



# BEST AVAILABLE TECHNIQUE ASSESSMENT

Environmental and sustainability solutions provided to  
**RESOURCE RECYCLING SOLUTIONS LIMITED**



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## 1.0 INTRODUCTION

### 1.1 Context & Scope

Resource Recycling Solutions Ltd (hereby referred to as “RRS”) have commissioned Walker Resource Management Ltd (hereon ‘WRM’) to undertake a Best Available Techniques (BAT) Assessment of the existing Composting Facility at their site at Iron House Farm, Lancaster Road, Out Rawcliffe, Preston, Lancashire, United Kingdom, PR3 6BP (the ‘Treatment Facility’).

In October 2021, RRS submitted a BAT assessment in response to a Regulation 61 Notice issued by the Environment Agency (EA) in relation to the open windrow composting (OWC) operations at the Site operated by RRS under an Environmental Permit (EPR/QB3036RB).

RRS are now seeking consent to vary their existing permit and process up to 75,000 tonnes a year of non-hazardous food waste from primarily from kerbside collected, civic amenity and commercial waste streams. The food waste may be comingled (food and garden waste) or source segregated. RRS are also seeking permission to treat wood waste, screen and blend waste to produce a soil and use waste in construction.

The intention of this report is to carry out an independent Best Available Technique (BAT) assessment of the Treatment Facility operations for the purposes of Environment Agency (EA) permitting requirements. The BAT assessment addresses how the site meets the BAT standards contained within the Best Available Techniques (BAT) Reference Document for Waste Treatment 2018 (BREF) 1. The BREF 2018 document, as well as the Commission Implementing Decision (EU) 2018/1147, have been consulted in order to ensure this BAT Assessment meets the requirements of legislation for Waste Treatment activities.

### 1.2 Legislative Background

In accordance with paragraph 6(1) of the Environmental Permitting (England and Wales) Regulations 2016 (EPR)<sup>2</sup>, the EA must be informed of developments in best available techniques and of the publication of any new or updated BAT conclusions. Furthermore, guidance published by the EA and the Department for Environment, Food & Rural Affairs

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<sup>1</sup> [Best Available Technique Reference Documents](#)

<sup>2</sup> [The Environmental Permitting \(England and Wales\) Regulations 2016](#)

(DEFRA) on addressing BAT within environmental permit applications notes that applicants must state whether they are going to follow each BAT that applies to their activity, or propose an alternative.

The latest BREF for Waste Treatment activities was published in 2018 and this process ensures the Environmental Permit for the Site is in line with the latest set of BAT standards. The BREF for Waste Treatment activities, as well as the Commission Implementing Decision (EU) 2018/1147, have been consulted in order to ensure this BAT Assessment meets the requirements of legislation and to ensure the site meets the required standards of compliance.

## 2.0 BAT ASSESSMENT

### 2.1 Description of Information Required

As a requirement under the Environmental Permitting (England and Wales) Regulations 2016, the environmental management system for the Iron House Farm Treatment Facility has been assessed against each relevant BAT conclusion to determine how the operator currently does or does not meet each BAT conclusion. As part of this assessment, the following information is provided for each BAT conclusion, where applicable:

- a) *Confirm whether or not you currently comply with each requirement, providing a description of how you meet the standard.*
  - b) *Where you do not currently comply with a requirement, describe how you intend to fully comply with the requirement.*
  - c) *Where you do not intend to comply with a requirement but intend to undertake the activity using alternative technique(s), you will need to apply to the Environment Agency for a derogation in sufficient time for this to be agreed. Confirm this intention.*
  - d) *Where you intend to cease operating an activity because you cannot comply with BAT, confirm this intention.*
  - e) *Where your activity has above ground storage or primary containment (tanks and/or vessels) used for the storage and treatment of waste, provide a detailed report which describes an assessment of the suitability of the existing primary containment in comparison to the relevant standard in the CIRIA C736 guidance or another equivalent industry standard.*
  - f) *Where your activity has above ground storage or primary containment and/or storage lagoons, provide a detailed report which describes an assessment of the suitability of*
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*the existing secondary containment and storage lagoons in comparison to the relevant standard in the CIRIA 736 guidance "Containment systems for the prevention of pollution". The report should follow the methodology for existing facilities which consists of a risk assessment.*

- g) Further to 1F, where you have concluded that secondary containment and/or storage lagoons are not required or does not need to meet the standards in the C736 guidance, explain why the current design and construction is fit for purpose, to enable a baseline standard so as to establish a quantified comparison.*
- h) Confirm if storage lagoons used for the storage and treatment of waste and non-waste are provided with appropriate covering to prevent emission loss.*
- i) Confirm if the site operational storage capacity provides a minimum of two months storage of compost.*

All non-site-specific information contained within the Commission Implementing Decision (EU) 2018/1147, containing the BAT conclusions, has been scrutinised but is not mentioned within this document to eliminate any potential confusion.

## 2.2 Definition of Best Available Techniques

The IED defines BAT as *"... the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole".*

Article 3, Definitions, of the IED further defines the component parts of BAT as:

- *"Best" – "means most effective in achieving a high general level of protection of the environment as a whole".*
- *"Available techniques" – "means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages ...".*
- *"Techniques" – "includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned".*

BAT may be demonstrated by either:

- Compliance with the sector-level, indicative BAT performance described in the Sector Guidance Notes (SGNs) produced by the Environment Agency and in the European Commission 'Reference Documents on BAT' (BREFs); or
- By conducting an installation-specific options appraisal of candidate techniques.

### 3.0 ASSESSMENT

The first phase of the process is to assess site activities and the associated permit management system against each of the relevant BAT conclusions. Following this, sections 3.2 and 3.3 contain the assessment against BAT conclusions for the biological treatment of waste as well as the BAT conclusions for the aerobic treatment of waste. The following tables have been produced from the Annex contained within the Commission Implementing Decision (EU) 2018/1147. Please note, as stated within the Commission Implementing Decision (EU) 2018/1147, the scope (e.g. level of detail) and nature of how the site addresses the BAT conclusions will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have (determined also by the type and quantity of wastes processed).

Each table below is grouped into the relevant area of the BAT conclusions and then individual rows compare information from BAT guidance with information from the relevant section of the management system or other site documents. The management system as well as other key documents, forming the permit management system, have been consulted with in order to undertake this BAT Assessment.



### 3.1 General BAT Conclusions

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
01	<p>In order to maintain a high level of environmental performance, BAT is to implement and adhere to an Environmental Management System (EMS) incorporating all of the following features (where applicable):</p> <ol style="list-style-type: none"> <li>I. commitment of the management, including senior management;</li> <li>II. definition, by the management, of an environmental policy that includes the continuous improvement of the environmental performance of the installation;</li> <li>III. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;</li> <li>IV. implementation of procedures paying particular attention to: <ol style="list-style-type: none"> <li>a) structure and responsibility,</li> <li>b) recruitment, training, awareness and competence,</li> <li>c) communication,</li> <li>d) employee involvement,</li> <li>e) documentation,</li> <li>f) effective process control,</li> <li>g) maintenance programmes,</li> <li>h) emergency preparedness and response,</li> </ol> </li> </ol>	<p>RRS are accredited to the PAS 100:2018 scheme. As part of this certification a suite of documents have been developed and implemented on site to enable the production of PAS 100 compost. The Site Manager, Julie Gardner, is responsible for the organisation's Compost Quality Management System (QMS), ensuring that all the requirements of PAS 100 are complied with. The COTC holder for the site is Julie Gardner. The PAS system is reviewed and externally audited on an annual basis and involves Senior Management.</p> <p>Operatives who are involved in the production of PAS 100 compost are trained on effective process control covering areas such as load acceptance, tipping, sorting, shredding, turning and screening. Training records are maintained for each Site Operative, together with a record of communication of awareness of the relevance and importance of their activities in relation to compost quality policy. Such records shall be updated on an annual basis, or as and when required.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
	<p>i) safeguarding compliance with environmental legislation;</p> <p>V. checking performance and taking corrective action, paying particular attention to:</p> <p>a. monitoring and measurement (see also the JRC Reference Report on Monitoring of emissions to air and water from IED installations – ROM),</p> <p>b. corrective and preventive action,</p> <p>c. maintenance of records,</p> <p>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;</p> <p>VI. review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness;</p> <p>VII. following the development of cleaner technologies;</p> <p>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;</p> <p>IX. application of sectoral benchmarking on a regular basis;</p> <p>X. waste stream management (see BAT 2);</p>	<p>Operations taking place on site are detailed within the PAS 100 Site Operational Procedures (SOPs). In order to claim conformance to the PAS 100 standard, RRS must demonstrate that the SOPs have been effectively implemented within daily operational procedures. This is evidenced through Batch Monitoring and Record forms.</p> <p>To further demonstrate that effective process control is maintained, RRS test the compost to verify the product is of PAS 100 quality according to the requirements of PAS 100 which means that a sample is taken and analysed for every 2,500t of produced compost. This sampling is carried out by operatives who are appropriately trained in line with BS EN 12579 (2013) on sampling composted materials in accordance with BSI PAS 100:2018. In the event that a compost sample should fail sampling, one of the following actions shall be taken:</p> <ul style="list-style-type: none"> <li>Undergo corrective action then be sampled and tested in terms of the parameter(s) relevant for evaluating efficacy of the QMS change or the corrective action;</li> </ul>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
	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).	<ul style="list-style-type: none"> <li>undergo re-composting with or without addition of further input material as appropriate, then be sampled and tested in terms of the parameter(s) relevant for evaluating efficacy of the corrective action; or</li> <li>be dispatched for use, processing elsewhere or disposal, and the recipient and regulator notified of the nature of its non-conformity with PAS 100.</li> </ul> <p>A log of which action has been taken is maintained through the appropriate QMS record sheet and inspected annually as part of the PAS 100 certification scheme. Following a failure to meet the quality criteria, actions within the 'Failed Batch Investigation Record Sheet' will be carried out and recorded.</p> <p><b>Organisation Structure, Training and Competency</b></p> <p>All staff are appropriately trained before working on the site and operating equipment. RRS operates in a structured way and delegates responsibilities within the company to ensure effective communication and employee involvement. Although, this could be evidenced through a</p>

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		<p>formal training log to summarise the training modules individuals have taken part in.</p> <p><b>Effective Process Control</b></p> <p>RRS are able to maintain high levels of process control through the combination of operational procedures and monitoring of all stages of the composting process. The regular monitoring and measurement of site processes and any environmental impacts such as odour, bioaerosols, noise and vibration are recorded and available for inspection, should it be requested. RRS also conduct and record daily site checks to assess a number of variables including within the environmental permit documents, including, but not limited to: site security, odour, litter, pests, mud &amp; debris and drainage systems.</p> <p><b>BC01 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

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02	<p>In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques given below.</p> <p><b>a) Set up and implement waste characterisation and pre-acceptance procedures</b> - These procedures aim to ensure the technical (and legal) suitability of waste treatment operations for a particular waste prior to the arrival of the waste at the plant. They include procedures to collect information about the waste input and may include waste sampling and characterisation to achieve sufficient knowledge of the waste composition. Waste pre-acceptance procedures are risk-based considering, for example, the hazardous properties of the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, as well as the information provided by the previous waste holder(s).</p> <p><b>b) Set up and implement waste acceptance procedures</b> - Acceptance procedures aim to confirm the characteristics of the waste, as identified in the pre-acceptance stage. These procedures define the elements to be verified upon the arrival of the waste at the plant as well as the waste acceptance and rejection criteria. They may include waste sampling, inspection and analysis. Waste</p>	<p>Hazards that may affect the safety and quality of compost have been reviewed within the Safety &amp; Quality Control System (SQCS) document. The SQCS assessment is externally reviewed as part of the annual management review. This is to ensure it stays up to date with customers' needs, processing technologies, input materials, and any new hazards that emerge.</p> <p>Due to the low risk that the allowable inputs pose, waste sampling and characterisation is not undertaken at present.</p> <p>The acceptance and processing of incorrect waste material is one of the hazards which forms part of the SQCS. RRS have implemented robust waste acceptance procedures to ensure that hazards are controlled to an acceptable level. RRS have implemented pre-acceptance procedures that will reduce the likelihood of any non-permitted or contaminated wastes from being accepted and subsequently processed at the site.</p>

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	<p>acceptance procedures are risk- based considering, for example, the hazardous properties of the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, as well as the information provided by the previous waste holder(s).</p> <p><b>c) Set up and implement a waste tracking system and inventory -</b> A waste tracking system and inventory aim to track the location and quantity of waste in the plant. It holds all the information generated during waste pre-acceptance procedures (e.g. date of arrival at the plant and unique reference number of the waste, information on the previous waste holder(s), pre-acceptance and acceptance analysis results, intended treatment route, nature and quantity of the waste held on site including all identified hazards), acceptance, storage, treatment and/or transfer off site. The waste tracking system is risk-based considering, for example, the hazardous properties of the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, as well as the information provided by the previous waste holder(s).</p> <p><b>d) Set up and implement an output quality management system -</b> This technique involves setting up and implementing an output</p>	<p>Furthermore, incoming waste is subject to visual inspection upon arrival at site. Input material containing material contrary other than biodegradable waste (EWC 20 02 01 or EWC 20 01 08) or failing the acceptance criteria for input loads is removed from the composting site. Prior to removal, the rejected load shall be kept separate from other loads awaiting inspection or processing to ensure no cross-contamination occurs. Should a load have a high physical contaminant or toxic plant content, but still &lt;5%, the load shall be accepted, and the contaminants shall be removed as far as practically possible and places into a “rejects” container stored on site. The contents of this container shall be regularly removed for disposal.</p> <p>All rejected loads or loads subject to contaminant removal shall have their Load Inspection Score and action taken logged into the ‘Input Load Inspection Record Sheet’.</p>

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	<p>quality management system, so as to ensure that the output of the waste treatment is in line with the expectations, using for example existing EN standards. This management system also allows the performance of the waste treatment to be monitored and optimised, and for this purpose may include a material flow analysis of relevant components throughout the waste treatment. The use of a material flow analysis is risk-based considering, for example, the hazardous properties of the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, as well as the information provided by the previous waste holder(s).</p> <p><b>e) Ensure waste segregation</b> - Waste is kept separated depending on its properties in order to enable easier and environmentally safer storage and treatment. Waste segregation relies on the physical separation of waste and on procedures that identify when and where wastes are stored.</p> <p><b>f) Ensure waste compatibility prior to mixing or blending of waste</b> - Compatibility is ensured by a set of verification measures and tests in order to detect any unwanted and/or potentially dangerous chemical reactions between wastes (e.g. polymerisation, gas evolution, exothermal reaction, decomposition, crystallisation,</p>	<p>The SQCS required under the PAS 100 system contains a process flow of the composting process, from waste acceptance to dispatch offsite.</p> <p><b>Traceability</b></p> <p>In line with the requirements of the environmental permit, RRS maintain a record system connecting sources of wastes with delivery dates and weights. Details of the waste carrier, waste type, waste code, client/source, quantity (tonnes) of waste and delivery date shall be recorded on a Waste Transfer Note and a central computer. Compost batches are created one at a time, with batch formation start and finish dates recorded within the 'Batch Formation and Monitoring Record Sheet'. This enables the waste within each batch to be traced back to the original source.</p> <p>RRS keep a record of the location and quantity of waste on site as well as the waste recovery code, destination and quantities of waste dispatched offsite. This information is supplied in the quarterly/annual</p>

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	<p>precipitation) when mixing, blending or carrying out other treatment operations. The compatibility tests are risk-based considering, for example, the hazardous properties of the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, as well as the information provided by the previous waste holder(s).</p> <p>g) <b>Sort incoming solid waste</b> - Sorting of incoming solid waste aims to prevent unwanted material from entering subsequent waste treatment process(es). It may include:</p> <ul style="list-style-type: none"> <li>– manual separation by means of visual examinations;</li> <li>– ferrous metals, non-ferrous metals or all-metals separation;</li> <li>– optical separation, e.g. by near-infrared spectroscopy or X-ray systems;</li> <li>– density separation, e.g. by air classification, sink-float tanks, vibration tables;</li> <li>– size separation by screening/sieving.</li> </ul>	<p>waste returns. Weighbridge tickets are also archived and inspected during the audit review process of the PAS 100 system.</p> <p><b>BC02 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>



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03	<p>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:</p> <p>(i) information about the characteristics of the waste to be treated and the waste treatment processes, including:</p> <ol style="list-style-type: none"> <li>simplified process flow sheets that show the origin of the emissions;</li> <li>descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances;</li> </ol> <p>(ii) information about the characteristics of the waste water streams, such as:</p> <ol style="list-style-type: none"> <li>average values and variability of flow, pH, temperature, and conductivity;</li> <li>average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, priority substances/micropollutants);</li> </ol>	<p>RRS do not discharge any of the generated wastewater into a water course, therefore this section of the BAT question is not considered relevant.</p> <p>There are three leachate tanks located at the Treatment Facility. All storage tanks are checked on a weekly basis for signs of damage or failure.</p> <p>The composting pad is impermeable concrete, where the northern half of the composting pad falls from the north to the south, with the southern half constructed with a fall from south to north. As such, any wastewater (leachate) which is generated on the composting pad is captured within the surface drains located at the centre of the composting pad and will subsequently be directed to one of the leachate tanks located to the east of the composting pad within the treatment facility boundary. The leachate/surface water is directed to the tanks via the use of pumps. The tanks are never kept at capacity as leachate from the tank is regularly re-</p>

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	<p>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);</p> <p>(iii) information about the characteristics of the waste gas streams, such as:</p> <p>a) average values and variability of flow and temperature;</p> <p>b) average concentration and load values of relevant substances and their variability (e.g. organic compounds, POPs such as PCBs);</p> <p>c) flammability, lower and higher explosive limits, reactivity;</p> <p>d) presence of other substances that may affect the waste gas treatment system or plant safety (e.g. oxygen, nitrogen, water vapour, dust).</p>	<p>circulated into the compost. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p> <p>The IVC building for green waste, comingled food and green waste deliveries is located at the western side of the treatment facility site. Green waste, food waste, or comingled (green and food waste) will be deposited on the reception building floor, separated by waste stream and in clearly designated areas. The reception building floor is constructed of impermeable concrete. All leachate drainage channels for the waste reception will be cut into the concrete floor and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in the waste reception area will direct leachate from south to north &amp; east to west. The concrete floor also features falls ensuring leachate flows into the designated 'dirty area' channel and does not enter the APBR designated 'clean area' corridor that is situated in front of the tunnels. Leachate exits the building at the southern portion of the western edge into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent to the biofilter. The tank will be constructed of concrete and feature a</p>

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		<p>corrugated steel cladding. Collected leachate is to be re-used when moistening of waste material during the batch formation phase within the tunnels.</p> <p>Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel entrance. A singular enclosed drainage channel runs along the front of the tunnel entrance points. This leachate drainage channel runs south to north and then east to west along the northern edge of the waste reception hall, directing leachate into the enclosed external drainage channel on the western edge of the building. Leachate will then flow northward to the leachate storage tank.</p> <p>The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels &amp; corridor) have dedicated drainage channels within the IVC building. This enables separation of processed and unprocessed materials preventing leachate related cross contamination between the area.</p>

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		<p>The level of leachate within the tank is monitored regularly to ensure that the tank is never kept at capacity due to being reused at the batch formation phase of the IVC process. If required, unpasteurised (unsanitised) leachate from the reception building leachate tank will be removed from site and treated at an appropriately licenced facility.</p> <p>The IVC building and the composting pad will operate using different drainage systems that result in the comingled food and green waste leachate and green waste only leachate being stored in separate leachate tanks. In the event of a fire and the requirement to store firewater both tanks can be used, however any process material contaminated with ABPR leachate must be removed from the OWC area and appropriately treated to prevent any further cross-contamination of waste.</p> <p>One double walled fuel tank is stored on-site which can take 110% of the volume of fuel stored in the tank. The tank is clearly marked and carries signs showing the material contained within and its maximum capacity.</p>

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		<p>Material is not stored or transported within 6m of the fuel tank unless they are refuelling.</p> <p>Emissions to air mostly take the form of open-air emissions so an inventory of waste gas streams is not seen to be required. Air extracted from the IVC reception hall and tunnels will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess</p>

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		<p>condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%.</p> <p>As part of the PAS 100 management system, there is a process flow within the SQCS. This is seen to provide the descriptions of the process-integrated techniques. As this is the case the operator is of the view that a number of elements in this BAT conclusion are not required.</p> <p><b>BC03 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
04	<p>In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below.</p> <p>a) <b>Optimised storage location</b> (Generally applicable to new plants) - This includes techniques such as:</p> <ul style="list-style-type: none"> <li>- the storage is located as far as technically and economically possible from sensitive receptors, watercourses, etc.;</li> <li>- the storage is located in such a way so as to eliminate or minimise the unnecessary handling of wastes within the plant (e.g. the same wastes are handled twice or more or the transport distances on site are unnecessarily long).</li> </ul> <p>b) <b>Adequate storage capacity</b> (Generally applicable) - Measures are taken to avoid accumulation of waste, such as:</p> <ul style="list-style-type: none"> <li>- the maximum waste storage capacity is clearly established and not exceeded taking into account the characteristics of the wastes (e.g. regarding the risk of fire) and the treatment capacity;</li> <li>- the quantity of waste stored is regularly monitored against the maximum allowed storage capacity;</li> <li>- the maximum residence time of waste is clearly established.</li> </ul>	<p>With regards to Technique A, it is of the view of the Operator that it is not applicable for green waste storage, as the site is well established and has been operating for a number of years. However, there are a range of measures in place to mitigate any impact to sensitive receptors from waste storage of green wastes, food wastes only or comingled wastes delivered to the IVC building, located within the western side of the treatment facility boundary.</p> <p>The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting. For pedestrians</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
	<p>c) <b>Safe storage operation</b> (Generally applicable) - This includes measures such as:</p> <ul style="list-style-type: none"> <li>- equipment used for loading, unloading and storing waste is clearly documented and labelled;</li> <li>- wastes known to be sensitive to heat, light, air, water, etc. are protected from such ambient conditions;</li> <li>- containers and drums are fit for purpose and stored securely.</li> </ul> <p>d) <b>Separate area for storage and handling of packaged hazardous waste</b> (Generally applicable) - When relevant, a dedicated area is used for storage and handling of packaged hazardous waste.</p>	<p>there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight and enable safe access away from the delivery vehicles and as an emergency escape during fires.</p> <p>The IVC building operates under negative aeration due to the extraction system in place, which means that air that exits the reception hall and IVC tunnels and will be processed using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the</p>



Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%.</p> <p>Green wastes, food wastes only and comingled waste that is tipped to the reception building floor will be inspected and then stored in separate piles that will be periodically shredded (mobile shredded). The waste piles will be stored in accordance with the treatment facility fire prevention plan and will operate under a first in, first out basis to ensure that waste storage duration is limited.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>Storage durations for green waste materials are clearly defined within the PAS 100 SOPS as follows:</p> <ul style="list-style-type: none"> <li>• The waste carrier will take each load of green waste to the composting pad, where it will be tipped into a dedicated storage area to ensure separation from other loads.</li> <li>• The maximum storage duration for input materials prior to shredding shall not exceed 7 days.</li> <li>• The waste accepted and stored for composting shall not be stockpiled in a quantity that exceeds 1000 tonnes before shredding.</li> <li>• Sanitisation normally occurs over a 2-week period.</li> <li>• Stabilisation shall occur over a minimum period of 8-weeks.</li> <li>• The stabilised compost will be screened in accordance with the PAS 100 Quality protocol to the appropriate grades: <ul style="list-style-type: none"> <li>○ 0-10mm, Soil Improver</li> <li>○ 0-40mm, Soil Improver</li> <li>○ 10-60mm, Mulch</li> </ul> </li> </ul>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<ul style="list-style-type: none"> <li>All three grades are stored within the permitted site area, outside at the top of the composting pad.</li> <li>Each product batch shall contain compost from no greater than 6 windrows and may be stored for a maximum of 12 months prior to dispatch. Product stored for longer than 6 months must be retested in conformance with the PAS100:2018 standard.</li> <li>Product batches shall be stored in such a way that post-process contamination does not occur.</li> </ul> <p>The maximum annual throughput of the site will remain at 75,000 tonnes.</p> <p>The site does not accept or process hazardous waste; therefore, Technique D is not applicable.</p> <p><b>BC04 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
05	<p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>- handling and transfer of waste are carried out by competent staff;</li> <li>- handling and transfer of waste are duly documented, validated prior to execution and verified after execution;</li> <li>- measures are taken to prevent, detect and mitigate spills;</li> <li>- operation and design precautions are taken when mixing or blending wastes (e.g. vacuuming dusty/powdery wastes).</li> </ul> <p>Handling and transfer procedures are risk-based considering the likelihood of accidents and incidents and their environmental impact.</p>	<p>The overall site procedures including those associated with the handling and transfer of waste is managed by the Site Manager, Julie Gardner. The Site Manager is WAMITAB certified and is the site's qualified TCM.. Site operatives also receive training covering all areas of the PAS 100 system.</p> <p>All areas of impermeable concrete, drainage system, buildings and storage tanks shall be inspected on a weekly basis as per the Site Inspection Form (RRS-Site Daily Check Sheet).</p> <p>The operator has an Accident Management Plan to ensure systems are in place should an incident occur. This plan includes identification of potential incidents that may occur, their impact, the control measures that are in place to prevent such an incident and actions to be taken in the event of an incident.</p> <p>All waste is handled and transferred on site in line with the operator's waste acceptance procedure and environmental management system.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>Waste Transfer Notes are provided by every driver delivering a load to the site and shall be completed in full for every load received.</p> <p>Permitted wastes do not contain sludges or liquids.</p> <p>Composting operations will be carried out on a Concrete Hardstanding composting pad, where the northern half of the composting pad falls from the north to the south, with the southern half constructed with a fall from south to north. As such, any wastewater (leachate) which is generated on the composting pad is captured within the surface drains located at the centre of the composting pad and will subsequently be directed to the leachate tanks located to the east of the composting pad within the treatment facility boundary. The leachate/surface water is directed to the tanks via use of pumps. The tank is never kept at capacity as leachate from the tank is regularly re-circulated into the compost. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>The IVC reception hall for green wastes, food wastes and comingled (food and green) wastes deliveries is located at the western side of the treatment facility site. Green wastes, food only wastes, or comingled (green and food waste) wastes will be deposited on the reception hall floor, separated by waste stream and in clearly designated areas. The reception hall floor is constructed of impermeable concrete.</p> <p>All leachate drainage channels for the waste reception will be cut into the concrete floor and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in the waste reception area will direct leachate from south to north &amp; east to west. The concrete floor also features falls ensuring leachate flows into the designated 'dirty area' channel and does not enter the APBR designated 'clean area' corridor that is situated in front of the tunnels. Leachate exits the building at the southern portion of the western edge into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent to the biofilter. The tank will be constructed of concrete and feature a corrugated steel cladding.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>Collected leachate is to be re-used when moistening of waste material during the batch formation phase within the tunnels.</p> <p>Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel entrance. A singular enclosed drainage channel runs along the front of the tunnel entrance points. This leachate drainage channel runs south to north and then east to west along the northern edge of the waste reception hall, directing leachate into the enclosed external drainage channel on the western edge of the building. Leachate will then flow northward to the leachate storage tank.</p> <p>The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels &amp; corridor) have dedicated drainage channels within the IVC building. This enables separation of processed and unprocessed materials preventing leachate related cross contamination between the area. A formalised clean down procedure of the clean area corridor will also take</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>place each time un-sanitised material has been deposited in the tunnels (e.g., pressure washing of the concrete floor and shovel loaders).</p> <p>The fuel tank is bunded to 110% of its capacity for secondary containment and managed in accordance with the site’s management procedures. The tank is clearly marked and carries signs showing the material contained within and its maximum capacity. Material is not stored or transported within 6m of the fuel tank unless they are refuelling. The tank is inspected on a weekly basis and any defects will be reported immediately, and remedial works undertaken as soon as reasonably practicable following identification. Maintenance and regular inspections of the composting pad are carried out. In the event of a spillage, Spillage Kits are located in the workshop area of the site and operative are trained/advised to follow the operator’s spillage management procedure as detailed in Section 6.7 of the Environmental Management System document.</p> <p>RRS shall keep records of site inspections and monitoring within the permit management system. Any adverse operating conditions, non-</p>



Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>conformances, complaints, and mitigation/management failure resulting in an accident or non-compliance with the Permit shall be recorded in the site diary.</p> <p><b>BC05 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
06	<p>For relevant emissions to water as identified by the inventory of waste water streams (see BAT 3), BAT is to monitor key process parameters (e.g. waste water flow, pH, temperature, conductivity, BOD) at key locations (e.g. at the inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).</p>	<p>The BAT criteria have been assessed and it is the view of the operator that the key process parameters do not need to be monitored.</p> <p>There are three leachate tanks located at the Treatment Facility. All storage tanks are checked on a weekly basis for signs of damage or failure.</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>The composting pad is constructed of impermeable concrete, where the northern half of the composting pad falls from the north to the south, with the southern half constructed with a fall from south to north. As such, any wastewater (leachate) which is generated on the composting pad is captured within the surface drains located at the centre of the composting pad and will subsequently be directed to the leachate tank located to the east of the composting pad within the treatment facility boundary. The leachate/surface water is directed to the tanks via use of pumps. The tanks are never kept at capacity as leachate from the tank is regularly re-circulated into the compost. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p> <p>The IVC reception hall for green wastes, food wastes and comingled (food and green) wastes deliveries is located at the western side of the treatment facility site. Green wastes, food only wastes, or comingled (green and food waste) wastes will be deposited on the reception hall floor, separated by waste stream and in clearly designated areas. The reception hall floor is constructed of impermeable concrete.</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>All leachate drainage channels for the waste reception will be cut into the concrete floor and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in the waste reception area will direct leachate from south to north &amp; east to west. The concrete floor also features falls ensuring leachate flows into the designated 'dirty area' channel and does not enter the APBR designated 'clean area' corridor that is situated in front of the tunnels. Leachate exits the building at the southern portion of the western edge into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent to the biofilter. The tank will be constructed of concrete and feature a corrugated steel cladding. Collected leachate is to be re-used when moistening of waste material during the batch formation phase within the tunnels.</p> <p>Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel entrance. A singular enclosed drainage channel runs along the front of the tunnel entrance points. This leachate drainage channel runs south to</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>north and then east to west along the northern edge of the waste reception hall, directing leachate into the enclosed external drainage channel on the western edge of the building. Leachate will then flow northward to the leachate storage tank.</p> <p>The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels &amp; corridor) have dedicated drainage channels within the IVC building. This enables separation of processed and unprocessed materials preventing leachate related cross contamination between the area. A formalised clean down procedure of the clean area corridor will also take place each time un-sanitised material has been deposited in the tunnels (e.g., pressure washing of the concrete floor and shovel loaders).</p> <p>One double walled fuel tank is stored on-site which can take 110% of the volume of fuel stored in the tank. The tank is clearly marked and carries signs showing the material contained within and its maximum capacity.</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>Material is not stored or transported within 6m of the fuel tank unless they are refuelling.</p> <p><b>BC06 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>
07	<p>BAT is to monitor emissions to water with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <p>See section 1.2 of <i>Commission Implementing Decision (EU) 2018/1147</i> for full BAT conclusion 7 table containing frequency and standards and the waste treatment processes they are to be monitored against.</p>	<p>As per the above, there are no emissions to water from the facility.</p> <p><b>BC07 Status: N/A.</b></p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
08	<p>BAT is to monitor channelled emissions to air with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <p>See section 1.2 of <i>Commission Implementing Decision (EU) 2018/1147</i> for full BAT conclusion 8 table containing frequency and standards and the waste treatment processes they are to be monitored against.</p>	<p>RRS operates an open-air composting facility and stores green waste material in open air, so there are no channelled emissions from green waste to air. Nuisance odours are most likely during the summer months, therefore the operator shall endeavour to minimise feedstock storage duration over this time period. The operator shall implement odour controls in line with their Odour Management Plan.</p> <p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p> <p>The IVC building operates under negative aeration due to the extraction system in place, which means that air that exits the reception hall and IVC tunnels and will be processed using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%. The biofilter will be monitored for odour, ammonia and hydrogen sulphide every 6 months as required by the environmental permit.</p> <p>Bioaerosol monitoring is undertaken every six months in line with the latest guidance (TGN M9) and the operator's Site Specific Bioaerosol Risk Assessment. In the event that bioaerosol monitoring detects elevated levels of bioaerosols at the site, the operator will consider whether corrective action is required and control emissions in a responsible manner.</p>



Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<b>BC08 Status: Compliant</b> – It is the operator's view that they are compliant with this BAT conclusion.

Monitoring										
BAT No.	BAT Guidance	Permit Documents								
09	<p>BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given below.</p> <table border="1"> <thead> <tr> <th>Technique</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>a Measurement</td> <td>Sniffing methods, optical gas imaging, solar occultation flux or differential absorption. See descriptions in Section 6.2 of <i>Commission Implementing Decision (EU) 2018/1147</i>.</td> </tr> <tr> <td>b Emissions factors</td> <td>Calculation of emissions based on emissions factors, periodically validated (e.g. once every two years) by measurements.</td> </tr> <tr> <td>c Mass balance</td> <td>Calculation of diffuse emissions using a mass balance considering the solvent input, channelled emissions to air, emissions to</td> </tr> </tbody> </table>	Technique	Description	a Measurement	Sniffing methods, optical gas imaging, solar occultation flux or differential absorption. See descriptions in Section 6.2 of <i>Commission Implementing Decision (EU) 2018/1147</i> .	b Emissions factors	Calculation of emissions based on emissions factors, periodically validated (e.g. once every two years) by measurements.	c Mass balance	Calculation of diffuse emissions using a mass balance considering the solvent input, channelled emissions to air, emissions to	<p>These BAT techniques are not considered relevant as RRS do not process or have any solvents on site.</p> <p><b>BC09 Status: N/A.</b></p>
	Technique	Description								
	a Measurement	Sniffing methods, optical gas imaging, solar occultation flux or differential absorption. See descriptions in Section 6.2 of <i>Commission Implementing Decision (EU) 2018/1147</i> .								
	b Emissions factors	Calculation of emissions based on emissions factors, periodically validated (e.g. once every two years) by measurements.								
c Mass balance	Calculation of diffuse emissions using a mass balance considering the solvent input, channelled emissions to air, emissions to									

Monitoring			
BAT No.	BAT Guidance		Permit Documents
		water, the solvent in the process output, and process (e.g. distillation) residues.	

Monitoring		
BAT No.	BAT Guidance	Permit Documents
10	<p>BAT is to periodically monitor odour emissions.</p> <p>Odour emissions can be monitored using:</p> <ul style="list-style-type: none"> <li>- 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);</li> <li>- 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.</li> </ul> <p>The monitoring frequency is determined in the odour management plan (see BAT 12).</p>	<p>Odour emissions have been carefully managed in order to reduce the impact on local sensitive receptors.</p> <p>RRS currently have an Odour Management Plan (OMP) developed as part of their environmental permit application and associated. This is written in line with Environment Agency’s Technical Guidance Note H4 standard. Please note, due to the nature and scale of RRS’ composting operation it is the view of the operator that odour is not a significant risk for the site.</p> <p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV’s) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p> <p>The IVC building operates under negative aeration due to the extraction system in place, which means that air that exits the reception hall and IVC tunnels and will be processed using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of ≥45 seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%. The biofilter will be monitored for odour, ammonia and hydrogen sulphide every 6 months as required by the environmental permit.</p> <p>Odour is also included within the site inspection regime and monitored daily at six points around the perimeter of the site on a daily basis.</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>Odour emissions are not monitored to ISO, national or international standards, however all complaints investigated and recorded accordingly.</p> <p><b>BC10 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>
11	<p>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.</p> <p>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.</p>	<p>The following information is recorded by the operator for each calendar year:</p> <ul style="list-style-type: none"> <li>• Annual total water usage;</li> <li>• Annual energy usage.</li> </ul> <p>Annual water usage pertains to the use of mains water, and the site has recently acquired a meter to record their consumption. Energy usage is</p>

Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>in the form of mains electricity (MWh) and fuel oil (tonnes). The operator monitors and maintains a record these parameters.</p> <p>The following information is currently recorded by the operator as part of their PAS 100 management system for each calendar year:</p> <ul style="list-style-type: none"> <li>• Annual total of material inputs; and;</li> <li>• Annual total of compost outputs.</li> </ul> <p>Evidence of material input is recorded on site via the weighbridge, where details of the waste carrier, waste type, waste code, client/source, quantity of waste and delivery date shall be recorded on a waste transfer note and a central computer system. A record system is maintained connecting sources of wastes with delivery dates and weights. This is achieved via the use of the weighbridge system, the duty of care information and the 'Input Load Inspection Record Sheet'. Composting batches are created one at a time. Batch formation 'start' and 'finish' dates are recorded in the 'Batch Formation and Monitoring Sheet'. All waste loads that arrive at the weighbridge between these two dates therefore have gone into that batch, and thus can be traced back to source. All batches which are removed offsite are recorded by the</p>



Monitoring		
BAT No.	BAT Guidance	Permit Documents
		<p>operator along with their destination. This allows the operator to track how much waste has been received and left site in any given time period.</p> <p><b>BC11 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
12	<p>In order to prevent or, where that is not practicable, 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:</p> <ul style="list-style-type: none"> <li>- a protocol containing actions and timelines;</li> <li>- a protocol for conducting odour monitoring as set out in BAT 10;</li> <li>- a protocol for response to identified odour incidents, e.g. complaints;</li> </ul>	<p>RRS currently have an OMP developed as part of their original permit application, this document was last reviewed as part of this latest permit variation. This is written in line with Environment Agency’s Technical Guidance Note H4 standard. Please note, due to the nature and scale of RRS’ composting operation it is the view of the operator that odour is not a</p>

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	<ul style="list-style-type: none"> <li>- 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.</li> </ul>	<p>significant risk for the site. Aspects covered within this OMP include:</p> <ul style="list-style-type: none"> <li>• Feedstock Inventory</li> <li>• Odour Inventory</li> <li>• Process Management</li> <li>• Evaporation</li> <li>• Containment and Abatement Systems</li> <li>• Dispersion</li> <li>• Sensitive Receptors</li> <li>• Incidents and Emergencies</li> </ul> <p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste.</p>

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		<p>Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p> <p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of</p>

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		<p>leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of ≥45 seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting</p>

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		<p>operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%. The biofilter will be monitored for odour, ammonia and hydrogen sulphide every 6 months as required by the environmental permit.</p> <p>Odour is included within the site inspection regime and monitored daily at six points around the perimeter of the site and an Odour Assessment Report is filled in. The procedure for undertaking odour monitoring is contained within section 4.14 Internal Odour Assessment and Monitoring of OMP and states the following:</p> <p>RRS will carry out odour checks at 6 points around the perimeter of the site on a daily basis. Findings will be recorded in the Odour Assessment Report (Annex B) or noted in the site diary. Odour assessment will be undertaken by a suitably trained member of staff. The odour assessor may not be subject to significant compost odour in the 30 minutes prior to the assessment. This is to ensure that the assessor is not suffering</p>

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		<p>from odour fatigue and will be sensitive to composting odours. Any odours found to be present onsite will be recorded and their source investigated, and steps will be taken to mitigate the sources of odours using the strategies to control odour as outlined above. The internal monitoring procedure, including a survey of odour reports will be re-assessed on a yearly basis by the Operations Manager and the Managing Director, unless the number of odour incidents warrants additional reviews.</p> <p>On the detection of odour, the following process shall be undertaken by the Site Manager:</p> <p>An investigation will be initiated into the cause of the odour. This shall involve as necessary:</p> <ul style="list-style-type: none"> <li>• A review of the site activities at RRS and other nearby potential sources at the time of the olfactory survey;</li> </ul>

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		<ul style="list-style-type: none"> <li>• A review of the meteorological conditions at the time of the olfactory survey; and</li> <li>• A review of the effectiveness of process operations and odour control procedures.</li> </ul> <p><b>Corrective Action</b></p> <p>The outcome of an investigation will determine the corrective actions to be implemented, they will consider, but not be limited to:</p> <ul style="list-style-type: none"> <li>• Alteration to waste reception procedures and odour control measures employed;</li> <li>• Effectiveness of methods used to mix waste to achieve a compost of suitable structure and moisture for composting and to avoid formation of anaerobic conditions;</li> <li>• Review of compost process monitoring results;</li> <li>• Turning frequencies and meteorological conditions under which turning should be carried out;</li> </ul>

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		<ul style="list-style-type: none"> <li>• Consider removal of material from site responsible for unacceptable offsite impacts;</li> <li>• Consider ceasing the reception of further material from site until issue resolved;</li> <li>• Activities that are necessary to bring the process back under control shall not be suspended without detailed consideration of risks; and</li> <li>• Update of OMP if new procedures are created.</li> </ul> <p><b>BC12 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>



13	<p>In order to prevent or, where that is not practicable, reduce odour emissions, BAT is to use one or a combination of the techniques given below.</p>			<p>Due to the nature of the operations conducted at RRS, technique C is not seen to be applicable.</p> <p>A) With regards to technique A, the maximum storage duration for input materials prior to shredding shall not exceed 7 days as per the PAS 100 SOPs. Separately, the OMP also references that odorous wastes will be rejected from site. The operator acknowledges that their management system doesn't explicitly reference how long leachate is retained in the tanks (however, leachate is recirculated to add moisture to piles as required and the fill level of the tank is monitored and never kept at capacity as leachate from the tanks is regularly re-circulated into the compost). Leachate from the unsanitised leachate tank is regularly monitored and will be regularly removed from the treatment facility to be processes at an appropriately licenced treatment facility.</p> <p>The Odour Inventory section of the OMP (section 3.0) contains critical limits for storage and process controls the operator utilises to operate in line with these limits. It is therefore the view of the operator that their management system does reference how the minimisation of residence times is undertaken at site.</p>	
	Technique		Description		Applicability
	a.	Minimising residence times	Minimising the residence time of (potentially) odorous waste in storage or in handling systems (e.g. pipes, tanks, containers), in particular under anaerobic conditions. When relevant, adequate provisions are made for the acceptance of seasonal peak volumes of waste.		Only applicable to open systems.
	b.	Using chemical treatment	Using chemicals to destroy or to reduce the formation of odorous compounds (e.g. to oxidise or to precipitate hydrogen sulphide).		Not applicable if it may hamper the desired output quality.
c.	Optimising aerobic treatment	In the case of aerobic treatment of water- based liquid waste, it may include:  – use of pure oxygen;	Generally applicable.		

			<ul style="list-style-type: none"> <li>– removal of scum in tanks;</li> <li>– frequent maintenance of the aeration system.</li> </ul> <p>In the case of aerobic treatment of waste other than water-based liquid waste, see BAT 36.</p>		<p>The OMP also references seasonal variation in feedstocks through section 2.2 <i>Feedstock Management</i>. This section reviews the various feedstocks which are likely to be accepted and how seasonal variation affects their supply and odour implication. It also advises the C:N ratio amendments likely to be required due to seasonal variation in order to control potential increases in odour.</p> <p>Please note, the Site Manager is WAMITAB certified and is the TCM for the site. A number of elements of the techniques stated are best practise and are undertaken by the operator on a practical level and dictated within their management system.</p> <p>B) With respect to technique B, There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection</p>
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		<p>Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p> <p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l</p>
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		<p>* w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of ≥45 seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%. The biofilter will be monitored for odour, ammonia and hydrogen sulphide every 6 months as</p>
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		<p>required by the environmental permit.</p> <p><b>BC13 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>
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14	<p>In order to prevent or, where that is not practicable, 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.</p>			<p>As a responsible operator RRS employ preventative and reactive measures to fugitive emissions as indicated within their existing Accident Management Plan (AMP), Dust Management Plan, Drainage and Leachate Management Plan and Site Specific Bioaerosol Risk Assessment. These measures include the following:</p> <ul style="list-style-type: none"> <li>• Adjusting operations in line with adverse weather conditions.</li> <li>• As part of its daily inspection regime, the site will be visually inspected for the presence of fugitive emissions (dust, litter) if required, remedial action shall be taken.</li> </ul> <p>A) With regards to Technique A, the composting pad is constructed of impermeable concrete, where the northern half of the composting pad falls from the north to the south, with the southern half constructed with a fall from south to north. As such, any wastewater (leachate) which is generated on the composting pad is captured within the surface drains located at the centre of the composting pad and will subsequently be</p>
	Technique	Description	Applicability	
	a. Minimising the number of potential diffuse emission sources	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> <li>- appropriate design of piping layout (e.g. minimising pipe run length, reducing the number of flanges and valves, using welded fittings and pipes);</li> <li>- favouring the use of gravity transfer rather than using pumps;</li> <li>- limiting the drop height of material;</li> <li>- limiting traffic speed;</li> <li>- using wind barriers.</li> </ul>	Generally applicable.	
b. Selection and use of high-integrity equipment	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> <li>- valves with double packing seals or equally efficient equipment;</li> <li>- high-integrity gaskets (such as spiral wound, ring joints) for critical applications;</li> </ul>	Applicability may be restricted in the case of existing plants due to		

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			<ul style="list-style-type: none"> <li>- pumps/compressors/agitators fitted with mechanical seals instead of packing;</li> <li>- magnetically driven pumps/compressor-</li> <li>- s/agitators;</li> <li>- appropriate service hose access ports, piercing pliers, drill heads, e.g. when degassing WEEE containing VFCs and/or VHCs.</li> </ul>	operability requirements.	<p>directed to the leachate tanks located to the east of the composting pad within the treatment facility boundary. The leachate/surface water is directed to the tanks via use of pumps. The tanks are never kept at capacity as leachate from the tank is regularly re-circulated into the compost. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p> <p>All leachate drainage channels for the waste reception will be cut into the concrete floor and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in the waste reception area will direct leachate from south to north &amp; east to west. The concrete floor also features falls ensuring leachate flows into the designated 'dirty area' channel and does not enter the APBR designated 'clean area' corridor that is situated in front of the tunnels. Leachate exits the building at the southern portion of the western edge into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent</p>
	c.	Corrosion prevention	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> <li>- appropriate selection of construction materials;</li> <li>- lining or coating of equipment and painting of pipes with corrosion inhibitors.</li> </ul>	Generally applicable.	
	d.	Containment, collection and treatment of diffuse emissions	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> <li>- storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment (e.g. conveyor belts);</li> <li>- maintaining the enclosed equipment or buildings under an adequate pressure;</li> </ul>	The use of enclosed equipment or buildings may be restricted by safety considerations such as the risk of	

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		<ul style="list-style-type: none"> <li>- collecting and directing the emissions to an appropriate abatement system (see Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i>) via an air extraction system and/or air suction systems close to the emission sources.</li> </ul>	<p>explosion or oxygen depletion.</p> <p>The use of enclosed equipment or buildings may also be constrained by the volume of waste.</p>	<p>to the biofilter. The tank will be constructed of concrete and feature a corrugated steel cladding. Collected leachate is to be re-used when moistening of waste material during the batch formation phase within the tunnels.</p> <p>Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel entrance. A singular enclosed drainage channel runs along the front of the tunnel entrance points. This leachate drainage channel runs south to north and then east to west along the northern edge of the waste reception hall, directing leachate into the enclosed external drainage channel on the western edge of the building. Leachate will then flow northward to the leachate storage tank.</p> <p>The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels &amp; corridor) have dedicated drainage channels within the IVC building. This enables separation of processed</p>
	e.	Dampening	<p>Dampening potential sources of diffuse dust emissions (e.g. waste storage, traffic areas, and open handling processes) with water or fog.</p>	Generally applicable.
	f.	Maintenance	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> <li>- ensuring access to potentially leaky equipment;</li> <li>- regularly controlling protective equipment such as lamellar curtains, fast-action doors.</li> </ul>	Generally applicable.



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	g.	Cleaning of waste treatment and storage areas	This includes techniques such as regularly cleaning the whole waste treatment area (halls, traffic areas, storage areas, etc.), conveyor belts, equipment and containers.	Generally applicable.	<p>and unprocessed materials preventing leachate related cross contamination between the area. A formalised clean down procedure of the clean area corridor will also take place each time un-sanitised material has been deposited in the tunnels (e.g., pressure washing of the concrete floor and shovel loaders). The leachate/surface water is directed to a leachate tank via use of pumps. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p> <p>The level of leachate within the tank is monitored regularly to ensure that the tank is never kept at capacity due to being reused at the batch formation phase of the IVC process. If required, unpasteurised (unsanitised) leachate from the reception building leachate tank will be removed from site and treated at an appropriately licenced facility.</p> <p>The Environmental Management System includes the relevant aspects, such as:</p>
	h.	Leak detection and repair (LDAR) programme	See Section 6.2 of <i>Commission Implementing Decision (EU) 2018/1147</i> . When emissions of organic compounds are expected, a LDAR programme is set up and implemented using a risk-based approach, considering in particular the design of the plant and the amount and nature of the organic compounds concerned.	Generally applicable.	

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		<ul style="list-style-type: none"> <li>• Limiting the drop height of material.</li> <li>• Limiting traffic speed.</li> <li>• The use of wind barriers.</li> </ul> <p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors</p>

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		<p>will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p> <p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an</p>

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		<p>external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%.</p> <p>B) With reference to technique B, RRS operate an open windrow composting facility with minimal fixed infrastructure.</p>

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		<p>Plant/machinery is maintained in line with the manufacturer's recommendations and health &amp; safety standards. All plant/machinery is also inspected on daily basis.</p> <p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that emissions to air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be</p>

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		<p>filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>The operator is therefore of the view they satisfy technique B.</p> <p>C) With reference to technique C, the treatment facility composting pad is constructed of an impermeable concrete pad. The existing surfaces are constructed of reinforced concrete with a typical thickness of 200mm on a 40mm bed of clean stone. Joints between the concrete slabs that make up the operational area are sealed with an appropriate flexible sealer. The concrete pad and joints are subject to weekly inspections as per the site's environmental management system.</p>

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		<p>The IVC reception hall floor is constructed of concrete. Green wastes, food waste, or comingled (green and food waste) wastes will be deposited on the reception hall floor, separated by waste stream and in clearly designated areas.</p> <p>All leachate drainage channels for the waste reception will be cut into the concrete floor and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in the waste reception area will direct leachate from south to north &amp; east to west. The concrete floor also features falls ensuring leachate flows into the designated 'dirty area' channel and does not enter the APBR designated 'clean area' corridor that is situated in front of the tunnels. Leachate exits the building at the southern portion of the western edge into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent to the biofilter. The tank will be constructed of concrete and feature a corrugated steel cladding. Collected leachate is to be</p>

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		<p>re-used when moistening of waste material during the batch formation phase within the tunnels.</p> <p>Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel entrance. A singular enclosed drainage channel runs along the front of the tunnel entrance points. This leachate drainage channel runs south to north and then east to west along the northern edge of the waste reception hall, directing leachate into the enclosed external drainage channel on the western edge of the building. Leachate will then flow northward to the leachate storage tank.</p> <p>The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels &amp; corridor) have dedicated drainage channels within the IVC building. This enables separation of processed and unprocessed materials preventing leachate related cross contamination between the area. A formalised clean down</p>



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		<p>procedure of the clean area corridor will also take place each time un-sanitised material has been deposited in the tunnels (e.g., pressure washing of the concrete floor and shovel loaders). The leachate/surface water is directed to a leachate tank via use of pumps. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p> <p>The level of leachate within the tank is monitored regularly to ensure that the tank is never kept at capacity due to being reused at the batch formation phase of the IVC process. If required, unpasteurised (unsanitised) leachate from the reception building leachate tank will be removed from site and treated at an appropriately licenced facility.</p> <p>D) With reference to technique D, the site is an open windrow composting facility and stores all green waste material in open air. As mentioned in the OMP, odorous green wastes will be rejected from site. In addition, bioaerosol emissions are monitored from site every six-months.</p>

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		<p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller</p>

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		<p>shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p> <p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that emissions to air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be</p>

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		<p>filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%.</p> <p>E) With reference to technique E, the site's Fugitive Emissions Management Plan states that:</p> <p><i>The site management shall ensure a mobile water bowser and water spray units are used throughout the site to dampen surfaces during periods of dry weather.</i></p>

Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
		<p><i>Where necessary and during periods of dry conditions, water sprays will be deployed to dampen material during stockpiling</i></p> <p><i>The site management shall ensure a mobile water bowser and water spray units are used throughout the site to dampen surfaces during periods of dry weather. Such surfaces shall include stockpiles where appropriate.</i></p> <p>F) In accordance with RRS's Standard Operating Procedures and PAS 100 Management System, regular maintenance and servicing programmes are completed at the treatment facility. RRS ensures that no plant or equipment may be worked on for maintenance purposes unless it has been removed from the site and has been isolated to prevent an accidental start; only in exceptional circumstances which prevent its removal, shall work be undertaken on any item of plant within the site. Furthermore, our maintenance and servicing regime ensures that the composting process operates efficiently, whilst reducing environmental and health and safety risks.</p>

Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
		<p>RRS undertake regular inspections of site equipment, machinery and maintain a clear record of these examinations. RRS operate a management system which outlines maintenance activities including inspections, checks, tests and scheduled replacements. RRS have machine specific maintenance and general check sheets which are routinely completed on a daily or weekly basis. A record of any maintenance to mobile plant that is undertaken is kept in RRS's Maintenance Log. The Maintenance Log tracks the time and date of any other scheduled checks, including LOLER, MOT and Standard Service. RRS's proactive and preventative approach to maintenance of all machinery on site ensures that all equipment is running at optimum energy efficiency and mitigates the risk of incidents leading to unscheduled downtime. In addition to check sheets, RRS also utilise a site diary to make records of all normal and abnormal activity occurring at the site. RRS ensures the following activities are recorded within the site diary (non-exhaustive):</p> <ul style="list-style-type: none"> <li>• Any machinery breakdown,</li> </ul>

Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
		<ul style="list-style-type: none"> <li>• Any deposit of unsuitable waste at the site,</li> <li>• Condition of site infrastructure and engineering,</li> <li>• Incidence of litter, dust, pest, odour and noise problems,</li> <li>• Results of various inspections for litter, odour, noise, birds, pests etc.</li> </ul> <p>Any failure in systems or equipment on site shall be actioned immediately and investigated and recorded within the relevant maintenance check sheets or the corrective action records. Should a site operative find that any piece of temperature monitoring equipment or system has failed, immediate corrective action shall be taken and recorded. After taking corrective action, the affected piece of equipment or system shall be re-checked, evaluated, and recorded.</p> <p>G) With reference to technique G, cleaning of the site is undertaken at a practical level by the operator as per section 2.2.1 of the Fugitive Emissions Management Plan. This states</p>

Emissions to Air		
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		<p>that:</p> <p><i>All haul and access roads within the site and at the site entrance shall be kept free from mud and debris at all times by manual clearing. Mud and debris on access and haul roads shall be monitored daily by the site manager and cleaned when required. If this proves to be insufficient, a road sweeper will need to be provided.</i></p> <p>The operator is therefore of the view they satisfy technique G.</p> <p>H) With reference to technique H, the site is an open block composting facility and stores all green waste material in open air. Please note, bioaerosol monitoring detects elevated levels of bioaerosols at the site, the operator will consider whether corrective action is required.</p> <p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility</p>



Emissions to Air		
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		<p>boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p>

Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
		<p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that emissions to air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter</p>

Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
		<p>construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p> <p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%.</p> <p><b>BC14 Status: Compliant:</b> It is the operator's view that they are compliant with this BAT conclusion.</p>

Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
15	<p>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.</p> <p>See section 1.3 of <i>Commission Implementing Decision (EU) 2018/1147</i> for full BAT conclusion 15 table containing technique and description and the waste treatment processes they applicable to.</p>	<p>The operator does not utilise a flare, so this BAT Conclusion is not considered applicable.</p> <p><b>BC15 Status: N/A.</b></p>
16	<p>In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given below.</p> <p>See section 1.3 of <i>Commission Implementing Decision (EU) 2018/1147</i> for full BAT conclusion 16 table containing technique and description and the waste treatment processes they applicable to.</p>	<p>The operator does not utilise a flare, so this BAT Conclusion is not considered applicable.</p> <p><b>BC16 Status: N/A.</b></p>

Noise and Vibration		
BAT No.	BAT Guidance	Permit Documents
17	<p>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:</p> <ol style="list-style-type: none"> <li>I. a protocol containing appropriate actions and timelines;</li> <li>II. a protocol for conducting noise and vibration monitoring;</li> <li>III. a protocol for response to identified noise and vibration events, e.g. complaints;</li> <li>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.</li> </ol>	<p>RRS have a Noise and Vibration Management Plan and associated risk assessment, which forms part of the Environmental Permit Management System. The document has been completed in line with the Environment Agency Technical Guidance Note H3 (Part 2) – Horizontal Guidance for Noise (part2), Sector Guidance Note (SGN) IPPC 5.06. Aspects covered within the Noise and Vibration Management Plan include the following:</p> <ul style="list-style-type: none"> <li>- Legislative context,</li> <li>- Noise sources on site identified via multiple noise monitoring events,</li> <li>- Noise and vibration source mitigation assessment,</li> <li>- Description of sensitive receptors,</li> <li>- Noise and vibration control measures;</li> <li>- Monitoring plan containing actions in the event elevated noise levels are detected.</li> </ul> <p>All complaints relating to the site in terms of noise are tracked and resolved using the operator’s Complaints Procedure and Complaint</p>

Noise and Vibration			
BAT No.	BAT Guidance		Permit Documents
			<p>Record Form. Records of complaints are maintained and used as management information to highlight areas for improvements.</p> <p><b>BC17 Status: Compliant:</b> It is the operator’s view that they are compliant with this BAT conclusion.</p>
18	<p>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.</p>		
	a.	<p>Appropriate location of equipment and buildings</p>	<p>Noise levels can be reduced by increasing the distance between the emitter and the receiver, by using buildings as noise screens and by relocating building exits or entrances.</p>
		<p>Applicability</p>	<p>For existing plants, the relocation of equipment and building exits or entrances may be restricted by a lack of space or excessive costs.</p>
<p>A) With regards to technique A, the site has been in operation for a number of years. All composting activity occurs outside. It is the view of the operator that the proposed amendments to the existing site layout are unlikely to dramatically affect noise emissions. The IVC tunnels will be situated within an enclosed building with roller shutter doors that mitigate noise emissions from the site. The Noise and Vibration Management plan details the possible sources of noise and vibration as Vehicles and Plant</p> <p>B) With regards to technique B, the following operational measures are in place to limit noise emissions from the site:</p>			

Noise and Vibration				
BAT No.	BAT Guidance			Permit Documents
	b.	Operational measures	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> <li>(i) inspection and maintenance of equipment;</li> <li>(ii) closing of doors and windows of enclosed areas, if possible;</li> <li>(iii) equipment operation by experienced staff;</li> <li>(iv) avoidance of noisy activities at night, if possible;</li> <li>(v) provisions for noise control during maintenance, traffic, handling and treatment activities.</li> </ul>	<p>Generally applicable.</p> <ul style="list-style-type: none"> <li>• All vehicles, plant and machinery operated at the site will be maintained in accordance with the manufacturer’s specification, with all mobile plant fitted with white noise reversing alarms;</li> <li>• Vehicles and Plant will be switched off when not in motion or operation;</li> <li>• Management schedules are adhered to for onsite infrastructure;</li> <li>• Site speed limit at 10 mph;</li> </ul> <p>As per the permit management system for the site, all plant/machinery is maintained and serviced in line with the manufacturer’s recommendations and inspected on a daily basis prior to use. Site plant/machinery shall only be operated by appointed trained staff, and no activities shall be undertaken outside the hours of operation as stated within operator’s permit management system (08:30-18:00 Mon-Fri, 08:30-12:30 Sat).</p>
	c.	Low-noise equipment	<p>This may include direct drive motors, compressors, pumps and flares.</p>	

Noise and Vibration				
BAT No.	BAT Guidance			Permit Documents
	d.	Noise and vibration control equipment	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> <li>(i) noise reducers;</li> <li>(ii) acoustic and vibrational insulation of equipment;</li> <li>(iii) enclosure of noisy equipment;</li> <li>(iv) soundproofing of buildings.</li> </ul>	<p>Applicability may be restricted by a lack of space (for existing plants).</p>
	e.	Noise attenuation	<p>Noise propagation can be reduced by inserting obstacles between emitters and receivers (e.g. protection walls, embankments and buildings).</p>	<p>Applicable only to existing plants, as the design of new plants should make this technique unnecessary. For existing plants, the insertion of obstacles may be restricted by a lack of space.</p>
<p>Please note, preventative measures are documented in detail in the Noise and Vibration Management Plan.</p> <p>C &amp; D) With regards to technique C &amp; D, the operator has ensured that all vehicles used will be maintained in accordance with the manufacturer's specification and be fitted with effective silencers. In addition, the site comprises of an open air continuous turned block composting facility and stores all green waste material in open air, so a number of elements of this technique are not considered relevant for green waste.</p> <p>However Green wastes, food wastes and comingled (food and green waste) wastes will be stored within the reception building prior to shredding and processing via the IVC tunnels. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area</p>				



Noise and Vibration				
BAT No.	BAT Guidance			Permit Documents
			For mechanical treatment in shredders of metal wastes, it is applicable within the constraints associated with the risk of deflagration in shredders.	<p>within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that noise pollution is contained and minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised noise pollution.</p> <p>Therefore, these two techniques are considered satisfied.</p> <p>E) With regards to technique E, the site is an open air continuous turned block composting facility and stores all green waste material in open air, so the addition of noise attenuation is not considered relevant for green waste given the nature of the site. The operator has</p>

Noise and Vibration		
BAT No.	BAT Guidance	Permit Documents
		<p>also never received a noise complaint which further evidences this viewpoint.</p> <p>Green wastes, food wastes and comingled (food and green waste) wastes, alongside IVC infrastructure and mobile shredders, will be stored within the reception building The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that noise pollution is contained and minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter</p>

Noise and Vibration		
BAT No.	BAT Guidance	Permit Documents
		<p>door. These doors will be airtight to ensure a minimised noise pollution. Therefore, these two techniques are considered satisfied.</p> <p><b>BC18 Status: Compliant</b> – It is the view of the operator that they operate in line with this element of current BAT standards</p>

Emissions to Water			
BAT No.	BAT Guidance		Permit Documents
19	<p>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.</p>		<p>A number of these techniques are not considered pertinent as the treatment facility is a small-scale site and the majority of their generated wastewater (leachate) derives from the composting pad. Generated wastewater (leachate) is captured via the following system and then dealt with in one of two ways.</p>
	Technique	Description	

Emissions to Water					
BAT No.	BAT Guidance			Permit Documents	
	a.	Water management	<p>Water consumption is optimised by using measures which may include:</p> <ul style="list-style-type: none"> <li>– water-saving plans (e.g. establishment of water efficiency objectives, flow diagrams and water mass balances);</li> <li>– optimising the use of washing water (e.g. dry cleaning instead of hosing down, using trigger control on all washing equipment);</li> <li>– reducing the use of water for vacuum generation (e.g. use of liquid ring pumps with high boiling point liquids).</li> </ul>	Generally applicable.	<p>There are three leachate tanks located at the Treatment Facility. All storage tanks are checked on a weekly basis for signs of damage or failure.</p> <p>The composting pad is constructed of impermeable concrete, where the northern half of the composting pad falls from the north to the south, with the southern half constructed with a fall from south to north. As such, any wastewater (leachate) which is generated on the composting pad is captured within the surface drains located at the centre of the composting pad and will subsequently be directed to the leachate tanks located to the east of the composting pad within the treatment facility boundary. The leachate/surface water is directed to the tanks via use of pumps. The tanks are never kept at capacity as leachate from the tanks is regularly re-circulated into the compost. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p>
	b.	Water recirculation	<p>Water streams are recirculated within the plant, if necessary after treatment. The degree of recirculation is limited by the water balance of the plant, the content of</p>	Generally applicable.	<p>The IVC reception hall floor is constructed of concrete. Green wastes, food waste, or comingled (green and food waste) wastes will be deposited on the reception hall floor, separated by waste stream and in clearly designated areas.</p>

Emissions to Water				
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			impurities (e.g. odorous compounds) and/or the characteristics of the water streams (e.g. nutrient content).	
	c.	Impermeable surface	Depending on the risks posed by the waste in terms of soil and/or water contamination, the surface of the whole waste treatment area (e.g. waste reception, handling, storage, treatment and dispatch areas) is made impermeable to the liquids concerned.	Generally applicable.
	d.	Techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels	Depending on the risks posed by the liquids contained in tanks and vessels in terms of soil and/or water contamination, this includes techniques such as: – overflow detectors;	Generally applicable.
<p>All leachate drainage channels for the waste reception will be cut into the concrete floor and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in the waste reception area will direct leachate from south to north &amp; east to west. The concrete floor also features falls ensuring leachate flows into the designated 'dirty area' channel and does not enter the APBR designated 'clean area' corridor that is situated in front of the tunnels. Leachate exits the building at the southern portion of the western edge into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent to the biofilter. The tank will be constructed of concrete and feature a corrugated steel cladding. Collected leachate is to be re-used when moistening of waste material during the batch formation phase within the tunnels.</p> <p>Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel</p>				

Emissions to Water					
BAT No.	BAT Guidance			Permit Documents	
			<ul style="list-style-type: none"> <li>– overflow pipes that are directed to a contained drainage system (i.e. the relevant secondary containment or another vessel);</li> <li>– tanks for liquids that are located in a suitable secondary containment; the volume is normally sized to accommodate the loss of containment of the largest tank within the secondary containment;</li> <li>– isolation of tanks, vessels and secondary containment (e.g. closing of valves).</li> </ul>		<p>entrance. A singular enclosed drainage channel runs along the front of the tunnel entrance points. This leachate drainage channel runs south to north and then east to west along the northern edge of the waste reception hall, directing leachate into the enclosed external drainage channel on the western edge of the building. Leachate will then flow northward to the leachate storage tank.</p> <p>The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels &amp; corridor) have dedicated drainage channels within the IVC building. This enables separation of processed and unprocessed materials preventing leachate related cross contamination between the area. A formalised clean down procedure of the clean area corridor will also take place each time un-sanitised material has been deposited in the tunnels (e.g., pressure washing of the concrete floor and shovel loaders). The leachate/surface water is directed to a leachate tank via use of pumps. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p>
	e.	Roofing of waste storage and treatment areas	Depending on the risks posed by the waste in terms of soil and/or water	Applicability may be constrained when high	

Emissions to Water					
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			contamination, waste is stored and treated in covered areas to prevent contact with rainwater and thus minimise the volume of contaminated run-off water.	volumes of waste are stored or treated (e.g. mechanical treatment in shredders of metal waste).	The level of leachate within the tank is monitored regularly to ensure that the tank is never kept at capacity due to being reused at the batch formation phase of the IVC process. If required, unpasteurised (unsanitised) leachate from the reception building leachate tank will be removed from site and treated at an appropriately licenced facility.
	f.	Segregation of water streams	Each water stream (e.g. surface run-off water, process water) is collected and treated separately, based on the pollutant content and on the combination of treatment techniques. In particular, uncontaminated waste water streams are segregated from waste water streams that require treatment.	Generally applicable to new plants. Generally applicable to existing plants within the constraints associated with the layout of the water collection system.	The IVC building and the composting pad will operate using different drainage systems that result in the comingled food and green waste leachate and green waste only leachate being stored in separate leachate tanks. In the event of a fire and the requirement to store firewater both tanks can be used, however any process material contaminated with ABPR leachate must be removed from the OWC area and appropriately treated to prevent any further cross-contamination of waste.  A) With regards to technique A, water-saving plans shall be added as an agenda at the management review to be discussed.

Emissions to Water					
BAT No.	BAT Guidance			Permit Documents	
	g.	Adequate drainage infrastructure	<p>The waste treatment area is connected to drainage infrastructure.</p> <p>Rainwater falling on the treatment and storage areas is collected in the drainage infrastructure along with washing water, occasional spillages, etc. and, depending on the pollutant content, recirculated or sent for further treatment.</p>	<p>Generally applicable to new plants.</p> <p>Generally applicable to existing plants within the constraints associated with the layout of the water drainage system.</p>	<p>The operator only uses water for washing of vehicles if their wheels are dirty or to reduce dust emissions. As this is the case, the other two elements of this technique are considered applicable.</p> <p>B) With regards to technique B, the water collected in the sanitised leachate tank is used in the composting process to amend moisture levels of the compost block complying with BAT.</p> <p>C) With regards to technique C, the entire site area is situated on impermeable concrete, therefore complying with this aspect of BAT standards. The integrity of the impermeable site surface is inspected on a weekly basis and recorded in the site diary. Remedial action will be taken that is proportionate to the nature of any faults found.</p>
	h.	Design and maintenance provisions to allow detection and repair of leaks	<p>Regular monitoring for potential leakages is risk-based, and, when necessary, equipment is repaired.</p> <p>The use of underground components is minimised. When underground components are used, and depending on the risks</p>	<p>The use of above-ground components is generally applicable to new plants. It may be limited however by the risk of freezing.</p>	<p>The reception building floor, where food waste and comingled waste (food waste and garden waste) is deposited, is constructed of concrete hardstanding, and has a fall from west to east. This area is impermeable and thus the operator complies with this technique.</p>



Emissions to Water					
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			posed by the waste contained in those components in terms of soil and/or water contamination, secondary containment of underground components is put in place.	The installation of secondary containment may be limited in the case of existing plants.	D) As per the operator's Drainage Management Plan, the leachate tanks shall be inspected on a weekly basis and following rainfall events and shall be emptied when the collected liquids reach 90% of capacity as measured by dip. Tank emptying shall be undertaken by a contractor within 48 hours of capacity being reached, with the wastewater disposed of at a fully permitted wastewater treatment facility.
	i.	Appropriate buffer storage capacity	Appropriate buffer storage capacity is provided for waste water generated during other than normal operating conditions using a risk-based approach (e.g. taking into account the nature of the pollutants, the effects of downstream waste water treatment, and the receiving environment).  The discharge of waste water from this buffer storage is only possible after	Generally applicable to new plants.  For existing plants, applicability may be limited by space availability and by the layout of the water collection system.	Similarly, when the reception building leachate tank (unsanitised leachate) is approaching full capacity and it is not possible to re-use the leachate in the pre-batch formation phase, then a tanker is arranged to remove the excess water from the tank for treatment / disposal at a suitably licenced facility. Therefore, it is the operators view that they comply with BAT.  E) With regards to technique E, this is not relevant for the treatment process as the composting pad and green waste storage are is operated as an open-air site.

Emissions to Water			
BAT No.	BAT Guidance		Permit Documents
		appropriate measures are taken (e.g. monitor, treat, reuse).	<p>However, green wastes, food wastes and comingled (food and green waste) wastes are delivered to a fully enclosed reception building. In accordance with the BAT Guidance, the covered areas prevent contact with rainwater and thus minimise the volume of contaminated run-off water.</p> <p>F) With regards to technique F, both rain and process water flow into the central drainage channel and then into the wastewater (leachate) storage tanks via pumps. It is the operator's view that the segregation of these streams is not required as they have always operated in this manner and the leachate is not processed.</p> <p>G) With regards to technique G, the green waste storage area is connected to drainage infrastructure which it is drained via a pump into one of two leachate storage tanks with a combined capacity of 646m<sup>3</sup>; food and comingled waste storage is served by its own drainage system and leachate storage tank.</p>

Emissions to Water		
BAT No.	BAT Guidance	Permit Documents
		<p>The composting pad is constructed of impermeable concrete , where the northern half of the composting pad falls from the north to the south, with the southern half constructed with a fall from south to north. As such, any wastewater (leachate) which is generated on the composting pad is captured within the surface drains located at the centre of the composting pad and will subsequently be directed to the leachate tanks located to the east of the composting pad within the treatment facility boundary. The leachate/surface water is directed to the tanks via use of pumps. The tanks are never kept at capacity as leachate from the tank is regularly re-circulated into the compost. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p> <p>The IVC reception hall floor is constructed of concrete. Green wastes, food waste, or comingled (green and food waste) wastes will be deposited on the reception hall floor, separated by waste stream and in clearly designated areas.</p> <p>All leachate drainage channels for the waste reception will be cut into the concrete floor and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in</p>

Emissions to Water		
BAT No.	BAT Guidance	Permit Documents
		<p>the waste reception area will direct leachate from south to north &amp; east to west. The concrete floor also features falls ensuring leachate flows into the designated 'dirty area' channel and does not enter the APBR designated 'clean area' corridor that is situated in front of the tunnels. Leachate exits the building at the southern portion of the western edge into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent to the biofilter. The tank will be constructed of concrete and feature a corrugated steel cladding. Collected leachate is to be re-used when moistening of waste material during the batch formation phase within the tunnels.</p> <p>Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel entrance. A singular enclosed drainage channel runs along the front of the tunnel entrance points. This leachate drainage channel runs south to north and then east to west along the northern edge of the waste reception hall, directing leachate into the enclosed external drainage channel on the</p>

Emissions to Water		
BAT No.	BAT Guidance	Permit Documents
		<p>western edge of the building. Leachate will then flow northward to the leachate storage tank.</p> <p>The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels &amp; corridor) have dedicated drainage channels within the IVC building. This enables separation of processed and unprocessed materials preventing leachate related cross contamination between the area. A formalised clean down procedure of the clean area corridor will also take place each time un-sanitised material has been deposited in the tunnels (e.g., pressure washing of the concrete floor and shovel loaders). The leachate/surface water is directed to a leachate tank via use of pumps. Monitoring records enable the operator to keep track of where leachate has been added to the system.</p> <p>The level of leachate within the tank is monitored regularly to ensure that the tank is never kept at capacity due to being reused at the batch formation phase of the IVC process. If required, unpasteurised</p>

Emissions to Water		
BAT No.	BAT Guidance	Permit Documents
		<p>(unsanitised) leachate from the reception building leachate tank will be removed from site and treated at an appropriately licenced facility.</p> <p>The IVC building and the composting pad will operate using different drainage systems that result in the comingled food and green waste leachate and green waste only leachate being stored in separate leachate tanks. In the event of a fire and the requirement to store firewater both tanks can be used, however any process material contaminated with ABPR leachate must be removed from the OWC area and appropriately treated to prevent any further cross-contamination of waste.</p> <p>H) With regards to technique H, monitoring for potential leakages is undertaken in accordance with the management system as detailed below:</p> <p>The pad surfaces will be inspected on a daily basis to ensure no cracking, pooling or prevention of free-flowing runoff to the tanks. The results of the inspections will be recorded in the inspection forms together with any</p>

Emissions to Water		
BAT No.	BAT Guidance	Permit Documents
		<p>remedial actions that are taken. The frequency of inspection will be increased at times of higher risk under the direction of the Site Manager. The leachate tanks shall be inspected no less frequently than weekly and after rainfall events.</p> <p>l) As stated within the FPP:</p> <p><i>The 522m<sup>3</sup> leachate tank will always operate with a retained volume of 250m<sup>3</sup> inside it. This provides approximately 75 minutes of firefighting water (250m<sup>3</sup> / 3.33m<sup>3</sup>). This should provide an adequate amount of time for recirculation of fire water to the tank to occur and the local fire hydrant can also be used in addition, if required. There is therefore a volume of 272m<sup>3</sup> available for fire water capture in this tank. Please note, the smaller 124m<sup>3</sup> leachate tank is not factored into the containment calculations to provide a buffer.</i></p> <p><b>BC19 Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

Emissions to Water				
BAT No.	BAT Guidance			Permit Documents
20	In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given below.			
		<b>Technique</b>	<b>Typical pollutants targeted</b>	<b>Applicability</b>
	<i>Preliminary and primary treatment, e.g.</i>			
	a.	Equalisation	All pollutants	Generally applicable.
	b.	Neutralisation	Acids, alkalis	
c.	Physical separation, e.g. screens, sieves, grit separators, grease separators, oil- water separation or primary settlement tanks	Gross solids, suspended solids, oil/grease		
				<p>These treatment techniques are not considered relevant for RRS due to the nature of the site and that they do not treat any of their generated wastewater (leachate) on site.</p> <p><b>BC20 Status: N/A</b></p>



Emissions to Water				
BAT No.	BAT Guidance			Permit Documents
	Biological treatment, e.g.			
	l.	Activated sludge process	Biodegradable organic compounds	Generally applicable.
	m.	Membrane bioreactor		
<p>The activities which are not relevant to the operator have been removed from the table.</p> <p>In addition, see table 6.1 entitled 'BAT-associated emission levels (BAT-AELs) for direct discharges to a receiving water body' and table 6.2 entitled 'BAT-associated emission levels (BAT-AELs) for indirect discharges to a receiving water body' of <i>Commission Implementing Decision (EU) 2018/1147</i>. These tables contain the relevant BAT-EAL and substances/parameters which discharges to receiving water bodies should be tested for.</p>				

Emissions from accidents and incidents			
BAT No.	BAT Guidance		Permit Documents
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).		RRS has a dedicated Accident Management Plan (AMP), and associated Risk Assessment developed as part of their Environmental Permit Management System.  Emergency contact details for the following: <ul style="list-style-type: none"> <li>• Emergency services</li> <li>• Fire Brigade</li> <li>• Local Police</li> <li>• Environment Agency Hotline</li> <li>• Health and Safety Executive</li> <li>• Electricity Supplier</li> <li>• Local Authority</li> <li>• Waste Disposal Contractor</li> <li>• Gas Supplier</li> <li>• Sewerage Undertaker</li> </ul>
	Technique	Description	
	a.	Protection measures  These include measures such as: <ul style="list-style-type: none"> <li>– protection of the plant against malevolent acts;</li> <li>– fire and explosion protection system, containing equipment for prevention, detection, and extinction;</li> <li>– accessibility and operability of relevant control equipment in emergency situations.</li> </ul>	
b.	Management of incidental/accidental emissions  Procedures are established and technical provisions are in place to manage (in terms of possible containment) emissions from accidents and incidents such as emissions from spillages, firefighting water, or safety valves.		

Emissions from accidents and incidents			
BAT No.	BAT Guidance		Permit Documents
	c.	Incident/accident registration and assessment system	This includes techniques such as: <ul style="list-style-type: none"> <li>– a log/diary to record all accidents, incidents, changes to procedures and the findings of inspections;</li> <li>– procedures to identify, respond to and learn from such incidents and accidents.</li> </ul>
			<ul style="list-style-type: none"> <li>• Fuel Supplier</li> <li>• Out of hours company contact.</li> </ul> Assessment of the risks at site such as (not exhaustive): <ul style="list-style-type: none"> <li>• plant or equipment failure</li> <li>• fires arising from storage of waste and fuel</li> <li>• failure of mains services</li> <li>• site security failures/vandalism/arson</li> </ul> <p>A) With regards to technique A, plant is protected against malevolent acts through site security measures, detailed within the Environmental Management System as follows:</p> <p><i>The facility lies within a gated facility which is bunded on 4 sides (except where the gate for accessing the site is) and is situated within a rural location.</i></p>

Emissions from accidents and incidents		
BAT No.	BAT Guidance	Permit Documents
		<p><i>Within the specified licensed area, the site is closed (gate and bunding) and secured outside of operating hours.</i></p> <p><i>The access road which connects the site is gated at the site entrance from the highway and these gates are locked outside all normal operating hours.</i></p> <p><i>The boundary fences (which are fixed on top of the bunds to the north and west of the facility) to the application site and gate from the internal access are checked on a regular basis for damage or signs of attempted entry. Such occurrences are entered in the site diary and any damage is repaired at the earliest opportunity.</i></p> <p>B) With regard to technique B, RRS possess a Fire Prevention Plan, which includes full details of the site’s preventative, detection and extinction equipment. This includes:</p>

Emissions from accidents and incidents		
BAT No.	BAT Guidance	Permit Documents
		<ul style="list-style-type: none"> <li>• Appropriate waste separation at reception and quarantining where required;</li> <li>• Fire extinguishers on site that are subject to annual servicing by an accredited third party contractor;</li> <li>• Policies regarding smoking, machine/plant maintenance, electrical testing and hot works;</li> <li>• Fire drills conducted on a bi-annual basis;</li> <li>• A full list of emergency contacts, including Lancashire Fire and Rescue.</li> </ul> <p>C) With regard to technique C, RRS operates with an Accident Reporting procedure to ensure all accidents are reported in the appropriate manner. An accident book is kept in the site office for the recording of any accidents on site, as well as all incidents being recorded in the site diary. All records are kept for a minimum of 3 years.</p>

Emissions from accidents and incidents		
BAT No.	BAT Guidance	Permit Documents
		<b>BC21 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.

Material efficiency		
BAT No.	BAT Guidance	Permit Documents
22	<p>In order to use materials efficiently, BAT is to substitute materials with waste.</p> <p>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).</p> <p>Some applicability limitations derive from the risk of contamination posed by the presence of impurities (e.g. heavy</p>	<p>As the operator purely undertakes a composting treatment process of waste materials the opportunities for substituting materials with waste are quite limited. To adjust the composition of the open windrows the operator utilises oversize material to increase airflow. Wastewater (leachate) from the waste is re-circulated and used to dampen the composting windrows where required. Both of these procedures are viewed to satisfy this BAT conclusion.</p>

Material efficiency		
BAT No.	BAT Guidance	Permit Documents
	metals, POPs, salts, pathogens) in the waste that substitutes other materials. Another limitation is the compatibility of the waste substituting other materials with the waste input (see BAT 2).	<b>BC22 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.

Energy efficiency			
BAT No.	BAT Guidance	Permit Documents	
23	In order to use energy efficiently, BAT is to use both of the techniques given below.	A) With regards to technique A, the operator has a Carbon Reduction Plan that has been in place since July 2023. The plan includes calculating the specific energy consumption of the activity and setting key performance indicators on an annual basis (for example, specific energy consumption expressed in kWh/tonne of waste processed). The plan sets out RRS’s scope 1, 2 and 3 emissions as and net zero targets in line with the 2015 Paris Agreement.	
	Technique		Description
	a. Energy efficiency plan		An energy efficiency plan entails defining and calculating the specific energy consumption of the activity (or activities), setting key performance

Energy efficiency			
BAT No.	BAT Guidance		Permit Documents
		<p>indicators on an annual basis (for example, specific energy consumption expressed in kWh/tonne of waste processed) and planning periodic improvement targets and related actions. The plan is adapted to the specificities of the waste treatment in terms of process(es) carried out, waste stream(s) treated, etc.</p>	<p>B) With regards to technique B, the majority of the site is OWC facility, so energy usage is minimal. The IVC building will only use the minimum amount of energy to provide the required air changes in the building and circulation air to the IVC tunnels. As this is the case, an energy balance record is not seen to be required. As noted above, the treatment facility has a Carbon Reduction Plan which includes a carbon baseline, demonstrating the clear records that RRS hold of energy usage.</p> <p><b>BC23 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>
	b.	<p>Energy balance record</p> <p>An energy balance record provides a breakdown of the energy consumption and generation (including exportation) by the type of source (i.e. electricity, gas, conventional liquid fuels, conventional solid fuels, and waste). This includes:</p> <ul style="list-style-type: none"> <li>(i) information on energy consumption in terms of delivered energy;</li> <li>(ii) information on energy exported from the installation;</li> <li>(iii) energy flow information (e.g. Sankey diagrams or energy balances) showing how the energy is used throughout the process.</li> </ul> <p>The energy balance record is adapted to the specificities of the waste treatment in terms of process(es) carried out, waste stream(s) treated, etc.</p>	



Reuse of Packaging		
BAT No.	BAT Guidance	Permit Documents
24	<p>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).</p> <p>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).</p>	<p>As the site received kerbside collected green waste, comingled food and green waste, soil, wood and concrete waste, minimal packaging is received at site. Therefore, this BAT conclusion is not seen to be relevant.</p> <p><b>BC24 Status: N/A.</b></p>

### 3.2 General BAT Conclusions for the Biological Treatment of Waste

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
33	In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input. 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.	<p>The operator complies with this aspect of the BAT assessment through their Waste Acceptance Procedure (described in their EMS) and as part of RRS' compliance with the PAS 100 scheme. Selection of waste input is clearly described within the PAS 100 management system documents and SOPs. Please see BAT conclusion 2 earlier in the document for details on waste acceptance.</p> <p>Moisture levels are monitored and adjusted as per the PAS 100 requirements. The operator monitors the levels for each batch via squeeze test in accordance with BS EN 13040 and guidance from the Association for Organics Recycling.</p> <p>The nutrient balance and toxic compounds of the waste is well managed through Senior Management's knowledge of managing the composting process to produce material which is of PAS 100 standard. Although it is acknowledged this needs to be documented within the permit management system documents.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that emissions to air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of <math>\geq 45</math> seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%.</p> <p><b>BC33 Status: Compliant</b> – It is the operator's view that they are compliant with this BAT conclusion.</p>

Emissions to Air									
BAT No.	BAT Guidance		Permit Documents						
34	<p>In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H<sub>2</sub>S and NH<sub>3</sub>, BAT is to use one or a combination of the techniques given below.</p>		<p>There are a range of measures in place to mitigate any adverse impact to sensitive receptors from storage of green wastes, food wastes or comingled wastes delivered to the IVC reception hall, located within the western side of the treatment facility boundary. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature a 2No. of roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter and deposit waste. Next to that will be a double roller shutter specifically for a mobile shredder to access the building, that has a dedicated area within the waste reception hall. Finally at the southern portion of the eastern edge another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated and remain closed when vehicles are not entering/exiting to ensure that any release of unfiltered air is minimised. For pedestrians there will be on 2No. of entrance points. One will be situated next to the waste reception roller shutter door and one situated next to the IVC tunnels roller shutter door. These doors will be airtight to ensure a minimised release of emissions.</p>						
	<table border="1"> <thead> <tr> <th>Technique</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>a. Adsorption</td> <td>See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i>.</td> </tr> <tr> <td>b. Biofilter</td> <td>See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i>.  A pretreatment of the waste gas before the biofilter (e.g. with a water or acid scrubber) may be needed in the case of a high NH<sub>3</sub> content (e.g. 5-40 mg/Nm<sup>3</sup>) in order to control the media pH and to limit the formation of N<sub>2</sub>O in the biofilter.  Some other odorous compounds (e.g. mercaptans, H<sub>2</sub>S) can cause acidification of the biofilter media and</td> </tr> </tbody> </table>			Technique	Description	a. Adsorption	See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i> .	b. Biofilter	See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i> .  A pretreatment of the waste gas before the biofilter (e.g. with a water or acid scrubber) may be needed in the case of a high NH <sub>3</sub> content (e.g. 5-40 mg/Nm <sup>3</sup> ) in order to control the media pH and to limit the formation of N <sub>2</sub> O in the biofilter.  Some other odorous compounds (e.g. mercaptans, H <sub>2</sub> S) can cause acidification of the biofilter media and
	Technique	Description							
a. Adsorption	See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i> .								
b. Biofilter	See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i> .  A pretreatment of the waste gas before the biofilter (e.g. with a water or acid scrubber) may be needed in the case of a high NH <sub>3</sub> content (e.g. 5-40 mg/Nm <sup>3</sup> ) in order to control the media pH and to limit the formation of N <sub>2</sub> O in the biofilter.  Some other odorous compounds (e.g. mercaptans, H <sub>2</sub> S) can cause acidification of the biofilter media and								

Emissions to Air			
BAT No.	BAT Guidance		Permit Documents
		necessitate the use of a water or alkaline scrubber for pretreatment of the waste gas before the biofilter.	<p>Except for during waste deliveries and removal, the IVC building operates under negative aeration due to the extraction system in place, which means that emissions to air that exits the reception hall and IVC tunnels and will be treated using a biofilter. The biofilter is located on the western area of the treatment facility, south of leachate tank and west of the IVC area of the building. The internal dimensions of the biofilter housing are 10m x 27.3m (l * w) with a maximum air volume/min of 557.6m<sup>3</sup> and total biofilter volume of 418.2m<sup>3</sup>, therefore it will be capable of processing 122.6m<sup>3</sup>/m<sup>2</sup>/hr. The biofilter is built with a spigot floor, for an optimal air distribution. Air will exit the reception hall and tunnels via extraction fans and will be directed to an external mixing duct. An air injection fan will be attached to the biofilter to draw air from the external mixing duct into the biofilter. The biofilter media itself will be constructed of coarse shredded untreated wood and will be filled to 1.53m of media per m<sup>2</sup> of biofilter housing. The biofilter will have the recommended minimum airflow residency period of ≥45 seconds. The fan, ventilation system and bio-filter construction materials should minimise the effects of corrosive waste gas, excess condensate, dust and sludge build up within the IVC building and IVC tunnels.</p>
c.	Fabric filter	See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i> . The fabric filter is used in the case of mechanical biological treatment of waste.	
d.	Thermal oxidation	See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i> .	
e.	Wet scrubbing	See Section 6.1 of <i>Commission Implementing Decision (EU) 2018/1147</i> . Water, acid or alkaline scrubbers are used in combination with a biofilter, thermal oxidation or adsorption on activated carbon.	
	<p>For the BAT-associated emission levels (BAT-AELs) for channelled NH<sub>3</sub>, odour, dust and TVOC emissions to air from the biological treatment of waste see table 6.7 in Commission Implementing Decision (EU) 2018/1147. The contents of the table are displayed below for ease of reference.</p>		

Emissions to Air				
BAT No.	BAT Guidance			Permit Documents
	Parameter	Unit	BAT-AEL (Average over the sampling period)	Waste treatment process
	NH3(1)(2)	mg/Nm3	0,3-20	All biological treatments of waste
	Odour concentration(1)(2)	ouE/Nm3	200-1 000	
	Dust	mg/Nm3	2-5	Mechanical biological treatment of waste
	TVOC	mg/Nm3	5-40(3)	
	<p>(1) Either the BAT-AEL for NH3 or the BAT-AEL for the odour concentration applies.</p> <p>(2) This BAT-AEL does not apply to the treatment of waste mainly composed of manure.</p> <p>(3) The lower end of the range can be achieved by using thermal oxidation.</p>			
	The associated monitoring is given in BAT 8.			
	<p>Biofilters are a well-established method for controlling odorous and volatile organic compound air emissions from composting operations. When designed and operated per Best Management Practices they routinely reduce VOC and odour emissions by more than 95%. Monitoring for odour, hydrogen sulphide and ammonia is carried out every 6 months by MCERTS certified emissions monitoring specialists.</p> <p><b>BC34 Status:</b> It is the operator's view that they are compliant with this BAT conclusion.</p>			



Emissions to Water and Water Usage					
BAT No.	BAT Guidance			Permit Documents	
35	In order to reduce the generation of waste water and to reduce water usage, BAT is to use all of the techniques given below.			Technique A is dealt with as part of BAT 19f.  Technique B is dealt with as part of BAT 19b.  C) With regards to technique C, the moisture content of the waste is assessed by the operator and amended as required. Any runoff is captured within one of the two wastewater (leachate) tanks, allowing process water to be re-circulated into the composting process or tankered offsite as required. Tankering offsite is expected to be limited to the winter months due to the reduced requirement for moisture addition. Moisture checks are performed on the actively management compost process as part of the PAS 100 management system.  <b>BC35 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.	
	Technique		Description		Applicability
	a.	Segregation of water streams	Leachate seeping from compost piles and windrows is segregated from surface run-off water (see BAT 19f).		Generally applicable to new plants.  Generally applicable to existing plants within the constraints associated with the layout of the water circuits.
b.	Water recirculation	Recirculating process water streams (e.g. from dewatering of liquid digestate in anaerobic processes) or using as much as possible other water streams (e.g. water condensate, rinsing water, surface run-off water). The degree of recirculation is limited by the water balance of the plant, the	Generally applicable.		

Emissions to Water and Water Usage				
BAT No.	BAT Guidance			Permit Documents
			content of impurities (e.g. heavy metals, salts, pathogens, odorous compounds) and/or the characteristics of the water streams (e.g. nutrient content).	
	c.	Minimisation of the generation of leachate	Optimising the moisture content of the waste in order to minimise the generation of leachate.	Generally applicable.

### 3.3 Bat Conclusions for the Aerobic Treatment of Waste

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
36	<p>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.</p> <p>Monitoring and/or control of key waste and process parameters, including:</p> <ul style="list-style-type: none"> <li>- waste input characteristics (e.g. C to N ratio, particle size);</li> <li>- temperature and moisture content at different points in the windrow;</li> <li>- aeration of the windrow (e.g. via the windrow turning frequency, O<sub>2</sub> and/or CO<sub>2</sub> concentration in the windrow, temperature of air streams in the case of forced aeration);</li> <li>- windrow porosity, height and width.</li> </ul> <p>Monitoring of the moisture content in the windrow is not applicable to enclosed processes when health and/or safety issues have been identified. In that case, the moisture content can be monitored before loading the waste into the enclosed composting stage and adjusted when it exits the enclosed composting stage.</p>	<p>The operator follows a PAS 100 certified Standard Operating Procedure (SOPS RRS07) which monitors and/or controls key waste and process parameters.</p> <ol style="list-style-type: none"> <li>1) <b>Waste input characteristics:</b> The operator follows waste acceptance / rejection procedures which follows set criteria on physical contaminants, invasive species, plants containing toxins and wood with preservatives. The C:N ratio is typically controlled by operator experience as required through the mixing of feed stocks. This involves mixing in oversized material and/or cardboard (high carbon content) removed during the product screening phase. The decision is subjective but a visual mix of 1:4 green (fresh) to brown (dry non-green material) is seen as appropriate.</li> <li>2) <b>Temperature and moisture content in compost block:</b> Temperature monitoring during the sanitisation and stabilisation</li> </ol>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>phases of the composting process is monitored as follows:</p> <ol style="list-style-type: none"> <li>3) Handheld temperature probes are inserted into the windrow, at a minimum of 0.5 metres below the windrow surface at eight points per batch.</li> <li>4) The temperature detected by the sensor when inserted in the windrow shall be allowed to stabilise before a final reading is recorded.</li> <li>5) All temperature monitoring results for the sanitisation phase shall be recorded in the 'Batch Formation and Monitoring Record Sheet'. Temperatures are monitored on a daily basis during the sanitisation phase and on a weekly basis during the stabilisation phase.</li> <li>6) Corrective actions to ensure temperatures remain within critical limits may be carried out where necessary. These include additional turning, increasing the batch size, water addition and alteration of batch shape (cross section profile).</li> </ol>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>7) Moisture content is measured before a batch is formed and then from eight points per batch daily during the sanitisation phase and eight points per batch weekly during the stabilisation phase. The moisture is measured via a squeeze test in accordance with BS EN 13040 and guidance from the Association for Organics Recycling. Where the moisture is found to be too low, water may be sprayed onto the batch from the lagoon. Where the conditions are too moist, relatively dry input materials may be added. Temperature and moisture are critical limits in the composting process. All temperature and moisture results for sanitisation and stabilisation are recorded in the 'Batch Formation and Monitoring Sheet'.</p> <p>8) <b>Aeration of open windrows:</b> Aeration of the open windrows is achieved through turning during the sanitisation and stabilisation phases. The frequency of turning depends on the rate of decomposition, the moisture content, temperature and porosity of the material. The SOPs detail the minimum number of turns for the sanitisation and stabilisation phases and these are critical limits. The compost must be turned at least twice during sanitisation and at least four times during stabilisation. Should any batch fail to</p>

Overall Environmental Performance		
BAT No.	BAT Guidance	Permit Documents
		<p>meet the critical limits, all of the material within that batch shall either: undergo corrective action then be re-evaluated; undergo re-composting; or, be dispatched from site for use, processing elsewhere or disposal with notification of PAS100 non-conformance.</p> <p>9) <b>Windrow porosity:</b> The porosity of the windrows is measured by proxy through daily squeeze tests that are logged daily on the batch record monitoring sheets as levels between 0-5 as per the PAS100 requirements. The typical batch size is 600 tonnes, with minimum expected size of 80 tonnes and maximum expected size of 1000 tonnes.</p> <p><b>BC36 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

Odour and Diffuse Emissions to Air					
BAT No.	BAT Guidance			Permit Documents	
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.			<p>A) With regards to technique A, the operator does not currently incorporate this technique.</p> <p>B) With regards to technique B, operations are adapted during adverse weather conditions such as heavy rain or strong winds as per the site’s FEMP. Wind data has been analysed as part of the site’s OMP, however given the varying directions to local sensitive receptors, it is not deemed practical to restrict activities by wind direction. However, within section 4.0 <i>Process Management</i> of the OMP, it is stated that ‘<i>Turning is required to ensure the product does not become anaerobic and as such the turning of the stockpiles will not take place when the wind is in the direction of sensitive receptors to the north</i>’.</p> <p>With reference to aerial emissions of dusts, fibres and particulates, Section 6.1 of the FEMP states that ‘<i>Site staff supervising individual waste handling operations shall, during the carrying out of those operations, undertake visual monitoring of</i></p>	
	Technique		Description		Applicability
	a.	Use of semipermeable membrane covers	Active composting windrows are covered by semipermeable membranes.		Generally applicable.
b.	Adaptation of operations to the meteorological conditions	<p>This includes techniques such as the following:</p> <ul style="list-style-type: none"> <li>- Taking into account weather conditions and forecasts when undertaking major outdoor process activities. For instance, avoiding formation or turning of windrows or piles, screening or shredding in the case of adverse meteorological conditions in terms of emissions dispersion (e.g. the wind speed is too low or too high, or the wind blows in</li> </ul>	Generally applicable.		

Odour and Diffuse Emissions to Air				
BAT No.	BAT Guidance			Permit Documents
			<p>the direction of sensitive receptors).</p> <ul style="list-style-type: none"> <li>- Orientating windrows, so that the smallest possible area of composting mass is exposed to the prevailing wind, to reduce the dispersion of pollutants from the windrow surface. The windrows and piles are preferably located at the lowest elevation within the overall site layout.</li> </ul>	<p><i>aerial emissions. On detection or notification of visible aerial emissions that are likely to be transported beyond the site boundary, immediate action shall be taken to stop the waste handling operations giving rise to the emission and to suppress the aerial emission from the waste. The incident and the remedial action shall be recorded in the site diary'.</i></p> <p>With reference to bioaerosols, the operator undertakes bioaerosol monitoring on a six-monthly basis in line with permit requirements and any exceedance of the stipulated bioaerosol limits are discussed between site management. Dependent on if the source of the elevated levels can be established, corrective actions may be implemented if required.</p> <p>To monitor meteorological conditions, RRS have a weather station installed at the weighbridge that monitors temperature, rainfall, humidity, wind speed and direction. The weighbridge operator has been trained to understand wind direction and prevailing winds specific to the site. The weather station is</p>



Odour and Diffuse Emissions to Air		
BAT No.	BAT Guidance	Permit Documents
		<p>monitored at least every two hours. Each morning, the current and prevailing wind direction is logged and displayed on the weighbridge notice board. When then prevailing wind direction is blowing toward the nearest sensitive receptors, major site activities are suspended. Such as windrow turning, screening and shredding.</p> <p><b>BC37 Status: Compliant</b> – It is the operator’s view that they are compliant with this BAT conclusion.</p>

#### 4.0 COMBUSTION PLANT

RRS does not have any combustion plant or generators associated with the permitted activity at the site at Iron House Farm.