



IED Permitting

Hayden STW Substantial Variation Resubmission

| 2

December 2023

Severn Trent Water Ltd

EPR/ZP3202PU/V002



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1. Introduction

This application relates to a substantial variation application for a bespoke installation bioresources treatment permit for the Hayden Sewage Treatment Works, operated by Severn Trent Water Ltd.

The site is currently permitted for the operation of an existing Medium Combustion Plant under the Environmental Permitting (England and Wales) (Amendment) Regulations 2018, specifically one biogas engine permitted as a Tranche B Specified Generator aggregated to <50 MWth. This operation will be varied and become a Directly Associated Activity (DAA) to the main listed activity of the site, namely the biological treatment of sewage sludge for recovery. The site also has an existing waste import permit, for imports of sewage sludge to the works inlet. This permit will be merged with the installation permit.

This substantial permit variation application relates to the addition of a listed activity to the site, that of biological treatment of waste under the Industrial Emissions Directive. It relates to the non-urban waste water treatment directive (UWWTD) treatment of indigenous UWWTD derived sludge and imported UWWTD sludges from other works and cess and septic tank imported material which is of a similar composition. Note that these operations are currently operated at the site, under the UWWTD and The Controlled Waste Regulations 2012 (paragraph 3 exclusion). The anaerobic digestion process will require an extension to the current site boundary.

The listed activity starts 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, covered by the Medium Combustion Plant Directive.

A bespoke installation permit is required for this site due to its proximity to a number of designated habitat sites.

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 substantial variation to environmental permit EPR/AP3437QJ 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.

The current permit for the site covers the operation of a single 1.6MWth CHP engine combusting biogas that is generated by the onsite anaerobic digestion of sewage sludge. There is also an older style waste management licence (now an environmental permit) at the site for the import of sewage sludge to the works inlet.

The anaerobic digestion process treats sewage sludge arising from the indigenous treatment of UWWTD derived materials supplied to the site by the sewer network and from tanker imports of waste materials to the works that are similar in composition to UWWTD derived materials. Indigenous sludge is thickened and mixed with imports of waste sludges from other water treatment plants prior to biological treatment via anaerobic digestion within one of two anaerobic digester tanks located on site. Previously, sewage treatment sites operated by sewerage undertakers importing sludges and liquids were only regulated for the import and treatment of these materials to the wider site and indigenous sludges arising from the treatment of sewage was not required to be included in a permit. It has now been determined that the treatment of indigenous sludges do need to be permitted as they fall outside of the Urban Waste Water Treatment Directive (UWWTD).

This variation application is:

- To update the existing waste import permit to modern standards and to clarify that it is two activities, one for the import of waste for treatment through the UWWTD processes on site and one for the import of digested sludge from other sites for dewatering and storage on the site cake pad;

- To incorporate the addition of a new listed activity to the permit, that of biological treatment by anaerobic digestion, to make this an installation permit;
- To increase the overall waste throughput of the site to include both imported and indigenous derived sewage and similar wastes; and
- To amend the site boundary to include the area of the anaerobic digestion plant and directly associated activities.

The installation covers the biological treatment of sewage sludge, both indigenous and imported from other waste water treatment sites, in a mixture with imported cess and septic tank derived wastes, by anaerobic digestion, with a capacity above the relevant threshold. 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 currently permitted under the Medium Combustion Plant Directive.

The site is located in a rural setting on the outskirts of Hayden to the west of Cheltenham. The Hatherley Brook runs to the south of the site across agricultural land. The first waste activity comprises an offloading coupling for tankers and cess vehicles to discharge through, located at the works inlet. All tanker imports are passed through a logger to record the incoming volume and the company carrying out the import. The import is directly into the works inlet, with no holding or blending tanks before the import. Once the tanker waste has mixed with the incoming UWWTD material, its treatment falls outside the scope of the Environmental Permitting Regulations.

There is a second waste activity, which is currently permitted as part of the first activity, that of the import of digested sludge from other works, for dewatering using the plant on site and storage on the cake pad, pending application to land in the same manner as indigenous wastes.

The installation is for the biological treatment of non-hazardous wastes by means of anaerobic digestion. It also comprises an import point at the works inlet for cess and septic tank imported materials from third parties to join the UWWTD route for aerobic treatment. There is also an import point for sludge transfers from other waste water works, near to the anaerobic digester assets which transfers to the imported sludge tank. This material is transferred and blended with the thickened indigenous sludge separated from the main aerobic treatment flow and thickened site derived SAS (surplus activated sludge).

There are two digester feed tanks used to ensure that the incoming materials are properly mixed to give a more homogeneous mixture, prior to transfer to one of the two primary anaerobic digesters located at the site. Both digesters are above ground tanks and manufactured of steel construction, one of which has external insulation and the other a steel outer skin, and operate on a continuous process basis, that is incoming sludge is added to the process as digested sludge is removed from the primary digesters. Removed sludge is transferred to one of five pathogen kill tanks to ensure that the required level of pathogen kill has been achieved. Following this, fully digested sludge is transferred to site dewatering equipment via the centrifuge buffer tank, where, following the addition of polyelectrolyte based coagulant, it is dewatered by centrifuge and stored on the sites open cake pad. Treated cake is removed from the pad for landspreading under the Sludge Use in Agriculture Regulations 1989, in accordance with the Biosolids Assurance Scheme (BAS). Dewatering centrate is stored within two centrate balancing tanks on the site, prior to transfer back to the head of the works for treatment via the UWWTD processes onsite.

Biogas is captured from the primary anaerobic digesters and stored within a dual membrane biogas storage 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 storage vessel is fitted with pressure release valves as a safety precaution in the event of over pressurising the system.

The biogas is taken from the storage vessel for combustion in a CHP engine which is currently permitted under MCPD with a thermal input of 1.6MW, generating electricity for use both within the site and for export to the grid, and heat to maintain primary digester temperature. Biogas can also be used in two dual fuelled auxiliary boilers.

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 an emergency flare. This is utilised under 10% of the year.

2. Technical Description

This application is for the substantial variation of the site's existing 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 imported sewage sludge and other wastes for treatment by anaerobic digestion for the Hayden Sewage Treatment Works, operated by Severn Trent Water Ltd (Severn Trent).

This variation application also includes the addition of existing biogas fuelled boilers which fall under the definition of "existing" medium combustion plant (MCP) as defined by Schedule 25A of the Environmental Permitting Regulations (EPR) 2018, in that it is less than 20MW thermal and was commissioned prior to 20 December 2018. These are not Specified Generators under Schedule 25B of the EPR 2018.

The substantial variation to the permit is to include a new listed activity, the biological treatment by anaerobic digestion, of indigenous sewage sludge in a mixture with imported cess and septic tank derived wastes. In addition, the variation includes the operation of biogas fuelled boiler units for the generation of heat (when needed) to the primary digesters, in addition to the existing Medium Combustion plant permitted CHP engine at the site. The site operates 24 hours per day with the site being unstaffed overnight. A standby rota picks up alarms overnight.

Site Setting

The site is located in a semi-rural setting on the outskirts of Cheltenham with the small settlement of Hayden situated to the immediate West of the site. To the immediate East is the Cheltenham Circular Footpath (a Public Right of Way (PRoW)) and beyond this is open arable farmland for approximately 350m to the fringes of Cheltenham (Springbank and Fiddler's Green). To the South is further open arable farmland, Hatherley Brook (an ordinary watercourse) and residential properties and farmsteads associated with Golden Valley. To the West and North-West is open arable farmland intersected by PRoW and field boundaries and extends for approximately 800m to the boundary of the M5 motorway. Beyond the M5 motorway is the settlement of Staverton and a series of industrial estates, factories and a technology park. To the North is the continuation of open arable farmland intersected with field boundaries and scattered farmstead properties.

The site sits entirely within a flood zone 1, indicating that it has a low probability of flooding having less than 1:1000 annual probability of river or sea flooding in any year. The site is not located within a designated source protection zone (SPZ). The nearest designated nature conservation site is a Local Nature Reserve (LNR) situated approximately 1.9km to the South-East and a Site of Special Scientific Interest (SSSI) located approximately 2.1km to the South of the site. There are no further LNRs and SSSIs within the appropriate distance of the site. There are no areas of ancient woodland or local wildlife sites within 2km of the site. There is one Special Area of Conservation (SAC) and one National Nature Reserve (NNR) within 10km of the site. There are no Special Protection Areas (SPAs), Marine Protected Areas (MPAs) or RAMSAR sites within 10km of the site. The site is located directly adjacent to the Cheltenham Whole Borough Air Quality Management Area (AQMA).

Application Basis

Waste Activities

The waste activity comprises an offloading coupling for tankers to discharge through, located at the works inlet. All imports are passed through a logger to record the incoming volume and the company carrying out the import. The import is directly into the works inlet, with no holding or blending tanks before the import. The waste codes for imported waste accepted at the installation are detailed in Form C3, Table C3-1b. Once the tanker trade waste has mixed with the incoming UWWTD material, its treatment falls outside the scope of the Environmental Permitting Regulations.

This activity is currently permitted and the existing permit incorporated into this variation, although due to the age of the existing permit this does not include a set of EWC codes which have been added for clarity. Note some

of the imports are excluded from the scope of the permitted activities by the Controlled Waste Regulations 2012.

There is a second waste management activity at the site, to allow for the import of treated sewage sludge from other works for the purposes of dewatering on site, followed by storage on the cake pad. Imported sludge is kept separate from the indigenous digested sludge as far as practicable on site.

Installation Activities

Indigenous sludge is transferred to the primary continuous thickener where it is thickened and transferred to the two digester feed tanks. Surplus Activated Sludge (SAS) is stored in a tank, prior to thickening. The output of the thickening process is transferred to the two digester feed tanks.

There is an offloading coupling for tankers to discharge UWWTD derived sludge from other waste treatment sites located at the facility. Sludge is passed through a logger to record the incoming volume of sludge, with the imported sludge being transferred initially to the imported sludge tank, before being blended with thickened indigenous SAS and thickened indigenous primary sludges prior to the biological treatment process in one of two digester feed tanks.

Blended, dewatered sludge from the digester feed tanks, is transferred for treatment in one of two above ground anaerobic digesters which are centrally located and of steel construction, one of which has external insulation and the other a steel outer skin. Each of the primary digesters are fitted with two pressure relief valves (PRVs), which operate in an emergency only. The digesters operate on a continual basis with incoming sludge added to the process as digested sludge is transferred to one of the five path kill tanks (PKT's) (secondary digesters) at the site. Sludge is held within each digester and path kill tank for the period specified by the site's HACCP (hazard and critical control point) plan for sludge use in agriculture regulations. The path kill tanks are five, above ground, open topped steel tanks. The digested sludge is then transferred via a centrifuge buffer tank for dewatering. It is mixed with a polymer coagulant and dewatered using one of two centrifuges on site. The supernatant liquor is returned to the head of the STW for aerobic treatment via the UWWTD treatment route via two above ground, open topped, centrate balancing tanks. Digested sludge from other works may be imported for dewatering at the site. Where this occurs, it is transferred to the centrifuge buffer tank and then treated in the same manner as indigenous sludge.

The sludge cake is transferred to an open, engineered cake pad following dewatering. The sludge is analysed to check compliance with Sludge Use in Agriculture Regulations (1989) (SUiARs), in accordance with the Biosolids Assurance Scheme (BAS) and once the sludge is confirmed to be compliant it is removed from site for land spreading.

Biogas

Biogas from the primary digesters is captured and transferred to a dual membrane gas holder. Biogas can then be combusted within a 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 emergency flare 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 is transferred from the gas holder via a biogas pipeline that is largely above ground and is 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 1.6MWth input and is equipped with a vertical stack, unimpeded by cowls or flaps. The unit was permitted as a combustion plant under the Medium Combustion Plant Directive in 2019. 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 and an emergency flare. The flare is utilised under 10% of the year.

Hydrogen sulphide (H₂S) and siloxane levels are monitored within the biogas and treated if required by their concentrations.

Process Monitoring

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.

BAT Assessment

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

Containment

The site infrastructure is not currently fully compliant with the requirements of BAT, specifically with regards to containment and surfacing. A spill risk assessment and proposed containment solution, in accordance with CIRIA 736 is supplied as Appendix E.

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

Open Topped Tanks

There are a number of open top tanks within the permit boundary at Hayden, including the sludge storage tanks, the path kill tanks and centrate balancing 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 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.

All proposed coverings will be subject to a cost benefit analysis, based upon the Environment Agency tool.

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.

Severn Trent Water have always undertaken periodical sampling of ammonia on the centrate returns with regard to loading impacting the operation of the treatment works. More recently, they have also undertaken shadow sampling twice monthly for Ammonia, Soluble BOD, Total BOD, Orthophosphates and Suspended Solids in

return liquors to the inlet, using the sample points noted in the table. Direct regular sampling of these returns is a fairly recent addition to processes so understanding of the variance in these returns is developing. COD, BOD, Total Nitrogen, TOC, Ammoniacal Nitrogen, total Phosphorous, suspended solids and pH are directly available at our UKAS accredited contract laboratory and we will begin sampling for these determinands. Not all processes have flow meters on the return lines, assumptions will be made from the throughput of the asset. Temperature would be a field-based measurement, currently this is not measured. STW will aim to sample for PFOS and PFOA on a six-monthly basis to build up a data set, but due to the two weeks analysis turn around, these are not of use to the live operational process.

The data obtained from the return sampling will be used to optimise the process and STW will carry out root cause investigations with the process support teams to understand what changed on site and ensure that we can reduce the risk to the inlet. If any abnormalities are identified in the sample data following root cause investigations, the Process Team will collaborate with wider site based teams and the Catchment team to ascertain the root cause.

As part of the new IED permit and in line with BAT 3, STW commit to carrying out further chemical analysis of the waste water, testing for all pollutants expected to be present in the discharge. STW are currently in discussion with UKAS accredited laboratories to see what analysis is possible on 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 suitably trained internal teams that already undertake compliance sampling for EA discharge permits to MCERTS standards. Analysis will be contracted to UKAS accredited laboratories.

Liquor Returns

Site drainage 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. These returns enter the inlet after the storm offtake and therefore, cannot bypass onsite treatment via the UWWTD route. Site drainage plans are included within Annex A.

Other Matters

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.

Site tank inventory

Tank Purpose	Number	Operational Volume (each) (m ³)	Construction	Tank Covering
Primary Continuous Thickener Tank	1	2,071m ³	Concrete	Open
Digester Feed Tanks	2	2,071m ³	Concrete	Open
Imported Sludge Tank	1	51m ³	Concrete	Open
Centrifuge Buffer Tank	1	72m ³	Steel	Open
Sludge Import Tanks	2	2,500m ³	Concrete	Open

		2,800m ³		
Primary Digester Tanks	2	2,989m ³ 3,040m ³	Concrete	Enclosed
Pathogen Kill Tanks	5	860m ³	Steel	Open
Centrate Balancing Tanks	2	500m ³	Steel	Open

All of the tanks are predominately above ground.

2.1 Regulatory listing

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

The relevant listing under Schedule 1 is:

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

- *Part A(1) (b); Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC—*
 - (i) *biological treatment;*

In addition to the listed activity at the site, there is a directly associated activity of a biogas combustion plant 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):

- Import of sewage sludge, cess and septic tank wastes for digestion;
- Blending of imported wastes prior to treatment;
- Storage of digestate prior to dewatering;
- Dewatering of digested sewage sludge;
- Transfer of centrate back to the head of the sewage treatment works;
- Storage of dewatered sewage cake prior to offsite recovery;
- 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.

The currently permitted waste activity at the site is the import of liquids and thin sludges for aerobic biological treatment.

There is also a waste activity for the import of treated sewage sludge from other sites for the purposes of dewatering.

Following questions at similar sites, we have re-evaluated the site capacity and throughput. We wish to present the following data as the appropriate throughputs:

Digester throughput = $504 \text{ m}^3 / \text{day}$ = 504 wet tonnes per day.

Maximum pre-thickened throughput = $467,788 \text{ m}^3 / \text{year}$ = 467,788 wet tonnes per year.

The digested sludge imports is incorrect and should be $20,000 \text{ m}^3$ (wet tonnes) per annum

3. Application Form Questions:

3.1 Form C2

1 About the permit

1a Discussions before your application

Hayden STW Substantial Variation Application was initially submitted in January 2021.

1b Permit number.

What is the permit number that this application relates to?

EPR/ZP3202PU issued 09/09/19

1c Site details

What is the site name, address and postcode of the site?

Severn Trent Water Limited
 Hayden Sewage Treatment Works
 Hayden Lane
 Hayden
 Cheltenham
 GL51 0SP

Grid reference: SO 9067 23032 About your proposed changes

2a Type of variation

What type of variation are you applying for?

Substantial variation

2b Changes or additions to existing activities

Table C2-1 Proposed changes to current activities

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operations	Proposed changes document reference
Hayden STW	S5.1A1(b)i – operation of an anaerobic digester >100tpd		Import of cess, septic tank, portaloo and similar sewage derived wastes to the inlet for treatment via the UWWTD route	
Hayden CHP Engine		Operation of a 1.6MWth biogas fuelled Combined Heat		

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operations	Proposed changes document reference
		and Power unit to be a DAA		

2c Consolidating (combining) or updating existing permits

Yes

2c1 Do you want to have a modern style permit?

Yes

2c2 Identify all the permits you want to consolidate (combine)

See Table 2 below

Table C2-2

Table 2 – Permit Numbers
EPR/ZP3202PU/A001 – Severn Trent Water Limited, Hayden Lane EPR/EP3395CC/A001 (formerly WML48056; 154/434) – Hayden Sewage Treatment Works issued 26/06/1995

2d Treating batteries

2d1 Are you proposing to treat batteries?

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

2e Ship recycling

2e1 Is your activity covered by the Ship Recycling Regulations 2015?

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

2f Low impact installations

2f1 Will any changes mean that any of the regulated facilities will become low impact installations?

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

3 Your ability as an operator

3a Relevant offences

Table C2-3 – relevant offences

Total payout	Type	Date	Location	Offender	Description of offence
£870,000	Prosecution	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	Sentenced for four breaches of the Regulations for four cases. Sewage was discharged contrary to Regulation 38 (2) of the Environmental Permitting (England and Wales) Regulations 2016. (Blackminster) Breach of a limit contrary to regulation 38(2) Environmental Permitting (England and Wales) Regulations 2016. (Bromsgrove, Stoke Prior, Priest Bridge)

3b Technical ability

Severn Trent Water utilises a competence management system (CMS) to demonstrate technical competence at the site.

Please see the appended CMS certificate, which has a scope including waste storage and treatment. Severn Trent Water are under contract with the certification body to increase the scope of the CMS to include the Hayden site.

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 taken 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 (all)

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? What management system will you provide for your regulated facility? Please make sure you send us a summary of your management system with your application

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, having held certification to previous versions of this standard continuously since 2011. 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 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 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 operational and other 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 site 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 and being issued a work authorisation.

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 and there is an alarms process managed by a central team that flags anything outside of the set parameters for that process.

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;
- 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, or earlier, including routine inspections. 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.

Contingency Plans; Accident Prevention and Management Plans

All operational sites have accident prevention and management plans, developed to reflect the site specific operational risk and control measures. Plans take into account the structures and design of individual sites, including their environmental setting and location. Where appropriate, these include contingency plans for how imports and exports are to be handled during any period of operational disruption, including details of the closest alternative sites for these substances. Full contingency plans are limited by the nature of the sewerage infrastructure, as incoming UWWTD materials delivered by sewer cannot be diverted due to capacity and practicality issues.

Plans for individual sites are currently being reviewed to ensure that they fully comply with current BAT and Environment Agency guidance, with the aim of having these plans up to date by July 2022.

All contingency plans fit within our centralized Standard for incident management, which incorporates a Bronze, Silver and Gold response level, ensuring the required levels of management are involved in the response. Once the incident is raised, it is managed by the central Network Control Team to maintain structure to the decisions, actions and records throughout.

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.

Record Keeping

Each site keeps electronic records of operational and environmental monitoring, as required within the management system, to comply with the requirements of OFWAT and the Environment Agency, including any monitoring data required for environmental permit compliance. All information required for the permit is kept for the required retention time, and this information is checked through EMS internal and external audits.

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 initially identified by role, and managed through Severn Trent's Academy system. Additional individual development opportunities are identified by the employee's immediate supervisor or line manager.

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.

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 Advisors and relevant Departments are responsible for rolling out the Basic Environmental Awareness, Permit competence training, and job specific training.

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

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 UKAS accredited requirements of the EU Skills Standard. The CMS is subject to management review at least annually. All appointed Technically Competent Persons (TCPs) undergo EMS awareness training and CMS Permit Competence training. These skills appear on employees SAP training records, and they are required to re-take training every 2 years. SAP automatically sends out a reminder to the individual and their line manager when the training is due to be renewed. 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, and subject to performance reviews.

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. The Schedule 5 procedure ensures required notification to the environmental regulator where applicable.

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.

Climate Change

As part of its management program, including reviews associated with the AMP process (asset management plan, part of the OFWAT price review process) regular assessments are undertaken of works for the impacts of climate change including consideration of potential increased rainfall. Operational sites have been reviewed for flood resilience and energy management, and these findings are subject to periodic review and updating.

Communication

There are regular meetings held on site to discuss all aspects of the treatment works and performance against targets; these are generally called "Comm Cells". These meetings include the operation and performance of the installation and due to a standardized structure, allow issues direct line of sight escalation up to senior management and back again. Other communication methods to promote environmental management issues and continual improvement include: 'Lessons Learnt' bulletins, 'One Supply Chain (OSC) portal forums and compliance audits.

Site Closure

Where new plant, structures and equipment are planned for a site, consideration is given in the design phase, including engineering specifications, for the long term maintenance of that asset. This includes the eventual cleaning and decommissioning of the asset. Due to the underlying sewerage infrastructure, there is no site wide closure plan, as Severn Trent does not envision closing any full works.

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, which is entirely within the boundary of this permit, 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 – Site Layout Plan

Figure 3 – Site Drainage Plan

Figure 4 – Process Flow Diagram

Do any of the variations you plan to make need extra land to be included in the permit.

Yes. See Appendix E for the site report for the extra land. Although the site has an old waste management licence, there is no clear permit boundary within the plans included in the sites working plan.

5c Provide a non- technical summary of your application

Please see Section 1.1 in this document.

5d Risk of fire from sites storing combustible waste

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.

5e Will your variation increase the risk of a fire occurring or increase the environmental risk if a fire occurs?

N / A

5f Adding an installation

If you are applying to add an installation, tick the box to confirm that you have sent in a baseline report and provide a reference.

Severn Trent Water have chosen not to provide a baseline report for the site. The site has operated as a sewage treatment works for a significant period of time and there are no proposals to close or relocated the site. Due to the site history and difficulties in obtaining representative samples from land below existing infrastructure, in accordance with current Environment Agency guidance, no baseline data is provided. The surrender risk this poses is acknowledged.

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.

An environmental screening assessment is provided in Table C2-5. To inform the screening assessment, a review of the sensitivity of the site setting has been undertaken.

Data taken from the MAGIC.gov.uk website, accessed December 2023 and a preapplication screening assessment from the Environment Agency dated January 2022 is presented in Table C2-4 below. For habitat sites, the relevant distances for consideration are: international designations (SAC, MPA, SPA and RAMSAR - 10km); national designations (SSSI – 2km), LNRs (2km) local wildlife sites and areas of ancient woodland habitat (2km).

Table C2-4 – Proximity of nature conservation sites

Site Name	Designation	Distance	Direction
Badgeworth	SSSI	2,100m	South
Griffiths Avenue	LNR	1,900m	South-East
Cotswold Beechwoods	SAC	8,100m	South
Cotswold Commons and Beechwoods	NNR	9,100m	South

Badgeworth SSSI is the closest nationally designated nature conservation site to the Hayden STW, which is 2.1km to the south. There are no further SSSIs located within 2km of the site. The closest LNR to the site is Griffiths Avenue located 1.9km to the South-East. There are no areas of ancient woodland or local wildlife sites within 2km of the site. The closest SAC to the site is Cotswold Beechwoods situated approximately 8.1km to the

south and the closest NNR to the site is situated approximately 9.1km to the south. There are no SPAs, MPAs or RAMSAR sites within 10km of the site.

The whole of the sewage treatment works site sits within Flood Zone 1, that is, it has a flood risk of less than 1:1000 per annum. The site does not sit within a groundwater source protection zone (SPZ).

The site is located directly adjacent to the Cheltenham Whole Borough Air Quality Management Area (AQMA) declared for Annual Mean Nitrogen dioxide (NO₂).

Table C2-5 Environmental Screening Assessment

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
Amenity issues: Litter, vermin and pests	<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 semi-rural setting on the outskirts of Cheltenham and the fringes of the settlement of Hayden. The nearest commercial properties are situated to the South of the site perimeter (between 500-800m). The nearest residential properties to the site are situated less than 100m to the West at Hayden.</p> <p>The nearest school to the site is situated approximately 830m to the East.</p> <p>To the immediate East is the Cheltenham Circular Footpath (a PRoW) and to the West and North-West there are further PRoW.</p> <p>Ecological receptors: there is one SAC and one NNR within 10km of the site. There are no SPAs, MPAs or RAMSAR sites within 10km of site. There is one SSSI and one LNR within 2km of the site. There are no areas of ancient woodland within 2km of the site.</p>	<p>The wastes handled at the site are primarily liquids and sludges, along with UWWTD derived material delivered by sewer.</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>	X
Dust and bioaerosols	<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 Litter above.</p> <p>The impact of dust on human health will depend on the distance and wind direction.</p>	<p>The wastes handled at the site are liquids, sewage sludges and sewage cake, along with UWWTD derived material delivered by sewer.</p> <p>The site will not be handling inherently dusty or powdery wastes. Sewage cake retains a high moisture content and is not dusty. Roads will be maintained to avoid the production of dust.</p> <p>Produce sewage cake has sufficient moisture content to ensure it does</p>	X

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
		<p>not give rise to dust and is located on the eastern side of the site, away from sensitive receptors.</p> <p>Severn Trent has undertaken bioaerosol monitoring at three sites and found that there are no emissions. There are residential properties to the North west and west which are between 180 - 250m from the cake pad.</p>	
<p>Assessment of point source emissions to air</p> <p>Emissions deposited from air to land</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 impact of emissions from air on human health will depend on the distance and wind direction.</p>	<p>The installation has a biogas fuelled CHP engine and biogas boilers, for which ADMS modelling indicates emissions are unlikely to result in unacceptable impacts on air quality.</p> <p>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.</p> <p>Fugitive emissions to air are assessed separately.</p>	X
<p>Assessment of point source and fugitive emissions to water</p>	<p>Hatherley Brook, an ordinary watercourse, is located approximately 390m to the south of the boundary of the wider sewage works. All of the works is in flood zone 1 indicating a low annual probability of flooding (<1:1000)</p> <p>Surface water drainage within the site drains to the inlet of the adjacent sewage treatment works for full treatment prior to discharge.</p>	<p>The main product of the process is a sewage cake, which is stored within flood zone 1, on a concrete pad equipped with drainage.</p> <p>Other aqueous discharges generated by the process are limited (comprising dewatering liquors, biogas condensate, and surface water run off). These sources are discharged to the on-site drainage system where they are transferred to the main sewage works inlet.</p> <p>Due to the nature and small quantity of these emissions no further assessment of point source emissions is deemed necessary.</p>	X
<p>Assessment of odour</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 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.</p>	X

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
	The impact of emissions from odour on human receptors will depend on the distance and wind direction.	There are no odour control units at the site. There is no history of odour complaints associated with the site.	
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. Waste heat from the CHP engine is utilised to control primary digester temperature when required and reduce demand on the auxiliary boilers.	X
Land and disposal of waste to other processes	Rivers and streams – see Assessment of point source and fugitive emissions to water above. Drainage systems/sewers. The site is not located within a Groundwater source protection zone (SPZ). Aquifers are classified as secondary – undifferentiated (solid deposits) and secondary A (superficial deposits).	All waste streams disposed of off-site will continue to be to appropriately permitted facilities.	X
Noise and vibration	Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, amenity and recreation areas such as playing fields and playgrounds. Industrial estates and rail stations. The site is located in a semi-rural setting on the outskirts of Cheltenham and the fringes of the settlement of Hayden. The nearest commercial properties are situated to the South of the site perimeter (between 500-800m). The nearest residential properties to the site are situated less than 100m to the West at Hayden. The nearest school to the site is situated approximately 830m to the East. To the immediate East is the Cheltenham Circular Footpath (a PRoW) and to the West and North-West there are further PRoW. Ecological receptors: there is one SAC and one NNR within 10km of the site. There are no SPAs, MPAs or RAMSAR sites within 10km of site. There is one SSSI and one LNR within 2km of the	Site design has been chosen to minimise the impact of noise on offsite receptors through building orientation, finishes and location of openings. Noise from plant and equipment will be minimised through purchasing decisions and a robust preventative maintenance programme. There are no sources of vibration within the facility.	X

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
	site. There are no areas of ancient woodland within 2km of the site.		
Other issues (including visual impact)	Not Applicable	<p>There are no identified protected species in close proximity to the site.</p> <p>There are no other site-specific environmental risks identified.</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 boiler input/use as a result of less heat demand, or increased heat dumping via air cooled radiator. If less biogas is used, the site may require a new 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

3.2 Form C3

1 What activities are you applying to vary?

Table C3-1a

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 descriptions	Hazardous waste treatment capacity (if this applies)	Non-hazardous waste treatment capacity (if this applies)
Hayden STW Bioresources	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 recovery of by-products (digestate).	603m ³ per day (input) 4,221m 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 12 (excluding temporary storage, pending collection, on the site where the waste is produced)	None	603m ³ per day

Name of DAA	Description of the DAA
AR2	Import of sewage sludge, cess and septic tank wastes;
AR3	Blending of imported wastes prior to treatment

Name of DAA	Description of the DAA	
AR4	Storage of digestate prior to dewatering	
AR5	Dewatering of digested sewage sludge	
AR6	Transfer of centrate back to the head of the sewage treatment works	
AR7	Storage of dewatered sewage cake prior to offsite recovery	
AR8	Storage of biogas	
AR9	Combustion of biogas in an MCPD and Specified Generator (SG) compliant biogas CHP unit and boiler units	
AR10	Emergency flare	
AR11	Storage of raw materials	
Waste Activities		
Import of waste to head of works for treatment through UWWTD route		100,000 m ³ per annum
Import of digested sludge for dewatering and storage onsite cake pad		10,000 tonnes per annum
Total storage capacity (tonnes)	6,029 m ³	
Annual throughput (tonnes each year)	220,095 tonnes	

Types of waste accepted

Table C3-1bi – Wastes for head of works import waste activity ONLY

Waste code	Description of the waste
16 10 02	aqueous liquid wastes other than those mentioned in 16 10 01
16 10 04	aqueous concentrates other than those mentioned in 16 10 03
20 03 04	Septic tank sludge

Table C3-1bi – Wastes for dewatering waste activity ONLY

19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 06	wastes from anaerobic treatment of waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (sewage sludge only)

Table C3-1biii – Waste accepted for installation ONLY

19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 02	wastes from physico/chemical treatment of waste (including dechromatation, decyanidation, neutralisation)
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)
19 06	wastes from anaerobic treatment of waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (digested sewage sludge only)
19 08	wastes from waste water treatment plants not otherwise specified
19 08 05	sludges from the treatment of urban waste water
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11 (sewage sludge only) subjected to mechanical treatment only from a process that treats wastes which are listed in this table only
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions
20 03	other municipal wastes
20 03 04	septic tank sludge

2 Point source emissions to air, water and land

Table C3-2 Emissions to Air

Emission point reference and location	Source	Parameter	Concentration	Units
A1 SO 90626 23031	CHP engine (biogas only)	NOx	190	mg/m ³
A2 SO 90646 23042	Auxiliary Boiler 1	No limit set	-	-
A3 SO 90661 23033	Auxiliary Boiler 2	No limit set	-	-
A4 SO 90638 23096	Emergency Flare (note 1)	NOx	150	mg/m ³
A5 SO 90637 23031	Digester storage tanks pressure relief valve	No limit set	-	-
A6 SO 90656 23021	Digester storage tanks pressure relief valve	No limit set	-	-
A7 SO 90677 23069	Gas storage pressure relief valves	No limit set	-	-

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

There are no Odour Control Units at the site.

Table C3-2b – Transfer Points

Emission point reference and location	Source	Parameter	Limit	Unit
T1 SO 90622 22945	Surface water run off; boiler blowdown; thickening liquors	No parameters set	No limit set	-
T2 SO 90808 22868	Dewatering liquors	No parameters set	No limit set	-
T3 SO 90871 23133	Tanker trade imports	No parameters set	No limit set	-

Table C3-2c – Sampling Points

Emission point reference and location	Source	Parameter	Limit	Unit
S1 SO 90808 22846	Dewatering liquors	No parameters set	No limit set	-

S2 SO 90630 23079	Surface water run off; boiler blowdown; thickening liquors	No parameters set	No limit set	-
S3 SO 90868 23133	Tanker trade imports	No parameters set	No limit set	-

3 Operating techniques

3a Technical standards

Table C3-3 Technical standards

Schedule 1 activity or DAA	Best available technique	Document reference
Other biological treatment of waste: deposit of imported non-hazardous waste for treatment through a wastewater treatment works.	Biological waste treatment: appropriate measures for permitted facilities	Updated 6th July 2023

3a1 Does your permit have references to any of your own documents or parts of documents submitted as part of a previous application for this site?

Yes – ADMS remains as per previously permitted CHP operations.

3b General requirements

Table C3-4 General requirements

Name of the installation: Hayden STW Bioresources	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 C2-6 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 C2-6 above

3b - General requirements

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

Although screened out of the detailed Risk Assessment (Question C2 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. An assessment of fugitive emissions has been undertaken using the following methodology. The risk assessment is presented in Tables C3-3b(i) to (iv).

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

<p>Low</p>	<p>Probability of an event is low and likely only to occur in the long-term (a yearly basis or less frequent).</p>	<p>Impact is low or a minor, short-term nuisance.</p> <p>Minor release to a non-sensitive receptor or pollution of water course.</p> <p>Non-permanent health effects to human health (preventable by appropriate PPE).</p> <p>Minor surface damage to buildings; structures; services; or the environment which can be repaired immediately.</p>	<p>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.</p>
<p>Medium</p>	<p>It is probable that an event will occur periodically in the medium-term (twice yearly basis).</p>	<p>Impact is noticeable in the short to medium-term.</p> <p>Large release impacting on the receiving media killing flora and fauna and requires remediation.</p> <p>Nuisance causing non-permanent health effects to human health.</p> <p>Damage to buildings; structures; services; or the environment preventing short-term use and/or requiring repair.</p>	<p>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.</p>
<p>High</p>	<p>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.</p>	<p>Impact is significant, wide-ranging and long-lasting effect.</p> <p>Has a chronic or acute impact on human health.</p> <p>Very large release that has a major impact on flora and fauna which may be very difficult to remediate.</p> <p>Significant damage to buildings; structures; services; or the environment which prevents use long-term and may require complete replacement.</p> <p>May cause a long-term impact or contribute towards a global issue due to releases of greenhouse gases.</p>	<p>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.</p>

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

Table C3-3b(i) Fugitive emissions risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Emissions to air of NO_x, SO₂, CO₂ and VOCs	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors	High	Low	Medium	Activities are managed and operated in accordance with the site management system (including inspection and maintenance of equipment and engine management systems), and an LDAR plan. Point source emissions to air (CHP engines, boiler and emergency flare stack) have emission limits for NO _x , CO ₂ , SO ₂ . Flare stack height approx. 5m, CHP stack approx. 6m and boiler flue approx. 6m.	Low
Gas transfer systems, gas storage tank, gas engines, flares or PRV failure causing emissions of biogas	Abnormal	Emissions to air and dispersion leading to: inhalation by local human and animal receptors. Odour impact. Global warming potential. Risk of fire and explosion	Low	Medium	Low	The plant is designed to capture and utilise all biogas possible, combusting the biogas in order to maximise recovered value from the biological treatment of sludge. The 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.	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						<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 gas holder to be operated in the event of failure of the emergency flare to prevent overpressurisation and catastrophic failure.</p>	
<p>Catastrophic loss of biogas emissions from gas transfer systems, gas storage tank, gas engines, flares or PRVs</p>	<p>Abnormal</p>	<p>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</p>	<p>Low</p>	<p>High</p>	<p>Medium</p>	<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</p>	<p>Medium</p>

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						<p>the level that can be safely stored or utilised. Use of emergency flare is recorded.</p> <p>PRVs are in place on the gas holder to be operated in the event of failure of the emergency flare to prevent over pressurisation and catastrophic failure.</p>	
<p>Combustion of biogas within CHP engine and emergency flare. Combustion of biogas or natural gas within boilers</p>	Normal	<p>Emissions to air and dispersion leading to: inhalation by local human and animal receptors. Global warming potential</p>	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>The CHP engine is located away from the nearest residential properties, which are 175m to the north west; the nearest commercial buildings (transportation company) are located approximately 625m to the South. The emergency flare is located more centrally at the site and approximately 180m from nearest residential property and 680m from the nearest commercial buildings.</p>	Low
<p>Release of bioaerosols and dust</p>	Normal	<p>Emissions to air and dispersion leading to inhalation by local human and animal receptors. Odour impact of</p>	Medium	Low	Medium	<p>The risk of bioaerosol and dust is largely minimised by storing the digested sludge cake away from sensitive receptors, in the Southern area of the site. This is approximately 170m and 270m from sensitive residential receptors (namely properties at the settlement of</p>	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
		bioaerosols. Nuisance impact of dust.				<p>Hayden and Hayden Knoll respectively) and approximately 485m from the nearest commercial buildings. Cake is stored on an engineered hardstanding cake pad which is connected to the site drainage system. Walls around the pads help to reduce wind impact on the cake. The cake pad is not situated in close proximity to sensitive designated ecological sites.</p> <p>Roads are made from concrete/asphalt and not prone to the generation of dust.</p>	
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.	Medium	Low	Medium	<p>The risk of bioaerosol and dust is largely minimised by storing the digested sludge cake away from sensitive human receptors. The cake pad is approximately 170m and 270m from sensitive residential receptors (namely properties at the settlement of Hayden and Hayden Knoll) and 485m from commercial buildings. The cake pad is not situated in close proximity to sensitive designated ecological sites.</p> <p>Severn Trent carried out a monitoring exercise at 3 sites and Upwind and downwind locations results remained below the industry standard threshold values of 500cfu/m³ for Aspergillus Fumigatus. Upwind and downwind locations results remained below the industry standard</p>	Medium

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						<p>threshold values of 1000cfu/m3 for Total Bacteria.</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>	
<p>Spillage of liquids, including chemicals and oils.</p>	<p>Abnormal</p>	<p>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</p> <p>Emissions to ground and ground water.</p>	<p>Low</p>	<p>Medium</p>	<p>Low</p>	<p>The closest surface water body is a channel on the Western perimeter of the site and the Hatherley Brook, an ordinary watercourse, is also located approximately 390m to the South of the site perimeter, where the works discharges final effluent.</p> <p>Chemicals and oils all stored within suitably bunded tanks and IBCs with rainwater removed as required to maintain 110% capacities. Penstock valves available within chemical delivery areas 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 with drainage system pumping back to works inlet.</p>	<p>Low</p>

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Spillage from storage and digestion tanks, overtopping of tanks, leakage from same tanks and from buried pipes	Abnormal	Emissions to surface waters close to and downstream of site. Acute effect resulting in loss of flora and fauna. Chronic effect resulting in deterioration of water quality Emissions to ground and ground water.	Low	Medium	Low	<p>The site is not located within a Groundwater Source Protection Zone (SPZ).</p> <p>Provision of suitably structurally integral tanks constructed from pre-conditioned concrete, and, steel and glass reinforced plastic/insulation (where needed). All tanks are subject to 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, joins etc</p> <p>Biogas condensate discharged back to the works inlet through site drainage system.</p> <p>Spill kits available on site.</p> <p>There are no point source emissions to water with drainage system pumping back to works inlet.</p>	Low
Generation of solid waste resulting in litter	Normal	Releases of litter to the environment. Visual nuisance and local loss of amenity	Low	Low	Low	Site operations do not give rise to large amounts of solid wastes and litter that would be prone to dispersion by wind. Rags are stored within skips and retain high moisture content.	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						Waste is stored securely for collection by appropriately licensed approved contractors. Litter picking activities are completed as required.	

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 C3-3b(ii) Odour risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
H₂S/biogas emissions from uncovered tanks	Normal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	High	Low	Medium	Biogas will principally be generated in the two primary digestion tanks which are covered with fixed roofs. The nearest residential properties approximately 170m to the West from the digesters and the nearest commercial buildings are located over 500m to the South of the digesters. Small amounts of biogas may also be generated within digestate storage tanks which are located centrally but still over 100m from	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						<p>residential properties and over 500m from commercial buildings.</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 a double membrane gas holder which is suitably sized to manage biogas generation.</p> <p>The gas system utilised is subject to regular preventative maintenance 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>Physical protection measures in place for biogas holder, including kerbing and pipework is guarded.</p> <p>PRVs available to safely manage pressures within the biogas holder and prevent under or over pressurization.</p>	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
<p>Activation of biogas PRV</p>	<p>Abnormal</p>	<p>Emissions to air and dispersion leading to inhalation by local human receptors</p> <p>Loss of amenity from odour nuisance</p>	<p>Low</p>	<p>Low</p>	<p>Low</p>	<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 SCADA and visual checks by site personnel.</p> <p>Biogas is principally stored within the site gas holder which is suitably sized to manage biogas generation and act as buffer storage for biogas. The site has one 1.6MW CHP engine, two boilers (2 x 450kW, total of 0.9MW thermal input) and one flare which are used in order of preference to maximise recovery of energy.</p> <p>The 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>CHP engine and boilers are located away from the nearest residential properties which are 175m to the West; the nearest commercial buildings (transportation company) are located approximately 625m South. The emergency flare is located more centrally at the site and approximately 180m from nearest residential property and 680m from the nearest commercial buildings.</p>	<p>Low</p>

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
H₂S/biogas emitted when biogas cannot be combusted in engine, boilers or flare	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Low	Low	Low	<p>Biogas is principally stored within the double membrane gas holder which is suitably sized to manage biogas generation and act as buffer storage when biogas cannot be combusted. The site has one CHP engine, two boilers and one flare giving multiple outlets for biogas.</p> <p>CHP engine and boilers are located away from the nearest residential properties which are 175m to the West; the nearest commercial buildings (transportation company) are located approximately 625m South.</p> <p>The 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
Storage of treated digested sludge cake	Normal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	High	Low	Medium	<p>Digested sludge cake is stored on an engineered hardstanding cake pad which is connected to the site drainage system at the site away from sensitive receptors and is inherently low odour material.</p> <p>Should any odorous sludge cake be produced, this will be subject to process checks undertaken to identify root cause of production and removed from site expediently.</p>	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
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 C3-3b(iii) Noise risk assessment

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Operation of CHP engine	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors	High	Low	Medium	The CHP engine is acoustically baffled, self-contained and designed for external applications therefore noise emissions are already low. CHP engine and boilers are located away from the nearest residential properties which are 175m to the West; the nearest commercial buildings (transportation company) are located approximately 625m South. Good	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
						<p>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>	
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 located away from sensitive human receptors. The nearest residential properties to the Site are situated less than 100m to the West at Hayden and the nearest commercial properties are situated to the South of the site perimeter (between 500-800m).</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	Generation of noise with air transportation, causing loss of amenity to local human receptors.	High	Medium	High	<p>Vehicle movements across the site subject to speed limit and one-way system to reduce generation of noise.</p> <p>Reversing obligations minimised by site layout.</p>	Low

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
		Generation of vibration with ground transmission, causing loss of amenity to local human receptors.				Tanker deliveries limited to daytime only.	
Operation of emergency flare	Abnormal	Generation of noise with air transportation, causing loss of amenity to local human receptors.	High	Low	Medium	<p>Use of the emergency flares is minimized by prioritizing use of the CHP and boilers with use of the flare recorded.</p> <p>The emergency flare is located more centrally at the site and approximately 180m from nearest residential property and 680m from the nearest commercial buildings.</p>	Low

Table C3-3b (iv) - 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</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>	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	<p>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>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 glows, 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>	
<p>Minor fire causing the release of polluting materials to air, water or land</p>	<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.</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>	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	<p>Harm to aquatic flora and fauna and chronic effect on water quality.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p>				<p>Biogas contained within a closed system and monitored for safety. Automatic cut off valve to biogas supply to stop gas glows, 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>	
<p>Failure to contain firefighting water</p>	<p>Emissions to ground and ground water of contaminated firefighting water entering soil and/or 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>Low</p>	<p>Medium</p>	<p>Low</p>	<p>Likelihood of firefighting water being generated is low as the risk of fire is low.</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>	<p>Low</p>

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
<p>Accidental explosion of biogas</p>	<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>	<p>Low</p>	<p>High</p>	<p>Medium</p>	<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>	<p>Low</p>
<p>Significant leak of biogas to atmosphere</p>	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population.</p> <p>Global warming potential of greenhouse gases.</p>	<p>Low</p>	<p>High</p>	<p>Medium</p>	<p>Site assets are protected by physical means to prevent vehicle strike and exposed pipework is guarded.</p> <p>Regular proactive and preventative maintenance and regular visual checks.</p> <p>PRVs are present to avoid over pressurisation of biogas system. Gas detectors are in place between the</p>	<p>Low</p>

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					two layers of biogas membranes which will raise the alarm should a leak of biogas be detected.	
Leaks of emission to air, but principally NOx.	<p>Emissions to air and dispersion leading to harm to protected nature conservation sites – SSSIs, SAC and SPA.</p> <p>Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.</p>	Low	Medium	Medium	<p>The nearest designated nature conservation site is a LNR situated approximately 1.9km to the South-East and a SSSI located approximately 2.1km to the South of the site. There are no further LWS, LNRs and SSSIs within the appropriate distance of the site. There are no areas of ancient woodland within 2km of the site. There is one SAC and one NNR within 10km of the site. There are no SPAs, MPAs or RAMSAR sites within 10km of the site.</p> <p>Emissions modelling shows that deposition and impacts on habitats sites are acceptable.</p> <p>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.</p>	Low
Spillage of raw materials during (e.g. diesel, polymer,) during use, transfer and disposal operations.	<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	Medium	Low	<p>Raw materials are stored on made ground, within bunded 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.</p> <p>In event of a spillage, follow site spillage response plan and inform relevant site personnel. COSHH data sheets available.</p>	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					<p>Deliveries to site are made by approved suppliers. Use of raw materials is carried out by trained personnel or automatically controlled processes.</p> <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>	
<p>Spillage of sludges (e.g. raw sludge, digested sludge) during processing and transfer operations e.g. tank overtopping, pipework leaks</p>	<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>	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					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.	
Failure of sludge storage tanks / digester tanks	<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	High	Medium	<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Regular 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 found on unmade ground but are 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>	Medium
All on-site hazards: machinery	Direct physical contact with human population and /or livestock after gaining unauthorised access to the installation	Low	High	Medium	Direct physical contact is minimised by activity being carried out within enclosed digesters	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	Bodily injury				<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>	
<p>Vandalism causing the release of polluting materials to air (smoke or fumes), water or land.</p>	<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>Unauthorised access is unlikely to happen and minimised by physical site security measures and effective management systems.</p> <p>Site has access controlled barrier 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>	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Flooding from rivers, streams and groundwater	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.	Medium	Low	Low	<p>The site is located within Flood Zone 1 indicating that it has a low probability of flooding.</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	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.	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> <p>Take appropriate corrective and preventative actions to minimise environmental impact</p>	Low
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>	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					<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>	

3c –Types and amounts of raw materials

Table C3-5 Types and amounts of raw materials

Name of the installation					
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	5,000 litres	21,000 litres	Added to primary digesters to reduce foaming, as required	Standard product used for this purpose within the industry
Section 5.1A(1)(b)(i)	Fuel oil	2,000 litres	Normal – 14,000	Back-up fuel for use within boilers	No viable alternative. Used as a backup only.
Section 5.1A(1)(b)(i)	Lubricating oils	200 litres	2,400 litres	Equipment lubricant	None available
Section 5.1A(1)(b)(i)	Polymer (dry, powder)	Data unavailable	32,000 kg	Digested sludge thickening	None available
Section 5.1A(1)(b)(i)	Polymer (liquid)	5,000 litres	15,600 litres	Digested sludge thickening	None available

4 Monitoring

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

The existing air emission point A1 retains existing monitoring in accordance with the current permit (EPR/ZP3202PU/A001) and the requirements of MCPD.

Point A4 to be monitored in accordance with EA guidance in the event the flare is operational over 876 hours per year.

Emission points A2 – A3; A5 – A7 to be monitored in accordance with current EA guidance. There are no OCU's at the site.

Transfer points T1 and T2 will be monitored in accordance with the requirements of the permit.

Sampling point S1 will be monitored in accordance with the agreed liquor return monitoring proposal scope.

4b Point source emissions to air only

The site has a number of emission points to air. Points which are subject to gas monitoring in accordance with the requirements of the current environmental permit, MCPD and EA guidance.

Hours of operation of the flare, A4, to be monitored and logged. In the unlikely event that the total annual hours of operation exceed 10% of the hours in a year (836 hours), emissions from the flare would be subject to monitoring in accordance with EA guidance.

There is no routine monitoring proposed for points for A5-A7 (PRVs) other than recommended by the manufacturer to achieve effective operational conditions.

There are no odour controls units (OCUs) installed at the site

Air emission point A1 will be subject to periodic monitoring in accordance with the requirements of the Medium Combustion Plant Directive (EU2015/2193)

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?

Yes

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

No

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

As an existing site with combustion assets, sampling locations and sampling ports may not meet all of the requirements for BS EN 15259, but monitoring has been carried out over a number of years in accordance with the permit requirements with the installed ports. 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 is as previously 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-A3 will be subject to periodic monitoring in accordance with the requirements of the Medium Combustion Plant Directive (EU2015/2193).

5 Environmental impact assessment

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

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.

3.1 Form C4

1 What waste operations are you applying to vary?

Types of Waste accepted

See Table C3-1b in Section 3.3 above.

EWC codes as currently permitted.

1c Deposit for recovery purposes

Are you applying for a waste recovery activity involving the permanent deposition of waste on land for construction or land reclamation (including landfill restoration)?

No

2 Point source emissions to air, water and land

See Table C3-2 – Emissions to air

3 Operating techniques

3a Technical standards

Table C4-3a – Technical standards

Description of waste operation	Appropriate measure (TGN reference)	Document reference (if appropriate)
Other biological treatment of waste: deposit of imported non-hazardous waste for treatment through a wastewater treatment works.	Biological waste treatment: appropriate measures for permitted facilities	Updated 6 th July 2023

In all cases, describe the type of facility or operation you are applying for and provide site infrastructure plans, location plans and process flow diagrams or block diagrams to help describe the operations and processes undertaken.

3b – General requirements

Table C4-3b General requirements

Name of the waste operation	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 C2-6 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 C2-6 above

3c Information for specific sectors

N/A

4 Monitoring

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

See response for Form C3 previously

4b Point source emissions to air only

See response for Form C3 previously

3.2 Form C6

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 changes you want to make to your permit

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 dewatering liquors transferred to the centrate balancing tanks, following the dewatering of treated sewage sludge, along with surface water run off from the cake pad area and biogas condensate.

From Point T2 – release via the site drainage system

This effluent is the same as that transferred from point T1, following its return from the centrate balancing tanks, back to the works inlet for treatment via the UWWTD route.

For both points, the only wastes treated within the installation are sewage related, either being separated from the UWWTD flow in the wider works, or comprise of waste imports, principally of sludge from smaller satellite treatment works, with lower volumes of cess, septic tank and similar sewage related arisings delivered by third parties.

1b Give this effluent a unique name

T1 - Liquor returns

T2 – Liquor returns

1c is this release from a dam, weir or sluice ('reservoir release') under Schedule 21 of the EPR meaning of water discharge activity?

No

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?

603 cubic metres

3c What is the maximum rate of discharge?

7.0 litres / second

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

603 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 603 tonnes, assuming 1 tonne = 1 cubic metre. The liquor arisings must come from the installation inputs as there is limited additional water inputs. Actual discharge will be slightly lower as no allowance has been made for water entrained in the produced sewage cake, but there will be lower volumes inputs like biogas condensate.

3c – this is based on $(603\text{m}^3 / 86400) \times 1000$. Arisings from sources such as dewatering are constant as the plant runs continuously. This gives a value of 6.97917 litres, rounded up to 7.0 litres per second.

3d – based on the maximum daily site input of 350 tonnes, assuming 1 tonne = 1 cubic metre. The liquor arisings must come from the installation inputs as there is limited additional water inputs. This is primarily the outputs from the dewatering plant, which assumes all materials input to the primary digesters end up in the dewatering plant. Actual discharge will be slightly lower as no allowance has been made for water entrained in the produced sewage cake, but there will be lower volumes inputs like biogas condensate.

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	31	Activated sludge process
Third	03	Tertiary biological treatment

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 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.

Severn Trent Water have always undertaken periodical sampling of ammonia on the centrate returns with regard to loading impacting the operation of the treatment works. More recently, they have also undertaken shadow sampling twice monthly for Ammonia, Soluble BOD, Total BOD, Orthophosphates and Suspended Solids in return liquors to the inlet, using the sample points noted in the table. Direct regular sampling of these returns is a fairly recent addition to our processes so our understanding of the variance in these returns is developing. COD, BOD, Total Nitrogen, TOC, Ammoniacal Nitrogen, total Phosphorous, suspended solids and pH are directly available at our UKAS accredited contract laboratory and we will begin sampling for these determinands. Not all processes have flow meters on the return lines, assumptions will be made from the throughput of the asset. Temperature would be a field-based measurement, currently this is not measured. STW will aim to sample for PFOS and PFOA on a six-monthly basis to build up a data set, but due to the two weeks analysis turn around, these are not of use to the live operational process.

The data obtained from the return sampling will be used to optimise the process and STW will carry out root cause investigations with the process support teams to understand what changed on site and ensure that we can reduce the risk to the inlet. If any abnormalities are identified in the sample data following root cause investigations, the Process Team will collaborate with wider site based teams and the Catchment team to ascertain the root cause.

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.

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. Discussions are being held with the local catchment team, to identify any known sources of these materials within the sewage works catchment area.

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?

Current sampling occurs at the final effluent point: SO 90620 23100

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 89930 24860

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

River Chelt

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

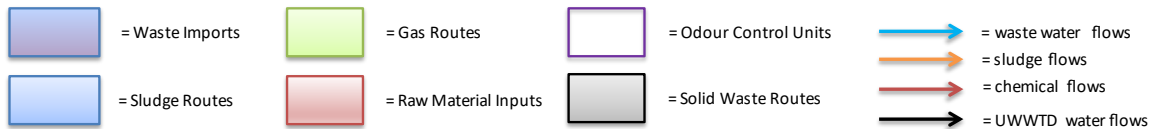
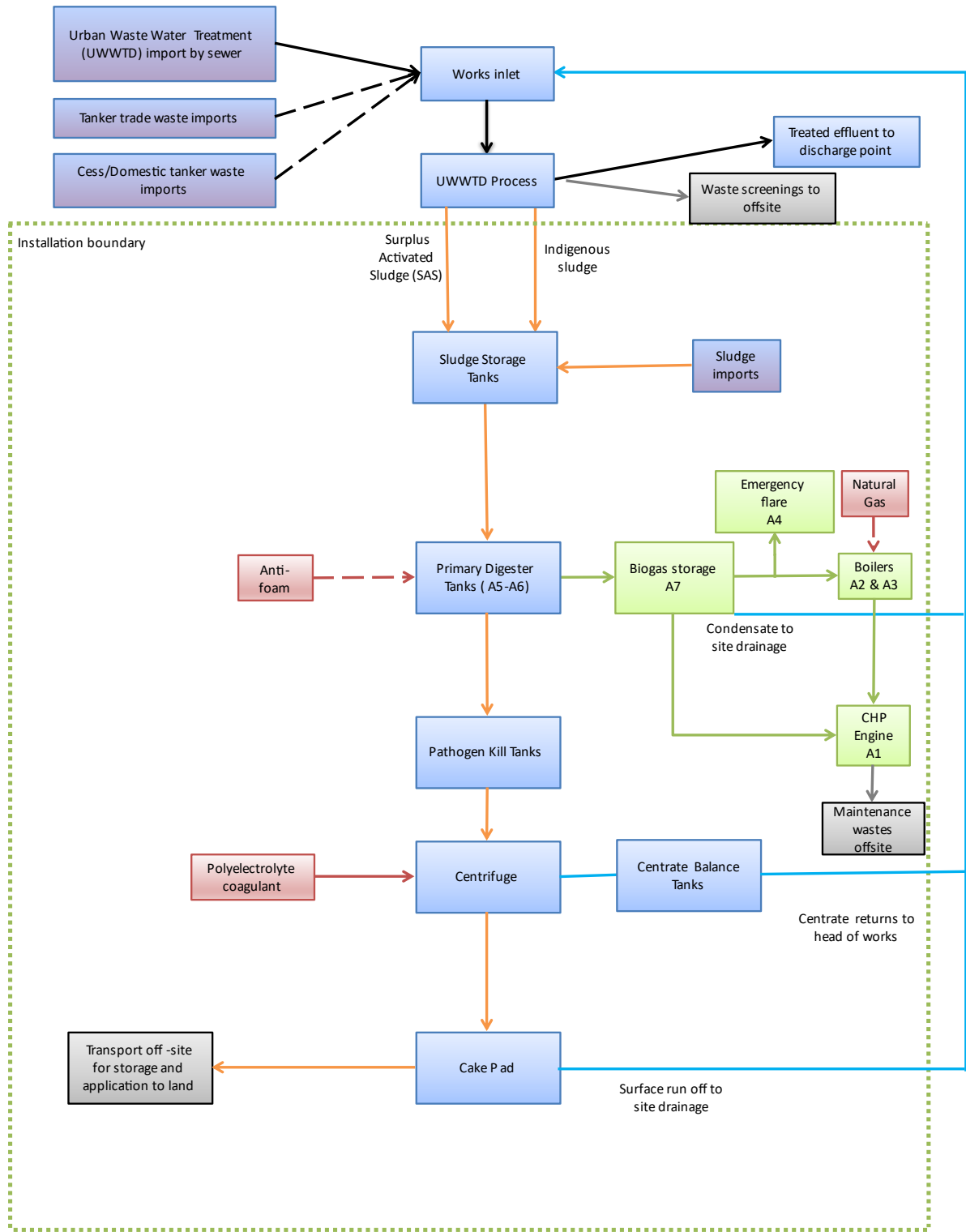
Appendix A. Figures

A.1.1 Site location plan

A.1.2 Site layout plan

A.1.3 Site drainage plan

A.1.4 Process Flow Diagram



Appendix B. Certificates

Appendix C. Air Dispersion Modelling Report

Appendix D. BAT Assessment

Please see appended spreadsheet

Appendix E. H5 Site condition report

SITE CONDITION REPORT TEMPLATE

For full details, see H5 *SCR guide for applicants* v2.0 4 August 2008

COMPLETE SECTIONS 1-3 AND SUBMIT WITH APPLICATION

DURING THE LIFE OF THE PERMIT: MAINTAIN SECTIONS 4-7

AT SURRENDER: ADD NEW DOC REFERENCE IN 1.0; COMPLETE SECTIONS 8-10; & SUBMIT WITH YOUR SURRENDER APPLICATION.

1.0 SITE DETAILS	
Name of the applicant	Severn Trent Water Limited
Activity address	Hayden Sewage Treatment Works, Hayden Lane, Hayden, Cheltenham, GL51 0SP
National grid reference	SO 9067 2303
Document reference and dates for Site Condition Report at permit application and surrender	Variation Application for bespoke Permit, January 2021
Document references for site plans (including location and boundaries)	Please see site plan in Appendix A and information within Air Quality Assessment.

Note:

In Part A of the application form you must give us details of the site’s location and provide us with a site plan. We need a detailed site plan (or plans) showing:

- Site location, the area covered by the site condition report, and the location and nature of the activities and/or waste facilities on the site.
- Locations of receptors, sources of emissions/releases, and monitoring points.
- Site drainage.
- Site surfacing.

If this information is not shown on the site plan required by Part A of the application form then you should submit the additional plan or plans with this site condition report.

2.0 Condition of the land at permit issue	
Environmental setting including: <ul style="list-style-type: none"> • geology • hydrogeology • surface waters 	According to the Environment Agency’s online flood maps, the site is not subject to flooding located in flood zone 1. The site is not located within the catchment zone of an SPZ. The geology of the site comprises the following sequence: alluvium (clay, silt, sand and gravel) superficial deposits underlain by the Charmouth Mudstone Formation and the Rugby Limestone Formation. The alluvium is classified as a Secondary A Aquifer and the Mudstone / Limestone as a Secondary Undifferentiated Aquifer.
Pollution history including: <ul style="list-style-type: none"> • pollution incidents that may have affected land • historical land-uses and associated contaminants • any visual/olfactory evidence of existing contamination 	The site is located in a semi-rural setting on the outskirts of Cheltenham with the small settlement of Hayden situated to the immediate West of the site. Prior to the 1940’s the site was undeveloped agricultural land becoming a sewage works in the

<ul style="list-style-type: none"> evidence of damage to pollution prevention measures 	<p>1940's. Since this time, the site has been a sewage treatment works.</p> <p>Development and expansion of the site has taken place between the 1950's and 1970's at the same time as additional development within the proximity of the site, including engineering works and industrial sites.</p> <p>Environment Agency data on pollution incidents does not identify any pollution incidents (Category 1 and 2).</p>
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	There has been a sewage treatment works at the site since the 1940s. The layout of the works and treatment methodologies have varied over time.
Baseline soil and groundwater reference data	None collected
Supporting information	None collected. Severn Trent acknowledge this may be an issue when the permit is surrendered, but there are no proposals to close the site.

3.0 Permitted activities	
Permitted activities	Operation of an anaerobic digestion plant for sewage sludge waste and imported sewage sludge wastes and combustion of biogas within a CHP engine to generate electricity for use on site.
Non-permitted activities undertaken	<ul style="list-style-type: none"> Discharging of waste Storage of waste Storage of biogas Physical blending of wastes Storage of raw materials
<p>Document references for:</p> <ul style="list-style-type: none"> plan showing activity layout; and environmental risk assessment. 	Please see Technical Summary in Chapter 2 of main application document

Note:

In Part B of the application form you must tell us about the activities that you will undertake at the site. You must also give us an environmental risk assessment. This risk assessment must be based on our guidance (*Environmental Risk Assessment - EPR H1*) or use an equivalent approach.

It is essential that you identify in your environmental risk assessment all the substances used and produced that could pollute the soil or groundwater if there were an accident, or if measures to protect land fail.

These include substances that would be classified as 'dangerous' under the Control of Major Accident Hazards (COMAH) regulations and also raw materials, fuels, intermediates, products, wastes and effluents.

If your submitted environmental risk assessment does not adequately address the risks to soil and groundwater we may need to request further information from you or even refuse your permit application.

4.0 Changes to the activity	
Have there been any changes to the activity boundary?	Yes. Please see the new site boundary in the permit application.
Have there been any changes to the permitted activities?	Yes. The site is currently permitted for the operation of a single CHP engine. The varied permit includes all sludge treatment activities at the site, from the storage of indigenous thickened sludge and blending with imported sludge, through digestion to dewatering and storage on the cake pad. It also includes the capture, storage and utilisation of biogas. The permit boundary includes non-operational areas which are required as part of the proposed spill containment solution at the site.
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	No
Checklist of supporting information	<ul style="list-style-type: none"> • Plan showing any changes to the boundary (where relevant) • Description of the changes to the permitted activities (where relevant) • List of 'dangerous substances' used/produced by the permitted activities that were not identified in the Application Site Condition Report (where relevant)

5.0 Measures taken to protect land	
Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.	
Checklist of supporting information	<ul style="list-style-type: none"> • Inspection records and summary of findings of inspections for all pollution prevention measures • Records of maintenance, repair and replacement of pollution prevention measures

6.0 Pollution incidents that may have had an impact on land, and their remediation

<p>Summarise any pollution incidents that may have damaged the land. Describe how you investigated and remedied each one. If you can't, you need to collect land and /or groundwater reference data to assess whether the land has deteriorated while you've been there.</p>	
Checklist of supporting information	<ul style="list-style-type: none"> • Records of pollution incidents that may have impacted on land • Records of their investigation and remediation

<p>7.0 Soil gas and water quality monitoring (where undertaken)</p>	
<p>Provide details of any soil gas and/or water monitoring you did. Include a summary of the findings. Say whether it shows that the land deteriorated as a result of the permitted activities. If it did, outline how you investigated and remedied this.</p>	
Checklist of supporting information	<ul style="list-style-type: none"> • Description of soil gas and/or water monitoring undertaken • Monitoring results (including graphs)

<p>8.0 Decommissioning and removal of pollution risk</p>	
<p>Describe how the site was decommissioned. Demonstrate that all sources of pollution risk have been removed. Describe whether the decommissioning had any impact on the land. Outline how you investigated and remedied this.</p>	
Checklist of supporting information	<ul style="list-style-type: none"> • Site closure plan • List of potential sources of pollution risk • Investigation and remediation reports (where relevant)

<p>9.0 Reference data and remediation (where relevant)</p>	
<p>Say whether you had to collect land and/or groundwater data. Or say that you didn't need to because the information from sections 3, 4, 5 and 6 of the Surrender Site Condition Report shows that the land has not deteriorated.</p> <p>If you did collect land and/or groundwater reference data, summarise what this entailed, and what your data found. Say whether the data shows that the condition of the land has deteriorated, or whether the land at the site is in a "satisfactory state". If it isn't, summarise what you did to remedy this. Confirm that the land is now in a "satisfactory state" at surrender.</p>	
Checklist of supporting information	<ul style="list-style-type: none"> • Land and/or groundwater data collected at application (if collected) • Land and/or groundwater data collected at surrender (where needed) • Assessment of satisfactory state • Remediation and verification reports (where undertaken)

<p>10.0 Statement of site condition</p>
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Using the information from sections 3 to 7, give a statement about the condition of the land at the site. This should confirm that:

- the permitted activities have stopped
- decommissioning is complete, and the pollution risk has been removed
- the land is in a satisfactory condition.

Appendix F. Odour Management Plan

Appendix G. Site Spill Risk Assessment and Containment Report