BAT Conclusions Assessment

BV Dairy

August 2023 v1

The following table lists the BAT conclusions references from 'BATC - Best Available Techniques (BAT) Conclusions for Waste Treatment' (August 2018) with comments on how BV Dairy comply.

BAT No.	Conclusion	Comments
1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features: I. commitment of the management, including senior management; II. definition, by the management, of an environmental policy that includes the continuous improvement of the environmental performance of the installation; III. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; IV. implementation of procedures paying particular attention to: (a) structure and responsibility, (b) recruitment, training, awareness and competence, (c) communication, (d) employee involvement, (e) documentation, (f) effective process control, (g) maintenance programmes, (h) emergency preparedness and response, (i) safeguarding compliance with environmental legislation; V. checking performance and taking corrective action, paying particular attention to: (a) monitoring and measurement (see also the JRC Reference Report on Monitoring of emissions to air and water from IED installations – ROM), (b) corrective and preventive action, (c) maintenance of records, (d) independent (where practicable) internal or external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; VI. review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness; VII. following the development of cleaner technologies;	The site operates under a certificated EMS to the ISO 14001:2015 Standard (certificate no. CEM21491), accredited by Sai Global. The ESH manual is contained at document C2.3d

BAT No.	Conclusion	Comments
	VIII. consideration for the environmental impacts from the eventual decommissioning of the plant at the stage of designing a new plant, and throughout its operating life; IX. application of sectoral benchmarking on a regular basis; X. waste stream management (see BAT 2); XI. an inventory of waste water and waste gas streams (see BAT 3); XII. residues management plan (see description in Section 6.5); XIII. accident management plan (see description in Section 6.5); XIV. odour management plan (see BAT 12); XV. noise and vibration management plan (see BAT 17).	
2	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques given below. a. Set up and implement waste characterisation and pre-acceptance procedure. b. Set up and implement waste acceptance procedures c. Set up and implement a waste tracking system and inventory d. Set up and implement an output quality management system e. Ensure waste segregation f. Ensure waste compatibility prior to mixing or blending of waste g. Sort incoming solid waste	Waste is derived from the adjacent BV Dairy plant and consist of two waste streams, trade waste and permeate, both in liquid phase and stored in separate tanks prior to mixing in the digester. Daily samples are taken of both waste streams automatically to ensure compatibility. Daily samples are also taken of trade effluent sent to sewer in accordance with the sites Trade Effluent Discharge Consent. Continual monitoring is untaken automatically of gas composition used to supply the gas engine. No solid wastes are accepted at the site.
3	In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the environmental management system (see BAT 1), that incorporates all of the following features: (i) information about the characteristics of the waste to be treated and the waste treatment processes, including: (a) simplified process flow sheets that show the origin of the emissions; (b) descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances; (ii) information about the characteristics of the waste water streams, such as: (a) average values and variability of flow, pH, temperature, and conductivity; (b) average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, priority substances/micropollutants);	Daily sampling is undertaken of both incoming wastes streams to ascertain load values and composition. Daily samples are also taken of trade effluent sent to sewer in accordance with the sites Trade Effluent Discharge Consent. Continual monitoring is untaken automatically of gas composition used to supply the gas engine. The whole process is available on a process mimic display with results recorded on the SCADA system.

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	(c) data on bioeliminability (e.g. BOD, BOD to COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. inhibition of activated sludge)) (see BAT 52); (iii) information about the characteristics of the waste gas streams, such as: (a) average values and variability of flow and temperature; (b) average concentration and load values of relevant substances and their variability (e.g. organic compounds, POPs such as PCBs); (c) flammability, lower and higher explosive limits, reactivity; (d) presence of other substances that may affect the waste gas treatment system or plant safety (e.g. oxygen, nitrogen, water vapour, dust).	
4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below. a. Optimised storage location b. Adequate storage capacity c. Safe storage operation d. Separate area for storage and handling of packaged hazardous waste	Storage, capacity and operating procedures are in accordance with BAT with all storage sufficient or the processes and contained within an impermeable sealed system.
5	In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures. Description Handling and transfer procedures aim to ensure that wastes are safely handled and transferred to the respective storage or treatment. They include the following elements: — handling and transfer of waste are carried out by competent staff; — handling and transfer of waste are duly documented, validated prior to execution and verified after execution; — measures are taken to prevent, detect and mitigate spills; — operation and design precautions are taken when mixing or blending wastes (e.g. vacuuming dusty/powdery wastes). Handling and transfer procedures are risk-based considering the likelihood of accidents and incidents and their environmental impact.	Handling of incoming wastes is via an automatic sealed pipework system connected to volume recorders. Blending and mixing are undertaken by the main CPU of the plant and shown on the mimic display. Transfer of products is again undertaken by the main CPU of the plant and shown on the mimic display.
6	For relevant emissions to water as identified by the inventory of waste water streams (see BAT 3), BAT is to monitor key process parameters (e.g. waste water flow, pH, temperature, conductivity, BOD) at key locations (e.g. at the inlet	Waste water emissions are recoded on the mimic display and recorded on the SCADA system for review.

BAT No.	Conclusion	Comments
	and/or outlet of the pretreatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	
7	BAT is to monitor emissions to water with at least the frequency given below, 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.	No emissions to water are involved in the process.
8	BAT is to monitor channelled emissions to air with at least the frequency given below, 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.	Monitoring of emissions to air is in accordance with existing permit requirements and current EN, ISO and MCERTS methods and analysis.
9	N/A to AD	N/A
10	BAT is to periodically monitor odour emissions. Description Odour emissions can be monitored using:. — EN standards (e.g. dynamic olfactometry according to EN 13725 in order to determine the odour concentration or EN 16841-1 or -2 in order to determine the odour exposure); — when applying alternative methods for which no EN standards are available (e.g. estimation of odour impact), ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. The monitoring frequency is determined in the odour management plan (see BAT 12). Applicability - The applicability is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.	There have not been any instances of odour nuisance at the facility since operations commenced. An odour management plan is available within the EMS.
11	BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and waste water, with a frequency of at least once per year. Description Monitoring includes direct measurements, calculation or recording, e.g. using suitable meters or invoices. The monitoring is broken down at the most appropriate level (e.g. at process or plant/installation level) and considers any significant changes in the plant/installation.	Continual recording of water and energy consumption is maintained on the SCADA system. Outputs and residues from the process are also continually recorded and maintained on the SCADA system. Raw material usage is analysed with reference to invoices for deliveries.

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12	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 as set out in BAT 10; — a protocol for response to identified odour incidents, e.g. complaints; — an odour prevention and reduction programme designed to identify the source(s); to characterise the contributions of the sources; and to implement prevention and/or reduction measures. Applicability The applicability is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.	There have not been any instances of odour nuisance at the facility since operations commenced. An odour management plan is available within the EMS.
13	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given below. b. Using chemical treatment	Ferric Chloride is added to reduce the potential for odorous emissions.
14	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques given below. a. Minimising the number of potential diffuse emission sources b. Selection and use of high integrity equipment c. Corrosion prevention d. Containment, collection and treatment of diffuse emissions e. Maintenance f. Cleaning of waste treatment and storage area g. Leak detection and repair (LDAR) programme	The only air emission point is the engine exhaust. Maintenance is conducted at manufacturers recommended intervals on the engine to ensure efficient combustion and operation.
15	BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given below. a. Correct design of flaring devices b. Plant management	The flare is only used during maintenance of the engine or breakdowns.
16	In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given below. a. Correct design of flaring devices	Where flare operation is in excess of 10% of annual hours in any year the flare is monitored in accordance with the existing permit, EN and ISO requirements.

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	b. Monitoring and recording as part of flare management	
17	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: I. a protocol containing appropriate actions and timelines; II. a protocol for conducting noise and vibration monitoring; III. a protocol for response to identified noise and vibration events, e.g. complaints; IV. a noise and vibration 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. Applicability - The applicability is restricted to cases where a noise or vibration nuisance at sensitive receptors is expected and/or has been substantiated.	There have not been any instances of noise or vibration nuisance at the facility since operations commenced. A noise management plan is available within the EMS.
18	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below. a. Appropriate location of equipment and buildings b. Operational measure c. Low-noise equipment d. Noise and vibration control equipment e. Noise attenuation	The plant is shielded from any sensitive receptors by topography (noise attenuation). The primary noise source is the engine and this is contained within an acoustic enclosure to minimise noise generation.
19	In order to optimise water consumption, to reduce the volume of waste water generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given below.	See below at BAT 20.
20	In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given below. c. Physical separation, e.g. screens, sieves, grit separators, grease separators, oil/water separation or primary settlement tank l. Activated sludge process o. Coagulation and flocculation r. Flotation	The process utilises a range of techniques to treat the waste water. The plant itself acts as activated sludge process. The addition of coagulation and flocculation chemicals precipitates any particles and these are removed by floating scrapers back into the main AD tank. The sump prior to discharge removes any heavy sediment.

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21	In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques given below, as part of the accident management plan (see BAT 1). a. Protection measures b. Management of incidental/accidental emissions c. Incident/accident registration and assessment system	The accident management plan is contained within the site EMS. It uses a combination of physical control measures, continuous monitoring and plant fail-safes to control and manage the potential for accidents.
22	In order to use materials efficiently, BAT is to substitute materials with waste. Description - Waste is used instead of other materials for the treatment of wastes (e.g. waste alkalis or waste acids are used for pH adjustment, fly ashes are used as binders).	Waste water is reused within the process to minimise the need for raw materials.
23	In order to use energy efficiently, BAT is to use both of the techniques given below. a. Energy efficiency plan b. Energy balance record	Use and generation of energy is detailed on the main CPU mimic display and recorded on the SCADA system.
24	In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residues management plan (see BAT 1). Description - Packaging (drums, containers, IBCs, pallets, etc.) is reused for containing waste, when it is in good condition and sufficiently clean, depending on a compatibility check between the substances contained (in consecutive uses). If necessary, packaging is sent for appropriate treatment prior to reuse (e.g. reconditioning, cleaning).	Chemicals used in the process are stored in returnable IBCs. Contracts are in place for the return of these contained to the chemical manufacturer.
25-32	N/A to AD	N/A
33	In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input. Description - The technique consists of carrying out the pre-acceptance, acceptance and sorting of the waste input (see BAT 2) so as to ensure the suitability of the waste input for the waste treatment, e.g. in terms of nutrient balance, moisture or toxic compounds which may reduce the biological activity.	Handling of incoming wastes is via an automatic sealed pipework system connected to volume recorders. Blending and mixing of the two waste streams are undertaken by the main CPU of the plant and shown on the mimic display.
34	In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H2S and NH3, BAT is to use one or a combination of the techniques given below. d. Thermal oxidation	Emissions to air are through the gas engine, following combustion.

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35	In order to reduce the generation of waste water and to reduce water usage, BAT is to use all of the techniques given below. b. Water recirculation c. Minimisation of the generation of leachate	The process uses a recirculation system to feed a proportion of waste water back through the AD plant to maintain the reactions within the tank.
36-37	N/A to AD	N/A
38	In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters. Description - Implementation of a manual and/or automatic monitoring system to: — ensure a stable digester operation; — minimise operational difficulties, such as foaming, which may lead to odour emissions; — provide sufficient early warning of system failures which may lead to a loss of containment and explosions. This includes monitoring and/or control of key waste and process parameters, e.g.: — pH and alkalinity of the digester feed; — digester operating temperature; — hydraulic and organic loading rates of the digester feed; — concentration of volatile fatty acids (VFA) and ammonia within the digester and digestate; — biogas quantity, composition (e.g. H2S) and pressure; — liquid and foam levels in the digester.	Handling of incoming wastes is via an automatic sealed pipework system connected to volume recorders. Manual and automatic daily monitoring of key incoming wastes is undertaken. Operation, monitoring and process parameters are controlled by the main CPU of the plant and shown on the mimic display. Parameters can be adjusted using the mimic board. All parameters are recorded on the SCADA system.