Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016 (as amended)

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/LP3593LM
The Operator is: AmeyCespa (East) Ltd
The Installation is: Waterbeach Waste Management Park
This Variation Notice number is: EPR/LP3593LM/V009

What this document is about

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication by the European Commission of updated decisions on Best Available Techniques (BAT) Conclusions (BATc).

We have reviewed the permit for this Installation against the revised BAT Conclusions for the Waste Treatment industry sector published on 10 August 2018 in the Official Journal of the European Union. In this decision document, we set out the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the Installation. This review has been undertaken with reference to the decision made by the European Commission establishing BAT Conclusions for Waste Treatment as detailed in document reference C(2018) 5070. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the Installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. Where this has not already been done, it also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and with other permits issued to Installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental

protection achieved by the Permit in any way. In this document, we therefore address only our determination of substantive issues relating to the new BAT Conclusions.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

How this document is structured

1. Our decision
2. How we reached our decision
3. The legal framework
4. Annex 1 – Review of operating techniques within the Installation against the BAT Conclusions.
5. Annex 2 – Review and assessment of changes that are not part of the BAT Conclusions derived permit review
6. Annex 3 – Improvement Conditions
7. Annex 4 - Pre-operational measures for future development

1 Our decision

We have decided to issue the Variation Notice to the Operator. This will allow the Operator to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice that updates the whole permit.

We consider that, in reaching our decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the Operator for the operation of their Installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of "tailor-made" or Installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

2.1 Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under Regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a Regulation 61 Notice) on 19 July 2019 requiring the Operator to provide information to demonstrate where the operation of their Installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Notice required that where the revised standards are not currently met, the Operator should provide information that:

- Describes the techniques that will be implemented before 17 August 2022, which will then ensure that operations meet the revised standards, or
- Justifies why standards will not be met by 17 August 2022, and confirmation of the date when the operation of those processes will cease within the Installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- Justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standards described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT-AEL) described in the BAT Conclusions Document, the Regulation 61 Notice required that the Operator make a formal request for derogation from compliance with that BAT-AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61 Notice response from the Operator was received on 16 January 2020.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 61 Notice response that appears to be confidential in relation to any party.

2.2 Review of our own information in respect to the capability of the Installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous experience in the regulation of the Installation, we consider that the Operator will be able to comply with the techniques and standards described in the BAT Conclusions other than for those techniques and requirements described in BAT Conclusions 1, 3, 4, 8, 12, 14, 21, 23, 34 and 36. In relation to these BAT Conclusions, we do not fully agree with the Operator in respect of their current stated capability as recorded in their regulation 61 Notice response. We have therefore included Improvement Conditions 1 to 8 in the Consolidated Variation Notice to ensure that the requirements of the BAT Conclusions are delivered before 17 August 2022.

2.3 Requests for further information during determination

There were no requests for further information during determination.

2.4 Pre-operational measures for future development

The Operator's Regulation 61 response failed to review the existing S5.4 A(1)(b)(i) Open windrow composting (OWC) activity against the relevant Waste Treatment BAT Conclusions.

A pre-operational measure for future development has been included in the permit (Table S1.4) to ensure that, prior to the Operator recommencing operation of the OWC activity, the Operator will be required to submit a BAT report which includes an assessment of compliance of the OWC operation against the Waste Treatment BAT Conclusions which is in force at that time. The operation of the OWC activity shall not be restarted until the Environment Agency agrees to this and approves the report submitted. For further information on the pre-operational measure for future development included, please refer to Annex 4 of this document.

The decisions detailed in Annex 1: decision checklist regarding relevant BAT Conclusions refers specifically to our review of the existing S5.4 A(1)(b)(i) in-vessel composting installation activity, for which the Operator provided a review of compliance against the relevant Waste Treatment BAT Conclusions.

3 The legal framework

The Consolidated Variation Notice will be issued under Regulations 18 and 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *Installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

Annex 1: decision checklist regarding relevant BAT Conclusions

The BAT Conclusions for the Waste Treatment sector, were published by the European Commission on 10 August 2018. There are 53 BAT Conclusions but not all of them will be relevant to the Installation. This annex provides a record of decisions made in relation to each relevant BAT Conclusion which are applicable to biowaste treatment Installations. This annex should be read in conjunction with the Consolidated Variation Notice.

The overall status of compliance with the BAT conclusion is indicated in the table as:

NA – Not Applicable
CC – Currently Compliant
FC – Compliant in the future (within 4 years of publication of BAT conclusions)
NC – Not Compliant

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features: I. commitment of the management, including senior management; II. definition, by the management, of an environmental policy that includes the continuous improvement of the environmental performance of the Installation; III. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; IV. implementation of procedures paying particular attention to: (a) structure and responsibility, (b) recruitment, training, awareness and competence, (c) communication, (d) employee involvement, (e) documentation, (f) effective process control, (g) maintenance programmes, (h) emergency preparedness and response,	**FC**	The Operator confirmed that the Installation holds an Environmental Management System (EMS) which is accredited to ISO14001, an internationally recognised standard for EMS accreditation. The EMS follows the recognised management system framework as specified in ISO 14001:2015 and the Plan, Do, Check and Act model. The Operator provided certification to demonstrate that the Installation operates an EMS which complies with the requirements of ISO 14001:2015. Although we are satisfied that the Installation is currently compliant with many of the elements of BAT 1, we have identified certain aspects which have to be addressed in order to confirm that the Installation is fully compliant with this BAT point: • The EMS fails to adequately address containment infrastructure in place to minimise fugitive odour emissions; • The EMS fails to address the implementation of procedures to ensure effective process control;

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	(i) safeguarding compliance with environmental legislation; V. checking performance and taking corrective action, paying particular attention to: (a) monitoring and measurement (see also the JRC Reference Report on Monitoring of emissions to air and water from IED Installations – ROM), (b) corrective and preventive action, recruitment, training, awareness and competence, (c) maintenance of records, (d) independent (where practicable) internal or external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained VI. review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness; VII. following the development of cleaner technologies; 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;		• The EMS does not detail how abatement performance will be monitored, including what corrective and preventative action will be implemented following the substantiation of odour. We have included Improvement Condition 2 to ensure the Installation demonstrates full compliance with BAT point 1. **Environment Agency assessment** **We are satisfied that the Installation will be future compliant with BATc 1. Improvement condition 2 has been included in the permit to achieve compliance (see Annex 3).**

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	IX. application of sectoral benchmarking on a regular basis; X. waste stream management (see BAT 2); XI. an inventory of waste water and waste gas streams (see BAT 3); XII. residues management plan (see description in Section 6.5); XIII. accident management plan (see description in Section 6.5); XIV. odour management plan (see BAT 12) XV. noise and vibration management plan (see BAT 17).		
2	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques listed 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; (f) Ensure waste compatibility prior to mixing or blending of waste; (g) Sort incoming solid waste	**CC**	The Operator confirmed that the Installation currently employs each of the techniques listed in BAT point 2, as follows: (a) **Set up and implement waste characterisation and pre-acceptance procedures**; and (b) **Set up and implement waste acceptance procedures** - Waste is delivered to the reception hall by bulk waste haulage vehicles and refuse collection vehicles, where it is deposited onto an impermeable concrete waste reception area. The incoming waste

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			can be broadly categorised into two main types of source selected/controlled waste streams: (1) woody green waste from household waste recycling centres and woody, bulk organic material deposited by landscapers, and (2) kerbside green waste from households, typically grass, plant cuttings and meat included in kitchen waste. Waste acceptance checks of all waste received are undertaken within the waste reception building. This includes visual characterisation by a trained and competent member of staff. Once incoming material is determined to meet the relevant characteristics, it is moved to the incoming waste stockpile pending shredding (all undertaken within the enclosed waste reception building). Instructions are in place for site operatives to ensure the following aspects are managed when waste is received at the Installation: • Receipt and acceptance – Upon receipt, waste is visually inspected to ensure it meets the requirements of the permitted waste types. If any loads are found to be contaminated, the contaminated components are either removed (if low levels of contamination) or the whole load is rejected (if higher levels of

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			contamination is found). If incoming wastes are found to be odorous, they will be rejected. • Tonnages – The tonnage of all loads accepted at the site are monitored by the Site Supervisor by means of mass balance reporting. The IVC processing throughput is limited to filling ten Barrier 1 vessels per week; if the predicted amount of incoming waste is above this capacity, the excess is diverted to other regulated sites to ensure the on-site treatment capacity is managed. • Rejected loads – Any rejected loads are loaded into a dumper and weighed out on the internal weighbridge, with the weighbridge database recording the tonnage of any rejected loads. All rejected loads are logged in the site diary and recorded on the relevant load rejection documentation. • Size of material received – All material accepted is assessed to ensure that it meets the requirement of being 400 mm or less in diameter. To ensure compliance with this, material is passed through a slow speed shredder to provide a consistent feedstock particle size. • Order in which material will be processed – All waste is processed in order of date and time received, with the oldest waste being processed first.

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			• Storage times – Storage times of waste are managed through monitoring of tonnages received to ensure the facility has adequate processing capacity and to avoid any incoming waste from being stored (prior to processing) for more than 24 hours. (c) **Set up and implement waste tracking system and inventory** – The Installation implements a waste tracking system. Records of material delivery are documented within a batch formation record, with every new batch assigned a batch code (recorded and monitored using Compost Manager software package) which is maintained throughout the composting process until the product compost leaves the Installation. The date on which a given batch is screened and its batch code is recorded using the Compost Manager software package, and stabilisation, maturation and screening monitoring record sheet. When a batch is added to the stabilisation pad, the batch identification number that is created at the beginning of the actively managed process is recorded on the batch marker board which is placed firmly into the batch to ensure this batch can be identified throughout the process. (d) **Set up and implement output quality management system** – The Installation holds a Compost Quality Management System

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			and Compost Quality Policy. Compost samples are taken and tested once the compost has completed the composting process (including maturation) and after product preparation (screening). The compost is screened to produce a 12mm fraction and an oversize fraction. An appropriately trained member of staff samples and tests representative batches to determine compliance with PAS 100 standards. (e) **Ensure waste segregation** – Any rejected loads are segregated, transferred to the weighbridge and moved to either the adjacent Mechanical Biological Treatment (MBT) site or the adjacent landfill site. Any rejections are logged in the site diary and recorded on the load rejection form. (f) **Ensure waste compatibility prior to mixing or blending of waste** – Any incompatible wastes are identified and segregated as part of waste acceptance procedures. The waste feedstock is mixed and blended when required in order to maintain a suitable C:N ratio, moisture content and open structure (to assist air flow) within the feedstock.

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			(g) **Sort incoming solid waste** – Solid incoming waste is sorted and assessed for suitability once it is received on-site, as described above. Incoming wastes are subject to visual examination to identify any waste loads which: • Are contaminated; • Are rotting/highly odorous; • Have a high moisture content (assessed by means of a squeeze test). **<u>Environment Agency assessment</u>** **We are satisfied that the Installation is currently compliant with BATc 2.**
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:	**FC**	**(i) (a) Information about the characteristics of the waste to be treated and the waste treatment processes –** As detailed above for BAT 2, the incoming waste to the IVC process can be broadly categorised into two main waste types, woody green waste and kerbside green waste. The Operator provided a process flow schematic of the IVC process undertaken, commencing from the

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	(a) simplified process flow sheets that show the origin of the emissions; (b) descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances; **(ii)** information about the characteristics of the waste water streams, such as: (a) average values and variability of flow, pH, temperature, and conductivity; (b) average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, priority substances /micropollutants); (c) data on bioeliminability (e.g. BOD, BOD to COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. inhibition of activated sludge)) (see BAT 52); **(iii)** information about the characteristics of the waste gas streams, such as: (a) average values and variability of flow and temperature; (b) average concentration and load values of relevant substances and their variability (e.g. organic compounds, POPs such as PCBs);		receipt of incoming waste into the waste reception hall, concluding with the storage and despatch of final product and oversized material. **(i)(b) Descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances:** **Process-integrated techniques -** The Operator failed to provide sufficient detail on what process-integrated techniques are employed within the IVC activity. This aspect is outstanding and will be addressed through an improvement condition (further detail below). **Waste water treatment -** The Operator confirmed there is no wastewater treatment performed on-site. All direct run-off and leachate from the process vessels and maturation pad is collected in a designated leachate tank and tankered off-site for disposal. Rainwater from roofs and non-process surface water is directly discharged to an off-site lagoon without the use of an interceptor. The Operator provided a drainage plan to show the areas which drain to the leachate tank and those that drain to the surface water lagoon. **Waste gas treatment -** The previous permit did not include any listed point source emissions to air from the facility, however, the IVC activity is served by the following odour abatement systems with associated point source emissions to air:

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	(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).		• An acid scrubber in-line prior to the biofilter which removes ammonia from the air streams extracted from the Barrier 2 IVC vessels prior to this air being conveyed to the biofilter for further treatment. • A biofilter which treats air that is extracted from the waste reception building and from the Barrier 2 IVC vessels (downstream of acid scrubber). The biofilter only treats air extracted from the vessels immediately before emptying, however, the air from the vessels is not extracted and treated on a permanent basis. The extraction system for the reception building is located above the processing area to aid the extraction of odorous air arising from the incoming waste shredding process. • Two activated carbon filters which serve the IVC leachate storage tank. One of the carbon filters treats the odour within the leachate tank, while the other carbon filter is used for back-venting when leachate is being transferred to tanker for despatch off-site. Although the Operator's response included details on the above point source emissions, the level of detail provided on the waste gas

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			treatment in place was insufficient. The following points require explanation and justification: • Description of the odour abatement systems; • Description of the specific areas served in the waste reception building (e.g. where is local extraction located, does the provide extraction for the full building); • Description and justification of the approach of treating the odorous air from only 2 out of 20 vessels at any given time prior to emptying the vessels, including full consideration of the fugitive odour risk this poses; • The specific pollutants abatement systems are designed to treat; • The pollutant concentrations /odour levels the abatement is designed to treat (inlet) and achieve (outlet). This aspect is outstanding and will be addressed through an improvement condition (further detail below). **(ii) (a) – (c) - Information about the characteristics of the waste water streams -** We agree that the waste water parameters specified in BAT point 3 are not applicable to the leachate collected (which is tankered off-site, listed as S1 in Table S3.3), or the clean surface

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			water drainage associated with the IVC activity (listed as W1 in Table S3.2). **(iii) (a) – (d) – Information about the characteristics of the waste gas streams –** The Operator provided details on the extraction air flow design for the extraction system serving the reception hall, however, it was unclear from the information provided whether this also covers the extraction of air from the IVC vessels too (which are also served by the biofilter), and whether this extraction rate is consistent, or changes depending on the activities being undertaken (e.g. prior to IVC vessel changeover). Furthermore, the information provided for the extracted air did not address each of the elements in BAT element (iii). The Operator stated that no other emission sources are contained (other than the waste reception building), however, we would expect the contained and abated leachate storage tank emissions to be discussed, as well as the IVC vessel emissions (abated and unabated vessels). The Operator provided a residual odour, hydrogen sulphide (H_2S) and ammonia (NH_3) concentration for the biofilter emissions, however, no details were provided on the typical inlet concentrations, and no details

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			were provided to explain/validate the pollutant concentrations presented. No information was presented on the average concentration and load values of relevant substances in the waste gas streams, nor their variability throughout the range of operating scenarios at the Installation. Furthermore, no consideration of the presence of other substances that may affect the waste gas treatment system or plant safety was included for the main waste gas streams. Therefore, the operator is required to review BAT elements (iii)(a)-(d) for each of the waste gas streams on site and address this aspect of BATc 3 in their response. We have included Improvement condition 2 to ensure the Installation demonstrates full compliance with BATc point 3. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation will be future compliant with BATc 3. Improvement condition 2 has been included in the permit to achieve compliance (see Annex 3).**

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4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below: (a) Optimised storage location; (b) Adequate storage capacity; (c) Safe storage operation; (d) Separate area for storage and handling of packaged hazardous waste.	**FC**	The Operator confirmed that they use a combination of techniques (a), (b) and (c). The Installation does not handle packaged hazardous waste, therefore, technique (d) is not applicable. **(a) Optimised storage location** – The IVC activity is undertaken approximately 250 m away from the nearest receptor at the Frimstone weighbridge and office. Waste is stored and treated within the reception hall, composting vessels and on the external maturation pad. Waste is transported out of the reception building over a limited distance into the composting vessels using loading shovels. The second transfer (between Barrier 1 and Barrier 2 vessels) is over a short distance as the vessels are adjacent to one another, therefore limiting the distance of material transferred. Following Barrier 2, the composted material is transferred to the maturation pad, which is located adjacent to the composting vessels. **(b) Adequate storage capacity –** The Operator provided details of the normal operating tonnages and maximum capacity (including storage/residence times) for different areas of the IVC process, covering the reception hall, Barrier 1 vessels, Barrier 2 vessels, stabilisation/maturation area and screened

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			product storage areas. The Installation is currently permitted to accept 55,000 tonnes per annum (combined limit for the IVC and OWC activities). The Operator explained that the site is limited to filling ten Barrier 1 vessels per week, and that if the predicted amount of incoming waste exceeds this capacity, the excess is diverted to other processors to ensure adequate treatment and storage capacity is maintained. **(c) Safe storage operation –** The Operator provided an inventory of the machinery/equipment available within the IVC plant, and confirmed that all machinery on-site are subject to daily Operator checks and are serviced in accordance with manufacturer's requirements. However, the Operator failed to provide sufficient details on the measures in place to ensure containers and drums are fit for purpose and stored securely, including details on the leachate storage tank. Furthermore, for BAT elements (a) to (c), the Operator's response focused on the waste reception hall, and insufficient detail was

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			provided for the composting vessels and the external maturation pad which should be considered. **(d) Separate area for storage and handling of packaged hazardous waste** – We agree with the Operator that this element of BAT 4 is not applicable to the Installation as the site does not accept packaged hazardous waste. We have included Improvement condition 2 to ensure the Installation demonstrates full compliance with BATc point 4. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation will be future compliant with BATc 4. Improvement condition 2 has been included in the permit to achieve compliance (see Annex 3).**
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.	**CC**	The Operator confirmed they have handling and transfer procedures in place and that staff involved are appropriately trained by competent staff on-site. Each batch is given a unique identifier bar code which is scanned using the Compost Manager system which allows for the monitoring details of each individual batch to be recorded, e.g. location

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	Handling and transfer procedures aim to ensure that wastes are safely handled and transferred to the respective storage or treatment. They include the following elements: • handling and transfer of waste are carried out by competent staff; • handling and transfer of waste are duly documented, validated prior to execution and verified after execution; • measures are taken to prevent, detect and mitigate spills; • operation and design precautions are taken when mixing or blending wastes (e.g. vacuuming dusty/powdery wastes). Handling and transfer procedures are risk-based considering the likelihood of accidents and incidents and their environmental impact.		and date of turning. Furthermore, housekeeping activities are undertaken on an ongoing basis and any spills identified are cleaned up as soon as practicable. Incoming wastes are only blended/mixed within the waste reception hall, prior to entering the composting vessels once the desired C:N ratio is obtained. Localised extraction is in place above the shredding activity to treat the odorous air resulting from this activity, and the reception hall is fitted with rapid action rolling doors to mitigate the emissions associated with the activities undertaken within the reception building. **Environment Agency assessment** **We are satisfied that the Installation is currently compliant with BATc 5.**
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-	**NA**	The Operator confirmed that all leachate and waste water arising on site from the IVC activity are stored in the leachate tank and tankered off-site, and the only other emission to water associated with the IVC activity is of clean surface water (listed as W1 in Table S3.2 of the

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	treatment, at the inlet to the final treatment, at the point where the emission leaves the Installation).		permit). Therefore, we do not consider this BAT point to be applicable to the IVC activity. **<u>Environment Agency assessment</u>** **We are satisfied that BATc 6 is not applicable to this Installation.**
7	BAT is to monitor emissions to water with at least the frequency given in BATc 7, 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.	**NA**	As per the comments included for BATc 6 above, the IVC activity does not have any permitted emissions to water other than W1, which is solely for clean surface water. Therefore, we do not consider this BAT point to be applicable to the IVC activity. **<u>Environment Agency assessment</u>** **We are satisfied that BATc 7 is not applicable to this Installation.**
8	BAT is to monitor channelled emissions to air with at least the frequency given in BATc 8, 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.	**FC**	BAT 8 is applicable to the biofilter serving the waste reception building, and the vent serving the leachate storage tank (equipped with a carbon filter).

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			The Operator's Regulation 61 response referred to monitoring of H_2S, NH_3 and odour. However, prior to this permit review, the only permitted monitoring requirement was for daily olfactory monitoring (detection at site boundary) to be undertaken. Therefore, the permit has been updated as part of this review to add the relevant emission limits and associated monitoring requirements for the following parameters (for both the biofilter and carbon filter point source emissions), to implement the requirements of BAT 8 (associated with BAT 34): • Odour concentration • NH_3 • H_2S **<u>Environment Agency assessment</u>** **We are satisfied that the Installation will be future compliant with BATc 8. Improvement condition 2 has been included in the permit to achieve compliance (see Annex 3).**
10	BAT is to periodically monitor odour emissions.	**CC**	The Operator confirmed that odour emissions from the IVC activity are monitored bi-annually in accordance with BS EN 13725, however, this

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	Odour emissions can be monitored using: • EN standards (e.g. dynamic olfactometry according to EN 13725 in order to determine the odour concentration or EN 16841-1 or -2 in order to determine the odour exposure); • when applying alternative methods for which no EN standards are available (e.g. estimation of odour impact), ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. The monitoring frequency is determined in the odour management plan (see BAT 12).		monitoring requirement was not specified in the permit. As part of this permit review, the monitoring requirement has been formalised in the permit. The Operator also confirmed that a site inspection and odour assessment are undertaken daily by the IVC site manager or nominated deputy. The odour assessment includes reviewing the odour conditions at each of the following process areas: • Reception building doors (while closed); • Biofilter; • Barrier vessels (all); • Stabilisation and maturation pad; • Shredding area; • Final product storage area. The odour management plan describes the daily olfactory monitoring plan which covers both off-site and on-site locations. One of the olfactory checks ('pre-start') is carried out at Research Park, which the Operator identified as the nearest sensitive receptor. This monitoring informs whether the Installation will undertake any turning or screening operations.

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			<u>Environment Agency assessment</u> **We are satisfied that the Installation is currently compliant with BATc 10.**
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. 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.	**CC**	The Operator confirmed that the annual consumption of water, energy and raw materials is reported on annually, in accordance with their existing permit. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation is currently compliant with BATc 11.**
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;	**FC**	The Installation currently has a draft Odour Management Plan (OMP) which is yet to be approved by the Environment Agency. The Operator addressed the following elements of BAT 12 in their response: **A protocol containing actions and timelines –** The Operator confirmed that they undertook a comprehensive review of emission control options at the Installation in 2017, which resulted in various

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
	• 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.		mitigation options being implemented. Odour mitigation options introduced were: • A reduction in the annual tonnage processed; • Increasing the residence time in the composting vessels; • Increasing the amount of air from the most odorous barriers that is treated by acid scrubbing; • Introducing a 'pre-start' and on-going monitoring protocol to restrict site activities when odour impact is expected to occur as a result. Monthly odour monitoring was undertaken over a six month period during 2018 to evaluate and review the impact of these changes. **A protocol for conducting odour monitoring as set out in BAT 10 –** The draft OMP contains an odour monitoring procedure for routine inspections on-site and also routine inspections off-site. The Operator also confirmed that bi-annual odour monitoring commenced in 2019. The relevant odour monitoring BAT requirements have been included in the permit as part of this permit review.

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			A protocol for response to identified odour incidents, e.g. complaints – The OMP contains an odour complaint response procedure which covers the details of the complainant that are to be recorded, who complaints are communicated to (including timescales for doing so), how odour complaints are investigated, how the findings are then communicated to site management and the relevant site operations reviewed, as well as how promptly feedback will be provided to the complainant. **An odour prevention and reduction programme to:** • **Identify the source(s) –** The OMP includes an inventory of the main odour sources identified by the Operator. • **Characterise contributions of different sources –** The Operator confirmed that the contributions from the different odour sources are understood following the comprehensive review of emission control options carried out in 2017. • **Implement prevention and/or reduction measures –** As summarised above, the Operator investigated odour prevention/reduction measures and implemented these afterwards.

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			Although the Operator addressed a number of the points above, all aspects were not included in the site's OMP, with certain aspects (odour prevention and reduction programme) not addressed in sufficient detail in the OMP. As stated above, the OMP is yet to be approved by the Environment Agency. The following aspects are to be addressed: • Details on the investigation procedures followed to identify the root cause of odour complaints; • Details on the operating parameters, limits and design criteria of abatement plant; • Details on how the abatement systems are monitored to ascertain abatement performance, including the optimal parameters for each abatement system; • Description of the corrective actions taken and contingency measures in place (including timescales for such actions) in the event that odour is detected from the Installation or a given abatement performance parameter is detected to be outside of the optimal operating range; • Further investigation of potential prevention and reduction measures are required for the main odour sources;

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			• The current practice of turning windrows and undertaking post-treatment screening regardless of monitoring parameters (identified through regulatory compliance) is not considered BAT and poses an odour risk;
			• The OMP fails to address the lack of appropriate containment infrastructure:
			  ○ The lack of containment of composting vessels and the fugitive odour emissions associated with these vessels (identified through regulatory compliance);
			  ○ The lack of negative pressure serving the waste reception building and reliance on keeping building doors closed when not in use (identified through regulatory compliance);
			We have included Improvement condition 2 to ensure the Installation demonstrates full compliance with BAT point 12.
			
			<u>Environment Agency assessment</u>
			We are satisfied that the Installation will be future compliant with BATc 12. Improvement condition 2 has been included in the permit to achieve compliance (see Annex 3).

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
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 treatment	**NA**	The Operator stated that they did not consider this BAT point to be relevant to the IVC activity. We agree with this: **(a) Minimising residence times** – This element is only applicable to open treatment systems. **(b) Using chemical treatment** – This element is not applicable where it may hamper the desired output quality. **(c) Optimising aerobic treatment** – This element is only applicable in the case of aerobic treatment of water-based liquid. **Environment Agency assessment** **We are satisfied that BATc 13 is not applicable to this Installation.**
14	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques given below: (a) Minimising the number of potential diffuse emission sources; (b) Selection and use of high-integrity equipment; (c) Corrosion prevention; (d) Containment, collection and treatment of diffuse emissions;	**FC**	The Operator confirmed that they employ an appropriate combination of the following techniques to reduce diffuse emissions to air: **(d) Containment, collection and treatment of diffuse emissions** - The Operator confirmed that the IVC uses an enclosed reception building (which includes fast acting roller doors) for the storage and handling of waste receipts and waste shredding. The Operator also

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
	(e) Dampening; (f) Maintenance; (g) Cleaning of waste treatment and storage areas; (h) Leak detection and repair (LDAR) programme		stated that the building is maintained under negative pressure. However, as detailed later for this BAT point, the Environment Agency is not satisfied that negative pressure is maintained in this building (identified through regulatory compliance). **(f) Maintenance** - The Operator confirmed they have a planned preventative maintenance (PPM) scheme in place for vehicles, plant and machinery. **(g) Cleaning of waste treatment and storage areas** - The Operator confirmed they have a daily cleaning procedure in place for all waste treatment and storage areas. The daily cleaning recording sheet was also provided, which covered different aspects including: • End of day wash of all external concrete that has had vehicle or plant movement on it; • End of day wash-down of the front-end loader; • Cleanliness and litter checks at the boundary of the building; • Contamination checks of the skips; • Cleaning of shredder and ground surrounding shredder.

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			Although the Operator uses a combination of the above techniques to manage diffuse emissions, there are certain aspects that need to be addressed by the Operator: • The Operator has not demonstrated that the waste reception building is adequately sealed and subject to negative pressure to contain diffuse emissions. Evidence is required to demonstrate that this building is maintained under negative pressure; • Our understanding is that the biofilter only provides local extraction above the shredder, and the extraction system in place at the reception building is not designed to provide adequate extraction for the entire waste reception building. This aspect must be considered and addressed in the OMP; • The Operator failed to provide adequate information on the composting vessels and also the leachate tank and surrounding area to demonstrate that they have appropriate odour management techniques in place for these sources; • The fugitive odour risk associated with the following activities must be addressed in sufficient detail: o handling of materials outside the reception building and vessels within ambient air; o materials loaded and stored in the tunnels;

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			○ when the materials are transferred between the two composting stages; ○ the external storage of non-PAS compliant and oversize material currently stored on the OWC area pad. • The capacity of the biofilter limits the use of the biofilter to a maximum of two composting vessels at any one time (identified through regulatory compliance) resulting in a large proportion of the odorous emissions not being treated prior to emission to atmosphere from the other composting vessels. We do not consider this approach to represent BAT for odour control and the Operator is required to address this fugitive odour risk; • The current practice of re-circulating untreated, odorous air within the IVC tunnels (identified through regulatory compliance) is not considered BAT as this is likely to raise the waste temperature and increase the possibility of anaerobic conditions occurring, which could result in increased temperatures and odour emissions. Consequently the dirty air from the IVC tunnels should be extracted to an appropriately designed abatement system, or another suitable alternative should be proposed by the Operator to address this odour risk.

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			Many of the above issues were previously communicated to the Operator in the 2017 report – '*AmeyCespa (East) Ltd: Waterbeach IVC, Report of Site Visit – 10 August 2017'.* We have included Improvement condition 2 to ensure the Installation demonstrates full compliance with BATc point 14. **Environment Agency assessment** **We are satisfied that the Installation will be future compliant with BATc 14. Improvement condition 2 has been included in the permit to achieve compliance (see Annex 3).**
15	BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given below: (a) Correct plant design; (b) Plant management	**NA**	No flaring takes place at the Installation. **Environment Agency assessment** **We are satisfied that BATc 15 is not applicable to this Installation.**

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
16	In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given below: (a) Correct design of flaring devices; (b) Monitoring and recording as part of flare management	**NA**	No flaring takes place at the Installation. **Environment Agency assessment** **We are satisfied that BATc 16 is not applicable to this Installation.**
17	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: I. a protocol containing appropriate actions and timelines; II. a protocol for conducting noise and vibration monitoring; III. a protocol for response to identified noise and vibration events, e.g. complaints; IV. a noise and vibration reduction programme designed to identify the source(s), to measure /estimate noise and vibration exposure, to characterise the contributions of the sources and to implement prevention and /or reduction measures.	**NA**	The Operator confirmed they have a noise risk assessment procedure in place which identifies sources of noise, nearby receptors and corresponding control measures that are in place. Furthermore, the Installation holds a nuisance management plan which addresses noise risk. The Operator considers the noise monitoring and management techniques in place to be proportional to the scale of noise and vibration risk posed by the site. **Environment Agency assessment** The applicability of BATc 17 is restricted to cases where a noise or vibration nuisance at sensitive receptors is expected and/or has been substantiated (which does not apply to this Installation). We are satisfied this is not applicable to the IVC activity.

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			The permit condition 3.4 ensures that the Operator submits a noise management plan in the event emissions of noise and vibration are causing annoyance beyond the site boundary. **We are satisfied that BATc 17 is not applicable to the Installation.**
18	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below: (a) Appropriate location of equipment and buildings; (b) Operational measures; (c) Low noise-equipment; (d) Noise and vibration equipment; (e) Noise attenuation	**CC**	The Operator confirmed that they use a combination of measures to manage and mitigate noise and vibration risks on site. The shredding operation (for incoming wastes) is undertaken within the reception building to minimise the noise emissions from this activity. Furthermore, the site holds procedures for inspection and maintenance of equipment, closing the reception doors as well as ensuring noisy equipment is operated by experienced members of staff. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation is currently compliant with BATc 18.**

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
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: (a) Water management; (b) Water recirculation; (c) Impermeable surface; (d) Techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels; (e) Roofing of waste storage and treatment areas; (f) Segregation of water streams (g) Adequate drainage infrastructure; (h) Design and maintenance provisions to allow detection and repair of leaks (i) Appropriate buffer storage capacity	**CC**	The Operator confirmed that they use a combination of the following techniques: **(a) Water management** – Rainwater run-off from the IVC sheds is collected into a separate lagoon and used for washing on-site surfaces. The waste rejection procedures also aim to minimise the acceptance of any waste which has too high a moisture content for the treatment process, ensuring that very wet wastes are rejected. **(c) Impermeable surface** – The Operator confirmed that the IVC activity is contained within a bund with an impermeable base and confirmed that the design of the IVC storage meets the relevant standard as described in the "Containment systems for the prevention of pollution (C736)" report. No evidence was included within the Regulation 61 response to demonstrate the secondary containment complies with CIRIA C736, therefore, we have decided to include Improvement condition 5 (separate to this BAT point) to address this aspect. For further detail please refer to Annex 3 of this document.

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			(d) Techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels – The Operator confirmed that in addition to the leachate storage tank, there are two overflow bladder tanks adjacent to the leachate tank to avoid overflow during periods of heavy rain. The leachate tank level is monitored daily by site management and the weather forecast is monitored to allow forward planning and increased despatch of leachate from the site by means of registered road tankers. The number of tankers per day is set per the level of leachate within the leachate tank in order to keep the level at a minimum. **(e) Roofing of waste storage and treatment areas –** The IVC building is covered and enclosed to minimise fugitive emissions from this processing area. The composting vessels are comprised of concrete sides, floor and rear wall, a solid steel entrance door and a retractable waterproof fabric roof, which is only ever opened when the vessels are being loaded or unloaded. The leachate tank is also covered. **(f) Segregation of water streams –** The Operator confirmed that process water drainage is segregated from clean roof water arising from the IVC reception building roof. The leachate generated by the

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			IVC activity (from the composting process and also rainwater falling within the contained operational areas) drains to the leachate storage tank, whereas the clean water from the IVC building roof drains directly to a segregated lagoon. **(g) Adequate drainage infrastructure –** Please see (d) above. **(h) Design and maintenance provisions to allow detection and repair of leaks –** The Operator confirmed that the drainage system serving the IVC bunding is inspected on a weekly basis. **(i) Appropriate buffer storage capacity – P**lease see (d) above. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation is currently compliant with BATc 19.**
20	In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given below:	**NA**	The Operator confirmed that waste water generated by the IVC activity is not treated at or discharged from the facility; all process waste water

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	Preliminary and primary treatment, e.g. (a) Equalisation (b) Neutralisation (c) Physical separation, e.g. screens, sieves, grit separators, grease separators, oil-water separation or primary settlement tanks ***Physico-chemical treatment, e.g.*** (d) Adsorption (e) Distillation /rectification (f) Precipitation (g) Chemical oxidation (h) Chemical reduction (i) Evaporation (j) Ion exchange (k) Stripping ***Biological treatment, e.g.*** (l) Activated sludge process (m) Membrane bioreactor		drains to a leachate tank prior to being despatched off-site for treatment by a third party company, and the only emission to water associated with the IVC activity is W1, for clean surface water. Therefore, we do not consider this BAT point to be applicable to the IVC activity. **<u>Environment Agency assessment</u>** **We are satisfied that BATc 20 is not applicable to this Installation.**

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
	(n) Nitrification / denitrification when the treatment includes a biological treatment ***Solids removal, e.g.*** (o) Coagulation and flocculation (p) Sedimentation (q) Filtration (e.g. sand filtration, microfiltration, ultrafiltration) (r) Flotation See also: Table 6.1: BAT-associated emission levels (BAT-AELs) for direct discharges to a receiving water body See also: Table 6.2: BAT-associated emission levels (BAT-AELs) for indirect discharges to a receiving water body		
21	In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques given below, as part of the accident management plan (see BAT 1): (a) Protection measures; (b) Management of incidental /accidental emissions; (c) Incident /accident registration and assessment system	**FC**	The Operator confirmed that the Installation has various procedures embedded within the site EMS to deal with accidents and incidents, including: • Guidance on managing firewater and major spillages; • Guidance on investigating and reporting incidents;

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			• Guidance on assessing significance of incidents and accidents; • Contingency and emergency plan; • Incident response plan; • Fire prevention plan. Although the Operator has detailed these procedures, which could all come under an Accident Management Plan (AMP), we consider that these procedures are all embedded in different aspects of the EMS and not part of a robust AMP which should be a feature of the site's EMS in line with BAT requirements (see BATc 1). Consequently, we consider that the Operator will be future compliant with BATc 21. IC2 has been included in the permit to achieve compliance. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation will be future compliant with BATc 21. Improvement condition 2 has been included in the permit to achieve compliance (Annex 3).**

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
22	In order to use materials efficiently, BAT is to substitute materials with waste. Waste is used instead of other materials for the treatment of wastes (e.g. waste alkalis or waste acids are used for pH adjustment, fly ashes are used as binders).	**NA**	This is not feasible for this process. Few materials are used on site, and where they are currently used there are no suitable alternatives. **Environment Agency assessment** **We are satisfied that BATc 22 is not applicable to this Installation.**
23	In order to use energy efficiently, BAT is to use both of the techniques given below: (a) Energy efficiency plan; (b) Energy balance record	**FC**	The Operator confirmed that an energy audit has been undertaken which details the metering to the IVC, the different uses of energy within the IVC activity and energy saving opportunities. The permit includes energy efficiency conditions which require the Operator to take appropriate measures to ensure energy is used efficiently, and to review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the IVC activity. Furthermore, the Operator is required to report their energy usage to the Environment Agency annually, including primary energy (MWh) and specific energy usage (MWh/unit output). However, we consider that the information provided is insufficient to demonstrate compliance with the requirements of BATc 23. Therefore, we have included IC2 in the permit to achieve compliance. The Operator is required to complete the improvement condition and

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			demonstrate compliance with the Waste Treatment BREF and BAT Conclusions by the compliance date, 17 August 2022. **Environment Agency assessment** **We are satisfied that the Installation will be future compliant with BATc 23. Improvement condition 2 has been included in the permit to achieve compliance (Annex 3).**
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). 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).	**NA**	The Operator confirmed the IVC receives kerbside source-segregated garden and kitchen waste, as well as woody green waste from segregated sources. The Operator stated that they do not consider this BAT point to be applicable to the IVC activity. We agree with this assessment. **Environment Agency assessment** **We are satisfied that BATc 24 is not applicable to this Installation.**
33	In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input.	**CC**	The incoming waste to the IVC process can be broadly categorised into two main waste types; woody green waste and kerbside green

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
	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.		waste. The woody green waste consists of waste from household waste recycling centres (HWRC) and landscapers and typically woody, bulky organic matter. The kerbside green waste is waste collected from households and is typically grass, plant cuttings and meat included kitchen wastes. The primary purpose of the IVC activity is to accept and treat the above wastes under the Cambridgeshire Waste PFI Contract, of which the majority is source selected/controlled material. Please see BAT 2 above which provides details on the waste inputs, acceptance checks and sorting procedures in place to ensure the waste input is suitable for the treatment process. The permitted waste types are restricted only to those suitable for treatment by in-vessel composting. **Environment Agency assessment** **We are satisfied that the Installation is currently compliant with BATc 33.**
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 below: (a) Adsorption;	**CC**	The Operator confirmed that the following techniques are employed to reduce channelled emissions to air from the IVC activity (please refer

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
	(b) Biofilter; (c) Fabric filter; (d) Thermal oxidation; (e) Wet scrubbing See also: 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.		to BAT 3 for further details on what areas of the process these abatement systems serve): • Acid scrubber (wet scrubber) which feeds into an open bed biofilter; • Activated carbon filters (adsorption). For the above channelled emissions the relevant pollutants are: • Odour concentration • NH_3 • H_2S As discussed in BAT 8, the relevant ELVs and associated monitoring requirements have been included in the permit for the biofilter and the carbon filter serving the leachate storage tank. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation is currently compliant with BATc 34.**

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
		FC (BATc 34, Table 6.7)	Improvement condition (IC1) has been included in the permit to achieve compliance with the relevant BAT-AELs, as specified in Table 6.7 of the BAT Conclusions. The operator is required to complete the improvement condition and demonstrate compliance with BAT-AEL by the compliance date, 17 August 2022. In addition to the BAT-AEL, we have inserted the requirement to monitor odour concentration, hydrogen sulphide and ammonia on a 6-monthly frequency in Table S3.4 (process monitoring). As part of the Environment Agency approach to reduce emissions in the Biowaste Treatment sector, we have included the following improvement conditions: <u>Improvement condition for the review of effectiveness of abatement plant</u> Improvement condition 7 (IC7) requires the operator to review abatement plant on site, in order to determine whether existing measures have been effective and adequate to prevent and /or minimise emissions released to air. Where further improvements are identified, the operator is required to implement these measures.

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			<u>Improvement condition for the review of abatement plant design</u> Improvement condition 8 (IC8) requires the operator to review the design of the site ventilation system and abatement plant in order to determine whether it is fit for purpose and effective in controlling odorous compounds in the air streams from site processes. Where further improvements are identified, the operator is required to implement these measures.
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: (a) Segregation of water streams; (b) Water recirculation; (c) Minimisation of the generation of leachate	**CC**	The Operator confirmed that they employ each of the techniques listed in this BAT point: **(a) Segregation of water streams** – The Operator confirmed that all water generated within the IVC processing areas drains to the leachate storage tank, with all roof and non-process water collected from the IVC building roof draining to a segregated lagoon. **(b) Water recirculation** – Segregated rainwater is used for washing of site surfaces. Leachate collected is tankered off-site for disposal.

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			(c) Minimisation of the generation of leachate – The Operator confirmed that site procedures ensure that the generation of leachate is minimised by rejecting any very wet wastes as part of the waste acceptance/rejection process. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation is currently compliant with BATc 35.**
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. 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; • aeration of 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);	**FC**	The Operator confirmed that the following parameters are monitored and/or controlled: • **Waste input characteristics** - The C:N ratio and moisture of kerbside and household waste recycling centre wastes are tested. Upon mixing, the achieved C:N ratio is approximately 30:1, with a target moisture level of between 50-70%. The incoming waste material is shredded to provide a consistent feedstock (green waste + kerbside) size of 400 mm. • **Temperature and moisture content at different points in the windrow** - The site employs Compost Manager software

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
	• windrow porosity, height and width.		to monitor the progress of the windrow process. Each batch is given a unique bar code which is scanned using the management system, allowing all relevant information to be recorded. For example, the system records measurements of oxygen, carbon dioxide, moisture and temperature at three points within each batch, which is undertaken at weekly intervals by site operatives. • **Aeration of the windrow** – As summarised above for temperature and moisture content, the Compost Manager system also monitors windrow aeration and prompts any necessary process changes if required. • **Windrow porosity, height and width** – The Operator confirmed that each windrow is maintained at 2.8 m high and 5 m wide. The size of the windrows is controlled by the cross section of the straddle windrow turner. Although the measures summarised above address a number of the requirements in this BAT point, the following outstanding aspects have been identified:

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			• The pile temperature is not accounted for when removing waste from the composting vessels. Although temperature is monitored, this monitoring is not used to inform odour management of the piles (identified through regulatory compliance); • Although the Compost Manager system provides instructions when to complete certain tasks (e.g. turning windrows), the turning of windrows is not driven by the Compost Manager instructions and notifications, but the limitations imposed by the current infrastructure (identified through regulatory compliance). This results in more frequent turning than is necessary and increases the risk of fugitive emissions associated with windrow turning; • Similarly, the timescales for compost screening are not driven by the process requirements or a stable compost (supported by the use of Compost Manager and monitoring data), but the limitations imposed by the current infrastructure; • The temperature of waste is not monitored prior to screening to determine if screening should take place, thus minimising the control of the risk associated with this activity.

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			Each of the above issues were previously communicated to the Operator in the 2017 report – '*AmeyCespa (East) Ltd: Waterbeach IVC, Report of Site Visit – 10 August 2017'.* We have included Improvement Condition 2 to ensure the Installation demonstrates full compliance with BATc 36. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation will be future compliant with BATc 36. Improvement condition 2 has been included in the permit to achieve compliance (see Annex 3).**
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: (a) Use of semi permeable membrane covers; (b) Adaptation of operations to the meteorological conditions	**CC**	The Operator confirmed that they use the following technique: **(b) Adaptation of operations to the meteorological conditions** – A 'pre-start' check is carried out by a member of the IVC staff at strategic points, including the nearest sensitive receptor prior to operation commencing. If an odour is detected above a set threshold, then turning and screening operations are not started. The findings of the

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
			'pre-start' check are communicated to the Odour Monitoring Officer to allow them to incorporate them into their daily checks. If any odour relating to the IVC operations is detected, then the IVC manager or supervisor will be informed and a decision made to cease turning and screening operations, taking into account the current weather and also weather forecasts. **<u>Environment Agency assessment</u>** **We are satisfied that the Installation is currently compliant with BATc 37.**
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. This includes monitoring and/or control of key waste and process parameters: • pH and alkalinity of the digester feed; • digester operating temperature; • hydraulic and organic loading rates of the digester feed;	**NA**	The IVC activity undertaken is an aerobic biological treatment process. **<u>Environment Agency assessment</u>** **We are satisfied that BATc 38 is not applicable to this Installation.**

BAT Conclusion No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / FC / NC	Assessment of the Installation capability and any alternative techniques proposed by the Operator to demonstrate compliance with the BAT Conclusion requirement
	• concentration of volatile fatty acids (VFA) and ammonia within the digester and digestate; • biogas quantity, composition (e.g. H_2S) and pressure; • liquid and foam levels in the digester.		
39	In order to reduce emissions to air, BAT is to use both of the techniques given below: (a) Segregation of the waste gas streams; (b) Recirculation of waste gas	**NA**	The IVC activity does not include mechanical biological treatment. **Environment Agency assessment** **We are satisfied that BATc 39 is not applicable to this Installation.**

Annex 2: Review and assessment of changes that are not part of the BAT Conclusions derived permit review

Existing Medium Combustion Plant

The Operator confirmed there are no combustion plant or generators associated with the permitted activity.

Bioaerosols monitoring requirements

We assessed bioaerosols monitoring at the facility as part of the permit review. In the Regulation 61 Notice, we asked the Operator to:

a) State if operational processes of biodegradable waste are in open processes within 250 metres of human receptors.

b) Confirm whether or not there are channelled or point source releases within 250 metres that are open sources e.g. biofilters within 250 metres of human sensitive receptors.

c) Confirm whether or not the existing permit already requires bioaerosols monitoring and state:

i. the microbiological markers the permit currently refers to and the relevant limits.

ii. the monitoring standard the permit refers to.

The Operator stated in their Regulation 61 response that:

- The biological process within the IVC is part enclosed and part open-air. The nearest sensitive receptor is located approximately 250 metres from the closest point of the IVC.
- The existing permit (prior to this permit review) required bioaerosols monitoring. The microbiological markers referred to are Total bacteria and Aspergillus fumigatus, and the monitoring standard referred to is - 'Technical Guidance Note M9 – Environmental monitoring of bioaerosols at regulated facilities'.

We are satisfied that the existing permit conditions and monitoring requirements for bioaerosols are in line with the current standards. We consider it necessary to retain the existing bioaerosols monitoring requirements.

Soil & groundwater risk assessment (baseline report)

The IED requires that the Operator of any IED Installation using, producing or releasing "relevant hazardous substances" (RHS) shall, having regarded the possibility that they might cause pollution of soil and groundwater, submit a "baseline report" with its permit application. The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the regulated facility and at cessation of activities. It must enable a quantified comparison to be made between the baseline and the state of the site at surrender.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into account both the baseline conditions and the site's current or approved

future use. To do this, the Operator has to submit a surrender application to us, which we will not grant unless and until we are satisfied that these requirements have been met.

The Operator stated the following in their Regulation 61 response:

- The majority of the IVC site was uncontained historic landfill prior to construction.
- A ground condition survey of the reception and vessel areas was undertaken prior to commencement of the IVC construction. The historic waste was not removed, rather, it was 'dynamically compacted' and then concreted over.
- All potentially hazardous substances used at the IVC – sulphuric acid, gas oil, and hydraulic oils have been stored in appropriate containers. Drums are stored on bunded pallets, IBCs within a purpose built steel bunded container.
- All materials have been stored on concreted areas, and no storage has occurred on permeable areas.
- There is no material risk of groundwater or soil contamination from the current activities.

We have included two improvement conditions in the permit which require the Operator to:

- Submit an updated site condition report which includes baseline soil and groundwater data (Improvement Condition 3);
- Where the risk assessment carried out under IC3 above establishes a risk to soil and groundwater:
    - Prepare and submit a baseline report compliant with Article 22 of the Industrial Emissions Directive (IED) containing information necessary to determine the current state of soil and groundwater contamination; or
    - Provide a summary report referring to information previously submitted where the Operator is satisfied that such information represents the current state of soil and groundwater contamination (Improvement Condition 4).

This approach will enable a quantified comparison to be made with the state of the soil and groundwater contamination upon definitive cessation of activity.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the Operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate
- the environmental risk assessment is acceptable.

We have removed the following wastes from the permit as the operator confirmed they are no longer accepted and treated by IVC and could be removed from the permit (correspondence dated 19 August 2020).

EWC code	Description
02 04 01	Soil from cleaning and washing beet
04 02 21	Wastes from unprocessed textile fibres

04 02 22	Wastes from processed textile fibres.
17 02 01	Wood
19 12 07	Wood other than that mentioned in 19 12 06
20 01 38	Wood other than that mentioned in 20 01 37

We have also removed the following wastes from the permit as the operator confirmed they are no longer accepted and treated by OWC and could be removed from the permit (correspondence dated 19 August 2020).

EWC code	**Description**
02 04 01	Soil from cleaning and washing beet
17 02 01	Wood
19 12 07	Wood other than that mentioned in 19 12 06
20 01 38	Wood other than that mentioned in 20 01 37

Secondary containment and storage infrastructure

Risk assessment for secondary containment and storage lagoons

We assessed secondary containment as part of the permit review. In the Regulation 61 Notice, we asked the Operator to:

a) describe any secondary containment and whether it currently meets the relevant standard in the "Containment systems for the prevention of pollution (C736)" report, where the activity has above-ground storage or primary containment.

b) describe how the construction of any storage lagoons meet CIRIA 736 report.

c) explain why the current design and construction of the secondary containment is fit for purpose, and enable a baseline standard so as to establish a quantified comparison where it is concluded that secondary containment is not required or does not need to meet the standards in the C736 report.

d) confirm if any storage lagoons on site are covered to prevent emission loss.

e) confirm that the operational storage capacity on site provides a minimum of two months storage.

The Operator confirmed that:

- The IVC activity has above ground storage tanks (IBCs) for concentrated sulphuric acid, ammonium sulphate and dirty water/leachate.
- There are no storage lagoons present on-site (although there is an off-site surface water lagoon).
- The sulphuric acid and ammonium sulphate tanks are approved intermediate bulk containers (IBCs) which are housed within a purpose built proprietary steel bunded container.
- The leachate storage tank is a steel frame tank with HDPE flexible liner. The number of tankers per day is set per the level of leachate within the leachate tank in order to keep the leachate tank level at a minimum. In the event the tank was to overflow, the liquid would be collected in two bladder tanks which are directly connected to the main tank overflow line. In the event that the site

experiences extreme rainfall, and both the leachate tank and bladder tanks are full, then excess water will be collected on the bunded concrete pad.
- The design of the liquid storage meets the relevant standard as described in the CIRIA C736 guidance.

Although the above information in relation to secondary containment and storage infrastructure was provided, the Operator did not provide any evidence to support the statement that the existing secondary containment meets the CIRIA 736 standard. We have therefore set an Improvement Condition (IC5) in the permit to address this aspect of the permit review.

Improvement Condition 5 requires the Operator to submit a site secondary containment plan within 12 months of the permit issue. The plan shall contain details of:

- the condition and extent of the site secondary containment and storage systems, where all polluting liquids and solids are being stored, treated, and/or handled;
- individual improvement measures necessary for the site secondary containment and storage systems to adhere to the standards detailed/referenced within CIRIA C736 (2014), or equivalent.
- timescales for implementation of the individual measures

Improvement Condition 5 requires the Operator to implement the secondary containment and storage plan within the timescales approved by the Environment Agency.

Primary Containment

We assessed primary containment as part of the permit review. This information was not requested in the Regulation 61 Notice issued to the Operator, however, it was considered prudent to address this aspect as part of the permit review process. In this instance, the required information relating to the review of primary containment infrastructure against CIRIA C598 was not previously submitted to the Environment Agency, nor was it included in the supporting documentation submitted by the Operator in their Regulation 61 response.

We have therefore set an Improvement Condition (IC6) in the permit to address this aspect of the permit review. See Improvement condition 6 in Annex 3 of this decision document.

Annex 3: Improvement Conditions

Based on the information in the Operator's Regulation 61 Notice response and our own records of the capability and performance of the Installation at this site, we consider that we need to set Improvement Conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the Installation. These Improvement Conditions are set out below - justifications for them is provided at the relevant section of the decision document (Annex 1 or Annex 2).

If the consolidated permit contains existing Improvement Conditions that are not yet complete or the opportunity has been taken to delete completed Improvement Conditions then the numbering in the table below will not be consecutive as these are only the Improvement Conditions arising from this permit variation.

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
Improvement condition for progress report to achieve BAT-AELs		
IC1	The Operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the Best Available Techniques Conclusion Associated Emission Levels (BAT-AELs) where BAT is currently not achieved, but will be achieved before 17 August 2022. The report shall include, but not be limited to, the following: 1) Current performance against the BAT-AELs. 2) Methodology for reaching the BAT-AELs. 3) Associated targets /timelines for reaching compliance by 17 August 2022. 4) Any alterations to the initial plan (in progress reports). The report shall address the BAT Conclusions for Waste Treatment with respect to the following: • **BAT 34 Table 6.7** (compliance with BAT-AELs for channelled NH_3, odour, dust and TVOC emissions to air from the biological treatment of waste) Refer to BAT Conclusions for a full description of the BAT requirement.	Progress reports at six monthly intervals from date of permit issue: 15/03/2021 15/09/2021 15/03/2022
Improvement condition for progress report to achieve Narrative BAT		
IC2	The Operator shall submit, for approval by Environment Agency, a report setting out progress to achieving the 'Narrative' BAT where BAT is currently not achieved, but will be achieved before 17 August 2022. The report shall include, but not be limited to, the following: 1) Methodology for achieving BAT	Progress reports at six monthly intervals from date of permit issue: 15/03/2021 15/09/2021

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	2) Associated targets /timelines for reaching compliance by 17 August 2022 3) Any alterations to the initial plan (in progress reports). The report shall address the BAT Conclusions for Waste Treatment with respect to BAT 1, 3, 4, 8, 12, 14, 21, 23 and 36.	15/03/2022
Improvement condition for site risk assessment to prevent soil & groundwater pollution		
IC3	The Operator shall submit to the Environment Agency for approval a risk assessment considering the possibility of soil and groundwater contamination at the Installation where the activity involves the use, production or release of a relevant hazardous substance (as defined in Article 3(18) of the Industrial Emissions Directive). The risk assessment shall clearly establish with appropriate evidence whether or not there is a risk of contamination of soil and groundwater and should follow the Defra Guidance – Industrial Emissions Directive EPR Guidance on Part A Installations (Section 5.10-5.15, pages 28-29 - Baseline Reports and Permit Surrender).	15/09/2021
IC4	Where the risk assessment carried out under IC4 above establishes a risk to soil and groundwater, the Operator shall: a) prepare and submit a baseline report compliant with Article 22 of the Industrial Emissions Directive (IED) containing information necessary to determine the current state of soil and groundwater contamination; or b) provide a summary report referring to information previously submitted where the Operator is satisfied that such information represents the current state of soil and groundwater contamination, so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity.	15/09/2021 or other date as agreed in writing with the Environment Agency
Improvement condition for secondary containment		
IC5	The operator shall submit a written 'secondary and tertiary containment plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of a review conducted, by a competent person, in accordance	15/09/2021 or other date as agreed in writing with the

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	with the risk assessment methodology detailed within CIRIA C736 (2014) guidance, of the condition and extent of secondary and tertiary containment systems where all polluting liquids and solids are being stored, treated, and/or handled. The review shall consider, but not limited to, the storage vessels, bunds, loading and unloading areas, transfer pipework/pumps, temporary storage areas, and liners underlying the site. The plan must contain dates for the implementation of individual improvement measures necessary for the secondary and tertiary containment systems to adhere to the standards detailed/referenced within CIRIA C736 (2014) guidance, or equivalent. The plan shall be implemented in accordance with the Environment Agency's written approval.	Environment Agency
Improvement condition for primary containment		
IC6	The operator shall submit a written 'primary containment plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of a review conducted, by a competent person, and shall compare the design specification of primary containment systems where all polluting liquids and solids are being stored, treated, and/or handled against the design standards within CIRIA C598 guidance or equivalent. The review shall include: • physical condition of all primary containment systems (storage and treatment vessels); • the suitability for providing primary containment when subjected to the dynamic and static loads caused by the vessels' contents; • any work required to ensure compliance with the standards set out in CIRIA C598 or equivalent; and • a preventative maintenance and inspection regime The plan must contain dates for the implementation of individual improvement measures necessary for the primary containment to adhere to the standards detailed/referenced within CIRIA C598 guidance, or equivalent. The plan shall be implemented in accordance with the Environment Agency's written approval.	15/09/2021 or other date as agreed in writing with the Environment Agency

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
Improvement condition for review of effectiveness of abatement plant		
IC7	The operator shall carry out a review of the abatement plant on site, in order to determine whether the measures have been effective and adequate to prevent and where not possible minimise emissions released to air including but not limited to odour and ammonia. The operator shall submit a written report to the Environment Agency following this review for assessment and approval. The report shall include but not limited to the following aspects: • Full investigation and characterisation of the waste gas streams. • Abatement emissions monitoring results (not limited to odour and ammonia) • Abatement process monitoring results (not limited to odour and ammonia) • Details of air quality quantitative impact assessment including modelling and a proposal for site-specific “action levels” (not limited to odour concentration, hydrogen sulphide and ammonia). • Odour monitoring results at the site boundary • Records of odour complaints and odour related incidents • Recommendations for improvement including the replacement or upgrading the abatement plant • Timescales for implementation of improvements to the abatement plant The operator shall implement the improvements in line with the timescales as approved by the Environment Agency.	15/09/2021 or other date as agreed in writing with the Environment Agency
Improvement condition for review of abatement plant design		
IC8	The operator shall submit to the Environment Agency a written review report of the design details of the site ventilation system and abatement plant and obtain the Environment Agency’s written approval to it. The report shall include but not limited to: a) Ventilation design performance criteria for effective fugitive odorous emission control	15/09/2021 or other date as agreed in writing with the Environment Agency

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	b) Design of the abatement systems that will ensure compliance with the odour condition 3.3. The report shall include a demonstration (whether by a detailed review of technical papers or by trial results) that all odorous chemical compounds and their loading rates expected in the relevant air streams have been considered in the design; and supporting evidence that the odorous compounds will be controlled and/or abated either by operating techniques or by the proposed abatement systems. c) Design alarms and triggers for each relevant scenario to alert the operator to the malfunction of both ventilation and abatement systems. The report should further list all relevant contingency mitigation actions to minimise risk of elevated odour pollution from the installation linked to each malfunction scenario and detail the actions to restore systems to normal operating conditions for effective odour control. Ventilation and abatement systems should be designed by suitably qualified named engineers who can supervise and sign-off on construction quality assurance.	

Annex 4: Pre-operational measures for future development

Based on the information in the Operator's Regulation 61 Notice response and our own records of the capability and performance of the Installation at this site, we consider that we need to set a pre-operational measure for future development so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the Installation prior to the S5.4 A (1) (b) (i) Open windrow composting (OWC) activity being restarted.

Table S1.4 Pre-operational measures for future development		
Reference	**Operation**	**Pre-operational measures**
1	Open windrow composting operation (AR2)	At least 6 months prior to restarting the open windrows composting operation, the operator shall submit a BAT report to the Environment Agency for review and approval. The report shall include but not limited to an assessment of compliance of the proposed open windrow composting operation against the Waste Treatment BAT Conclusions (current at the time). The open windrows composting operation shall not be restarted until agreed and approved by the Environment Agency.