The BAT (Best Available Techniques) Reference Document (BREF), entitled 'Waste Treatments Industries' reflects an information exchange carried out under Article 16(2) of Council Directive 96/61/EC (IPPC Directive).

	BAT Conclusion relevant to the installation	How the BAT requirements will be met at the O'Toole Composting Facility
Section	**Generic BAT**	
5.0 Best available techniques for Waste Treatment Industries	1. Implement and adhere to an EMS that incorporates, as appropriate to individual circumstances, the following features: (see Section 4.1.2.8). i. Definition of an environmental policy for the installation by top management (commitment of the top management is regarded as a precondition for a successful application of other features of the EMS) ii. Planning and establishing the necessary procedures iii. Implementation of the procedures, paying particular attention to: • Structure and responsibility • Training, awareness and competence • Communication • Employee involvement • Documentation • Efficient process control • Maintenance programme • Emergency preparedness and response • Safeguarding compliance with environmental legislation iv. Checking performance and taking corrective action, paying particular attention to • Monitoring and measurement (see also the Reference document on General Principles of Monitoring) • Corrective and preventive action • Maintenance of records • Independent (where practicable) internal auditing in order to determine whether or not the environmental management system conforms to planned arrangements and has been properly implemented and maintained. v. Review by top management. vi. Having the management system and audit procedure examined and validated by an accredited certification body or an external EMS verifier.	The company has in place an EMS that incorporates the features listed over including corrective action reviews and senior management reviews.

	vii. Preparation and publication (and possibly external validation) of a regular environmental statement describing all the significant environmental aspects of the installation, allowing for year-by-year comparison against environmental objectives and targets as well as with sector benchmarks as appropriate. viii. Implementation and adherence to an internationally accepted voluntary system such as EMAS or EN ISO 14001:1996. This voluntary step could give higher credibility to the EMS. In particular EMAS, which embodies all the above-mentioned features, gives higher credibility. However, non-standardised systems can in principle be equally effective provided that they are properly designed and implemented. ix. Giving consideration to the environmental impact from the eventual decommissioning of the unit at the stage of designing a new plant. x. Giving consideration to the development of cleaner technologies. xi. Where practicable, sectoral benchmarking on a regular basis, including energy efficiency and energy conservation activities, choice of input materials, emissions to air, discharges to water, consumption of water and generation of waste.	It is proposed to progress the development of this EMS with a view to having it accredited to the standard ISO 14001 within the next 2 years.
	2. Ensure the provision of full details of the activities carried out on-site. A good detail of that is contained in the following documentation (see Section 4.1.2.7 and related to BAT number 1.g) i. Descriptions of the waste treatment methods and procedures in place in the installation. ii. Diagrams of the main plant items where they have some environmental relevance, together with process flow diagrams (schematics). • Details of the chemical reactions and their reaction kinetics/energy balance • Details on the control system philosophy and how the control system incorporates the environmental monitoring information. iii. Details on how protection is provided during abnormal operating conditions such as momentary stoppages, start-ups, and shutdowns.	Detailed descriptions and operating manuals of all of the main waste treatment methods and processes are maintained on site.

	iv. An instruction manual. v. An operational diary (related to BAT number 3). vi. An annual survey of the activities carried out and the waste treated. The annual survey should also contain a quarterly balance sheet of the waste and residue streams, including the auxiliary materials used for each site (related to BAT number 1.g).	
	3. Have a good housekeeping procedure in place, which will also cover the maintenance procedure, and an adequate training programme, covering the preventive actions that workers need to take on health and safety issues and environmental risks (see Sections 4.1.1.4, 4.1.1.5, 4.1.2.5, 4.1.2.10, 4.1.4.8 and 4.1.4.3)	Housekeeping and maintenance procedures are in place as part of the EMS.
	4. Try to have a close relationship with the waste producer/holder in order that the customers sites implement measures to produce the required quality of waste necessary for the waste treatment process to be carried out (see Section 4.1.2.9)	All waste is profiled prior to acceptance from a new producer/holder and all other producers are long time suppliers to the O'Toole Composting Ltd. facility and good relationships exist.
	5. Have sufficient staff available and on duty with the requisite qualifications at all times. All personnel should undergo specific job training and further education (see Section 4.1.2.10. This is also related to BAT number 3)	Sufficient qualified staff are on duty at all times.
	Waste In	
	6. Have a concrete knowledge of the waste IN. Such knowledge needs to take into account the waste OUT, the treatment to be carried out, the type of waste, the origin of the waste, the procedure under consideration (see BAT number 2 and 8) and the risk (related to waste OUT and the treatment) (see Section 4.1.1.1). Guidance on some of these issues is provided in Sections 4.2.3, 4.3.2.2 and 4.4.1.2	A good knowledge of all incoming waste is had by the supervisory and management staff at all times.
	7. Implement a pre-acceptance procedure containing at least the following items (see Section 4.1.1.2): a) Tests for the incoming waste with respect to the planned treatment b) Making sure that all necessary information is received on the nature of the process(es) producing the waste, including the variability of the process. The personnel having to deal with the pre-acceptance procedure need to be able due to his profession and/or experience to deal with all necessary questions relevant for the treatment of the wastes in the WT facility c) A system for providing and analysing a representative sample(s) of the waste from the production process producing such waste from the current holder d) A system for carefully verifying, if not dealing directly with the waste producer, the	All incoming waste is inspected prior to acceptance. This is carried out in line with the facility requirements and acceptance criteria that has been provided to customers. In the case of new customers this will not be accepted until it has met the acceptance criteria for the facility including where necessary an analysis and correct waste categorization.

	information received at the pre-acceptance stage, including the contact details for the waste producer and an appropriate description of the waste regarding its composition and hazardousness e) Making sure that the waste code according to the European Waste List (EWL) is provided f) Identifying the appropriate treatment for each waste to be received at the installation (see Section 4.1.2.1) by identifying a suitable treatment method for each new waste enquiry and having a clear methodology in place to assess the treatment of waste that considers the physico-chemical properties of the individual waste and the specifications for the treated waste.	
	8. Implement an acceptance procedure containing at least the following items (see Section 4.1.1.3): a) A clear and specified system allowing the operator to accept wastes at the receiving plant only if a defined treatment method and disposal/recovery route for the output of the treatment is determined (see pre-acceptance in BAT number 7). Regarding the planning for the acceptance, it needs to be guaranteed that the necessary storage (see Section 4.1.4.1), treatment capacity and dispatch conditions (e.g. Acceptance criteria of the output by the other installation) are also respected b) Measures in place to fully document and deal with acceptable wastes arriving at the site, such as a pre-booking system, to ensure e.g. That sufficient capacity is available c) Clear and unambiguous criteria for the rejection of wastes and the reporting of all non conformances d) A system for identifying the maximum capacity limit of waste that can be stored at the facility (related to BAT number 10.b, 10.c, 27 and 24.f) e) Visually inspect the waste IN to check compliance with the description received during the pre-acceptance procedure. *For some liquid and hazardous waste, this BAT is not applicable* (see Section 4.1.1.3).	A waste acceptance procedure is in place at the facility. It will be reviewed and updated if appropriate in accordance with BAT on an ongoing basis.
	9. Implement different sampling procedures for all different incoming waste vessels delivered in bulk and/or containers. These sample procedures may contain the following items (see Section 4.1.1.4): a. Sampling procedures based on a risk approach. Some elements to consider are the type of waste (e.g. *Hazardous* or non-hazardous) and the knowledge of the customer (e.g. Waste producer) b. Check on the relevant physico-chemical parameters. The relevant parameters are related to the knowledge of the waste needed in each case	Sampling procedures where appropriate are operated by O'Toole Composting Ltd.

	(see BAT number 6) c. Registration of all waste materials d. Have different sampling procedures for bulk (liquid and solids), large and small containers and laboratory smalls. The number of samples taken should increase with the number of containers. In extreme situations, small containers must all be checked against the accompanying paperwork. The procedure should contain a system for recording the number of samples and degree of consolidation e. Details of the sampling of wastes in drums within designated storage, e.g. The time- scale after receipt f. Sample prior to acceptance g. Maintenance of a record at the installation of the sampling regime for each load, together with a record of the justification for the selection of each option h. A system for determining and recording: • A suitable location for the sampling points • The capacity of the vessel sampled (for samples from drums, an additional parameter would be the total number of drums) • The number of samples and degree of consolidation • The operating conditions at the time of sampling. i. A system to ensure that the waste samples are analysed (see Section 4.1.1.5) j. In the case of cold ambient temperatures, a temporary storage may be needed in order to allow sampling after defrosting. This may affect the applicability of some of the above items in this BAT (see Section 4.1.1.5).	
	10. Have a reception facility covering at least the following issues (see Section 4.1.1.5): a) Have a laboratory to analyse all the samples at the speed required by BAT. Typically this requires having a robust quality assurance system, quality control methods and maintaining suitable records for storing the analyses results. *Particularly for hazardous wastes, this often means that the laboratory needs to be on-site* b) Have a dedicated quarantine waste storage area as well as written procedures to manage non-accepted waste. If the inspection or analysis indicates that the wastes fail to meet the acceptance criteria (including, e.g. damaged, corroded or unlabelled drums) then the wastes can be temporarily stored there safely. Such storage and procedures should be designed and managed to promote the rapid management (typically a matter of days or less) to	A reception area with a dedicated quarantine facility, waste inspection procedure, waste acceptance criteria and waste acceptance procedure are in place. Waste that is not acceptable is either quarantined or rejected as per the procedure. Waste that is accepted is moved to the production area. There is a closed loop drainage system in the reception area – this means that all liquid received at this point is used in the composting system. The acceptance of waste within the composting building also complies with Animal By-Product Regulations. Each load is individually tracked via the weighbridge system

	find a solution for that waste c) Have a clear procedure dealing with wastes where inspection and/or analysis prove that they do not fulfill the acceptance criteria of the plant or do not fit with the waste description received during the pre-acceptance procedure. The procedure should include all measures as required by the permit or national/international legislation to inform competent authorities, to safely store the delivery for any transition period or to reject the waste and send it back to the waste producer or to any other authorised destination d) Move waste to the storage area only after acceptance of the waste (related to BAT number 8) e) Mark the inspection, unloading and sampling areas on a site plan f) Have a sealed drainage system (related to BAT number 63) g) A system to ensure that the installation personnel who are involved in the sampling, checking and analysis procedures are suitably qualified and adequately trained, and that the training is updated on a regular basis (related to BAT number 5) h) The application of a waste tracking system unique identifier (label/code) to each container at this stage. The identifier will contain at least the date of arrival on-site and the waste code (related to BAT number 9 and 12).	
Waste Out		
	11. Analyse the waste OUT according to the relevant parameters important for the receiving facility (e.g. landfill, incinerator) (see Section 4.1.1.1)	All waste out is analysed out to ensure it meets customer acceptance criteria.
Management Systems		
	12. Have a system in place to guarantee the traceability of waste treatment. Different procedures may be needed to take into account the physico-chemical properties of the waste (e.g. liquid, solid), type of WT process (e.g. continuous, batch) as well as the changes that may occur to the physico-chemical properties of the wastes when the WT is carried out. A good traceability system contains the following items (see Section 4.1.2.3): i. Documenting the treatments by flow charts and mass balances (see Section 4.1.2.4 and this is also related to BAT number 2.a) ii. Carrying out data traceability through several operational steps (e.g pre-acceptance/acceptance/storage/treatment/dispatch). Records can be made and kept up-to-date on an ongoing basis to reflect deliveries, on-	A Quality Management System is in place at the facility. This addresses the issues of waste treatment and quality. During ongoing review this will be brought into line with BAT.

	site treatment and dispatches. Records are typically held for a minimum of six months after the waste has been dispatched iii. Recording and referencing the information on waste characteristics and the source of the waste stream, so that it is available at all times. A reference number needs to be given to the waste and needs to be obtainable at any time in the process to enable the operator to identify where a specific waste is in the installation, the length of time it has been there and the proposed or actual treatment route iv. Having a computer database/series of databases, which are regularly backed up. The tracking system operates as a waste inventory/stock control system and includes: date of arrival on-site, waste producer details, details on all previous holders, an unique identifier, pre-acceptance and acceptance analysis results, package type and size, intended treatment/disposal route, an accurate record of the nature and quantity of wastes held on-site including all hazards details on where the waste is physically located in relation to a site plan, at which point in the designated disposal route the waste is currently positioned v. Only moving drums and other mobile containers between different locations (or loaded for removal off site) under instructions from the appropriate manager, ensuring that the waste tracking system is amended to record these changes (see Section 4.1.4.8).	
	13. Have and apply mixing/blending rules oriented to restrict the types of wastes that can be mixed/blended together in order to avoid increasing pollution emission of down-stream waste treatments. These rules need to consider the type of waste (e.g. *hazardous,* non- hazardous), waste treatment to be applied as well as the following steps that will be carried out to the waste OUT (see Section 4.1.5)	This is carried out at the facility in line with their Quality Management System
	14. Have a segregation and compatibility procedure in place (see Section 4.1.5 and this is also related to BAT number 13 and 24.c), including: i. Keeping records of the testing, including any reaction giving rise to safety parameters (increase in temperature, generation of gases or raising of pressure); a record of the operating parameters (viscosity change and separation or precipitation of solids) and any other relevant parameters, such as generation of odours (see Sections 4.1.4.13 and 4.1.4.14) ii. Packing containers of chemicals into separate drums based on their hazard classification. Chemicals which are incompatible (e.g. oxidisers and flammable liquids) should not be stored in the same drum (see Section 4.1.4.6).	As above.
	15. Have an approach for improving waste treatment efficiency. This typically includes the finding of suitable indicators to report WT efficiency and a monitoring	This is ongoing at the facility

	programme (see Section 4.1.2.4 and this is also related to BAT number 1)	
	16. Produce a structured accident management plan (see Section 4.1.7)	An accident management plan is in place at the facility.
	17. Have and properly use an incident diary (see Section 4.1.7 and related to BAT number 1 and to quality management system)	An incident diary is in place.
	18. Have a noise and vibration management plant in place as part of the EMS (see Section 4.1.8 and this is also related to BAT number 1). For some WT installations, noise and vibration may not be an environmental problem	A noise management plan is in place as part of the EMS.
	19. Consider any future decommissioning at the design stage. For existing installations and where decommissioning problems are identified, put a programme to minimise these problems in place (see Section 4.1.9 and this is also related to BAT number 1.i).	A decommissioning plan is in place in the event that this may be carried out at some future date.
Utilities and Raw Material Management		
	20. Provide a breakdown of the energy consumption and generation (including exporting) by the type of source (i.e. electricity, gas, liquid conventional fuels, solid conventional fuels and waste) (see Section 4.1.3.1 and related to BAT number 1.k). This involves: i. Reporting the energy consumption information in terms of delivered energy ii. Reporting the energy exported from the installation iii. Providing energy flow information (for example, diagrams or energy balances) showing how the energy is used throughout the process.	This will be carried out in line with BAT
	21. Continuously increase the energy efficiency of the installation, by (see Section 4.1.3.4): i. Developing an energy efficiency plan ii. Using techniques that reduce energy consumption and thereby reduce both direct (heat and emissions from on-site generation) and indirect (emissions from a remote power station) emissions iii. Defining and calculating the specific energy consumption of the activity (or activities), setting key performance indicators on an annual basis (e.g. MWh/tonne of waste processed) (related to BAT number 1.k and 20).	An energy efficiency plan will be developed for the facility in line with BAT
	22. Carry out an internal benchmarking (e.g. on an annual basis) of raw materials consumption (related to BAT number 1.k). Some applicability limitations have been identified and these are mentioned in Section 4.1.3.5	As above
	23. Explore the options for the use of waste as a raw material for the treatment of other wastes (see Section 4.1.3.5). If waste is used to treat other wastes, then to	This is carried out on an ongoing basis by O'Toole Composting Ltd..

	have a system in place to guarantee that the waste supply is available. If this cannot be guaranteed, a secondary treatment or other raw materials should be in place in order to avoid any unnecessary waiting treatment time (see Section 4.1.2.2)	
	Storage and Handling	
	24. Apply the following techniques related to storage (see Section 4.1.4.1): i. locating storage areas: • Away from watercourses and sensitive perimeters, and • In such a way so as to eliminate or minimise the double handling of wastes within the installation ii. Ensuring that the storage area drainage infrastructure can contain all possible contaminated run-off and that drainage from incompatible wastes cannot come into contact with each other iii. Using a dedicated area/store which is equipped with all necessary measures related to the specific risk of the wastes for sorting and repackaging laboratory smalls or similar waste. These wastes are sorted according to their hazard classification, with due consideration for any potential incompatibility problems and then repackaged. After that, they are removed to the appropriate storage area iv. Handling odorous materials in fully enclosed or suitably abated vessels and storing them in enclosed buildings connected to abatement v. Ensuring that all connections between the vessels are capable of being closed via valves. Overflow pipes need to be directed to a contained drainage system (i.e. the relevant bunded area or another vessel) vi. Having measures available to prevent the building up of sludges higher than a certain level and the emergence of foams that may affect such measures in liquid tanks, e.g. by regularly controlling the tanks, sucking out the sludges for appropriate further treatment and using anti-foaming agents vii. Equipping tanks and vessels with suitable abatement systems when volatile emissions may be generated, together with level meters and alarms. These systems need to be sufficiently robust (able to work if sludge and foam is present) and regularly maintained viii. Storing organic waste liquid with a low flashpoint under a nitrogen atmosphere to keep it inertised. Each storage tank is put in a waterproof retention area. Gas effluents are collected and treated.	All of these measures where appropriate to the operation at O'Toole Composting Ltd. are carried out on an ongoing basis. All storage is away from watercourses. All contaminated drainage is captured and reused in the process. All odorous materials are handled indoors under the control of a bio-filter.

	25. Separately bund the liquid decanting and storage areas using bunds which are impermeable and resistant to the stored materials (see Section 4.1.4.4)	N/A
	26. Apply the following techniques concerning tank and process pipe work labeling (see Section 4.1.4.12): i. Clearly labeling all vessels with regard to their contents and capacity, and applying an unique identifier. Tanks need to have an appropriately labeled system depending on their use and contents ii. Ensuring that the label differentiates between waste water and process water, combustible liquid and combustible vapour and the direction of flow (i.e. in or outflow) iii. Keeping records for all tanks, detailing the unique identifier; capacity; its construction, including materials; maintenance schedules and inspection results; fittings; and the waste types which may be stored/treated in the vessel, including flashpoint limits.	N/A
	27. Take measures to avoid problems that may be generated from the storage/accumulation of waste. This may conflict with BAT number 23 when waste is used as a reactant (see Section 4.1.4.10)	Waste is removed from the site within the shortest possible timeframe.
	28. Apply the following techniques when handling waste (see Section 4.1.4.6): i. Having systems and procedures in place to ensure that wastes are transferred to the appropriate storage safely ii. Having in place a management system for the loading and unloading of waste in the installation, which also takes into consideration any risks that these activities may incur. Some options for this include ticketing systems, supervision by site staff, keys or colour-coded points/hoses or fittings of a specific size iii. Ensuring that a qualified person attends the waste holder site to check the laboratory smalls, the old original waste, waste from an unclear origin or undefined waste (especially if drummed), to classify the substances accordingly and to package into specific containers. In some cases, the	These are all carried out at the O'Toole Composting Ltd. facility in line with BAT.

	individual packages may need to be protected from mechanical damage in the drum with fillers adapted to the packaged waste properties iv. Ensuring that damaged hoses, valves and connections are not used v. Collecting the exhaust gas from vessels and tanks when handling liquid waste vi. Unloading solids and sludge in closed areas which are fitted with extractive vent systems linked to abatement equipment when the handled waste can potentially generate emission to air (e.g. odours, dust, VOCs) (see Section 4.1.4.7) vii. Using a system to ensure the bulking of different batches only takes place with compatibility testing (see Section 4.1.4.7 and 4.1.5 and this is also related to BAT number 13, 14 and 30).	
	29. Ensure that the bulking/mixing to or from packaged waste only takes place under instruction and supervision and is carried out by trained personnel. For certain types of wastes, such a bulking/mixing needs to be carried out under local exhaust ventilation (see Section 4.1.4.8)	Only trained personnel carry out bulking operations.
	30. Ensure that chemical incompatibilities guide the segregation required during storage (see Section 4.1.4.13 and 4.1.4.14 and this is also related to BAT number 14)	Not applicable at this facility.
	31. Apply the following techniques when containerised wastes are handled (see Section 4.1.4.2): i. Storing of containerised wastes under cover. This can also be applied to any container that is held in storage pending sampling and emptying. Some exceptions on the applicability of this technique related to containers or waste not affected by ambient conditions (e.g. sunlight, temperature, water) have been identified (see Section 4.1.4.2). Covered areas need to have adequate provision for ventilation ii. Maintaining the availability and access to storage areas for containers holding substances that are known to be sensitive to heat, light and water, under cover and protected from heat and direct sunlight.	This is carried out at this facility. It is not deemed as a requirement for containers holding civic amenity facility waste.
Other common techniques not mentioned above		
	32. Perform crushing, shredding and sieving operations in areas fitted with extractive vent systems linked to abatement equipment (see Section 4.1.6.1) when handling materials that can generate emission to air (e.g. odours, dust, VOCs)	This is carried out in accordance with Bat in the composting shed. It is proposed to install extractive equipment (biofilter) in the recycling shed subject to planning permission.

	33. Perform crushing/shredding operations (see Sections 4.1.6.1 and 4.6) under full encapsulation and under an inert atmosphere for drums/containers containing flammable or highly volatile substances. This will avoid ignition. The inert atmosphere is to be abated	Not applicable.
	34. Perform washing processes considering (see Section 4.1.6.2): i. Identifying the washed components that may be present in the items to be washed (e.g. solvents) ii. Transferring washings to appropriate storage and then treating them in the same way as the waste from which they were derived iii. Using treated waste water from the WT plant for washing instead of fresh water. The resultant waste water can then be treated in the WWTP or re-used in the installation.	Not applicable.
Air emission treatments		
	To prevent or control the emissions mainly of dust, odours and VOC and some inorganic compounds, BAT is to: 35. Restrict the use of open topped tanks, vessels and pits by: i. Not allowing direct venting or discharges to air by linking all the vents to suitable abatement systems when storing materials that can generate emissions to the air (e.g. odours, dust, VOCs) (see Section 4.1.4.5) ii. Keeping the waste or raw materials under cover or in waterproof packaging (see Section 4.1.4.5 and this is also related to BAT number 31.a) iii. Connecting the head space above the settlement tanks (e.g. where oil treatment is a pretreatment process within a chemical treatment plant) to the overall site exhaust and scrubber units (see Section 4.1.4.1).	All waste is stored indoors or under cover where possible. All putrescible waste is stored indoors.
	36. Use an enclosed system with extraction, or under depression, to a suitable abatement plant. This technique is especially relevant to processes which involve the transfer of volatile liquids, including during tanker charging/discharging (see Section 4.6.1)	An air extraction system complete with biofilter is in use at the composting building and is proposed for the recycling building.
	37. Apply a suitably sized extraction system which can cover the holding tanks, pretreatment areas, storage tanks, mixing/reaction tanks and the filter press areas, or to have in place a separate system to treat the vent gases from specific tanks (for example, activated carbon filters from tanks holding waste contaminated with solvents) (see Section 4.6.1)	As above
	38. Correctly operate and maintain the abatement equipment, including the handling and treatment/disposal of spent scrubber media (see Section 4.6.11)	The operation of the biofilter is carried out in accordance with the manufacturer's instructions.
	39. Have a scrubber system in place for the major inorganic gaseous releases from those unit operations which have a point discharge for process emissions. Install a	A scrubber unit is in place.

<table>
<tr><td></td><td>secondary scrubber unit to certain pretreatment systems if the discharge is incompatible, or too concentrated for the main scrubbers (see Section 4.6.11)</td><td></td></tr>
<tr><td></td><td>40. Have leak detection and repair procedures in place in installations a) handling a large number of piping components and storage and b) compounds that may leak easily and create an environmental problem (e.g. fugitive emissions, soil contamination) (see Section 4.6.2). This may be seen as an element of the EMS (see BAT number 1)</td><td>Leak detection and repair procedures are in place and will be fully documented as part of the next EMS review.</td></tr>
<tr><td></td><td>41. Reduce air emission to the following levels by using a suitable combination of preventive and/or abatement techniques (see Section 4.6). The techniques mentioned above in the BAT ‘Air emission treatments’ section (BAT numbers 35 – 41) also contribute to achieve these values

<table><tr><th>Air parameter</th><th>Emission levels associated to the use of BAT (mg/Nm^3)</th></tr><tr><td>VOC</td><td>7 – 20[1]</td></tr><tr><td>PM</td><td>5 – 20</td></tr><tr><td colspan="2">[1] For low VOC loads, the higher end of the range can be extended</td></tr></table></td><td>Air emissions from the facility are in line with BAT.</td></tr>
<tr><td colspan="3">Waste water management</td></tr>
<tr><td></td><td>42. Reduce the water use and the contamination of water by (see Sections 4.1.3.6 and 4.7.1):
i. applying site waterproofing and storage retention methods
ii. Carrying out regular checks of the tanks and pits especially when they are underground
iii. Applying separated water drainage according to the pollution load (roof water, road water, process water)
iv. Applying a security collection basin
v. Performing regular water audits, with the aim of reducing water consumption and preventing water contamination
vi. Segregating process water from rainwater (see Section 4.7.2 and this is also related to BAT number 46).</td><td>Waterproofing of hardstanding areas is ongoing
Process water is all separated and re-used in the process.
Water audits will be introduced.
Rainwater (roof) is harvested for use in the process and for use as firewater.</td></tr>
<tr><td></td><td>43. Have procedures in place to ensure that the effluent specification is suitable for the on-site effluent treatment system or discharge (see Section 4.7.1)</td><td>Other than domestic waste water from the toilet facilities, the effluent from the plant is re-used in the process. In exceptional circumstances it is sent for off site treatment,</td></tr>
<tr><td></td><td>44. Avoid the effluent by-passing the treatment plant systems (see Section 4.7.1)</td><td>This is avoided by having a closed loop system in place.</td></tr>
</table>

	45. Have in place and operate an enclosure system whereby rainwater falling on the processing areas is collected along with tanker washings, occasional spillages, drum washings, etc. and returned to the processing plant or collected in a combined interceptor (see Section 4.7.1)	This is in place.
	46. Segregate the water collecting systems for potentially more contaminated waters from less contaminated water (see Section 4.7.2)	This is in place at the facility.
	47. Have a full concrete base in the whole treatment area that falls to internal site drainage systems which lead to storage tanks or to interceptors that can collect rainwater and any spillage. Interceptors with an overflow to sewer usually need automatic monitoring systems, such as pH checks, which can shut down the overflow (see Section 4.1.3.6 and this is also related to BAT number 63),	This will be carried out as part of the upgrade of the facility hardstanding areas
	48. Collect the rainwater in a special basin for checking, treatment if contaminated and further use (see Section 4.7.1)	This is in place at the facility.
	49. Maximise the re-use of treated waste waters and use of rainwater in the installation (see Section 4.7.1)	This is in place at the facility.
	50. Conduct daily checks on the effluent management system and to maintain a log of all checks carried out, by having a system for monitoring the effluent discharge and sludge quality in place (see Section 4.7.1)	This will be incorporated into the EMS.
	51. Firstly identify waste waters that may contain hazardous compounds (e.g. adsorbable organically bound halogens (AOX); cyanides; sulphides; aromatic compounds; benzene or hydrocarbons (dissolved, emulsified or undissolved); and metals, such as mercury, cadmium, lead, copper, nickel, chromium, arsenic and zinc) (see Section 4.7.2). Secondly, segregate the previously identified waste water streams on-site and thirdly, specifically treat waste water on-site or off-site.	N/A
	52. Ultimately after the application of BAT number 42, select and carry out the appropriate treatment technique for each type of waste water (see Section 4.7.1)	N/A
	53. Implement measures to increase the reliability with which the required control and abatement performance can be carried out (for example, optimising the precipitation of metals) (see Section 4.7.1)	N/A

<table>
<tr><td></td><td>54. Identify the main chemical constituents of the treated effluent (including the make-up of the COD) and to then make an informed assessment of the fate of these chemicals in the environment (see Section 4.7.1 and their applicability restrictions identified)</td><td>The effluent is re-used on site in the process.</td></tr>
<tr><td></td><td>55. Only discharge the waste water from its storage after the conclusion of all the treatment measures and a subsequent final inspection (see Section 4.7.1)</td><td>This is carried out at the facility.</td></tr>
<tr><td></td><td>56. Achieve the following water emission values before discharge by applying a suitable combination of techniques mentioned in Sections 4.4.2.3 and 4.7. The techniques mentioned above in this section on ‘waste water management’ (BAT number 42 – 55) also contribute to reach these values.
<table>
<tr><th>Water parameter</th><th>Emission values associated with the use of BAT (ppm)</th></tr>
<tr><td>COD</td><td>20 – 120</td></tr>
<tr><td>BOD</td><td>2 – 20</td></tr>
<tr><td>Heavy metals (Cr, Cu, Ni, Pb, Zn)</td><td>0.1 – 1</td></tr>
<tr><td>Highly toxic heavy metals:
As
Hg
Cd
Cr(VI)</td><td>
<0.1
0.01 – 0.05
<0.1 – 0.2
<0.1 – 0.4</td></tr>
</table></td><td>This is in place at the facility.</td></tr>
<tr><td colspan="3">Management of the process generated residues</td></tr>
<tr><td></td><td>57. Have a residue management plan (see Section 4.8.1) as part of the EMS including:
i. Basic housekeeping techniques (related to BAT number 3)
ii. Internal benchmarking techniques (see Section 4.1.2.8 and this is also related to BAT numbers 1.k and 22).</td><td>This is in place at the facility.</td></tr>
<tr><td></td><td>58. Maximise the use of re-usable packaging (drums, containers, IBCs, palettes, etc.) (see Section 4.8.1)</td><td>This is in place at the facility.</td></tr>
<tr><td></td><td>59. Re-use drums when they are in a good working state. In other cases, they are to be sent for appropriate treatment (see Section 4.8.1)</td><td>This is in place at the facility.</td></tr>
</table>

	60. Keep a monitoring inventory of the waste on-site by using records of the amount of wastes received on-site and records of the wastes processed (see Section 4.8.3 and this is also related to BAT number 27)	This is in place at the facility.
	61. Re-use the waste from one activity/treatment possibly as a feedstock for another (see Section 4.1.2.6 and this is also related to BAT number 23)	This is in place at the facility. For example shavings from shredding of timber is used as bulking up material in the composting process.
	Soil contamination	
	62. Provide and then maintain the surfaces of operational areas, including applying measures to prevent or quickly clear away leaks and spillages, and ensuring that maintenance of drainage systems and other subsurface structures is carried out (see Section 4.8.2)	This is in place at the facility.
	63. Utilise an impermeable base and internal site drainage (see Section 4.1.4.6, 4.7.1 and 4.8.2)	This is in place at the facility. Any impermeable surfaces will be upgraded on an ongoing basis.
	64. Reduce the installation site and minimise the use of underground vessels and pipe work (see Section 4.8.2 and this is also related to BAT number 10.f, 25, and 40)	This is in place at the facility.
	BAT for specific types of waste treatments	
	Biological treatments	
	65. Use the following techniques for storage and handling in biological systems (see Section 4.2.2): i. For less odour-intensive wastes, use automated and rapid action doors (opening times of the doors being kept to a minimum) in combination with an appropriate exhaust air collection device resulting in an under pressure in the hall ii. For highly odour-intensive wastes, use closed feed bunkers constructed with a vehicle sluice iii. House and equip the bunker area with an exhaust air collection device.	An airlock door system is proposed and will be installed shortly subject to planning permission. Closed feed bunkers (tunnels) are in use at the facility There is a full negative air extraction system complete with biofilter in use.
	66. Adjust the admissible waste types and separation processes according to the type of process carried out and the abatement technique applicable (e.g. depending on the content of non- biodegradable components) (see Section 4.2.3)	This is in place at the facility
	67. Use the following techniques when applying anaerobic digestion (see Sections 4.2.4 and 4.2.5):	The composting process employed at O'Toole Composting Ltd employs these techniques. (Gicom System)

	i. Application of a close integration between the process with the water management ii. A recycling of the maximum amount of waste water to the reactor. See some operational issues that may appear when applying this technique in Section 4.2.4 iii. Operate the system under thermophilic digestion conditions. For certain types of wastes, thermophilic conditions cannot to be reached (see Section 4.2.4) iv. Measure TOC, COD, N, P and Cl levels in the inlet and outlet flows. When a better control of the process is required, or a better quality of the waste OUT, more parameters are necessary for measuring and controlling v. Maximise the production of biogas. This technique needs to consider the effect on the digestate and biogas quality.	
	68. Reduce the air emissions of the exhaust gas when using biogas as a fuel by restricting the emissions of dust, NO_X, SO_X, CO, H_2S and VOC by using an appropriate combination of the following techniques (see Section 4.2.6): i. Scrubbing the biogas with iron salts ii. Using de-NO_X techniques such as SCR iii. Using a thermal oxidation unit iv. Using activated carbon filtration.	N/A
	69. Improve the mechanical biological treatments (MBT) by (see Sections 4.2.2, 4.2.3, 4.2.8, 4.2.10, 4.6.23): i. Using fully enclosed bioreactors ii. Avoiding anaerobic conditions during aerobic treatment by controlling the digestion and the air supply (by using a stabilised air circuit) and by adapting the aeration to the actual biodegradation activity iii. Using water efficiently iv. Thermally insulating the ceiling of the biological degradation hall in aerobic processes v. Minimising the exhaust gas production to levels of 2500 to 8000 Nm^3 per tonne. Levels below 2500 Nm^3 per tonne do not have been reported vi. Guaranteeing a uniform feed vii. Recycling process waters or muddy residues within the aerobic treatment process to completely avoid water emissions. If waste water is generated, then this should be treated to reach the values mentioned in BAT number 56	Where relevant these processes are in place at the O'Toole Composting facility.

<table>
<tr><td></td><td>viii. Continuously learning of the connection between the controlled variables of biological degradation and the measured (gaseous) emissions
ix. Reducing emissions of nitrogen compounds by optimising the C:N ratio.</td><td></td></tr>
<tr><td></td><td>70. Reduce the emissions from mechanical biological treatments to the following levels (see Section 4.2.12) by using an appropriate combination of the following techniques (see Section 4.6):
<table><tr><th>Parameter</th><th>Treated exhaust gas</th></tr><tr><td>Odour (ouE/m^3)</td><td><500 – 6000</td></tr><tr><td>NH_3 (mg/Nm^3)</td><td><1 – 20</td></tr><tr><td colspan="2">For VOC and PM, see the generic BAT 41
The TWG recognised that N_2O (see Section 4.6.10) and Hg also needed to be added to this table, however not enough data were provided to validate values on these issues.</td></tr></table>i. Maintaining good housekeeping (related to BAT number 3)
ii. Regenerative thermal oxidiser
iii. Dust removal.</td><td>These emission levels are achieved at the O'Toole Composting Facility.</td></tr>
<tr><td></td><td>71. Reduce the emissions to water to the levels mentioned in BAT number 56. In addition, restrict the emissions to water of total nitrogen, ammonia, nitrate and nitrite as well (see Section 4.7.7 and the concluding remarks Chapter 7)</td><td>The water level emissions are within the IGV limits set by the EPA.</td></tr>
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