

Bioresources Permitting – Stanley Downton STW Environmental Permit Application Resubmission

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Severn Trent Water Ltd
EPR/Stanley Downton/EPR/LB3403ZL/A001

Severn Trent IED Permitting
10 November 2023



Bioresources Permitting – Stanley Downton STW Environmental Permit Application Resubmission

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1. Introduction

This application relates to a new environmental permit application for a bespoke installation bioresources treatment permit for the Stanley Downton Sewage Treatment Works, operated by Severn Trent Water Ltd.

The site has a current T21 waste exemption which allows for the recovery of waste at a waste water treatment works which will be superseded by this permit application.

This new permit application comprises an installation for the biological treatment of waste under the Industrial Emissions Directive, as implemented through the Environmental Permitting Regulations (2016) (as amended). It relates to the non-urban waste water treatment directive (UWWTD) treatment of indigenous UWWTD derived sludge. Note that these operations are currently operated at the Stanley Downton Sewage Treatment Works site, under the UWWTD. Note further that there are no imported wastes handled at Stanley Downton.

Permitted activities include operations from the point of the separation of the sludge from the main UWWTD treatment stream, through to its storage on the site cake pad, prior to its recovery to land offsite. The additional aspect of the permit includes the biogas handling and treatment system as a directly associated activity, including a biogas fuelled gas engine and boilers, covered by the Medium Combustion Plant Directive.

A number of other activities are undertaken at the site, outside of the scope of this permit, relating to the treatment of sewage derived materials through aerobic processes. These activities are covered by the UWWTD.

1.1 Non-Technical Summary

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 (UWWTD) by the Environment Agency.

It covers the biological treatment of sludge by anaerobic digestion, with a capacity above the relevant thresholds. The biological treatment of sludge includes treatment of the indigenous sewage sludges from the onsite aerobic treatment process. The indigenous sludges are generated from the aerobic treatment of waste waters from the sewer network arriving into the site at the works inlet. There are a number of directly associated activities including the operation of a biogas fuelled Combined Heat and Power (CHP) unit and two boilers for the generation of electricity and heat at the site, which is classified as an existing combustion source under the Medium Combustion Plant Directive (MCPD).

The site is located to the south west on the outskirts of Stonehouse, Gloucestershire, in a predominately rural area and is accessed via an unnamed lane. The River Frome is 270m north of the site at its closest point. The River Frome splits into multiple rivers further north west and one more of these rivers is located 570m north of the site and the Stroudwater Navigation 680m north of the site. A small unnamed stream is located 670m south of the site.

The primary activity of the installation is for the biological treatment of non-hazardous wastes for recovery by means of anaerobic digestion. Surplus Activated Sludges (SAS) are thickened using belt thickeners before being transferred and blended in the feed tanks. Indigenous sludges pass through three batch thickening tanks before being added to the feed tanks.

There is one primary anaerobic digester at the site. The tank is an above ground tank of concrete construction with a concrete fixed roof, fitted with pressure release valves, where incoming sludge is added to the process as digested sludge is removed. Removed sludge is transferred to two subsurface, open topped, concrete secondary digesters (pathogen kill tanks). Digested sludge is then transferred to the two, open topped, export tanks, which are subsurface and of concrete construction. Following this, digested sludge is then removed from site in liquid state for dewatering at another permitted site. Digested sludge cake is not produced or stored at the Stanley Downton site.

Waste liquors from the installation are transferred, via the site drainage system, back to the works inlet where they are treated via the UWWTD processes on site.

There is one gas engine on site for the combustion of biogas and associated emergency flare. There are also two dual fuel boilers present on site. Biogas is captured from the primary anaerobic digesters and stored in a dual membrane gas holder. The above ground 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 gas holder is fitted with pressure release valves as a safety precaution in the event of over pressurising the system.

The biogas is taken from the dual membrane gas holder for combustion in the CHP engine, generating electricity for use both within the site and for export to the grid, and heat to maintain primary digester temperature. This is classified as an 'existing' combustion plant under the Medium Combustion Plant Directive, due to the generator being commissioned prior to 20 December 2018. Biogas can also be used in the dual fuelled auxiliary boilers on site. In the event there is excess biogas, i.e., more than the CHP can utilise, or in the event that the CHP is unavailable, there is a ground mounted emergency flare. This is utilised under 10% of the year.

1.2 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 the permitting of indigenous sewage sludge and by anaerobic digestion for the Stanley Downton Sewage Treatment Works, operated by Severn Trent Water Ltd (Severn Trent).

Scope

This application covers the biological treatment of indigenous sewage sludge, by anaerobic digestion for recovery, with a capacity above the relevant thresholds. The site operates 24 hours per day with the site being unstaffed overnight. 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, operation of two dual fuelled auxiliary boilers and storage of biogas.

The Combined Heat and Power unit and auxiliary boilers on site fall under the definition of "existing" medium combustion plant (MCP) as defined by Schedule 25A of the Environmental Permitting Regulations (EPR) 2018, in that they are less than 20MW thermal and were commissioned prior to 20 December 2018.

The operations at the site do not fit within the requirements of the appropriate standard rules permit (2021 no 11, v1). A bespoke permit application is therefore required.

Location

The site is located in a predominantly rural, sparsely populated area, south west of the towns Stonehouse and Bridgend and west of the settlement Stanley Downton. The site is bounded to the north, west and south by arable farmland and bounded to the east by a railway track with arable farmland beyond that. Farm buildings are located adjacent to the north east corner of the site and east immediately across the railway track.

In the wider vicinity of the site, the River Frome is located 270m north of the site at it's closest point. The River Frome splits into multiple rivers further north west and one more of these rivers is located 570m north of the site and the Stroudwater Navigation is 680m north of the site. A small nameless stream is located 670m south of the site.

The nearest residential receptor is a farmhouse 112m north of the site boundary and a small residential area 230m north. The closest commercial receptors are the small farm buildings located 15m north and 110m east of the site boundary.

The site is not located within a Flood Risk Zone as outline on the Environment Agency's Flood Map for Planning. The nearest Flood Risk Zone (Flood Risk Zone 3, defined as land having a 1 in 100 or greater annual probability of river flooding) is located immediately north associated with the River Frome. The site is not within a Source Protection Zone (SPZ). The nearest designated habitat sites comprises of one Ancient Woodland and Local Wildlife Site (LWS) located 0.3m south, a Special Area of Conservation (SAC) 5.5km east and another SAC 5.5km west which is also a Special Protection Area (SPA) and RAMSAR site. There are no Local or National Nature Reserves (LNR and NNR) or Sites of Special Scientific Interest (SSSI) within 2km of the site. The site is not within an Air Quality Management Area (AQMA)

Sludge Processes

The SAS, separated by the Activated Sludge Plant (ASP), is thickened in the SAS thickening building and stored in the SAS buffer tank prior to being blended with indigenous sludge in two feed tanks. These are steel, above ground, open topped tanks.

The indigenous sludge, separated by the primary settlement tanks, is thickened in the three covered batch thickening tanks prior to being blended with SAS in the feed tanks.

The digestion process consists of one primary, fixed roof, anaerobic digester, which is an above ground concrete tank. Anti-foam is added to the primary digester on an 'as required' basis to control foaming within the digester.

The digester is fitted with pressure relief valves, which operate in an emergency only, and are subject to regular external inspections and 10-yearly internal inspection. Sludge is held within the digester for a period in accordance with the sites HACCP plan within primary digester, with sludge being fed on a continual basis as digested sludge is removed and transferred to the secondary digesters or pathogen kill (path kill) tanks to ensure the appropriate level of pathogen kill is achieved.

There are two pathogen kill tanks (path kill tanks) at the site. These tanks are rectangular concrete, subsurface, open topped tanks.

Digested sludge is transferred offsite to a different works for dewatering. Prior to transfer, digested sludge is stored in two export tanks, which are square concrete, subsurface, open topped tanks. Table (i) below gives a summary of the tanks within the permit area.

Table (i) – Tank Summary

Tank Type	Number	Volume (each)	Construction
Batch Thickening Tanks	3	400m ³	Steel
SAS Buffer Tank	1	80m ³	Steel
Feed Tanks	2	80m ³	Steel
Primary Digesters	1	2,000m ³	Concrete
Pathogen Kill Tanks	2	1,000m ³	Concrete
Export Tanks	2	500m ³	Concrete

Liquor Returns

Site drainage and liquor returns from operational areas is captured within the site wide drainage system and returned to the head of the works for treatment within the UWWTD treatment route. The site drainage is to be assessed at the site.

There are no liquor returns generated from the processes on site, as dewatering is undertaken offsite.

Treated, final effluent is then discharged to the River Frome under the terms of environmental permit MI/S/22/26240/R/003 . The final effluent sampling point is at grid reference SO 79100 04800.

There are no direct emissions to water from the sludge treatment facility. The only indirect emission is of limited volumes of process waters such as cleaning residues, boiler blowdown and biogas condensate; which are returned to the wastewater treatment works for aerobic treatment under Urban Wastewater regulations in a mixture with rain water.

Biogas

Biogas is stored in the dual membrane gas holder and combusted within one CHP engine on site, which runs on biogas only and provides both electricity to the site processes and heat to maintain the primary digester temperature. Electricity can also be exported to the National Grid when there is excess supply above the site needs. The site also has two dual fuelled auxiliary boilers and an auxiliary flare stack that can combust biogas when there is excess biogas that cannot be combusted by the CHP or when the CHP is offline for maintenance. Biogas transfer lines are fitted with condensate pots that capture entrained moisture from the generated biogas and allow it to be drained into the site drainage system for aerobic treatment via the UWWTD treatment route.

The CHP engine has a thermal input of 0.6 MWth input and is equipped with a vertical stack. This is classified as a 'existing' combustion plant under the Medium Combustion Plant Directive. In the event there is excess biogas, i.e. more than the CHP can utilise, or in the event that the CHP is unavailable, there are two dual fuelled auxiliary boilers, each of 0.4MWth input and one ground mounted emergency flare. The flare is utilised under 10% of the year. H₂S and siloxane levels are monitored within the biogas and treated if required by their concentrations. There is no routine dosing for H₂S with ferrous sulphate undertaken within the permitted processes on site and no siloxane treatment required based on the levels within the biogas.

An air dispersion model using ADMS has been prepared for the air emissions from combustion plants at the site and is appended to this application as Appendix C. The key findings are that the CHP engine and boilers operations are unlikely to result in any unacceptable impacts on air quality.

Process Controls

Anaerobic digester 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, including for the presence of foaming, which is treated with anti-foam as appropriate. All tanks are equipped with appropriate high-level alarms and automatic cut off valves to minimise the risk of overtopping. Site operations are covered by Severn Trent's ISO14001 accreditation for all operations, and technical competence is provided by the organisations CMS and training program. Stanley Downton will be included within the CMS certification scope within the next 12 months, but operational staff are already trained as competent within the CMS based on their responsibilities at other permitted sites within the area.

BAT Considerations

The site infrastructure is not currently fully compliant with the requirements of BAT, specifically with regards to containment and surfacing.

A figure showing the current site surfacing within the permit boundary is included within the figures.

There are a number of open top tanks within the permit boundary at Stanley Downton, including the pathogen kill tanks. It is acknowledged that there may be emissions of biomethane and/or odour from some of these tanks, and Severn Trent is preparing a monitoring exercise to determine the nature of any emissions and the quantity. Based on these outputs, the requirement for covering the tanks will be assessed, in accordance with the design of

the existing tanks and HSE requirements around ATEX and DSEAR, in accordance with the applicability notes for BAT 14d.

As part of any tank cover design, the initial monitoring data will be necessary to determine if the correct routing of any gas from the tank headspace would be to the biogas utilisation system or to a new OCU. The quantification of tank emissions is needed to determine if the gas treatment assets also require upgrading, e.g. existing engine utilisation levels. If an OCU is the required for the gases, the quantification and nature of the emissions will be required in order to ensure that the unit is sized correctly, with the right media to deal with the substances present.

Due to the variability of air pressure on the potential release rate of gas from the tank contents, it is proposed that the monitoring exercise will involve 4 rounds of sampling over a 6 month period, to reflect levels at different ambient air temperatures and atmospheric pressures.

The site is not equipped with any odour control units, following a review of need by process scientists.

The site does not dewater or store sewage cake, nor does it have any odour control units, as such, there is no requirement for a bioaerosol risk assessment for the site.

A full assessment of the relevant sections of the Waste Treatment BRef are supplied as Appendix D.

The site has an odour management plan which is supplied as Appendix F.

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

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

Containment

A spill risk assessment and proposed containment solution, in accordance with CIRIA 736 is supplied as Appendix G.

The outline containment solution does not utilised flood gates within its design.

Liquor Returns Monitoring

There are no direct emissions to water from the sludge treatment facility. The only indirect emission is of the sludge liquors and surface waters, which are returned to the wastewater treatment works for aerobic treatment under Urban Wastewater regulations. The liquors returned from the sludge treatment facility have originated from wastewater treatment works that are also under the control of Severn Trent Water. Liquors returned from the sludge treatment facility are minimal at the Stanley Downton site when compared to other STW sites due to the lack of a dewatering process.

As part of the new IED permit and in line with BAT 3, we commit to carrying out further chemical analysis of the waste water, testing for all pollutants expected to be present in the discharge. We are currently in discussion with UKAS accredited laboratories to see what analysis is possible on our leachate returns, and what 'minimum reporting value' is appropriate. This review will be undertaken in line with EA guidance, for example 'Surface Water Pollution Risk Assessment for your environmental permit', and 'Monitoring Discharges to Water'. The sampling will be undertaken by our suitably trained internal teams that already undertake compliance sampling for EA discharge permits to MCERTS standards. Analysis will be contracted to UKAS accredited laboratories.

The site has an odour management plan which is supplied as Appendix F

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

1.3 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 for the primary activity, that of anaerobic digestion, 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 which is 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).

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

- Storage of digestate prior to transfer offsite to a suitable works for dewatering;
- Storage of biogas;
- Combustion of biogas in an MCPD and SG compliant biogas CHP unit and auxiliary boilers;
- Emergency flare; and
- Storage of raw materials.

2. Application Form Questions

2.1 Form B2

1 About the Permit

1a Discussion before your application?

None

A Nature and heritage conservation screening assessment was issued on 20th June 2022, ref. EPR/LB3403ZL/A001.

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

This application relates to a site.

2 About the site

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

Severn Trent Water Limited

Stanley Downton STW

Stonehouse

GL10 3QZ

SO 7904 3151

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

This application relates to a bespoke 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?

Table B2-3a1 – Relevant offences

Total Payout	Type	Date	Location	Offender	Description of Offence
£870,000	Persecution	Jun-20	Shropshire, England	Severn Trent Water Ltd	Causing an unpermitted discharge, contrary to Regulation 38(1)(a) and regulation 12(1)(b) of the Environmental Permitting (England & Wales) Regulations 2010 and failing to comply with permit conditions, contrary to regulation 38(2).
£1,558,536	Prosecution	Dec 21	Worcestershire, England	Severn Trent Water Ltd	<p>Sentenced for four breaches of the Regulations for four cases.</p> <p>Sewage was discharged contrary to Regulation 38 (2) of the Environmental Permitting (England and Wales) Regulations 2016. (Blackminster)</p> <p>Breach of a limit contrary to regulation 38(2) Environmental Permitting (England and Wales) Regulations 2016. (Bromsgrove, Stoke Prior, Priest Bridge)</p>

3b Technical ability

Severn Trent Water utilises a competence management system to demonstrate technical competence at the site. The current management system is integrated where possible with our ISO14001 EMS, and comprises of written Scope, Policy, Objectives and Targets, Roles and Responsibilities, Competence and Training, Communication, Performance Monitoring and Measuring, Internal Audit, Non-conformance procedure, Legal Requirements, Record Control, and Management Review. Please see the appended CMS certificate, which has a scope including waste storage and treatment. Our CMS certification, under the Environmental Services Association/Energy and Utility Skills (ESA/EU skills) competence management scheme, has been held continuously since the scheme's inception in 2012. In accordance with the scheme, this site will be added to the scope within a year of the new permit being issued.

The EU Skills coordinator has confirmed to STW there is no need to identify a specified person as TCM if the organisation is under the EU Skills scheme. The following is directly from the gov.uk website:

EU Skills scheme: The EU Skills scheme considers the competence of your business as a whole. To join this scheme you need to have a competence management system in place and this must be certified by one of the scheme's approval bodies.

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?

There are no current or past bankruptcy or insolvency proceedings against the applicant.

3d Management systems

Confirm that you have read the guidance and that your management system will meet our requirements.

Yes, we can confirm that this is the case.

Does your management system meet the conditions set out in our guidance?

Yes. The Company holds BS EN ISO 14001:2015.

Please see **Appendix B** for EMS and CMS certificates.

Scope

Severn Trent Water was awarded certification to BS EN ISO14001:2015 for its Environmental Management System in August 2018. The certified EMS scope covers "Management and delivery of wastewater treatment processes. Transfer and storage of highway waste on depots. CHP biogas plant activities. Mothballed landfill monitoring activities, Head office functions at Severn Trent Centre."

Environmental Policy

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

<https://www.severntrent.com/about-us/governance/our-policies/> Management and Responsibilities

The Management Systems Team (EMS specialists) has overall 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 Management Systems Team (EMS specialists) maintain a Legal Register and, in consultation with Operations Teams, their permit compliance advisors 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 take into account legal and other requirements, cost to the business, scale of impact and interested parties.

Management Systems Team (EMS specialists) are responsible for setting internal environmental standards with Standard owners which are then implemented by the relevant business areas. The Standards and other relevant information are communicated through a number of routes. Incident and corrective action routes exist to promote continual improvement.

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 to identify and control environmental issues arising from Severn Trent Water activities. Each department is required to achieve operational control of its activities and, using a central database, identify and record any departmental environmental issues.

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 and environmental risks and method statements are produced to address these, as part of the Managing Contractors process. Contractors who are required to carry out major services are closely managed by the team to ensure that compliance with Severn Trent Water's H&S and environmental policies is achieved. No contractors may work on site without having undergone a full site induction.

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. The following basic inspections and maintenance activities are carried out on site:

- Daily operation of plant (24/7) involves visual inspection of operational assets;
- Daily inspection of temporary pipe work installed;
- Weekly visual inspections of the bulk oil storage tanks and the oil pipework (visual check on above ground pipework);
- Monthly inspection of all bunds (oil, transformer, temporary, etc.) and condition of containerised engines;
- 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 to ensure compliance with the Infrastructure Monitoring Programme.

All regular maintenance of all plant and equipment will be completed on the time scale specified by the equipment manufacturer including routine. A full engine overhaul is likely to be scheduled every 20,000 operating hours. This high-level preventative maintenance is designed to avoid unscheduled down time, maximising the plant availability and its ability to control emissions and maintain an efficient level of operation between overhaul services. Record sheets will be completed that would highlight any issues that may require operator intervention outside the routine maintenance programme.

Environmental Improvement

Severn Trent 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.

The EMS is subject to a Senior Management Review twice a year to consider environmental performance, objectives and targets and continual improvement.

Competence, Training and Training Records

Severn Trent 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.

The EMS delivers a structured environmental awareness programme and targeted awareness training, where a need is identified. Managers and the CMS (Competence Management System) Manager review the competence of those working for the company where the tasks have the potential to cause a significant negative environmental impact, or impact on the operation of permitted activities within the EMS scope. The EMS Team, Permit Compliance Technicians and relevant Departments are responsible for rolling out the Basic Environmental Awareness Modules and job specific training.

For each internal training course held a Training Record is issued. The Training Record includes a statement of understanding, which the employee signs to confirm that he/she has attended the course and understood the subject matter.

For each internal training course held a Training Record is issued through the employees' role specific records on SAP.

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. All training is overseen by a dedicated in-house Learning and Development team, through "The Academy" process.

Severn Trent Water is able to demonstrate that permitted activities are managed by technically competent staff with its Competence Management System (CMS) that is independently certified to meet the requirements of an Industry Standard. All appointed Technically Competent Persons (TCPs) undergo EMS awareness training and CMS training. TCPs are required to re-take training every 2 years. A list of technically competent persons is stored within the CMS documentation on SharePoint. Managing 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 contractor 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 or a TCP who is suitably qualified, 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.

Managing Contractors

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The contractor 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 or a TCP who is suitably qualified, 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

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

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

Complaints are managed by Customer Services, where all complaints are logged on the Complaints Records Online Storage System (CROSS). The Regional Managers are responsible for ensuring that action is taken and for liaising with the relevant regulatory bodies (where appropriate). They ensure that any complaint is investigated and, if found to be justified, that work is undertaken to resolve the issue. They also provide an appropriate response to the complainant in a timely manner detailing the reason behind the issue and the actions taken to resolve the matter.

Information regarding complaints is recorded to allow determination of an appropriate response (corrective action) and to determine what measures need to be taken in the future to prevent its reoccurrence (preventive action). These records will be maintained as part of the management system for a minimum of four years.

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: 'Lessons Learnt' bulletins, OSC portal forums and compliance audits.

Auditing

The controls for addressing environmental aspects and impacts are checked through the EMS audit programme which is managed by the EMS Auditor. Findings are reported to Site Managers and their Leadership Team. All permitted sites are internally audited by the permitting team every three years as a minimum. These inspections support the EMS audit programme and are audited by the EMS Team on a sample basis. The EMS also checks that other audit programmes exist for our wider environmental obligations, for example, MCerts and Operator Self-Monitoring compliance assessments.

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?

No – site drainage is managed within the wider sewage works, 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 1999, 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** for the following plans:

- Figure 1 – site location plan
- Figure 2 – installation boundary and air emission points
- Figure 3 – site drainage plan
- Figure 4 – process flow diagram

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

Yes. See Appendix E for H5 template site condition report for the site

5c Provide a non- technical summary of your application

Please see Section 1.1 in this document.

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

No – the site handles and treats wastes using processes that fall outside the scope of the FPP guidance. Note that the site primarily handles liquids or pumpable sludges which do not pose a fire risk.

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.

Table B2-6(i) – Environmentally Sensitive Locations

Site Name	Designation	Distance	Direction
Five Acre Grove	Ancient Woodland	0.3km	South
Severn Estuary	RAMSAR, SAC, SPA	5.5km	West
Rodborough Common	SAC	5.5km	East
List of Local Wildlife Sites*			
Five Acre Grove (Leonard Stanley)			<2km

* These sites were identified by the EA as being within 2km of the sludge treatment works, however, there were no labels on the map provided so a specific distance and direction could not be determined. No data was available on the public domain on google maps or MAGIC.gov.uk.

The above table shows data taken from MAGIC.gov.uk website, accessed October 2023, and from the EA, provided June 2022. For habitat sites, the relevant distance for consideration are: International designations (SAC, MPA, SPA and Ramsar - 10km); National designations (SSSI – 2km); Nature reserves and ancient woodland (2km)

There are three designated habitat sites within the relevant distances of the site. There is one area of ancient woodland, which is also an LWS, names Five Acre Grove 0.3km south of the site. There are also two SACs, named Rodborough Grove and Severn Estuary located 5.5km east and 5.5km west respectively. Severn Estuary is also a SPA and RAMSAR site. There are no LNRs NNRs or SSSIs located within 2km of the site.

There are a number of protected species in the River Frome, namely:

Brown Trout; European eel; Bullhead; and unidentified Lamprey.

The River Frome is also a migratory route for Atlantic salmon and European eels.

The sewage treatment works site is not located within a Flood Risk Zone as outlined on the Environment Agency's Flood Map for Planning and therefore is not situated in an area prone to flooding. The nearest Flood Risk Zone (Flood Risk Zone 3, defined as land having a 1 in 100 or greater annual probability of river flooding; or land having a 1 in 200 or greater annual probability of sea flooding) is located immediately along the northern perimeter of the sewage treatment works associated with the River Frome. The site is not within a groundwater source protection zone (SPZ). The site is not within an Air Quality Management Area.

Table B2-6(ii) - Screening Assessment

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	The wastes handled at the site are primarily liquids and sludges, along with UWWTD derived material delivered by sewer.	X

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Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
	<p>and playgrounds. Industrial estates and rail stations.</p> <p>The site is located in a rural area, south west of the settlement of Stonehouse and Bridgend and west of the settlement Stanley Downton.</p> <p>The site is bounded to the north, west and south by arable farmland and bounded to the east by a railway track with arable farmland beyond that. Farm buildings are located adjacent to the north east corner of the site and east immediately across the railway track.</p> <p>The River Frome is to the north of the site with more arable land beyond it and a small residential area adjacent to it.</p> <p>The River Frome is 270m north of the site at its closest point and 415m north from the closest sludge treatment works facility (Boiler House). The River Frome splits into multiple rivers further north west and one more of these rivers is located 570m north of the site and the Stroudwater Navigation 680m north of the site. A small nameless stream is located 670m south of the site.</p> <p>The closest residential receptor is a small farm house 112m north of the site and a small residential area 230m north of the site. The closest commercial receptors are the small farm buildings located 15m north and 110m east of the site.</p> <p>Ecological receptors: There are three designated habitat sites within the relevant distances of the site. There is one area of ancient woodland, which is also an LWS, names Five Acre Grove 0.3km south of the site. There are also two SACs; Rodborough Grove and Severn Estuary located 5.5km east and 5.5km west respectively. Severn Estuary is also a SPA and RAMSAR site. There are no LNRs NNRs or SSSIs within 2km of the site.</p>	<p>There is no source of litter within the materials handled at the site.</p> <p>In the unlikely event pests or vermin are observed on site a suitable contractor is called in as soon as practicable.</p>	
<p>Dust and bioaerosols</p>	<p>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.</p> <p>For human health and ecological receptors, see notes for Amenity issues above.</p>	<p>The wastes handled at the site are liquids, and sewage sludges along with UWWTD derived material delivered by sewer. No dewatering of cake occurs at the site, nor is there any cake stored at the site</p> <p>The site will not be handling inherently dusty or powdery wastes. Roads will be</p>	<p>X</p>

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Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
	The impact of dust on human health will depend on the distance and wind direction.	maintained to avoid the production of dust. Digested sludge is removed from site for dewatering.	
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.	The installation has a biogas fuelled CHP engine, two dual fuelled boilers and an auxiliary flare, for which ADMS modelling indicates emissions are unlikely to result in unacceptable impacts on air quality. The emergency flare is used only during periods when there is a larger volume of biogas than the CHP engine or boilers are able to manage or are offline. Fugitive emissions to air are assessed separately.	X
Assessment of point source and fugitive emissions to water	The River Frome is located 270m north of the site, with an offshoot 570m north of the site and the Stratford Navigation 680m north of the site. The is a small nameless stream located 370m south of the site. The site is not located within a Flood Risk Zone as outlined on the Environment Agency's Flood Map for Planning and therefore is not situated in an area prone to flooding. 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 digested sludge, and this is not stored within a flood risk zone and is stored within open topped subsurface concrete tanks. Other aqueous discharges generated by process are limited (comprising, biogas condensate, and surface water run off). These sources are discharged to the on-site drainage system where they are transferred to 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 site has an odour management plan in place. This includes management systems, procedures and monitoring to control fugitive emissions of odour at the plant. Waste inputs to the site are of a similar nature to indigenous waste streams and as such there is no change in odour profile at the site. Odorous activities are centrally located within the site, but the location provides screening for this.	X
Energy	Global atmosphere (direct and indirect emissions)	Biogas generated by the facility is utilised to generate electrical power for the site and exported to the grid; thus increasing renewable energy supplies.	X

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Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
		Waste heat from the CHP engine is utilised to control primary digester temperature when required and reduce demand on the auxiliary boilers.	
Land and disposal of waste to other processes	<p>Rivers and streams – see Assessment of point source and fugitive emissions to water above.</p> <p>Drainage systems/sewers.</p> <p>The site is not within a groundwater source protection zone (SPZ). Aquifers are classified as unproductive (superficial deposits) and secondary undifferentiated (bedrock deposits).</p>	All waste streams disposed of off-site will continue to be to appropriately permitted facilities.	X
Noise and vibration	<p>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.</p> <p>The site is located in a rural area, south west of the settlement of Stonehouse and Bridgend and west of the settlement Stanley Downton.</p> <p>The site is bounded to the north, west and south by arable farmland and bounded to the east by a railway track with arable farmland beyond that. Farm buildings are located adjacent to the north east corner of the site and east immediately across the railway track.</p> <p>The River Frome is to the north of the site with more arable land beyond it and a small residential area adjacent to it.</p> <p>The River Frome is 270m north of the site at it's closest point and 415m north from the closest sludge treatment works facility (Boiler House). The River Frome splits into multiple rivers further north west and one more of these rivers is located 570m north of the site and the Stroudwater Navigation 680m north of the site. A small nameless stream is located 670m south of the site.</p> <p>The closest residential receptor is a small farm house 112m north of the site and a small residential area 230m north of the site. The closest commercial receptors are the small farm buildings located 15m north and 110m east of the site.</p> <p>Ecological receptors: There are three designated habitat sites within the relevant distances of the site. There is one</p>	<p>Site design has been chosen to minimise the impact of noise on offsite receptors through building orientation, finishes and location of openings.</p> <p>Noise from plant and equipment will be minimised through purchasing decisions and a robust preventative maintenance programme. Sensitive receptors are distant to the operational areas of the site, which are screened by the existing structures to reduce noise impacts.</p> <p>There are no sources of vibration within the facility.</p>	X

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Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
	area of ancient woodland, which is also an LWS, names Five Acre Grove 0.3km south of the site. There are also two SACs, named Rodborough Grove and Severn Estuary located 5.5km east and 5.5km west respectively. Severn Estuary is also a SPA and RAMSAR site. There are no LNRs NNRs or SSSIs located within 2km of the site.		
Other issues (including visual impact)	<p>There are a number of nearby designated sites, including one area of ancient woodland/LWS within 1km of the site.</p> <p>The River Frome is home to a number of protected species, and is also a migratory route for protected species</p>	<p>These have been considered in the AQIA.</p> <p>The permitted activity does not discharge directly to the River, instead it discharges via the wider sewage works, where the potential impact on protected species has been considered as part of its discharge consent.</p>	X
Climate Change	<p>Risks of increased temperature impacts resulting in digesters heating beyond optimal operating temperature and increased odour from sewage process. For human health and ecological receptors, see notes for Amenity issues above.</p>	<p>Digesters may require reduced heat input to digester via heat exchange system and digesters are insulated against worse impacts. Warmer temperatures may require less boilers 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 gas engine that is appropriately sized to utilise additional biogas. However, the CHP engines will need to be replaced prior to 2050 when they reach the end of their operational lifespans.</p>	X
	<p>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</p>	<p>The STW design may require expansion or additional storm capacity; however, this would apply to UWWTD operations at the site rather than permitted activities.</p> <p>May need to increase bund or containment volume for sewage treatment works or individual assets.</p> <p>Land spreading activities could be prevented during very wet, winter months. Although the site has a large cake pad 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.</p>	X

2.2 Form B3

1 What activities are you applying to vary?

Table B3-1a: Types of activities

Schedule 1 listed activities						
Installation name	Schedule 1 references	Description of the Activity	Activity capacity	Annex I (D codes) and Annex II (R codes) and description	Hazardous waste treatment capacity (if this applies)	Non-hazardous waste treatment capacity (if this applies)
Stanley Downton STW	S5.4A1(b)(i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC— (i) biological treatment by anaerobic digestion	From receipt of permitted waste through to digestion and transfer of digested sludge for offsite dewatering. Anaerobic digestion of permitted waste including pasteurisation and chemical addition.	117m ³ per day (input) 819m ³ per week (input)	R3 Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) R13 Storage of waste pending any of the operations numbered R1 to R 2 (excluding temporary storage, pending collection, on the site where the waste is produced) D10 Incineration on land	None	117m ³ per day
Name of DAA		Description of DAA				
AR2		Storage of digestate prior to transfer offsite to a suitable works for dewatering;				
AR3		Storage of biogas;				
AR4		Combustion of biogas in an MCPD and SG compliant biogas CHP unit and auxiliary boilers;				

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AR5	Emergency flare;
AR6	Storage of raw materials.
Total storage capacity (tonnes)	2,000 m ³
Annual throughput (tonnes each year)	42,588 tonnes

1b Waste Accepted

No wastes accepted at site.

2 Point source emissions to air, water and land

Table B3-2(i) – Emissions to Air

Emission point reference and location (NGR/Latitude and Longitude)	Source	Parameter	Concentration	Units
A1 SO 79159 04580	CHP engine	NOx	500	mg/m ³
		SO ₂	350	mg/m ³
		CO	1400	mg/m ³
A2 SO 79167 04560	Boilers 1 (biogas)	NOx	200	mg/m ³
		SO ₂	100	mg/m ³
		CO	No limit set	mg/m ³
	Boilers 1 (natural gas)	NOx	100	mg/m ³
		CO	No limit set	mg/m ³
A3 SO 79168 04560	Boilers 2 (biogas)	NOx	200	mg/m ³
		SO ₂	100	mg/m ³
		CO	No limit set	mg/m ³
	Boilers 2 (natural gas)	NOx	100	mg/m ³
		CO	No limit set	mg/m ³
A4 SO 79097 04580	Emergency Flare (note 1)	NOx	150	mg/m ³
		CO	50	mg/m ³
		Total VOCs	10	mg/m ³
A5 SO 79127 04557	Primary Digester pressure relief valve	No limit set	-	-
A6 SO 79126 04578	Gas Storage pressure relief valve	No limit set	-	-

Note 1: Monitoring to be undertaken in the event the auxiliary flare has been operational for more than 10 per cent of a year (876 hours). Record of operating hours to be submitted to the Environment Agency

Table B3-2(ii) - Points where emissions leave the permit boundary

Emission Point reference and location (NGR/Latitude and Longitude)	Source	Parameter	Concentration	Units
T1	Installation returns to works inlet	No limit set	-	-

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

3 Operating techniques

Table B3-3(i) – (Table 3) Technical Standards

Schedule 1 activity or DAA	Best available techniques	Document references
Anaerobic Digestion plant S5.4A1(b)(i) Storage of waste (DAA)	Biological waste treatment: appropriate measures for permitted facilities	Updated 6 th July 2023

3b General requirements

Table B3-3(ii) – (Table 4) General requirements

Name of the installation: Stanley Downton Sewage Treatment Works	Document references
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them.	N/A – see Table B2-6 above
If the technical guidance or your risk assessment shows that odours are an important issue, send us your plan for managing them.	See Odour Management Plan Appendix F
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration plan (or both).	N/A – see Table B2-6 above

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 of Consequences

Classification	Definition
Low	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 (easily prevented by appropriate use of PPE) Minor surface damage to a building, structure, service or the environment which can be repaired immediately
Medium	Impact is noticeable in the short to medium term Large release impacting on the receiving media which kills flora and fauna and requires remediation Nuisance causing non-permanent health effects to human health Damage to buildings, structures and services which prevents use in the short-term and/or requires a specialist repair
High	Impact is significant, wide-ranging and long lasting effect Has either 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 a single or multiple building, structure and service which prevents use over a 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

Classification of Likelihood

Classification	Definition
Low	Probability of an event is low and likely only to occur in the long term (a yearly basis or less frequent)
Medium	It is probable that an event will occur periodically in the medium term (twice yearly basis)
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

The following categorisation of risk has been developed and the terminology adapted as follows:

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Term	Definition
Low	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 measures and techniques
Medium	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	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 B2 Q6), due to the nature of the processes, the anaerobic digestion operations, 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(iii) – Fugitive emissions risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Emissions to air of NO _x , SO ₂ , CO ₂ and VOCs	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors	High	Low	Medium	<p>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 engines, boilers and emergency flare stack) have emission limits for NO_x, CO₂, SO₂.</p> <p>Flare stack height approx. 6m, CHP stack approx. 6m and boilers flue approx. 6m.</p>	Low
Gas transfer systems, gas storage tank, gas engines, flares 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	<p>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.</p> <p>The gas system utilised is subject to regular preventative maintenance including an 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.</p> <p>The railway track is located 250m east of the gas storage and the closest residential area is located 340m north east.</p> <p>Personnel on site wear portable gas detectors in order to alert staff to presence of biogas.</p> <p>A waste gas burner (emergency flare) is utilised for the safe disposal of surplus gas in the event of plant breakdown, or a surplus of gas above the level that can be safely stored or utilised. Use of emergency flare is recorded.</p> <p>PRVs are in place on the top of the digester to be operated in the event of failure of the emergency</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						flare to prevent over pressurisation and catastrophic failure.	
Catastrophic loss of biogas emissions from gas transfer systems, gas storage tank, gas engines, flares 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	<p>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.</p> <p>The gas system utilised is subject to regular preventative maintenance including an 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.</p> <p>A waste gas burner (emergency flare) is utilised for the safe disposal of surplus gas in the event of plant breakdown, or a surplus of gas above the level that can be safely stored or utilised. Use of emergency flare is recorded.</p> <p>PRVs are in place on the top of the digesters to be operated in the event of failure of the emergency flare to prevent over-pressurisation and catastrophic failure.</p>	Medium
Combustion of biogas within CHP engine and emergency flare. Combustion of biogas or natural gas within boilers	Normal	Emissions to air and dispersion leading to: inhalation by local human and animal receptors. Global warming potential	High	Low	Medium	<p>Combustion plant is regularly maintained and appropriately sized to manage volumes of gas.</p> <p>Combustion plant operates within permitted ELVs subject to routine monitoring against permit compliance.</p> <p>CHP engine located away from the nearest residential and commercial properties. The closest residential receptor to the CHP engine and emergency flare is a small farm house located 300m north east. The railway track lies 210m east of the CHP.</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Fugitive emissions from open top tanks within the installation	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors. Odour impact of bioaerosols. Global warming potential	Medium	Low	Medium	<p>Secondary digesters / pathogen kill tanks may give rise to fugitive emissions of biomethane and odour. Severn Trent are committed to carrying out a survey of these potential emissions and considering the way in which they can be captured and mitigated if the measured emissions require this.</p> <p>As part of the monitoring programme at the site, emissions from this tank will also be analysed.</p>	Medium
Release of bioaerosols and dust	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors. Odour impact of bioaerosols. Nuisance impact of dust.	Low	Low	Low	<p>The risk of bioaerosol and dust is largely eliminated by only handling sludges at the site. All dewatering and storage of cake is undertaken offsite.</p> <p>Roads are made from concrete/asphalt and not prone to the generation of dust.</p>	Low
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	<p>The risk of bioaerosol and dust is largely eliminated by only handling sludges at the site. All dewatering and storage of cake is undertaken offsite. The site is located in a rural area away from sensitive receptors. Natural barriers to windblown dispersion are provided by stands of trees which surround the site.</p> <p>Roads are made from concrete/asphalt and not prone to the generation of dust.</p> <p>Staff responsible for site housekeeping and cleaning of spillages in a timely manner.</p>	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	Low	Medium	Low	<p>The River Frome is 270m north of the site at its closest point and 415m north from the closest sludge treatment works facility (Boiler House). The River Frome splits into multiple rivers further north west and one more of these rivers is located 570m north of the site and the Stroudwater Navigation 680m north of the site. A</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
		deterioration of water quality Emissions to ground and ground water.				<p>small nameless stream is located 670m south of the site.</p> <p>Chemicals and oils all stored within suitably bunded tanks and IBCs with rainwater removed as required to maintain 110% capacities. Chemical delivery areas are centrally located and fitted with penstock valves to contain large spillages.</p> <p>Handling and use of chemicals and oils is carried out by trained personnel. COSHH data sheets available.</p> <p>Spill kits available on site.</p> <p>There are no point source emissions to water within the permit boundary, as the drainage system pumping back to works inlet.</p>	
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.	Medium	Low	Medium	<p>The site does not lie within a groundwater Source Protection Zone (SPZ).</p> <p>Provision of suitably structurally integral tanks constructed from steel and glass reinforced plastic/insulation (where needed). All tanks are subject to internal and external asset inspection and proactive maintenance programme including regular visual inspection for cracks or weeping.</p> <p>Leak detection systems, visual checks during regular day-to-day operations and scheduled preventative maintenance of equipment, such as pumps, pipes, joints etc</p> <p>Biogas condensate discharged back to the works inlet through site drainage system.</p> <p>Spill kits available on site.</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						There are no point source emissions to water within the permit boundary, as the drainage system pumping back to works inlet.	
Generation of solid waste resulting in litter	Normal	Releases of litter to the environment. Visual nuisance and local loss of amenity	Low	Low	Low	<p>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.</p> <p>Waste is stored securely for collection by appropriately licensed approved contractors.</p> <p>Litter picking activities are completed as required.</p>	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 F**.

Table B3-3b(iv) – Odour risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
H ₂ S/biogas emissions from uncovered tanks	Normal	<p>Emissions to air and dispersion leading to inhalation by local human receptors</p> <p>Loss of amenity from odour nuisance</p>	High	Low	Medium	<p>Biogas will principally be generated in the primary digestion tank which is covered with a fixed roof.</p> <p>There may be low levels of biogas emitted from the secondary digesters / pathogen kill tanks, where digested sludge is held for an extended period to ensure that a sufficient level of pathogen kill has been achieved. Emissions from these tanks will be monitored and measured by</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						<p>Severn Trent to determine the need for capture and abatement.</p> <p>The other open topped tank, the export tank, should not have biological activity.</p> <p>The nearest properties consists of a small farm house located approximately 340m north east of the primary digester. The railway track runs along the eastern boundary of the site and is 235m east of the primary digester at it's closest point.</p> <p>Small amounts of biogas may also be generated within primary batch tanks (covered) and digester feed tanks (uncovered) located at the southern side of the wider STW site. .</p> <p>H₂S production is controlled through the digestion process which can be manually overridden if required.</p>	
Loss of containment from biogas holder and biogas pipework	Abnormal	<p>Emissions to air and dispersion leading to inhalation by local human receptors</p> <p>Loss of amenity from odour nuisance</p>	Low	Medium	Low	<p>Biogas is principally stored within dual membrane biogas holder which is suitably sized to manage biogas generation and act as buffer storage for biogas. The gas system utilised is subject to regular preventative maintenance including an 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.</p> <p>Personnel on site wear portable gas detectors in order to alert staff to presence of biogas.</p> <p>PRVs available to safely manage pressures within the primary digesters to prevent under or over pressurization.</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Activation of biogas pressure relief valve	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Low	Low	Low	<p>PRVs are only activated in emergency situations to maintain safety within the biogas system and are re-seated/repared promptly to minimize biogas emissions.</p> <p>PRVs subject to monitoring via pressure on SCADA and visual checks by site personnel.</p> <p>Biogas is principally stored within dual membrane biogas holder which is suitably sized to manage biogas generation and act as buffer storage for biogas. Site has one CHP engine, two boilers and one flare which are used in order of preference to maximise recovery of energy.</p> <p>CHP engine and 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.</p> <p>The closest residential receptor to the CHP engine and emergency flare is the small residential area located 370m south west.</p>	Low
H ₂ S/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	<p>Biogas is principally stored within dual membrane biogas holder which is suitably sized to manage biogas generation and act as buffer storage for biogas. Site has one CHP engine, two boilers and one flare giving multiple outlets for biogas.</p> <p>The closest residential receptor to the CHP engine and emergency flare is the small farm house located 300m north east.</p> <p>CHP engine and 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.</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Storage of treated digested sludge	Normal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Medium	Low	Low	Digested sludge cake is not produced or stored on site. Digested sludge is stored in the open topped, subsurface concrete export tanks before removal off site for dewatering. The closest residential receptor to the export tank is a small farm house located 290m to the north east and is separated from sensitive receptors by trees. Should any odorous digested sludge 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	Low	Low	There are no odour control units within the permitted area	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(v) - Noise Risk Assessment

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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	<p>The CHP engine is acoustically baffled, self-contained and designed for external applications therefore noise emissions are already low.</p> <p>The closest residential receptor to the CHP engine and emergency flare is the small farm house located 300m north east. Good maintenance of plant to ensure that excessive noise levels are not generated.</p> <p>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.</p>	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	<p>Air cooled radiators do not give rise to high levels of noise and are only used as required. They are centrally located, away from sensitive human receptors with the nearest sensitive receptor over 250m away.</p> <p>Good maintenance of fans to ensure that excessive noise levels are not generated. Where repair or replacement is required, this will be completed promptly.</p>	Low
Operation of site vehicles	Normal	<p>Generation of noise with air transportation, causing loss of amenity to local human receptors.</p> <p>Generation of vibration with ground transmission, causing loss of amenity to local human receptors.</p>	Medium	Medium	Medium	<p>Vehicle movements across the site subject to speed limit and traffic management plan to reduce generation of noise.</p> <p>Reversing obligations minimised by site layout.</p> <p>Tanker movements limited to daytime only.</p>	Low

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Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Operation of emergency flare	Abnormal	Generation of noise with air transportation, causing loss of amenity to local human receptors.	Medium	Low	Medium	Use of the emergency flares is minimized by prioritizing use of the CHP and boilers with use of the flare recorded. Emergency flare is located in the northern part of the sludge treatment site and is located 360m north east from the nearest residential receptor.	Low

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

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Major fire and/or explosion causing the release of polluting materials to air, water or land.	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population</p> <p>Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p>	Low	High	Medium	<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Management systems requires DSEAR assessment which is adhered to by site operations.</p> <p>Designated ATEX zones on site and lightning protection system in place around biogas holder. Fire alarm system installed and maintained.</p> <p>Biogas contained within a closed system and monitored for safety. Automatic cut off valve to biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc.</p> <p>Warning signs clearly displayed and staff wear gas alarms to alert to the presence of biogas. All visitors subject to site inductions and accompanied. Permit-to-work system in place.</p>	Low

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Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					<p>Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively.</p> <p>Smoking only permitted in designated areas of site.</p>	
Minor fire causing the release of polluting materials to air, water or land	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population</p> <p>Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p>	Low	Medium	Low	<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Management systems requires DSEAR assessment which is adhered to by site operations.</p> <p>Designated ATEX zones on site and lightning protection system in place around biogas holder. Fire alarm systems installed and maintained.</p> <p>Biogas contained within a closed system and monitored for safety. Automatic cut off valve to biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc.</p> <p>Warning signs clearly displayed and staff wear gas alarms to alert to the presence of biogas. All visitors subject to site inductions and accompanied. Permit-to-work system in place.</p> <p>Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively.</p> <p>Smoking only permitted in designated areas of site.</p>	Low
Failure to contain firefighting water	Emissions to ground and ground water of contaminated firefighting water entering soil and/or	Low	Medium	Low	Likelihood of firefighting water being generated is low as the risk of fire is low.	Low

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Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	<p>groundwater. Run-off from site to surface water courses.</p> <p>Harm to aquatic flora and fauna.</p> <p>Chronic effect on water quality</p>				<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Spill kits provided around the site can be used to direct run-off towards site drainage. Site drainage returns to works inlet providing containment and treatment process for fire water.</p> <p>Arrange for off-site tankering of firefighting water, if required.</p>	
Accidental explosion of biogas	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p> <p>Pollution of water or land</p>	Low	High	Medium	<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Management systems requires DSEAR assessment which is adhered to by site operations.</p> <p>Designated ATEX zones on site and lightning protection system in place around biogas holder. Fire alarm systems installed and maintained.</p> <p>Biogas contained within a closed system and monitored for safety. Automatic cut off valve to biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc. Lightning protection system installed.</p> <p>Likelihood reduced by availability of multiple on site uses of biogas (CHP, boilers and emergency flare) and use of pressure release valves as a safety measure.</p>	Low
Significant leak of biogas to atmosphere	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population.</p>	Low	High	Medium	<p>Site assets are protected by physical means to prevent vehicle strike and exposed pipework is guarded.</p>	Low

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Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	Global warming potential of greenhouse gases.				Regular proactive and preventative maintenance and regular visual checks. Pressure relief valves are present to avoid over-pressurisation of biogas system.	
Leaks of emission to air, but principally NOx.	Emissions to air and dispersion leading to harm to protected nature conservation sites – SSSIs, SAC and SPA. Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Medium	Medium	Medium	The nearest designated habitat sites is Five Acre Grove Ancient Woodland/LWS, which is located 0.3km south of the site. Rodborough Common SAC is located 5.5km east and Severn Estuary SAC/SPA/RAMSAR site is located 5.5km west of the site/ There are no LNRs, NNRs or SSSIs within 2km of the site. Emissions modelling shows that deposition and impacts on habitats sites are acceptable. Site operations will be subject to emission limits under current Regulations with infrastructure designed to minimise uncontrolled releases. Checks, monitoring and preventative maintenance will further minimise fugitive emissions.	Low
Spillage of raw materials during (e.g. diesel, polymer) during use, transfer and disposal operations.	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna. Chronic effect on water quality	Low	Medium	Low	Raw materials are stored on made ground, within banded containers or on bunds to contain spillages of 110% of the volume. Contents of bunds are regularly checked during environmental audits and after periods of heavy rainfall and emptied as required. In event of a spillage, follow site spillage response plan and inform relevant site personnel. COSHH data sheets available. Deliveries to site are made by approved suppliers. Use of raw materials is carried out by trained personnel or automatically controlled processes.	Low

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Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					<p>Penstock valves available within chemical delivery areas to contain large spillages. In the event of a minor spillage, spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage if suitable.</p> <p>Site drainage returns to works inlet providing treatment process for suitable materials, or arrange off-site tankering of waste, if required.</p>	
Spillage of sludges (e.g. raw sludge, digested sludge) during processing and transfer operations e.g. tank overtopping, pipework leaks	<p>Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses.</p> <p>Harm to aquatic flora and fauna.</p> <p>Chronic effect on water quality</p>	Low	Low	Low	<p>Processing and transfer operations of waste materials is largely an automatic process controlled by the Process Controllers and parameters set within the SCADA system.</p> <p>Storage and digestion tanks are fitted with sensors to monitor levels within a tank and can inhibit additional pumping if high alarms activate.</p> <p>Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively and minimise the risk of spillages.</p> <p>In event of a spillage, follow site spillage response plan and inform relevant site personnel and relevant authorities.</p> <p>Spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage. Site drainage returns to works inlet providing treatment process for sludge or arrange off-site tankering of waste to another site. Sludge is relatively viscous and not highly mobile.</p>	Low
Failure of sludge storage tanks / digester tanks	Emissions to ground and ground water of materials entering soil	Low	High	Medium	Follow site Incident Response Plan and inform relevant authorities.	Low

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Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	<p>and/or groundwater. Run-off of liquids from site to surface water courses.</p> <p>Harm to aquatic flora and fauna.</p> <p>Chronic effect on water quality.</p>				<p>Regular internal and external infrastructure inspections for tanks and pipework and planned preventive maintenance system in place. Regular visual inspections for tanks and pipework and reactive maintenance.</p> <p>In-line flow monitoring in key locations and tank level monitoring would identify losses and enable a quick response.</p> <p>Tanks are based on made ground and connected to site drainage which returns to works inlet. Sludge is relatively viscous and not highly mobile limiting the distance it can spread in a short time period.</p>	
All on-site hazards: machinery	<p>Direct physical contact with human population and /or livestock after gaining unauthorised access to the installation.</p> <p>Bodily injury</p>	Low	High	Medium	<p>Direct physical contact is minimised by activity being carried out by enclosed plant and equipment, which has undergone a HAZOP assessment.</p> <p>Site activities are managed and operated in accordance with a management system. Site physical security measures to prevent unauthorised access.</p> <p>Assets are protected by various physical means including fencing, kerbing and bollards to prevent vehicle strikes.</p> <p>Site has a one-way traffic management system to minimise the need to reverse. Use of banksmen as appropriate.</p> <p>Vehicles equipped with reversing alarms.</p>	Low
Vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory	Low	High	Medium	Unauthorised access is unlikely to happen and minimised by physical site security measures and effective management systems.	Low

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Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	<p>irritation, illness and nuisance to local population</p> <p>Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p>				<p>Site has access controlled gated entry for all vehicular access. Fence runs the perimeter of the site.</p> <p>Additional security fences around some assets and other assets are kept within locked containers or buildings. Warning signs are displayed.</p>	
Flooding from rivers, streams and groundwater	<p>Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to aquatic flora and fauna and chronic effect on water quality.</p>	Low	Low	Low	<p>The site is not located within a Flood Risk Zone as outlined on the Environment Agency's Flood Map for Planning and therefore is not situated in an area prone to flooding. The nearest Flood Risk Zone (Flood Risk Zone 3) is located immediately along the northern boundary of the site associated with the River Frome.</p> <p>General wider works designed to minimise risk of localised works flooding due to storm surges.</p> <p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Take appropriate corrective and preventative actions to minimise environmental impact</p>	Low
Flooding due to drain blockages and/or excessive rainfall causing localised on-site surface water flooding	<p>Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to aquatic flora and fauna and chronic effect on water quality.</p>	Medium	Low	Low	<p>Site wide drainage system linked to main sewage works, which includes additional capacity in storm tanks within the works to manage additional flows.</p> <p>Follow site Incident Response Plan and inform relevant authorities.</p>	Low

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Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					Take appropriate corrective and preventative actions to minimise environmental impact	
Loss of mains power leading to failure of pumps / control systems and possible leaks and escape of sludge.	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna.	Low	Medium	Low	<p>Site CHP engine is able to supply electricity to the site using biogas supplies on site. Standby generators provide back-up power / contingency plans to provide power to critical operations in the event of an electrical outage.</p> <p>Failsafe systems in place to ensure sludge remains in situ in the event of a loss of power and that systems are promptly returned into operation.</p> <p>Site wide drainage system linked to main sewage works in the event of a spillage.</p>	Low

3c Types and amounts of raw materials

Table B3-3(vii) – (Table 5) Types and amounts of raw materials

Name of Installation Stanley Downton Sewage Treatment Works					
Schedule 1 activity	Description of raw material and composition	Maximum storage amount (tonnes or as stated)	Annual throughput (tonnes per annum or as stated)	Description of the use of the raw material including any main hazards (include safety data sheets)	Alternatives
Section 5.1A(1)(b)(i)	Anti-foam: KemFoamX 2599	1,000 litres (1 IBCs)	<4,000 litres	Added to primary digester to reduce foaming, as required	Standard product used for this purpose within the industry
	Diesel	18,000 litre tank	<12,000 litres	Back-up fuel for use within boilers	Standard product used for this purpose within the industry
	Lubricating oils	1,000 litres	3,500 litres	Equipment lubricant	Standard product used for this purpose within the industry
	Waste oil	Data unknown	Data unknown	Waste oil from the CHP.	None.
	Biogas	Data unknown	Data unknown	Primary fuel for the CHP engines	Best available practice.

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, A2 and A3 (CHP and boilers) to be monitored in accordance with the requirements of MCPD and Environment Agency guidance.

Emission points A4 (Emergency Flare), A5-6 (biogas pressure relief valves), to be monitored in accordance with current EA guidance.

Point T1 to be monitored in accordance with BAT7.

4b Point source emissions to air only

These questions have been responded to, in relation to points A1 -A3 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?

Yes

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)

N/A – ducting is 0.3m diameter

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 with the combustion assets 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 nature of the ducting access, it is not possible to conduct a full velocity profile, however, no particulate sampling is required for biogas fuelled units, and all gaseous species are considered to be mixed sufficiently for the purposes of monitoring. There is no requirement to undertake a homogeneity test as per BS EN 15259 and as such the location cannot be compared against that or the criteria in M1. The sampling location to be used is the same as that used at other, similar, permitted facilities and have been approved for use by the Environment Agency.

Due to the size of the CHP and 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.

Air emission points A1, A2 and A3 will be subject to periodic monitoring in accordance with the requirements of the Medium Combustion Plant Directive (EU2015/2193).

5 Environmental impact assessment

5a Have your proposals been the subject of an environmental impact assessment under Council Environmental Impact Assessment [EIA] Directive 2014/52/EU transposed into UK legislation in 2017

No

6 Resource efficiency and climate change

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

The installation is designed to treat thickened sewage sludge to enable its recycling to land as a fertiliser, and to capture and utilise biogas to generate green electricity.

The plant has been designed from first principles to be energy efficient. Gravity is used as far as practicable for the transfer of sludge and liquids within the installation in order to minimise energy requirements. Biogas is captured and used within the CHP engine in the first instance to generate both electricity for use within the wider site and for export to the electrical grid as appropriate. Waste heat from the CHP engine is utilised to ensure that the primary digesters operate within the optimum temperature range for the anaerobic digestion process to be undertaken. The digester vessels are insulated to retain this additional heating, and boilers which are fuelled by biogas, are utilised in particularly cold periods to supplement the digester heating. Flaring is minimised.

Lighting has been optimised for low energy use and all pumps and other mechanical and electrical plant subject to regular, routine, preventative maintenance to minimise losses.

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

The main site energy sources are electricity from the public supply and biogas generated by the anaerobic digester which is combusted in the CHP engine to generate electricity and heat on site.

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.

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

See response to question 3c above.

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 waste. 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

CHP 1x 0.6MWth – 8760 hours per annum

Flare <876 hours per annum.

Boilers 2 x 0.4MWth – 6000 hours per annum (approx.)

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

Units are existing plant under MCPD. For clarity information below supplied.

Table B3-7b – Medium Combustion Plant Information

MCP specific identifier*	CHP 1 - Stanley Downton	Boiler 1 - Stanley Downton	Boiler 2 - Stanley Downton
12-digit grid reference or latitude/longitude	E 379159 N 204580	E 379167 N 204560	E 379168 N 204560
Rated thermal input (MW) of the MCP	0.6	0.4	0.4
Type of MCP (diesel engine, gas turbine, other engine or other MCP)	Gas engine	Boilers	Boilers
Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas	Biogas	Dual fuelled (biogas / gas-oil). Modelled with biogas.	Dual fuelled (biogas / gas-oil). Modelled with biogas.
Date when the new MCP was first put into operation (DD/MM/YYYY)	2015	Pre-2010	Pre-2010
Sector of activity of the MCP or the facility in which it is applied (NACE code**)	37.00	37.00	37.00
Expected number of annual operating hours of the MCP and average load in use	Modelled continuously (i.e. 8,760 hours) at maximum load	Modelled continuously (i.e. 8,760 hours) at maximum load	Modelled continuously (i.e. 8,760 hours) at maximum load
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	N / A	N / A

2.3 Form B6

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

1 About 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

From Point T1 – release via the site drainage system

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 rainwater, as dewatering takes place off site. IN addition to rain water, cleaning residues, biogas condensate and boilers blowdown will be present at low volumes.

The only wastes treated within the installation are sewage related, either being separated from the UWWTD flow in the wider works.

1b Give this effluent a unique name

T1 - Permit 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.

2 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

3 How much do you want to discharge?

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

117 cubic metres

3c What is the maximum rate of discharge?

1.35 Litres / second

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

117 cubic metres

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

3b – based on the maximum daily site input of 117 tonnes, assuming 1 tonne = 1 cubic metre. There are limited returns due to the lack of dewatering at the site, however any arisings must come from the installation inputs as there is limited additional water inputs. Actual discharge will be much lower as no allowance has been made for water entrained in the produced sewage sludge removed from site for dewatering, but there will be low volumes inputs like biogas condensate.

3c – this is based on $(117\text{m}^3 / 86400) \times 1000$. Arisings from sources such as dewatering are constant as the plant runs continuously. This gives a value of 1.3541667 litres, rounded up to 1.35 litres per second.

3d – based on the maximum daily site input of 117 tonnes, assuming 1 tonne = 1 cubic metre. The liquor arisings must come from the installation inputs as there is limited additional water inputs. As there is no dewatering on site, the actual produced returned liquors will be much lower than at suggested as sludge is removed from site by tankers. There will be low volumes of returns such as biogas condensate, cleaning residues and surface water only.

4 No questions

5 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.

6 How will the effluent be treated?

6a Do you treat your effluent?

Waste waters generated within the installation are not subject to pre-treatment.

The combined effluent generated by the process of treating sewage and sewage related arisings within the installation is returned to the inlet of the wider sewage treatment works, where it is subject to aerobic treatment 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

Table B6-6b – (Table 2) Treatments carried out on your effluent

Order of Treatment	Code Number	Description
First	09	Primary settlement within sewage works
Second	01	Biological filtration
Third	03	Tertiary biological treatment

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 MI/S/22/26240/R/003.

7 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?

BAT 6&7 sampling returns:

There are no direct emissions to water from the sludge treatment facility. The only indirect emission is of the surface waters, which are returned to the wastewater treatment works for aerobic treatment under Urban Wastewater regulations. The returns from the sludge treatment facility have originated from wastewater treatment works that are also under the control of Severn Trent Water. Therefore, the majority of process controls and sampling are carried out upstream of the point where liquors are returned from the sludge treatment facility to the onsite wastewater treatment works.

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?

Please see previous answer.

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 within the effluent.

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

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

8 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, due to a lack of quality data and confirmation of flows. 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.

9 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?

Final effluent release point is SO 78890 04890

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.

10 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 Outlet

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

SO 78890 04890

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

River Frome

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

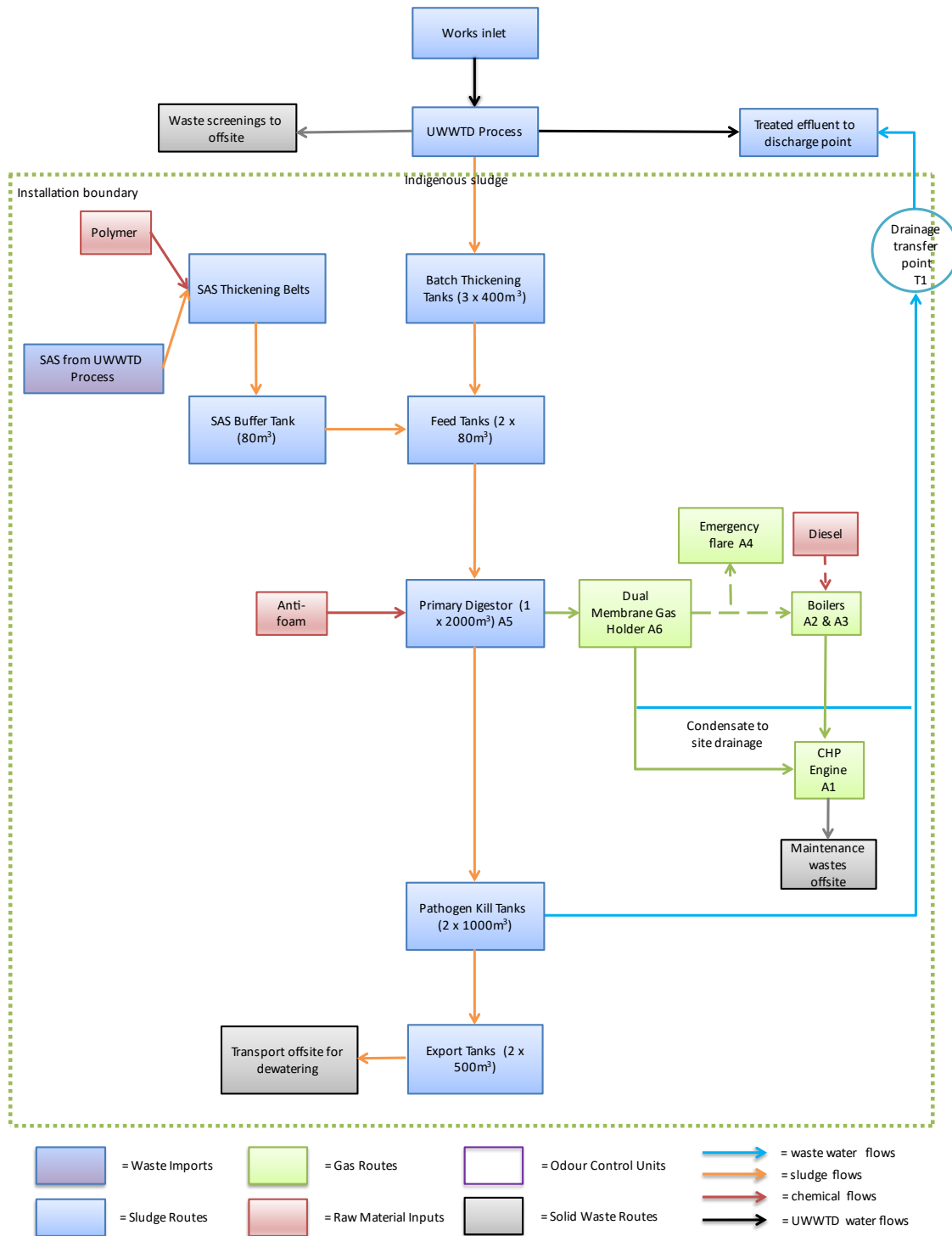
Appendix A. Figures

A.1 Site Location Plan

A.2 Installation Boundary and Air Emission Point Plan

A.3 Site Drainage Plan

A.4 Process Flow Diagram



Appendix B. Certificates

Appendix C. Air Dispersion Modelling Report

Appendix D. BAT Assessment

Appendix E. H5 Site Condition Report

Appendix F. Odour Management Plan

Appendix G. Spill risk assessment and proposed containment solution