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/GP3932PL
The Operator is:	Simpsons Malt Limited
The Installation is:	Tweed Valley Maltings
This Variation Notice number is:	EPR/GP3932PL/V007

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. Review and assessment of derogation requests made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value
5. Annex 1 – Review of operating techniques within the Installation against BAT Conclusions.
6. Annex 2 – Review and assessment of changes that are not part of the BAT Conclusions derived permit review
7. Annex 3 – Improvement 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 09/06/2022 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 11/10/2022.

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

The Operator claimed that certain information was commercially confidential and should be withheld from the public register. We considered this request and determined that: the Cost Benefit Assessment (CBA) document submitted in support of the permit derogation application is treated as confidential. Apart from the issues and information just described, 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 consider that the Operator will be able to comply with the techniques and standards described in the BAT Conclusions other than for those techniques and requirements described in BAT Conclusion BATc1 Environmental Management System (parts of), BATc9 Refrigerants and BATc12 BAT-AEL for Chemical Oxygen Demand (COD) emissions to a receiving watercourse. In relation to these BAT Conclusions, we do not fully agree with the Operator in respect of their current stated capacity as recorded in their response to the Reg 61 Notice. We have therefore included Improvement Conditions IC9 and IC10 relating to narrative BAT, along with IC11 and IC12 relating to a derogation from the BAT-AEL for COD. We have also included IC13 and IC14 relating to abatement and particulate differentiation at the peat kiln and IC15 requiring the operator to survey containment infrastructure in the Consolidated Variation Notice to ensure the requirements of the BAT Conclusions are delivered within 3 months and 12 months.

2.3 Requests for further information during determination

Although we were able to consider the Regulation 61 Notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment, and issued further information requests on 24/07/2023 requesting additional information on BATc1 Environmental Management System, BATc 4 effluent discharges to water, BATc6 energy efficiency, BATc7 water reuse, BATc9 refrigerants, BATc11 buffer capacity, Medium Combustion Plant, Air emissions, Climate change, Site Condition Report, Relative Hazardous Substances and containment.

The operator applied for a permit derogation for BATc 12 BAT-AEL for direct emissions to a receiving waterbody for COD of 25-100mg/l on the 03/10/2023. Additional information has been received in support of this throughout the determination.

A copy of each further information request was placed on our public register.

We consulted on our draft decision from 25/03/2025 to 22/04/2025. No responses were received.

2.4 Key issues of the decision

Site overview and derogation request

The installation processes grains to form malt for the brewing, distilling and food industries across the world. The barley is steeped in the steephouse, in one of the 24 large cylindroconical steeping vessels which stand at 11m tall and 5m wide, each has a capacity to hold between 65-75 tonnes of barley. The steeping process uniforms the moisture content of each grain to trigger the start of the germination phase. The steep water is drained away and a period of air rest follows, the process is repeated until a moisture content of 45% has been reached.

After the steeping process the majority of the barley is transferred to one of nine germination & kilning vessels (GKVs) where the germination and kilning process takes place. During this process the endosperm of the grains is modified by breaking down the cell walls and protein matrix making starch granules available for conversion to sugar in the mashing stage of the brewing or distilling processes. Once the germination process is complete the grains are then dried through the kilning process. The kilning process kills the embryo and stabilises the endosperm of the grain leaving viable enzymes that are used by brewers and distillers. The moisture content of the grains is reduced from 45% to 4% or lower in the finished malt. A smaller quantity of the barley is transferred from the steeping process to the germination room, to produce green (unkilned) malt.

The installation operates an effluent treatment plant (ETP) which treats the process effluent from the operation. The ETP treatment process consists of the following stages; screening to remove gross debris

with the collected grains are dewatered and sent off site for energy recovery through anaerobic digestion. Effluent is then stored in the balancing tank and pass forward to the bioreactor at a controlled rate via fine screens. The bioreactor reduces the concentration of COD by promoting bacterial growth, a proportion of resulting sludge (biomass) is dewatered and sent offsite for land spreading as a soil improver. The remaining sludge is passed through ultrafiltration (UF) membranes to remove solids and the filtered permeate is collected in the UF permeate tanks before discharge. A proportion of the permeate is transferred to one of two reverse osmosis (RO) systems. The RO systems 'polish' the permeate to allow for reuse within the stepping process, rejected water from the UF is combined with the permeate and discharged to surface water (Tweed Estuary).

At the discharge location the River Tweed is considered to be tidal to the upstream confluence with the Whiteadder Water, which is approximately 6.4km above the discharge point. At the discharge location the Tweed Estuary is considered to be macrotidal with a tidal range of up to 4.2m. The Tweed Estuary receives little tidal inflow from the North Sea. Given the nature of the receiving water course and the available dilution it is considered that the discharge is not having an impact on the receiving water course.

As a result of the steeping process the steep water is unable to be reused without treatment (as described above) as the used steep water would act as a germination inhibiter and prevent the germination of the grains. Polyphenols from the steeping process are captured on the reverse osmosis membranes, these have a high COD to BOD ratio. The use of RO to recycle water reduces the pressure on the abstraction boreholes on which the site relies upon for the onsite processes. The membrane of the RO process captures the high COD waste, this is known as RO retentate which is then discharged to the river Tweed.

The Operator built and commissioned the effluent treatment plant in 2008, which included the ability to treat and re-use water from the steeping process. The construction of the effluent treatment plant was in response to notice being given on the existing discharge of effluent to the foul sewer and downstream wastewater treatment works which is owned and operated by Northumbrian Water. It is noted that the Operator was the first malting site in the world to successfully recycle steepwater on a commercial basis, technology that is now used throughout the UK and beyond.

Whilst the RO and MBR allow the site to successfully treat the steep water for reuse in the process the resulting retentate has a high COD concentration. If the recovery process wasn't in operation the steep waters would be treated and discharged to the Tweed Estuary. The same amount of COD would still be discharged from the site, essentially the COD loading of the effluent has remained unchanged, and the greater concentration is due to less dilution within the effluent stream.

Simpsons Malt have requested a derogation of the BAT-AEL in relation to COD for direct discharges to surface water until the next permit review following the inception of the next Food Drink and Milk Bref or as required by the Environment Agency. See section 4 below.

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.

4 Review and assessment of derogation requests made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value

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

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

a) the geographical location or the local environmental conditions of the installation concerned; or
b) the technical characteristics of the installation concerned.

4.1 Introduction

Derogation from COD BAT AEL, from BAT 12 of the Food Drink and Milk Industries BAT Conclusions.

The BAT AEL for direct discharges is 100 mg/l as a daily average. This AEL cannot currently be met by the plant. The operator has provided monitoring data to demonstrate this. There is no current emission limit values (ELV) within the operator's permit for COD.

The operator applied for a non - limited derogation based on the technical characteristics of the effluent treatment on site and the geographical location of the site.

The site is unable to meet the BAT-AEL for COD as the site recycles steep water via RO and MBR. The RO membranes capture high COD effluent (RO retentate) which cannot be recycled back into the process and produces a hard to breakdown COD which is discharged to the River Tweed.

The operator has proposed (and we have included) a COD ELV of 850mg/l to be included within the permit which will be reviewed on an annual basis. The proposed ELV has been calculated from monitoring data taken between 01/05/2023 and 31/07/2024 using the standard deviation of the data along with the average as displayed below:

Min/Max concentrations	185 mg/g / 831mg/l
Average concentration	458 mg/l
Standard deviation	129.41mg/l
3 x Standard deviation	388.23mg/l
3 x Standard deviation + Average	856.22mg/l

Geographical characteristics

The Environment Agency has reviewed the application and concluded the local environmental conditions of the receiving watercourse are valid criterion for the derogation. The receiving water course is noted as having a 'high' Dissolved Oxygen (DO) water framework directive (WFD) status. The main potential impact of the discharge is the consumption of the DO within the water course leading to 'dissolved oxygen sag'. DO sag is the decrease in the availability of DO levels within a body of water downstream from a point source of a discharge. Modelling undertaken to support the derogation focused on the consumption of the DO as a result of the discharge. The conclusion of the modelling is that the WFD status of the receiving water course is not impacted as a result of the discharge, and should the discharge meet that of the BAT-AEL there would be a negligible increase in the concentration of DO (+/-1%) and no change in the WFD status.

In summary, modelling of the discharge on the receiving water course demonstrates the discharge is not having a significant impact and that meeting the BAT-AEL limit of 100mg/l would not impact the WFD status of the watercourse.

In addition, water used in the process is currently abstracted from two onsite boreholes. If the recycling/reuse of the steep water is unable to continue to meet the BAT-AEL additional water would need to be abstracted from the onsite borehole The abstraction is deemed to be unsustainable due to water stress/scarcity within the area. Therefore, the current process of recycling water via the RO and MBR is the preferred environmental approach.

Technical characteristics

In addition to geographical characteristics the derogation was sought on the technical characteristics of the installation.

The achievement of emission levels associated with the best available techniques as described in the BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits.

Effluent treatment by RO and MBR is considered BAT for the treatment of biodegradable organic compounds. However, the Bref makes no reference to treatments for hard to degrade “hard COD”. The operator has investigated the use of alternative technology that considers ozonolysis or hydroxyl free radical attack which is capable of polyphenol oxidation but these are conditions far removed from normal enzymatic oxidation conditions employed in a maltsters MBR and go beyond the BAT requirements.

Currently the Operator has only conducted lab trials of this technology, the next stage is to undertake larger scale trials and if successful engineering companies will need to be approached to build the solution. Further details of the technologies are provided below

Recycling and re-use of water is a requirement of the FDM Bref which is associated with BATc 7a. The undertaking of water recycling leads to a high concentration of COD being present within the effluent stream. If the recovery process wasn’t in operation the steep waters would be treated and discharged to the Tweed Estuary with the same concentration of COD being discharged from the site, diluted within a greater volume of effluent.

Review of techniques to achieve the BAT-AEL

The operator considered and discounted the following techniques for achieving the BAT-AEL:

- Not recovering the steep water. Whilst the BAT-AEL could potentially be achieved if water was not recovered, this would lead to additional pressure on the site boreholes and the water table. This is also converse to the requirements of BATc 7a recycling/reuse of water

- Improvement to the existing effluent treatment plant for COD removal. BAT 12 includes appropriate techniques in order to reduce emissions of organic pollutants. The Operator had considered the use of ozonolysis, a treatment technique not mentioned within the BAT conclusions. Since modelling demonstrated the discharge is having no impact on the receiving water course, the Operator has applied for a non limited derogation.

- The Operator has considered other technologies using Ultra Violet (UV) along with activated carbon and ozonolysis as described above. We agree that these technologies go beyond the current BAT requirements and have only been trialled within a lab setting. They require further validation in order to be proven at a commercial/site scale.

- The ETP was built and commissioned in 2008 following expansion of the site which included an almost doubling of capacity. Construction of the ETP included calculating for future development. The ETP is running at a lower capacity than the design capacity which is 1376m^3 whilst the average forward flow is 1131m^3.

- Tankering of effluent to a 3rd party facility. Three companies were approached. Two of which were unable to take the full volume of effluent (360m3 over 14 tankers). The third company was approximately 80 miles away and was discounted on both economic and environmental costs.

Alternative Treatment

The operator carried out a cost benefit analysis and considered two alternative treatment technologies Melifiq Ozonation & Carbon Filter and Arvia Nyex Rosalox system. The Melifiq trial used ozonation as a final polishing step to remove the COD load. Arvia use an oxidation technique where organic pollutants are adsorbed onto a conductive media (Nyex TM) and concentrated in one place. Both trials saw the concentration of COD reduce however these trails need to be followed by a successful pilot plant before commercial installation can be considered.

The operator also considered discharging the RO retentate to the sewer operated by Northumbrian Water Limited however NWL rejected the application for RO reject water on the basis that it would pose a risk to treatment at their wastewater treatment works..

The full outcome of the CBA is discussed below however with hindsight both the trails and discharge to Northumbrian Water sewer should not have been taken forward for assessment.

Summary

The Operator has addressed all the options for achieving the BAT-AEL The impact of the discharge on the receiving environment has been modelled and the results demonstrate the discharge is not having a significant impact whilst meeting of the BAT-AELs would have negligible impact on the receiving environment. Whilst the MBR and RO technologies allow the site to successfully treat the steep water for reuse in the process the resulting retentate has a high COD concentration. If the recovery process wasn't in operation the steep waters would be treated and discharged to the Tweed Estuary. The COD loading of the effluent would remain unchanged, the greater concentration is due to less dilution within the effluent stream.

4.2 Cost Benefit Analysis (CBA)

The operator assessed the following options in the cost benefit analysis:

- Option 0: Business as usual
- Option 1: Proposed derogation (same as business as usual)
- Option 2: BAT-AEL Reduce production capacity to lower discharge emissions
- Option 3: Discharge to town works (Northumbrian Water Sewer)
- Option 4: Melifiq Ozonation & Carbon Filter
- Option 5: Arvia's Nyex Rosalox system

They provided costs for the BAT-AEL, Discharge to town woks and Arvia's Nyex Roasalox system. These costs along with damage costs were used to calculate the net present value (NPV) of each option.

Summary of NPV analysis					
Option	**Proposed derogation**	**BAT AEL**	**Discharge to town works**	**Melifiq ozonation & carbon filter**	**Arvia's Nyex Rosalox system**
Lowest NPV – High costs, Low benefits **(£millions)**	0.00	-221036.00	3755.76	6513.88	-6019.30
Highest NPV – Low costs, high benefits **(£millions)**	0.00	-221036.00	4256.81	6513.46	-3740.35

After discounting Melifiq and Discharge to town works as these are not currently viable options the proposed derogation has the lowest NRV. The significant NPV of meeting the BAT-AEL by reducing production and treatment by Arvia (which is also an unproven technology at scale) are disproportionately expensive compared to derogation.

Summary of the CBA.

The Operator has provided a credible argument that the increased costs linked to the geographical location/technical characteristics are disproportionate for achieving the BAT AEL. An appropriate range of options were reviewed and those identified as technically viable were considered further. Viable options were taken forward for Cost Benefit Analysis (CBA), were adequately described in the CBA and the cost of the BAT AEL option was confirmed as disproportionate compared to the environmental benefits. The main factor associated with this is the loss of revenue. The Cost Benefit Analysis using central assumptions shows a negative NPV for the BAT AEL of £221036 million (£221 billion) and therefore the cost of compliance is disproportionate compared to the environmental benefit achieved.

Final Considerations

We are satisfied that the Operator has demonstrated that the proposed derogation option achieves the best overall environmental outcome and we have no concerns regarding the ongoing Business As Usual impact upon the River Tweed for the duration of the time limited derogation (until the next Food, Drink and Milk Bref review). The waste water flow is having no significant effect on the environment. The time limited derogation gives the operator time to consider water treatment options with the BAT-AEL for COD achieved at a later date.

We have included a daily COD limit of 850mg/l for the duration of the derogation along with Improvement Conditions (IC11 and IC12) requiring the operator to review the technologies available in reducing the COD concentration in order to meet the BAT-AEL.

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.	**FC**	The operator has provided information to support compliance with BATc 1. We have assessed the information provided and we are not satisfied that the operator has demonstrated compliance with BATc 1. The Operator is working towards compliance with BATc 1, with a number of the sub points are still being noted as 'not currently compliant' these include ii) implementing an internal management system xvi) undertaking of regular sectoral benchmarking xvii) independent auditing of the of the EMS. The site is not accredited to the ISO14001 standard, but is working towards achieving accreditation. We have included improvement condition (IC9) in the permit to achieve compliance.
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 provided a detailed overview of the monitoring undertaken through the process on site. This includes the monitoring of the waste water stream prior to discharge, monitoring of the waste gas streams and monitoring of the energy usage on site, raw material usage and residues generated.

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
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 undertakes monitoring of the effluent throughout the treatment process. This includes the continuous monitoring of; pH, Temperature, Flow, conductivity of the reverse osmosis units, turbidity of the UF permeate, dissolved oxygen levels and MLSS levels in the bioreactor. In addition, daily spot samples are taken from the balance tanks, bioreactor and at the point of discharge. These include COD, Total Suspended Solids, Ammonia, Nitrate, Phosphate, Total Dissolved Solids and Conductivity.
4	**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.	**CC**	The operator has provided information to support compliance with BATc 4. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 4. Prior to the permit review the Operator was required to monitor Flow, pH, Temperature, Suspended Solids and BOD. They also monitored for COD. BATc 4 requires the daily monitoring of • COD • Total Suspended Solids • Total Nitrogen • Total Phosphorous • Chloride

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
			These requirement have been added to the permit and the Operator has agreed compliance.
5	**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 refer to BAT5 table in BATc and in accordance with EN standards.	**NA**	We are satisfied that BATc 5 is not applicable to this Installation. The emissions from the onsite peat kiln (dryer) exhaust (A35) is not required to be monitored under the BATc. However we have taken this opportunity to review this approach, and have now included a monitoring requirement for the emissions from the peat kiln A35. In addition, an improvement condition (IC13) has been included to review the efficiency and suitability of the abatement, with a view of reducing the emissions to the benchmark of 20mg/m^3.
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 externally accredited to the ISO50001 standard. In addition, the Operator is using the following energy efficiency techniques: • variable speed drives; • insulation of pipe work; • process control systems, • heat recovery through heat exchangers; and • energy efficient motors.

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
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 main use of water on site is the steeping of the grains which accounts for 80% of water usage. The used steep water is recycled using reverse osmosis (RO). Other water minimisation techniques include the use of high pressure hoses, and the use of manual cleaning of the floors within the main building.
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. The Operator has stated that the use of harmful substances on site is kept to a minimum. Hydrochloric acid is used for the cleaning on the RO and UF filtration systems. With Caustic used for pH control in the scrubber. A 2% Hypochlorite solution is used for cleaning/disinfection around the site. The Operator is seeking alternatives to the use of Hypochlorite.
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	**FC**	The operator has provided information to support compliance with BATc 9. We have assessed the information provided and we are

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
	refrigerants without ozone depletion potential and with a low global warming potential.		not satisfied that the operator has demonstrated compliance with BATc 9. The site has one refrigeration system on site which uses R410a.R410a is not considered as having a low GWP and a phase out plan has not been provided. We consider that the operator will be future compliant with BATc 9. Improvement condition (IC10) has been included in the permit to achieve compliance (see Annex 3).
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 has demonstrated resource efficiency at the site. The techniques include the selling of the barley residues from the initial dressing as animal feed along with broken grains and rootlets from the germination process. Spoiled wet grains not fit for animal consumption are sent for energy recovery at an off-site Anaerobic Digestion (AD) plant. Sludges from the ETP are dewatered and used as a soil improver.
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 Operator has stated they can hold up to 24hours of waste water onsite within a

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
			1,400m^3 capacity buffer tank . Should the capacity of the buffer be exceeded the Operator has an agreement in place with the local sewage company to discharge the effluent to the foul sewer. The Operator has a Prevent & Response Action plan which sets out the procedures in place should there be any incidents on site. Spill kits are located around the site along with drain mat covers near open drains, to prevent/minimise the impact of any spills/loss of containment on the environment.
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 site operates an effluent treatment plant that incorporates the aerobic membrane bioreactor (AMBR) technology. The stages of the treatment include the screening of the effluent to remove gross solids, aerobic treatment within the MBR reactor, sludge removal by use of a centrifuge, solid remove by the use of ultrafiltration prior to discharge. A proportion of the treated effluent is further treated via the use of reverse osmosis to allow reuse on site.

<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>12</td><td>Emissions to water – treatment
BAT-associated emission levels (BAT-AELs) for direct emissions to a receiving water body

<table>
<tr><th>Parameter</th><th>BAT-AEL ([15]) ([16]) (daily average)</th></tr>
<tr><td>Chemical oxygen demand (COD) ([17]) ([18])</td><td>25-100 mg/l ([19])</td></tr>
<tr><td>Total suspended solids (TSS)</td><td>4-50 mg/l ([20])</td></tr>
<tr><td>Total nitrogen (TN)</td><td>2-20 mg/l ([21]) ([22])</td></tr>
<tr><td>Total phosphorus (TP)</td><td>0,2-2 mg/l ([23])</td></tr>
</table>
(16) The BAT-AELs may not apply to the production of citric acid or yeast
(17) No BAT-AEL applies for biochemical oxygen demand (BOD). As an indication, the yearly average BOD5 level in the effluent from a biological waste water treatment plant will generally be ≤ 20 mg/l.
(18) The BAT-AEL for COD may be replaced by a BAT-AEL for TOC. The correlation between COD and TOC is determined on a case-by-case basis. The BAT-AEL for TOC is the preferred option because TOC monitoring does not rely on the use of very toxic compounds.
(20) The lower end of the range is typically achieved when using filtration (e.g. sand filtration, microfiltration, membrane bioreactor), while the upper end of the range is typically achieved when using sedimentation only.
(21) The upper end of the range is 30 mg/l as a daily average only if the abatement efficiency is ≥ 80 % as a yearly average or as an average over the production period.
(22) The BAT-AEL may not apply when the temperature of the waste water is low (e.g. below 12 °C) for prolonged periods.</td><td>FC</td><td>The operator has provided information to support future compliance with BATc 12 (BAT-AELs). We have assessed the information provided and we are satisfied that the operator has demonstrated future compliance with BATc 12 (BAT-AELs)

The operator has stated in their Regulation 61 response and supported by monitoring data that they can achieve the BAT-AELs for TN and TP. The limits for TN and TP have been included at the maximum end of the range 20mg/l and 2mg/l respectively.

The extant permit limits for other parameters; flow, pH, temperature SS and BOD have been retained in the varied permit. Suspended Solids (SS) has been changed to total suspended solids (TSS), with the same limit retained and the monitoring frequency increased from weekly to daily in line with BATc4.

As discussed above, the Operator has applied for a derogation from the COD limit of 100mg/l. We have accepted this with 850mg/l included within the permit.

We consider that the operator will be future compliant with BATc 12 requirements to monitor emission to water. Improvement conditions (IC11 and IC12) have been included in the permit to achieve compliance (see Annex 3).</td></tr>
<tr><td>13</td><td>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:</td><td>CC</td><td>The operator has provided information to support compliance with BATc 13. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BATc 13.</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
	- 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. Note: BAT13 is only applicable where a noise nuisance at sensitive receptors is expected and/or has been substantiated.		A noise management plan has previously been required by the permit. A draft version of a NMP has been provided as part of the, regulation 61 response. This hasn't been reviewed and will form part of the Operators EMS.
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 [for detail of each technique, refer BAT 14 table in BATCs]	**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 implements a number of measures on site to reduce the impact of noise including; • The replacement low pressure blowers with units incorporating improved acoustic shielding; • fitting constrained damping plates to the heads of vulnerable conveyors; • automatic sequencing of startup/shutdown of conveying systems to minimise the time they run empty; • fitted Quiet Fan Technology to a range of fans; improved acoustic dampers on some fan exhausts; • rules for operating outside day time hours and vehicle movements; • maintenance focus on reducing noise associated with equipment failures • relocation of noisy areas, • managing contractors, • improving loading and unloading processes and

<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></td><td></td><td>• reducing the impact from chillers.</td></tr>
<tr><td>15</td><td>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.
BAT 15 is only applicable to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.</td><td>CC</td><td>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.

An odour management plan has previously been required by the permit. A draft version of the OMP has been provided as part of the, regulation 61 response. This hasn’t been reviewed and will form part of the Operators EMS.</td></tr>
<tr><td colspan="4">BREWING BAT CONCLUSIONS (BAT 18 – 20)</td></tr>
<tr><td>18</td><td>Energy efficiency – Brewing Sector

In order to increase energy efficiency, BAT is to use an appropriate combination of the techniques specified in BAT 6 and of the techniques given below.

<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>(a)</td><td>Mashing-in at higher temperatures</td><td>The mashing-in of the grain is carried out at temperatures of approximately 60 °C, which reduces the use of cold water.</td><td rowspan="3">May not be applicable due to the product specifications.</td></tr>
<tr><td>(b)</td><td>Decrease of the evaporation rate during wort boiling</td><td>The evaporation rate can be reduced from 10 % down to approximately 4 % per hour (e.g. by two-phase boiling systems, dynamic low-pressure boiling).</td></tr>
<tr><td>(c)</td><td>Increase of the degree of high-gravity brewing</td><td>Production of concentrated wort, which reduces its volume and thereby saves energy.</td></tr>
</table>

Applicable in addition to BAT6

See Tables below for the EPL figures</td><td>NA</td><td>We are satisfied that BATc 18 is not applicable to this Installation.

BATc 18 is specific to the brewing sector. This installation is a malt producer therefore, this BATc is not applicable</td></tr>
</table>

<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>19</td><td>In order to reduce the quantity of waste sent for disposal, BAT is to use one or a combination of the techniques given below.

<table><tr><th colspan="2">Technique</th><th>Description</th></tr><tr><td>(a)</td><td>Recovery and (re)use of yeast after fermentation</td><td>After fermentation, yeast is collected and can be partially reused in the fermentation process and/or may be further used for multiple purposes, e.g. as animal feed, in the pharmaceutical industry, as a food ingredient, in an anaerobic waste water treatment plant for biogas production.</td></tr><tr><td>(b)</td><td>Recovery and (re)use of natural filter material</td><td>After chemical, enzymatic or thermal treatment, natural filter material (e.g. diatomaceous earth) may be partially reused in the filtration process. Natural filter material can also be used, e.g. as a soil improver.</td></tr></table></td><td>NA</td><td>We are satisfied that BATc 19 is not applicable to this Installation.

BATc 19 is the reduction in quantity of waste sent for disposal from the fermentation process. This installation is a malt producer therefore, this BATc is not applicable. However, the installation has good resource efficiency as demonstrated under BATc 10.</td></tr>
<tr><td>20</td><td>In order to reduce channelled dust emissions to air, BAT is to use a bag filter or both a cyclone and a bag filter.</td><td>NA</td><td>We are satisfied that BATc 20 is not applicable to this Installation.

BATc 20 is specific to the brewing sector. This installation is a malt producer therefore, this BATc is not applicable</td></tr>
<tr><td>20</td><td>In order to reduce channelled dust emissions to air, BAT is to use a bag filter or both a cyclone and a bag filter.

BAT-associated emission level (BAT-AEL) for channelled dust emissions to air from handling and processing of malt and adjuncts

<table><tr><th rowspan="2">Parameter</th><th rowspan="2">Description</th><th colspan="2">BAT-AEL (average over the sampling period)</th></tr><tr><td>New plants</td><td>Existing plants</td></tr><tr><td>Dust</td><td>mg/Nm^3</td><td><2 – 5</td><td><2 – 10</td></tr></table>
Note: There are no BAT-AELs for malt production. However, we want to set an ELV to ensure this parameter is adequately controlled. These should be based on what the operator can achieve (if monitoring data is available) and should be in line with the compound animal feed BAT-AELs (10mg/m^3 for grinding and/or</td><td>N/A</td><td>BATc 20 relates to channelled dust emissions from the handling and processing of malt and adjuncts. As the site only produces malt and does not process malt the BATc is not considered applicable.

We are satisfied that BATc 20 is not applicable to this installation however the barley is flavoured and dried by the use of a peat kiln. The emissions from the kiln (A35) are abated by a wet scrubber. The Operator is not currently required to monitor the emissions from the peat kilning plant.

Germination Kilning Vessels (GKV) are used to both germinate and dry the barley.</td></tr>
</table>

<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>20mg/m^3 for cooling). However, as it is not a BAT-AEL, no derogation is required if the operator cannot achieve this. We will ensure they have the correct abatement and set an appropriate ELV with an IC.</td><td></td><td>Emissions are channelled via 2 emission points (A33 and A34) via dust filters.

We have taken this opportunity to review this approach, we have now included a monitoring requirement for the emissions from the peat kiln (A35). In addition, an improvement condition (IC13) has been included to review the efficiency and suitability of the abatement, with a view of reducing the emissions to the benchmark of 20mg/m^3.</td></tr>
<tr><td colspan="2">Brewing Sector Environmental Performance Levels</td><td></td><td></td></tr>
<tr><td>EPL</td><td>Environmental Performance Level – Energy consumption for the brewing sector<table><tr><td>Unit</td><td>Specific energy consumption (yearly average)</td></tr><tr><td>MWh/hl of products</td><td>0.02 – 0.05</td></tr></table></td><td>NA</td><td>We are satisfied that BAT-EPL for energy consumption for the brewing sector is not applicable to this Installation.

This site is not a brewery but a malt producer therefore, the specific energy consumption is not applicable.</td></tr>
<tr><td>EPL</td><td>Environmental Performance Level – Specific waste water discharge for the brewing sector<table><tr><td>Unit</td><td>Specific waste water discharge (yearly average)</td></tr><tr><td>m^3/hl of products</td><td>0.15 – 0.50</td></tr></table></td><td>NA</td><td>We are satisfied that BAT-EPL for waste water discharge for the brewing sector is not applicable to this Installation.

This site is not a brewery but a malt producer therefore, the specific energy consumption is not applicable.</td></tr>
</table>

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

Updating permit during permit review consolidation

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.

This included some other administrative changes to the permit to ensure cross-sector consistency, including:

- An updated introductory note
- Site plan
- Table S1.1 overhaul
    - Activity Reference (AR) renumbering
    - Updated listed activities
    - Addition of production capacity
    - Directly associated activities (DAAs) standardisation
- Standardisation of reporting parameters.

Capacity 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 existing H1 assessment of emissions to water remains valid for the capacity threshold now placed within table S1.1 of the permit.

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

	GKV Old Side - Burner 1	GKV Old Side - Burner 2	GKV Old Side - Burner 3	GKV Old Side - Burner 4	GKV Old Side - Burner 5	GKV new side - Burner 1	GKV new side - Burner 2	GKV new side - Burner 3	GKV new side - Burner 4
1. Rated thermal input (MW) of the medium combustion plant.	2.3	2.3	2.3	2.3	2.3	4.4	4.4	4.4	4.4
2. Type of the medium combustion plant (diesel engine, gas turbine, dual fuel engine, other engine or other medium combustion plant).	Boiler/ Burner	Boiler/ Burner	Boiler/ Burner	Boiler/ Burner	Boiler/ Burner	Boiler/ Burner	Boiler/ Burner	Boiler/ Burner	Boiler/ Burner
3. Type and share of fuels used according to the fuel categories laid down in Annex II.	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
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.	Jan 1993	Jan 2019	Jan 1993	Jan 1993	Jan 2017	Jan 2007	Jan 2007	Jan 2007	Jan 2007

We have reviewed the information provided and we consider that the declared combustion plant qualify as “existing” medium combustion plant with the exception of GKV Old Side Burner 2 (A5)) which was replaced in 2019 and considered “new”.

For existing MCP with a rated thermal input of less than or equal to 5 MW, the emission limit values set out in tables 1 and 3 of Part 1 of Annex II MCPD shall apply from 1 January 2030.

Emission limit values for Old Side Burner 2 (A5) shall apply from permit issue.

We have included the appropriate emission limit values for existing medium combustion plant as part of this permit review. 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.

In addition to the boilers detailed above there are a number natural gas fired kilns >1MWth which are used as a direct heat source and are as such excluded from the requirements of the MCPD.

Particulate Emissions

The BAT-AELs for the brewing sector are in relation to the handling and processing of malt and adjuncts. As the Operator is producing malt the BAT-AELs for particulate emissions do not apply to the site. The Operator is not currently required to undertake any monitoring from the drying on site. We have taken this opportunity to review this approach, we have now included a monitoring requirement for the emissions from the peat kiln (A35). In addition, an improvement condition (IC13) has been included to review the efficiency and suitability of the abatement, with a view of reducing the emissions to the benchmark of 20mg/m^3.

We have added an improvement condition (IC14) for size fractionation of particulate emissions because a BAT-AEL applies for dust emissions to air. The justification for this IC is that there are a number of activities within the FDM sector which may result in release of particulates to air e.g. drying, milling and grinding. Overall, there is little available information on how much fine particulates are released. This IC is a one-off exercise requiring operators to monitor and report on the fractions of fine particulate (PM_{10} and $PM_{2.5}$) emissions and increase our understanding of potential health effects. Where BAT-AELS may apply to multiple emission points e.g. grain milling, we may accept limited representative monitoring rather than expecting them to monitor every single emission point

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 previously provided assessments for all emissions to water at the installation. The operator declares there has been no change to activities and subsequent effluents generated at the installation since this risk assessment was taken. Consequently, we agree that the original risk assessments remain valid at this time.

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, Application Site Report, Tweed Valley Maltings. March 2005 during the original application received on 30/05/2005. 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 has confirmed there has been no change in the hazardous substances used, their capability of causing pollution and/or the pollution prevention measures at the installation since the risk assessment was submitted on April 2008 Consequently, we are satisfied there has been no change to the assessment of risk for hazardous substances.

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 unavailability of land for land spreading of waste and prolonged dry weather/ drought, which we consider to be a severe weather events.

In response to the unavailability of land for land spreading the Operator has provided additional detail that the volume of waste sent for land spreading is relatively low and the issues surround the delivering sludges to farms rather than lack of land. In the event land spreading was unavailable the Operator would either store the materials at another site or send them for commercial composting.

The Operator requires large volumes of water for the production process as such contingency plans to supply additional water to site aren't viable. The Operator recycles water through the use of the reverse osmosis plants on site for re-use in the steeping process.

Given the Operators responses we consider that an additional climate change adaptation plan isn't required.

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.

We reviewed the information provided by the operator and their findings. We are not satisfied that the existing tanks and containment measures on site meet the standards set out in CIRIA C736.

We have set improvement conditions in the permit to address the deficiencies in the existing tanks and containment measures on site (IC15). See Improvement condition(s) in Annex 3 of this decision document.

Annex 3: Improvement Conditions

Previous improvement conditions marked as complete in the previous permit.

Superseded Improvement Conditions – Removed from permit as marked as "complete"	
Reference	**Improvement Condition**
IC1	The operator shall provide appropriately labelled sample points for discharge of effluent to emission point W3, arising from the WWTP. Confirmation of the installation of such sample points should be sent in writing to the Agency.
IC2	The operator shall submit details of the management system, training, and operational and maintenance procedures required to ensure the environmental impact from the site WWTP is minimised.
IC3	The operator shall install discharge flow metres to the offsite discharge point from Phase 1 and Phase 2 development to emission point W1. The equipment shall conform to MCERTS standards for water, as specified by the Agency's Technical Guidance Note M18.
IC4	The operator shall submit a post-commissioning report for the WWTP installation. The report shall include a review of operational performance against the design proposals submitted within the variation application. A comparison of process performance and emissions performance shall be included in the report.
IC5	The operator shall review the containment measures for the prevention or minimisation of liquid releases from the effluent treatment plant. The operator shall submit a report of the survey and compare findings against BAT requirements provided in sector guidance note S6.10. Where improvements can be made, and the options considered BAT for future use, a proposed plan and timescales shall be submitted for approval by the Agency.
IC6	A written plan shall be submitted to the Environment Agency for approval detailing proposals for the monitoring and reporting of the performance results for the peat smoke abatement wet scrubber. This shall be undertaken initially over a 12 month period for particulates, the results of which will be assessed by the Environment Agency to decide if further monitoring or an emission limit is required. The sampling procedure and testing shall conform to MCERTS standards. The plan shall be implemented by the operator from the date of approval in writing by the Environment Agency subject to such amendments or additions as notified by the Environment Agency.
IC7	A written plan shall be submitted to the Environment Agency for approval detailing proposals for smoke emission reduction from the peat smoke abatement system. The plan shall identify measures to reduce emissions to air, the likely cost of such measures and a proposed timetable for their implementation and/or any improvements to the existing peat smoke abatement system. The plan shall be implemented by the operator from the date of approval in writing by the Environment Agency subject to such amendments or additions as notified by the Environment Agency.
IC8	A written plan shall be submitted to the Environment Agency for integrating the monitoring of the operation of the peat smoke abatement equipment into the centrally controlled SCADA monitoring system. The plan shall identify the aspects of the abatement equipment to be monitored and alarmed together with a timetable for the completion of the work. The plan shall be implemented by the operator from the date of approval in writing by the Environment Agency subject to such amendments or additions as notified by the Environment Agency.

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**
IC9	The operator shall confirm, with the Environment Agency's agreement, achievement of the 'Narrative' BAT conclusions as identified in the Food, Drink and Milk Bref published on 4 December 2019 where BAT is currently not demonstrated or achieved with respect to BATc 1 Refer to BAT Conclusions for a full description of the BAT requirement.	3 months from date of permit issue or other date as agreed in writing with the Environment Agency
IC10	The operator shall use refrigerants without ozone depletion potential and with a low global warming potential (GWP) in accordance with BAT 9 from the Food, Drink and Milk Industries BATCs. To demonstrate compliance against BAT 9, the operator shall produce a plan for the onsite refrigerant system(s) at the installation. The plan is to be approved by the Environment Agency and shall be incorporated within the existing environmental management system. The plan should include, but not be limited to, the following: • Where practicable, retro filling systems containing high GWP refrigerants e.g. R-404A with lower GWP alternatives as soon as possible. • An action log with timescales, for replacement of end-of-life equipment using refrigerants with the lowest practicable GWP.	3 months from date of permit issue or other date as agreed in writing with the Environment Agency
IC11	The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the BAT conclusion AEL for Chemical Oxygen Demand (COD) where a derogation has been applied for and granted. The report shall include, but not be limited to, the following: • COD emissions monitoring data. • An assessment of the emissions data against the COD emissions limit within the permit • Proposal for measures to be taken to reduce COD emissions • Proposed a reduced COD emission limit value (ELV) for inclusion within the permit	Annually until BAT-AEL achieved from 08/05/2025 permit issue date.

	1) Current performance against the COD BAT-AEL. 2) Methodology for reaching the BAT-AELs. 3) Associated targets / timelines for reaching compliance by issue of the next food Drink and Milk Industries Bref. 4) Any alterations to the initial plan (in progress reports). The report shall address the BAT Conclusions for Food, Drink and Milk industries with respect to the following: • BAT 12 Table 1 (compliance with BAT-AELs for direct discharges to a receiving water body)	
IC12	The operator shall submit a written report detailing the steps they have taken to reduce emissions to the River Tweed of Chemical Oxygen Deman (COD) from the Installation as part of trials proposed by the Operator through their request for derogation and to be agreed by the Environment Agency. The report shall identify the actions implemented along with an appraisal of their success including any results from trials, including but not limited to: • Melifiq Ozonation and Carbon Filtration • Arvia's Nyex Rosalox system The report shall include proposals for any further methods to be implemented, along with a commitment from the operator to provide a regular update to this report as a minimum every two years. The report shall be submitted for written approval from the Environment Agency. The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the BAT conclusion AEL for Chemical Oxygen Demand (COD) from the installation to the River Tweed as part of their trials proposed by the Operator through their request for a derogation and to be agreed by the Environment Agency.	Every two years from permit issue date 08/05/2025
IC13	The Operator shall submit a written report to the Environment Agency reviewing the efficiency and suitability of the onsite dust abatement from the peat kiln (A35). The report shall contain but not be limited to: • Confirmation of the current abatement efficiency, based on monitoring data, with an appraisal of the performance against Best Available Techniques (BAT). • Comparison of the dust emissions data against an indicative benchmark of 20mg/m^3.	12 months from date of issue of the permit or other date as agreed in writing with the Environment Agency

	• Identification of any improvements that could be made to the plant, such as maintenance and operating techniques, to maintain or improve the performance in line with BAT. • Where required, an appraisal on other suitable abatement techniques as listed with Chapter 2 of the Food, Drink and Milk Industries Bref (2019). The Operator shall implement any necessary improvements to a timetable agreed in writing with the Environment Agency.	
IC14	The Operator shall submit a written report to the Environment Agency of monitoring carried out to determine the size distribution of particulate matter in the exhaust gas emissions to air from emission point A35, identifying the fractions within the PM_{10} and $PM_{2.5}$ ranges. The monitoring shall be carried out under representative operating conditions and shall be in accordance with EN ISO 23210 unless otherwise agreed with the Environment Agency.	12 months from date of permit issue or other date as agreed in writing with the Environment Agency
IC15	The Operator shall undertake a survey of the primary, secondary and tertiary containment at the site and review measures against relevant standard including: • CIRIA Containment systems for the prevention of pollution (C736) – Secondary, tertiary and other measures for industrial and commercial premises, • EEMUA 159 - Above ground flat bottomed storage tanks The operator shall submit a written report to the Environment Agency approval which outlines the results of the survey and the review of standard and provide details of • current containment measures • any deficiencies identified in comparison to relevant standards, • improvements proposed • time scale for implementation of improvements. The operator shall implement the proposed improvements in line with the timescales agreed by the Environment Agency.	12 months from date of permit issue or other date as agreed in writing with the Environment Agency