Sludge Treatment Centre Permitting

Environmental Permit Application - Bracknell Sludge Treatment Centre Resubmission

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Thames Water

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Contents

1. Introduction

This application relates to a biological treatment permit for the Bracknell Sludge Treatment Centre (STC), located at the Bracknell Sewage Treatment Works (STW), operated by Thames Water Utilities Ltd (Thames Water). It is being made due to sludge treatment operations within sewage treatment works requiring a suitable Environmental Permit under the Environmental Permitting Regulations 2016 (as amended), in order to comply with the requirements of the Industrial Emissions Directive.

Previously, sewage treatment sites operated by sewerage undertakers treating indigenous sewage sludges ('sludge') separated from the main urban waste water treatment stream at the site along with the importation of similar wastes such as cess wastes and interworks sludge and cake transfers, were regulated under the Urban Waste Water Treatment Directive (UWWTD), and Environmental Permitting Regulations as exempt or waste management activities, although some works had parts of the process, specifically biogas utilisation covered by the Environmental Permitting regime.

Now, all aspects of the sludge treatment process at the site, from the thickening of sludge separated from the main aerobic treatment flow, blending with imported waste of a similar nature to indigenous sludge and anaerobic digestion of sludge, through to the storage of digested sludge cake prior to recovery to land offsite, including biogas storage and utilisation will fall within the scope of this permit application.

Bracknell STC does not currently hold an Environmental Permit. Previously, operations were conducted using Regulatory Position Statement 109, allowing for operations of a combustion asset in the absence of an Environmental Permit however this was withdrawn in October 2021.

A number of other sewage treatment related activities are undertaken at the site, outside of the scope of this permit, relating to the treatment of waste waters from the sewer network through aerobic processes. These activities are covered by the UWWTD.

1.1 Non-Technical Summary

This application is for a new bespoke installation permit for the biological treatment of sludge, by anaerobic digestion, with a capacity above the relevant thresholds.

The biological treatment of sludge includes treatment of indigenous sewage sludges from the onsite aerobic treatment process and treatment of imported sewage sludges from other sites, arriving by road to a dedicated sludge import point. The indigenous sludges are generated from the aerobic treatment of waste waters from the sewer network arriving into site at the works inlet. The storage of biogas and operation of a biogas fuelled Combined Heat and Power (CHP) engine and auxiliary boilers for the generation of electricity and heat at the site, which are classified as an 'existing' combustion sources under the Medium Combustion Plant Directive.

The site is located within a rural area, outside of the village of Binfield, near Bracknell and is bounded on all sides by fields and woodland, with a number of buildings including both commercial and residential properties located north of the wider site boundary.

The STC treats both indigenous sludges and imported sludges. Indigenous sludge is generated from the incoming flow to the STW, which passes to the Primary Settlement Tanks and through the aerobic treatment process under the UWWTD. Sludge is drawn off and pumped to a Picket Fence Thickener (PFT) or Sludge Thickening Plant where the sludge is thickened.

Imported sludge from other works is delivered by tankers to a Sludge Import Tank via sludge offloading point, is screened and pumped to the Thickener Feed Tank and then to the Sludge Thickening Plant where it is thickened with the addition of a polymer. All such imports are subject to appropriate waste pre-acceptance and acceptance checks, prior to acceptance.

Liquors from both the PFT and Sludge Thickening Plant is returned to the Works Inlet via Liquor Return Pumping Station 1 and the site drainage for further treatment. Indigenous thickened sludge and imported sludge are both pumped to the Digester Feed Tank where they are mixed.

Mixed sludge is then pumped to one of the four Primary Digester Tanks at the site. Sludge within the Primary Digester Tanks is heated via dedicated heat exchange systems using heat generated on site by the CHP engine or two boilers. Primary Digester Tanks are partially subsurface with fixed roofs and fitted with Pressure Relief Valves (PRVs).

Following treatment over an appropriate number of days within the Primary Digester Tanks, sludge is pumped to one of four Secondary Digester Tanks, which are arranged in series so that sludge cascades through the four Secondary Digester Tanks from tank number 4 to tank number 1. Digested sludge is held in the Secondary Digester Tanks for an appropriate retention time to ensure that the required level of pathogen kill is achieved in order to comply with digested sludge cake output quality requirements.

Digested sludge is then pumped to the aboveground Dewatering Feed Tank, adjacent to the enclosed Cake Barn before the digested sludge is pumped inside of the Cake Barn to the Digested Sludge Dewatering Plant where it is dewatered with the addition of a polymer. Digested sludge dewatering liquors return to the inlet for further treatment via the Liquor Return Pumping Station 2.

Digested sludge cake is transferred via conveyors and deposited on engineered made ground within the fully enclosed and odour abated Cake Barn for storage prior to removal from the site under the Sludge Use in Agriculture Regulations (SUiAR) (1989), and in accordance with the Biosolids Assurance Scheme (BAS).

Biogas from the Primary Digester Tanks is captured and transferred to a double membrane Biogas Storage holder. 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 treatment. The Biogas Storage is fitted with PRVs as a safety precaution in the event of over pressurising the system. The biogas is taken from the storage vessel for combustion in a CHP engine, generating electricity for use within the site, and heat to maintain temperatures in the Primary Digester Tanks. This is classified as an 'existing' combustion plant under the Medium Combustion Plant Directive (MCPD).

In the event that additional heating is required for the Primary Digester Tanks, there are two dual fuelled auxiliary boilers that can combust biogas or fuel oil. An emergency flare is available for use during periods of essential maintenance and for emergency use. The flare is utilised under 10% of the year or less than 876 hours per year.

This application includes the import of treated sludge cake from other works, for temporary storage in the Cake Barn, pending offsite recovery. All such imports will be subject to appropriate waste pre-acceptance and acceptance checks, prior to import, including checking whether the incoming cake complies with the requirements of SuiAR and BAS.

Imported treated sludge cake is offloaded into an areas of the Cake Barn, so as to be stored separately to indigenous sludge cake. The waste stream is the same as that arising from the treatment of sludge within the Bracknell STC with the same characteristics, composition and eventual end use – application to land. As such, the infrastructure which is acceptable for use for site cake is appropriate for the imported material.

Cake is stored on an impermeable surface within the Cake Barn, for the shortest time practicable, the duration depending on factors such as prevailing weather and availability of the landbank.

2. Technical Description

This application is for a new bespoke installation permit under the Environmental Permitting (England and Wales) Regulations 2016 (as amended), following a change of interpretation of the Urban Waste Water Treatment Directive by the Environment Agency. It relates to a biological waste treatment permit for the Bracknell Sludge Treatment Centre (STC), located at the Bracknell Sewage Treatment Works (STW), operated by Thames Water Utilities Limited (Thames Water).

Scope

The application covers the biological treatment of sewage sludge, both indigenous and imported from other waste water treatment sites, by anaerobic digestion, with a capacity above the relevant thresholds. There are a number of directly associated activities, including the operation of a biogas fuelled CHP unit for the generation of electricity and heat at the site, which is classified as an 'existing' combustion source under the Medium Combustion Plant Directive.

Site Location

The site is located within a rural area, outside of the village of Binfield and approximately 2.7 km to the north of the town of Bracknell, Berkshire. There are fields and woodland on all sides of the STW. The nearest sensitive receptors are domestic properties approximately 85 m to the northwest of the site with further residential and commercial properties within 250 m of the site towards the north and west.

The site is fully located within the boundaries of a Source Protection Zone (SPZ) Zone 3.

There are a number of statutory designated habitat sites within the relevant distances of the site. The closest of which is a Local Nature Reserve (LNR), Tinkers Copse, which is approximately 1 km to the south of the site. Further, Jock's Copse LNR and Temple Copse LNR can be found approximately 1.2 km and 1.3 km to the south of the site. Piggy Wood LNR can be found 1.3 km to the south-east and Farley Copse LNR can be found 2 km to the south-west. There is also one SPA, Thames Heath Basins SPA, which is located approximately 5.5 km south of the site and Windsor Forest and Great Park (a SAC and SSSI) is located approximately 6.5 km to the West of the site. There are no SSSIs within 2 km of the site. There are no MPAs or RAMSAR sites within 10 km of the site.

There are 24 areas of Ancient Woodland within 2 km of the site. The closest of which is Hazelwood Copse which is located to the north-west and adjacent to the boundary of the sludge treatment centre. There are 11 non-statutory designated LWS's within 2 km of the site, the closest of which is located to the north-west and adjacent to the boundary of the sludge treatment centre, namely Hazelwood Copse LWS.

The area of the site is located entirely within a Flood Zone 1, indicating there is a with a low probability of flooding (<1:1000 annual probability of flooding). The site is not located within or adjacent to the boundaries of an Air Quality Management Area (AQMA).

A site plan, showing the permitted area of Bracknell STC and the wider STW can be found in Appendix A.2 while a process flow diagram summarising the sludge treatment process can be found in Appendix A.5. A site tank inventory is included below, followed by the site process description which identifies where tanks are located within the sludge treatment process.

Table 2.1 Site tank inventory

Tank Purpose	Number	Operational Volume (m^3)	Total Operational Volume (m3)	Construction
Picket Fence Thickener	1	464	464	Steel

Sludge Import Tank	1	147	147	Steel
Thickener Feed Tank	1	82	82	Concrete
Digester Feed Tank	1	82	82	Concrete
Primary Digester Tanks	2	487	974	Concrete
	2	487	974	Steel
Secondary Digester Tanks	2	487	974	Concrete
	2	340	680	Concrete
Emergency Storage Tanks	3	800	2,400	Concrete
Dewatering Feed Tank	1	235	235	Steel
Liquor Balancing Tank	1	544	544	Steel
Auxiliary Boiler Diesel Tank	1	6,000 litres		Steel
Cake Barn Generator Diesel Tank	1	16,000 litres		Steel

Waste Activities

The STC comprises of biological treatment processes for indigenous sludges separated from the UWWTD permitted area of the site and treatment processes for imported sludge that arrives at Bracknell STC by road, tankers and consists of sludge from other Thames Water sites, which forms a waste activity for the site.

Waste imports of non-hazardous waste to the STC are considered a secondary wate operation to the main listed activity as are the imports to the cake pad are for temporary storage and transfer offsite.

Waste Imports

This application includes a waste activity at the same site for the import of non-hazardous treated, dewatered sludge cake from other works, for temporary storage pending transfer offsite. All such imports will be subject to appropriate waste pre-acceptance and acceptance checks, prior to import, including checking whether the incoming cake complies with the requirements of SUiAR and BAS. The waste stream is the same as that arising from the treatment of sludge within the Bracknell STC with the same characteristics, composition and eventual end use – application to land. As such, the infrastructure which is acceptable for use for site cake is appropriate for the imported material.

Cake is stored on an impermeable surface within the Cake Barn, for the shortest time practicable, the duration depending on factors such as prevailing weather and availability of the landbank.

Sludge Processes

Imports of sludge from other sites can also be made to Bracknell STC. There is a site supplied import hose (to avoid misconnections) connected to the data logger and waste materials discharge from tanker vehicles and through a sludge logger unit into the Sludge Import Tank. Access to the sludge logger is via a key fob that is issued to drivers and the logger records the volume of sludge transferred and the originating site. The Sludge Import Tank is an aboveground tank of steel construction, on a concrete base. There is an ultrasonic level within this tank which measures the level of sludge inside to prevent over-filling. From the Sludge Import Tank, sludge is screened in order to remove inorganic material, which is deposited into a skip for offsite disposal, and then the screened sludge is pumped to the Thickener Feed Tank.

Indigenous sludge is drawn off the Primary Settlement Tanks (PSTs) and pumped to a Picket Fence Thickener (PFT), at which point, it falls into the scope of this permit. The PFT is an aboveground tank of steel construction, on a concrete base that is connected to an Odour Control Unit (OCU). In the PFT, the sludge is subject to thickening by a rotating fence which moves around the inside of the tank, with sludge gravitating to the bottom of the tank where it is removed and pumped to the Digester Feed Tank and combines with thickened imported sludge. Liquor from the PFT weirs out of the tank, gravitates to Liquor Return Pumping Station 1 and is returned via site drainage to the inlet for additional treatment. The PFT can be bypassed as required, with unthickened sludge pumped directly from the PSTs to the Digester Feed Tank, via the Sludge Thickening Plant.

Screened imported sludge gravitates to the Thickener Feed Tank before it is pumped for thickening in Sludge Thickening Plant, which uses a polymer, made up of a liquid polymer, from an intermediate bulk container (IBC), mixed with final effluent/potable water, to aid coagulation. Thickened imported sludge discharges into the Digester Feed Tank where it mixes with thickened indigenous sludge. Liquors from the Sludge Thickening Plant is returned to the head of the works inlet via site drainage and Return Liquor Pumping Station 1 for further treatment. The Sludge Import Tank, Sludge Screens and the Digester Feed Tank are connected to an OCU. The Thickener Feed Tank and the Digester Feed Tank are subject to air mixing to prevent settling. The Thickener Feed Tank is fitted with an ultrasonic level which measures the level of sludge and inhibits further transfers from the sludge screens in the event of a high-level. The Digester Feed Tank is fitted with an ultrasonic level which measures the level of sludge and inhibits further transfers from the PFT and the Sludge Thickening Plant in the event of a high-level.

Digestion Processes

The thickened blended sludge is pumped via duty/standby pumps to one of the four Primary Digester Tanks at the site. Two of the Primary Digester Tanks are of concrete construction while two of the Primary Digester Tanks are of steel construction. The Primary Digester Tanks are partially subsurface and extend approximately 4 m underground with a conical bottom. The contents of each of the Primary Digester Tanks are subject to biogas mixing while the contents undergo anaerobic digestion. The Primary Digester Tanks operate on a continuous basis, receiving batches of sludge that is pumped sequentially into each tank in turn. Primary Digester Tanks have a normal retention time of approximately 12 days. Each Primary Digester Tank is fitted with dual pressure relief valves (PRVs). Pressure level devices in the roof of Primary Digester Tanks number 1 and 2 and pressure transducers on the side wall of Primary Digester Tanks number 3 and 4 measures the sludge level in each tank.

Heat exchange systems for each of the Primary Digester Tanks are located within the digester gallery, between each pair of Primary Digester Tanks, which provides external heat input to each tank. The heat exchanges use heat generated on site by either the CHP engine or by the two auxiliary boilers. Sludge is drawn from the base of each Primary Digester Tank, via a pump through a heat exchanger and returned mid-way up the Primary Digester Tanks; with thickened blended sludge also joining the sludge line from the heat exchanger. Probes monitor the temperature within each of the Primary Digester Tanks.

After the required duration, digested sludge is continuously transferred from the Primary Digester Tanks to the primary digested sludge sump, where pumps transfer the digested sludge to the Secondary Digester Tanks. The Secondary Digester Tanks operate in series, cascading from Secondary Digester Tank 4 in turn to tank number 3, tank number 2 and tank number 1. Any of the Secondary Digester Tanks can be bypassed as required for maintenance requirements. The four Secondary Digester Tanks are mainly subsurface, of concrete construction

with an aboveground steel collar. Secondary Digester Tanks have a normal retention time of approximately 14 days. Each Secondary Digester Tank is subject to air mixing to prevent settling, has an ultrasonic level, high-level float alarm and low-level probe to monitor the tanks. Digested sludge is pumped from Secondary Digester Tank number 1 by one of two pumps at to the Dewatering Feed Tank, adjacent to the Cake Barn.

In the event of the Secondary Digester Tanks being unavailable, digested sludge can gravitate to one of three additional Emergency Storage Tanks. The Emergency Storage Tanks, are only needed as a short-term contingency storage and are open tanks of concrete construction.

The Dewatering Feed Tank is an aboveground tank of steel construction and is located on a concrete base. The Dewatering Feed Tank is uncovered and fitted with an ultrasonic level which measures the level of sludge within the tank and inhibits the two Sludge Transfer Pumps to prevent overfilling of the tank. The digested sludge is subject to air mixing to prevent settling. Digested sludge is then pumped to the Digested Sludge Dewatering Plant located within the Cake Barn by dedicated feed pumps. Pumping of sludge is inhibited by low-levels within the Dewatering Feed Tank. A polymer solution is dosed to each sludge feed, using a polymer from a bulk bag system that is mixed with potable water/final effluent within a mixing tank and stored within a storage tank. The dewatered digested sludge cake is conveyed into the cake barn. Liquor from the belt presses gravitates to the Liquor Balancing Tank and is pumped via Return Liquor Pumping Station 2 for further treatment via the STW.

Cake Storage

The cake barn is fully enclosed and odour abated via an OCU. A shovel loader or similar plant moves digested sludge cake from under each conveyor belt into the larger cake storage bay, for storage prior to removal from the site under SUiAR, and in accordance with the BAS. The ground inside of the cake barn is constructed of engineered concrete and equipped with gully drainage. As the cake barn is totally enclosed there is a low risk from bioaerosols from stored digested sludge cake although there are sensitive receptors within 250 m of the cake barn. If any non-compliant cake is produced, it is segregated and held for an extended period of time to achieve the required level of pathogen kill.

There are two bays within the large cake barn, of which one is used for storage of non-compliant cake.

A site specific bioaerosol risk assessment for the STC is provided in Appendix F.

Biogas

Biogas produced from the four Primary Digester Tanks is captured and transferred via a biogas pipeline to the double membrane Biogas Storage holder for storage. The biogas transfer pipeline is fitted with condensate pot that capture entrained moisture from the generated biogas. These pots allow moisture to be removed from the biogas and condensate is returned to the head of the works for further treatment, via Liquor Return Pumping Station 1. The Biogas Storage is a dual membrane type with an inner and outer bag that is fitted with biogas detection systems and PRVs that operate in an emergency as a safety precaution in the event of over pressurising the system. The Biogas Storage is fitted with lightning protection and a secure fence for physical security. Biogas passes through chiller units and biogas boosters via an aboveground pipe to the CHP engine or two auxiliary boilers. When the levels within the Biogas Storage reaches a high setpoint, biogas is automatically diverted to an emergency flare located at the site. In the event of an emergency, slam shut valves found on the biogas line would isolate the supply.

The biogas is taken from the Biogas Storage for combustion in one CHP engine, a MWM TCG2016V12 model with a thermal input of 1.408 MWth, which is located externally. The CHP engine is used to generate electricity for use within the site and for export when there is excess amounts above the site use. Recoverable low-grade heat is passed via a heat exchanger to maintain the Primary Digester Tanks temperature. The CHP engine is classified as an 'existing' combustion plant. Emissions from the CHP engine are via a single stack that is approximately 4 m tall. There are two carbon-based siloxane filters upstream of the CHP engine, to remove impurities from the biogas prior to combustion. In the event of additional heating being required by the Primary Digester Tanks, this is provided by two onsite dual fuel auxiliary boilers, both of which are Strebel boilers. Emissions are via two stacks that exit on top of the boiler house building. The two auxiliary boilers are dual

fuelled and can run using either fuel oil or biogas. Fuel oil for the auxiliary boilers is stored within a bunded fuel tank that is located outside of the boiler house. There are two other boilers used for domestic heating within the admin building and the workshop which are outside of the scope of this permit and below the threshold to be classified as MCPs.

In the event of there being excess biogas, i.e. more than the CHP engine or the auxiliary boilers can utilise, or in the event that the CHP engine or auxiliary boilers are unavailable, there is a single ground mounted flare stack which automatically operates on a high level of biogas within the Biogas Storage. This is utilised under 10% of the year, less than 876 hours per year.

Emergency Standby Generators

Bracknell STW has two emergency generators at the site which provide back-up power to the site in the event of a grid failure.

- Generator 1 – an emergency standby generator <1 MWth
- Generator 2 – an emergency standby generator <1 MWth located adjacent to the Cake Barn.

Generator 1 does not meet the requirements of a DAA and is excluded from the scope of this permit.

Generator 2 is currently an excluded generator but is required to be included within the Environmental Permit via this permit application as a DAA excluded generator because it will meet the requirements under Guidance note "Understanding the meaning of regulated facility"RGN2. This is because this emergency standby generator meets the criteria for inclusion as DAAs and is located within the installation permit boundary as described below:

1. The emergency standby generator 2 is directly associated with the installation and the installation will be the "principal user" of the electricity generated in the event of a site-wide loss of power. The emergency standby generator provides 100% of the power generated to the Cake Barn.

2. The emergency standby generator 2 has a technical connection with the listed activities at the installation with output of the activity, electrical power, used with the treatment of waste in the Cake Barn at the installation.

3. The limited running periods of emergency standby generator 2 constrain its potential to have impacts on air quality.

The DAA excluded generator 2 is located at emission point A12, as indicated on the site plan in Appendix A.

BAT Considerations

A BAT gap analysis has been completed for the STC against the associated BAT conclusions and this gap analysis is attached as Appendix D.

2.1 BAT 3; 6; 7: Return Liquors

The Bracknell site does not have a liquor treatment plant. Liquor treatment for waste waters arising within the permitted area is part of the waste water treatment process of the STW and does not fall within the permit boundary.

There are no direct emissions to water from the STC. The only indirect emissions are of the sludge related liquors, primarily sludge dewatering liquor, and surface (rain) waters, which are returned to the wastewater treatment works for aerobic treatment under Urban Wastewater Treatment Regulations.

Return Liquor Monitoring is included in Appendix M.

2.2 Management of Diffuse Emissions – BAT 14

There are open top tanks within the permit boundary at Bracknell STC including the Secondary Digester Tanks, and the Dewatering Feed Tank.

Thames Water is committed to meeting the requirement of BAT. A full BAT risk assessment is required to determine the potential need to cover open topped tanks. Thames is not able to commit to covering tanks by the stated deadline of December 2024 delivery timescales will be subject to the outcome of the PR24 and subsequent price review discussions.

2.3 Site Infrastructure

Management of emissions to water – BAT 19

Thames Water is committed to meeting the requirements of BAT. A full BAT risk assessment is required to determine the detailed design for Bracknell secondary containment. The secondary containment options report (see Appendix G) is an outline solution that may be subject to change. Thames is not able to commit to secondary containment requirements by the stated deadline of December 2024 delivery timescales will be subject to the outcome of the PR24 and subsequent price review discussions.

A figure showing the current site surfacing within the permit boundary is included within Appendix A, Figure A.3.

Process Controls

Anaerobic digestor operations are monitored automatically from the control centre at the site and outside of normal operational hours, from the regional control centre. Checks include digester health, temperature and operation. As described, tanks are equipped with appropriate high-level alarms and automatic cut off valves to minimise releases. The Primary Digester Tanks and Biogas Storage are also fitted with dual pressure relief valves which operate in an emergency to minimise releases from over- or under-pressurisation. Site operations are covered by Thames Water's management system, including the preventative maintenance programme for the site.

A range of process parameters are subject to routine monitoring or checking to ensure that the digestion process is operating optimally so that the required sewage cake output quality is achieved.

- pH: At a conventional digestion site such as Bracknell the processes is maintained around pH 7 but within the range 6.72 – 7.6 (this is % dry solids and digester load dependant) for healthy operation.
- alkalinity: Levels dependant on feedstock characteristics (primary sludge: surplus activated sludge (SAS) ratio). Conventional digestion typically, 3,500 - 5,000mg/litre range.
- temperature: minimum target of 38° C. This is maintained within the range 36-40° C.
- HRT (hydraulic retention time): minimum target is 15-days, there is no upper limit. Retention times shall not be less than 12-days during plant outages to keep the product pathogen kill efficiency control.
- OLR (organic loading rate): see table below - this is dependent on the primary/SAS ratio. Bracknell fits into the first row of the table.
- Dry solids feed: see table below, Bracknell has a target of 6%DS, but this can vary between 3-8%DS and impacts the HRT.

Type of Digestion	0%- 35% SAS[x]	36%- 45% SAS	46%- 50% SAS	51%- 55% SAS	>55% SAS	Max Feed %DS

MAD* in Conventional Digestion	3	2.5	2	1.75	n/a	6
MAD after Pre-pasteurisation	4.5	4	3.5	3	n/a	7
MAD after Acid Hydrolysis	4.5	4	3.5	3	n/a	7
MAD after Thermal Hydrolysis	7	6.5	6	5.5	5.5	14

* mesophilic anaerobic digestion
[X] surplus activated sludge, arising from the UWWTD treatment route.

- VFA (volatile fatty acid) concentration: There is no specific range for VFAs as it depends on the feedstock. It is used as an indicator of digester health rather than a process control. The production of organic acids depends on the volume of solids fed to the digester. The typical range for VFAs in a primary digester is between 50 and 800 mg/L. When VFA concentrations climb above 1000 mg/L, the digester could be overloaded or experiencing other problems.

- Ammonia - Ammonia concentrations of 50 to 1000 mg/L are beneficial, but ammonia levels of 1500 to 3000 mg/L (pH greater than 7.4) could be inhibitory but not always. An ammonia concentration higher than 3000 mg/L for prolonged period is toxic.

- VFA to Alkalinity ratio: Very important parameter to monitor for digestion process. The VFA to alkalinity ratio of below 0.4 is good and above this threshold value means diminishing alkalinity and low pH i.e. sour digester content. As long as this ratio is maintained higher VFA, and alkalinity digester content can be acceptable, and the digestion process is deemed healthy. Anaerobic digestion process is always controlled based on holistic parameters but not based on single parameter.

Waste Tracking

Because of the nature of the waste accepted at the site for treatment, and the processes undertaken, the location of any specific load of waste cannot be tracked directly within the installation. Instead, tracking, if required, is based on the normal operational periods for treatment, which can locate the approximate location of the imported material with the process, based on the number of days post acceptance.

For digested cake imports, these are stored separately in the Cake Barn, and their location can be identified on this basis.

Odour

The facility has an odour management plan which is supplied as Appendix E.

Bioaerosols

Digested sludge cake is stored within a fully enclosed and odour abated Cake Barn that is within 250 m of the nearest sensitive receptor, where people live or work for more than 6 hours at a time. See Appendix F for the site specific bioaerosol risk assessment.

Other Items

Please see Appendix A, A.6 for photographs of key plant infrastructure.

A leak detection and repair (LDAR) plan has been prepared for the site and this is presented as Appendix H.

An air dispersion model using ADMS has been prepared for the air emissions from combustion plants at the site and is provided as Appendix L to this application. The key findings are that the impact from the emissions are acceptable.

Other Risk Assessments

There is no requirement for a fire prevention plan, due to the nature of the wastes treated at the site and the processes utilised, in accordance with Environment Agency guidance.

2.4 Regulatory listing

The installation is permitted as a Schedule 1 listed activity under the Environmental Permitting (England and Wales) Regulations 2016 (as amended).

The relevant listing under Schedule 1 is:

Section 5.4 Disposal, recovery or a mix of disposal and recovery of non-hazardous waste

Part A(1) (b); 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 one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC—

(i) biological treatment.

In addition to the listed activity at the site, there is a directly associated activity of a biogas combustion plant covered by specified generator controls.

The site includes the following Directly Associated Activities (DAA):

- Imports of waste, including sludge from other sewage treatment works;
- Blending of indigenous sludges and imported wastes/waste sludge prior to treatment;
- Storage of digestate prior to dewatering;
- Dewatering of digested sewage sludge
- Transfer of dewatering liquors via site drainage back to the sewage treatment works inlet;
- Transfer of surface water runoff back to the sewage treatment works inlet;
- Storage of dewatered digested sludge cake prior to offsite recovery;
- Storage of biogas;
- Transfer of biogas condensate via site drainage back to the head of the sewage treatment works;
- Combustion of biogas in a MCPD and Specified Generator (SG) compliant biogas CHP engine and boilers;
- Operation of an emergency flare;
- Operation of a siloxane filter;
- Storage of diesel
- Storage of wastes, including waste oils; and

- Storage of raw materials; and
- Operation of a standby emergency generator (Generator 2).

The waste activities at the site are:

- Imports of digested sludge cake for temporary storage pending off-site removal

In addition to the listed activity at the site, there is directly associated activity of a biogas combustion plant which is classified as 'existing' MCP and also a specified generator, covered by the Medium Combustion Plant Directive under Schedule 25A and B of the Environmental Permitting (England and Wales) Regulations 2016 (as amended). This comprises:

- 1x 1.408 MWth CHP engine;
- 2x <0.7 MWth auxiliary boilers; and
- 1x <1.0 MWth emergency standby generator (which is a DAA and operates for emergency use only);

Total thermal input of site is approximately <3.408 MW, of which approximately 1.408 MW is in routine use (total excludes 1 standby that is not a DAA)

2.5 Combustion Plant

Bracknell CHP Engine	
MCP specific identifier*	Bracknell STC CHP Engine 1
12-digit grid reference or latitude/longitude	SU 85996 71849
Rated thermal input (MW) of the MCP	1.408
Type of MCP (diesel engine, gas turbine, other engine or other MCP)	Other engine
Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas, landfill gas	Biogas
Date when the new MCP was first put into operation (DD/MM/YYYY)	April 2016
Sector of activity of the MCP or the facility in which it is applied (NACE code**)	E37.0.0
Expected number of annual operating hours of the MCP and average load in use	8,760
Where the option of exemption under Article 6(8) is used the operator (as identified on Form A) should sign a declaration here that the MCP will not be operated more than the number of hours referred to in this paragraph	n/a

Bracknell Boiler 1 (too small to be a mcp)	
MCP specific identifier*	Bracknell STC Boiler 1
12-digit grid reference or latitude/longitude	SU 85957 71871
Rated thermal input (MW) of the MCP (too small to be a mcp)	0.7
Type of MCP (diesel engine, gas turbine, other engine or other MCP)	Boiler
Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas, landfill gas	Dual fuelled (Biogas or diesel)
Date when the new MCP was first put into operation (DD/MM/YYYY)	Exact date unknown but existing equipment put into operation prior to 20th December 2018
Sector of activity of the MCP or the facility in which it is applied (NACE code**)	E37.0.0
Expected number of annual operating hours of the MCP and average load in use	5,000
Where the option of exemption under Article 6(8) is used the operator (as identified on Form A) should sign a declaration here that the MCP will not be operated more than the number of hours referred to in this paragraph	n/a

Bracknell Boiler 2 (too small to be a mcp)	
MCP specific identifier*	Bracknell STC Boiler 2
12-digit grid reference or latitude/longitude	SU 85958 71868
Rated thermal input (MW) of the MCP (too small to be a mcp)	0.7
Type of MCP (diesel engine, gas turbine, other engine or other MCP)	Boiler
Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas, landfill gas	Dual fuelled (Biogas or diesel)

Date when the new MCP was first put into operation (DD/MM/YYYY)	Exact date unknown but existing equipment put into operation prior to 20th December 2018
Sector of activity of the MCP or the facility in which it is applied (NACE code**)	E37.0.0
Expected number of annual operating hours of the MCP and average load in use	5,000
Where the option of exemption under Article 6(8) is used the operator (as identified on Form A) should sign a declaration here that the MCP will not be operated more than the number of hours referred to in this paragraph	n/a

3. Form B2 Questions

1 About the permit

1a Discussions before your application

The pre-application process is currently not available due to Environment Agency resourcing issues, discussions have been held with the local area Environment Agency staff. Nature and heritage conservation screening was requested and received via email from the pre-application advice service of the Environment Agency.

1b Is the permit for a site or for mobile plant?

No - This application relates to a site.

2 About the site

2a What is the site name, address, postcode and national grid reference?

Bracknell Sludge Treatment Centre

Bracknell Sewage Treatment Works

Hazelwood Lane

Binfield

Bracknell

RG42 5NE.

NGR SU 85969 71894

2b What type of regulated facility are you applying for?

This application relates to a bespoke waste installation.

2c If you are applying for more than one regulated facility on your site, what are their types and their grid references?

This application is for a single regulated facility, namely an installation.

2d Low impact installations (installations only)

2d1 Are any of the regulated facilities low impact installations?

No, this application is not for a low impact installation.

2e Treating batteries

2e1 Are you planning to treat batteries?

No, this application is not for the treatment of batteries.

2f Ship recycling

2f1 Is your activity covered by the Ship Recycling Regulations 2015?

No, this application is not covered by the Ship Recycling Regulations 2015

2g Multi-operator installation

No. This is not a multi-operator installation.

3 Your ability as an operator

3a Relevant offences

3a1 Have you, or any other relevant person, been convicted of any relevant offence?

Yes. The applicant has been convicted of a relevant offence within the last 12 months.

Event Name	Court	Date of hearing	Fine	Summary
EA v Thames Water Utilities Limited	Lewes Crown Court	3rd & 4th July 2023	Fine: £3,334,000.00 Prosecution Costs: £128,961.05 and victim surcharge of £120.00	Thames Water pleaded guilty to four charges under the Environmental Permitting (England and Wales) Regulations 2016. The detail of each summons is included below: Summons 1: Between 9 October 2017 and 14 October 2017 TW caused a water discharge activity, namely A discharge of sewage effluent from Crawley Sewage Treatment Works into the Gatwick Stream and the River Mole, except under and to the extent authorised by an environmental permit contrary to Regulation 38(1)(a) and Regulation 12(1)(b) of the Environmental Permitting (England and Wales) Regulations 2016. Summons 2: On and /or before 14 October 2017 TW did contravene condition 11 of environmental permit CNTM.1402 by failing to have capacity of not less than 11,000 m3 in the storm lagoon at Crawley Sewage Treatment Works contrary to Regulation 38(2) of the Environmental Permitting (England and Wales) Regulations 2016. Summons 3: Between 9 October 2017 and 14 October 2017 TW contravened condition 12 of environmental permit CNTM.1402 by failing to discharge when the rate of flow at the inlet sewer at Crawley Sewage Treatment Works is in

				excess of 840 l/s due to rainfall and /or snowmelt contrary to Regulation 38(2) of the Environmental Permitting (England and Wales) Regulations 2016. Summons 4: On and /or before 14 October 2017 TW did contravene condition 13 of environmental permit CNTM.1402 by failing to empty the storm lagoon at Crawley Sewage Treatment Works and return the contents for full treatment as soon as practicable after cessation of the overflow to the lagoon contrary to Regulation 38(2) of the Environmental Permitting (England and Wales) Regulations 2016.

3b Technical ability

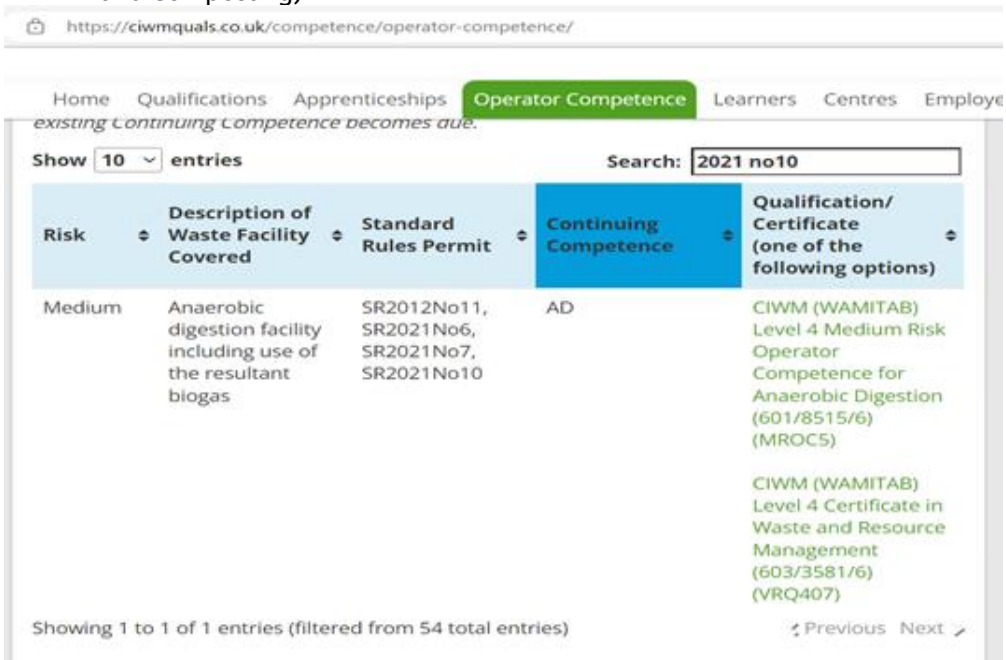
Thames Water uses WAMITAB qualified staff at their waste facilities. The relevant person for the site has been named below and full details have been provided separately on a spreadsheet.

Mark Mc Coy

Please see Appendix B for evidence of competency.

Following discussions with CIWM (WAMITAB), Thames Water understands there are two routes to holding an appropriate CoTC for the permit as laid out in the screen shot below:

a) CIWM (WAMITAB) Level 4 medium risk operator competence for anaerobic digestion (MROC5)
b) CIWM (WAMITAB) Level 4 Certificate In waste and Resource Management – VRQ" and optional "VRQ407 – Principles and practices of managing a biological treatment processing facility (Anaerobic Digestion and Composting)"



Thames intend to follow option B at this site.

Thames Water understands from the CIWM website that the proposed option is acceptable.

3c Finances

Installations, waste operations and mining waste operations only.

Do you or any relevant person or a company in which you were a relevant person have current or past bankruptcy or insolvency proceedings against you?

No

3d Management systems

What management system will you provide for your regulated facility?

Identify the form of the management system from the list:

• Own management system

Thames Water has a SharePoint based Environmental Management System, with site specific elements and procedures linked from across the organisation Thames Water also has an Asset Management System accredited to ISO 55001 and an Energy Management System accredited to ISO 50001.

Scope

Thames Water has an EMS in place for its permitted assets.

Environmental Policy

Implementation of Thames Water's Environmental Policy is approved by the Thames Water Executive Committee of the Thames Water Board and is the responsibility of all employees, with the Chief Executive being accountable for its implementation. The policy covers all company activities, including this installation, and applies to all individuals who are employed by, or carry out work on behalf of, any Thames Water company including contractors, temporary staff and agency workers. The Management Systems Team is responsible for the implementation and assurance of the EMS, the site operations teams will be responsible for maintaining ongoing compliance with the EMS and managing the site.

Management and Responsibilities

The Management Systems Team (EMS specialists) have responsibility for the management and upkeep of the EMS. Compliance with specific elements of environmental legislation is managed by the relevant Business Areas across the Company. The Environmental Assurance Team maintain a Legal Register and, in consultation with Operations Teams, the environmental permitting team and other specialists, assess environmental risks for in-scope areas using a significance scoring method under normal, abnormal and emergency conditions. Significant environmental aspects and impacts consider legal and other requirements, cost to the business, scale of impact and interested parties.

Management Systems Team are responsible for setting internal environmental standards which are then implemented by the relevant business areas. The Standards and other relevant information are communicated through several routes. Incident and corrective action routes exist to promote continual improvement. The team run a programme of Management System Audits to determined adherence to the environmental policy and environmental standards.

Local operating procedures are the responsibility of the operational teams that operate the sewage works.

The defined roles and responsibilities are allocated to relevant personnel, depending on their job description, qualifications, knowledge, experience and training. Training and competency are based on specific roles.

Operational Control

Procedures are in place within the EMS to identify and control environmental issues arising from company activities. Each department is required to achieve operational control of its activities using standardised systems.

Routine sewage treatment operations and activities are recorded within the corporate management database, SAP. These include routine inspections, monitoring and maintenance tasks.

Non-routine activities, such as major overhauls/refurbishments, which involve the use of sub-contractors are assessed for health & safety concerns; relevant environmental risks and with accompanying method statements to respond to these. Contractors who are required to carry out major services are closely managed by operational or other staff to ensure that compliance with Thames Water's H&S and environmental policies is achieved. No contractors may work on site without having undergone a full site induction and being issued with a Thames Water Operational Safety Authorisation (TWOSA) for the task(s) they intend to complete.

Processes on site operate continuously, 24-hours per day, 7-days per week, apart from maintenance periods. The plant is designed to operate unattended with process parameters being monitored continuously. Operating logs are stored electronically.

Maintenance and Monitoring

Management will have the ultimate responsibility for the effective maintenance of plant throughout the company. The facility has named staff that are responsible for day-to-day maintenance operations and contractors are also used as required. All maintenance is logged on SAP. The following basic inspections and maintenance activities are indicative of those carried out on site:

- Daily operation of plant (24/7) involves visual inspection of operational assets;
- Daily inspection of temporary pipe work installed;
- Routine maintenance programme for plant; and
- Routine lubrication programme.

Personnel responsible for the inspection, testing and maintenance of pollution prevention infrastructure are trained to an appropriate level.

All regular maintenance of all plant and equipment will be completed on the time scale specified by the equipment manufacturer including routine inspections.

Environmental Improvement

Thames Water is committed to environmental improvements and has established environmental targets and plans relating to materials and waste management, transport, climate change mitigation and adaptation (energy efficiency and renewable energy generation), water resources, biodiversity, river water quality, and drainage asset performance. TWUL's Environmental Governance Board meets on a regular basis to provide strategic direction, and interrogative review, attached to any environmental issue of substantive concern including emerging risks as well as current topics.

Competence, Training and Training Records

Thames Water aims to ensure that all employees are in possession of the knowledge, skills and experience necessary to perform their role in accordance with the company's operating procedures and in full compliance with the law. Training needs are identified by the employee's immediate supervisor or line manager.

For those sites treating 'waste' as defined by the Waste Regulations 2011, coverage at all permitted sites by staff who hold the appropriate level of WAMITAB 'Certificate of technical Competence' is monitored centrally. This aspect of the staff training is currently being reviewed in light of the change in permitting requirements for sludge treatment centres.

For each internal training course held a Training Record is issued.

Induction training is carried out by the responsible line manager and consists of an introduction to the Company's Environmental Health and Safety Policy and description of emergency response and spill prevention procedures.

Staff receive specific training in the plant's operation and the environmental impact of the process as well as health and safety. The operators will have a detailed understanding of the operational procedures for the site for both normal and abnormal operation. As part of the training, operators will receive specific instructions relating to those aspects of plant operation that have the potential for a negative impact on the environment. This training will be provided by the equipment manufacturers or in-house staff as appropriate.

Contractors

There are several procedures to ensure contractors have the required skills and environmental competencies to carry out works at the site.

Initially, contractors are assessed by the procurement department for inclusion on the approved supplier list, which includes health and safety and environmental criteria for example, waste documentation such as waste carrier's licence/training certificates. Even when the contractors are on the approved supplier list, they are still further assessed for each specific contracted activity.

The contactor is required to submit a method statement prior to any commencement of work, identifying how work is to be undertaken and the associated risks. The method statement must be approved by the Site Manager, who will also identify any site hazards and issue an Authorisation to Work/Enter the site, following a site induction. When on-site, the contractor must carry this Authorisation to Work at all times.

Incidents, Non-Compliances and Complaints

Thames Water has procedures for incidents, non-compliances and environmental complaints.

Incidents are managed through corporate and site-specific procedures which ensure that all incidents are logged and that necessary preventative and/or corrective actions are taken.

Customer complaints are made via the Customer Services Centre which will log all complaints electronically. An action is raised to Waste Operations Control Centre (WOCC) who contact the CSM by telephone and email the complaint information to both the CSM and Performance Manager. The CSM and Performance Manager will review the complaint and take action to investigate the complaint. The CSM is responsible for contacting the customer and updating them on the outcome of the investigation and any actions taken. Where complaints relate to odour/noise/amenity, typical follow up action would include physical checks onsite of the operation of plant; offsite checks where needed; with all the actions taken being logged. Where appropriate, site management may contact the customer to discuss the outcome of the complaint, otherwise, there is a customer communication plan that identifies how and when contact will be made with customers and other stakeholders.

Information regarding complaints is recorded to allow determination of an appropriate response (corrective action) and identify what measures need to be taken in the future to prevent its reoccurrence (preventive action).

Communication

There are regular meetings held on site to discuss all aspects of the treatment works and performance against targets. These meetings include the operation and performance of the installation. Other communication methods to promote environmental management issues and continual improvement include: toolbox talks, environmental alerts, OSC portal forums, formalised event learning processes following an operational incident and compliance audits.

4 Consultation

Could the waste operation or installation involve releasing any substance into any of the following?

4a A sewer managed by a sewerage undertaker?

Yes. The site discharges into a drainage system of the wider sewage treatment works, controlled and operated by the applicant.

4b A harbour managed by a harbour authority?

No

4c Directly into relevant territorial waters or coastal waters within the sea fisheries district of a local fisheries committee?

No

4d Is the installation on a site for which:

4d1 a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?

No

4d2 a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 2015, or a safety report is needed under regulation 7 of those Regulations?

No

5 Supporting information

5a Provide a plan or plans for the site

Please see Appendix A:

- A.1 Site location plan
- A.2 Installation Boundary and Air Emission Points
- A.3 Site Impermeable and Permeable Surface Plan
- A.4 Site Drainage Plan
- A.5 Process Flow Diagram

- A.6 Site Photographs

5b Provide the relevant sections of a site condition/baseline report if this applies

See Appendix C for the Site Condition Report.

5c Provide a non-technical summary of your application

Please see earlier text in Section 1.

5d Are you applying for an activity that includes the storage of combustible wastes?

No. The site processes sit outside the scope of the Environment Agency fire prevention plan guidance, as set out in the Environment Agency guidance.

6 Environmental risk assessment

An environmental risk assessment of the site changes has been carried out in line with the requirements of the Horizontal Guidance Note H1 and Guidance given on gov.uk. This guidance specifies the following approach to carrying out an environmental risk assessment for a proposed activity:

- Identify potential risks that your activity may present to the environment;
- Screen out those that are insignificant and don't need detailed assessment;
- Assess potentially significant risks in more detail if needed;
- Choose the right control measures, if needed; and
- Report your assessment.

Designated site review

Site Name	Designation	Direction from site	Distance from site
Tinkers Copse	LNR	South	1,000m
Jock's Copse	LNR	South	1,200 m
Temple Copse	LNR	South	1,300 m
Piggy Wood	LNR	South-East	1,300 m
Farley Copse	LNR	South-West	2,000 m
Thames Basin Heaths	SPA	South	5,500 m
Windsor Forest and Great Park	SAC	East	6,500 m
n/a	SSSI		

Site Name	Designation	Direction from site	Distance from site
n/a	RAMSAR		
Un-named	Ancient and Semi-Natural Woodland	South-West	1,500 m
Warfield Hall: The Grove	Ancient and Semi-Natural Woodland	East	215 m
Tithe: Furzes Coppice	Ancient and Semi-Natural Woodland	South	955 m
Tithe: Dean's Coppice	Ancient and Semi-Natural Woodland	South-West	1,800 m
Dean's Coppice	Ancient and Semi-Natural Woodland	South-West	1,700 m
Warfield Hall: The Grove	Ancient and Semi-Natural Woodland	East	235 m
Warfield Hall: The Grove	Ancient and Semi-Natural Woodland	East	285 m
Westhatch Corner	Ancient and Semi-Natural Woodland	East	1,300 m
Gardener's Copse	Ancient and Semi-Natural Woodland	North-West	1,900 m
Farleymoor Copse (Epoch2-3:Farley Copse / Tithe: Farley Moor Coppice)	Ancient and Semi-Natural Woodland	South	1,900 m
Epoch3. Point Copse. Tithe: Stackpool Coppice	Ancient and Semi-Natural Woodland	North	1,700 m
Epoch3: Wilson's Copse / Tithe: Burgess Coppice / Rocque: Hasel Wood	Ancient and Semi-Natural Woodland	North	1,300 m
Hazelwood Copse	Ancient and Semi-Natural Woodland	North	Adjacent
Hazelwood Copse / Tithe: Haughfords Grove	Ancient and Semi-Natural Woodland	North	Adjacent
Epoch3: Lever's Piece / Tithe: Marsh Coppice	Ancient and Semi-Natural Woodland	North	125 m
Hawland's Copse / Tithe: Hawlands Coppice	Ancient and Semi-Natural Woodland	West	1,300 m

Site Name	Designation	Direction from site	Distance from site
Farleymoor Copse (Epoch2-3:Farley Copse / Tithe: Farley Moor Coppice)	Ancient and Semi-Natural Woodland	South	1,900 m
Tithe: Temple Coppice	Ancient and Semi-Natural Woodland	South	1,400 m
Jock's Copse / Tithe: Jocks Coppice	Ancient and Semi-Natural Woodland	South	1,200 m
Tinker's Copse / Tithe: An Intake	Ancient and Semi-Natural Woodland	South	1,000 m
Long Copse / Tithe: Long Coppice	Ancient and Semi-Natural Woodland	South	590 m
Allotment to Farley Moor Coppice	Ancient and Semi-Natural Woodland	South	2,000 m
Farleymoor Copse (Epoch2-3:Farley Copse / Tithe: Farley Moor Coppice)	Ancient and Semi-Natural Woodland	South	1,900 m
List of Local Wildlife Sites			
Binfield Hall Binfield Manor Bryony Copse/Temple Copse Hawlands Copse Hazelwood Copse Hazelwood Meadow/Hazelwood House Garden Long Copse Ryehurst Meadow Tinkers Copse and Jocks Copse Brickwork Meadows Piggy Wood			All sites within 2,000 m

Data taken from MAGIC.gov.uk website, accessed January 2022. For habitat sites, the relevant distance for consideration are: International designations (SAC, MPA, SPA and Ramsar - 10km); National designations (SSSI – 2km); Local and National Nature Reserves, Local Wildlife Sites (LWS) and Ancient Woodland (AW) (2km).

The Thames Heath Basins SPA is located approximately 5.5 km south of the site and Windsor Forest and Great Park (a SAC and SSSI) is located approximately 6.5 km to the west of the site. There are no SSSIs within 2 km of

the site, the nearest is situated approximately 2.9 km away. There are no MPAs or RAMSAR sites within 10 km of the site.

There are however a number of designated Local Nature Reserves (LNRs) within 2 km of the Bracknell Sewage Treatment Works including: Farley Copse LNR, Jock's Copse LNR, Piggy Wood LNR, Temple Copse LNR and Tinkers Copse LNR.

There are 24 areas of Ancient Woodland within 2 km of the site, with closest comprising areas of Ancient and Semi-Natural Woodland located adjacent to the boundary of the wider sewage treatment works site.

There are 11 non-statutory designated LWS's within 2 km of the site, the closest of which is located adjacent to the boundary of the wider sewage treatment works site.

The site sits within the boundaries of a Zone 3 Source Protection Zone (SPZ).

The permitted area of the site sits within Flood Zone 1 with low probability of flooding (<1:1000 annual probability of flooding).

The site is not located within or adjacent to the boundaries of an Air Quality Management Area (AQMA). The nearest AQMA is located approximately 3 km to the South of the site within the settlement of Bracknell and is referred to as the Area 1 The Bagshot Road A322 Horse and Groom Roundabout Downshire Way AQMA, as designated by Bracknell Forest Borough Council, which has been declared for Nitrogen Dioxide (NO2) – Annual Mean.

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
Amenity issues: Litter, vermin and pests	Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, amenity and recreation areas such as playing fields and playgrounds. Industrial estates and rail stations. The site is located in a mainly rural area surrounded on all sides by woodland or fields. A public access bridleway runs north-east from outside of the site entrance. The nearest commercial premises are approximately 300 m north of the site, comprising an equine stable while a recreation ground including football pitch is 400m west of the site. The nearest residential dwellings are located approximately 100 m north of the site boundary, comprising a number of individual dwellings along a predominantly rural, single track road. Ecological receptors: There are five LNRs within 2 km of the site, the closest of which is 1 km to the south of the site, being Tinkers Copse LNR. There is one SPA, Thames Heath Basins, which can be found approx. 5.5 km to the south while Windsor Forest and Great Park (both a SAC and SSSI) is approx. 6.5 km to the west of the site. There are no SSSIs within 2 k m of the site and no MPAs or Ramsar sites within 10 km of the site. There are a further 24 areas of Ancient Woodland (AW) and 11 LWSs within 2 km of the site. The closes AW and LWS is adjacent to the boundary of the wider STW.	The wastes handled at the site are primarily liquids and sludges, along with UWWTD derived material delivered by sewer. As such, there is no source of litter within the materials handled at the site. In the unlikely event pests or vermin are observed on site a suitable contractor is called in as soon as practicable.	X
Dust and bioaerosol	Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, recreation areas such as playing fields and playgrounds. Industrial estates and rail stations. For human health and ecological receptors, see notes for Litter above. The impact of dust on human health will depend on the distance and wind direction. For bioaerosols this is 250 m.	The wastes handled at the site are liquids, sewage sludges and digested sludge cake, along with UWWTD derived material delivered by sewer. The site will not be handling inherently dusty or powdery wastes. Digested sludge cake is handled within an enclosed cake barn which has odour extraction via an OCU. Therefore, dust and bioaerosols will not impact on nearby receptors, which are approx. 100 m to the north. Roads will be maintained to avoid the production of dust. Anaerobic digestion of sludge takes place within a closed system. Digested sludge cake is stored within the enclosed and abated cake barn and the risk from bioaerosols is low and monitoring is not required. The nearest receptors to the cake barn are approx. 100 m north.	√

		Please see Appendix F for the site specific bioaerosol risk assessment.	
Assessment of point source emissions to air Emissions deposited from air to land	Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, recreation areas such as playing fields and playgrounds. Industrial estates and rail stations. For human health and ecological receptors, see notes for Amenity issues above. The impact of emissions from air on human health will depend on the distance and wind direction.	ADMS modelling indicates impact from the emissions are acceptable. The emergency flare is used only during periods when there is a larger volume of biogas than the CHP engine and auxiliary boilers are able to manage. Fugitive emissions to air are assessed in Table B3-3b(i). The site is not located within an AQMA.	X
Assessment of point source and fugitive emissions to water	The Cut, Berkshire is located 300 m west of the boundary of the wider sewage works and all of the works is in Flood Zone 1 with a low annual probability of river flooding. Smaller streams and ditches run close to the site perimeter. Most of the surface water drainage within the site drains to the inlet of the adjacent sewage treatment works for full treatment prior to discharge.	The main product of the process is a digested sludge cake, which is stored within Flood Zone 1 inside of an enclosed and abated cake barn equipped with an engineered drainage system. Other aqueous discharges generated by process are limited (comprising only biogas condensate, filter press liquors, wash water and surface water run off). These sources are discharged to the on-site drainage system where they are transferred main sewage works inlet. Due to the nature and small quantity of these emissions no further assessment of point source emissions is deemed necessary.	X
Assessment of odour	Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, recreation areas such as playing fields and playgrounds. Industrial estates and rail stations. For human health and ecological receptors, see notes for Amenity issues above. The impact of emissions from odour on human receptors will depend on the distance and wind direction.	The wider sewage treatment works, which includes the area of the STC to be permitted has processes in place to minimise odour which includes physical containment, odour abatement, management systems, procedures and monitoring to control fugitive emissions of odour at the plant. Odour from the STC cannot be considered in isolation from the wider works. The sewage treatment works has an odour management plan, which is appended as Appendix E. Odour emissions are assessed in Table B3-3b(ii)..	X
Energy	Global atmosphere (direct and indirect emissions)	Use of biogas on site within the CHP engine to generate electricity which is exported to the National Grid reduces the demand for non-renewable electricity. Use of additional biogas within the site auxiliary boilers minimises the need to import	X

		non-renewable natural gas from the gas grid. Export of renewable electricity to the National Grid can offset consumption of fossil fuels within the energy mix, lowering the carbon intensity of power. Good maintenance procedures will help the plant to run efficiently and reduce energy consumption	
Land and disposal of waste to other processes	Rivers and streams – see Assessment of point source and fugitive emissions to water above. Drainage systems/sewers. The site lies within a Groundwater Source Protection Zone 3 (SPZ). Aquifers are classified as unproductive (bedrock).	All waste streams are disposed of off-site for recovery or disposal and will continue to be transferred (and consigned where hazardous) to appropriately permitted facilities.	**X**
Noise and vibration	Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, amenity and recreation areas such as playing fields and playgrounds. Industrial estates and rail stations. The site is located in a mainly rural area surrounded on all sides by woodland or fields. A public access bridleway runs north-east from outside of the site entrance. The nearest commercial premises are approximately 300 m north of the site, comprising an equine stable while a recreation ground including football pitch is 400m west of the site. The nearest residential dwellings are located approximately 100 m north of the site boundary, comprising a number of individual dwellings along a predominantly rural, single track road. Ecological receptors: There are five LNRs within 2 km of the site, the closest of which is 1 km to the south of the site, being Tinkers Copse LNR. There is one SPA, Thames Heath Basins, which can be found approx. 5.5 km to the south while Windsor Forest and Great Park (both a SAC and SSSI) is approx. 6.5 km to the west of the site. There are no SSSIs within 2 k m of the site and no MPAs or Ramsar sites within 10 km of the site. There are a further 24 areas of Ancient Woodland (AW) and 11 LWSs within 2 km of the site. The closes AW and LWS is adjacent to the boundary of the wider STW.	Site design has been chosen to minimises the impact of noise on offsite receptors through building orientation, finishes and location of openings. Combustion plant is internal and acoustically shielded from nearby receptors. Noise from plant and equipment will be minimised through purchasing decisions and a robust preventative maintenance programme. There will be no sources of vibration within the facility. Noise and vibration emissions are assessed in See Table B3-3b(iii).	**X**
Other issues (including visual impact)	Protected Species and Habitats	There are records of protected species (Code 2 – not identified) located within the specified screening distance of the site associated with land located within the boundary of the STW. There are no records of protected habitats located within the specified screening distance of the site	**X**

Climate Change	Risks of increased temperature impacts resulting in digesters heating beyond optimal operating temperature and increased odour potential from site process. For human health and ecological receptors, see notes for Amenity issues above.	Primary Digester Tanks may require reduced heat input to digester via heat exchange system and digesters are insulated against worse impacts. Warmer temperatures may require less boiler input/use as a result of less heat demand, or, increased heat dumping via air cooled radiator. If less biogas is used, the site may require a new consumptive biogas solution e.g. a CHP engine or other technology, that is appropriately sized to utilise additional biogas. However, the current CHP engine will need to be replaced prior to 2050 when they reach the end of their operational lifespans. Pre-digestion tanks are already covered and OCU's to be utilised as appropriate. OCU's may require oversizing compared to current use.	**X**
Climate Change	Risks of increased storm events that causes surface water runoff exceeds capacity of site drainage system, or additional dewatering operations due to rainwater ingress, or caused bunds to infill. Increased precipitation may increase flooding on agricultural land, decreasing ability to spread digested sludge cake to land. For water environment receptors, see notes for Assessment of point source and fugitive emissions to water above	The STW design may require expansion or additional storm capacity; however, this would apply to UWWTD operations at the site rather than permitted activities. May need to increase bund or containment volume for sewage treatment works or individual assets. Land spreading activities could be restricted during very wet, winter months. Although the site has a cake barn which would allow digested sludge cake to be stored prior to application, contingency plans to move digested sludge cake to other sites may be required.	**X**

Appendix 2 – Date of birth information for Relevant offences and/or Technical ability questions only

This information has been supplied separately for the ease of exclusion from the public register

4. Form B3 Questions

1 – What activities are you applying to vary?

Table B3-1a – Types of activities

Installation name	Schedule 1 references	Description of the Activity	Activity Capacity	Annex I and II codes and descriptions	Non-hazardous waste treatment capacity
Bracknell Sewage Treatment Works AR1	S5.4 A1 (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 Anaerobic digestion of permitted waste in eight Primary and Secondary Digester Tanks followed by combustion of biogas produced from the process	From receipt of permitted waste through to digestion and recovery of by-products (digestate and biogas).	273 wet tonnes per day (throughput based on 3,272/ 12 days = 273 m3 per day)	R1 Use principally as a fuel or other means to generate energy R3: Recycling reclamation of organic substances which are not used as solvents R13 Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced) D15: Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced	Maximum waste throughput 270,000 wet tonnes per annum including indigenous UWWTD derived sludge from within the wider Sewage Treatment Works. As per volume calculations in Note 1 below
Directly Associated Activities					
AR2	Imports of waste, including sludge from other sewage treatment works				
AR3	Blending of indigenous sludges and imported wastes/waste sludge prior to treatment				
AR4	Storage of digestate prior to dewatering				
AR5	Dewatering of digested sewage sludge				
AR6	Transfer of dewatering liquors back to the sewage treatment works inlet				

AR7	Transfer of surface water runoff back to the sewage treatment works inlet
AR8	Storage of dewatered digested sludge cake prior to offsite recovery
AR9	Storage of biogas
AR10	Transfer of biogas condensate via site drainage back to the head of the sewage treatment works
AR11	Combustion of biogas in a MCPD and Specified Generator (SG) compliant biogas CHP engine and boilers
AR12	Operation of an emergency flare
AR13	Operation of a siloxane filter
AR14	Storage of diesel
AR15	Storage of wastes, including waste oils
AR16	Storage of raw materials
AR17	Operation of a standby emergency generator (Generator 2)

Waste Operations				
	Description of the waste operation	**Annex I (D codes) and Annex II (R codes) and descriptions**	**Hazardous waste treatment capacity**	**Non-hazardous waste treatment capacity**
AR18	Imports of wastes: to the works inlet for treatment through the UWWTD route	D13: Blending or mixing prior to submission to any of the operations numbered D1 to D12	n/a	Maximum waste throughput 10,000 wet tonnes per annum
	Digested sludge cake for temporary storage pending off-site removal	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). R3: Recycling or reclamation of organic substances which are not used as solvents	n/a	Maximum waste throughput 1,000 wet tonnes per annum
For all Waste Operations		**Total capacity**	**9,556 wet tonnes**	**[a] + [b]**
		Total STC treatment capacity (tank volume)	7,556 wet tonnes	[a]

	Total cake barn storage capacity	2,000 wet tonnes	[b]
For waste imports to the head of the works	Annual throughput (tonnes each year)	Imports: 10,000 wet tonnes	
For waste imports of digested sludge cake for temporary storage	Annual throughput (tonnes each year)	Imports: 1,000 wet tonnes	
Note 1: Import Calculation based on: **Unthickened Sludge: 8.43 tds/day; worse case 1.60% dry solids = 527 m3/day = 192,382 m3/year** **Imports – Liquid: 5.17 tds/day; worse case 3.00 % dry solids = 172 m3/day = 62,886 m3/year** **Total Combined import calculation 255,268 m3/year; rounded to 270,000 m3/year**			

Table 1b Types of waste accepted

Table B3-1b(i): Waste accepted for Anerobic Digestion

Waste Code	Description of Waste
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (sewage sludge only)
19 08 05	sludges from treatment of urban waste water
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)

Table B3-1b(ii): Waste accepted at the head of the works import point

Waste Code	**Description of Waste**
16 10 02	aqueous liquid wastes other than those mentioned in 16 10 01 [note 1]
Note 1 – comprising but not limited to: Thickening and dewatering liquors, centrate and filtrate derived from TWUL processes	

Table B3-1b(iii): Waste accepted for temporary storage and transfer off-site

Waste Code	Description of Waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (sewage sludge only)

1c Recovery of hazardous waste on land

Are you applying for a waste recovery activity involving the permeant deposit of inorganic hazardous waste to land for construction or land reclamation?

No - Where the answer is no, there is no requirement to answer further questions in 1c.

2 – Point source emissions to air, water and land

Table B3-2a – Emissions to Air

Emission point reference and location	Source	Parameter	Limit	Unit	Reference Period	Monitoring Frequency	Monitoring standard or method
A1	CHP Engine 1 (existing Medium Combustion Plant which is an engine fuelled on biogas) [Note 1], [Note 2]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	500	mg/m^3	-	Annual	BS EN 14792
		Sulphur Dioxide	350	mg/m^3		Annual	BS EN 14792 or CEN TS 17021
		Carbon Monoxide	1,400	mg/m^3	-	Annual	BS EN 15058
A2	Auxiliary Boiler 1 NB Below 1MWth unit is dual fuel operating on biogas and fuel oil (back-up fuel)	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	Run hours No limit set	-	-	-	BS EN 14792
		Carbon Monoxide	Run hours	-	-	-	BS EN 15058

			No limit set				
A3	Auxiliary Boiler 2 NB Below 1MWth unit is dual fuel operating on biogas and fuel oil (back-up fuel)	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	Run hours No limit set	-	-	-	BS EN 14792
		Carbon Monoxide	Run hours No limit set	-	-	-	BS EN 15058
A4	Emergency Flare [Note 3]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	150	mg/m^3	Average over sample period	[Note 4]	BS EN 14792
		Carbon Monoxide	50	mg/m^3			BS EN 15058
		Total VOCs	10	mg/m^3			BS EN 12619
A5	Primary Digester Tank PRV	-	-	-	-	-	-
A6	Primary Digester Tank PRV	-	-	-	-	-	-
A7	Primary Digester Tank PRV	-	-	-	-	-	-
A8	Primary Digester Tank PRV	-	-	-	-	-	-
A9	Biogas Holder PRV	-	-	-	-	-	-
A10	OCU 2 (cake barn)	Hydrogen sulphide	No limit set	-	Average over sampling period	Once every 6 months	CEN TS 13649 for sampling. NIOSH 6013 for analysis OR US EPA M11
		Ammonia	20	mg/m^3		Once every 6 months	EN ISO 21877 OR CEN TS

							1369 for sampling NIOSH 6016 for analysis
A11	OCU 1	Hydrogen sulphide	No limit set	-	Average over sampling period	Once every 6 months	CEN TS 13649 for sampling. NIOSH 6013 for analysis OR US EPA M11
		Ammonia	20	mg/m^3		Once every 6 months	EN ISO 21877 OR CEN TS 1369 for sampling NIOSH 6016 for analysis
A12	Emergency Standby Generator – Generator 2	-	-	-	-	-	-

Note 1: These limits are based on normal operating conditions and load – temperature 0°C (273K); pressure: 101.3 kPa and oxygen: 5 per cent (dry gas). The measurement uncertainty specified in LFTGN08 v2 2010 shall apply.

Note 2: This emission limit applies from 1 January 2030.

Note 3: These limits are based on normal operating conditions and load – temperature 0°C (273K); pressure: 101.3 kPa and oxygen: 5 per cent (dry gas). The measurement uncertainty specified in LFTGN05 v2 2010 shall apply.

Note 4: Monitoring to be undertaken in the even 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.

Table B3-2b – Emissions to Sewer

Emission point reference and location	Source	Parameter	Limit [note b]	Unit
T1 (as per site plan A.2) (NGR: SU 85691 71965)	Sludge Thickening Plant Liquors, Picket Fence Thickener Liquors, Biogas Condensate, OCU Waste Waters, Surface Water Run Off	No parameters set	No limit set	-
T2 (as per site plan A.2) (NGR: SU 85880 71939)	Digested Sludge Dewatering Liquors, OCU Waste Waters, Surface Water Run Off	No parameters set	No limit set	-
T3 (as per site plan A.2) (NGR: SU 85880 71939)	Emergency Storage Tank Return Flows	No parameters set	No limit set	-

There are no permitted emissions to water, or land from the activities covered by this permit.

3 – Operating techniques

3a - Technical standards

Description of the schedule 1 activity or directly associated activity	Relevant technical guidance note or Best available techniques as described in BAT conclusions under IED	Document Reference
Anaerobic Digestion plant S5.4A1(b)(i); Storage of waste (DAA)	Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2018) 5070) (Text with EEA relevance.)	

3b - General requirements

If the TGN or H1 assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them.

Although screened out of the detailed Risk Assessment (Question B2 Q6), due to the nature of the process the installation has the potential to generate fugitive emissions to air and water, which are subject to a number of process controls.

Risk Matrix and Terminology for Accident for Risk Assessment

Likelihood ↓	Consequence		
	Low	Medium	High
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

Classification	Likelihood	Consequence	Risk
Low	Probability of an event is low and likely only to occur in the long-term (a yearly basis or less frequent).	Impact is low or a minor, short-term nuisance. Minor release to a non-sensitive receptor or pollution of water course. Non-permanent health effects to human health (preventable by appropriate PPE). Minor surface damage to buildings; structures; services; or the environment which can be repaired immediately.	A level of harm is possible although this may not be noticeable to a receptor and would be a short-term event without lasting effects. Level of harm can be reduced using industry best practice and appropriate management techniques.
Medium	It is probable that an event will occur periodically in the medium-term (twice yearly basis).	Impact is noticeable in the short to medium-term. Large release impacting on the receiving media killing flora and fauna and requires remediation. Nuisance causing non-permanent health effects to human health. Damage to buildings; structures; services; or the environment preventing short-term use and/or requiring repair.	A level of harm may arise to a receptor which is noticeable although not long-lasting and may require some remedial actions in order to prevent re-occurrences.
High	An event is very likely to occur in the short-term (monthly or weekly basis) and is almost inevitable over the long-term OR there is evidence at the receptor of harm or pollution.	Impact is significant, wide-ranging and long-lasting effect. Has a chronic or acute impact on human health. Very large release that has a major impact on flora and fauna which may be very difficult to remediate. Significant damage to buildings; structures; services; or the environment which prevents use long-term and may require complete replacement. May cause a long-term impact or contribute towards a global issue due to releases of greenhouse gases.	A level of harm is likely to arise to a receptor that is severe causing significant harm to human health or the environment without appropriate remedial and mitigation measures being implemented. Remedial works to infrastructure and processes is required in the long-term.

Although screened out of the detailed Risk Assessment (Question C2 Q6), due to the nature of the processes, the anaerobic digestion operations and cake storage, along with biogas utilisation have the potential to generate fugitive emissions to air and water, which are subject to a number of process controls.

Table B3-3b(i) Fugitive emissions risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Emissions to air of NOx, SO_2, CO_2 and VOCs	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors	High	Low	Medium	Activities are managed and operated in accordance with the site management system (including inspection and maintenance of equipment, including engine management systems), point source emissions to air (CHP engine, auxiliary boilers and emergency flare stack) have emission limits. Flare stack height of approx. 5 m, CHP engine stack height is approx. 4 m and boiler flues approx. 5 m each (exiting through boiler house roof). Site has a siloxane filter fitted on the main biogas pipeline connected to the CHP engine to remove impurities within the biogas.	Low
Biogas transfer systems, Biogas Storage Holder, CHP engine, flare or PRVs failure causing emissions of biogas	Abnormal	Emissions to air and dispersion leading to: inhalation by local human and animal receptors. Odour impact. Global warming potential. Risk of fire and explosion	Low	Medium	Low	The plant is designed to capture and utilise all biogas possible, combusting the biogas in order to maximise recovered value from the biological treatment of sludge. The biogas system utilised is subject to regular preventative maintenance including a LDAR plan to the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with	Low

						isolation valves to minimise the potential for release if a leak is detected. Personnel on site wear portable biogas detectors in order to alert staff to presence of biogas. A flare stack (emergency flare) is utilised for the safe disposal of surplus biogas in the event of plant breakdown, or a surplus of biogas above the level that can be safely stored or utilised. Use of emergency flare is recorded. PRVs are in place on the Biogas Storage to be operated in the event of failure of the emergency flare to prevent over pressurisation and catastrophic failure. PRVs are monitored by site staff and re-seated/repaired in the event of activation to minimise the emissions to air.	
Catastrophic loss of biogas emissions from biogas transfer systems, Biogas Storage holder, CHP engine, flare or PRVs	Abnormal	Emissions to air and dispersion leading to: inhalation by local human and animal receptors. Odour impact. Global warming potential. Risk of significant fire and explosion	Low	High	Medium	The plant is designed to capture and utilise all biogas possible, combusting the biogas in order to maximise recovered value from the biological treatment of sludge. The biogas system utilised is subject to regular preventative maintenance including a LDAR plan to minimise the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with isolation valves to minimise the potential for release if a leak is detected.	Medium

						Personnel on site wear portable biogas detectors in order to alert staff to presence of biogas. A flare stack (emergency flare) is utilised for the safe disposal of surplus biogas in the event of plant breakdown, or a surplus of biogas above the level that can be safely stored or utilised. Use of emergency flare is recorded. PRVs are in place on the Biogas Storage to be operated in the event of failure of the emergency flare to prevent over pressurisation and catastrophic failure.	
Combustion of biogas within CHP engine and emergency flare. Combustion of biogas or diesel within boilers	Normal	Emissions to air and dispersion leading to: inhalation by local human and animal receptors. Global warming potential	High	Low	Medium	Combustion plant is regularly maintained and appropriately sized to manage volumes of biogas. Combustion plant operates within permitted ELVs subject to routine monitoring against permit compliance. CHP engine stack, auxiliary boiler flues and emergency flare are located away from nearby receptors on the eastern side of the site. The nearest receptors are over 400 m north-west from each emission point.	Low
Release of bioaerosols and dust	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors. Odour impact of	Medium	Low	Low	The risk of bioaerosol and dust is largely minimised by storing the digested sludge cake within an enclosed cake barn. The nearest residential properties are approx. 100 m from the cake barn, towards the north-west.	Low

		bioaerosols. Nuisance impact of dust.				Roads are made from concrete/asphalt and not prone to the generation of dust.	
Release of bioaerosols and dust from spillages	Abnormal	Emissions to air and dispersion leading to inhalation by local human and animal receptors with potential harm to health. Odour impact of bioaerosols. Nuisance impact of dust.	Low	Low	Low	The risk of bioaerosol and dust is largely minimised by storing the digested sludge cake within an enclosed cake barn. Internal site roads are made from concrete/asphalt and not prone to the generation of dust. Sludge retains a high moisture content and is not prone to windblown dispersion which could cause the generation of dust in the event of a spillage. Staff responsible for site housekeeping and cleaning of spillages in a timely manner.	Low
Spillage of liquids, including chemicals and oils.	Abnormal	Emissions to surface waters close to and downstream of site. Acute effect resulting in loss of flora and fauna. Chronic effect resulting in deterioration of water quality Emissions to ground and ground water.	Low	Medium	Low	The closest surface water body, a small ditch/stream can be found on the STW perimeter, running north within Hazelwood Copse. The nearest large water body is The Cut, located 300 m west of the boundary of the wider sewage works. The site is located within a Groundwater Source Protection Zone 3 (SPZ). Chemicals and oils all stored within suitably bunded tanks and IBCs with rainwater removed as required to maintain 110% capacities.	Low

						Handling and use of chemicals and oils is carried out by trained personnel. COSHH data sheets available. Spill kits available on site. Staff are trained in their use.	
Spillage from storage and digestion tanks, overtopping of tanks, leakage from same tanks and from buried pipes	Abnormal	Emissions to surface waters close to and downstream of site. Acute effect resulting in loss of flora and fauna. Chronic effect resulting in deterioration of water quality Emissions to ground and ground water.	Low	Medium	Low	The site is located within a Groundwater Source Protection Zone 3 (SPZ). The closest surface water body, a small ditch/stream can be found on the STW perimeter, running north within Hazelwood Copse. Provision of suitably structurally integral tanks constructed from steel and glass reinforced plastic or concrete. All tanks are subject to asset inspection and proactive maintenance programme including regular visual inspection for cracks or weeping. Due to some assets being subsurface, it may not be possible to identify all leaks immediately. Visual checks during regular day-to-day operations and scheduled preventative maintenance of equipment, such as pumps, pipes, joins etc Biogas condensate discharged back to the works inlet through site drainage system. Spill kits available on site. Staff are trained in their use.	Low

Generation of solid waste resulting in litter	Normal	Releases of litter to the environment. Visual nuisance and local loss of amenity	Low	Low	Low	Site operations do not give rise to large amounts of solid wastes and litter that would be prone to dispersion by wind. Rags are stored within skips and retain high moisture content. Waste is stored securely for collection by appropriately licensed approved contractors. Litter picking activities are completed as required.	Low

Where the TGN or H1 assessment shows that odours are an important issue, send us your odour management plan.

Due to the nature of the process, the installation has the potential to generate odorous emissions resulting from the permitted activities. Odour management is a key operational objective, as summarised in the risk assessment table below. A copy of the site-specific odour management plan has been appended to this application as Appendix E.

Table B3-3b(ii) Odour risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
H2S/biogas emissions from uncovered tanks	Normal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	High	Low	Medium	Biogas will principally be generated in Primary Digester Tanks which are covered with fixed roofs. The nearest receptors are approx. 370 m to the north and west. Biogas is also generated in smaller quantities within Secondary Digester Tanks, which are uncovered tanks. The Secondary Digester Tanks are located towards the east of the site and approx. 380 m from the nearest sensitive receptors, located to the north and west.	Low

						H_2S production is controlled through the digestion process which can be manually overridden if required.	
Loss of containment from Biogas Storage and biogas pipework	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Low	Medium	Low	Biogas is principally stored within the double membrane Biogas Storage which is suitably sized to manage biogas generation. The biogas system utilised is subject to regular preventative maintenance including a LDAR plan to minimise the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with isolation valves to minimise the potential for release if a leak is detected. The biogas pipelines are mainly aboveground. Personnel on site wear portable biogas detectors in order to alert staff to presence of biogas. Physical protection measures in place around the Biogas Storage including lightning protection and pipework is guarded. PRVs present on the Biogas Storage to safely manage biogas pressures and prevent under or over pressurization. PRVs are monitored by site staff and re-seated/repaired in the event of activation to minimise the emissions to air.	Low
Activation of biogas pressure relief valve	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors	Low	Low	Low	PRVs are only activated in emergency situations to maintain safety within the biogas system and are re-seated/repaired promptly to minimize biogas emissions.	Low

		Loss of amenity from odour nuisance				PRV subject to monitoring via visual checks by site personnel. Biogas is principally stored within the double membrane Biogas Storage which is suitably sized to manage biogas generation. Site has multiple outlets to use biogas - one CHP engine, two auxiliary boilers and one emergency flare which are used in order of preference to maximise recovery of energy. CHP engine and auxiliary boilers are subject to regular maintenance to maintain maximum use of outlets, with flare maintained in good working order should it need to be used. The nearest receptor is approx. 390 m north-west of the Biogas Storage.	
H2S/biogas emitted when biogas cannot be combusted in engine, boilers or flare	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Low	Low	Low	Biogas is principally stored within the double membrane Biogas Storage which is suitably sized to manage biogas generation and act as buffer storage when biogas cannot be combusted. Site has one CHP engine, two auxiliary boilers and one emergency flare giving multiple outlets for biogas. The nearest receptors are approx. 390 m north-west of the Biogas Storage The CHP engine is subject to regular maintenance to maintain maximum use of outlets, with the emergency flare maintained in	Low

						good working order should they need to be used.	
Storage of treated digested sludge cake	Normal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	High	Low	Medium	Digested sludge cake is stored within an odour abated and enclosed cake barn. Digested sludge cake is an inherently low odour material. The cake barn is approx. 85 m from the nearest sensitive receptor, a residential property located towards the north-west. Should any odorous sludge cake be produced, this will be subject to process checks undertaken to identify root cause of production and removed from site expediently.	Low
Failure of odour control units	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Low	High	Medium	Odour control units are subject to regular preventative maintenance. Media is replaced inline with the manufacturer's recommendations	Low
Storage of site generated wastes	Normal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Low	Low	Low	Wastes generated on site are not inherently odorous and is stored securely for collection by appropriately licensed approved contractors.	Low

If the TGN or H1 assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)

The installation has the potential to generate noise as a result of the permitted activities. Potentially noisy activities are subject to a number of process controls and noise management is a key operational objective, as summarised in the risk assessment table below. Note there is no history of substantiated noise complaints relating to the site:

Table B3-3b(iii)Noise risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Operation of CHP engine	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors	High	Low	Medium	The CHP engine is acoustically baffled, self-contained and designed for external applications therefore noise emissions are already low. The CHP engine is located in the south-east of the site, away from sensitive receptors, approx. 440 m north-west of the CHP engine. Good inspection regimes and maintenance of plant to ensure that excessive noise levels are not generated. Regular checks of noise mitigation measures fitted to items of plant. Such measures include silencers and baffles fitted to specific areas of plant. Where repair or replacement is required, the plant will, where possible, be taken out of service until repair or replacement of parts has been undertaken.	Low
Operation of fans on air cooled radiators	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors	High	Low	Medium	Air cooled radiators do not give rise to high levels of noise and are only used as required. They are located approx. 440 m from the nearest sensitive receptors. Good maintenance of fans to ensure that excessive noise levels are not generated.	Low

						Where repair or replacement is required, this will be completed promptly.	
Operation of site vehicles	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors. Generation of vibration with ground transmission, causing loss of amenity to local human receptors.	High	Low	Medium	Vehicle movements across the site subject to speed limit and subject to one-way system to reduce generation of noise. Shovel loading of digested sludge cake takes place within the enclosed cake barn. The nearest sensitive receptors to the cake barn are approx. 85 m towards the north-west beyond a large earthen environmental bund.	Low
Vehicle movements - tanker deliveries of waste sludge and bulk collections of digested sludge cake	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors. Generation of vibration with ground transmission, causing loss of amenity to local human receptors.	High	Low	Medium	Imports of waste sludge arrive into a point within the central areas of the site. Imports do not take place 24/7. Vehicle movements across the site subject to speed limit and one-way system to reduce generation of noise. Shovel loading of digested sludge cake takes place within the enclosed cake barn. The nearest sensitive receptors to the cake barn are approx. 85 m towards the north-west beyond a large earthen environmental bund.	Low
Vehicle movements - tanker deliveries of chemicals and raw materials	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors. Generation of vibration with ground transmission, causing loss of amenity to local human receptors.	High	Low	Medium	Deliveries likely to take place during daytime hours to dedicated delivery areas. Vehicle movements across the site subject to speed limit and one-way system to reduce generation of noise.	Low

Operation of emergency flare	Abnormal	Generation of noise with air transportation, causing loss of amenity to local human receptors.	High	Low	Medium	Emergency flare is located away from sensitive receptors, approx. 400 m from the nearest sensitive receptors to the north and to the west. Use of the emergency flare is minimized by prioritizing use of the CHP engine and auxiliary boilers. Use of the flare recorded.	Low

Table B3-3b (iv) - Environmental Risk Assessment and Accident Management Plan

A site specific Accident Management Plan (AMP) is located in Appendix J.

Table B3-3b (v) - Bioaerosol Risk Assessment

The installation has the potential to generate bioaerosols which may pose a risk to nearby sensitive receptors. A site-specific bioaerosol risk assessment (SSBRA) is presented in Appendix F.

3c - Types and amounts of raw materials

Table B3-3c – Types and amounts of raw materials

Type and amounts of raw materials used by the installation are summarised in the site specific Residue Management Plan (RMP) which is located in Appendix I.

4 - Monitoring

4a - Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

The air emission points A1-A4 are to be monitored in accordance with EA guidance and the requirements of MCPD.

Hours of operation of the flare (A4) are monitored and logged. In the unlikely event that the total annual hours of operation exceed 10% of the hours in a year (876 hours), emissions from the flare would be subject to monitoring in accordance with EA guidance.

Point A10s and A11, 2x OCU will have bi-annual testing.

There is no routine monitoring proposed for points A5 – A9 (PRVs).

Table B3-4a – Emission Monitoring

Monitoring point	NGR	Monitoring frequency	Methodology (standard)	Assessment procedures
A1 (CHP Engine 1)	SU 85992 71844	Oxides of Nitrogen (NO and NO_2 expressed as NO_2) – Annually Sulphur Dioxide – Annually Carbon Monoxide – Annually	In accordance with Environment Agency guidance note M2 "Monitoring of stack emissions to air".	
A2 (Auxiliary Boiler 1)	SU 85956 71868	Oxides of Nitrogen – Run hours/ No limit set Carbon monoxide – Run hours / No limit set	In accordance with Environment Agency guidance note M2 "Monitoring of stack emissions to air".	
A3 (Auxiliary Boiler 2)	SU 85956 71870	Oxides of Nitrogen – Run hours/ No limit set Carbon monoxide – Run hours / No limit set	In accordance with Environment Agency guidance note M2 "Monitoring of stack emissions to air".	
A4 (Emergency Flare)	SU 86008 71915	Hours of operation – continuous and if over 876 hours then:	BS EN 14792 BS EN 15058	

Monitoring point	NGR	Monitoring frequency	Methodology (standard)	Assessment procedures
		Oxides of Nitrogen – Annual Carbon Monoxide – Annual Total VOCs - Annual		
A5 (Primary Digester PRV)	SU 85951 71915	n/a	n/a	-
A6 (Primary Digester PRV)	SU 85956 71899	n/a	n/a	-
A7 (Primary Digester PRV)	SU 85969 71880	n/a	n/a	-
A8 (Primary Digester PRV)	SU 85973 71865	n/a	n/a	-
A9 (Biogas Storage PRV)	SU 85925 71836	n/a	n/a	-
A10 (OCU2)	SU 85720 71994	Hydrogen sulphide Once every six months	CEN TS 13649 for sampling OR US EPA M11	NIOSH 6013 for analysis
		Ammonia: Once every six months	EN ISO 21877 OR CEN TS 1369 for sampling NIOSH 6016 for analysis	
A11 – (OCU1)	SU 85894 71924	Hydrogen sulphide Once every six months	CEN TS 13649 for sampling OR US EPA M11	NIOSH 6013 for analysis
		Ammonia: Once every six months	EN ISO 21877 OR CEN TS 1369 for sampling NIOSH 6016 for analysis	
A12 (standby generator)	SU 85749 71998	n/a	n/a	n/a
S1 (Liquor sampling point)	SU 85882 71912	n/a	MCERTS or ISO/IEC 17025 where available	
S2 (Liquor sampling point)	SU 85684 71982	n/a	MCERTS or ISO/IEC 17025 where available	

4b – Point source emissions to air only

4b1 Has the sampling location been designed to meet BS EN 15259 clause 6.2 and 6.3?

No

4b2 Are the sample ports large enough for monitoring equipment and positioned in accordance with section 6 and appendix A of BS EN 15259?

No

4b3 Is access adjacent to the ports large enough to provide sufficient working area, support and clearance for a sample team to work safely with their equipment throughout the duration of the test?

No

4b4 Are the sample location(s) at least 5 HD from the stack exit

No

4b5 Are the sample location(s) at least 2 HD upstream from any bend or obstruction?

No

4b6 Are the sample location(s) at least 5 HD downstream from any bend or obstruction?

No

4b7 Does the sample plane have a constant cross sectional area?

No

4b8 If horizontal, is the duct square or rectangular (unless it is less than or equal to 0.35 m in diameter)

No

4b9 If you have answered 'No' to any of the questions 4b1 to 4b8 above, provide an assessment to how the standards in BS EN 15259 will be met.

As an existing operational site entering environmental permitting for the first time, sampling locations and sampling ports may not meet all of the requirements for BS EN 15259, but these are being checked onsite. Due to the size of the CHP and auxiliary boilers, a permanent sampling platform is not provided, however, a temporary sampling platform is utilised to provide sufficient space, in accordance with standard industry practice, where sampling cannot be undertaken from the ground.

5 – Environmental impact assessment

5a Have your proposals been the subject of an environmental impact assessment under Council Directive 85/337/EEC of 27 June 1985 [Environmental Impact Assessment]?

No.

6 – Resource efficiency and climate change

6a – Describe the basic measures for improving how energy efficient your activities are

The Primary Digester Tanks are all suitably insulated. The CHP engine is suitably sized to maximise energy utilisation for the parasitic load, while minimising the use of the flare.

Low energy lighting and LED lighting is installed across the plant. The heating water from the CHP engine is located in close proximity to the digester heat exchangers and transferred in insulated pipes to minimise heat losses in transmission.

6b – Provide a breakdown of any changes to the energy your activities use up and create

The main site energy source is electricity from the site CHP, combusting indigenous biogas, supplemented by electricity imports from the public supply via National Grid to supply the treatment process. The CHP also provides useable heat for hot water to the Primary Digester Tanks via heat exchange.

Biogas is also combusted in the auxiliary boilers on site to meet additional heat demands from the Primary Digester Tanks, but the auxiliary boilers are dual fuelled and can also use fuel oil when there is insufficient biogas.

Use of waste heat from the CHP engine reduces the demand on the auxiliary boilers. Fuel oil is used as a back-up fuel in the event of the loss of power to the entire site via standby generators.

6c – Have you entered into, or will you enter into, a climate change levy agreement?

No, the activities are not eligible to take part in the CCL Scheme.

Describe the specific measures you use for improving your energy efficiency

The production and use of biogas to generate electricity for export and produce heat (which is used into the digestion process) on site minimises the use of fossil fuels whilst recovering biological wastes. Location of the heat exchange, auxiliary boilers, CHP and Primary Digester Tanks within close proximity minimises transmission losses on site, improving the efficiency of the process.

Regular and proactive maintenance of pumps and insulation of pipework will improve efficiency and minimise the electrical demands and heat losses on site.

6d – Explain and justify the raw and other materials, other substances and water that you will use

See response to question 3c above.

The processes take mainly waste materials which would otherwise require additional disposal and recover energy and nutrients which can be put to beneficial use.

Small quantities of chemical raw materials are required to control and maintain the process. These are all proven materials that are extensively used within the water industry.

The other main raw materials are used in the generation of electricity and heat and maintenance of combustion plant which is supplied to the treatment process.

6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste

The facility is a waste treatment plant, and the primary wastes produced through the processes on site are maintenance wastes. Production of maintenance waste is minimised by ensuring that preventative maintenance is carried out based on a combination of manufacturers' best practice and operational experience.

7 – Installations that include a combustion plant (excluding waste incinerators)

7a – List all your combustion plant at the site and provide thermal input and operating hours for each

Please see the information provided within the Technical Summary which lists combustion plant at Bracknell STC.

7b – Do any of your combustion plants have a net rated thermal input of 1 or more MW and is not an excluded MCP?

Yes, please see the following table from Appendix 1, Question 13

Appendix 1, Question 13 Information to be provided by the operator to the competent authority for each Medium Combustion Plant as identified in Annex I of Medium Combustion Plant Directive (EU/2015/2193)
See information within MCP Tables in Technical Summary, 2.5 Combustion Plant

7c – Is the aggregated net thermal input of your combustion plant more than 20 MW?

No

5. Form B4 Questions

1 About the permit

1a What waste operations are you applying for?, Waste operations which do not form part of an installation

This permit application is for temporary storage and transfer of non-hazardous waste as a secondary activity waste operation to the main listed installation.

1b –types of waste accepted and restrictions

The EWC list is included in the responses to form B3.

1c Deposit for recovery purposes

This is not a deposit for recovery application

2 Point source emissions to air, water and land

Please see responses to form B3

3 Operating techniques

3a Technical standards

Please see responses to form B3

3b General requirements

Please see responses to form B3

4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

Please see responses to form B3

4b Point source emissions to air only

Please see responses to form B3

6. Form B6 Questions

The relevant questions within the form are those applicable to effluent and / or surface water run-off arising from the operation of an installation

Q1About the effluent – details and type, continued

1a Give a brief description of the effluent discharge you want a permit for, for example, treated domestic sewage effluent

This effluent is a mixture of waste liquors from the operation of the installation for the anaerobic treatment of separated sewage sludge. It primarily comprises of thickening process and dewatering process liquors returned to the work inlet following the dewatering of treated sewage sludge within the installation. Lower volume constituents will include rainfall; biogas condensate; siloxane filtrate; boiler blowdown water; contaminated run off and washdown water. The only wastes treated within the installation are sewage related, either being separated from the UWWTD flow in the wider works, or comprise of waste imports, principally of sludge from smaller satellite treatment works.

1b Give this effluent a unique name

Liquor returns

1d Have you obtained all the necessary permissions in addition to this environmental permit to be able to carry out the discharge (see B6 guidance notes for more details)?

Yes. The discharge is into the inlet of a sewage works controlled by the applicant.

Q2 About the effluent – how long will you need to discharge the effluent for?

2c Will the discharge take place all year?

Yes, the discharge will take place all year

Q3 How much do you want to discharge?

3b What is the maximum volume of effluent you will discharge in a day?

565 Cubic metres

3c What is the maximum rate of discharge?

6.53 Litres / second

3d What is the maximum volume of non-rainfall dependent effluent you will discharge in a day?

565 cubic metres

3f For each answer in question 3, show how you worked out the figure on a separate sheet

Q3b – The liquor arisings must come from the installation inputs as there is limited additional water inputs. The maximum volume of effluent discharged per day will consist of primary thickening liquors, post-digestion dewatering liquors and biogas condensate generated from the inputs and outputs of the Primary Digester Tanks.

Q3c – Maximum rate of discharge (L/second) is generated from the maximum volume of effluent per day, [564.59m^3 x 1000] / 86400 from sources such as thickening and dewatering. This gives a value of 6.5346064 litres, rounded up to 6.53 litres per second.

Q3d - Liquor arisings must come from installation inputs as there is limited additional water inputs. The maximum volume of effluent discharged per day will consist of primary thickening liquors, post-digestion dewatering liquors and biogas condensate generated from the inputs and outputs of the Primary Digester Tanks.

Q4 No questions

Q5 Should your discharge be made to the foul sewer?

5a How far away is the nearest foul sewer from the boundary of the premises?

Not applicable, the site is located within the curtilage of a sewage treatment works and discharges into the works inlet via the site drainage system.

5b2 Discharges from all other premises including trade effluent

Not applicable, the site is located within the curtilage of a sewage treatment works and discharges into the works inlet via the site drainage system.

Q6 How will the effluent be treated?

6a Do you treat your effluent?

No. The Effluent generated by the process of treating sludge within the installation is returned to the inlet of the wider Bracknell STW, where it is subject to aerobic treated in a mixture with UWWTD related waste waters.

6b Fill in Table 2 for each stage of the treatments carried out on your effluent in the order in which they are carried out

Order of Treatment	Code Number	Description
First	09	Primary settlement within sewage works
Second	31	Activated sludge process
Third	21	Sand filtration

6c You must provide details on a separate sheet of the final effluent discharge quality that the overall treatment system is designed to achieve

The final effluent discharge from the wider sewage treatment works is specified in Environmental Permit TH/CTCR.1205/007.

Q7 What will be in the effluent?

7b Are any of the specific substances listed in 'Risk assessment for treated sewage or trade effluent discharges to surface water or groundwater' added to or present in the effluent as a result of the activities on the site?

At present, no sampling or analysis for all substances listed within the referenced risk assessment at the site has been undertaken. Only limited chemicals are added to the process within the installation boundary, primarily antifoam (in low doses, as required) and polymer to aid dewatering of sludge. A review of the appropriate MSDS data does not indicate the presence of 'specific substances' within those chemicals.

Sampling and analysis of the liquor returns to fully characterise the waste streams in accordance with BAT 3 will be undertaken at the site, in line with what is technically achievable, as per the commitment to undertake a chemical analysis of the installation's effluents as per "Return Liquors: BAT 3, 6, 7" within Appendix M

7c Have any of the specific substances listed in 'Risk assessment for treated sewage or trade effluent discharges to surface water or groundwater' been detected in samples of the effluent or in the sewerage catchment upstream of the discharge?

At present, no routine sampling or analysis for all substances listed within the referenced risk assessment at the site has been undertaken either for effluent from the installation or within the wider sewerage catchment. Thames Water commits to undertaking a chemical analysis of the installation's effluents as per "Return Liquors: BAT 3, 6, 7" within Appendix M.

7d Are there any other harmful or specific substances in your effluent not mentioned in 'Risk assessment for treated sewage or trade effluent discharges to surface water or groundwater'?

At present, no sampling or analysis for all substances listed within the referenced risk assessment at the site has been undertaken. A review of the MSDS sheets for chemicals used within the installation does not indicate the presence of any other harmful or specific substances. Thames Water commits to undertaking a chemical analysis of the installation's effluents as per "Return Liquors: BAT 3, 6, 7" within Appendix M.

7e If you have answered 'No' to any of questions 7a to 7d provide details on a separate sheet of how you have established that the effluent is not likely to contain specific substances

Thames Water commits to undertaking a chemical analysis of the installation's effluents as per "Return Liquors: BAT 3, 6, 7" within Appendix M.

A review has been undertaken of the relevant MSDS sheets for chemical used routinely within the installation to look for substances identified within the risk assessments listed.

7f What is the maximum temperature of your discharge?

20°C back into the sewage works

7g What is the maximum expected temperature change compared to the incoming water supply?

0°C

Q8 Environmental risk assessments and modelling

8b Discharges to lakes, estuaries, coastal waters or bathing waters

The installation does not discharge to lakes, estuaries, coastal waters or bathing waters

8d Discharges to groundwater

The installation does not discharge to groundwater

8e Discharges to freshwater (non-tidal) rivers from an installation, including discharges via sewer

No modelling has been undertaken on the output from the installation at present. The final effluent discharge from the wider works, which includes the installation arisings has previously been subjected to modelling as part of the environmental permitting discharge application process.

8f Environmental impact assessment

No environmental impact assessment has been carried out on the installation, as it is an existing facility.

Q9 Monitoring arrangements

9a What is the national grid reference of the inlet sampling point? (for example, SJ 12345 67890)

Not applicable to this installation

9b What is the national grid reference of the effluent sample point?

No sampling point installed at present. Effluents will be sampled from the Sample points identified in Table B3-4a (approximately) within the installation.

9d What is the national grid reference of the flow monitoring point?

No flow meter installed

9e Does the flow monitor have an MCERTS certificate?

No. No flow meter installed

9f Do you have a UV disinfection efficacy monitoring point?

No. Not installed as part of this installation.

9h You should clearly mark on the plan the locations of any of the above that apply to this effluent

Please see site emission point plan.

Q10 Where will the effluent discharge to?

10a Where the effluent discharges to

Non-tidal river, stream or canal

Appendix 5 – Discharges to non-tidal river, stream or canal

A5.1 Give the discharge point a unique name For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

Final effluent discharge

A5.2 Give the national grid reference of the discharge point

SU 85842 71818 or SU 85899 71986

A5.3 Give the name of the watercourse, canal or the main watercourse it is a tributary of if you know it

The Cut, Berkshire via the wider UWWTD sewage treatment works

A5.4 Is the discharge into a:

Non-tidal river

A5.5 Does the discharge reach the watercourse or canal by flowing through a surface water sewer?

No

A5.6 Does the watercourse dry up for part of the year?

No

A5.61 If the watercourse does dry up for part of the year can you indicate a typical period when the surface water runs dry each year – start and finish (in months)

N / A

A5.6.2 If the watercourse does dry up for part of the year, how many metres downstream of the discharge is it before the discharged effluent soaks in?

N / A

A5.7 Is the discharge made to a roadside drain or ditch?

No

10b Is this effluent discharged through more than one outlet?

No

10c If you answered yes to question 10b above make sure you show clearly on your discharge point appendix or appendices and site plan that this one effluent can discharge to more than one discharge point

N / A

7. Form B2.5 Questions

1 About the permit

1a Discussions before your application

See earlier response

1b What is your permit for?

Installation, including MCPD as DAA's

1c In addition to the 1-50 MWth and/or existing 5-50MWth plant would you also like to include existing stationary Medium Combustion Plant 1-5 MWth or Tranche A Specified Generators aggregating to less than 5MWth to this permit in advance of the regulatory requirement?

Yes

2 About your MCP/SG

2a For each stationary MCP what is the address, postcode and national grid reference of where the plant is located?

See earlier answers

2b Is your permit application for a new activity or substantially refurbished activity for MCPs with a total aggregated thermal input of 20MW thermal or more?

No

2c Is your permit application for an MCP?

A unit greater than or equal to 20MW thermal

One that burns waste biomass as described in Article 3(18) (b) of MCPD

Do an of the MCPs on the site meet the criteria of a Chapter 1, Section 1.1 Part B activity?

Do an of the MCPs on the site meet the criteria of a Chapter 5, Section 5.1 Part B activity?

No to all

2c3 Do any of the MCPs and/or SG on site meet the criteria of a EPR Chapter 1, Section 1.1 Part B activity?

No

2c4 Do any of the MCPs and/or SG on site meet the criteria of a EPR Chapter 5, Section 5.1 Part B activity?

No

2d Does your MCP(s) require an air emissions risk assessment to assess the risk to habitats?

Yes please see Appendix L

2e Do you want to declare that your existing MCP(s) will meet new MCP emission limit values (ELVs) from the medium combustion plant directive (MCPD) in order to demonstrate a low risk impact to habitats under a stage 1 or 2 air emissions risk assessment? If you do make this voluntary declaration we will include new MCP ELVs in your permit.

No

2f Does your SG require dispersion modelling to assess the risk to human health and habitats from proposed emissions to air?

Undertaken, please see Appendix L

3 Your ability as an operator

3b Finances

Do you or any relevant person or a company in which you were a relevant person have current or past bankruptcy or insolvency proceedings against you?

Please see response for Form B2

3c Management systems

You must have an effective, written management system in place that identifies and reduces the risk of pollution. You may show this by using a certified scheme or your own system.

Your permit requires you (as the operator) to ensure that you manage and operate your activities in accordance with a written management system.

Please see response for Form B2

4 Supporting Information

4a Provide a non-technical summary of your application

Please see Section 1.

Appendix A. Figures

A.1 Site location plan

See document: B22849AM-JAC-BKL-DR-0001

A.2 Installation Boundary and Air Emission Points

See document: B22849AM-JAC-BKL-DR-0002

A.3 Site Impermeable and Permeable Surface Plan

See document: B22849AM-JAC-BKL-DR-0003

A.4 Site Drainage Plan

See document: BKLS1ZZ_DPL_001

A.5 Process Flow Diagram

See document: B22849AZ-BRACK1ZZ-LSX-DR-P-0001

A.6 Site Photographs

See document: TW_STC_EPR_21A_BKL_APPA.6

Appendix B. CoTC

For the qualifications of the site manager, see document: TW_STC_EPR_21a_BKL_APPB

Appendix C. Site Condition Report – H5

See document: TW_STC_EPR_21a_BKL_APPC

Appendix D. BAT Assessment

Please see the appended BAT Assessment Spreadsheet: TW_STC_EPR_21a_BKL_AppD

Appendix E. Odour Management Plan

Includes: Odour Management Plan and Odour Risk Assessment. See documents TW_STC_EPR_21a_BKL_AppE

Appendix F. Bioaerosol Risk Assessment

See document: TW_STC_EPR_21a_BKL_APPF

Appendix G. Containment Assessment

G.1 Containment Options Report (CIRIA 736)

See document: B22849AZ-JA-BRACS1ZZ-100-RP-Z-0001

G.2 Containment Assessment

See document: B22849AZ-JA-BRACS1ZZ-100-CA-P-0002

Appendix H. Leak Detection and Repair (LDAR) Plan

See document: TW_STC_EPR_21a_BKL_APPH

Appendix I. Residue Management Plan

I.1 Residue Management Plan

See document: TW_STC_EPR_21a_BKL_APPI.1

I.2 Material Safety Data Sheets Folder.

See zip folder: TW_STC_EPR_21a_BKL_APPI.2

Appendix J. Accident Management Plan

See documents: TW_STC_EPR_21a_BKL_APPJ

Appendix K. Acceptance of Third-Party Waste Imports

K.1 Waste Acceptance of Third-Party Waste Imports

See document: TW_STC_EPR_21a_BKL_APPK.1

K.2 Waste Acceptance of Thames Water Inter-Site Sludge and Cake

See document: TW_STC_EPR_21a_BKL_APPK.2.

Appendix L. Air Quality Impact Assessment

See document: TW_STC_EPR_21a_BKL_APPL

Appendix M. Liquor Monitoring

See document: TW_STC_EPR_21a_BKL_APPM