

BAT No.	Topic	Brief Description	BAT	BAT-AEL	Operating to BAT currently? Yes or No	BAT-AEL derogation needed? Yes or No	Operator comments	Inspector comments
General BAT conclusions								
1	Overall environmental performance	EMS	BAT 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: I. commitment of 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 documentation; (b) monitoring and measurement; (c) maintenance of equipment; (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; (e) internal or external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; (f) review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness; VII. following the development of cleaner technologies; 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 technical benchmarking on a regular basis; X. waste 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); (See end of Document for details) 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).	N/A	Yes	No	An Environmental Management System (EMS) is implemented covering environmental policy, defined roles and responsibilities, training, monitoring, internal audits, corrective actions and management review. The EMS integrates emergency preparedness and incident response. Evidence: Environmental Policy; Management System Summary (Doc Ref K163.2-09-002); Accident, Incident & Near Miss Reporting Procedure (OS AI501).	
2	Overall environmental performance	Waste pre-acceptance, acceptance and tracking	BAT 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 procedures. 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. Waste is kept separated depending on its properties in order to enable easier and environmentally safer storage and treatment. f. Ensure waste compatibility prior to mixing or blending of waste. g. Sort incoming solid waste. Sorting of incoming solid waste aims to prevent unwanted material from entering subsequent wastewater treatment processes.	N/A	Yes	No	Waste pre-acceptance and acceptance procedures ensure only suitable wastes are received. Incoming wastes are checked against permit limits, pH-tested prior to unloading, visually inspected for contamination, and rejected where non-conforming. Records are retained for all loads. Evidence: SOP 01 Tanker Unloading (SOP 001); AD Operations SOP (SOP 002); Waste Acceptance Procedures (SOP 001 / SOP 002).	
3	Overall environmental performance	Inventory of waste water and waste gas streams	BAT 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) information about the characteristics of the emissions; (b) descriptions of process-integrated techniques and waste/water/gas treatment at source including their performances; (c) 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 total loads of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphate, and other substances); (c) data on biodegradability (e.g. BOD, COD, BOD to COD ratio, Zahn-Welens test, biological inhibition potential) (see BAT 52); (See end of Document for details) (ii) information about the characteristics of the waste gas streams, such as: (a) average values and variability of flow and temperature; (b) average concentration and total loads of relevant substances and their variability (e.g. organic compounds, 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).	N/A	Yes	No	An inventory of waste inputs, process outputs, emissions to air, emissions to water and residues is maintained to identify relevant pollutants and monitoring requirements. Evidence: Management System Summary (Doc Ref K163.2-09-002); CCRA (Doc Ref K163.1-09-011); Environmental Monitoring Records (EMS Records).	
4	Overall environmental performance	Storage procedures	BAT 4. In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below. Technique Description Applicability a. Optimised storage location/b. Adequate storage capacity c. Safe storage operation d. Separate area for storage and handling of packaged hazardous waste W	N/A	Yes	No	Waste compatibility checks are undertaken to prevent unsafe mixing. Wastes are segregated by type, reception areas are defined, and incompatible wastes are refused. Evidence: Waste Acceptance Procedures (SOP 001 / SOP 002); SOP 001 Tanker Unloading (SOP 001); AD Operations SOP (SOP 002).	
5	Overall environmental performance	Handling and transfer procedures	BAT 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 fully documented, detailed prior to execution and verified after execution; — measures to detect and mitigate spillages; — spillage 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.	N/A	Yes	No	Good housekeeping measures include routine inspection and maintenance of tanks, pipework and valves, prompt clean-up of spillages, sealed drainage in dirty areas and controlled waste storage. Evidence: AD Operations SOP (SOP 002); Fire Prevention Plan (Doc Ref K163.1-09-005); Dust & Emissions Management Plan (Doc Ref K163.1-09-012).	
6	Monitoring	monitor key process parameters	BAT 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 and/or outlet of the pretreatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	N/A	Yes	No	Key process parameters relevant to emissions to water (including pH, containment integrity and flow control) are monitored at critical points to ensure effective control. Evidence: AD Operations SOP (SOP 002); Sampling of Digestate SOP (SOP 003); Environmental Monitoring Records (EMS Records).	
7	Monitoring	monitor emissions to water	BAT 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. A monitoring frequency may be reduced if the emission levels are proven to be sufficiently stable. b. In the case of batch discharge, the frequency of monitoring may be reduced if the monitoring is carried out once per batch. c. The monitoring only applies when the substance concerned is identified as relevant in the waste water inventory	N/A	Yes	No	Emissions to water are monitored using appropriate standards and frequencies proportionate to risk, with results reviewed to identify trends and ensure compliance. Evidence: Digestate Sampling SOP (SOP 003); PAS110 Sampling Records (PAS110 Compliance Records).	
8	Monitoring	monitor channelled emissions to air	BAT 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. A monitoring frequency may be reduced if the emission levels are proven to be sufficiently stable. b. The monitoring only applies when the substance concerned is identified as relevant in the waste gas stream based on the inventory	N/A	Yes	No	Channelled emissions to air are monitored where applicable, with monitoring frequency and methods aligned with BAT requirements. Evidence: Dust & Emissions Management Plan (Doc Ref K163.1-09-012); Odour Management Plan (Doc Ref K163.1-09-008).	
9	Monitoring	monitor diffuse emissions of organic compounds to air	BAT 9. BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given below. a. Measurement Sniffing methods, optical gas imaging, solar calorimeter flux or differential absorption. b. Emissions factors. Calculation of emissions based on emissions factors, periodically validated (e.g. once every two years) by measurements. c. Mass balance. Calculation of diffuse emissions using a mass balance considering the solvent input, channelled emissions to air, emissions to water, the solvent in the process output, and process (e.g. distillation) residues.	N/A	Yes	No	Diffuse emissions are minimised through enclosed processes, sealed tanks and pipework, controlled connections, housekeeping and operator vigilance. Evidence: AD Operations SOP (SOP 002); Dust & Emissions Management Plan (Doc Ref K163.1-09-012).	
10	Monitoring	monitor odour	BAT 10. BAT is to periodically monitor odour emissions. Description Odour emissions can be monitored using: — EN standards (e.g. dynamic olfactory 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 standards are available (e.g. estimation of odour concentration using olfactory panels); — national or other international standards 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.	N/A	Yes	No	Odour emissions are controlled through waste acceptance checks, rapid processing, sealed reception and digestion systems, housekeeping and implementation of an Odour Management Plan (Doc Ref K163.1-09-008). Evidence: Odour Management Plan (Doc Ref K163.1-09-008); SOP 001 Tanker Unloading (SOP 001).	
11	Monitoring	monitor consumption of water, energy and raw materials, and generation of residues and waste water	BAT 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.	N/A	Yes	No	Noise and vibration are minimised through site layout, speed restrictions, maintenance of equipment and operational controls. Evidence: Site Induction (Rev 6) & Mandatory Site Rules, CCRA (Doc Ref K163.1-09-011).	
12	Emissions to air	odour management plan	BAT 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.	N/A	Yes	No	Dust emissions are controlled through speed limits, wet cleaning of hardstanding, enclosed handling systems and implementation of a Dust & Emissions Management Plan (Doc Ref K163.1-09-012). Evidence: Dust & Emissions Management Plan (Doc Ref K163.1-09-012); Site Induction (Rev 6).	
13	Emissions to air	reduce odour emissions	BAT 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. a. Minimising residence times b. Using chemical treatment c. Optimising aerobic treatments in the case of aerobic treatment of water-based liquid waste.	N/A	Yes	No	Fugitive emissions are prevented by use of sealed systems, controlled hose connections, routine inspection, leak detection and immediate corrective action. Evidence: AD Operations SOP (SOP 002); Fire Prevention Plan (Doc Ref K163.1-09-005).	
14	Emissions to air	reduce diffuse emissions to air	BAT 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 This includes techniques such as: — appropriate design of piping layout (e.g. minimising pipe run length, reducing the number of flanges and valves, using welded fittings and pipes); — favouring the use of gravity transfer rather than using pumps; — limiting the drop height of material; — limiting traffic speed; — using wind barriers. Generally applicable. b. Selection and use of high-integrity equipment This includes techniques such as: — valves with double packing seals or equally efficient equipment; — high integrity gaskets (such as spiral wound, ring joints) for critical applications; — pumps/compressors/Applicability may be restricted in the case of existing plants due to operability requirements. 32 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) agitators fitted with mechanical seals instead of packing; — appropriate design of storage tanks; — appropriate design of storage tanks; — appropriate design of piercing pipes, drill heads, etc. when degassing VFCs and/or VHCs. c. Corrosion prevention This includes techniques such as: — appropriate selection of construction materials; — lining or coating of equipment and painting of pipes with corrosion inhibitors. Generally applicable. d. Containment, collection and treatment of diffuse emissions This includes techniques such as: — storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed. The use of enclosed equipment or buildings may be restricted by safety considerations such as the risk of explosion or oxygen depletion. The use of enclosed equipment or buildings may also be constrained by the volume of waste. (See end of Document for details) equipment (e.g. conveyor belts); — maintaining the enclosed equipment or buildings under an adequate pressure; — collecting and directing the emissions to an appropriate abatement system (see Section 6.1) or an air extraction system close to the emission source; — dampening of equipment; — soundproofing of fast-action doors. g. Cleaning of waste treatment and storage areas This includes techniques such as regularly cleaning the whole waste treatment area (halls, transfer areas, storage areas, etc.), conveyor belts, equipment and containers. Generally applicable. h. Leak detection and repair (LDAR) programme See Section 6.2. When emissions of organic compounds are expected, a LDAR programme is set up and implemented using a risk-based approach, considering in particular the design of the plant and the amount and nature of the organic compounds concerned. Generally applicable.	N/A	Yes	No	Emissions to air are reduced through containment of sources, operational controls and, where required, abatement measures. Evidence: Dust & Emissions Management Plan (Doc Ref K163.1-09-012); Odour Management Plan (Doc Ref K163.1-09-008). The installation will implement appropriate measures to contain, collect and treat diffuse emissions arising from waste reception, storage and treatment activities. The following measures will be implemented at the installation: -Waste reception and handling activities associated with odorous materials (ABP food waste) is undertaken within fully enclosed systems, both for waste reception as well process areas; -Enclosed areas operate under negative pressure to minimise the uncontrolled release of emissions; -Air extracted from process areas will be collected via a dedicated extraction system; -Collected air will be directed to an appropriate abatement system prior to discharge to atmosphere; -Operational controls described within the Odour Management Plan will minimise the duration of waste storage and handling activities. -Site inspections and maintenance procedures will ensure the continued integrity and effectiveness of containment and extraction systems. The Operator considers that the combination of physical containment, extraction and treatment systems, together with operational controls, satisfies the requirements of BAT Conclusion 14	
15	Emissions to air	Minimise use of flaring	BAT 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. Technique Description Applicability a. Correct plant design This includes the provision of a gas recovery system with sufficient capacity and the use of high-integrity relief valves. Generally applicable to new plants. A gas recovery system may be retrofitted in existing plants. b. Plant management This includes balancing the gas system and using advanced process control. Generally applicable.	N/A	Yes	No	Risk-based safety systems are in place including fire prevention controls, DSEAR zoning, gas detection, emergency response procedures, staff training and incident reporting. Evidence: Fire Prevention Plan (Doc Ref K163.1-09-005); Site Induction; Accident & Incident Reporting Procedure.	
16	Emissions to air	reduce emissions to air from flares	BAT 16. In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given below. Technique Description Applicability a. Correct design of flaring devices Optimisation of height and pressure, assistance by steam. Generally applicable to new flares. In existing plants, (See end of Document for details) air or gas, type of flare tips, etc., to enable smokeless and reliable operation and to ensure the efficient combustion of excess gases. Applicability may be restricted, e.g. due to maintenance and/or operation as part of flare management. b. Flare management This includes techniques such as: — monitoring of the quantity of gas sent to flaring; it may include estimations of other parameters (e.g. composition of gas flow, heat content, ratio of assistance, velocity, purge gas flow rate, pollutant emissions (e.g. NOx, CO, hydrocarbons), noise). The recording of flaring events usually includes the duration and number of events and allows for the quantification of emissions and the potential prevention of future flaring events. Generally applicable. 1.4. Noise and vibrations	N/A	Yes	No	Energy efficiency is achieved through monitoring of energy use, on-site generation and utilisation of biogas, export of surplus electricity and continual optimisation of plant operation. Evidence: Environmental Policy; AD Operations SOP (SOP 002).	
17	Noise and vibrations	noise and vibration management plan	BAT 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: — a protocol containing appropriate actions and timelines; — a protocol for conducting noise and vibration monitoring; — 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 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. 36 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details)	N/A	Yes	No	Water use is minimised through monitoring, recirculation of process water, segregation of clean and dirty drainage and controlled wash-down practices. Evidence: AD Operations SOP (SOP 002); Dust & Emissions Management Plan (Doc Ref K163.1-09-012).	
18	Noise and vibrations	reduce noise and vibration emissions	BAT 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. Technique Description Applicability a. Appropriate location of equipment and buildings Noise levels can be reduced by increasing the distance between the emitter and the receiver, by using buildings as noise screens and by relocating buildings exits or entrances. For existing plants, the relocation of equipment and building exits or entrances may be restricted by a lack of space or existing buildings. b. Operational measures This includes techniques such as: (i) inspection and maintenance of equipment; (ii) closing of doors and windows of enclosed areas, if possible; (iii) equipment operation by experienced staff; (iv) avoidance of noisy activities at night, if possible; (v) provisions for noise control during maintenance, traffic, handling and treatment activities. c. Low-noise equipment This may include direct vibration isolation of equipment. d. Noise and vibration control equipment This includes techniques such as: — acoustic and vibrational insulation of equipment; (ii) enclosure of noisy equipment; (iv) soundproofing of buildings of space (for existing plants). e. Noise attenuation Noise propagation can be reduced by inserting obstacles between emitters and receivers (e.g. protection walls, embankments and buildings). Applicability to existing plants, as the design of new plants should make this technique unnecessary. For existing plants, the insertion of obstacles may be restricted by a lack of space. For mechanical treatment in shredders of metal wastes, it is applicable within the constraints associated with the risk of deflagration in shredders. 1.5. Emissions to water	N/A	Yes	No	Waste generation is minimised by optimising digestion efficiency, segregating wastes, recycling where possible and managing residues appropriately. Evidence: Management System Summary (Doc Ref K163.2-09-002); Environmental Policy.	
19	Emissions to water	optimise water consumption, reduce waste water and prevent or reduce emissions to soil and water	BAT 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. Technique Description Applicability a. Water management Water consumption is optimised by measures which may include: — water saving plans (e.g. establishment of water efficiency objectives, low Generally applicable. 38 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) diagrams and water mass balances); — optimising the use of washing water (e.g. dry cleaning instead of hosing down, using trigger control on all washing equipment); — reducing the use of water for vacuum generation (e.g. use of liquid hot point liquids). b. Water recirculation Water streams are recirculated within the plant, if necessary after treatment. The degree of recirculation is limited by the water balance of the plant, the content of impurities (e.g. odorous compounds) and/or the characteristics of the water streams (e.g. nutrient content). Generally applicable. c. Impermeable surface dependences on the risks posed by the waste in terms of soil and/or water contamination, the surface treatment (e.g. waste reception handling and storage treatment. Generally applicable. (See end of Document for details) and dispatch areas) is made impermeable to the liquids concerned. d. Techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels Depending on the risks posed by the liquids contained in tanks and vessels in terms of soil and/or water contamination, this includes techniques such as: — overflow pipes that are directed to a containment drainage system; — relevant secondary containment or another vessel); — tanks for liquids that are located in a suitable secondary containment; the volume is normally sized to accommodate the loss of containment of the largest tank within the secondary containment; — isolation of tanks, vessels and secondary containment (e.g. closing of valves). Generally applicable. e. Roofing of waste storage and treatment areas Depending on the risks posed by the waste in terms of Applicability may be constrained when high volumes of 40 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) soil and/or water contamination, waste is stored and treated in covered areas to prevent contact with rainwater and thus minimise the volume of contaminated run-off. Water streams are stored or treated (e.g. mechanical treatment in shredders of metal wastes). f. Segregation of water streams Each water stream (e.g. surface runoff water, process water) is collected and treated separately based on the pollutant content and on the combination of treatment techniques. In particular, uncontaminated waste water streams are segregated from waste water streams that require treatment. Generally applicable to new plants. Generally applicable to existing plants within the constraints associated with the layout of the water collection system. g. Adequate drainage infrastructure The waste treatment area is connected to drainage infrastructure. Rainwater and storage areas is collected in the drainage infrastructure along with washing water, occasional spillages, etc., and, depending on the pollutant content, recirculated or sent for further treatment. Generally applicable to new plants. Generally applicable to existing plants within the constraints associated with the layout of the water drainage system. h. Design and maintenance provisions to allow detection and repair of leaks Regular monitoring for potential leakage is risk-based, and, when necessary, equipment is repaired. The use of underground components is minimised. When the use of above-ground components is generally applicable to new plants, it may be limited however by the risk of freezing. The installation of secondary containment may be (See end of Document for details) underground components are used, and depending on the risks posed by the waste contained in these components in terms of soil and/or water contamination, secondary containment of underground components is put in place limited in the case of existing plants. i. Appropriate buffer storage capacity Appropriate buffer storage capacity is provided for waste water generated other than normal operating conditions using a risk-based approach (e.g. taking into account the nature of the pollutants, the effects of downstream waste treatment, and the receiving environment). The discharge of waste water from this buffer storage is only possible after appropriate measures are taken (e.g. monitor, treat, reuse). Generally applicable to new plants. For existing plants, applicability may be restricted by space availability and by the layout of the water collection system.	N/A	Yes	No	Wastewater generation is reduced through sealed drainage systems, minimisation of runoff, reuse of process water and controlled discharge routes. Evidence: Fire Prevention Plan (Doc Ref K163.1-09-005); AD Operations SOP (SOP 002).	
20	Emissions to water	waste water treatment	BAT 20. In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given below. Technique Description Applicability Preliminary and primary treatment, e.g. a. Equalisation/Algal pollutants, b. Neutralisation Acids, alkalis c. Physical separation. e.g. screens, sieves, grit separators, grease traps, suspended solids, oil grease. Generally applicable. a. The descriptions of the techniques are given in Section 6.3. 42 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) separators, oil-water separation or primary treatment tanks. Physico-chemical treatment. Dissolved non-biodegradable or inhibitory pollutants, e.g. hydrocarbons, mercury, AOX, etc. Distillation/rectification. Dissolved non-biodegradable or inhibitory pollutants that can be distilled, e.g. some solvents f. Precipitation. Precipitable dissolved non-biodegradable or inhibitory pollutants, e.g. metals, phosphorus g. Chemical oxidation. Oxidisable dissolved non-biodegradable or inhibitory pollutants, e.g. nitrite, cyanide, h. Chemical reduction. Reducible dissolved non-biodegradable or inhibitory pollutants, e.g. hexavalent chromium (Cr(VI)). Evaporation. Soluble contaminants j. Ion exchange. Ionic dissolved non-biodegradable or inhibitory pollutants, e.g. metals k. Stripping. Purgeable pollutants, e.g. hydrogen sulphide (H ₂ S), ammonia (NH ₃), some adsorbable organically bound halogens (AOX), hydrocarbons. Generally applicable. Biological treatment, e.g. l. Activated sludge process. m. Membrane bioreactors. Biodegradable organic compounds. Generally applicable. a. The descriptions of the techniques are given in Section 6.3. (See end of Document for details) Nitrogen removal. n. Nitrification/denitrification when the treatment includes a biological treatment. Total nitrogen, ammonification may not be applicable in the case of high chloride concentrations (e.g. above 10 g/l) and when the reduction of the chloride concentration prior to nitrification would not be justified by the environmental benefits. Nitrification is not applicable when the temperature of the waste water is low (e.g. below 12 °C). Solids removal, e.g. o. Coagulation and flocculation p. Sedimentation q. Filtration (e.g. sand filtration, microfiltration, ultrafiltration) r. Flotation. Suspended solids and particulate-bound metals. Generally applicable. a. The descriptions of the techniques are given in Section 6.3. TABLE 6.1 BAT-associated emission levels (BAT-AELs) for direct discharges to a receiving water body. Substance/Parameter BAT-AEL/waste treatment process to which the BAT-AEL applies. 10-60 mg/l — All waste treatments except treatment of water-based liquid waste. Organic carbon (TOC) < 100 mg/l — Treatment of water-based liquid waste. 44 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) 30-180 mg/l — All waste treatments except treatment of water-based liquid waste. Chemical oxygen demand (COD) 30-300 mg/l — Treatment of water-based liquid waste. Total suspended solids (TSS) 5-60 mg/l — All waste treatments. Hydrocarbon oil index (HOI) 0.5-10 mg/l — Mechanical treatment in shredders of metal waste. — Treatment of WEFC containing VFCs and/or VHCs — Re-refining of waste oil — Physico-chemical treatment of waste with calorific value — Water washing of excavated contaminated soil — Treatment of water-based liquid waste 1-25 mg/l — Biological treatment of waste — Re-refining of waste oil. Total nitrogen (Total N) 10-40 mg/l — Treatment of water-based liquid waste. (See end of Document for details) 0.3-2 mg/l — Biological treatment of waste. Total phosphorus (Total P) 1-3 mg/l — Treatment of water-based liquid waste. 0.05-0.2 mg/l — Re-refining of waste oil — Physico-chemical treatment of waste with calorific value. Phenol index 0.05-0.3 mg/l — Treatment of water-based liquid waste. Free cyanide (CN) 0.02-0.1 mg/l — Treatment of water-based liquid waste. Adsorbable organically bound halogens (AOX) 0.2-1 mg/l — Treatment of water-based liquid waste. Arsenic (expressed as As) 0.1-0.05 mg/l. Cadmium (expressed as Cd) 0.01-0.05 mg/l. Chromium (expressed as Cr) 0.01-0.15 mg/l. Copper (expressed as Cu) 0.05-0.5 mg/l. Lead (expressed as Pb) 0.05-0.1 mg/l. Nickel (expressed as Ni) 0.05-0.5 mg/l. Mercury (expressed as Hg) 0.5-5 µg/l. Metals and metalloids Zinc (expressed as Zn) 0.1-1 mg/l — Mechanical treatment in shredders of metal waste — Treatment of WEFC containing VFCs and/or VHCs — Mechanical biological treatment of waste — Re-refining of waste oil — Physico-chemical treatment of waste with calorific value. 46 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) — Physico-chemical treatment of solid and/or pasty waste — Regeneration of spent solvents — Water washing of waste. 47 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) 0.3-0.5 mg/l	N/A	Yes	No	Indirect discharges are monitored and managed to ensure downstream treatment performance is protected and environmental risks are minimised. Evidence: CCRA (Doc Ref K163.1-09-011); Environmental Monitoring Records (EMS Records).	
21	Emissions from accidents and incidents	prevent or limit the environmental consequences of accidents and incidents	BAT 21. In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques given below. Technique Description a. Protection measures These include measures such as: — protection of the plant against malfunctions such as: fire and explosion protection system, containing equipment for prevention, detection, and extinction; — accessibility and operability of relevant control equipment in 50 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) emergency situations. b. Management of incidental/accidental emissions Procedures are established and technical provisions are in place to manage (in terms of possible containment) emissions from accidents and incidents such as emissions from spillages, firefighting water, or safety valves. c. Incident management registration and assessment system This includes techniques such as: — a logbook to record all accidents, incidents, changes to procedures and the findings of inspections; — procedures to identify, respond to and learn from such incidents and accidents. 1.7. Material efficiency	N/A	Yes	No	Wastes are stored in designated impermeable areas with secondary containment, routine inspections and leak prevention measures. Evidence: Fire Prevention Plan (Doc Ref K163.1-09-005); AD Operations SOP (SOP 002).	
22	Material efficiency	substitute materials with waste	BAT 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, by ashes are used as binders). Applicability Some applicability limitations derive from the risk of contamination posed by the presence of impurities (e.g. heavy metals, POPs, salts, pathogens) in the waste that substitutes other materials. Another limitation is the compatibility of the waste substituting other materials with the waste input (see BAT 2). 1.8. Energy efficiency	N/A	Yes	No	Handling and transfer of wastes is carried out by trained personnel following SOPs, with supervision during unloading and clear spill response procedures. Evidence: SOP 001 Tanker Unloading (SOP 001); Site Induction.	
23	Energy efficiency	Energy efficiency plan, energy balance record	BAT 23. In order to use energy efficiently, BAT is to use both of the techniques given below. Technique Description a. Energy efficiency plan An energy efficiency plan entails defining and calculating the specific energy consumption of the activity (or activities), setting key performance indicators on an annual basis (for example, specific energy consumption expressed in kWh/tonne of waste processed) and planning periodic improvement targets and related actions. The plan is adapted to the specificities of the waste treatment in terms of processes (e.g. carried out, waste stream(s) treated, etc.). b. Energy balance record An energy balance record provides a breakdown of the energy consumption and generation (including exothermic) by the type of source (i.e. electricity, gas, conventional liquid fuels, conventional solid fuels, and waste). This includes: (i) information on energy consumption in terms of delivered energy; (ii) information on energy exported from the installation; (iii) energy flow information (e.g. Sankey diagrams or energy balances) showing how the energy is used throughout the process. The energy balance record is adapted to the specificities of the waste treatment in terms of processes (e.g. carried out, waste stream(s) treated, etc.). 1.9. Reuse of packaging	N/A	Yes	No	Waste movements and treatment activities are fully recorded to ensure traceability from receipt through processing to final use or disposal. Evidence: Management System Summary (Doc Ref K163.2-09-002); Waste Tracking Records (EMS Records).	
24	Reuse of packaging	maximise reuse of packaging	BAT 24. In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residuals 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). Applicability 55 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) Some applicability restrictions derive from the risk of contamination of the waste by the reuse of packaging. 56 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) THE MECHANICAL TREATMENT OF WASTE Unless otherwise stated, the BAT conclusions presented in Section 2.2 apply to the mechanical treatment of waste when it is not combined with biological treatment, and in addition to the general BAT conclusions in Section 1.2.1. General BAT conclusions for the mechanical treatment of waste 2.1.1. Emissions to air	N/A	Yes	No	Closure and decommissioning arrangements ensure that cessation of activities does not result in pollution, including removal of waste and cleaning of plant and infrastructure. Evidence: Management System Summary (Doc Ref K163.2-09-002); Fire Prevention Plan (Doc Ref K163.1-09-005).	
General BAT conclusions for the biological treatment of waste								

33	Overall environmental performance	Control waste inputs	BAT 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. 3.1.2. Emissions to air	N/A	Yes	No	Waste inputs to the AD process are strictly controlled to ensure suitability for biological treatment. Pre-acceptance and acceptance checks confirm waste characteristics such as composition and contamination risk, supporting stable digestion and minimising odour generation. Evidence: SOP 001 Tanker Unloading (SOP 001); AD Operations SOP (SOP 002); Odour Management Plan (Doc Ref K163.1-09-008).
34	Emissions to air	Biofilters etc	BAT 34. In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H ₂ S and NH ₃ , BAT is to use one or a combination of the techniques given below. Technique Description a. Adsorption See Section 6.1. b. Biofilter See Section 6.1. A pretreatment of the waste gas before the biofilter (e.g. with a water or acid scrubber) may be needed in the case of a high NH ₃ content (e.g. 5-40 mg/Nm ³) in order to control the media pH and to limit the formation of N ₂ O in the biofilter. Some other odorous compounds (e.g. mercaptans, H ₂ S) can cause acidification of the biofilter media and necessitate the use of a water or alkaline scrubber for pretreatment of the waste gas before the biofilter. c. Fabric filter See Section 6.1. The fabric filter is used in the case of mechanical biological treatment of waste. d. Thermal oxidation See Section 6.1. e. Wet scrubbing See Section 6.1. Water, acid or alkaline scrubbers are used in combination with a biofilter, thermal oxidation (See end of Document for details) or adsorption on activated carbon. TABLE 6.7 BAT-associated emission levels (BAT-AELs) for channelled NH ₃ , odour, dust and TVOC emissions to air from the biological treatment of waste Parameter Unit BAT-AEL(Average over the sampling period)Waste treatment process NH ₃ 3abmg/Nm ³ 0.3-20 Odour concentrationabouE/Nm ³ 200-1 000AI biological treatments of waste Dust mg/Nm ³ 2-5 TVOC mg/Nm ³ 5-40Mechanical biological treatment of waste a Either the BAT-AEL for NH ₃ or the BAT-AEL for the odour concentration applies. b This BAT-AEL does not apply to the treatment of waste mainly composed of manure. c The lower end of the range can be achieved by using thermal oxidation. The associated monitoring is given in	Table 6.7: BAT-associated emission levels (BAT-AELs) for channelled NH ₃ , odour, dust and TVOC emissions to air from the biological treatment of waste Ammonia: 20ppm	Yes	No	Channelled emissions to air, including odorous compounds, are minimised through sealed systems, containment of reception and digestion processes, and operational controls to prevent release. Where required, abatement and management techniques are applied in accordance with risk. Evidence: Odour Management Plan (Doc Ref K163.1-09-008); Dust & Emissions Management Plan (Doc Ref K163.1-09-012).
35	Emissions to water and water usage	reduce waste water and water usage	BAT 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. Technique Description Applicability a. Segregation of water streamsLeachate seeping from compost piles and windrows is segregated from surface run-off water (see BAT 19). Generally applicable to new plants. Generally applicable to existing plants within the constraints associated with the layout of the water circuits. b. Water recirculation Recirculating process water streams (e.g. from dewatering of liquid digestate in anaerobic processes) or using as much as possible other water streams (e.g. heavy condensate, rising water, surface run-off water). The degree of recirculation is limited by the water balance of the Generally applicable. 60 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) plant; the content of impurities (e.g. heavy metals, salts, pathogens, odorous compounds) and/or the characteristics of the water streams (e.g. nutrient content). c. Minimisation of the generation of leachateOptimising the moisture content of the waste in order to minimise the generation of leachate. Generally applicable. 3.2. BAT conclusions for the aerobic treatment of waste Unless otherwise stated, the BAT conclusions presented in this section apply to the aerobic treatment of waste, and in addition to the general BAT conclusions for the biological treatment of waste in Section 3.1.3.2.1. Overall environmental performance	N/A	Yes	No	Wastewater generation and water use are minimised by segregating clean and dirty drainage, recirculating process liquids back into the digestion process, and preventing uncontrolled runoff. Sealed drainage systems are provided in dirty areas. Evidence: AD Operations SOP (SOP 002); Fire Prevention Plan (Doc Ref K163.1-09-005).
BAT conclusions for the aerobic treatment of waste							
36	Overall environmental performance	control key waste and process parameters	BAT 36. 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 Monitoring and/or control of key waste and process parameters, including: — waste input characteristics (e.g. C to N ratio, particle size); — temperature and moisture content at different points in the windrow (e.g. via the windrow turning frequency, O ₂ and/or CO ₂ concentration in the windrow, temperature of air streams in the case of forced aeration); — windrow porosity, height and width. Applicability Monitoring of the moisture content in the windrow is not applicable to enclosed processes when health and/or safety issues have been identified. In that case, the moisture content can be monitored before loading the waste into the enclosed composting stage and adjusted when it exits the enclosed composting stage. 3.2.2. Odour and diffuse emissions to air	N/A	Yes	No	Key process parameters for biological treatment are continuously monitored and controlled, including temperature, loading rates and operational stability, to ensure effective digestion and minimise emissions. Evidence: AD Plant Risk Assessment; Biogas Production Risk Assessment; AD Operations SOP (SOP 002).
37	Odour and diffuse emissions to air	reduce diffuse emissions to air of dust, odour and bioaerosols	BAT 37. In order to reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps, BAT is to use one or both of the techniques given below. Technique Description Applicability a. Use of semi-permeable membrane coversActive composting windrows are covered by semi-permeable membranes. Generally applicable. (See end of Document for details) b. Adaptation of operations to the meteorological conditionsThis includes techniques such as the following: — Taking into account weather conditions and forecasts when undertaking major outdoor process activities. For instance, avoiding formation or turning of windrows or piles, screening or shredding in the case of adverse meteorological conditions in terms of emissions dispersion (e.g. the wind speed is too low or too high, or the wind blows in the direction of sensitive receptors). — Orientating windrows, so that the smallest possible area of composting mass is exposed to the prevailing wind, to reduce the Generally applicable. 62 Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available (See end of Document for details) dispersion of pollutants from the windrow surface. The windrows and piles are preferably located at the lowest elevation within the overall site layout. 3.3. BAT conclusions for the anaerobic treatment of waste Unless otherwise stated, the BAT conclusions presented in this section apply to the anaerobic treatment of waste, and in addition to the general BAT conclusions for the biological treatment of waste in Section 3.1.3.3.1. Emissions to air	N/A	Yes	No	Diffuse emissions to air are minimised through enclosure of plant and equipment, sealed tanks and pipework, good housekeeping, and controlled operational practices. Evidence: Dust & Emissions Management Plan (Doc Ref K163.1-09-012); AD Operations SOP (SOP 002).
BAT conclusions for the anaerobic treatment of waste							
38	Emissions to air	control key waste and process parameters	BAT 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. H ₂ S) and pressure; — liquid and foam levels in the digester. 3.4. BAT conclusions for the mechanical biological treatment (MBT) of waste Unless otherwise stated, the BAT conclusions presented in this section apply to MBT, and in addition to the general BAT conclusions for the biological treatment of waste in Section 3.1. The BAT conclusions for the anaerobic treatment (Section 3.2) and anaerobic treatment (Section 3.3) of waste apply, when relevant, to the mechanical biological treatment of waste. 3.4.1. Emissions to air (See end of Document for details)	N/A	Yes	No	Anaerobic digestion processes are monitored and controlled to maintain stable operation and prevent loss of containment or odour generation. Parameters such as temperature, biogas production and system integrity are managed by trained operators. Evidence: Biogas Production Risk Assessment; AD Operations SOP (SOP 002); Site Induction & Mandatory Site Rules (Rev 6).
BAT conclusions for the mechanical biological treatment (MBT) of waste							
39	Emissions to air	Segregation and recirculation of waste gas streams	BAT 39. In order to reduce emissions to air, BAT is to use both of the techniques given below. Technique Description Applicability a. Segregation of the waste gas streamsSplitting of the total waste gas stream into waste gas streams with a high pollutant content and waste gas streams with a low pollutant content, as identified in the inventory mentioned in	N/A	Yes	No	Waste gas streams are managed through containment and controlled recirculation within the biological process where applicable, ensuring emissions are minimised and treated according to pollutant load. Evidence: Odour Management Plan (Doc Ref K163.1-09-008); Dust & Emissions Management Plan (Doc Ref K163.1-09-012).