**Permit number: EPR/WP3231NB** **Operator: Dairy Partners (Cymru Wales) Limited** **Facility name: The Creamery**

This table should be read and used to make reference to your Regulation 61 submission. Reference will need to be made to BAT Conclusions for the Food, Drink and Milk industry published on the 4th December 2019 and the supporting interpretation document (date and version).

FDM BREF BAT conclusions https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2019.313.01.0060.01.ENG&toc=OJ%3AL%3A2019%3A313%3ATOC

Full FDM BREF document including https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118627_FDM_Bref_2019_published.pdf

| BAT No. | Topic | Brief Description | BAT | Applicable BAT-AEL | Specific considerations for the Regulation 61 response | Operating to BAT? | BAT-AEL derogation needed? | Provide reference to the section in the Regulation 61 response demonstrating how compliance with BAT is met or confirmation of action that will be taken to ensure compliance with BAT by 03/12/2023 |
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| **General BAT Conclusions and Indicative Environmental Performance (IEP) levels** | | | | | | | | |
| **1** | **Environmental Management Systems** | In order to improve overall environmental performance | To Elaborate and Implement and adhere to an EMS that incorporates key features identified: i, - xx | N/A | i. Commitment, leadership and accountability of the management, including senior management, for the implementation of the EMS. | Yes - compliant now | No | Site Environmental and Sustainability Policy reviewed every August. The document is signed by the Managing Director and Site Manager. |
| | | | | | ii. An analysis that includes the determination of the organisations context, the identification of the needs and expectations of interested parties, the identification of characteristics of the installation that are associated with possible risks for the environment (or human health) as well as the applicable legal requirements relating to the environment. | Yes - compliant now | No | Context of the organisation - Draft EMS Guidance Manual, Chapter 1. Chapter 1 follows ISO 14001, Clause 4.1, by considering internal and external issues that define the organisational context in relation to the company's environmental objectives using methods such as SWOT and PESTLE analysis.<br><br>Identification of the needs and expectations of interested parties - Draft EMS Guidance Manual, Chapter 2. Chapter 2 follows ISO 14001, Clause 4.2, and defines the process for determining the needs and expectations of interested parties to establish the obligations that may be imposed on the business.<br><br>Characteristics of the Installation - Environmental Accident Management Plan EP-017. The plan details characteristics such as the environmental risk assessment, materials inventory (containment vessels and chemical/dairy constituents), drainage and potential sources of environmental accidents/nuisances.<br><br>Applicable legal requirements - Draft legal register. |
| | | | | | iii. Development of an environmental policy that includes the continuous improvement of the environmental performance of the installation. | Yes - compliant now | No | Newcastle Emlyn Environmental and Sustainability Policy, Version 4, issued 15/08/23.<br><br>Continuous improvement measures documented in the policy includes:<br>Annual review of environmental objectives in relation to aspects identified in the Aspects Register and environmental risk assessment.<br>Investigation of environmental incidents, including additional controls.<br>Ongoing review of energy efficiency measures, as per the Energy Efficiency Plan.<br>Use of new technologies to monitor energy consumption.<br>Investigating ways to improve production efficiency.<br>Investigating ways to reduce energy losses and carbon footprint.<br>Encouraging sustainable working. |

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| | | | | | iv. Establishing objectives and performance indicators in relation to significant environmental aspects, including safeguarding compliance with applicable legal requirements. | Yes - compliant now | No | Dairy Partners Environmental Objectives statement. The statement states:<br><br>*'FRM-EHS-048 Environmental Aspects Register' details the environmental aspects on site, including a significance score (using a 5x5 matrix), considering normal, abnormal and emergency conditions. As per BAT 1, Para iv, objectives are based on the outcomes on the results of the environmental assessment and findings in the register. Only aspects with a medium rating or above have been considered. Objectives have been agreed by internal stakeholders.*<br><br>Environmental objectives are reviewed annually. |
| | | | | | v. Planning and implementing the necessary procedures and actions (including corrective and preventive actions where needed), to achieve the environmental objectives and avoid environmental risks; | Yes - compliant now | No | Aspects and Impacts Register<br><br>EP-017 Environmental Accident Management Plan<br><br>SOP/WWTP/004 - Abnormal and Emergency Response<br><br>Draft EMS Guidance Manual |
| | | | | | vi. Determination of structure, roles and responsibilities in relation to environmental aspects and objectives and provision of the financial and human resources needed. | Yes - compliant now | No | Draft EMS Guidance Manual, Chapter 7. The chapter documents the roles and responsibilities allocated to employees within the organisation. The Site manager, assisted by the EHS Lead, is to define the role profiles of employees with responsibility for the development of the EMS. Specific roles are:<br>Monitoring the impact from environmental aspects - EHS Lead<br>Identifying objectives - Site Manager/EHS Lead<br>Provision of financial and human resources needed - Site Manager |
| | | | | | vii. Ensuring the necessary competence and awareness of staff whose work may be affect the environmental performance of the installation (e.g. by providing information and training). | Yes - compliant now | No | Site-specific Environmental Awareness training course in use. |
| | | | | | viii. Internal and external communication. | Yes - compliant now | No | Doc Ref: EP-011 Environmental Communications. The policy details the responsibilities placed on selected managers (including the EHS Lead), dealing with complaints, liaision with the general public, meetings with environmental officers, recording and reporting incidents of non-compliance, emergency communications, contact with neighbours and dealing with environmental issues. |
| | | | | | ix. Fostering employee involvement in good environmental practices. | Yes - compliant now | No | Site-specific Environmental Awareness training course in use. |
| | | | | | x. Establishing and maintaining a management manual and written procedures to control activities with significant environmental impact as well as relevant records. | Yes - compliant now | No | Eighteen EMS procedures in use. Includes EP-012 Control of Documents, which includes procedure for the control of documentation and retention periods.<br><br>Aspect / Impact Register in use. |
| | | | | | xi. Effective operational planning and process control. | Yes - compliant now | No | Draft EMS Guidance Manual, Chapter 20. The chapter documents the extent of control given to outsourced processes against the site EMS. Also detailed is guidelines on the extent of control required in accordance with a list of factors affecting environmental management and performance, an overview of the lifecycle perspective and lifecycle considerations. The guidance is commensurate with ISO 14001, Clause 8.1. |
| | | | | | xii. Implementation of appropriate maintenance programmes. | Yes - compliant now | No | A comprehensive PPM system being utilised to ensure the safe operation of equipment and plant, including the periodic inspection of static items such as tanks and bunds. |

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| | | | | | xiii. Emergency preparedness and response protocols, including the prevention and/or mitigation of the adverse (environmental) impacts of emergency situations. | Yes - compliant now | No | EP-017 Environmental Accident Management Plan |
| | | | | | xiv. When redesigning a (new) installation or part thereof, consideration of its environmental impacts throughout its life, which includes construction, maintenance, operation and decommissioning. | Yes - compliant now | No | New Installations Through-life Environmental Impact Policy - Issue 1 |
| | | | | | xv. Implementation of a monitoring and measurement programme, if necessary, information can be found in the Reference Report on Monitoring of Emissions to Air and Water from IED Installations. | Yes - compliant now | No | Monitoring requirements carried out in accordance with the conditions of Envionmental Permit EPR/WP3231NB. |
| | | | | | xvi. Application of sectoral benchmarking on a regular basis. | Yes - compliant now | No | Contact made with Dairy UK regarding their benchmarking scheme. Results of 2022 Dairy UK survey to be published in late 2023. Dairy Partners will compare site performance with the survey data. |
| | | | | | xvii. Periodic independent (as far as practicable) internal auditing and periodic independent external auditing in order to assess the environmental performance and to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained. | Yes - compliant now | No | Internal and external auditing planned for 2024. This will be an ongoing process. External audit frequency to be determined. |
| | | | | | xviii. Evaluation of causes of nonconformities, implementation of corrective actions in response to nonconformities, review of the effectiveness of corrective actions, and determination of whether similar nonconformities exist or could potentially occur. | Yes - compliant now | No | Annual Environmental Report submitted for senior managament review at the end of 2022. Includes details on incidents, investigations and complaints. |
| | | | | | xiv. Periodic review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness | Yes - compliant now | No | Planned as part of audit schedule - internal and external auditing planned for 2024, and will be an ongoing process. Audit results to be reviewed by company senior management. |
| | | | | | xx. Following and taking into account the development of cleaner techniques. | Yes - compliant now | No | Review of BREFS applicable to Dairy / Milk industry when looking at upgrades / replacement of current plant and equipment. Also sough advice from industry specialist suppliers of relevant equipment and plant. |
| | | | Specifically for the food, Drink and Milk Sector BAT is to also incorporate following features in the EMS | | i. Noise Management Plan (ref to BAT 13). | See Improvement Condition | No | See BAT 13. |
| | | | | | ii. Odour Management Plan (ref to BAT 15). | Yes - compliant now | No | See BAT 15. |
| | | | | | iii. Inventory of waste, energy and raw materials consumption as well as waste water and waste gas streams. | Yes - compliant now | No | Included in internal Production Pack. Relevant sections submitted to NRW, as required in Schedule 3 and 4 of Environmental Permit EPR/WP3231NB. |
| | | | | | iv. Energy Efficiency Plan (Bat 6a). | Yes - compliant now | No | See BAT 6a. |
| **2** | **Efficiency** | Increase resource efficiency and reduce emissions | Establish, maintain and regularly review an inventory of water, energy, raw material consumption, waste water and waste gas streams that incorporates all the key features listed: | | I. Information about the food, drink and milk production processes, including:<br>(a) simplified process flow sheets that show the origin of the emissions;<br>(b) descriptions of process-integrated techniques and waste water/waste gas treatment techniques to prevent or reduce emissions, including their performance. | Yes - compliant now | No | A4 Simplified Process Flow Diagram, Production Energy Efficiency Measures 27102023 - this diagram is a simple flowchart which details the production process, including energy efficiency measures used. Efficiency is monitored. The steam traps are subject to pre-planned preventative maintenance.<br><br>Wastewater Treatment Process diagram - this diagram details the effluent and wastewater treatment process, including the locations of odour controls. |
| | | | | | II. Information about water consumption and usage (e.g. flow diagrams and water mass balances), and identification of actions to reduce water consumption and waste water volume (see BAT 7). | Yes - compliant now | No | Water schematic in use detailing all three water sources, treatment, storage and use.<br><br>Water consumption figures recorded daily, including mains supply, x5 boreholes and polished water.<br><br>Water reduction measures implemented, as per BAT 7. |

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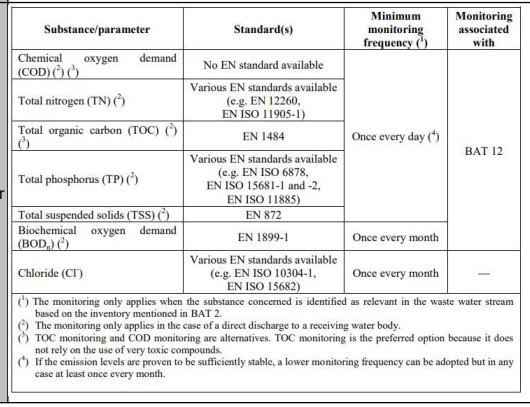
| | | | | | III. Information about the quantity and characteristics of the waste streams such as:<br>a. average values and variability of flow and temperature;<br>b. average concentration and load values of relevant pollutants / parameters (e.g. TOC or COD, nitrogen species, phosphorus, chloride, conductivity) and their variability. | Yes - compliant now | No | a. Average values and variability of flow, pH and temperature are monitored daily and reported to NRW monthly as part of emissions to water submissions.<br>b. Average concentration and load values of relevant pollutants / parameters as detailed in our permit monitoring requirements. |
| | | | | | IV. Information about the characteristics of the waste gas streams such as:<br>a. average values and variability of flow and temperature.<br>b. average concentration and load values of relevant pollutants / parameters (e.g. Dust, TVOC, CO, NOx, SOx) and their variability.<br>c. presence of other substances that may effect the waste gas treatment system or plant safety (e.g. oxygen, water, vapour, dust). | Yes - compliant now | No | Stack emissions monitoring carried our by Anchem on the to evaluate NOx and O2 flow rates and dispersion from the boilers. Monitoring carried out on an annual basis as required in Schedule 3 of Environmental Permit EPR/WP3231NB. |
| | | | | | V. Information about energy consumption and usage, the quantity of raw materials used, as well as the quantity and characteristics of residues generated, and identification of actions for continuous improvement of resource efficiency (see for example BAT 6 and BAT 10). | Yes - compliant now | No | We currently record and monitor usage and trends for raw material usage, energy consumption, water usage, water waste, and cheese tonnage produced. Data tracking in place to give KWh per tonne of cheese and milk per tonne of cheese etc. See BAT 6 & 10. |
| | | | | | VI. Identification and implementation of an appropriate monitoring strategy with the aim of increasing resource efficiency, taking into account energy, water and raw materials consumption. Monitoring can include direct measurements, calculations or recording with an appropriate frequency. The monitoring is broken down at the most appropriate level (e.g. at process or plant/installation level). | Yes - compliant now | No | Resource and energy usage monitoring carried out by the business. An Energy Efficiency Plan is in use, as per BAT 6a. Current measures include:<br>The installation of electrical sub-metering across the site to monitor individual areas for electrical consumption and efficiency.<br>Scope 1 & 2 emissions are routinely monitored; Scope 3 monitoring is at the early stages of development.<br>LNG usage is monitored and efficiency measures have been investigated.<br>Water consumption is monitored on a daily basis; investigating water efficiency measures is ongoing. An example is the installation of the new CIP system to reduce water usage. |
| **3** | **Monitoring emissions to water** | Monitor relevant emissions to water identified by the inventory of waste water streams in BAT 2 | Monitor key process parameters at key locations for emissions to water e.g. continuous monitoring of: | See BAT 12 for AELs | 1. Waste Water Flow<br>2. pH<br>3. Temperature at inlet / out let of pre treatment and inlet to final treatment and discharge point. | Yes - compliant now | No | Flow from the plant to final discharge is monitored by an MCERTS certified flowmeter, which is connected to a data logging system monitoring all flows from the plant.<br><br>Continuous pH and temperature readings are taken at the final (M1) emission point, as required in Schedule 3 of Environmental Permit EPR/WP3231NB. |
| **4** | **Monitoring emissions to water** | Monitor emissions to water with at least the frequency in the corresponding table and in accordance with the EN standards. | Monitor emissions to water with at least the frequency in the corresponding table and in accordance with the 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 | See BAT 12 for AELs |  | Investigating testing options | No | NRW provided two conditions for wastewater testing and analysis:<br><br>1. The test kits are suitable for the effluent being analysed (i.e. there has been a proper evaluation of the equipment against the sample matrix of the effluents produced on site).<br>2. Robust QA and QC procedures for the sampling and monitoring of the effluent.<br><br>In-house test kit options being explored from three suppliers. |

| Substance/parameter | Standard(s) | Minimum monitoring frequency (1) | Monitoring associated with |
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| Chemical oxygen demand (COD) (2) (3) | No EN standard available | Once every day (4) | BAT 12 |
| Total nitrogen (TN) (2) | Various EN standards available (e.g. EN 12260, EN ISO 11905-1) | | |
| Total organic carbon (TOC) (2) (3) | EN 1484 | | |
| Total phosphorus (TP) (2) | Various EN standards available (e.g. EN ISO 6878, EN ISO 15681-1 and -2, EN ISO 11885) | | |
| Total suspended solids (TSS) (2) | EN 872 | | |
| Biochemical oxygen demand ($BOD_n$) (3) | EN 1899-1 | Once every month | |
| Chloride ($Cl^-$) | Various EN standards available (e.g. EN ISO 10304-1, EN ISO 15682) | Once every month | — |

(1) The monitoring only applies when the substance concerned is identified as relevant in the waste water stream based on the inventory mentioned in BAT 2.
(2) The monitoring only applies in the case of a direct discharge to a receiving water body.
(3) TOC monitoring and COD monitoring are alternatives. TOC monitoring is the preferred option because it does not rely on the use of very toxic compounds.
(4) If the emission levels are proven to be sufficiently stable, a lower monitoring frequency can be adopted but in any case at least once every month.

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| **5** | **Monitoring emissions to air** | Monitor channelled emissions to air with at least the frequency in the corresponding table and in accordance with the EN standards. | Monitor channelled emissions to air with at least the frequency in the corresponding table and in accordance with the EN standards. | | Dust - Dairies - Drying Processes | Yes - compliant now | No | There are no drying processes in our cheese manufacture, there for this BAT technique is not applicable. |
| **6** | **Energy efficiency** | In order to increase energy efficiency | Use an energy efficiency plan and an appropriate combination of the common techniques identified | | **a. Energy Efficiency Plan -** An energy efficiency plan, as part of the environmental management system (see BAT 1), entails defining and calculating the specific energy consumption of the activity (or activities), setting key performance indicators on an annual basis (for example for the specific energy consumption) and planning periodic improvement targets and related actions. The plan is adapted to the specificities of the installation. | Yes - compliant now | No | We currently record and monitor:<br>1. Electical consumption, including utilising sub-metering for a greater depth of data and scope 1 & 2 monitoring.<br>2. LFO and LNG fuel consumption (only one is used at a time - dual fuel boilers) is monitored on a continual basis.<br>3. Water consumption from the three water sources - mains, borehole and reclaimed water from the production process.<br>4. Scope 1 & 2 monitoring.<br><br>KPIs:<br>1. Electricity KW per tonne of cheese produced.<br>2. Cubic metres of water used per 1000L of milk processed.<br>3. Breakdown of water sources.<br>4. LNG/LFO litres per tonne of cheese produced.<br><br>An Energy Efficiency Plan is in use on site and is reviewed annually. |
| | | | | | **b. Use of common techniques:**<br><br>Common techniques include techniques such as:<br>- burner regulation and control;<br>- cogeneration;<br>- energy-efficient motors;<br>- heat recovery with heat exchangers and/or heat pumps (including mechanical vapour recompression);<br>- lighting;<br>- minimising blowdown from the boiler;<br>- optimising steam distribution systems;<br>- preheating feed water (including the use of economisers);<br>- process control systems;<br>- reducing compressed air system leaks;<br>- reducing heat losses by insulation;<br>- variable speed drives;<br>- multiple-effect evaporation;<br>- use of solar energy. | Yes - compliant now | No | 1. Burner regulation and control. Our current boilers are fitted with burner regulation.<br>2. Co-generation - We currently don't have any co-generation systems on site.<br>3. Energy efficient motors - 80-90% of our motors have been replaced out in the last 2-3 years with energy efficient models with variable speed drives PLC controlled capable of ramping up and down as required to save energy.<br>4. Heat recovery with heat exchangers - all our pasteurisers and chillers operate as energy efficient heat exchange units.<br>5. Lighting - we have completed a 50% change out of lighting on site to LED energy efficient bulbs and where possible timer / PR sensor controlled to switch off lighting in areas where no activity detected.<br>6. Minimising blow down from the boiler - boilers maintained by external service contract. Our servicing contractor has changed the chemicals used in the boilers which has minimised build up and reducing the need for frequent blowdowns - reduction of daily to weekly on an automated blow-down setting. |

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| | | | | | | Yes - compliant now | No | 7. Optimising steam distribution systems - system fitted with pressure reducing valve and PPM in place to reduce leaks.<br>8. Preheating feed water (including the use of economisers) - No 2 boiler uses the heated gas going out to preheat the water coming in. Boiler was upgraded in 2018 / 2019.<br>9. Process control systems - Major upgrades to plant and equipment in the last few years with improved cheese making technology. Majority of process PLC controlled to optimise efficiency - production output /energy usage / waste reduction.<br>10. Reducing compressed air leaks - Variable speed drive / PLC controlled to ramp up and down as required. PP maintenance in place to reduce compressed air leaks. System also serviced by external contractor with efficiency modelling / reporting.<br>11. Reducing heat losses by insulation - steam and water pipes lagged, CIP tank lagged.<br>12. Variable speed drives. 80-90% motors on site upgraded to variable speed drives / PLC controlled.<br>13. Multiple effect evaporation - not applicable to our process.<br>14. Use of solar energy - feasibility has been investigated but has not been progressed. |
| **7** | **Reduce water consumption and waste water discharge** | Reduce water consumption and the volume of waste water discharged | Recycle and/or re-use water streams, including the use of one or more of the techniques specified in the associated table. | | a. Water Recycling and or Reuse | Yes - compliant now | No | We currently operate an RO plant recovering polished water from whey, whilst producing a concentrated whey product for 3rd party re-processing. Water recovery accounts for 40.4% of water used on site (2022). Recovered water is reused for plant cleaning. |
| | | | | | b. Optimisation of water flow - use of control devises e.g. photocells, flow valves, thermostatic valves to automatically adjust water flow | Yes - compliant now | No | All our hand wash sinks are either operated by knee operated pressure valves, or photo cell operated. Level sensors are fitted to brine tanks to prevent overflow. CIP system is automated with flow meters / level probes / conductivity metering etc. |
| | | | | | c. Optimisation of water nozzles and hoses - use of correct number and positioning of nozzles: adjustment of water pressure | Yes - compliant now | No | CIP systems have optimised positioning of nozzles and water pressure to effect optimised cleaning spray patterns and turbulence to remove production residues. |
| | | | | | d. Segregation of water streams - water streams that do not need treatment, e.g. uncontaminated cooling water or uncontaminated run off water are segregated from waste water that has to undergo treatment thus enabling uncontaminated water recycling | Yes - compliant now | No | Water streams are now fully segregated. Excess Reverse Osmosis (RO) processed water is diverted for wastewater treatment and not to the lagoon. Uncontaminated rainwater run-off remains directed to the lagoon and is released to the River Arad in accordance with the Environmental Permit WP3231NB.<br><br>Drains are marked as blue for surface water and red for foul water. Foul water drains are directed to the wastewater treatment plant for treatment. |
| | | | | | e. Dry cleaning / f. Pigging systems / G High pressure cleaning. | Not applicable | No | None of these cleaning systems are relevant to our process. Majority of plant cleaned via CIP system / foam cleaning |
| | | | | | h. Optimisation of chemical dosing and water use in cleaning in place (CIP). | Yes - compliant now | No | CIP systems are all automatically controlled with in line flow metering, conductivity measurement to optimise chemical dosing, and inline temperature probes. Final rinse water is recycled to use as pre rinse. Detergent wash / sterilant phase is recirculated reducing chemical usage costs and reducing disposal volumes through WWTP. |
| | | | | | i. Low pressure foam and or gel cleaning. | Yes - compliant now | No | Low Pressure Foaming units used in the plant for non CIP cleanable areas like walls / floors / platforms external equipment surfaces etc. |

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| | | | | | j. Optimised design and construction of equipment and process areas. | Yes - compliant now | No | Cheese making plant and new RO plant has been upgraded in the last few years to modern energy efficient / optimised production capabilities / easily cleanable mainly via integrated CIP systems reducing water and chemical usage. |
| | | | | | k. Cleaning of equipment as soon as possible. | Yes - compliant now | No | Plant runs for maximum of 22 hours then goes into a 4-6 hour deep cleaning / CIP cycle. This is driven by the need for cheese quality and food safety preventing the build up of harmful bacteria and or phage's that could alter the cheese quality / texture or flavour. |
| **8** | **Prevent or reduce the use of harmful substances** | Prevent or reduce the use of harmful substances, e.g. in cleaning and disinfection | The use of one or more of the techniques specified in the associated table | | **a. Proper Selection of Cleaning Chemicals and / or disinfectants** - Avoidance or minimisation of the use of cleaning chemicals and or disinfectants that are harmful to the aquatic environment, in particular priority substances considered under Water Framework Directive 2000/60/EC. | Yes - compliant now | No | As of September 2023, the site uses multiple chemicals which can be considered harmful to the aquatic environment with the H400 (x4), 410 (x10) and 411 (x1) classifications. The site does not use any chemical listed under Directive 2000/60/EC of the European Parliament and of the Council, Annex X. All residues from the dairy production process are sent to the Wastewater Treatment Plant - emissions to the River Teifi are monitored in accordance with the Environmental Permit WP3231NB. |
| | | | | | **b. Reuse of cleaning chemicals in cleaning in place (CIP).** Collection and reuse of cleaning chemicals in CIP. When reusing cleaning chemicals, hygiene and food safety requirements are taken into account. | Yes - compliant now | No | Detergent recirculation through equipment to achieve temperature/ conductivity. Final rinse water recycles back to pre-rinse water maximising water usage. |
| | | | | | **c. Dry cleaning** | Yes - compliant now | No | Not applicable to our process - no dry cleaning |
| | | | | | **d. Optimised design and construction of equipment and process areas** | Yes - compliant now | No | Dedicated CIP systems in place for milk intake, raw milk silos, Vats CIP and then CIP cleaning of all major cheese manufacture equipment to optimise cleaning to achieve food safety and minimisation of cleaning chemicals. |
| **9** | **Reduce emissions to air** | Prevent emissions from ozone depleting substances and of substances with high global warming potential from cooling and freezing | Use refrigerants without ozone depletion potential and with a low global warming potential | | Suitable refrigerants include water, carbon dioxide or ammonia. | Yes - compliant now | No | We currently use the following gases:<br><br>R513A - ODP 0; GWP 631.4<br>R32 - ODP 0; GWP 675<br>R134A - ODP 0; GWP 1430<br>R410A - ODP 0; GWP 2088<br>R438A - ODP 0; GWP 2265<br>R404A - ODP 0; GWP 3922<br><br>Refrigeration systems annually serviced and checked for any leaks by our contractor, they record any gas recharging volumes to monitor fugitive emissions.<br><br>See Improvement Condition 19. |
| **10** | **Resource efficiency** | To increase resource efficiency | The use of one or more of the techniques specified in the associated table | | a. Anaerobic digestion - treatment of biodegradable residues by microorganisms in the absence of oxygen resulting in biogas and digestate. | Yes - compliant now | No | New wastewater treatment plant is a Flotation Bio Reactor - continuous aerobic system. There is an anaerobic chamber built within the aeration tank to create anoxic conditions for the conversion of nitrates to nitrites. WWTP not set up for the production of biogas. |
| | | | | | b. Use of Residues - Residues are used as animal feed. | Yes - compliant now | No | Waste cheese can be sent for pig food via licenced waste carrier, where required. Sludge removal via WWTP is collected by 3rd party tanker removal. |
| | | | | | c. Separation of residues, e.g. using accurately positioned splash protectors, screens, flaps, catchpots, drip trays and troughs.<br>d. Recovery and reuse of residues from the pasteuriser. | Yes - compliant now | No | Cheese residues produced throughout the plant already captured and re-blended / re-fed back into the process, where food safety allows. i.e. fines from clarifiers / underweight mis-shaped cheese blocks / chemically out of spec product, etc.<br>Whey is processed through the RO plant to produce concentrated whey (approx 24%) and sold on to 3rd party to produce whey products. Water recovery is polished and re-used in plant. |

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| | | | | | e. Phosphorus recovery - also see BAT 12g -<br>Only applicable to waste water streams with high total phosphorus content (e.g. above 50mg/l) and a significant flow. | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| | | | | | f. Use of waste water for land spreading -<br>After appropriate treatment, waste water is used for land spreading in order to take advantage of the nutrient content and/or to use the water. | Yes - compliant now | No | Location of the site within village location within close proximity to residents housing and close to stream prevents us from adopting waste water for land spreading. We deem this technique not applicable due to the limited availability of suitable land adjacent to our installation. |
| **11** | **Emissions to water** | To prevent uncontrolled emissions to water | Provide an appropriate buffer storage capacity for waste water | | The appropriate buffer storage capacity is determined by risk assessment (taking into account the nature of the pollutant(s), the effects of these pollutants on further waste treatment, the receiving environments etc). The wastewater from this buffer storage is discharged after appropriate measures are taken (e.g. monitoring, treatment, re-use). | Yes - compliant now | No | All emissions to water will be channelled through the WWTP, entering a crude pit / balance tank / DAF 1 / aeration tank and DAF 2 unit. The effluent quality of DAF 2 as the final section in the WWTP is monitored continuously. In case either the pre-set COD, TSS or ammonia level is exceeded, the water will be fed to a transfer tank, from where it will be pumped into the Out of Spec tank. The present 250m³ (with a mixer) and 100m³ (without a mixer) tanks will be used for this purpose. Any material held in these tanks can be assessed for further action and fed back into the WWTP for further treatment to reduce the pollutant before final discharge. The WWTP has been designed with 2 days full production (waste water) storage.<br><br>Refer to Waste Bref BATs returns summary for detailed description of new effluent plant stages of operation. |
| **12** | **Emissions to water** | To reduce emissions to water | The use a combination of the techniques specified in the associated table.<br>**Preliminary, Primary and general treatment** | **Specify applicable AEL(s) here** | a. Equalisation of all targeted pollutants. | Yes - compliant now | No | Equalisation of raw waste water from the dairy process is achieved through the WWTP balance tank. The wastewater from Dairy Partners will be screened by an existing mesh filter and will be collected in a crude pit to remove large debris (eg: leaves) prior to the treatment process. From the crude pit it will be fed to the balance tank by pumps in the WWTP. The purpose of the balance tank is to balance the pH of raw waste water. The balance tank has a mixer aerator continuously mixing the contents to prevent sedimentation. |
| | | | | | b. Neutralisation of Acids and Alkalis. | Yes - compliant now | No | Current WWTP - acids and alkalis neutralised by addition of relevant buffering chemicals - these are dosed automatically, triggered by a pH probe with manually controlled set points. Manual dosing can also be used as an alternative. |
| | | | | | c. Physical Separation e.g. screens, sieves, grit separators, oils / fat separators, or primary - Gross Solids, suspended solids oils / grease. | Yes - compliant now | No | Separation of solids is achieved by dissolved air floatation and the addition of flocculants. |
| | | | Aerobic and or anaerobic treatment (secondary treatment) | | d. Aerobic and or anaerobic treatment (secondary treatment ), e.g. activated sludge process, aerobic lagoon, up flow anaerobic sludge blanket (UASB) process, anaerobic process membrane bioreactor. | Yes - compliant now | No | The dissolved air floatation units use a continuous aerobic system, incorporating an active sludge process; this adds air into wastewater to aid bio-degradation of organic materials. |
| | | | Nitrogen Removal | | e. Nitrification and / or denitrification<br>f. Partial nitrification - anaerobic ammonium oxidation. | Yes - compliant now | No | The WWTP is designed with a nitrification / de-nitrification system converting ammonia to nitrates via aeration system, and nitrates to nitrites in an anaerobic (anoxic) chamber. Nitrite levels monitored monthly as required in Schedule 3 of Environmental Permit EPR/WP3231NB.<br>No requirement on existing permit to test for nitrate. Ammoniacal nitrogen is currently tested monthly as required in Schedule 3 of Environmental Permit EPR/WP3231NB.<br>All levels already compliant with permit requirements. |

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| | | | Phosphorus recovery and or removal | **<50mg/l** | g. Phosphorus recovery as struvite | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| | | | | | h. Precipitation | Not applicable | No | N/A for our WWTP. Plant works on dissolved air flotation (DAF) / aeration and aerobic digestion process. |
| | | | | | i. Enhanced biological phosphorus removal | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| | | | Final solids removal | | j. Coagulation and flocculation | Yes - compliant now | No | From the balance tank, the water will be pumped to the coagulation / flocculation/ flotation system. In the pipe flocculator, a coagulant, a neutraliser (caustic) and a flocculant (Polymer 223) will be dosed for flocculation. |
| | | | | | k. Sedimentation | Yes - compliant now | No | N/A for the WWTP. Plant works on DAF floatation / aeration and aerobic digestion process |
| | | | | | l. Filtration (e.g. sand filtration, microfiltration, ultrafiltration) | Yes - compliant now | No | N/A for the WWTP. Plant works on DAF floatation / aeration and aerobic digestion process |
| | | | | | m. Floatation | Yes - compliant now | No | 2 DAF units fitted on WWTP to produce floatation of solids to aid removal. |
| | | | BAT associated emission levels for direct emissions to receiving water body | **25 - 125mg/l** | Chemical Oxygen demand (COD) Upper AEL limit for Dairies is 125mg/l | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| | | | | **4 - 50mg/l** | Total Suspended Solids (TSS) | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| | | | | **2 - 20mg/l** | Total Nitrogen (TN) | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| | | | | **0.2 - 4mg/l** | Total Phosphorus (TP) upper AEL limit for Dairies is 4mg/l | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| | | | | | Mercury and Cadmium (permit requirements) | Investigating testing options | No | In-house test kit options being explored from three suppliers, as per BAT 4. |
| **13** | **Noise** | Prevent or reduce noise emissions | To set up, implement and review a noise management plan that incorporates key features identified | | 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, that includes all the following elements: | Yes - compliant now | No | Compliant now - due review in accordance with Improvement Condition 22 |
| | | | | | 1. A protocol containing actions and timelines. | See Improvement Condition | No | **Improvements to be identified as part of Improvement Condition 21b.** |
| | | | | | 2. A protocol for conducting noise emissions monitoring. | See Improvement Condition | No | Periodic specialist noise assessments and BAT audits carried out. The last assessment and BAT audit reports were written on 08 August 2023.<br><br>**To be submitted as required in Improvement Conditions 21a and 21b. The Noise Mangement Plan is to be submitted as required in Improvement Condition 22.** |
| | | | | | 3. A protocol for response to identified noise events, e.g. complaints. | Yes - compliant now | No | Noise complaints are logged on an internal spreadsheet titled 'Environmental Complaints Log'. Investigations are carried out in accordance with the Noise Management Plan - due review in accordance with Improvement Condition 22. |
| | | | | | 4. 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 | Yes - compliant now | No | An independent specialist Noise Impact Assessment and BAT Audit was written on 08 August 2023. All areas of the site have been assessed for noise at source and noise levels affecting sensitive noise receptors. Where issues were identified, noise reduction measures are being considered in accordance with Improvement Condition IC21b. |

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| **14** | **Noise** | In order to prevent or where that is not practicable, to reduce noise emissions | BAT is to use one or a combination of the following techniques | | **a. Appropriate location of equipment and buildings** - Noise levels can be reduced by increasing the distance between emitter and the receiver, by using buildings as noise screens and or relocating buildings exits or entrances | Yes - compliant now | No | Due to the age and location of the sites main production buildings it is not a possible to relocate existing entrances and exits. However, we have used the buildings to shield against noise generating equipment (where possible), e.g. cooling tower pumps situated in the corner of the boiler house which provides screening form residents to the west direction of the site. Where we cannot modify building screening, we have employed alternative techniques as detailed in Sections b - e. See Noise Impact Assessment and BAT Audit dated 20-23 July 2023 (report dated 08 August 2023). |
| | | | | | **b. Operational measures** - these include: 1. Improved inspection and maintenance of equipment. 2. Closing doors and windows of areas if possible. 3. Equipment operation by experienced staff. 4. Avoidance of noisy activities at night if possible. 5. Provisions for noise control e.g. during maintenance activities | Yes - compliant now | No | 1. Main equipment already has inspection and maintenance plan in place (documented on the site PPM tool).<br>2. All doors are kept closed as part of BRC site security; they are all self closing with key padlock to prevent unauthorised entry.<br>3. Our site is operated by experienced staff who have been at the site for many years. All staff are suitably trained.<br>4. As our site is 24/7 operational it is not always possible to eliminate noisy activities at night, however, where equipment and operations have been identified over the years as emitting nuisance noise at receptors, numerous improvements have been applied, as identified in our Annual Noise survey report - see latest attached noise impact assessment and BAT audit dated 28 July 2023.<br>5. Maintenance activities are usually undertaken during the day rather than at night and, where possible, steps will be taken to mitigate excessive noise. |
| | | | | | **c. Low Noise Equipment -** This includes low noise compressors, pumps and fans | See Improvement Condition | No | There have been a number of improvements in this area over the last few years. Please see latest Noise Survey 13th Nov 2020 which details improvement made by replacing out pumps fans and compressors with new low noise emitting versions. Further improvements have also been identified in the noise survey for roll out over the coming 3 years: examples of improvements completed are detailed below.<br><br>**To be reviewed as part of Improvement Condition 21b.** |
| | | | | | | Yes - compliant now | No | **LNG Refuelling**<br>LNG tankers utilise a pressure-based gas delivery system rather than a pump based delivery system. This has made the process almost silent during refuelling. However, as of 03/10/23, a new supplier is being used to replenish LNG. A predicted noise increase has been notified to the NRW site regualtion officer. To be monitored.<br><br>**LNG alarm** - Alarm is fitted within small box enclosure - door can be closed to reduce noise level by 25dB.<br><br>**NOTE:** If the LNG compound has been decommisioned for a period of time, ie: if the boilers have been fuelled with light fuel oil instead of LNG, the initial LNG will require pumped operation. |

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| | | | | | | Yes - compliant now | No | **Milk tankers pumping and idling** - Milk tankers (external contractor) idle their engines to provide pneumatic power to the vehicle brakes and valves.<br><br>All pumping capacity is provided by a floor-mounted electric pump, installed at the dairy on each connection point. Noise level of a pump measured at 65dB at a 1m range and 55dB at 10m range.<br><br>Milk tankers only visit the site between the hours of 06:00-18:00, in accordance with the Noise Management Plan.<br><br>No further action required. |
| | | | | | **d. Noise and Equipment control** - This includes : 1. Noise Reducers. 2. Insulation of Equipment. 3. Enclosure of Noisy equipment. 4. Soundproofing buildings | Yes - compliant now | No | Compliant now - see below. |
| | | | | | | Yes - compliant now | No | **Chilling/Cooling Operations**<br>Carried out a series of improvements to help reduce noise impacts from chilling/cooling operations:<br><br>installation of acoustic noise suppressing foam on the enclosure surrounding the chiller compound;<br>purchase and installation of a third chiller to reduce demand on the existing chiller systems;<br>purchase and installation of new cooling towers with noise silencers. |
| | | | | | | Yes - compliant now | No | **Cooling Tower Pumps**<br>NRW requested that DP should either replace the cooling tower pumps or fit engineered acoustic enclosures around them by the end of 2019. Acoustic enclosures have since been installed around the pumps.<br>**Cooling Towers:** New cooling towers recently installed with acoustic silencers on all exhausts. |
| | | | | | | Yes - compliant now | No | **Glycol pumps in chiller base** - Installed in open top enclosure with acoustic absorption installed to the walls. Acoustic lagging is also installed around the pumps.<br><br>**Whey dispatch pump**: Acoustic lagging installed on some of the components, further lagging to be implemented . |
| | | | | | **e. Noise Abatement:** Inserting obstacles between emitters and receivers (e.g. Protection walls / embankments and buildings) | Yes - compliant now | No | The new secondary containment lagoon installation will include extensive landscaping. Date TBC, post planning process. To include:<br><br>Fenceline - Fagus Sylvatica hedging<br><br>Soft landscaping surrounding WWTP - Alnus Glutinosa, Betula Pendula, Corylus Avellana and Prunus Avium |
| | | | | | | Yes - compliant now | No | **Borehole Pump Room** - several pumps. Installed within a room, rather than located outside. Ensuring door is closed when not in use provides a noise reduction of around 15dB in this area. |
| | | | | | | Yes - compliant now | No | **Boiler House Pressure Valve Release.** This exhausts at the rear of the building without line of site of most residents. An exhaust silencer could be installed on the flue - this would usually achieve 15-25dB noise reduction. Pressure release is carried out on an annual basis for a period totalling no longer than 15 seconds, typically in excess of 7 Bar. Purchasing and installing an exhaust silencer is a disproportionate solution for a highly negligible noise impact. |

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| **15** | **Odour** | Prevent or reduce odour emissions | To set up, implement and review an odour management plan that incorporates key features identified | | 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, that includes all the following elements: | Yes - compliant now | No | The latest Odour Management Plan has been reviewed in September 2023, in accordance with BAT 15 and Improvement Condition IC20.<br><br>The Odour Management Plan will be reviewed on an annual basis. |
| | | | | | 1. A protocol containing actions and timelines. | Yes - compliant now | No | A weekly odour monitoring schedule is a condition of the revised Odour Management Plan.<br><br>For improvements, the Odour Management Plan stipulates that an appropriate timeframe will be assigned to the works depending on aspects such as the purchase of spares, delivery forecasts, the time required to implement the improvement(s) and whether specialist intervention is required. |
| | | | | | 2. A protocol for conducting odour monitoring. It may be complemented by measurement / estimation of odour exposure or estimation or odour impact. | Yes - compliant now | No | Odour monitoring provision is detailed in the site Odour Management Plan. The formal sniff test procedure will be used in response to a complaint, a significant, noticeable odour being present, or routinely on a weekly basis. |
| | | | | | 3. A protocol for response to identified odour incidents, e.g. complaints. | Yes - compliant now | No | As documented in the site Odour Management Plan, a complaints procedure is in use for direct complaints from third parties, including statutory authorities, members of the general public and internal staff members, and complaints submitted via the NRW Incident Line. |
| | | | | | 4. An odour prevention and reduction programme designed to identify the source; to measure / estimate odour exposure; to characterise the contributions of the sources; and to implement prevention and / or reduction measures. | Yes - compliant now | No | Since the installation of the new WWTP, multiple odour assessments have been carried out by a specialist odour consultancy. This has included identification of the likely sources for odour emissions and recommendations for mitigation measures. Odour reduction measures include the creation of an Odour Management Plan, the installation of passive carbon filtration systems on the two Dissolved Air Floatation Units (DAFs) and displaced air from filling of the waste tanker with sludge, and a regular cleaning regime to reduce the accumulation of potentially odorous waste material. |
| **Dairies** | | | | | | | | |
| **21** | **Energy efficiency** | In order to Increase energy efficiency | BAT is to use a combination of the techniques specified in BAT 6 and BAT 21 table A-G where applicable | | a. Partial homogenisation of milk | Not applicable | No | Not Applicable - we do not have homogenisation of milk as part of our cheese making |
| | | | | | b. Energy-efficient homogeniser | Not applicable | No | Not Applicable - no homogenisers on site. |
| | | | | | c. Use of continuous pasteurisers | Yes - compliant now | No | Our flow through exchange pasteurisers are plate design, reducing the time required to achieve time / temperature combination. |
| | | | | | d. Regenerative heat exchange in pasteurisers | Yes - compliant now | No | Milk and whey pasteurisers are heat exchange models. |
| | | | | | e. UHT Processing of Milk | Not applicable | No | Not applicable to our process - No UHT treatment of milk on site. |
| | | | | | f. Multi Stage drying in powder production | Not applicable | No | Not applicable to our process - No production or drying of powdered products on site |
| | | | | | g. Pre-cooling of Ice Water | Yes - compliant now | No | Chilled water not used for cooling pasteurised milk. Cooling of post-pasteurised milk is achieved by energy efficient plate heat exchange system. We do not use iced water so this method not applicable. |

<table>
<tr><td>21<br>IEP</td><td>Energy Efficiency</td><td>Indicative Environmental Performance for specific energy consumption</td><td>See Table17.8</td><td></td><td>Indicative environmental performance levels for specific energy consumption<table><tr><th>Main product (at least 80 % of the production)</th><th>Unit</th><th>Specific energy consumption (yearly average)</th></tr><tr><td>Market milk</td><td rowspan="4">MWh/tonne of raw materials</td><td>0.1–0.6</td></tr><tr><td>Cheese</td><td>0.10–0.22 (1)</td></tr><tr><td>Powder</td><td>0.2–0.5</td></tr><tr><td>Fermented milk</td><td>0.2–1.6</td></tr><tr><td colspan="3">(1) The specific energy consumption level may not apply when raw materials other than milk are used.</td></tr></table></td><td>Yes - compliant now</td><td>No</td><td>2022 - specific energy consumption recorded as 0.152 MWh/tonne of raw material.<br><br>Considerations included:<br>LNG consumption<br>LFO consumption<br>Electricity consumption<br>Total energy<br>Raw milk use</td></tr>
<tr><td>21<br>IEP</td><td>Water consumption and waste water discharge</td><td>Indicative Environmental Performance levels for specific waste water discharge</td><td>See Table 17.9</td><td></td><td>Indicative environmental performance levels for specific waste water discharge<table><tr><th>Main product (at least 80 % of the production)</th><th>Unit</th><th>Specific waste water discharge (yearly average)</th></tr><tr><td>Market milk</td><td rowspan="3">$m^3$/tonne of raw materials</td><td>0.3–3.0</td></tr><tr><td>Cheese</td><td>0.75–2.5</td></tr><tr><td>Powder</td><td>1.2–2.7</td></tr></table></td><td>Yes - compliant now</td><td>No</td><td>For 2022, specific usage remained at around 1.3m3 - this remains inside the 0.75-2.5 m3 limit set in BAT 21.<br><br>The average for 2023 (up until end of August) is 1.28 with a predicted downward trend due to new CIP installation.</td></tr>
<tr><td rowspan="5">22</td><td rowspan="5">Waste</td><td rowspan="5">Reduce the quantity of waste sent for disposal</td><td rowspan="5">The use of one or more of the techniques specified in the associated table</td><td></td><td>a. Optimised operation of centrifuges</td><td>Yes - compliant now</td><td>No</td><td>The clarifiers / separators are designed / set up to produce optimised separation of cream / cheese fines etc which are recovered. Cheese fines fed back into process. Cream separation sold off as additional bi-product. All our units are new models purchased in the last 5 years and are also energy efficient models.</td></tr>
<tr><td></td><td>b. Rinsing of the cream heater with skimmed milk (butter production )</td><td>Not applicable</td><td>No</td><td>Not applicable to our site not producing butter</td></tr>
<tr><td></td><td>c. Continuous Freezing of Ice Cream</td><td>Not applicable</td><td>No</td><td>Not applicable to our site not producing ice cream</td></tr>
<tr><td></td><td>d. Minimisation of the generation of acid whey (Cheese Production) Whey from the manufacture of acid type cheeses is processed quickly as possible to reduce the formation of lactic acid.</td><td>Yes - compliant now</td><td>No</td><td>Whey from our manufacture of Mozzarella produces a sweet cream whey, not acid whey. Whey from our cheese manufacture is also processed through our RO plant to produce concentrated whey for 3rd party bi-product and the water recovered is used for cleaning processes in the plant. Therefore, this clause not applicable to our process.</td></tr>
<tr><td></td><td>e. Recovery and use of whey - whey is recovered using membrane filtration / reverse osmosis to recover water concentrating the whey.</td><td>Yes - compliant now</td><td>No</td><td>We recover whey via a reverse osmosis system into a whey concentrate (at 24%) which is sold on to a 3rd party for further processing. Water recovery from this process is then recycled for cleaning.</td></tr>
<tr><td>23</td><td>Emissions to air</td><td>Reduce channelled dust emissions to air from drying</td><td>The use of one or more of the techniques specified in the associated table</td><td>Specify applicable AEL(s)</td><td>A. Bag Filter, B. Cyclone, C. Cyclone</td><td>Not applicable</td><td>No</td><td>We do not undertake any drying processes on site. This BAT is not applicable to our current Dairy activities</td></tr>
</table>