Waste Treatment BATC CID Assessment

Licence Details	
Licence Register No.:	W0082-03
Name of Licensee:	Starrus Eco Holdings Ltd.
Address of installation:	Dock Road, Limerick
Email:	ehsteam@panda.ie
Phone	

Response Details	
Submitted by:	
Submission date:	

Confirm Class of Activity	Industrial Emission Directive – Licenced Class of Activity
5.3 (b)	— 5.1. Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving one or more of the following activities: (a) biological treatment; (b) physico-chemical treatment; (c) blending or mixing prior to submission to any of the other activities listed in points 5.1 and 5.2 of Annex I to Directive 2010/75/EU; (d) repackaging prior to submission to any of the other activities listed in points 5.1 and 5.2 of Annex I to Directive 2010/75/EU; (e) solvent reclamation/regeneration; (f) recycling/reclamation of inorganic materials other than metals or metal compounds; (g) regeneration of acids or bases; (h) recovery of components used for pollution abatement; (i) recovery of components from catalysts; (j) oil re-refining or other reuses of oil; — 5.3. (a) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the

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	following activities, and excluding activities covered by Council Directive 91/271/EEC: (i) biological treatment; (ii) physico-chemical treatment; (iii) pre-treatment of waste for incineration or co-incineration; (iv) treatment of ashes; (v) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of life vehicles and their components. (b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, and excluding activities covered by Directive 91/271/EEC: (i) biological treatment; (ii) pre-treatment of waste for incineration or co-incineration; (iii) treatment of ashes; (iv) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of life vehicles and their components. When the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for this activity shall be 100 tonnes per day. — 5.5. Temporary storage of hazardous waste not covered under point 5.4 of Annex I to Directive 2010/75/EU pending any of the activities listed in points 5.1, 5.2, 5.4 and 5.6 of Annex I to Directive 2010/75/EU with a total capacity exceeding 50 tonnes, excluding temporary storage, pending collection, on the site where the waste is generated. .

The following Commission Implementing Decisions, establishing best available techniques, shall be assessed by the licensee.

Licence BAT Assessment	
CID 2018/1147/EU	Best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for Waste Treatment. The document is available here, and shall be consulted for all BAT conclusions below.

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BATC No.	Objective / Licensee Response / Attachment	Applicability (describe how the technique applies or not to your installation)	Provide detailed information on how the relevant BAT will be implemented on your installation. Where multiple options are available within the specified BAT, details on the applicable option chosen for your installation must be provided.
1. General BAT conclusions **1.1 Overall environmental performance**			
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 features outlined in BAT 1 of the CID 2018/1147/EU.	Applicable	An Environmental Management System (EMS) certified to IS EN ISO 14001: 2015 and independently audited by the Certification Europe is in place. A company Environmental Policy has been adopted. All of the features outlined in BAT 1 of the CID are in place, with the exception of the following: A documented inventory of wastewater and air emissions (BAT 3) is not required, as there is no discharge of process wastewater to waters. A documented Noise and Vibration Management Plan (BAT 17) has not been prepared, as noise from installation activities are not a source of off-site nuisance. A Residues Management Plan has not been prepared. The management of residual waste on site in the event of a site closure is addressed in the Decommissioning Management Plan. An Accident Prevention Plan has been prepared but it does not include an inventory of pollutants present.

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			Starrus Eco Holdings will establish Key Performance Indicators (KPI), e.g. electricity consumption/tonne of materials processed for each of its MRFs.
2	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques given in BAT 2 of the CID 2018/1147/EU.	Applicable	Documented waste acceptance and handling procedures are in place that address initial off-site waste characterisation and on site segregation (EP-05 *Waste Acceptance Procedure*) and on site acceptance, sorting and tracking (EP-07 *Waste & Material Storage Procedure* and EP-08 *Waste Processing Procedure*). Given the nature of the wastes accepted and the processes carried out there is no need for compatibility testing
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 features listed in BAT 3 of the CID 2018/1147/EU.	Not Applicable. A documented inventory of wastewater and air emissions (BAT 3) is not required, as there is no emission of wastewater to waters. Waste gas streams are not generated.	
4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given in BAT 4 of the CID 2018/1147/EU.	Applicable	A Waste and Materials Storage Plan (WMSP) (EP-07*Waste & Material Storage Procedure)*- has been prepared and it complies with BAT 4 (a), BAT 4(b) and 4(c)
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.	Applicable	The handling and transfer of waste is carried out by trained staff in accordance with a documented procedure (EP-05 *Waste Acceptance Procedure*), An Accident Prevention Plan (IP-18 *Accident Prevention Procedure*) which includes spill clean

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			procedures is in place. Given the nature of the wastes handled, operation and design precaution other than those in the Procedures
1.2 Monitoring			
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 pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	Not Applicable. Process wastewater is not generated and there is no onsite wastewater treatment. Sanitary wastewater and liquid seeps from the floor of the process building discharge to the Irish Water Foul Sewer.	
7	BAT is to monitor emissions to water with at least the frequency given in BAT 7 of the CID 2018/1147/EU, 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.	Not Applicable. The monitoring frequencies set out in BAT 7 are linked to BAT 20, which relates to the treatment of wastewater. Wastewater is not treated at the installation.	
8	BAT is to monitor channelled emissions to air with at least the frequency given in BAT 8 of the CID 2018/1147/EU, 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.	Not Applicable. There are no channelled emissions to air at the installation	
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 physical-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 in BAT 9 of the CID 2018/1147/EU.	Not Applicable. Regeneration of spent solvents is not carried out at the installation	
10	BAT is to periodically monitor odour emissions.	Not Applicable. There are no channelled emissions to air at the	

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		installation	
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.	Applicable	The annual consumption of water, energy and raw materials and generation of residues is monitored and reported in the Annual Environmental Report
1.3 Emissions to air			
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 elements given in BAT 12 of the CID 2018/1147/EU.	Applicable	A site Odour Management Plan (EP-10 *Nuisance Management Procedure Limerick*) is in place. It includes a protocol for conducting odour monitoring; a protocol for response to identified odour incidents, e.g. complaints; an odour prevention and reduction programme to identify the source(s) contributions of the sources; and to implement prevention and/or reduction measures.
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 in BAT 13 of the CID 2018/1147/EU.	Applicable	BAT 13 (a) is applied. Putrescible waste is stored indoors and must be removed from the facility within 24-36 hours of its arrival.
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 in BAT 14 of the CID 2018/1147/EU.	Applicable	Based on the types of waste handled and the processes BAT 14 (e), (f) and (g) are applicable. The yards are dampened down with water in periods of dry weather (BAT 14 (e)); Plant and equipment are subject to a maintenance programme (BAT 14 (f)) and storage areas are cleaned as required (BAT14 (g)).
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 in BAT 15 of the CID 2018/1147/EU.	Not Applicable. There are no flares at the installation	
16	In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given in BAT 16 of	Not Applicable. There are no flares at the installation	

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	the CID 2018/1147/EU.		
1.4 Noise and vibrations			
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 elements given in BAT 17 of the CID 2018/1147/EU.	Not Applicable. Noise or vibration nuisance at sensitive receptors is not expected and has not been substantiated. Noise monitoring is carried out annually and noise emissions have not been audible at the nearest noise sensitive location	
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 in BAT 18 of the CID 2018/1147/EU.	Applicable	Although noise and vibration from installation activities are not a source of off-site nuisance BAT 18 (b) (i), (ii), (iii), (iv) and (v) are implemented.
1.5 Emissions to water			
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 in BAT 19 of the CID 2018/1147/EU.	Applicable	Based on the site location, the waste types accepted and the processes carried out the following BAT measures are implemented. BAT 19 (c) provision of impermeable surfaces; BAT 19 (d) above ground liquid storage tanks are bunded: BAT 19(e) waste processing is carried out inside a building; BAT 19 (f) separate collection systems for roof water run-off from processing building and the yard run-off; BAT 19(g) provision of adequate drainage infrastructure; BAT 19 (h) testing is carried out in accordance with Condition 3.13.5 to demonstrate the integrity and water tightness of all underground pipes, tanks, bunding structures and containers.

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20	In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given in BAT 20 of the CID 2018/1147/EU. Refer to Table A.1 and Table A.2, complete where relevant to your installation.	Not Applicable. Wastewater from waste storage and the processing of waste is not treated on site	
1.6 Emissions from accidents and incidents			
21	In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques given in BAT 21 of the CID 2018/1147/EU, as part of the accident management plan (see BAT 1).	Applicable	An Accident Prevention Plan (IP-18 *Accident Prevention Procedure*) Is in place. BAT 21 (a) There is a palisade fence around the entire facility and the entrance gates are locked outside operational hours. BAT 21 (b) The following documented procedures are in place: Fire Explosion Procedure (IP-16 *Fire Prevention Procedure*): Emergency Response Procedure (IP-15 *Emergency Preparedness & Response Procedure*): which includes procedures for dealing with unforeseen emergencies, fugitive emissions, spill clean-up and vehicle spill clean-up. A Firewater Retention Assessment has been completed. BAT 21 (c). There is a documented procedure in place to record and investigate all environmental incidents and implement appropriate corrective actions (EP-03 *Environmental Communications Procedure*).

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1.7 Material efficiency			
22	In order to use materials efficiently, BAT is to substitute materials with waste.	Not Applicable. Given the types of waste accepted and the processes that are carried out there is no opportunity to use waste materials to treat the wastes accepted.	
1.8 Energy efficiency			
23	In order to use energy efficiently, BAT is to use both of the techniques given in BAT 23 of the CID 2018/1147/EU.	Applicable.	BAT 23 (a) an energy efficiency plan has not been prepared. It is an objective to prepare this Plan in 2024. BAT 23 (b) Energy Balance Record; the consumption of electricity and fuel oil is recorded and reported in the AER. Energy is not generated at the installation.
1.9 Reuse of packaging			
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).	Applicable:	Waste pallets, depending on their condition, can be reused to store baled materials; waste oils from plant maintenance are stored in the empty containers in which they are delivered
2.1 General BAT conclusions for the mechanical treatment of waste			
25	In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin-like PCBs, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 25 of the CID 2018/1147/EU. Refer to Table A.3 and complete where relevant to your installation.	Not Applicable	Given the nature of the waste accepted and the processing carried dust control measures additional to those applied in accordance with BAT 14 (d) are not required.
2.2 BAT conclusions for the mechanical treatment in shredders of metal waste			
26	In order to improve the overall environmental performance, and to	Not Applicable. Shredding of	

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	prevent emissions due to accidents and incidents, BAT is to use BAT 14g and all of the techniques given in BAT 26 of the CID 2018/1147/EU.	metal waste is not carried out at the installation.	
27	In order to prevent deflagrations and to reduce emissions when deflagrations occur, BAT is to use technique a. and one or both of the techniques b. and c. given in BAT 27 of the CID 2018/1147/EU.	Not Applicable. Shredding of metal waste is not carried out at the installation.	
28	In order to use energy efficiently, BAT is to keep the shredder feed stable.	Not Applicable. Shredding of metal waste is not carried out at the installation.	
2.3 BAT conclusions for the treatment of WEEE containing VFCs and/or VHCs			
29	In order to prevent or, where that is not practicable, to reduce emissions of organic compounds to air, BAT is to apply BAT 14d, BAT 14h and to use technique a. and one or both of the techniques b. and c. given BAT 29 of the CID 2018/1147/EU.	Not Applicable. WEEE containing VFC and VHC are not treated at the installation.	
30	In order to prevent emissions due to explosions when treating WEEE containing VFCs and/or VHCs, BAT is to use either of the techniques given in BAT 30 of the CID 2018/1147/EU. Refer to Table A.4 and completer where relevant to your installation.	Not Applicable. WEEE containing VFC and VHC are not treated at the installation.	
2.4 BAT conclusions for the mechanical treatment of waste with calorific value			
31	In order to reduce emissions to air of organic compounds, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 31 of the CID 2018/1147/EU. Refer to Table A.5 and complete where relevant to your installation.	Not Applicable. The control measures implemented at the installation have been proven to be effective and therefore there is no requirement to apply any of the treatment techniques listed in BAT 31.	
2.5 BAT conclusions for the mechanical treatment of WEEE containing mercury			
32	In order to reduce mercury emissions to air, BAT is to collect mercury emissions at source, to send them to abatement and to carry out	Not Applicable. WEEE containing mercury is not treated at the	

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	adequate monitoring. Refer to Table A.6 and complete where relevant to your installation.	installation.	
3.1 General BAT conclusions for the biological treatment of waste			
33	In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input.	Not Applicable. The biological treatment of waste is not carried out at the installation	
34	In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H_2S and NH_3, BAT is to use one or a combination of the techniques given in BAT 34 of the CID 2018/1147/EU. Refer to Table A.7 and complete where relevant to your installation.	Not Applicable. The biological treatment of waste is not carried out at the installation	
35	In order to reduce the generation of waste water and to reduce water usage, BAT is to use all of the techniques given in BAT 35 of the CID 2018/1147/EU.	Not Applicable. The biological treatment of waste is not carried out at the installation	
3.2 BAT conclusions for the aerobic treatment of waste			
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.	Not Applicable. The aerobic treatment of waste is not carried out at the installation.	
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 in BAT 37 of the CID 2018/1147/EU.	Not Applicable. The aerobic treatment of waste is not carried out at the installation.	
3.3 BAT conclusions for the anaerobic treatment of waste			
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.	Not Applicable. The anaerobic treatment of waste is not carried out at the installation.	
3.4 BAT conclusions for the mechanical biological treatment (MBT) of waste			
39	In order to reduce emissions to air, BAT is to use both of the techniques given in BAT 39 of the CID 2018/1147/EU.	Not Applicable. Mechanical biological treatment of waste is not carried out at the installation.	
4.1 BAT conclusions for the physico-chemical treatment of solid and/or pasty waste			

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40	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	Not Applicable. The physico-chemical treatment of waste is not carried out at the installation.	
41	In order to reduce emissions of dust, organic compounds and NH_3 to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 41 of the CID 2018/1147/EU. Refer to Table A.8 and complete where relevant to your installation.	Not Applicable. The physico-chemical treatment of waste is not carried out at the installation	
4.2 BAT conclusions for the re-fining of waste oil			
42	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	Not Applicable. Refining of waste oil is not carried out at the installation	
43	In order to reduce the quantity of waste sent for disposal, BAT is to use one or both of the techniques given in BAT 43 of the CID 2018/1147/EU.	Not Applicable. Refining of waste oil is not carried out at the installation	
44	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 44 of the CID 2018/1147/EU.	Not Applicable. Refining of waste oil is not carried out at the installation e	
4.3 BAT conclusions for thete physico-chemical treatment of waste with calorific value			
45	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 45 of the CID 2018/1147/EU.	Not Applicable. The physico-chemical treatment of waste is not carried out at the installation	
4.4 BAT conclusions for the regeneration of spent solvents			
46	In order to improve the overall environmental performance of the regeneration of spent solvents, BAT is to use one or both of the techniques given in BAT 46 of the CID 2018/1147/EU.	Not Applicable. The regeneration of spent solvents is not carried out at the installation	
47	In order to reduce emissions of organic compounds to air, BAT is to apply BAT 14d and to use a combination of the techniques given in BAT 47 of the CID 2018/1147/EU. Refer to Table A.9 and complete where relevant to your installation.	Not Applicable. The regeneration of spent solvents is not carried out at the installation	

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4.5 BAT conclusions for the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil			
48	In order to improve the overall environmental performance of the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil, BAT is to use all of the techniques given in BAT 48 of the CID 2018/1147/EU.	Not Applicable. The thermal treatment of spent activated carbon is not carried out at the installation.	
49	In order to reduce emissions of HCl, HF, dust and organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 49 of the CID 2018/1147/EU.	Not Applicable. The thermal treatment of spent activated carbon is not carried out at the installation.	
4.7 BAT conclusions for the water washing of excavated contaminated soil			
50	In order to reduce emissions of dust and organic compounds to air from the storage, handling, and washing steps, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 50 of the CID 2018/1147/EU.	Not Applicable. The water washing of excavated contaminated soil is not carried out at the installation.	
4.8 BAT conclusions for the decontamination of equipment containing PCBs			
51	In order to improve the overall environmental performance and to reduce channelled emissions of PCBs and organic compounds to air, BAT is to use all of the techniques given in BAT 51 of the CID 2018/1147/EU.	Not Applicable. The decontamination of equipment containing PCBs is not carried out at the installation	
5. BAT conclusions for the treatment of water-based liquid waste			
52	In order to improve the overall environmental performance, BAT is to monitor the waste input as part of the waste pre-acceptance and acceptance procedures (see BAT 2).	Not Applicable. The treatment of water-based liquid waste is not carried out at the installation	
53	In order to reduce emissions of HCl, NH_3 and organic compounds to air, BAT is to apply BAT 14d and to use one or a combination of the techniques given in BAT 53 of the CID 2018/1147/EU. Refer to Table A.10 and complete where relevant to your installation.	Not Applicable. The treatment of water-based liquid waste is not carried out at the installation	

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TABLE A.1: BAT-AEL for direct discharges to a receiving water body – Not Applicable Wastewater Not Treated On-Site

Parameter	Unit	BAT-AEL [1] (Average over the sampling period)	Waste treatment process to which the BAT-AEL applies	Proposed Emission Limits		
				Daily Average	Average over the sampling period	Yearly Average
Total organic carbon (TOC) [2]	mg/l	10 – 60	• All waste treatments except treatment of water-based liquid waste.			
	mg/l	10 – 100 [3] [4]	• Treatment of water-based liquid waste.			
Chemical oxygen demand (COD) [2]	mg/l	30 – 180	• All waste treatments except treatment of water-based liquid waste.			
	mg/l	30 – 300 [3] [4]	• Treatment of water-based liquid waste.			
Total suspended solids (TSS)	mg/l	5 – 60	• All waste treatments.			
Hydrocarbon oil index (HOI)	mg/l	0.5 – 10	• Mechanical treatment in shredders of metal waste. • Treatment of WEEE 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.			
Total nitrogen (Total N)	mg/l	1 – 25 [5] [6]	• Biological treatment of waste. • Re-refining of waste oil.			
	mg/l	10 – 60 [5] [6] [7]	• Treatment of water-based liquid waste.			
Total phosphorus (Total P)	mg/l	0.3 – 2	• Biological treatment of waste.			
	mg/l	1 – 3 [4]	• Treatment of water-based liquid waste.			
Phenol index	mg/l	0.05 – 0.2	• Re-refining of waste oil. • Physico-chemical treatment of waste with calorific value.			
	mg/l	0.05 – 0.3	• Treatment of water-based liquid waste.			
Free cyanide (CN) [8]	mg/l	0.02 – 0.1	• Treatment of water-based liquid waste.			

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Parameter	Unit	BAT-AEL [1] (Average over the sampling period)	Waste treatment process to which the BAT-AEL applies	Proposed Emission Limits		
				Daily Average	Average over the sampling period	Yearly Average
Absorbable organically bound halogens (AOX) [8]	mg/l	0.2 – 1	• Treatment of water-based liquid waste.			
Metals & Metalloids [8]						
Arsenic (expressed as As)	mg/l	0.01 – 0.05	• Mechanical treatment in shredders of metal waste. • Treatment of WEEE containing VFCs and/or VHCs. • Mechanical biological treatment of waste. • Re-refining of waste oil. • Physico-chemical treatment of waste with calorific value — Physico-chemical treatment of solid and/or pasty waste. • Regeneration of spent solvents. • Water washing of excavated contaminated soil.			
Cadmium (expressed as Cd)	mg/l	0.01 – 0.05				
Chromium (expressed as Cr)	mg/l	0.01 – 0.15				
Copper (expressed as Cu)	mg/l	0.05 – 0.5				
Lead (expressed as Pb)	mg/l	0.05 – 0.1 [9]				
Nickel (expressed as Ni)	mg/l	0.05 – 0.5				
Mercury (expressed as Hg)	□g/l	0.5 – 5				
Zinc (expressed as Zn)	mg/l	0.1 – 1 [10]				
Arsenic (expressed as As)	mg/l	0.01 – 0.1	• Treatment of water-based liquid waste.			
Cadmium (expressed as Cd)	mg/l	0.01 – 0.1				
Chromium (expressed as Cr)	mg/l	0.01 – 0.3				
Hexavalent chromium (expressed as Cr(VI))	mg/l	0.01 – 0.1				
Copper (expressed as Cu)	mg/l	0.05 – 0.5				
Lead (expressed as Pb)	mg/l	0.05 – 0.3				
Nickel (expressed as Ni)	mg/l	0.05 – 1				
Mercury (expressed as Hg)	□g/l	1 – 10				
Zinc (expressed as Zn)	mg/l	0.1 – 2				

(1) The averaging periods are defined in the General considerations.
(2) Either the BAT-AEL for COD or the BAT-AEL for TOC applies. TOC monitoring is the preferred option because it does not rely on the use of very toxic compounds.
(3) The upper end of the range may not apply:
- when the abatement efficiency is ≥ 95 % as a rolling yearly average and the waste input shows the following characteristics: TOC > 2 g/l (or COD > 6 g/l) as a daily average and a high proportion of refractory organic compounds (i.e. which are difficult to biodegrade); or
- in the case of high chloride concentrations (e.g. above 5 g/l in the waste input).

(4) The BAT-AEL may not apply to plants treating drilling muds/cuttings.

(5) The BAT-AEL may not apply when the temperature of the waste water is low (e.g. below 12 °C).
(6) The BAT-AEL may not apply in the case of high chloride concentrations (e.g. above 10 g/l in the waste input).
(7) The BAT-AEL only applies when biological treatment of waste water is used.
(8) The BAT-AELs only apply when the substance concerned is identified as relevant in the waste water inventory mentioned in BAT 3.
(9) The upper end of the range is 0,3 mg/l for mechanical treatment in shredders of metal waste.
(10) The upper end of the range is 2 mg/l for mechanical treatment in shredders of metal waste.

TABLE A.2: BAT-AEL for indirect discharges to a receiving water body – Not Applicable Wastewater Not Treated On-Site

Parameter	Unit	BAT-AEL (1) (2) (Average over the sampling period)	Waste treatment process to which the BAT-AEL applies	Proposed Emission Limits		
				Daily Average	Average over the sampling period	Yearly Average
Hydrocarbon oil index (HOI)	mg/l	0.5 –10	• Mechanical treatment in shredders of metal waste. • Treatment of WEEE 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.			
Free cyanide (CN^-) (3)	mg/l	0.02 – 0.1	• Treatment of water-based liquid waste.			
Adsorbable organically bound halogens (AOX) (3)	mg/l	0.2 – 1	• Treatment of water-based liquid waste.			
Metals and metalloids (3)						
Arsenic (expressed as As)	mg/l	0.01 – 0.05	• Mechanical treatment in shredders of metal waste. • Treatment of WEEE containing VFCs and/or VHCs. • Mechanical biological treatment of waste. • Re-refining of waste oil. • Physico-chemical treatment of waste with calorific value.			
Cadmium (expressed as Cd)	mg/l	0.01 – 0.05				
Chromium (expressed as Cr)	mg/l	0.01 – 0.05				
Copper (expressed as Cu)	mg/l	0.05 – 0.5				
Lead (expressed as Pb)	mg/l	0.05 – 0.1 (4)				
Nickel (expressed as Ni)	mg/l	0.05 – 0.5				
Mercury (expressed as Hg)	□g/l	0.5 – 5				

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Parameter	Unit	BAT-AEL [1] [2] (Average over the sampling period)	Waste treatment process to which the BAT-AEL applies	Proposed Emission Limits		
				Daily Average	Average over the sampling period	Yearly Average
Zinc (expressed as Zn)	mg/l	0.01 – 1 [5]	• Physico-chemical treatment of solid and/or pasty waste. • Regeneration of spent solvents. • Water washing of excavated contaminated soil.			
Arsenic (expressed as As)	mg/l	0.01 – 0.1	• Treatment of water-based liquid waste.			
Cadmium (expressed as Cd)	mg/l	0.01 – 0.1				
Chromium (expressed as Cr)	mg/l	0.01 – 0.3				
Hexavalent chromium (expressed as CR (VI)	mg/l	0.01 – 0.1				
Copper (expressed as Cu)	mg/l	0.05 – 0.5				
Lead (expressed as Pb)	mg/l	0.05 – 0.3				
Nickel (expressed as Ni)	mg/l	0.05 – 1				
Mercury (expressed as Hg)	□g/l	1 – 10				
Zinc (expressed as Zn)	mg/l	0.1 – 2				

(1) The averaging periods are defined in the General considerations.
(2) The BAT-AELs may not apply if the downstream waste water treatment plant abates the pollutants concerned, provided this does not lead to a higher level of pollution in the environment.
(3) The BAT-AELs only apply when the substance concerned is identified as relevant in the waste water inventory mentioned in BAT 3.
(4) The upper end of the range is 0,3 mg/l for mechanical treatment in shredders of metal waste.
(5) The upper end of the range is 2 mg/l for mechanical treatment in shredders of metal waste.

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TABLE A.3: BAT-AELs for channelled dust emissions to air from the mechanical treatment of waste. – Not Applicable

Parameter	Unit	BAT-AEL (Average over the sampling period)	Proposed Emission Limit Values		
			Daily Average	Average over the sampling period	Yearly Average
Dust	mg/Nm^3	2 - 5 (1)			

(1) When a fabric filter is not applicable, the upper end of the range is 10 mg/Nm^3.

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TABLE A.4: BAT-AELs for channelled TVOC and CFC emissions to air from the treatment of WEEE containing VFCs and/or VHCs. – Not Applicable

Parameter	Unit	BAT-AEL (Average over the sampling period)	Proposed Emission Limit Values		
			Daily Average	Average over the sampling period	Yearly Average
TVOC	mg/Nm^3	3 – 15			
CFCs	mg/Nm^3	0.5 – 10			

TABLE A.5: BAT-AELs for channelled TVOC emissons to air from the mechanical treatment of waste with calorific value. – Not Applicable

Parameter	Unit	BAT-AEL (Average over the sampling period)	Emission Limit Value		
			Daily Average	Average over the sampling period	Yearly Average
TVOC	mg/Nm^3	10 - 30 (1)			

(1) The BAT-AEL only applies when organic compounds are identified as relevant in the waste gas stream, based on the inventory mentioned in BAT 3.

TABLE A.6: BAT-AELs for channelled mercury emissions to air from the mechanical treatment of WEEE containing mercury. – Not Applicable

Parameter	Unit	BAT-AEL (Average over the sampling period)	Emission Limit Value		
			Daily Average	Average over the sampling period	Yearly Average
Mercury (Hg)	□g/Nm^3	2 – 7			

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TABLE A.7: BAT-AELs for channelled NH_3, odour, dust and TVOC emissions to air from the biological treatment of waste. – Not Applicable

Parameter	Unit	BAT-AEL (Average over the sampling period)	Waste Treatment Process	Emission Limit Value		
				Daily Average	Average over the sampling period	Yearly Average
NH_3 (1) (2)	mg/Nm^3	0.3 - 20	All biological treatments of waste			
Odour concentration (1) (2)	ou_E/Nm^3	200 - 100				
Dust	mg/Nm^3	2 - 5	Mechanical biological treatment of waste			
TVOC	mg/Nm^3	5 - 40 (3)				

(1) Either the BAT-AEL for NH3 or the BAT-AEL for the odour concentration applies.
(2) This BAT-AEL does not apply to the treatment of waste mainly composed of manure.
(3) The lower end of the range can be achieved by using thermal oxidation.

TABLE A.8: BAT-AEL for channelled emissions of dust to air from the physico-chemical treatment of solid and/or pasty waste - Not Applicable

Parameter	Unit	BAT-AEL (Average over the sampling period)	Emission Limit Value		
			Daily Average	Average over the sampling period	Yearly Average
Dust	mg/Nm^3	2 - 5			

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TABLE A.9: BAT-AEL for channelled emissions of TVOC to air from the re-refining of waste oil, the physico-chemical treatment of waste with calorific value and the regeneration of spent solvents. – Not Applicable

Parameter	Unit	BAT-AEL (1) (Average over the sampling period)	Emission Limit Value		
			Daily Average	Average over the sampling period	Yearly Average
TVOC	mg/Nm^3	5 – 30			

(1) The BAT-AEL does not apply when the emission load is below 2 kg/h at the emission point provided that no CMR substances are identified as relevant in the waste gas stream, based on the inventory mentioned in BAT 3.

TABLE A.10: BAT-AEL for channelled emissions of HCl and TVOC to air from the treatment of water-based liquid waste. – Not Applicable

Parameter	Unit	BAT-AEL (1) (Average over the sampling period)	Emission Limit Value		
			Daily Average	Average over the sampling period	Yearly Average
Hydrogen chloride	mg/Nm^3	1 – 5			
TVOC	mg/Nm^3	3 - 20 (2)			

(1) These BAT-AELs only apply when the substance concerned is identified as relevant in the waste gas stream, based on the inventory mentioned in BAT 3.

(2) The upper end of the range is 45 mg/Nm^3 when the emission load is below 0,5 kg/h at the emission point.