Process Control systems – the site uses an distributed control system to manage plant processes. • Reducing compressed air system leaks – the site actively looks for and address any compressed air leaks, regular audio-visual inspection (AVI) routes are carried out. • Reducing heat losses by insulation – pipes and vessel are lagged to reduce heat loss from the process. • Variable speed drives – the site uses invertor driven drives to reduced energy consumption. • Multiple-effect evaporation – the CHP produces steam, which is supplied to the first effects of a multiple effect evaporator chain.

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			The thin juice supplied to the evaporators is preheated to ensure good thermal efficiency. The majority of the vapour generated in each of the initial 3 effects is passed to the next effect in the chain. A significant amount of the vapour from the 4th effects onwards is used for heating duties elsewhere in the sugar process. Vapour from the final evaporator is passed to the sugar end vacuum system.
7	**Water and wastewater minimisation** In order to reduce water consumption and the volume of waste water discharged, BAT is to use BAT 7a and one or a combination of the techniques b to k given below. (a) water recycling and/or reuse (b) Optimisation of water flow (c) Optimisation of water nozzles and hoses (d) Segregation of water streams Techniques related to cleaning operations: (e) Dry cleaning (f) Pigging system for pipes (g) High-pressure cleaning (h) Optimisation of chemical dosing and water use in cleaning-in-place (CIP) (i) Low-pressure foam and/or gel cleaning (j) Optimised design and construction of equipment and process areas (k) Cleaning of equipment as soon as possible	**CC**	The operator has provided information to support compliance with BATc 7. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 7. The operator implements a combination of techniques at site such as: (a) Sugar beet is 75% water, this water is stored and reused all over the site in multiple applications. (b) Control devices frequently employed in water circuits, and within the factory processes for flow & water optimisation. (c) Nozzles are used on many applications, including sugar beet cleaning/washing sprays, in the water circuit prior to the beet entering the factory and sugar crystal washing to remove traces of syrup in sugar extraction process. Hoses are utilised in many locations across the factory, and the water usage is monitored frequently. (d) Segregation of water streams is optimised in order to minimise treatment demand and is reviewed using water audits. (e) Dry cleaning is employed when the spillage/cleaning requirement is dry and can be cleaned without using water/liquid; e.g. final product areas (sugar, animal feed). (f) High-pressure cleaning is regularly used for heat exchange cleaning, removal of scale & blockages from pipework. (g) Optimisation of chemical dosing & water use in cleaning-in-place (CIP) – end of campaign beet-end chemical cleaning. (h) Optimised design and construction of equipment and process areas are applied through the stage & gate capital project development process. (k) Prioritised cleaning schedules are implemented across the site.

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8	**Prevent or reduce the use of harmful substances** In order to prevent or reduce the use of harmful substances, e.g. in cleaning and disinfection, BAT is to use one or a combination of the techniques given below. (a) Proper selection of cleaning chemicals and/or disinfectants (b) Reuse of cleaning chemicals in cleaning-in-place (CIP) (c) Dry cleaning (d) Optimised design and construction of equipment and process areas	**CC**	The operator has provided information to support compliance with BATc 8. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 8. Sugar manufacturing processes operate throughout the year in two distinct periods firstly beet processing and the second is sugar juice refining. Both of the processes employ very high temperatures and therefore the need to for cleaning and in particular Cleaning In Place (CIP) is minimal. The primary aim of the cleaning techniques employed is for descaling process plant. Where plant can safely be isolated from the process stream, e.g. heat exchangers, this will be carried out using high pressure water jetting. Where plant cannot be taken offline, cleaning is caried out at the end of operational periods using chemicals, namely sodium hydroxide or sodium carbonate and EDTA. EDTA is selected due to its effectiveness in cleaning the types of scale found in the sugar manufacturing process equipment, in particular calcium oxalate and is related to process chemistry. The amount of chemicals used is carefully monitored during the cleaning cycle and when the chemical levels reach constant concentration then the cleaning is considered to be finished. This activity tends to be carried out once per year at the end of the beet campaign. Halogenated biocides are used for biological control in water systems, generally for control of Legionella. Their use is carefully controlled based on targeted minimum residual levels of halogen and microbiological analysis to minimise health and safety risk. A number of chemicals used in sugar manufacturing historically, namely sulphuric acid, hydrochloric acid, caustic soda and sodium hypochlorite contained traces of cadmium and mercury by virtue of the manufacturing processes employed. These manufacturing techniques are now generally phased out and as a result, these chemicals are produced using techniques that do not give rise to contamination with cadmium or mercury and only appropriately sourced chemicals are used. Supplier analysis is received on a quarterly basis and shows mercury and cadmium levels are below the limits of detection.

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			Dry cleaning is utilised for process where appropriate such as cleaning of spillages of sugar and animal feed.
9	**Refrigerants** In order to prevent emissions of ozone-depleting substances and of substances with a high global warming potential from cooling and freezing, BAT is to use refrigerants without ozone depletion potential and with a low global warming potential.	**CC**	The operator has provided information to support compliance with BATc 9. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 9. The operator does not use large-scale cooling; and the majority of cooling across their operational sites is provided by evaporative cooling. However, the Operator has demonstrated a detailed understanding of the requirements of BAT 9 and has stated that all new refrigeration systems will use refrigerants with the lowest practical GWP. As with end of life system replacements, ultra-low GWP refrigerants would be used wherever possible.
10	**Resource efficiency** In order to increase resource efficiency, BAT is to use one or a combination of the techniques given below: (a) Anaerobic digestion (b) Use of residues (c) Separation of residues (d) Recovery and reuse of residues from the pasteuriser (e) Phosphorus recovery as struvite (f) Use of waste water for land spreading	**CC**	The operator has provided information to support compliance with BATc 10. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 10. The operator monitors and reports on the usage of all raw materials on a detailed basis. Monitoring of the main process raw materials and additives is reviewed at daily and weekly technical meetings. The majority of raw materials are reported based on the quantity of sugar beet processed to form KPI's. • Anaerobic Digestion is not a technique employed in the sugar manufacturing process in order to manage the quantity of residues. From the sugar manufacturing process British Sugar produces a number of co-products. • Use of Residues is not applicable to British Sugar. The animal feed produced is declared as a product and is sold as such into the feed market.

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			• Separation of Residues; British Sugar utilises drip trays as general good practice, which is generally applicable, although would not consider this to be significant. • Techniques d, and e are not applicable to British Sugar as none of these descriptions or applicability are related to British Sugar's manufacturing process or activities that are carried out. • Technique f is extensively used within beet sugar operations in mainland Europe. It is not used at the installation as all wastewater is treated and discharged to watercourse. Although the listed techniques are not used at the installation the operator ensures the processes are resource efficient in the following ways which we consider acceptable. Once the sugar is extracted from the sugar beet the residual beet pulp is either marketed as animal feed, either pressed (wet) or dried dependant on local markets or the pressed pulp can be used as an anaerobic digestion feedstock to produce methane. The sugar extracted from the beet is then purified by removal of impurities using lime and then crystallisation. The lime used for impurity removal is sold as an agricultural liming agent. The sugar will either be sold as crystal or low grade sugar syrup e.g. molasses. The soil washed from the sugar beet is sold as topsoil for multipurpose use.
11	**Waste water buffer storage** In order to prevent uncontrolled emissions to water, BAT is to provide an appropriate buffer storage capacity for waste water.	**CC**	The operator has provided information to support compliance with BATc 11. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 11. The site has sufficient buffer storage capacity onsite in the form of water storage ponds which are designed to have the required area to allow for initial settlement of the soil from the raw materials (sugar beet), and subsequent mixing of wastewater streams from the manufacturing process. In addition, the system capacity allows for surges in wastewater flows which may occur from time to time, due either to process changes or climatic conditions. The site also operates its own wastewater treatment plant.

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			The site storage ponds have a capacity of 443,670 m^3, the sites average total wastewater discharge per annum is 811,500 m^3. As the storage ponds have capacity for over half a years' worth of wastewater we are confident the storage ponds should have sufficient buffer storage capacity for wastewater should they be required.
12	**Emissions to water – treatment** In order to reduce emissions to water, BAT is to use an appropriate combination of the techniques given below. Preliminary, primary and general treatment (a) Equalisation (b) Neutralisation (c) Physical separate (eg screens, sieves, primary settlement tanks etc) Aerobic and/or anaerobic treatment (secondary treatment) (d) Aerobic and/or anaerobic treatment (eg activated sludge, aerobic lagoon etc) (e) Nitification and/or denitrification (f) Partial nitration - anaerobic ammonium oxidation Phosphorus recovery and/or removal (g) Phosphorus recovery as struvite (h) Precipitation (i) Enhanced biological phosphorus removal Final solids removal (j) Coagulation and flocculation (k) Sedimentation (l) Filtration (eg sand filtration, microfiltration, ultrafiltration) (m) Flotation	**CC**	The operator has provided information to support compliance with BATc 12. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 12. The operator employs the following techniques: • Equalisation (different wastewater streams are mixed) • Physical separation (tails screens, ponds themselves, interceptors) • Aerobic treatment • Nitrification • Final Solids removal by sedimentation. Site wastewater treatment systems have developed over time to meet processing requirements and improvements required to meet legislative requirements for discharge to the relevant receiving waters. The majority of the carbon load (COD) is naturally treated within the ponds over long term storage, with a small amount of COD reduction being carried out using aerobic treatment which in addition to COD removal provides ammoniacal nitrogen reduction via nitrification. Mixed liquor (water and biomass) from the aerobic treatment process. Wastewater from the sugar process typically contains small amounts of phosphorus therefore phosphorus removal is not required. Cantley has a final settlement pond prior to consented discharge, these effectively provide a final solids settlement. Fluming water passes over mechanical screens and is then sent to a large clarifier to separate any soil. The soil is settled further in a number of settling ponds. Settled water is returned back to the beet fluming system. Excess water from soil settlement ponds is transferred

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			to long-term storage for use as required for mixing with the sugar process wastewater, i.e. equalisation.
12	**Emissions to water – treatment** **BAT-associated emission levels (BAT-AELs) for direct emissions to a receiving water body** Parameter | BAT-AEL (1) (2) (daily average) Chemical oxygen demand (COD) (3) (4) | 25-100 mg/l (5) Total suspended solids (TSS) | 4-50 mg/l (6) Total nitrogen (TN) | 2-20 mg/l (7) (8) Total phosphorus (TP) | 0,2-2 mg/l (9)	**CC**	The operator has provided information to support compliance with BATc 12. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 12. Cantley have installed a new wastewater treatment plan in order to meet the BAT-AELs this plant consists of an anoxic and aeration tank followed by a settlement clarifier. British Sugar proposes that both abatement efficiencies are set on a yearly average basis with the year starting at the beginning of the annual beet campaign (generally September/October), once the effluent treatment plant has progressed through the start-up period and is fully operational, as defined in procedure CAN-WI-EMS-015. Analytical data from periods of OTNOC will be excluded from the calculation of abatement efficiency, however should the final effluent quality fall outside permit limits discharge will be stopped and the effluent will be recycled until compliance with limits is achieved at which stage discharge will be resumed: COD < 95% efficiency = 100 mg/l COD ≥ 95% efficiency = 155 mg/l TN < 80% efficiency = 20 mg/l TN ≥ 80% efficiency = 30 mg/l TSS ≤ 50 mg/l TP = ≤ 2 mg/l
13	**Noise management plan** In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to set up, implement and regularly review a noise management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:	**NA**	We are satisfied that BATc 13 is not applicable to this Installation The operator has a noise management plan built in as part of the sites Environmental Management System and they have stated noise is monitored regularly for occupational health reasons and there is a procedure for managing complaints However, noise nuisance at

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	- a protocol containing actions and timelines; - a protocol for conducting noise emissions monitoring; - a protocol for response to identified noise events, eg complaints; - a noise reduction programme designed to identify the source(s), to measure/estimate noise and vibration exposure, to characterise the contributions of the sources and to implement prevention and/or reduction measures.		sensitive receptors is not expected and has not been substantiated so we do not consider a separate noise management plan to be required.
14	**Noise management** In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to use one or a combination of the techniques given below. (a) Appropriate location of equipment and buildings (b) Operational measures (c) Low-noise equipment (d) Noise control equipment (e) Noise abatement	**CC**	The operator has provided information to support compliance with BATc 14. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 14. The operator employs the following techniques to minimise noise: • appropriate location of equipment & buildings • operational measures • Low-noise equipment • Noise equipment control
15	**Odour Management** In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: - a protocol containing actions and timelines; - a protocol for conducting odour monitoring. - a protocol for response to identified odour incidents eg complaints; - an odour prevention and reduction programme designed to identify the source(s); to measure/estimate odour exposure: to characterise the contributions of the sources; and to implement prevention and/or reduction measures.	**CC**	The operator has provided information to support compliance with BATc 15. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 15. The Operator has an odour management plan as part of its environmental management system. Odour is monitored regularly and there is a procedure for managing complaints

<table>
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<tr><td></td><td>ANIMAL FEED BAT CONCLUSIONS (BAT 16 – 17)</td><td></td><td></td></tr>
<tr><td>17</td><td>Emissions to air – particulates
In order to reduce channelled dust emissions to air, BAT is to use one of the techniques given; a. bag filter, b. cyclone.
<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Specific process</th><th rowspan="2">Unit</th><th colspan="2">BAT-AEL (average over the sampling period)</th></tr>
<tr><th>New plants</th><th>Existing plants</th></tr>
<tr><td rowspan="2">Dust</td><td>Grinding</td><td rowspan="2">mg/Nm^3</td><td><2-5</td><td><2-10</td></tr>
<tr><td>Pellet cooling</td><td colspan="2"><2-20</td></tr>
</table></td><td>CC</td><td>The operator has provided information to support compliance with BATc 17. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 17.

The site has five pellet coolers, which are discharged via two stacks, air emissions of particulate matter from these stacks are abated via cyclones. The operator has stated they can meet the BAT-AELs.

On that basis, we have included revised ELVs in the permit for the emission points A56 and A57 in line with the BAT-AELs. The previous ELV for particulate matter was 50mg/m^3 the new ELVs included in the permit are 20mg/m^3.</td></tr>
</table>

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<tr><td></td><td>SUGAR MANUFACTURING BAT CONCLUSIONS (BAT 35 – 37)</td><td></td><td></td></tr>
<tr><td>35</td><td>Energy Efficiency
In order to increase the energy efficiency, BAT is to use an appropriate combination of the techniques specified in BAT 6 and one or a combination of the techniques given below.
(a) Pressing of beet pulp
(b) Indirect drying (steam drying) of beet pulp
(c) Solar drying of beet pulp
(d) Recycling of hot gases
(e) Low-temperature (pre)drying of beet pulp

<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>(a)</td><td>Pressing of beet pulp</td><td>The beet pulp is pressed to a dry matter content of typically 25-32 wt-%.</td><td>Generally applicable.</td></tr>
<tr><td>(b)</td><td>Indirect drying (steam drying) of beet pulp</td><td>Drying of beet pulp by the use of superheated steam.</td><td>May not be applicable to existing plants due to the need for a complete reconstruction of the energy facilities.</td></tr>
<tr><td>(c)</td><td>Solar drying of beet pulp</td><td>Use of solar energy to dry beet pulp.</td><td>May not be applicable due to local climatic conditions and/or lack of space.</td></tr>
<tr><td>(d)</td><td>Recycling of hot gases</td><td>Recycling of hot gases (e.g. waste gases from the dryer, boiler or combined heat and power plant).</td><td rowspan="2">Generally applicable.</td></tr>
<tr><td>(e)</td><td>Low-temperature (pre)drying of beet pulp</td><td>Direct (pre)drying of beet pulp using drying gas, e.g. air or hot gas.</td></tr>
</table></td><td>CC</td><td>The operator has provided information to support compliance with BATc 35. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 35.

The site currently uses a combination of a) pressing of beet pulp and d) recycling of hot gases, the other techniques are not utilised on site.

The site has a pulp pressing station, which aims to achieve the best possible pressing possible and maximise the dry matter of the pressed pulp. The pressing station is comprised of 6 pulp presses, these are maintained every year following the completion of the beet processing campaign. Press pulp dry substance(%PPDS) is a performance indicator in the Energy Management system.

The Operator states that steam drying is not applicable as it would need to be retrofitted. This would require a complete re-design of the current energy balance and configuration of the factory, and that solar drying is not feasible due to UK climatic conditions.</td></tr>
</table>

BATC No.	Summary of BAT Conclusion requirement for Food, Drink and Milk Industries	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
36	**Emissions to Air – Dust** In order to prevent or reduce channelled dust emissions to air from beet pulp drying, BAT is to use one or a combination of the techniques given below. (a) Use of gaseous fuels (b) Cyclone (c) Wet scrubber (d) Indirect drying (steam drying) of beet pulp (e) Solar drying of beet pulp (f) Low-temperature (pre)drying of beet pulp	**CC**	The operator has provided information to support compliance with BATc 36. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 36. The site employs the following techniques to reduce the amount of channelled dust emissions: a) Use of gaseous fuels – the onsite dryer runs on natural gas b) Cyclones – the dryer has a cyclone to reduce dust emissions The site had another beet pulp dryer (Dryer 1, emission point A54) fuelled on coal which will not operate post 03/12/2023, this dryer has been removed from the permit.

BATC No.	Summary of BAT Conclusion requirement for Food, Drink and Milk Industries	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	<table><tr><td>Parameter</td><td>Unit</td><td>BAT-AEL (average over the sampling period)</td><td>Reference oxygen level (O_R)</td><td>Reference gas condition</td></tr><tr><td>Dust</td><td>mg/Nm^3</td><td>5 - 100</td><td>16 vol-%</td><td>No correction for water content</td></tr><tr><td colspan="5">The associated monitoring is given in BAT 5. BAT 37. In order to reduce channelled SOX emissions to air from high-temperature beet pulp drying (above 500 °C), BAT is to use one or a combination of the techniques given below.</td></tr></table>	**CC**	The operator has provided information to support compliance with the BAT-AEL. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BAT-AEL. For Dryer 2 emission point A55 the operator provided emissions data for particulate matter for the period of 2019 – 2021. This data demonstrates that emissions of dust from high temperature beet pulp drying is within the specified range at 16% O2: Average: 44.33 mg/m^3 Max: 77.9 mg/m^3 Min: 9.8 mg/m^3 On that basis, we will impose an ELV of 80mg/m^3 on emission points A55 (Dryer 2) from date of permit issue. The current site permit references for particulate matter is to 17% O_2, we have updated the references in the permit to 16% O_2. For Dryer 1 emission point A54 the operator provided emissions data for particulate matter for the period of 2019 – 2021. This data demonstrates that emissions of dust from high temperature beet pulp drying is not within the specified range at 16% O_2. The operator will not operate Dryer 1 post 03/12/2023, the Dryer and emission point A54 have been removed from the permit.
37	**Emissions to Air – Sulphur Dioxide** In order to reduce channelled SOX emissions to air from high-temperature beet pulp drying (above 500 °C), BAT is to use one or a combination of the techniques given below. (a) Use of natural gas (b) Wet scrubber (c) Use of fuels with low sulphur content	**CC**	The operator has provided information to support compliance with the BATc 37. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc 37. The operator employs the use of natural gas.

<table>
<tr><th>BATC No.</th><th>Summary of BAT Conclusion requirement for Food, Drink and Milk Industries</th><th>Status NA/ CC / FC / NC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td></td><td>
<table>
<tr><th>Parameter</th><th>Unit</th><th>BAT-AEL (average over the sampling period) (1)</th><th>Reference oxygen level (O_R)</th><th>Reference gas condition</th></tr>
<tr><td>SOx</td><td>mg/Nm^3</td><td>30 - 100</td><td>16 vol-%</td><td>No correction for water content</td></tr>
<tr><td colspan="5">(1) When using exclusively biomass as a fuel, emission levels are expected to be at the lower end of the range.</td></tr>
</table>
</td><td>NA</td><td>We are satisfied that the requirements of the BAT-AELs for BATc 37 do not apply, as the operator uses natural gas in Dryer 2.

The operator will not operate Dryer 1 post 03/12/2023, the coal fired Dryer and emission point A54 have been removed from the permit.</td></tr>
<tr><td></td><td>Sugar Manufacturing Environmental Performance Levels</td><td></td><td></td></tr>
<tr><td>EPL</td><td>Environmental Performance Level – Energy Consumption for Sugar Manufacturing
<table>
<tr><th>Specific process</th><th>Unit</th><th>Specific energy consumption (yearly average)</th></tr>
<tr><td>Sugar beet processing</td><td>MWh/tonne of beets</td><td>0.15– 0.40 (1)</td></tr>
<tr><td colspan="3">(1) The upper end of the range may include the energy consumption of the lime kiln and dryers.</td></tr>
</table>
</td><td>CC</td><td>The operator has provided information to support compliance with the specific energy consumption – environmental performance level (EPL) for sugar manufacturing.

The operator provided data for three years which confirms they are currently complaint. The performance maximum was 0.34 MWh/ tonnes of beets. This is within the EPL range.

The operator has confirmed this data includes heat and electricity utilised in the sugar process, animal feed and lime kilns.</td></tr>
<tr><td>EPL</td><td>Environmental performance level – Waste water discharge for Sugar Manufacturing
<table>
<tr><th>Product</th><th>Unit</th><th>Specific waste water discharge (yearly average)</th></tr>
<tr><td>Sugar beet processing</td><td>m^3/tonne of beets</td><td>0.5 – 1.0</td></tr>
</table>
</td><td>CC</td><td>The operator has provided information to support compliance with the specific wastewater discharge – environmental performance level (EPL) for sugar manufacturing.

The operator provided data for the three years which confirms they are currently compliant. The performance maximum was 0.72m^3/ tonnes of beets, which is within the EPL range.</td></tr>
</table>

<table>
<tr><th>BAT C No.</th><th>Summary of BAT Conclusion requirement for production of Cement, Lime and Magnesium Oxide</th><th>Status NA/ CC / FC / NC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>1</td><td>In order to improve the overall environmental performance of the plants/installations producing cement, lime and magnesium oxide, production BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the listed features.</td><td>CC</td><td>As per FDM BAT 1</td></tr>
<tr><td>3 - 29</td><td>BAT Conclusions that are not applicable to this installation</td><td>NA</td><td>We are satisfied that the requirements of BAT Conclusions 3 – 29 inclusive are not applicable as they apply to cement industry only.</td></tr>
<tr><td>2</td><td>In order to reduce/minimise noise emissions during the manufacturing processes for cement, lime and magnesium oxide, BAT is to use a combination of the listed techniques.

See the BATc for a list of the techniques.</td><td>CC</td><td>As per FDM BAT 13 and 14.</td></tr>
<tr><td>30</td><td>In order to reduce all kiln emissions and use energy efficiently, BAT is to achieve a smooth and stable kiln process, operating close to the process parameter set points by using the listed techniques.

<table><tr><th></th><th>Technique</th></tr><tr><td>a</td><td>Process control optimisation, including computer-based automatic control</td></tr><tr><td>b</td><td>Using modern, gravimetric solid fuel feed systems and/or gas flow meters</td></tr></table></td><td>CC</td><td>The operator has provided information to support compliance with the BATc30. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc30.

The operator employs the following techniques:

a) Process control optimisation, including computer-based automatic control. The lime kiln is run using the sites DCS system, process parameters such as temperatures and air flows are fed back to a centralised control room.
b) Both the limestone and fuel feeds to the lime kiln is done via gravimetric measurement. Limestone to fuel ratios are adjusted to optimise energy efficiency i.e., to ensure no overburnt limestone, and to maximise burnt lime and kiln gas quality.</td></tr>
</table>

<table>
<tr>
<td>31</td>
<td>In order to prevent and/or reduce emissions, BAT is to carry out a careful selection and control of the raw materials entering the kiln.</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc31. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc31.

The operator employs the following techniques to reduce emissions:

Raw materials, limestone and solid fuel are procured to a British Sugar specification to minimise and ensure that limestone and fuel impurity levels are minimised and both fuel and limestone breakage is minimised. The specifications define key parameters including the required physical properties.</td>
</tr>
<tr>
<td>32</td>
<td>BAT is to carry out monitoring and measurements of process parameters and emissions on a regular basis and to monitor emissions in accordance with the relevant EN standards or, if EN standards are not available, ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.
<table>
<tr><th></th><th>Technique</th><th>Applicability</th></tr>
<tr><td>a</td><td>Continuous measurements of process parameters demonstrating the process stability, such as temperature, O_2 content, pressure, flow rate and CO emissions</td><td rowspan="2">Applicable to kiln processes</td></tr>
<tr><td>b</td><td>Monitoring and stabilising of critical process parameters, e.g. fuel feed, regular dosage and excess oxygen</td></tr>
<tr><td>c</td><td>Continuous or periodic measurements of dust, NO_x, SO_x, CO emissions and NH_3 emissions when SNCR is applied</td><td>Applicable to kiln processes</td></tr>
<tr><td>d</td><td>Continuous or periodic measurements of HCl and HF emissions in case wastes are co-incinerated</td><td>Applicable to kiln processes</td></tr>
<tr><td>e</td><td>Continuous or periodic measurements of TOC emissions or continuous measurements in case wastes are co-incinerated</td><td>Applicable to kiln processes</td></tr>
<tr><td>f</td><td>Periodic measurements of PCDD/F and metal emissions</td><td>Applicable to kiln processes</td></tr>
<tr><td>g</td><td>Continuous or periodic measurements of dust emissions</td><td>Applicable to non-kiln processes

For small sources (<10 000 Nm^3/h) the frequency of the measurements should be based on a maintenance management system</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc32. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc32.

The operator employs the following techniques:

a) The sites kiln has continuous measurement on process parameters including, temperature, pressure, and air flows. These are fed back to the sites distributed control system (DCS).
b) Fuel and limestone feed to the kiln is monitored and controlled by the sites DCS.
c) SNCR is not employed on the lime kiln.
d) Waste fuels are not co-incinerated. The fuel is of a single type either coke or anthracite, both purchased to a specific specification.
e) Waste fuels are not co-incinerated. The fuel is of a single type either coke or anthracite, both purchased to a specific specification.</td>
</tr>
</table>

33	In order to reduce/minimise thermal energy consumption, BAT is to use a combination of the listed techniques.	**CC**	The operator has provided information to support compliance with the BATc33. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc33. The operator employs a combination of the following techniques: a) I. The sites limekiln has continuous measurements on process parameters to ensure that kiln control is run to optimal values. II. Not applicable to mixed feed shaft Kilns (MFSK). III. Limestone and fuel feed to the kiln is by a gravimetric system. IV. The kiln in regularly maintained, the site operates a Planned Preventative Maintenance (PPM) program that ensures the integrity of the limekiln is maintained and air ingress is minimised. Inspections and testing are undertaken at regular intervals by specially trained engineers to prevent the potential for breakdown, confirm safety and ensure it is efficient in operation. V. Stone size is specified in the defined British Sugar specification. b) The fuel used in the kiln is chosen to a defined British Sugar specification which includes calorific value and moisture content. c) Not applicable to MFSK.

	Technique	Description	Applicability
a	Applying improved and optimised kiln systems and a smooth and stable kiln process, operating close to the process parameter set points, through: I. process control optimisation II.heat recovery from flue-gases (e.g. use of surplus heat from rotary kilns to dry limestone for other processes such as limestone milling) III.modern, gravimetric solid fuel feed systems IV.maintenance of the equipment (e.g. air tightness, erosion of refractory) V.the use of optimised grain size of stone	Maintaining kiln control parameters close to their optimum values has the effect of reducing all consumption parameters due to, among other things, reduced numbers of shutdowns and upset conditions. The use of optimised grain size of stone is subject to raw material availability	Technique (a) II is applicable only to long rotary kilns (LRK)
b	Using fuels with characteristics which have a positive influence on thermal energy consumption	The characteristics of fuels, e.g. high calorific value and low moisture content can have a positive effect on the thermal energy consumption	The applicability depends on the technical possibility to feed the selected fuel into the kiln and on the availability of suitable fuels (e.g. high calorific value and low humidity) which may be impacted by the energy policy of the Member State
c	Limiting excess air	A decrease of excess air used for combustion has a direct effect on fuel consumption since high percentages of air require more thermal energy to heat up the excess volume. Only in LRK and PRK the limitation of excess air has an impact on thermal energy consumption. The technique has a potential of increasing TOC and CO emission	Applicable to LRK and PRK within the limits of a potential overheating of some areas in the kiln with consequent deterioration of the refractory lifetime

Year	GJ/tonne of product
2021	3.94
2020	4.05
2019	4.05

<table>
<tr><td></td><td></td><td></td><td>Cantley’s specific energy consumption falls within the BAT-associated levels for thermal energy consumption in the lime and dolime industry for mixed feed shaft kilns (MFSK) 3.4 – 4.7 GJ/tonne of product range.</td></tr>
<tr><td>34</td><td>In order to minimise electrical energy consumption, BAT is to use one or a combination of the listed techniques.

<table><tr><th></th><th>Technique</th></tr><tr><td>a</td><td>Using power management systems</td></tr><tr><td>b</td><td>Using optimised grain size of limestone</td></tr><tr><td>c</td><td>Using grinding equipment and other electricity based equipment with high energy efficiency</td></tr></table></td><td>CC</td><td>The operator has provided information to support compliance with the BATc34. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc34.

Electrical consumption is restricted to raw materials and burnt lime conveying and gas pumps and the lime slaker drive. There is no grinding of limestone within the process. Energy efficient equipment is employed where possible.</td></tr>
<tr><td>35</td><td>In order to minimise limestone consumption, BAT is to use one or a combination of the listed techniques
<table><tr><th></th><th>Technique</th><th>Applicability</th></tr><tr><td>a</td><td>Specific quarrying, crushing and well directed use of limestone (quality, grain size)</td><td>Generally applicable in the lime industry; however, stone processing is dependent on the limestone quality</td></tr><tr><td>b</td><td>Selecting kilns applying optimised techniques which allow for operating with a wider range of limestone grain sizes to make optimum use of quarried limestone</td><td>Applicable to new plants and major upgrades of kiln.
Vertical kilns can in principle only burn coarse limestone pebbles. Fine lime PFRK and/or rotary kilns can operate with smaller limestone grain sizes</td></tr></table></td><td>CC</td><td>The operator has provided information to support compliance with the BATc35. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc35.

The operator employs the following techniques:

a) Limestone sizing is defined in in specification PCS-014. The sizing is specified to allow efficient burning of stone and good air flows through the limekiln to produce high quality burnt lime which will slake effectively to produce a milk of lime which has a high surface area of lime particles which maximises purification of the sugar juice. This will ensure that the minimum amount of lime is used for sugar juice purification. A high-quality limestone is specified to ensure a high quality burnt lime is produced.
b) Unburnt limestone is recovered from the lime slaker and is recycled back to the kiln to minimise process losses and raw materials usage.</td></tr>
</table>

36	In order to prevent/reduce emissions, BAT is to carry out a careful selection and control of fuels entering the kiln	**CC**	The operator has provided information to support compliance with the BATc36. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc36. Cantley operates a mixed feed shaft kiln, the solid fuels that are used in the kiln are procured to meet BS specification (PCS-014). The kiln gas is initially scrubbed to remove particulate matter before passing through the gas pumps to the sugar process where it is introduced into a sugar juice, milk of lime mixture in a two stage carbonatation process. This is effectively ensuring all kiln gas is scrubbed twice, firstly by water in the gas washer and then through a lime solution in the sugar process. SO_2 is absorbed by the re-precipitated calcium carbonate in the process. In addition, the lime will scrub other acid gases.
37	In order to guarantee the characteristics of waste to be used as fuel in a lime kiln, BAT is to apply the listed techniques:	**NA**	We are satisfied that the requirements of BATc 37 as waste fuels are not used.
38	In order to prevent/reduce emissions occurring from the use of waste fuels into the kiln, BAT is to use the listed techniques	**NA**	We are satisfied that the requirements of BATc 38 as waste fuels are not used.
39	In order to prevent accidental emissions, BAT is to use safety management for the storage, handling and feeding into the kiln of hazardous waste materials	**NA**	We are satisfied that the requirements of BATc 39 as hazardous wastes are not used in the kiln.

<table>
<tr>
<td>40</td>
<td>In order to minimise/prevent diffuse dust emissions from dusty operations, BAT is to use one or a combination of the listed techniques
<table>
<tr><th></th><th>Technique</th></tr>
<tr><td>a</td><td>Enclosure/encapsulation of dusty operations, such as grinding, screening and mixing</td></tr>
<tr><td>b</td><td>Use of covered conveyors and elevators, which are constructed as closed systems, if dust emissions are likely to be released from dusty material</td></tr>
<tr><td>c</td><td>Use of storage silos with adequate capacity, level indicators with cut out switches and with filters to deal with dust-bearing air displaced during filling operations</td></tr>
<tr><td>d</td><td>Use of a circulation process which is favoured for pneumatic conveying systems</td></tr>
<tr><td>e</td><td>Material handling in closed systems maintained under negative pressure and dedusting of the suction air by a fabric filter before being emitted into the air</td></tr>
<tr><td>f</td><td>Reduction of air leakage and spillage points, completion of installation</td></tr>
<tr><td>g</td><td>Proper and complete maintenance of the installation</td></tr>
<tr><td>h</td><td>Use of automatic devices and control systems</td></tr>
<tr><td>i</td><td>Use of continuous trouble-free operations</td></tr>
<tr><td>j</td><td>Use of flexible filling pipes equipped with a dust extraction system for loading lime which are positioned at the loading floor of the lorry</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc40. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc40.

The operator employs a combination of the following techniques:

a) The burnt lime conveyor is enclosed to minimise dust emissions. The fuel hoppers have high level indication to reduce the risk of overloading and spillage, these are fed back to the DCS.
g) British sugar operates a planned preventative maintenance system to ensure the proper and complete maintenance of its equipment, plant item areas checked by regular audio-visual inspection routes.
h) The whole kiln, slaking and carbonatation process is monitored and controlled by the site DCS.</td>
</tr>
</table>

<table>
<tr>
<td>41</td>
<td>In order to minimise/prevent diffuse dust emissions from bulk storage areas, BAT is to use one or a combination of the listed techniques
<table>
<tr><th></th><th>Technique</th></tr>
<tr><td>a</td><td>Enclose storage locations using screening, walling or vertical greenery (artificial or natural wind barriers for open pile wind protection)</td></tr>
<tr><td>b</td><td>Use product silos and closed, fully-automated raw material storages. These types of storage are equipped with one or more fabric filters to prevent diffuse dust formation in loading and unloading operations</td></tr>
<tr><td>c</td><td>Reduce diffuse dust emissions at stockpiles by using sufficient humidification of stockpile charging and discharging points and the use of conveyor belts with adjustable height. When using humidification or spraying measures/techniques, the ground can be sealed and the surplus water can be gathered, and if necessary this can be treated and used in closed cycles</td></tr>
<tr><td>d</td><td>Reduce diffuse dust emissions at charging or discharging points of storage sites if they cannot be avoided, by matching the discharge height to the varying height of the heap, if possible automatically, or by reduction of the unloading velocity</td></tr>
<tr><td>e</td><td>Keep the locations wet, especially dry areas, using spraying devices and clean them by cleaning lorries</td></tr>
<tr><td>f</td><td>Use vacuum systems during removal operations. New buildings can easily be equipped with stationary vacuum cleaning systems, while existing buildings are normally better fitted with mobile systems and flexible connections</td></tr>
<tr><td>g</td><td>Reduce diffuse dust emissions arising in areas used by lorries, by paving these areas when possible and keeping the surface as clean as possible. Wetting the roads can reduce diffuse dust emissions, especially during dry weather. Good housekeeping practices can be used in order to keep diffuse dust emissions to a minimum</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc41. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc41.

The operator uses a combination of the following techniques:

a) Limestone and anthracite stocks are stored in locations with artificial screening for wind protection.
c) Floors are damped down to reduce diffuse dust emissions when required.
g) Surfaces are damped down to reduce diffuse dust emissions. Outside areas are regularly cleaned by road sweepers to reduce material build up which may lead to diffuse dust emissions by site transport and in extremely dry conditions from wind blow.</td>
</tr>
</table>

<table>
<tr>
<td>42</td>
<td>In order to reduce channelled dust emissions from dusty operations other than those from kiln firing processes, BAT is to use one of the listed techniques and to use a maintenance management system which specifically addresses the performance of filters
<table>
<tr><th></th><th>Technique ([20]) ([21])</th><th>Applicability</th></tr>
<tr><td>a</td><td>Fabric filter</td><td>Generally applicable to milling and grinding plants and subsidiary processes in the lime industry; material transport; and storage and loading facilities. The applicability of fabric filters in hydrating lime plants may be limited by the high moisture and low temperature of the flue-gases</td></tr>
<tr><td>b</td><td>Wet scrubbers</td><td>Mainly applicable to hydrating lime plants</td></tr>
</table>
<table>
<tr><th>Technique</th><th>Parameter</th><th>Unit</th><th>BAT-AEL
(daily average or average over the sampling period(spot measurements for at least half an hour)</th></tr>
<tr><td>Fabric Filter</td><td>Dust</td><td>mg/Nm^3</td><td><10</td></tr>
<tr><td>Wet Scrubber</td><td>Dust</td><td>mg/Nm^3</td><td><10 – 20</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc42. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc42.

Milk of lime for sugar processing is produced by mixing the burnt lime from the kiln with a dilute sugar solution within the lime slaker, exhaust air from the slaker passes through a hydro cyclone to reduce particulate emissions. Annual planned preventative maintenance is scheduled and carried out and shiftily Audio-Visual Inspections are carried out to ensure the plant is running to design specification.

For the lime slaker vent emission point A61 the operator provided emissions data for particulate matter for the period of 2018 – 2021. This data demonstrates that emissions of particulate matter averages 1.8 mg/m^3, demonstrating the operator can meet the BAT-AELs set in BATc42. Therefore, the previous limit for particulate emissions of 50mg/m^3 has been removed and a new limit of 10mg/m^3 has been implemented in line with the BAT-AELs for wet scrubbers.</td>
</tr>
</table>

43	In order to reduce dust emissions from the flue-gases of kiln firing processes, BAT is to use flue-gas cleaning with a filter. One or a combination of the listed techniques can be used **Technique [1]** a ESP — Applicable to all kiln systems b Fabric filter — Applicable to all kiln systems c Wet dust separator — Applicable to all kiln systems d Centrifugal separator/ cyclone — Centrifugal separators are only suitable as pre-separators and can be used to pre-clean the flue-gases from all kiln systems [1] A description of the techniques are provided in section 4.6.1 of the BAT conclusions **Technique / Parameter / Unit / BAT-AEL (daily average or average over the sampling period(spot measurements for at least half an hour)** Fabric Filter — Dust — mg/Nm^3 — <10 ESP or other filters — Dust — mg/Nm^3 — <20* (*) In exceptional cases where the resistivity of dust is high, the BAT-AEL could be higher, up to 30mg/Nm^3, as the daily average.	**CC**	The operator has provided information to support compliance with the BATc43. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc43. The operator uses the following techniques: c) The gas from the limekiln is pulled from the top of the limekiln through gas washers by a gas pump and is introduced into the sugar juice purification process (carbonatation). The gas washer removes any entrained particulate matter preventing damage to the gas pump. The gas washers are supplied with recycled water from the sugar process (condenser water). The sugar process carbonatation system essentially acts as a second stage wet scrubber. The BAT-AEL may not apply, subject to IC38.

<table>
<tr>
<td>44</td>
<td>In order to reduce the emissions of gaseous compounds (i.e. NOx, SOx , HCl, CO, TOC/VOC, volatile metals) from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques
<table>
<tr><th></th><th>Technique</th><th>Applicability</th></tr>
<tr><td>a</td><td>Careful selection and control of substances entering the kiln</td><td>Generally applicable</td></tr>
<tr><td>b</td><td>Reducing the pollutant precursors in fuels and, if possible, in raw materials, i.e.
I. selecting fuels, where available, with low contents of sulphur (for long rotary kilns in particular), nitrogen and chlorine
II. selecting raw materials, if possible, with low contents of organic matter
III. selecting suitable waste fuels for the process and the burner</td><td>Generally applicable in the lime industry subject to local availability of raw materials and fuels, the type of kiln used, the desired product qualities and the technical possibility of feeding the fuels into the selected kiln</td></tr>
<tr><td>c</td><td>Using process optimisation techniques to ensure an efficient absorption of sulphur dioxide (e.g. efficient contact between the kiln gases and the quicklime)</td><td>Applicable to all lime plants.
In general, complete process automation is not achievable due to uncontrollable variables, i.e. quality of the limestone</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc44. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc44.

The operator employs the following techniques:

a) Raw materials are purchased to a specification which minimises the amount of impurities in the limestone and fuel.
b) Both coke and anthracite are used in the kiln as a fuel and these are sourced to British Sugar specifications which include a specification to minimise the sulphur content. British Sugar specifies only very high purity limestone to be used in the lime kiln this is to maximise the quality of the burnt lime used for carbonatation. This ensures maximum juice purification.
c) Process control optimisation, including computer-based automatic control. The lime kiln is run using the sites DCS system, process parameters such as temperatures and air flows are fed back to a centralised control room. The carbonatation vessels are fitted with gas distributors which maximise the reprecipitation of calcium carbonate by ensuring maximum contact between the limed sugar juice and the carbon dioxide and subsequent removal by the lime of acid gases and impurities.

The BAT-AEL may not apply, subject to IC38.</td>
</tr>
</table>

<table>
<tr>
<td>45</td>
<td>In order to reduce the emissions of NOx from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques
<table>
<tr><th></th><th>Technique</th><th>Applicability</th></tr>
<tr><td>a</td><td colspan="2">Primary techniques</td></tr>
<tr><td></td><td>I. Appropriate fuel selection along with limitation of nitrogen content in the fuel</td><td>Generally applicable in the lime industry subject to fuel availability which may be impacted by the energy policy of the Member State and to the technical possibility to feed a certain type of fuel into the selected kiln</td></tr>
<tr><td></td><td>II. Process optimisation including flame shaping and temperature profile</td><td>Optimisation of process and process control can be applied in lime manufacturing but is subject to the final product quality</td></tr>
<tr><td></td><td>III. Burner design (low NO_X burner) (24)</td><td>Low NO_X burners are applicable to rotary kilns and to annular shaft kilns presenting conditions of high primary air. PFRKs and other shaft kilns have flameless combustion, thus rendering low NO_X burners not applicable to this kiln type</td></tr>
<tr><td></td><td>IV. Air staging (24)</td><td>Not applicable to shaft kilns.
Applicable only to PRK but not when hard burned lime is produced. The applicability may be limited by constraints imposed by the type of final product, due to possible overheating in some areas of the kiln and consequent deterioration of the refractory lining</td></tr>
<tr><td>b</td><td>SNCR (24)</td><td>Applicable to Lepol rotary kilns. See also BAT 46</td></tr>
</table>
<table>
<tr><th>Kiln type</th><th>Unit</th><th>BAT-AEL
(daily average value or average over the sampling period (spot measurements for at least half an hour), stated as NO_2)</th></tr>
<tr><td>PFRK, ASK, MFSK, OSK</td><td>mg/Nm^3</td><td>100 – 350</td></tr>
<tr><td>LRK, PRK</td><td>mg/Nm^3</td><td>< 200 – 500</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc45. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc45.

The operator uses a combination of the following techniques:

c) Primary techniques I. Cantley operates a Mixed feed shaft kiln and only anthracite, coke and limestone are used in the kiln. All gas from the limekiln passes through a gas washer (water scrubber) and through the sugar carbonatation process which acts as a lime scrubber.

The BAT-AEL may not apply, subject to IC38.</td>
</tr>
<tr>
<td>46</td>
<td>When SNCR is used, BAT is to achieve efficient NOx reduction, while keeping the ammonia slip as low as possible, by using the listed technique</td>
<td>NA</td>
<td>We are satisfied that the requirements of BATc 46 as SNCR is not used at the site.</td>
</tr>
</table>

<table>
<tr>
<td>47</td>
<td>In order to reduce the emissions of SOx from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques
<table>
<tr><th></th><th>Technique</th><th>Applicability</th></tr>
<tr><td>a</td><td>Process optimisation to ensure an efficient absorption of sulphur dioxide (e.g. efficient contact between the kiln gases and the quicklime)</td><td>Process control optimisation is applicable to all lime plants</td></tr>
<tr><td>b</td><td>Selecting fuels with a low sulphur content</td><td>Generally applicable, subject to fuel availability in particular for use in long rotary kilns (LRK), due to high SO_x emissions</td></tr>
<tr><td>c</td><td>Using absorbent addition techniques (e.g. absorbent addition, dry flue-gas cleaning with a filter, wet scrubber, or activated carbon injection) ([28])</td><td>Absorbent addition techniques are, in principle, applicable in the lime industry; however, this technique had not yet been applied in the lime sector in 2007. Particularly for rotary lime kilns further investigation is required in order to assess its applicability</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc47. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc47.

The operator uses a combination of the following techniques:

a) Process control optimisation, including computer-based automatic control. The lime kiln is run using the sites DCS system, process parameters such as temperatures and air flows are fed back to a centralised control room.
b) Both coke and anthracite used as fuel for the limekiln have maximum sulphur specifications. Gas from the kiln is passed through a gas washer and is then introduced into the sugar factory purification process. This acts as a lime scrubber and will remove sulphur dioxide readily.</td>
</tr>
<tr>
<td>48</td>
<td>In order to reduce the emissions of CO from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques
<table>
<tr><th></th><th>Technique</th><th>Applicability</th></tr>
<tr><td>a</td><td>Selecting, raw materials with a low content of organic matter</td><td>Generally applicable to the lime industry within the constraints of the local availability and composition of raw materials, the type of kiln used and the quality of the final product</td></tr>
<tr><td>b</td><td>Using process optimisation techniques to achieve a stable and complete combustion</td><td>Applicable to all lime plants.
In general, complete process automation is not achievable due to uncontrollable variables, i.e. quality of the limestone</td></tr>
</table>
</td>
<td>CC</td>
<td>The operator has provided information to support compliance with the BATc48. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc48.

The operator uses a combination of the following techniques:

a) Fuel and limestone used in the kiln is bought to a British Sugar specification the organic content of the limestone is low.
b) Process control optimisation, including computer-based automatic control. The lime kiln is run using the sites DCS system, process parameters such as temperatures and air flows are fed back to a centralised control room. The fuel to stone ratio is adjusted to ensure that the limestone is burnt efficiently to minimise over burning or under burning. This optimisation of combustion within the kiln will control carbon monoxide emissions.</td>
</tr>
</table>

<table>
<tr><td>49</td><td>In order to minimise the frequency of CO trips when using electrostatic precipitators, BAT is to use the listed techniques</td><td>NA</td><td>We are satisfied that the requirements of BATc 49 as as ESP’s are not utilised.</td></tr>
<tr><td>50</td><td>In order to reduce the emissions of TOC from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques
<table><tr><th></th><th>Technique</th></tr><tr><td>a</td><td>Applying general primary techniques and monitoring (see also BAT 30 and 31 in Section 1.3.1, and BAT 32 in Section 1.3.2)</td></tr><tr><td>b</td><td>Avoid feeding raw materials with a high content of volatile organic compounds into the kiln system (except for hydraulic lime production)</td></tr></table></td><td>CC</td><td>The operator has provided information to support compliance with the BATc50. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc50.

The operator employs the following techniques to reduce emissions: Raw materials, limestone and solid fuel are procured to a British Sugar specification to minimise to ensure that limestone and fuel impurity levels are minimised and both fuel and limestone breakage is minimised. The specifications define key parameters including the required physical properties.</td></tr>
<tr><td>51</td><td>In order to reduce the emissions of HCl and the emissions of HF from the flue-gas of kiln firing processes, when using waste, BAT is to use the following primary techniques</td><td>NA</td><td>We are satisfied that the requirements of BATc 51 as the site does not use waste as fuels.</td></tr>
<tr><td>52</td><td>In order to prevent or reduce the emissions of PCDD/F from the flue-gas of kiln firing processes, BAT is to use one or a combination of the listed primary techniques</td><td>NA</td><td>We are satisfied that the requirements of BATc 52 as British Sugar does not use waste or waste derived fuels within its limekilns. The limestone specification requires a minimum 98 % purity. All kiln gas is passed through a gas washer which quickly reduces the temperature to around 40C. The gas is then passed through the sugar factory carbonatation system which acts as a lime scrubber.</td></tr>
<tr><td>53</td><td>In order to minimise the emissions of metals from the flue-gases of kiln firing processes, BAT is to use one or a combination of the listed techniques</td><td>CC</td><td>The operator has provided information to support compliance with the BATc53. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc53.

The kiln gas is passed through a gas washer and then through the sugar factory carbonatation system which effectively acts as a lime scrubber. All particulates will therefore be removed in this two-stage wet scrubbing process.</td></tr>
</table>

54	In order to reduce the solid wastes from the lime manufacturing processes and to save raw materials, BAT is to use the listed techniques	**CC**	The operator has provided information to support compliance with the BATc54. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with the BATc54. The operator uses a combination of the following techniques: a) Limestone screenings are either sold or used in place of virgin aggregate to maintain site roadways. Unburnt limestone is recycled back into limestone feed to kiln where material is suitable. Inert material (dross) generated from limited impurities within the limestone raw material are used for internal site roads maintenance.
55-69	BAT Conclusions that are not applicable to this installation	**NA**	We are satisfied that the requirements of BAT Conclusions 55 – 69 inclusive are not applicable as they apply to the magnesium oxide industry only.

Annex 2: Review and assessment of changes that are not part of the BAT Conclusions derived permit review

Updating permit during permit review consolidation

- Activity name
- Introductory note (updated)
- Site plan
- Table S1.1 overhaul
    - Activity Reference (AR) renumbering
    - Updated listed activities
    - Addition of production capacity
    - Directly associated activities (DAAs) standardisation

We have updated permit conditions to those in the current generic permit template as a part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit.

Production Threshold

The Environment Agency is looking to draw a “line in the sand” for permitted production capacity; a common understanding between the Operator and regulator for the emissions associated with a (maximum) level of production, whereby the maximum emissions have been demonstrated as causing no significant environmental impact.

We have included a permitted production level (capacity) within table S1.1 of the permit for the section 6.8 listed activity and we need to be confident that the level of emissions associated with this production level have been demonstrated to be acceptable.

The operator has provided the production capacities of relevant activities as per Table S1.1 of the permit.

We are satisfied that the most recent risk assessment for these capacities remains valid.

Emissions to Air

We asked the operator to list all emission points to air from the installation in the Regulation 61 notice. And to provide a site plan indicating the locations of all air emission points.

The operator has provided an up to date air emission plan.

Implementing the requirements of the Medium Combustion Plant Directive

Existing Medium Combustion Plant (1MW-50MW)

We asked the Operator to provide information on all combustion plant on site in the Regulation 61 Notice as follows:

- Number of combustion plant (CHP engines, back-up generators, boilers);
- Size of combustion plant – rated thermal input (MWth)

- Date each combustion plant came into operation

The Operator provided the information in the table below:

Boilers

Name of combustion plants on the permit.	ICL Boiler No.1	Aalborg Boiler No.2 [NOTE 1]	Maxecon Boiler No.3 [NOTE 1]
1. Rated thermal input (MW) of the medium combustion plant.	46.5 MWth	48.4 MWth	16.8 MWth
2. Type of the medium combustion plant (diesel engine, gas turbine, dual fuel engine, other engine or other medium combustion plant).	Boiler	Boiler	Boiler
3. Type and share of fuels used according to the fuel categories laid down in Annex II.	Natural gas	Solid fuel (coal)	Gas oil
4. Date of the start of the operation of the medium combustion plant or, where the exact date of the start of the operation is unknown, proof of the fact that the operation started before 20 December 2018.	1968	1988	Pre 20/12/2018
NOTE 1: Boiler No.2 and No.3 will not operate post 01/01/2025.			

We have reviewed the information provided and we consider that the declared combustion plant qualify as “existing” medium combustion plant.

For existing medium combustion plant with a rated thermal input greater than 5 MW, the emission limit values set out in tables 2 and 3 of Part 1 of Annex II MCPD shall apply from 1 January 2025.

The operator has assessed the emissions from the existing boilers and has concluded that the Aalborg Boiler No.2 and Maxecon Boiler No.3 could not meet the ELVs set out in the MCP. They have therefore concluded they will not operate the boilers post 31/12/2024. We have included the appropriate emission limit values for existing medium combustion plants as part of this permit review, with notes to account for the boilers not being operated post 31/12/2021. We have maintained the emission limit values and monitoring in the permit for the ICL Boiler No.1 as in accordance with the MCPD. See Table S3.1 in the permit. We have also included a new condition 3.1.4 within the permit which specifies the monitoring requirements for the combustion plant in accordance with the MCPD.

National Emissions Ceiling Directive Substances

The site gives rise to emissions of NECD substances, and we have undertaken an assessment of these to ensure that the appropriate permit controls are in place.

Emissions of NO_2

The operator has undertaken an assessment of the emissions of NO_2 from the combustion plants and the animal feed dryer.

The assessment shows that the long term emissions of NO_2 are significant. The operator has also stated that two of the MCPs (Aalborg Boiler No.2 and Maxecon boiler No.3) will not be able to meet the MCPD limits thus these will be removed or no longer operated by 31/12/2024. This will reduce the emissions of NOx.

We have also reduced the NOx ELV in the permit for the remaining Dryer A55 from 300mg/m^3 to 55mg/m^3.

Emissions of SOx – No assessment undertaken

Based on the activities and routine fuels utilised, this is unlikely to be a significant parameter.

Emissions of Particulate matter

The operator has undertaken an assessment of the emissions of PM10 and PM2.5 from the lime slaker vents (PM10 only) and the animal feed dryers.

The assessment shows that the short term emissions of PM10 are significant from these sources.

BAT-AELs are derived for those substances identified as key environmental issues during the BREF review process.

The operator has identified current compliance against BAT-AELs and we have implemented the relevant emission limit value (ELV) from the effective date of the permit.

We have also included improvement conditions IC36 and IC39 for the operator to investigate further reductions in the emissions of particulate matter.

Emissions of ammonia

The operator has undertaken an assessment of the emissions of ammonia from the sugar process, cooling towers and the animal feed dryers.

The assessment shows that the short term emissions of ammonia are significant from these sources.

We have included IC34 for the operator to investigate further reductions in the emissions of ammonia.

Emissions of Non-methane Volatile Organic Compounds

The operator has undertaken an assessment of the emissions of NMVOCs (as Benzene) from the animal feed dryers. This was assessed against the revised LT EAL standard.

The assessment shows that the long term and short term emissions of NMVOCs are insignificant from these sources.

However, to further reduce emissions of CO, methane, formaldehyde etc, we have imposed improvement condition IC35.

Emissions to Water and implementing the requirements of the Water Framework Directive

We asked the Operator to provide information on all emissions to water at the installation in the Regulation 61 Notice as follows;

- Identify any effluents which discharge directly to surface or groundwater;
- Provide an assessment of volume and quality, including results of any monitoring data available;
- and for any discharges to water / soakaway whether a recent assessment of the feasibility of connection to sewer has been carried out.

The operator has provided a revised risk assessment using the Environment Agency's H1 software tool for EDTA.

However, the presence of EDTA in the wate water stream requires further investigation and we have added IC37, also having regard for the requirements of BATc 8.

To further protect water quality, we have imposed a monitoring requirement for neonicotinoids when these have been applied to the crop.

Finally, we have standardised the water discharge parameters to align with the processing and non-processing periods. As a result, we have ensured that the operator demonstrates BAT, and the requirements protect the WFD status of the receiving watercourse.

Soil & groundwater risk assessment (baseline report)

The IED requires that the operator of any IED installation using, producing or releasing "relevant hazardous substances" (RHS) shall, having regarded the possibility that they might cause pollution of soil and groundwater, submit a "baseline report" with its permit application. The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the regulated facility and at cessation of activities. It must enable a quantified comparison to be made between the baseline and the state of the site at surrender.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into account both the baseline conditions and the site's current or approved future use. To do this, the Operator has to submit a surrender application to us, which we will not grant unless and until we are satisfied that these requirements have been met.

The Operator submitted a site condition report during the original application. The site condition report included a report on the baseline conditions as required by Article 22. We reviewed that report and considered that it adequately described the condition of the soil and groundwater at that time.

Hazardous Substances

Hazardous substances are those defined in Article 3 of Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances and mixtures.

The operator did not provide a hazardous substances risk assessment; however, the operator has a robust Site Protection and Monitoring Plan (SPMP) in place which provides sufficient environmental protection for the pollution of soil and/or ground water against hazardous substances on site.

Climate Change Adaptation

The operator has considered if the site is at risk of impacts from adverse weather (flooding, unavailability of land for land spreading, prolonged dry weather / drought).

The operator has identified the installation as likely to be or has been affected by flooding and prolonged dry weather/drought, which we consider to be a severe weather event.

The operator has management plans in place, which considers, as a minimum the impact of severe weather on the operations within the installation.

We consider the management plans to be appropriate for the installation.

Containment

We asked the Operator vis the Regulation 61 Notice to provide details of the each above ground tanks which contain potentially polluting liquids at the site, including tanks associated with the effluent treatment process where appliable.

The Operator provided details of all tanks;

- Tank reference/name
- Contents
- Capacity (litres)
- Location
- Construction material(s) of each tank
- The bunding specification including
    - Whether the tank is bunded
    - If the bund is shared with other tanks
    - The capacity of the bund
    - The bund capacity as % of tank capacity
    - Construction material of the bund
    - Whether the bund has a drain point
    - Whether any pipes penetrate the bund wall
- Details of overfill prevention
- Drainage arrangements outside of bunded areas
- Tank filling/emptying mitigation measures (drips/splashes)
- Leak detection measures

- Details of when last bund integrity test was carried out
- Maintenance measures in place for tank and bund (inspections)
- How the bund is emptied
- Details of tertiary containment

and whether the onsite tanks currently meet the relevant standard in the CIRIA "Containment systems for the prevention of pollution (C736)" report or alternative appropriate measures.

We reviewed the information provided by the operator. We are satisfied that the existing tanks and containment measures are appropriate.

Annex 3: Improvement Conditions

Based on the information in the Operator's Regulation 61 Notice response and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These improvement conditions are set out below - justifications for them is provided at the relevant section of the decision document (Annex 1 or Annex 2).

Previous improvement conditions marked as complete in the previous permit.

Superseded Improvement Conditions – Removed from permit as marked as "complete"	
Reference	**Improvement Condition**
IC33	The Operator shall submit a written report to confirm the relationship between COD and BOD in the final effluent and how this is used in daily site checks to indicate compliance with BOD permitted limits.

The following improvement conditions have added to the permit as a result of the variation.

Improvement programme requirements		
Reference	**Reason for inclusion**	**Justification of deadline**
IC34	Ammonia is a key issue for the sector.	To give the operator appropriate time to undertake monitoring
IC35	Emissions of CO, methane, formaldehyde etc are elevated in this sector as demonstrated by PI returns	
IC36	Particulates are a key issue for the sector.	
IC37	In line with FDM BAT 8.	Reasonable timeframe for completion
IC38	The operator does not directly discharge lime kiln gases to atmosphere, as it is utilised into the sugar production process. As such, the nature of the emissions may be such that the CLM BAT-AELs do not apply	To give the operator appropriate time to undertake monitoring
IC39	A routine requirement in line with animal feed production	Reasonable timeframe for completion

Annex 4: Pre-operational Conditions

The following pre-operational condition has been marked as complete in the previous permit.

Superseded Improvement Conditions – Removed from permit as marked as "complete"		
Reference	**Operation**	**Pre-operational measures**
PO3	Changing of fuel type from heavy fuel oil to natural gas	The Operator shall inform the Environment Agency in writing of the intention to proceed with the changing of fuel to the No 2 Animal Feed dryer. The notice period shall be at least be 4 weeks prior to the start date.

The following pre-operational condition has been removed from the permit as the operator has confirmed they no longer intend to switch fuel type in the lime kiln, and if they change their position on this they will apply for a variation.

Superseded Improvement Conditions – Removed from permit		
Reference	**Operation**	**Pre-operational measures**
PO4	Changing of fuel type from coke/anthracite to natural gas	The Operator shall inform the Environment Agency in writing of the intention to proceed with the changing of fuel the fuel type in the lime kiln. The notice period shall be at least be 4 weeks prior to the start date.

The following pre-operational measures have been retained in the permit as they are still relevant for the site and need to be completed before the processes can commence.

Reference	Pre-operational measures
PO1	The Operator shall inform the Environment Agency in writing of the intention to proceed with the Raw Sugar Refinery process and provide the proposed date of commencement.
PO2	During the first year of operation of the Raw Sugar Refinery process within the Regulated Facility, the Operator shall carry out the following measures: • A noise survey shall be carried out around all plant, equipment and buildings installed as part of this project. Once the survey is completed a written report of the results shall be submitted to the Agency. Should the survey show that noise levels are above acceptable levels, the operator shall include information regarding actions to be taken to reduce noise. • A noise survey shall be carried out at the locations of the nearest receptors, as indicated in Report 1906/R2. Once the survey is completed a written report of the results shall be submitted to the Agency. Should the survey show that noise levels are above acceptable levels, the operator shall include information regarding actions to be taken to reduce noise. The Operator shall not commence the second year of Operation until they have completed the above actions and received written confirmation from the Agency that the plant can be brought into operation.