

Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Thames Water Utilities Limited
Riverside Sludge Treatment Centre
Riverside Sewage Treatment Works
Creekside
Rainham
Essex
RM13 8QS

Variation application number

EPR/GB3739DY/V004

Permit number

EPR/GB3739DY

Riverside Sludge Treatment Centre

Permit number EPR/GB3739DY

Introductory note

This introductory note does not form a part of the permit

Changes introduced by this variation

The Industrial Emissions Directive (IED) came into force on 7 January 2014 with the requirement to implement all relevant Best Available Techniques (BAT) Conclusions as described in the Commission Implementing Decision. The schedule of waste management activities includes the recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment, but excludes activities covered by the Urban Waste Water Treatment Regulations (UWWTR). However, UK environmental regulators concluded that the biological treatment of waste sewage sludge is not an activity covered by the UWWTR and is therefore within the scope of the IED. The BAT Conclusions for Waste Treatment (the BREF) was published on 17 August 2018 following a European Union wide review of BAT, implementing decision (EU) 2018/1147 of 10 August 2018. BAT applies to new waste sewage sludge treatment not covered by the UWWTR. The operations at Riverside Sludge Treatment Centre (STC) are existing but will be brought into environmental regulation for the first time and are required to operate using BAT.

Under the Environmental Permitting (England & Wales) Regulations 2016 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. All the conditions of the permit have been varied and are subject to the right of appeal.

The variation amends the permit to add a Section 5.4 Part A (1)(b)(i) scheduled activity and one waste activity to become a multi regime permit from a bespoke permit authorising a Schedule 25B Specified Generator activity for the burning of waste (biogas) as a fuel for the purpose of the generation of electricity and heat to use within the installation and/or export to the grid.

The three CHP engines and three boilers are to become directly associated activities (DAAs) to the Section 5.4 Part A (1)(b)(i) scheduled activity. This variation also includes the addition of a waste operation for the import of digested sludge for temporary storage and onward transfer.

Brief description of the process

Riverside STC ("the site") is located to the north of the River Thames near to the town of Rainham within the London Borough of Havering at National Grid Reference TQ 51468 82336. The site is located within an industrial area, bounded by a railway line to the north and the A13 to the south. To the west and east are industrial/commercial estates including a number of large-scale warehouses, logistic operations and waste operations (including commercial physical treatment and transfer station sites). There are also residential properties close to the site entrance. Rainham Creek flows from the north to the south, into the River Ingrebourne, approximately 40m away from the STC boundary and a drainage ditch can be found to the north and west of the site.

The facility comprises of the following operations:

- A Section 5.4 A (1) (b)(i) scheduled activity for the recovery of non-hazardous waste with a capacity exceeding 100 tonnes per day involving anaerobic digestion (AD)

- A waste activity for the import and temporary storage of digested sludge cake pending off-site removal.

The site treats both indigenous sludges and imported sludges. Imported sludge is delivered to either the sludge offloading point via tankers and pumped to one of two sludge buffer tanks or received directly from Beckton STC (EPR/PB3238RK) to the sludge blending tanks via a dedicated pipeline.

Undigested cake is also imported to site and undergoes rewetting using the mobile cake rewetting plant. The undigested sludge cake is loaded into the cake hopper of a mobile cake rewetting plant where it is re-wet using final effluent before it is pumped to the sludge blending tank. Imported sludge combines with indigenous sludge in the sludge buffer tanks and is screened and pumped to the sludge blending tank where it mixes with the re-wetted undigested sludge. Blended indigenous and imported sludge transfers to the sludge blending tank via sludge screens, where sludge is screened to remove contraries.

From the sludge buffer tanks sludge can also be transferred to the sludge holding tank for temporary storage prior to being screened.

From the sludge blending tanks sludge is transferred to the pre-thermal hydrolysis plant (THP) dewatering plant within the dewatering building where it is thickened. A powder polymer (stored in silos) is made up using final effluent/ potable water before it is dosed into each of the seven centrifuges to aid coagulation of the sludge.

Thickened sludge is transferred to one of two THP feed silos. Liquor produced as part of this thickening process is returned to the Wastewater Treatment Works (WwTW) which do not form part of the permit boundary and transferred at point T1 and sampled at point S1.

The pre-THP dewatering plant is connected to odour control unit (OCU) 1 for abatement. The sludge buffer tanks and sludge holding tank are connected to OCU 3 for abatement.

Thickened, blended sludges from the THP Feed Silos are then subject to a THP process with the application of temperature and pressure in an enclosed system. From the THP, sludge is transferred to one of the four anaerobic digestion (AD) tanks at the site. The digesters operate on a continual basis with a retention time of approximately 12 days. This biological treatment of this waste is regulated as an installation activity under Section 5.4 A (1) (b) (i) of the Environmental Permitting (England and Wales) Regulations 2016.

The resultant biogas produced from the AD process is captured and stored in the roof space of primary digester tanks, or in one of two dual membrane biogas holders. The biogas transfer pipeline is equipped with condensate pots that capture entrained moisture from the generated biogas and allow it to be drained into the site drainage system for return to the WwTW for treatment via transfer point T1, and it is sampled at point S1. The biogas storage holders, THP vessels and primary digester tanks are fitted with pressure release valves as a safety precaution in the event of over pressurising the system.

Biogas is directed from the biogas holders for combustion in three combined heat and power (CHP) engines with an aggregated thermal input of 15.3MWth (3 x 5.1MWth). The site also has three dual fuelled boilers rated at 3.3MWth each running on biogas or natural gas which are utilised if the CHP engine is unavailable. These are directly associated activities to the S5.4 A(1) (b) (i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment activity.

In the event of emergency, biogas is flared in a waste gas burner.

Following digestion in the primary digester tanks, digested sludge is transferred to the digested sludge dewatering buffer tanks before it is transferred to the sludge dewatering presses for dewatering. The presses use a polymer, made up from a powder polymer that is mixed with final effluent/potable water before being dosed to each belt to aid coagulation, with the liquor generated from this process joining liquor generated from the Pre-THP dewatering plant where it drains to an external liquor return tank before being returned to the WwTW at emission point T1 and sampled at point S1.

The digested sludge dewatering buffer tanks and the sludge dewatering presses are connected to OCU 1.

Dewatered sludge is stored in the fully enclosed barn in one of five bays, prior to removal from the site under the Sludge (Use in Agriculture) Regulations (SUiAR) and undergoes quality assurance under the Biosolids Assurance Scheme (BAS).

There are two OCUs on site. OCU 1 is a lava rock biofilter, followed by dual activated carbon adsorption units and serves the sludge blending tanks, THP feed silos, digested sludge dewatering buffer tanks and the liquor return tank. OCU 3 is a biofilter odour control unit and serves the sludge buffer tanks and the sludge holding tank.

This permit also allows for a waste operation. Digested cake produced at other Thames Water sites will be stored separately to indigenous cake produced as part of activity AR1 to AR10 in designated area/s in the cake barn prior to transfer off site. Cake that is temporarily stored on site will not undergo any treatment and must be kept separate from any cake produced as a result of activities AR1 to AR10 referenced in table S1.1.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Permit EPR/GB3739DY determined	27/03/2014	Permit issue to Thames Water Utilities Limited.
Variation application EPR/GB3739DY/V002	Duly made 30/12/2019	Variation application to implement the changes introduced by MCPD.
Additional information received	09/07/2020	Supplementary modelling provided in response to information request.
Additional information received	29/07/2020	Further clarification on the supplementary information provided.
Variation determined EPR/GB3739DY	16/11/2020	Varied permit issued.
Variation application EPR/GB3739DY/V003	Submitted 23/12/2021	Application withdrawn and resubmitted under V004.
Surrender determined EPR/GB3739DY/S005	04/04/2024	Partial surrender of 2 x 5.9MWth back up generators.
Application EPR/GB3739DY/V004	Duly made 13/12/2024	Application for an anaerobic digestion facility with combustion of biogas at a waste sewage sludge treatment site.
Additional information received	29/01/2025	Updated Site Specific Bioaerosol Risk Assessment and technical information around the primary digester daily throughput.
Variation and consolidation determined EPR/GB3739DY/V004 (EAWML Billing ref. EAWML 104176)	13/03/2025	Varied permit issued to Thames Water Utilities Limited.

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies and consolidates

Permit number

EPR/GB3739DY

Issued to

Thames Water Utilities Limited (“the operator”),

whose registered office is

Clearwater Court

Vastern Road

Reading

Berkshire

RG1 8DB

company registration number 02366661

to operate regulated facilities at

Riverside Sludge Treatment Centre

Riverside Sewage Treatment Works

Creekside

Rainham

Essex

RM13 8QS

to the extent set out in the schedules.

The notice shall take effect from 13/03/2025.

Name	Date
Rebecca Warren	13/03/2025

Authorised on behalf of the Environment Agency

Schedule 1

All conditions have been varied by the consolidated and varied permit issued as a result of the application made by the operator.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/GB3739DY

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2016

Thames Water Utilities Limited (“the operator”),

whose registered office is

Clearwater Court

Vastern Road

Reading

Berkshire

RG1 8DB

company registration number 02366661

to operate an installation and waste operations at

Riverside Sludge Treatment Centre

Riverside Sewage Treatment Works

Creekside

Rainham

Essex

RM13 8QS

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Rebecca Warren	13/03/2025

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.
- 1.1.4 The operator shall comply with the requirements of an approved competence scheme.

1.2 Energy efficiency

- 1.2.1 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR10) the operator shall:
- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
 - (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
 - (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

- 1.3.1 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR10) the operator shall:
- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
 - (b) maintain records of raw materials and water used in the activities;
 - (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
 - (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

- 1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).
- 2.1.2 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR10) the activities shall be undertaken in accordance with best available techniques.
- 2.1.3 All process plant and equipment shall be commissioned, operated and maintained and shall be fully documented and recorded in accordance with the manufacturer’s recommendations.
- 2.1.4 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR10) waste authorised by this permit shall be clearly distinguished from any other waste on the site.

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.4 Waste shall only be accepted if:
- (a) it is of a type and quantity listed in schedule 2 tables S2.2 and S2.3;
 - (b) it conforms to the description in the documentation supplied by the producer and holder.
 - (c) the facility has sufficient free capacity to store and treat the waste.
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
- (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and
 - (e) the waste code of the waste.

- 2.3.6 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.
- 2.3.7 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR10) waste pre-acceptance and acceptance procedures shall be undertaken in accordance with best available techniques.
- 2.3.8 For the following activities referenced in schedule 1, table S1.1 (AR4):
- (a) each MCP must be operated in accordance with the manufacturer's instructions and records must be made and retained to demonstrate this.
 - (b) the operator must keep periods of start-up and shut-down of the combustion plant as short as possible.
 - (c) there shall be no persistent emission of 'dark smoke' as defined in section 3(1) of the Clean Air Act 1993.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1 and S3.2.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour, but including ammonia) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 3.2.3 Subject to condition 3.2.4, below, all liquids in containers, whose emission to water or land could cause pollution, shall be provided with adequate secondary containment, unless other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container have been agreed in writing with the Environment Agency.

- 3.2.4 Condition 3.2.3, above, shall apply unless the operator strictly complies in full with IC6 below.
- 3.2.5 Subject to condition 3.2.6, below, all liquid wastes in storage tanks shall be fully enclosed, with emissions collected and directed to an appropriate abatement system, unless other appropriate measures to prevent or where that is not practicable, to minimise, emissions of waste gases from storage tanks have been agreed in writing with the Environment Agency.
- 3.2.6 Condition 3.2.5, above, shall apply unless the operator strictly complies in full with IC7 below.
- 3.2.7 Subject to condition 3.2.8, below, the operator shall use buffer storage to store waste water and digestate to prevent waste water or digestate being discharged off site during the receiving waste water treatment works storm overflow operating, unless other appropriate measures to prevent or where that is not practicable, to minimise, emissions during waste water treatment works storm overflow operation, have been agreed in writing with the Environment Agency.
- 3.2.8 Condition 3.2.9, above, shall apply unless the operator strictly complies in full with IC14 below.
- 3.2.9 The operator shall implement a leak detection and repair (LDAR) programme to detect and mitigate the release of volatile organic compounds, including methane from diffuse sources.

3.3 Odour

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.4 Noise and vibration

- 3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.
- 3.4.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;
 - (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

- 3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:
- (a) point source emissions specified in tables S3.1 and S3.2;
 - (b) process monitoring specified in tables S3.3 and S3.4;
 - (c) bioaerosols monitoring specified in tables S3.5 and S3.6.
- 3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall

have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.

- 3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.2, S3.3, S3.4, S3.5, S3.6 and S3.7 unless otherwise agreed in writing by the Environment Agency.
- 3.5.5 For the following activities referenced in Schedule 1 Table S1.1 (AR4):
- (a) For existing MCP Monitoring measurements shall be carried out before the relevant compliance date or within four months of the issue date of the permit whichever is the later.
 - (b) In the case of new medium combustion plant, the first monitoring measurements shall be carried out within four months of the issue date of the permit or the date when the MCP is first put into operation, whichever is later.
- 3.5.6 Monitoring of MCP shall not take place during periods of start up or shut down.

3.6 Bioaerosols

- 3.6.1 The operator shall take all appropriate measures, to prevent or where that is not practicable to minimise the release of bioaerosols. Emissions of bioaerosols from the operational activities shall not exceed the emission action levels specified in tables S3.4 and S3.5.
- 3.6.2 The operator shall where the emission action levels are exceeded:
- (a) notify the Environment Agency and investigate and take remedial action;
 - (b) submit to the Environment Agency for approval within the period specified, a bioaerosols management plan which identifies and minimises the risks of pollution from bioaerosols; and
 - (c) implement the bioaerosols management plan from the date of approval and revise the plan periodically, unless otherwise agreed in writing by the Environment Agency.

3.7 Pests

- 3.7.1 The activities shall not give rise to the presence of pests which are likely to cause pollution, hazard or annoyance outside the boundary of the site. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved pests management plan, have been taken to prevent or where that is not practicable, to minimise the presence of pests on the site.
- 3.7.2 The operator shall:
- (a) only use approved products for pest control;
 - (b) treat pest infestations promptly;
 - (c) reject pest-infected incoming waste;
 - (d) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a pests management plan which identifies and minimises risks of pollution from pests;
 - (e) implement the pests management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.8 Fire prevention

- 3.8.1 The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.
- 3.8.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;
- (b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.8.3 The operator shall undertake a DSEAR assessment and maintain an accident management plan.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

- (a) be legible;
- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.1.3 The operator shall maintain a record of the type and quantity of fuel used and the total annual hours of operation of each MCP.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR10) a report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
- (b) the annual production/treatment data set out in schedule 4 table S4.2; and
- (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
- (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.2.6 The operator shall keep records of non-waste materials leaving the site, including the type of material, the batch number, the date of export off-site and the tonnage exported on that date. These records shall be maintained for at least 2 years.

4.2.7 The operator shall submit an annual report detailing the efficiency of removal of non-digestible materials from feedstock prior to processing and the level of contamination in the final recovered digestate.

4.3 Notifications

4.3.1 In the event:

(a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

(i) inform the Environment Agency,

(ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

(iii) take the measures necessary to prevent further possible incidents or accidents;

(b) of a breach of any permit condition the operator must immediately—

(i) inform the Environment Agency, and

(ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;

(c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Following the detection of an issue listed in condition 4.3.1, the operator shall review and revise the management system and implement any changes as necessary to minimise the risk of re-occurrence of the issue.

4.3.4 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.5 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

In any other case:

- (a) the death of any of the named operators (where the operator consists of more than one named individual);
- (b) any change in the operator's name(s) or address(es); and
- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.6 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) the Environment Agency shall be notified at least 14 days before making the change; and
- (b) the notification shall contain a description of the proposed change in operation.

4.3.7 The Environment Agency shall be given at least 14 days' notice before implementation of any part of the site closure plan.

4.3.8 The operator shall notify the Environment Agency as soon as is practicable, in writing of any change of medium combustion plant.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
AR1	S5.4 A(1) (b) (i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment	R3: Recycling/reclamation of organic substances which are not used as solvents	<p>From receipt of waste through to digestion and recovery of by-products (waste treated by anaerobic digestion).</p> <p>Anaerobic digestion of waste in four tanks followed by burning of biogas produced from the process. Anaerobic digestion shall be limited to 1,890m³ per day.</p> <p>Waste types suitable for acceptance are limited to those specified in Table S2.2.</p>
Directly Associated Activity			
AR2	Storage of waste pending recovery or disposal	R13: Storage of waste pending the operations numbered R1 and R3 (excluding temporary storage, pending collection, on the site where it is produced)	<p>From the receipt of permitted waste to pre-treatment and despatch for anaerobic digestion on site.</p> <p>Storage of residual wastes from pre-treatment to despatch off-site for recovery.</p> <p>Storage of waste in enclosed equipment and tanks or an enclosed building fitted with appropriate odour abatement and on an impermeable surface with a sealed drainage system.</p> <p>Waste types suitable for acceptance are limited to those specified in Table S2.2.</p>
AR3	Physical treatment for the purpose of recycling	R3: Recycling/reclamation of organic substances which are not used as solvents	<p>From the receipt of waste to despatch for anaerobic digestion or despatch off site for recovery.</p> <p>Dilution of incoming wastes using final waste waters from the wastewater treatment works to aid pre-treatment and digestion only.</p> <p>Pre-treatment of waste in enclosed equipment and tanks or an enclosed building fitted with appropriate odour abatement and on an impermeable surface with a sealed drainage system, including shredding, sorting, screening, compaction, baling, mixing and maceration.</p>

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
			<p>Post-treatment of digestate in enclosed equipment and tanks or an enclosed building fitted with appropriate odour abatement and on an impermeable surface with a sealed drainage system, including separation, screening to remove contraries, centrifuge or pressing and addition of thickening agents (polymers) or drying for use as a fertiliser or soil conditioner (drying for the purpose of use as a fuel is not permitted).</p> <p>Heat treatment (thermal hydrolysis) of waste in twelve tanks for the purpose of recovery. Tanks are comprised of two pulping tanks, eight reactor tanks and two flash tanks.</p> <p>Gas cleaning by biological or physical (carbon filtration) or chemical scrubbing.</p> <p>Waste types suitable for acceptance are limited to those specified in Table S2.2.</p>
AR4	Steam and electrical power supply	R1: Use principally as a fuel to generate energy	<p>From the receipt of biogas produced at the on-site anaerobic digestion process to combustion with the release of combustion gases.</p> <p>Combustion of biogas in three combined heat and power (CHP) engines with an aggregated thermal input of 15.3MWth.</p> <p>Combustion of biogas and natural gas in three auxiliary boilers with an aggregated thermal input of 9.9MWth. Operation of the boiler shall be limited to less than 500 hours per year as a 5-year rolling average when operating on natural gas.</p> <p>The operation of medium combustion plant will be limited to the operation of two engines and two boilers at any one time.</p>
AR5	Emergency flare operation	D10: Incineration on land	<p>From the receipt of biogas produced at the on-site anaerobic digestion process to incineration with the release of combustion gases.</p> <p>There shall be no venting or flaring of gas for disposal.</p>

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
			Use of one auxiliary flare required only during periods of breakdown or maintenance of the CHP engines and/or auxiliary boilers.
AR6	Raw material storage	Storage of raw materials including lubrication oil, antifreeze, ferric chloride, activated carbon, diesel.	From the receipt of raw materials to despatch for use within the facility.
AR7	Gas storage	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	Storage of biogas produced from on-site anaerobic digestion of permitted waste in two double membrane stand-alone biogas holders or roof space of digesters. From the receipt of biogas produced at the on-site anaerobic digestion process to despatch for use within the facility. Emissions of unburnt biogas shall be minimised.
AR8	Digestate storage	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	From the receipt of processed digestate produced from the on-site anaerobic digestion process to despatch for use off-site. Storage of processed liquid digestate in two digested sludge dewatering buffer tanks. Storage of processed solid digestate on five cake pads within a fully enclosed cake barn and on an impermeable surface with sealed drainage system.
AR9	Surface water collection and storage	Collection and storage of uncontaminated roof and site surface water	From the collection of uncontaminated roof and site surface water from non-operational areas only to re-use within the facility or discharge off-site.
AR10	Air abatement	Collection and treatment of air from the buildings or plant using abatement system – [biofilters, carbon filters] prior to release to atmosphere.	From the collection of air from site processes to treatment and release of treated air to atmosphere. Collection and treatment of air from the buildings, tanks or plant using abatement system – [2 x biofilters and 2 x carbon filters].
Activity reference	Description of activities for waste operations		Limits of activities

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
AR11 - Temporary storage of digested cake	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)		<p>From the receipt of waste sludges (digested cake) for temporary storage prior to transfer of site.</p> <p>There shall be no treatment of incoming wastes.</p> <p>Blending and mixing shall not be undertaken to achieve a reaction or a dilution of contaminants.</p> <p>Subject to any other requirements of this permit wastes shall be stored for no longer than 1 year prior to disposal.</p> <p>The maximum amount of waste stored must not exceed 1,000 tonnes at any one time. Waste will be stored in a fully enclosed cake barn.</p> <p>Storage of waste shall take place on an impermeable surface with a sealed drainage system.</p> <p>Waste types as specified in Table S2.3.</p>

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	<p>Response to section 3a – technical standards, Part C3 of the application form.</p> <p>Best available techniques as described in the BAT Reference Document for Waste Treatment (the BREF) and BAT conclusions.</p> <p>Raw Materials, Water and Waste Residue Efficiency Management Plan: Riverside STW, Version 1, November 2023.</p> <p>Accident Prevention and Management Plan, Version 1, November 2023.</p> <p>Leak Detection and Repair Plan, Version 2, November 2023.</p> <p>Site Condition Report, December 2023.</p> <p>Drainage Plan, Version 1, March 2006.</p> <p>Drainage Plan 2, Version 1, March 2006.</p> <p>STC IED Containment Riverside STC – Containment Options Report, Version 2, December 2023.</p> <p>Acceptance of Third-Party Waste Imports, Version 12, November 2023.</p> <p>Process Flow Diagram, Version PO5, November 2023.</p> <p>Installation Boundary and Air Emission Points Plan “B22849AM-JAC-RVE-DR-0002”, Version PO6, November 2023.</p> <p>Odour Management Plan, Version 7.1, December 2023.</p>	19/12/2023

Table S1.2 Operating techniques		
Description	Parts	Date Received
Response to RFI dated 29/11/2024	Confirmation in response to a Schedule 5 notice that the final containment solutions will provide containment of at least 7,051m ³ .	13/12/2024
Response to Schedule 5 Notice dated 15/01/2025	Bioaerosol Risk Assessment, Version 3, January 2025.	29/01/2025

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1	<p>The Operator shall submit a written report to the Environment Agency on the commissioning of the waste activity. The report shall summarise the environmental performance and include but not be limited to:</p> <ul style="list-style-type: none"> • Atmospheric emission monitoring for carbon monoxide (CO) and volatile organic compounds (VOC's) for all engine emissions and oxides of nitrogen (NOX) emissions from the boilers. Monitoring shall have regard to Environment Agency MCERTS guidance note M2 monitoring of stack emissions to air. The report shall include a minimum of three samples for each parameter at each relevant emission point. • Details of any changes to the operating techniques after commissioning experience from that in the application with impact to minimise atmospheric environmental emissions impact The Environment Agency shall confirm in writing the Carbon Monoxide Emission Limit Value for the gas engines, after review of the above improvement program. 	Completed
IC2	The Operator shall carry out a noise assessment from the activities. The assessment shall include impact of operations during daytime and nighttime periods, and be made against current, including draft standards out for consultation, relevant British and International standards. A report shall be submitted summarising the outcomes of the assessment plus any recommendations for improvements with timescales for completion of noise and vibration minimisation actions.	Completed
IC3	The Operator shall assess the data used to verify the performance of the NOX emissions continuous emission monitoring systems (CEMs), comparing periodic data with the measurements produced by the CEMs, after a period of six months. On completion of improvement program 1 the final periodic monitoring frequency for the gas engines will be confirmed in writing by the Environment Agency NOX.	Completed
IC4	The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of the gas engine tuning to ensure compliance with the 400 mg/m ³ Daily Average Emission Limit Value (ELV) for oxides of nitrogen (NOX) emissions at emission points A1 to A3. The report shall also provide details of the optimisation including process monitoring of relevant parameters and operating procedures for optimisation of engine tuning.	Completed
IC5	The Operator shall submit a written summary report to the Environment Agency to confirm by the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters is as specified in Table S3.1. On completion of both improvement conditions 2 and 3 the Environment Agency shall confirm in writing their	Completed

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	acceptance of final monitoring procedures for process and continuous monitoring requirements for NOX emissions for the engines.	
Improvement condition for secondary containment design		
IC6	<p>The operator shall submit a written 'secondary containment implementation plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the finalised designs and an implementation schedule for the identified secondary containment systems proposed in the document "STC IED Containment Riverside STC – Containment Options Report", Version 2, December 2023 and "Request for Further Information – Riverside", December 2024. The finalised design(s) and specifications shall be produced by appropriate competent individuals (qualified civil or structural engineer), in accordance with the risk assessment methodology detailed within CIRIA C736 (2014) guidance. The plan shall include but not be limited to the following components:</p> <ul style="list-style-type: none"> • An updated BAT assessment with specific regard to BAT 19 of the Waste Treatment BREF to demonstrate how the finalised designs based on the proposed secondary containment in the document "STC IED Containment Riverside STC – Containment Options Report", Version 2, December 2023 and "Request for Further Information – Riverside", December 2024 meet BAT 19. • An assessment of the suitability for providing containment when subjected to the dynamic and static loads caused by catastrophic tank failure. • Finalised designs and specifications of the proposed secondary containment proposal completed by appropriate competent individuals. • A program of works with timescales for the commissioning of the secondary containment systems to comply with CIRIA C736 (2014) guidance, or equivalent. • An updated site and infrastructure plan. • A preventative maintenance and inspection regime. <p>The plan shall be implemented in accordance with the Environment Agency's prior written approval.</p>	<p>31/3/2025</p> <p>Implementation of all required and approved containment improvements must be completed by 31/03/2025.</p>
Improvement conditions for enclosure of tanks storing (or treating) sewage sludge (tanks pre-digestion)		
IC7	<p>The operator shall submit a written 'enclosure and abatement plan' and obtain the Environment Agency's written approval to it.</p> <p>The plan shall contain the final designs and an implementation schedule for the installation of enclosures/covers and associated emission abatement systems in line with BAT 14 and BAT 53 for storage and treatment tanks pre-anaerobic digestion identified as two sludge buffer tanks.</p> <p>The plan shall include evidence that the tank enclosures/covers will be designed and installed in accordance with guidance, <i>Biological waste</i></p>	<p>31/3/2025</p> <p>Implementation of all required vessel cover improvements must be completed by 31/03/2025</p>

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<p><i>treatment: appropriate measures for permitted facilities</i>, and provide evidence to demonstrate why the emission abatement system will be effective and meet the requirements of BAT 14 and BAT 53.</p> <p>The plan shall be implemented in accordance with the Environment Agency's prior written approval.</p> <p>(Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).</p>	
Improvement conditions for primary containment tanks		
IC8	<p>The operator shall submit a written 'primary containment plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of an inspection and program of works undertaken by an appropriately qualified engineer and shall assess the extent, design specification and condition of primary containment systems (including associated pipework) where polluting liquids and solids are being stored, treated, and/or handled.</p> <p>The plan shall include, but not be limited to:</p> <ul style="list-style-type: none"> • An assessment of the physical condition of all primary containment systems (storage and treatment vessels and associated pipework) using a Written Scheme of Examination and their suitability for providing primary containment when subjected to dynamic and static loads. • A program of works with timescales for the implementation of individual improvement measures necessary to demonstrate that the primary containment is fit for purpose or alternative appropriate measures to ensure all polluting materials will be contained on site. • A preventative maintenance and inspection regime. <p>The plan shall be implemented in accordance with the Environment Agency's written approval.</p>	<p>Within 12 months of permit issue or such other date as agreed in writing with the Environment Agency.</p>
Improvement conditions for establishing an inventory of liquid waste water discharged from anaerobic digestion and associated activities (AR1 – AR10)		
IC9a	<p>The operator shall submit a sampling programme in relation to waste water streams and shall obtain the Environment Agency's written approval to it. The sampling programme shall be designed to fully characterise the waste waters discharged to Riverside wastewater treatment works (WwTW) from emission point T1, which are to be sampled at S1 in table S3.2 of this permit.</p> <p>The programme shall include but not be limited to a methodology for a minimum of one 24-hour flow proportional sample a month, for each emission point, for a period of 12 months. The programme shall detail the sampling methods/standards used. Sampling methods shall be in</p>	<p>Within 2 months of issue of this permit or such other date as agreed in writing with the Environment Agency</p>

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<p>accordance with BAT conclusion 20 of the Waste Treatment BREF. The programme shall include the National Grid Reference (NGR) of the sampling point location.</p> <p>The programme shall establish the characteristics of the liquid waste water streams and shall include as a minimum for each emission point:</p> <ul style="list-style-type: none"> • Average values and variability of flow, pH, temperature and conductivity. • Average concentration and load values of all relevant substances and their variability. • Data on bioeliminability. <p>The programme shall sample for all relevant substances and must include:</p> <ul style="list-style-type: none"> • Hydrocarbon oil index (HOI) (mg/l) • Free cyanide (CN⁻) (mg/l) • Adsorbable organically bound halogens (AOX) (mg/l) • Metals and metalloids; arsenic (expressed as As), cadmium (expressed as Cd), chromium (expressed as Cr), hexavalent chromium (expressed as Cr(VI)), copper (expressed as Cu), lead (expressed as Pb), nickel (expressed as Ni), mercury (expressed as Hg), zinc (expressed as Zn) (µg/l) <p>The operator shall submit the collected monitoring data in writing to the Environment Agency according to agreed reporting periods.</p> <p>The sampling programme shall be produced in accordance with Environment Agency guidance:</p> <ul style="list-style-type: none"> • Specific substances and priority hazardous substances – <i>Surface water pollution risk for your environmental permit</i> <u>Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk)</u>. • <i>Monitoring discharges to water: guidance on selecting a monitoring approach</i> <u>Monitoring discharges to water: guidance on selecting a monitoring approach - GOV.UK (www.gov.uk)</u> <p>The monitoring programme shall be carried out and the monitoring data submitted in accordance with the Environment Agency's written approval.</p>	
Improvement conditions for indirect discharges to water discharged from anaerobic digestion and associated activities (AR1 – AR10)		
IC9b	<p>The operator shall submit a report for approval by the Environment Agency, following completion of the sampling programme approved under IC9a. The report shall include but not be limited to; a summary of the sample results, a completed H1 risk assessment(s) and modelling outputs where appropriate.</p> <p>The operator shall provide conclusions on whether the waste waters discharged from T1 and sampled at S1 will have any adverse impact on</p>	<p>Within 15 months of the Environment Agency's written approval of the sampling programme</p>

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<p>the receiving waters once discharged from Riverside WwTW. An assessment shall be made against the parameters specified in the relevant environmental standards as specified within Environment Agency guidance as follows:</p> <ul style="list-style-type: none"> • Specific substances and priority hazardous substances – <i>Surface water pollution risk for your environmental permit</i> <u>Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk).</u> • Sanitary substances – <i>H1 annex D2: assessment of sanitary and other pollutants in surface water discharges 1076_14 H1 Annex D2 - Assessment of sanitary and other pollutants within Surface Water Discharges</i> (publishing.service.gov.uk) <p>The report shall include any proposals and/or additional measures required to prevent or minimise any significant emissions from the installation along with timescales for implementation.</p>	submitted under IC9a or such other date as agreed in writing with the Environment Agency
IC9c	<p>The operator shall implement any improvements identified within the report approved under IC9b in accordance with the Environment Agency's written approval and provide written confirmation to the Environment Agency that the improvements have been completed.</p> <p>(Note, approval of reports under this improvement condition does not preclude the need for permit variation application(s) to operate the improvements identified in the report and/or include any necessary emission limit values).</p>	Within 6 months of the report in relation to IC9b being approved by the Environment Agency or such other date as agreed in writing with the Environment Agency
Improvement condition to address methane slip emissions from gas engines burning biogas		
IC10	<p>The operator shall submit a written plan for approval by the Environment Agency which establishes the methane emissions in the exhaust gas from engines burning biogas and or biomethane and compare these to the manufacturer's specification and benchmark levels.</p> <p>The plan shall develop proposals to assess the potential for methane slip and take corrective actions where emissions of methane above the manufacturer's specification are identified.</p> <p>The operator shall establish methane emissions in the exhaust gas and methane slip using the following standards:</p> <ul style="list-style-type: none"> • EN ISO 25139 • EN ISO 25140 	Within 6 months of permit issue or as such other agreed in writing with the Environment Agency
Improvement condition for the abatement of dispersion stacks		
IC11	<p>The operator shall submit a written 'abatement plan' and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of abatement plant at emission point A15 that meets the requirements of BAT 34 and BAT 53 of the Waste Treatment BREF. That plan shall also contain but not be limited to:</p>	Within 6 months of permit issue or such other date as agreed in writing with the

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<ul style="list-style-type: none"> The plan shall include a demonstration (whether by a detailed review of technical papers or by trial results) that all odorous chemical compounds and their loading rates expected in the relevant air streams have been considered in the design; and supporting evidence that the odorous compounds will be controlled and/or abated either by operating techniques or by the proposed abatement systems. Evidence that the abatement plant will be designed and installed in accordance with guidance, <i>Biological waste treatment: appropriate measures for permitted facilities</i>. A program of works with timescales for the commissioning of the abatement plant infrastructure. <p>The operator shall install and commission the abatement plant in line with the timescales as approved by the Environment Agency.</p> <p>(Note, approval of reports under this improvement condition does not preclude the need for permit variation application(s) to operate the improvements identified in the report and/or include any necessary emission limit values).</p>	Environment Agency
Improvement condition for review of effectiveness of abatement plant		
IC12	<p>The operator shall carry out a review of the abatement plant for the two odour control units on site at emission points A13 and A14, to determine whether the measures have been effective and adequate to prevent, or where this is not possible to minimise, emissions released to air (including but not limited to odour, ammonia, Hydrogen chloride (HCl) and TVOC).</p> <p>The operator shall submit a written report to the Environment Agency following this review for assessment and approval.</p> <p>The report shall include but not be limited to the following aspects:</p> <ul style="list-style-type: none"> Full investigation and characterisation of the waste gas streams. Evidence that the emission of pollutants in the waste gas stream is being prevented or where this is not possible minimised by the abatement plant. Abatement stack monitoring results (including but not limited to odour, ammonia, HCl and TVOC). Abatement process monitoring results (including but not limited to odour, ammonia, HCl and TVOC). Details of air quality quantitative impact assessment including modelling and a proposal for site-specific “action levels” (including but not limited to odour concentration, hydrogen sulphide, ammonia, HCl and TVOC.) Odour monitoring results at the site boundary. Records of odour complaints and odour related incidents. Recommendations for improvement including the replacement or upgrading of the abatement plant. Timescales for implementation of improvements to the abatement plant. 	Within 6 months of issue of this permit or as agreed in writing with the Environment Agency

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<p>The operator shall implement any improvements in line with the timescales as approved by the Environment Agency.</p> <p>(Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).</p>	
Improvement condition for monitoring digestate stability		
IC13	<p>The operator shall submit a written report, with supporting evidence, on the stability of whole digestate, (i.e. prior to dewatering), and obtain the Environment Agency's written approval to it.</p> <p>The report shall assess whether biogas emissions from post digestion storage or treatment of digestate is likely to have been minimised. The report shall include but not be limited to:</p> <ul style="list-style-type: none"> An assessment of residual biogas potential in accordance with the OFW004-005 [N6] methodology specified by <i>BSI PAS 110: Producing Quality Anaerobic Digestate</i> or an equivalent methodology for assessing residual biogas potential of the digestate. 	<p>Within 6 months of permit issue or such other date as agreed in writing with the Environment Agency</p>
Improvement conditions for operational storage buffer capacity		
IC14	<p>The operator shall submit a written "waste water and digestate buffer storage plan" and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of a review of the current storage of waste water and digestate produced from site operations. The review shall propose and describe site contingency arrangements to provide appropriate storage capacity or other appropriate measures to prevent or minimise emissions of waste water or digestate being discharged off site during any occasions when the receiving wastewater treatment works is in storm overflow operating conditions.</p> <p>The storage plan shall include but not be limited to:</p> <ul style="list-style-type: none"> Proposals for additional storage capacity with secondary containment within the site boundary for wastewater and/or other digestate during any occasions when the receiving wastewater treatment works is in storm overflow operating conditions. Procedures to cease discharges during these conditions. Calculation of a reasonable contingency capacity of waste water and/or other digestate during any occasions when the receiving wastewater treatment works is in storm overflow operating conditions. A description and design specification of the buffer storage infrastructure and secondary containment measures. The design shall be completed by an appropriately qualified engineer and secondary containment shall be designed in line with CIRIA C736. A program of works with timescales for the implementation and construction of the buffer storage. 	<p>31/03/2025</p> <p>Implementation of all required containment improvements must be completed by 31/03/2025</p>

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<ul style="list-style-type: none"> • A preventative maintenance and inspection regime. <p>The plan shall be implemented in accordance with the Environment Agency's prior written approval.</p>	

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
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Table S2.2 Permitted waste types and quantities for anaerobic digestion (AR1 – AR10)	
Maximum quantity	Annual throughput shall not exceed 3,450,000 tonnes
Exclusions	<p>Wastes having any of the following characteristics shall not be accepted:</p> <ul style="list-style-type: none"> • Biodegradable wastes that is significantly contaminated with non-compostable or digestible contaminants, in particular plastic and litter shall be no more than 5% w/w and shall be as low as reasonably practicable by 31 December 2025. • Wastes containing wood-preserving agents or other biocides and post-consumer wood. • Wastes containing persistent organic pollutants. • Wastes containing Japanese Knotweed or other invasive plant species listed in the Invasive Species (Amendment etc.) (EU Exit) Regulations 2019. • Manures, slurries and spoiled bedding and straw from farms where animals have notifiable diseases as stipulated in the Animal By-Products (Enforcement) (England) Regulations 2013. • Pest infested waste.
Waste code	Description
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 02	wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)
19 06	wastes from anaerobic treatment of waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (digested sewage sludge only)
19 08	wastes from waste water treatment plants not otherwise specified
19 08 05	sludges from the treatment of urban waste water
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11 (sewage sludge only) subjected to mechanical treatment only from a process that treats waste which are listed in this table, Table S2.2

Table S2.3 Permitted waste types and quantities for non-hazardous waste storage (Temporary storage of digested sludge cake) (AR11)	
Maximum quantity	Annual throughput shall not exceed 1,000 tonnes
Exclusions	<p>Wastes having any of the following characteristics shall not be accepted:</p> <ul style="list-style-type: none"> • Wastes containing persistent organic pollutants. • Wastes containing Japanese Knotweed or other invasive plant species listed in the Invasive Species (Amendment etc.) (EU Exit) Regulations 2019. • Manures, slurries and spoiled bedding and straw from farms where animals have notifiable diseases as stipulated in the Animal By-Products (Enforcement) (England) Regulations 2013. • Pest infested waste. • Hazardous waste.
Waste code	Description
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 06	wastes from anaerobic treatment of waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (digested sewage sludge only)

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
Existing medium combustion plant which are engines fuelled on biogas (greater than 5 MW)						
Point A1a on site plan in Schedule 7	CHP engine 1 stack – 5.1 MWth [note 1]	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³	Hourly average	Twice yearly	BS EN 14792
		Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³	Continuous	--	BS EN15267-3
		Sulphur dioxide	350 mg/m ³ [note 3]	Average over sample period	Annual	BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
		Sulphur dioxide	162 mg/m ³ [note 4]			
		Carbon monoxide	1400 mg/m ³			BS EN 15058
		Total VOCs	No limit set	--	--	BS EN 12619
Point A2a on site plan in Schedule 7	CHP engine 2 stack – 5.1 MWth [note 1]	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³	Hourly average	Twice yearly	BS EN 14792
		Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³	Continuous	--	BS EN15267-3
		Sulphur dioxide	350 mg/m ³ [note 3]	Average over sample period	Annual	BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
		Sulphur dioxide	162 mg/m ³ [note 4]			

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Carbon monoxide	1400 mg/m ³			BS EN 15058
		Total VOCs	No limit set	--	--	BS EN 12619
Point A3a on site plan in Schedule 7	CHP engine 3 stack – 5.1 MWth [note 1]	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³	Hourly average	Twice yearly	BS EN 14792
		Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	400 mg/m ³	Continuous	--	BS EN15267-3
		Sulphur dioxide	350 mg/m ³ [note 3]	Average over sample period	Annual	BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
		Sulphur dioxide	162 mg/m ³ [note 4]			
		Carbon monoxide	1400 mg/m ³			BS EN 15058
		Total VOCs	No limit set	--	--	BS EN 12619
Existing medium combustion plant other than engines fuelled on biogas (1 MW to 5 MW)						
Point A1b on site plan in Schedule 7	Boiler 1 stack – 3.3 MWth [burning biogas] [note 1]	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	120 mg/m ³	Average over sample period	Annual	BS EN 14792
		Sulphur dioxide	200 mg/m ³ [note 2]			BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
	Boiler 2 stack – 3.3 MWth	Oxides of Nitrogen	120 mg/m ³	Average over	Annual	BS EN 14792

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
Point A2b on site plan in Schedule 7	[burning biogas] [note 1]	(NO and NO ₂ expressed as NO ₂)		sample period		
		Sulphur dioxide	200 mg/m ³ [note 2]			
Point A3b on site plan in Schedule 7	Boiler 3 stack – 3.3MWth [burning biogas] [note 1]	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	120 mg/m ³	Average over sample period	Annual	BS EN 14792
		Sulphur dioxide	200 mg/m ³ [note 2]			BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
Existing medium combustion plant other than engines and gas turbines fuelled on natural gas						
Point A1b on site plan in schedule 7	Boiler 1 stack – 3.3MWth [burning natural gas]	--	--	--	--	--
Point A2b on site plan in schedule 7	Boiler 2 stack – 3.3MWth [burning natural gas]	--	--	--	--	--
Point A3b on site plan in schedule 7	Boiler 3 stack – 3.3MWth [burning natural gas]	--	--	--	--	--
Point A4 on site plan in schedule 7	Emergency flare stack [note 1]	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	150 mg/m ³	Average over sample period	[note 5]	BS EN 14792
		Carbon monoxide	50 mg/m ³			BS EN 15058

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
		Total VOCs	10 mg/m ³			BS EN 12619
Point A13 on site plan in schedule 7	Channelled emissions such as odour abatement stack or vent(s) – OCU 1 [note 7]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m ³	Average over sample period	Once every 6 months	EN ISO 21877
		Odour concentration	No limit set	--	Once every 6 months	BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m ³ [note 6]	Average over sample period	Once every 6 months	EN 1911
		TVOC	20 mg/m ³ [note 6]	Average over sample period	Once every 6 months	EN 12619
Point A14 on site plan in schedule 7	Channelled emissions such as odour abatement stack or vent(s) – OCU 3 [note 7]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m ³	Average over sample period	Once every 6 months	EN ISO 21877
		Odour concentration	No limit set	--	Once every 6 months	BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m ³ [note 6]	Average over sample period	Once every 6 months	EN 1911
		TVOC	20 mg/m ³ [note 6]	Average over sample period	Once every 6 months	EN 12619
Pressure relief valve [Point A6 on site plan in schedule 7]	Thermal Hydrolysis Plant	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
Pressure relief valves [Points A7, A8, A9 and	Primary Digesters	Biogas release and operational events	No limit set	Recorded duration	Daily inspection	--

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A10 on site plan in schedule 7]				and frequency		
Pressure relief valves [Points A11 and A12 on site plan in schedule 7]	Biogas Holder	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
Vents from tanks	Oil/Fuel Storage tanks	No parameter set	No limit set	--	--	--

Note 1 – These emission limits are based on normal operating conditions and load - temperature 0°C (273 K); pressure 101.3 kPa and oxygen 5% (for gas engines burning biogas) and oxygen 3% (for emergency flares and medium combustion plants other than engines and gas turbines burning biogas such as boilers).

Note 2 – This emission limit applies from 1 January 2030, unless otherwise advised by the Environment Agency.

Note 3 – This emission limit applies until 31 December 2024, unless the gas engine is replaced.

Note 4 – This emission limit applies from 1 January 2025, unless otherwise advised by the Environment Agency.

Note 5 – Monitoring to be undertaken in the event the emergency flare has been operational for more than 10 per cent of a year (876 hours). Record of operating hours to be submitted annually to the Environment Agency.

Note 6 – Monitoring and limits only apply where the substance concerned is identified as relevant in the waste gas inventory IC12.

Note 7 – The monitoring of NH₃ and H₂S can be used as an alternative to the monitoring of the odour concentration subject to the outcome of IC12.

Table S3.2 Point source emissions to sewer, effluent treatment plant or other transfers off-site – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter [Note 1]	Limit (incl. unit) [Note 1]	Reference Period	Monitoring frequency [Note 2]	Monitoring standard or method
S1 on site plan in schedule 7 emission to Rainham Creek via Riverside waste water treatment works	Sludge Dewatering Liquors, Digested Sludge Dewatering Liquors, Biogas Condensate, OCU Waste Waters, Boiler Waste Waters	Oil and grease	No visible oil or grease	--	Weekly	Visual assessment
		Benzene, toluene, ethylbenzene, xylene (BTEX)	--	Spot sample or flow-proportional composite sample	Once every month	EN ISO 15680
		Hydrocarbon oil index (HOI)	10 mg/l		Once every day	EN ISO 9377-2
		Free cyanide (CN ⁻)	0.1 mg/l			EN ISO 14403-1 or EN ISO 14403-2
		Adsorbable organically bound halogens (AOX)	1 mg/l			EN ISO 9562

Emission point ref. & location	Source	Parameter [Note 1]	Limit (incl. unit) [Note 1]	Reference Period	Monitoring frequency [Note 2]	Monitoring standard or method
		Arsenic (As)	0.1 mg/l	Spot sample or flow-proportional composite sample	Once every day	EN ISO 11885, EN ISO 17294-2 or EN ISO 15586
		Cadmium (Cd)	0.1 mg/l			
		Chromium (Cr)	0.3 mg/l			
		Copper (Cu)	0.5 mg/l			
		Lead (Pb)	0.3 mg/l			
		Nickel (Ni)	1 mg/l			
		Zinc (Zn)	2 mg/l			
		Mercury (Hg)	10 µg/l	Spot sample or flow-proportional composite sample	Once every day	EN ISO 17852 or EN ISO 12846
		Manganese (Mn)	--			EN ISO 11885, EN ISO 17294-2 or EN ISO 15586
		Hexavalent chromium (Cr(VI))	0.1 mg/l			EN ISO 10304-3 or EN ISO 23913
		PFOA and PFOS	--			Once every six months
<p>Note 1 – Monitoring and limits only apply where the substance concerned is identified as relevant in the waste water inventory as determined by improvement condition IC9a and IC9b</p> <p>Note 2 – Monitoring frequency as specified unless the Environment Agency has agreed in writing other alternative appropriate monitoring frequencies.</p>						

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Digester feed (digestion process)	pH	As described in site operating techniques	As described in site operating techniques	Process monitoring to be recorded using a SCADA system where relevant.
	Alkalinity			
	Temperature			
	Hydraulic loading rate			
	Organic loading rate			

Table S3.3 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
	Volatile fatty acids concentration Ammonia Liquid /foam level			
Biogas in digesters & biogas storage holders	Flow	Continuous	In accordance with EU weights and measures Regulations	Process monitoring to be recorded using a SCADA system where relevant. Gas monitors to be calibrated every 6 months or in accordance with the manufacturer's recommendations.
	Methane	Continuous	None specified	
	CO ₂	Continuous	None specified	
	O ₂	Continuous	None specified	
	Hydrogen sulphide	Daily	None specified	
	Pressure	Continuous	None specified	
Digestate batch	Volatile fatty acids concentration Ammonia	One sample at the end of each batch (hydraulic retention time) cycle.	As described in site operating techniques	--
Digesters and storage tanks	Integrity checks	Weekly	Visual assessment	In accordance with design specification and tank integrity checks.
Digesters	Agitation /mixing	Continuous	Systems controls	Records maintained in daily operational records.
	Tank capacity and sediment assessment	Once every 5 years from date of commission	Non-destructive pressure testing integrity assessment every 5 years or as specified by manufacturers technical specification.	In accordance with design specification and tank integrity checks.
Waste reception building or area; Digesters and storage tanks	Odour	Daily	Olfactory monitoring	Odour detection at the site boundary.

Table S3.3 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
CHP engine stacks	VOCs including methane	Annually	BS EN 12619	Total annual VOCs emissions from the CHP engine(s) to be calculated and submitted to the Environment Agency.
	Exhaust gas temperature		Traceable to National Standards	--
	Exhaust gas pressure		Traceable to National Standards	--
	Exhaust gas water vapour content		BS EN 14790-1	Unless gas is dried before analysis of emissions.
	Exhaust gas oxygen		BS EN 14789	--
	Exhaust gas flow		BS EN 16911-1	--
Meteorological conditions	Wind speed, air temperature, wind direction	Continuous	Method as specified in management system	<p>Conditions to be recorded in operational diary and records.</p> <p>Equipment shall be calibrated on a 4 monthly basis, in accordance with manufacturer's recommendations or as agreed in writing by the Environment Agency.</p>
Diffuse emissions from all sources identified in the Leak Detection and Repair (LDAR) programme	VOCs including methane	Every 6 months or otherwise agreed in accordance with the LDAR programme	'Sniffing' and/or Optical Gas Imaging techniques in accordance with BS EN 15446 & BS EN 17628	<p>Monitoring points as specified in a DSEAR risk assessment and LDAR programme.</p> <p>Limit as agreed with the Environment Agency as a percentage of the overall gas production.</p>

Table S3.3 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Emergency flare	Operating hours	Continuous	Recorded duration and frequency. Recording using a SCADA system or similar system	Date, time and duration of use of auxiliary flare shall be recorded.
	Quantity of gas sent to emergency flare			Quantity can be estimated from gas flow composition, heat content, ratio of assistance, velocity, purge gas flow rate, pollutant emissions.
Pressure relief valves and vacuum systems	Gas pressure	Continuous	Recording using a SCADA system	Continuous gas pressure shall be monitored.
	Re-seating	Weekly inspection	Visual	Operator must ensure that valves are re-seated after release in accordance with the manufacturer's design.
	Inspection, maintenance, calibration, repair and validation	Following foaming or overtopping or at 3 yearly intervals whichever is sooner	Written scheme of examination in accordance with condition 1.1.1	After a foaming event or sticking, build-up of debris, obstructions or damage, operator must ensure that pressure relief valve function remains within designed gas pressure in accordance with the manufacturer's design by suitably trained and qualified personnel.

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
	Inspection, calibration and validation report	In accordance with design and construction specifications or after over topping or foaming event	Written scheme of examination in accordance with condition 1.1.1	Operator must ensure that valves are re-seated after release, after a foaming event or sticking, build-up of debris, obstructions or damage. Operator must ensure that PRV function remains within designed operation gas pressure in accordance with the manufacturer's design by suitably trained/qualified personnel. Inspection, calibration and validation report. In accordance with industry Approved Code of Practice
Storage tanks	Volume	Daily	Visual or flow meter measurement	Records of volume must be maintained.

Emission point reference or source or description of point of measurement	Emission point reference or source or description of point of measurement	Emission point reference or source or description of point of measurement	Emission point reference or source or description of point of measurement	Emission point reference or source or description of point of measurement
Odour abatement plant				
Closed biofilters				
Biofilter 1 (OCU 1) and biofilter 2 (OCU 3) at emission points A13 & A14 on site plan in Schedule 7	Gas temperature – inlet and outlet	Daily	Temperature probe / Traceable to national standards	Odour abatement plant shall be regularly checked and maintained to ensure appropriate temperature and moisture content.
	Biofilter media moisture	Daily	Moisture meter, Grab test, oven	

			drying or recognised industry method	Odour abatement plant shall be managed in accordance with permit condition 3.3, the odour management plan and manufacturer's recommendations. Equipment shall be calibrated on a 4 monthly basis, or as agreed in writing by the Environment Agency.
	Thatching /compaction	Weekly	Back pressure	
	Gas flow rate – inlet and outlet	Continuous	Gas flow meter	
	pH (biofilter drainage effluent)	Daily	pH metre or litmus paper	
	Efficiency assessment	Annual	Media health, air-flow distribution and emission removal efficiency (BS EN 13725 for odour removal)	
	Hydrogen sulphide – inlet and outlet gas stream	Every 6 months or as agreed in writing by the Environment Agency.	CEN TS 13649 for sampling NIOSH 6013 for analysis	Action levels to be agreed on completion of IC12 as approved in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.
	Ammonia – inlet	Every 6 months or as agreed in writing by the Environment Agency.	EN ISO 21877	Action levels to be agreed on completion of IC12 as approved in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.
	Odour concentration – inlet and outlet gas stream	Every 6 months or as agreed in writing by the Environment Agency.	BS EN 13725	Action levels to be agreed on completion of IC12 as approved in writing by the

				Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.
Carbon filters				
Carbon filters 1 & 2 (OCU 1) at emission point A13 on site plan in Schedule 7	Carbon bed temperature – inlet and outlet	Continuous	Temperature probe	Odour abatement plant shall be managed in accordance with permit condition 3.3, the odour management plan and manufacturer's recommendations. Carbon filter(s) to be replaced in accordance with manufacturer's recommendations. Equipment shall be calibrated on a 4 monthly basis, or as agreed in writing by the Environment Agency.
	Gas flow rate – inlet and outlet	Continuous	Gas flow meter	
	Moisture or humidity	Daily	Moisture meter	
	Back pressure	Weekly	Recognised industry method	
	Efficiency assessment	Annual	Emission removal efficiency (BS EN 13725 for odour removal)	
	Hydrogen sulphide – inlet and outlet gas stream	Every 6 months or as agreed in writing by the Environment Agency.	CEN TS 13649 for sampling NIOSH 6013 for analysis	Action levels to be agreed on completion of IC12 as approved in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.
	Ammonia – inlet	Every 6 months or as agreed in writing by the	EN ISO 21877	Action levels to be agreed on completion of IC12 as approved

		Environment Agency.		in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.
	Odour concentration – inlet and outlet gas stream	Every 6 months or as agreed in writing by the Environment Agency.	BS EN 13725	Action levels to be agreed on completion of IC12 as approved in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.

Table S3.5 Bioaerosols monitoring requirements – ambient monitoring					
Location or description of point of measurement	Parameter	Bioaerosols action levels (CFU m⁻³)	Monitoring frequency	Monitoring standard or method	Other specifications
Upwind of the operational area, as described in the Technical Guidance Note M9	Total bacteria	1000 ^{Note 1}	Quarterly for the first year of operation and twice a year thereafter, unless another frequency is agreed in writing by the Environment Agency ^{Note 2}	In accordance with Technical Guidance Note M9 – Environmental monitoring of bioaerosols at regulated facilities.	As described in the Technical Guidance Note M9, including all the additional data requirements specified therein.
Downwind of the operational area, as described in the Technical Guidance Note M9	Aspergillus Fumigatus	500 ^{Note 1}			
<p>Note 1 – The bioaerosols action levels are only applicable at downwind sampling locations equivalent to the distance of the nearest sensitive receptor. Where these action levels are elevated, the operator must take action to mitigate the impact on sensitive receptors. Assessment of compliance will be based on risk and in line with guidance.</p>					

Table S3.5 Bioaerosols monitoring requirements – ambient monitoring					
Location or description of point of measurement	Parameter	Bioaerosols action levels (CFU m⁻³)	Monitoring frequency	Monitoring standard or method	Other specifications
Note 2. Where the bioaerosols action levels are exceeded, then monitoring remain quarterly until such time that it is demonstrated that the site has adequate mitigation for a 12 month period.					

Table S3.6 Bioaerosols monitoring requirements – point sources					
Location or description of point of measurement	Parameter	Bioaerosols action levels (CFU m⁻³)	Monitoring frequency	Monitoring standard or method	Other specifications
Biofilter (stack)	Total bacteria	As per quantitative impact assessment	Quarterly for the first year of operation and twice a year thereafter, unless another frequency is agreed in writing by the Environment Agency	In accordance with Technical Guidance Note M9 – Environmental monitoring of bioaerosols at regulated facilities.	As described in the Technical Guidance Note M9, including all the additional data requirements specified therein.
	Aspergillus Fumigatus	As per quantitative impact assessment			

Table S3.7 Emissions to sewer, effluent treatment plant or other transfers off-site – Monitoring points			
Effluent(s) and discharge point(s)	Monitoring type	Monitoring point NGR	Monitoring point reference
T1 on site plan in schedule 7 emission to Rainham Creek via Riverside WwTW	Effluent monitoring	TQ 51450 82385	S1 [Discharge to WwTW] in Schedule 7

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air from CHP engines and boilers Parameters as required by condition 3.5.1.	A1a, A1b, A2a, A2b, A3a and A3b	Every 12 months	1 January
Emissions to air from odour abatement plant	A13 and A14	Every 6 months	1 January, 1 July

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Parameters as required by condition 3.5.1.			
Emissions to air from abatement systems for waste gas treatment plant Reporting only applies where the substance concerned is identified as relevant in the waste gas inventory IC12 Parameters as required by condition 3.5.1.	A13 and A14	Every 6 months	1 January, 1 July
Emissions to sewer Parameters as required by condition 3.5.1	S1	Upon completion of IC9a and IC9b	Upon completion of IC9a and IC9b
Process monitoring – digester tank integrity Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.3	Every 5 years from the date of commissioning or as per the manufacturer's recommendation, whichever is sooner	1 January
Process monitoring – under and over pressure relief systems Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.3	Every 12 months Yearly summary report of over-pressure and under-pressure events detailing mass balance release	1 January
Process monitoring – pressure relief systems - leak detection and repair (inspection, calibration and maintenance) Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.3	Every 3 years	1 January
Process monitoring – leak detection and repair surveys Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.3	Every 12 months LDAR report to be submitted annually	1 January
Process monitoring – use of emergency flare Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.3	Every 12 months	1 January
Non-compostable contamination removal efficiency Parameters as required by conditions 2.3.4 and 2.3.7	--	Every 12 months Yearly report of detailing contamination removal efficiency and progress with	1 January

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
		plastic reduction contamination	
Total annual VOCs emissions from gas engines (calculated)	As specified in schedule 3 table S3.3	Every 12 months	1 January
Bioaerosols monitoring Parameters as required by condition 3.5.1	As specified in schedule 3 tables S3.5 and S3.6	Every 3 months or as agreed in writing by the Environment Agency	1 January, 1 April, 1 July, 1 October

Table S4.2 Annual production/treatment	
Parameter	Units
Electricity generated	MWh
Liquid digestate	m ³
Solid digestate	tonnes
Recovered outputs	tonnes or m ³

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Water usage	Annually	tonnes or m ³
Energy usage	Annually	MWh
Raw material usage	Annually	tonnes or m ³
Emergency flare operation	Annually	hours
Electricity exported	Annually	MWh
CHP engine usage	Annually	hours
CHP engine efficiency	Annually	%
Auxiliary boiler usage	Annually	hours

Table S4.4 Reporting forms		
Media/parameter	Reporting format	Date of form
Air	Form air 1 or other form as agreed in writing by the Environment Agency	13/03/2025
Bioaerosols	As specified in the Technical Guidance Note M9 or other form as agreed in writing by the Environment Agency	--
Process monitoring	Form process 1 or other form as agreed in writing by the Environment Agency	13/03/2025
Sewer	Form sewer 1 or other form as agreed in writing by the Environment Agency	13/03/2025
Water usage	Form water usage 1 or other form as agreed in writing by the Environment Agency	13/03/2025

Table S4.4 Reporting forms		
Media/parameter	Reporting format	Date of form
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	13/03/2025
Other performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	13/03/2025
Waste returns	E-waste Return Form or other form as agreed in writing by the Environment Agency	--

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“anaerobic digestion” means a process of controlled decomposition of biodegradable materials under managed conditions where free oxygen is absent, at temperatures suitable for naturally occurring mesophilic or thermophilic anaerobes and facultative anaerobe bacteria species, which convert the inputs to a methane-rich biogas and whole digestate.

“animal waste” means any waste consisting of animal matter that has not been processed into food for human consumption.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“appropriate abatement system” means the appropriate treatment technique for channelled emissions to air defined in 6.6.1 ‘Channelled emissions to air’ from the ‘Best Available Techniques (BAT) Reference Document for Waste Treatment’.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“Best available techniques” means 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:

(a) ‘techniques’ includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned;

(b) ‘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, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;

(c) ‘best’ means most effective in achieving a high general level of protection of the environment as a whole.

“bioaerosols action levels” mean the acceptable bioaerosols concentrations at the nearest sensitive receptor, or at an equivalent distance downwind of the biowaste treatment operations, which are attributable to the biowaste treatment operations. The acceptable concentrations are respectively 1000 and 500 CFU m⁻³ for total bacteria and *Aspergillus fumigatus*. Where these action levels are elevated, the operator must take action to mitigate the impact on sensitive receptors.

“Biodegradable” means a material is capable of undergoing biological anaerobic or aerobic degradation leading to the production of CO₂, H₂O, methane, biomass, and mineral salts, depending on the environmental conditions of the process.

“building” means a construction that has the objective of providing sheltering cover and minimising emissions of noise, particulate matter, odour and litter.

“BREF” means Best Available Techniques (BAT) Reference Document.

“Capacity” means the potential capacity and not historical or actual production levels or throughput. This means that the designed capacity is the maximum rate at which the site can operate. Biological treatment of waste usually takes place over more than one day, so the physical daily capacity can be calculated by dividing the maximum quantity of waste that could be subject to biological treatment at any one time by the minimum residence time. For in-vessel composting, the residence time for sanitisation should be calculated separately and then aggregated to the complete composting time. Further guidance [‘RGN2: Understanding the meaning of regulated facility Definition of regulated facility’](#) is available.

“channelled emissions” means the emissions of pollutants into the environment through any kind of duct, pipe, stack, etc. This also includes emissions from open top biofilters.

“combined heat and power” (CHP) or Cogeneration means the simultaneous generation in one process of thermal energy and electrical or mechanical energy.

“competent persons and resources” means that a technically competent person accredited to a relevant scheme must attend site and record their attendance, and that all roles and responsibilities are clearly stated in the management systems along with records of operatives’ training. See the guidance on the [level of competence and duration of attendance](#)

“compliance date” means 01/01/2025 for existing MCPs with net rated thermal input of greater than 5MWth or 01/01/2030 for existing MCPs with a net rated thermal input of less than or equal to 5MWth.

“compost” means solid particulate material that is the result of composting, which has been sanitised and stabilised, and which confers beneficial effects when added to soil, used as a component of growing media or used in another way in conjunction with plants.

“composting” means the managed biological decomposition of biodegradable waste organic materials, under conditions that are predominantly aerobic and that allow the development of thermophilic temperatures as a result of biologically produced heat and that result in compost.

“composting batch” means an identifiable quantity of material that progresses through the composting system and when fully processed has similar characteristics throughout. For composting systems that operate on a continuous- or plug-flow basis, batches will be taken to mean a series of “portions of production”.

“direct discharge” means discharge to a receiving water body.

“diffuse emissions” mean non-channelled emissions (e.g. of dust, organic compounds, odour) which can result in ‘area’ sources (e.g. tanks) or ‘point’ sources (e.g. pipe flanges). This also includes emissions from open-air windrow composting.

“digestate” means material resulting from an anaerobic digestion process.

“disposal” means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“DSEAR” means the Dangerous Substances and Explosive Atmospheres Regulations 2002.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

“emissions to land” includes emissions to groundwater.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“existing medium combustion plant” means an MCP which was put into operation before 20 December 2018.

“generator” means any combustion plant which is used to generate electricity, excluding mobile, unless it is connected to the national grid.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“impermeable surface” means a surface or pavement constructed and maintained to a standard sufficient to prevent the transmission of liquids beyond the pavement surface.

“Indirect discharge” means a discharge to a sewer or off-site waste water treatment plant.

“Industrial Emissions Directive” and/or “IED” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“Leak detection and repair (LDAR) programme” means a structured approach to reduce fugitive emissions of organic compounds by detection and subsequent repair or replacement of leaking components. Currently, sniffing (described by EN 15446) and optical gas imaging methods are available for the identification of leaks as set out in BAT 14 and section 6.6.2 of the Waste Treatment BAT Conclusions.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“medium combustion plant” or “MCP” means a combustion plant with a rated thermal input equal to or greater than 1 MW but less than 50 MW.

“Medium Combustion Plant Directive” or “MCPD” means Directive 2015/2193/EU of the European Parliament and of the Council on the limitation of emissions of certain pollutants into the air from medium combustion plants, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“new medium combustion plant” means an MCP which was put into operation after 20 December 2018. This includes replacement MCP and Generators.

“operating hours” means the time, expressed in hours, during which a combustion plant is operating and discharging emissions into the air, excluding start-up and shut-down periods

“operational area” means any part of a facility used for the handling, storing and treatment of waste.

“operator” means in relation to a regulated facility:

- (a) the person who has control over the operation of the regulated facility,
- (b) if the regulated facility has not yet been put into operation, the person who will have control over the regulated facility when it is put into operation, or
- (c) if a regulated facility authorised by an environmental permit ceases to be in operation, the person who holds the environmental permit

“pests” means Birds, Vermin and Insects.

“PFOA” means Perfluorooctanoic acid.

“PFOS” means Perfluorooctanesulphonic acid.

“pollution” means emissions as a result of human activity which may—

- (a) be harmful to human health or the quality of the environment,
- (b) cause offence to a human sense,
- (c) result in damage to material property, or
- (d) impair or interfere with amenities and other legitimate uses of the environment.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“recovery” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“sanitisation” means the actively managed and intensive stage of composting, lasting for at least 5 days, characterised by high oxygen demand and temperatures of over 55°C, during which biological processes, together with conditions in the composting mass, eradicate human and animal pathogens or reduce them to acceptably low levels. The operator also needs to meet ABPR requirements.

“sealed drainage system” in relation to an impermeable surface, means a drainage system with impermeable components which does not leak and which will ensure that:

- no liquids will run off the surface otherwise than via the system
- all liquids entering the system are collected in a sealed sump, except where liquids may be lawfully discharged to foul sewer.

“specified generator” means a group of generators other than excluded between 1 and 50 megawatts or less than 50 megawatts as defined in Schedule 25B(2) of SI 2018 No.110 of the EPR.

“stable” and/or “stabilised” means the degree of processing and biodegradation at which the rate of biological activity has slowed to an acceptably low and consistent level and will not significantly increase under favourable, altered conditions.

“VOC” means Volatile organic compounds as defined in Article 3(45) of Directive 2010/75/EU – ‘volatile organic compound’ means any organic compound as well as the fraction of creosote, having at 293.15K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use.

“Waste code” means the six-digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

“Waste Framework Directive” and/or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

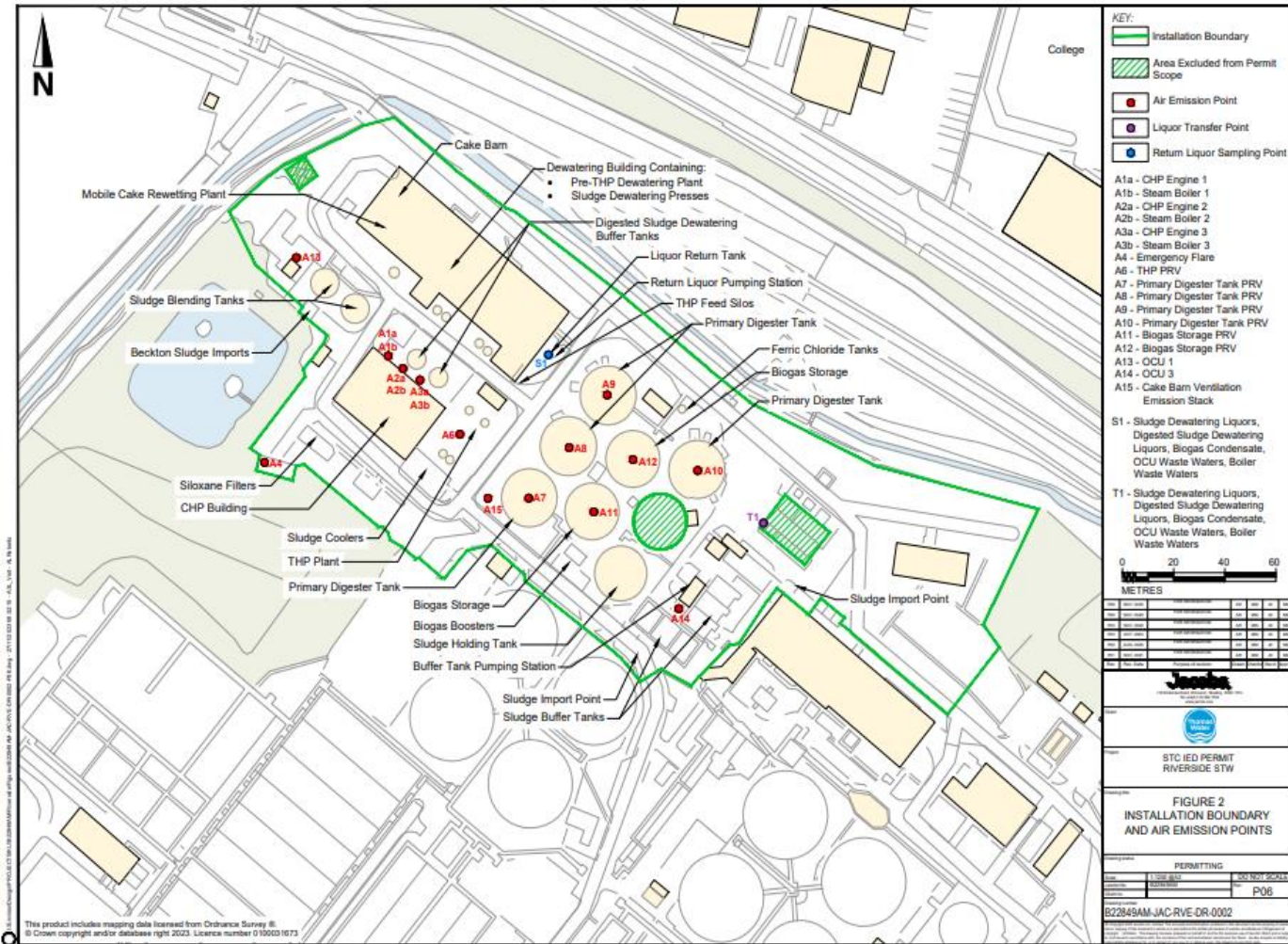
Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid fuels and gaseous fuels, 6% dry for solid fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

“year” means a calendar year ending on 31 December.

Schedule 7 – Site plan



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Annex 1 of MCP

<p>1. Rated thermal input (MW) of the medium combustion plant.</p>	<p>CHP 1 – 5.1MWth CHP 2 – 5.1 MWth CHP 3 – 5.1 MWth Boiler 1 – 3.3 MWth Boiler 2 – 3.3 MWth Boiler 3 – 3.3 MWth</p>
<p>2. Type of the medium combustion plant (diesel engine, gas turbine, dual fuel engine, other engine or other medium combustion plant).</p>	<p>CHP 1 – Combined heat and power engine CHP 2 – Combined heat and power engine CHP 3 – Combined heat and power engine Boiler 1 – Dual-fuel boiler Boiler 2 – Dual-fuel boiler Boiler 3 – Dual-fuel boiler</p>
<p>3. Type and share of fuels used according to the fuel categories laid down in Annex II.</p>	<p>CHP 1 – Biogas (Gaseous fuels other than natural gas) CHP 2 – Biogas (Gaseous fuels other than natural gas) CHP 3 – Biogas (Gaseous fuels other than natural gas) Boiler 1 – Biogas (Gaseous fuels other than natural gas) and natural gas. Operating hours – 500 hours when run on natural gas; above this threshold informing the need for emissions testing. Boiler 2 – Biogas (Gaseous fuels other than natural gas) and natural gas. Operating hours – 500 hours when run on natural gas; above this threshold informing the need for emissions testing. Boiler 3 – Biogas (Gaseous fuels other than natural gas). Operating hours – 500 hours when run on natural gas; above this threshold informing the need for emissions testing.</p>
<p>4. Date of the start of the operation of the medium combustion plant or, where the exact date of the start of the operation is unknown, proof of the fact that the operation started before 20 December 2018.</p>	<p>CHP 1 – Operated prior to 20 December 2018 CHP 2 – Operated prior to 20 December 2018 CHP 3 – Operated prior to 20 December 2018 Boiler 1 – Operated prior to 20 December 2018 Boiler 2 – Operated prior to 20 December 2018 Boiler 3 – Operated prior to 20 December 2018</p>

<p>5. Sector of activity of the medium combustion plant or the facility in which it is applied (NACE code).</p>	<p>E37.00</p>
<p>6. Expected number of annual operating hours of the medium combustion plant and average load in use.</p>	<p>CHP 1 – 8,760 CHP 2 – 8,760 CHP 3 – 8,760 Boiler 1 – 8,760 on biogas Boiler 1 – 500 on natural gas Boiler 2 – 8,760 on biogas Boiler 2 – 500 on natural gas Boiler 3 – 8,760 on biogas Boiler 3 – 500 on natural gas</p> <p>The operation of medium combustion plant will be limited to the operation of two engines and two boilers at any one time.</p>
<p>7. Where the option of exemption under Article 6(3) or Article 6(8) is used, a declaration signed by the operator that the medium combustion plant will not be operated more than the number of hours referred to in those paragraphs.</p>	<p>N/A</p>
<p>8. Name and registered office of the operator and, in the case of stationary medium combustion plants, the address where the plant is located.</p>	<p>Thames Water Utilities Limited</p> <p>Registered Office Address: Clearwater Court Vastern Road Reading Berkshire RG1 8DB</p> <p>Plant location: Riverside Sludge Treatment Centre Riverside Sewage Treatment Works Creekside Rainham Essex RM13 8QS</p>

END OF PERMIT