Yorkshire Water Services Limited

Esholt Sludge Treatment Facility (STF)

Application for Environmental Permit Variation

January 2023

Permit Reference: EPR/VP3130GZ

Stantec

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Sign-off Sheet

Project Name	Environmental Permitting Support
Project No	331001762-100.2101
Report Reference	331001762-100.2101-1

Revision	Date	Description	Author	Check	Review
FINAL	20/01/2023	FINAL	E Stewart	P. Smith	P. Duncan

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Non-technical Summary

Summary of changes

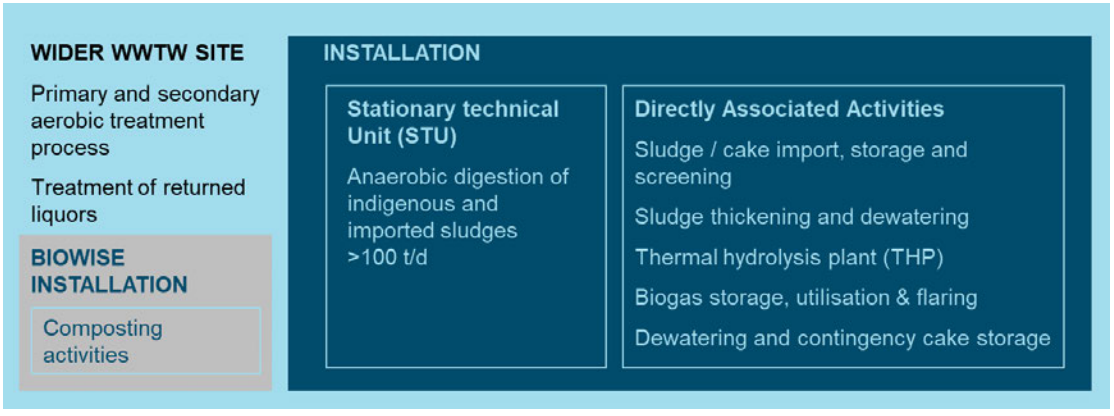
This application is being made due to changes to the Environment Agency (EA) interpretation of the environmental permitting exclusion for Urban Wastewater Activities (under Environmental Permitting (England and Wales) Regulations 2016 (EPR) Schedule 1, Part 2, Chapter 5, Section 5.4). The EA interpretation now requires that anaerobic digestion (AD) plants with a treatment capacity of over 100 tonnes/day (t/d) are classified as installations for the purposes of EPR. Furthermore, it has been determined that, in calculating digestor capacity, there should be no distinction between imported or indigenous sludges.

The Yorkshire Water (YW) Esholt Sludge Treatment Facility (STF), which forms part of the wider Esholt wastewater treatment works (WwTW), exceeds the 100t/d capacity limit and therefore a variation to an existing waste permit (reference number EPR/ VP3130GZ/V004) is required to add Schedule 5.4 Part A(1)b(i) for AD treatment activities. The waste operations permit currently regulates the Combined Heat and Power (CHP) energy centre including cleaning, storage and combustion of biogas in engines, boilers and/or flare as well as the import of sludge from Wastewater Treatment Works (WwTW) for the generation and utilisation of biogas. CHP and sludge intake activities will transition from being permitted waste operations to being DAAs to anaerobic digestion (i.e. DAAs to a Schedule 1 listed activity). The installation boundary will also be extended to include the land occupied by sludge digestion activities, as well as an area of land to the southeast which is used for digested sludge treatment and handling.

This application also includes adoption of Medium Combustion Plant Directive (MCPD) Emission Limit Values for existing combustion plant (including appropriate monitoring provisions) from the relevant phase in date for the plant in question.

The revised permit installation will comprise the following:

Figure 1 Installation schematic



Overview of activities

The Esholt STF treats indigenous sewage sludges arising from sewage treatment processes operated within the wider Esholt WwTW as well as sewage sludges generated by smaller YW WwTW. The principal activities undertaken within the installation includes:

- Sludge reception and screening,
- Undigested sludge thickening and dewatering,
- Thermal Hydrolysis Process (THP)
- Anaerobic digestion,
- Biogas collection and storage (including flaring if operationally necessary),
- Use of biogas (a renewable energy source) to fuel combined heat and power (CHP), generating electricity and heat,
- Operation of steam raising boiler plant for the THP,
- Digested sludge dewatering,
- Raw material storage and use,
- Surface water and process liquor collection and transfer to Esholt WwTW for treatment, and
- Waste storage and transfer off site.

Figure NTS-1 Illustration showing main activity areas

Impact assessment

A detailed assessment of emissions from the process and their potential effects on the environment, including local human and ecological sensitive receptors has been carried out. This is reported in this variation application and concludes that there are no significant negative environmental impacts predicted to arise as a result of activities covered within the scope of this permit variation application; in a number of areas the proposals contained within this variation application will bring about an environmental risk reduction and are considered positive.

A qualitative odour impact assessment has been undertaken. This assessment has concluded that the majority of sensitive receptors are exposed to either a negligible or slight adverse odour effect. Two of the ten sensitive receptors are assessed as being exposed to a moderately adverse effect. YW has not received any odour complaint from these locations. Furthermore, a sniff test odour survey carried out at the boundary of the site in June 2021 did not detect any odour at the boundary closest to these sensitive receptors. However, it is recognised that there is a residual risk arising from odour from any STF process, therefore YW has developed an Odour Management Plan (OMP), which is submitted with this application.

It is recognised that emissions of organic compounds may arise from uncovered sludge sources as well as from the air extraction and dispersion stacks. This includes ammonia, hydrogen sulphide, volatile organic compounds (VOCs) and methane. Measures to reduce these emissions from diffuse and (non-combustion) point sources are proposed.

A noise impact assessment has been undertaken. The risk of noise and vibration at nearby sensitive receptors is predicted to be low; more detailed assessment and further mitigation is not required, nor is a specific noise management plan. Noise will continue to be managed through operational controls and good practice.

A fugitive emissions/bioaerosol risk assessment has been undertaken. This has concluded that further assessment is required at Esholt STF.

All combustion plant emission points are already included within the scope of the existing installation. However, YW is proposing to bring a gas connection onto site to provide mains natural gas for operation of these steam raising boilers. This solution would replace gas oil as the main fuel source for the boilers (with biogas continuing to provide the back-up fuel source). It is also proposed that CHP1 will be converted to natural gas as its sole fuel source. The remaining three CHP engines would continue to operate with biogas as the sole fuel source. An Air Emission Risk Assessment (AERA) utilising atmospheric dispersion modelling has been undertaken to support this proposed change of fuel.

The assessment concludes that, in relation to human health, in both current and future operating scenarios, where impacts are not classified as ‘insignificant’ (i.e. process contribution (PC) less than 1% of the EAL for long-term concentrations or 10% for short-term) the predicted impacts of the installation do not lead to any exceedances of Environmental Assessment Level (EALs) and do not constitute ‘significant pollution’.

In relation to the impact of the installation on ecologically sensitive sites, at all locally designated sites, in both current and future operating scenarios, the predicted PCs from the installation are less than 100% of the applicable annual C_{Le} or C_{Lo}. At the South Pennine Moors SAC the predicted PC's in both scenarios are less than 1% of the applicable CLe or CLe and therefore can be considered 'insignificant'. Therefore, the impacts of the Installation are considered 'insignificant' at all designated ecological sites.

A secondary containment risk assessment has been undertaken to assess whether measures to protect the environment in the event of a failure of containment of primary storage tanks are adequate. Recommendations are made to enhancement containment in some areas.

Site operational controls

The Esholt STF installation is operated in accordance with an Environmental Management System (EMS), which includes controls to minimise point source and fugitive emissions to air, water and land. The YW EMS is certified to ISO14001 and a planned maintenance and inspection programme is in place to optimise the operation of plant.

A leak detection and repair plan is in place to minimise fugitive emissions to air.

An accident management plan has been prepared to assess risks and identify controls associated with accidents and other unplanned events.

Section I: Application Forms

Form A

Application for an environmental permit Part A – About you

You will need to fill in this part A if you are applying for a new permit, applying to change an existing permit or surrender your permit, or want to transfer an existing permit to yourself. Please check that this is the latest version of the form available from our website.

You can apply online for Waste standard rules environmental permits, bespoke waste permits and bespoke Medium combustion plant permits

Apply online for an environmental permit.

Please read through this form and the guidance notes that came with it.

The form can be:

1) **saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.**
2) **printed off and filled in by hand. Please write clearly in the answer spaces.**

Note: if you believe including information on a public register would not be in the interests of national security you must enclose a letter telling us that you have told the Secretary of State. We will not include the information in the public register unless directed otherwise.

It will take less than one hour to fill in this part of the application form.

Where you see the term 'document reference' on the form, give the document references and send the documents with the application form when you've completed it.

Contents

1 About you

Are you applying as an individual, an organisation of individuals (for example, a partnership), a company (this includes Limited Liability Partnerships) or a public body?

An individual	☐ Now go to section 2 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
An organisation of individuals (for example, a partnership)	☐ Now go to section 3 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
A public body	☐ Now go to section 4
A registered company or other corporate body	☑ Now go to section 5 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1

2 Applications from an individual

2a Please give us the following details

Name

Title (Mr, Mrs, Miss and so on) _____

First name _____

Last name _____

Now go to section 6

3 Applications from an organisation of individuals or charity

3a Type of organisation

For example, a charity, a partnership, a group of individuals or a club

3b Details of the organisation or charity

If you are an organisation of individuals, please give the details of the main representative below. If relevant, provide details of other members (please include their title Mr, Mrs and so on) on a separate sheet and tell us the document reference you have given this sheet

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Now go to question 3c or section 6

3c Details of charity

Full name of charity

This should be the full name of the legal entity not any trading name.

3d Company registration number

If you are registered with Companies House please tell us your registration number

3e Charity Commission number

If you are registered with the Charity Commission please tell us your registration number

Now go to section 6

4 Applications from public bodies

4a Type of public body

For example, NHS trust, local authority, English county council

4b Name of the public body

4c Please give us the following details of the executive

An officer of the public body authorised to sign on your behalf

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position

Now go to section 6

5 Applications from companies or corporate bodies

5a Name of the company

Yorkshire Water Services Limited

5b Company registration number

02366682

Date of registration (DD/MM/YYYY)

01/04/1989

If you are applying as a corporate organisation that is not a limited company, please provide evidence of your status and tell us below the reference you have given the document containing this evidence.

Document reference

5 Applications from companies or corporate bodies, continued

5c Please give details of the directors

If relevant, provide details of other directors and company secretary, if there is one, on a separate sheet and tell us the reference you have given this sheet.

Document reference: 5c Details of Company Directors (follows Form Part A)

Details of company secretary (if relevant) and director/s

Title (Mr, Mrs, Miss and so on)

First name

Last name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Now go to section 6

6 Your address

6a Your main (registered office) address

For companies this is the address on record at Companies House.

Contact name

Title (Mr, Mrs, Miss and so on)

First name: Company Secretary

Last name

Address: Western House
Western Way
Halifax Road
Bradford, West Yorkshire

Postcode: BD6 2SZ

Contact numbers, including the area code

Phone: 01274 691111

Fax

Mobile

Email: kathy.smith@yorkshirewater.co.uk

For an organisation of individuals every partner needs to give us their details, including their title Mr, Mrs and so on. So, if necessary, continue on a separate sheet and tell us below the reference you have given the sheet.

Document reference

6b Main UK business address (if different from above)

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

6 Your address, continued

Contact numbers, including the area code

Phone

Fax

Mobile

Email

Now go to section 7

7 Contact details

7a Who can we contact about your application?

It will help us if there is someone we can contact if we have any questions about your application. The person you name should have the authority to act on your behalf.

Please add a second contact on a separate sheet if this person is not always available.

Document reference of this separate sheet

This can be someone acting as a consultant or an 'agent' for you.

Contact name

Title (Mr, Mrs, Miss and so on) Mrs

First name Hazel

Last name Morgan

Address Western House

Western Way

Halifax Road

Bradford, West Yorkshire

Postcode BD6 2SZ

Contact numbers, including the area code

Phone

Fax

Mobile 07790 616 942

Email hazel.morgan@yorkshirewater.co.uk

7b Who can we contact about your operation (if different from question 7a)?

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

7 Contact details, continued

7c Who can we contact about your billing or invoice?

Note: Please provide the name and address that all invoices should be sent to for your subsistence fees.

As in question 7a ☐

As in question 7b ☐

Please give details below if different from question 7a or 7b.

Contact name

Title (Mr, Mrs, Miss and so on)	Mrs
First name	Hazel
Last name	Morgan
Address	Western House
	Western Way
	Halifax Road
	Bradford, West Yorkshire
Postcode	BD6 2SZ

Contact numbers, including the area code

Phone	
Fax	
Mobile	07790 616 942
Email	hazel.morgan@yorkshirewater.co.uk

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it. More information on how to do this is available at: www.gov.uk/government/organisations/environment-agency/about/complaints-procedure.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

9 Where to send your application

For how many copies to send see the guidance note on part A.

For water discharges by email to PSC-WaterQuality@environment-agency.gov.uk

For waste and installations by email to PSC@environment-agency.gov.uk

For flood risk activity permits send 1 copy only to enquiries@environment-agency.gov.uk or to the local Environment Agency office for where the work is proposed to be carried out.

Or

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19101
Clarity approved by Plain English Campaign

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Appendix 1 – Date of birth information for installation and waste activities (applications for a new permit or transferring a permit) only

Date of birth information in this appendix will not be put onto our Public Register

Are you applying as an individual, an organisation of individuals (for example, a partnership) or a company (this includes Limited Liability Partnerships)?

An individual ☐ Now go to 2

An organisation of individuals (for example, a partnership) ☐ Now go to 3

A registered company or other corporate body ☐ Now go to 4

2 Applications from an individual

Please give us the following details

Name

Date of birth (DD/MM/YY)

3 Applications from an organisation of individuals or charity

Details of the organisation or charity

If you are an organisation of individuals, please give the date of birth details of the main representative below. If relevant, provide details of other members on a separate sheet and tell us the document reference you have given this sheet.

Name

Date of birth (DD/MM/YY)

Document reference

4 Applications from companies or corporate bodies

Name of the company

Please give the date of birth details for all directors and company secretary if there is one. If relevant, provide those details of other directors on a separate sheet and tell us the document reference you have given this sheet.

Details of company secretary (if relevant) and director/s

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Document reference

5c Details of company directors

SMITH, Katharine Olivia Helen (Ms)	Company Secretary
AUTY, Scott (Mr)	Company Director
BARNES, Wendy Jacqueline (Ms)	Company Director
DENCH, Andrew James (Mr)	Company Director
HOULDEN, John Russel (Mr)	Company Director
JOHNS, Christopher Ian (Mr)	Company Director
MERRICK, Andrew David (Mr)	Company Director
MURRAY, Vanda	Company Director
O'TOOLE, Raymond (Mr)	Company Director
SHAW, Lucy Nicola	Company Director
UNWIN, Julia (Dame)	Company Director
WYLLIE, Andrew (Mr)	Company Director

https://find-and-update.company-information.service.gov.uk/company/02366682/officers

Accessed 19.01.2023

Form C2

Application for an environmental permit
Part C2 – General – varying a bespoke permit

Fill in this part of the form, together with part A and the relevant parts of C3 to C7 and part F1 or F2, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or changing existing ones).

Waste operation changing to installation or vice versa?

If your changes mean that a waste operation becomes an installation (or vice versa) you also need to fill in either part C3 (waste to installation) or part C4 (installation to waste).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

1 About the permit

Note: If you are applying to convert your existing permit to a standard permit or add a standard facility you need to fill out form C1.

1a Discussions before your application

If you have had discussions with us before your application, give us the permit reference or details on a separate sheet. Tell us below the reference you have given this extra sheet.

Permit or document reference

1b Permit number

What is the permit number that this application relates to? EPR/VP3130GZ

1c Site details

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

Site name Esholt WwTW

Address Ainsbury House
Idle
Bradford
West Yorkshire

Postcode BD10 0TW

2 About your proposed changes

2a Type of variation

What type of variation are you applying for?

Minor technical ☐

Normal variation ☐

Substantial ☑

2 About your proposed changes, continued

2b Changes or additions to existing activities

Please give us brief details in the box below. More detailed information can be given in Table 1 below.

The Yorkshire Water (YW) Esholt Sludge Treatment Facility (STF), which forms part of the wider Esholt WwTW, exceeds the 100t/d throughput limit and it has therefore been agreed that a variation to an existing permit (reference number VP3130GZ) is required to add Schedule 5.4 Part A(1)b(i) for AD treatment activities.

Fill in Table 1 with details of all the proposed changes to current activities. In the final column of the table, give us the document reference for the proposed changes and send them to us with your filled in application form.

Fill in a separate table for each activity you are applying to vary or add. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given this document.

Document reference: Refer to Section II: Technical Description

You only need to fill in one table for your mining waste operations.

2c Consolidating (combining) or updating existing permits

If your proposed change is to modernise (update) your permit, now answer 2c1; otherwise go to 2d.

If your proposed change is to consolidate (combine) a number of permits, now answer 2c2; otherwise go to 2d.

Note: In both cases we may require additional information from you about, for example, your management system. Therefore we would always advise you to talk to us before you submit any application to modernise or consolidate permits.

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

No ☐

Yes ☐

2c2 Identify all the permits you want to consolidate (combine) by listing the permit numbers in Table 2 below

Table 2 – Permit numbers

2d Treating batteries

2d Are you proposing to treat batteries?

No ☑

Yes ☐ Tell us how you will do this and send us a copy of your explanation and tell us below the reference you have given this explanation

Document reference for the explanation

2e Ship recycling

2e1 Is your activity covered by the Ship Recycling Regulations 2015? (See the guidance notes on part C2.)

No ☑

Yes ☐ Tell us how you will do this. Please send us a copy of your explanation and your facility recycling plan, and tell us below the reference numbers you have given these documents

Document reference for the explanation

Document reference for the facility recycling plan

2e2 Is this a renewal of an existing authorisation covered by the Ship Recycling Regulations 2015?

No ☑

Yes ☐ Tell us the expiry date of your existing authorisation (DD/MM/YYYY)

2 About your proposed changes, continued

Table 1 – Changes to existing activities

Fill in Table 1 with details of all the proposed changes to current activities. In the final column of the table, give us the document reference for the proposed changes and send them to us with your filled in application form.

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operation	Description of the mining waste operations	Description of water discharge activity	Description of groundwater activity	Proposed changes document reference
i.e. name of installation, waste operation, mining waste operation, water discharge activity or groundwater activity							
Example – effluent unique name					Example – treated sewage effluent		
If you do not have enough room, go to the line below or send a separate document and give us the document reference here							
Refer to Section III:	Section 5.4,	AD of indigenous and					
Supporting information	Part A(1) (b) (i)	imported UWWT					
Table C2: 1		derived sludges and					
		associated activities					

2 About your proposed changes, continued

2f Low impact installations (installations only)

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

No ☑ Now go to section 3

Yes ☐ If yes, tell us how you meet the conditions for a low impact installation (see the guidance notes on part C2 – Appendix 1)

Document reference

Tick the box to confirm you have filled in the low impact installation checklist in appendix 1 for each regulated facility ☐

3 Your ability as an operator

If you are applying to add waste installations or waste operations to a permit that has not previously had them, you need to fill in all of section 3.

If you are applying to consolidate (combine) two or more permits or have an updated permit you must fill in question 3d.

This section does not apply for applications to surrender a permit.

3a Relevant offences

Installations and waste operations only (see the guidance notes on part C2).

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

No ☐ Now go to question 3b

Yes ☑ Please give details below

Name of the relevant person

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position held at the time of the offence

Name of the court where the case was dealt with

Date of the conviction (DD/MM/YY)

Offence and penalty set

Date any appeal against the conviction will be heard (DD/MM/YYYY)

If necessary, use a separate sheet to give us details of other relevant offences and tell us below the reference number you have given the extra sheet.

Document reference: Refer to Appendix 1: Relevant Offences

Now go to question 3b

Please also complete the details in Appendix 2.

3b Technical ability

Specified waste management activities and waste operations only (see the guidance notes on part C1).

Please indicate which of the two schemes you are using to demonstrate you are technically competent to operate your facility and the evidence you have enclosed to demonstrate this.

ESA/EU skills

I have enclosed a copy of the current Competence Management System certificate ☐

CIWM/WAMITAB scheme

Please select **one** of the following:

- I have enclosed a copy of:
  - the relevant qualification certificate/s ☑

  or
  - evidence of deemed competence ☐

  or

3 Your ability as an operator, continued

- Environment Agency assessment ☐

or

- evidence of nominated manager status under the transitional provisions for previously exempt activities ☐

and, if deemed competent or Agency-assessed, or if there is evidence of a nominated manager, or if the original qualification is over two years old:

I have enclosed a copy of the relevant current continuing competence certificate/s ☑

For each technically competent manager please give the following information. If necessary, use a separate sheet to give us these details and tell us below the document reference you have given the extra sheet.

Title (Mr, Mrs, Miss and so on)	Mr
First name	David
Last name	Shaw
Phone	07790 616 149
Mobile	07790 616 149
Email	david.shaw@yorkshirewater.co.uk

Please provide the environmental permit number/s and site address for **all** other waste activities that the proposed technically competent manager provides technical competence for, including permits held by other operators. Continue on a separate sheet as required.

Permit number	Site address	Postcode
	Refer to Section III: Supporting Information	

Document reference: Refer also to Appendix 2: Technical Competence

Now go to question 3c

Please also complete the details in Appendix 2.

3c Finances

Installations, waste operations and mining waste operations only (see the guidance notes on part C2).

Please note that if you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

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

No ☑

Yes ☐ Please give details below, including the required set-up costs (including infrastructure), maintenance and clean up costs for the proposed facility against which a credit check may be assessed

We may want to contact a credit reference agency for a report about your business's finances.

3 Your ability as an operator, continued

Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste only

How do you plan to make financial provision (to operate a landfill or a mining waste facility you need to show us that you are financially capable of meeting the obligations of closure and aftercare)?

Renewable bonds ☐

Cash deposits with the Environment Agency ☐

Other – provide comprehensive details ☐

Document reference

Provide a cost profile and expenditure plan of your estimated costs throughout the aftercare period of your site.

Document plan reference

Now go to question 3d

3d Management systems

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

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

You need to be able to explain what happens at each site and which parts of the overall management system apply. For example, at some sites you may need to show you are carrying out additional measures to prevent pollution because they are nearer to sensitive locations than others.

You can find guidance on management systems on our website at www.gov.uk/government/organisations/environment-agency.

Tick this box to confirm that you have read the guidance and that your management system will meet our requirements ☑

What management system will you provide for your regulated facility?

ISO 14001 ☑

BS 8555 (Phases 1–5) ☐

Acorn ☐

Green dragon ☐

Own management system ☐

Please make sure you send us a summary of your management system with your application.

Document reference/s: Refer to Section III: Supporting Information

4 Consultation

Fill in 4a to 4c for installations and waste operations and 4d for installations only.

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

4a A sewer managed by a sewerage undertaker?

No ☑

Yes ☐ Please name the sewerage undertaker

4b A harbour managed by a harbour authority?

No ☑

Yes ☐ Please name the harbour authority

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

No ☑

Yes ☐ Please name the fisheries committee

4 Consultation, continued

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 ☑

Yes ☐

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

No ☑

Yes ☐

5 Supporting information

5a Provide a plan or plans for the site

See the guidance notes on part C2 for what needs to be marked on the plan.

Clearly mark the site boundary or discharge point, or both. Also include site drainage plans, site layout plans, and plant design drawings/process flow diagrams (as required). (See the guidance notes on part C2.)

Document reference/s of the plans: Refer to Section IV: Figures

5b Do any of the variations you plan to make need extra land to be included in the permit?

No ☐

Yes ☑ Please provide a site report for the extra land

Document report reference/s: Refer to Appendix 5: Site Condition Report

5c Provide a non-technical summary of your application

Document reference of the summary: Refer to Non-technical Summary

5d Risk of fire from sites storing combustible waste

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

(This applies to all activities excluding standalone water and groundwater discharges.)

No ☑ Go to question 5f

Yes ☐ Go to question 5e

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

See the guidance notes on part C2.

No ☐

Yes ☐ Provide a fire prevention plan. You need to highlight any changes you have made since your pre-application discussions

Document reference of the plan:

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 ☐

Document reference of the report:

6 Environmental risk assessment

If you need one, see the guidance notes on part C2.

Provide an assessment of any additional risks the proposed changes or additions to your regulated facilities poses to the environment as part of your application to vary this permit. The risk assessment must follow the methodology set out in 'Risk assessments for your environmental permit' at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit or an equivalent method.

Document reference for the assessment: Refer to Section III: Supporting Information

7 How to contact us

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General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

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How long did it take you to fill in this form?

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Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19110 Clarity approved by Plain English Campaign

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Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendix 1.

Appendix 1 – Low impact installation checklist

Installation reference				
Condition	Response			Do you meet this?
A – Management techniques	Provide references to show how your application meets A			Yes ☐ No ☐
	References			
B – Aqueous waste	Effluent created		m^3/day	Yes ☐ No ☐
C – Abatement systems	Provide references to show how your application meets C			Yes ☐ No ☐
	References			
D – Groundwater	Do you plan to release any hazardous substances or non-hazardous pollutants into the ground?		Yes ☐ No ☐	Yes ☐ No ☐
E – Producing waste	Hazardous waste		Tonnes per year	Yes ☐ No ☐
	Non-hazardous waste		Tonnes per year	
F – Using energy	Peak energy consumption		MW	Yes ☐ No ☐
G – Preventing accidents	Do you have appropriate measures to prevent spills and major releases of liquids? (See 'How to comply'.)		Yes ☐ No ☐	Yes ☐ No ☐
	Provide references to show how your application meets G			
	References			
H – Noise	Provide references to show how your application meets H			Yes ☐ No ☐
	References			
I – Emissions of polluting substances	Provide references to show how your application meets I			Yes ☐ No ☐
	References			
J – Odours	Provide references to show how your application meets J			Yes ☐ No ☐
	References			
K – History of keeping to the regulations	Say here whether you have been involved in any enforcement action as described in Compliance History Appendix 1 explanatory notes		Yes ☐ No ☐	

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

Date of birth information in this appendix will not be put onto our Public Register

Have you filled in the Relevant Offences question?

Yes ☑

No ☐

Have you filled in the Technical ability question?

Yes ☑

No ☐

2 Relevant Offences - date of birth information

Please give us the following details

Name: Not applicable - no individuals convicted of relevant offences

Date of birth (DD/MM/YY):

3 Technical ability - date of birth information

Name: David Shaw

Date of birth (DD/MM/YY): [redacted]

Form C3

Application for an environmental permit
Part C3 – Variation to a bespoke installation permit

Environment Agency

Fill in this part of the form, together with part A, part C2 and part F1, if you are applying to vary (change) the conditions or any other part of the permit.

Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that go with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

1 What activities are you applying to vary?

Fill in Table 1a below with details of all the activities listed in schedule 1 or other references (see note 1) of the Environmental Permitting Regulations (EPR) and all directly associated activities (DAAs) (in separate rows), that you propose to vary.

Note: if you want to add a Medium Combustion Plant or Specified Generator (MCP/SG) to your installation please use part C2.5 instead. If you want to vary an intensive farm permit please use part C3.5 instead.

Fill in a separate table for each installation you are applying to vary. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given the document.

Document reference | Refer to Section III: Supporting Information

1 What activities are you applying to vary?, continued

Table 1a – Types of activities

Schedule 1 listed activities						
Installation name	Schedule 1 or other references (See note 1)	Description of the activity (See note 2)	Activity capacity (See note 3)	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies) (See note 3)	Non-hazardous waste treatment capacity (if this applies) (See note 3)
If there are not enough rows, send a separate document and give the document reference number here	Put your main activity first			For installations that take waste only	For installations that take waste only	For installations that take waste only
Refer to Section III: Supporting information	Section 5.4, Part A(1) (b) (i)	AD of UWWT derived sludges and associated activities				
Directly associated activities (See note 4)						
Name of DAA If there are not enough rows, send a separate document and give the document reference number here		Description of the DAA (please identify the schedule 1 activity it serves)				
		Refer to Section III: Supporting Information Table C3: 1a - 1				
For installations that take waste (See note 5 below)		Total storage capacity				
		Annual throughput (tonnes each year)				

1 What activities are you applying to vary?, continued

Notes

1. Quote the section number, part A1 or A2 or B, then paragraph and sub paragraph number as shown in EPR part 2 of schedule 1.
2. Use the description from schedule 1 of EPR. Include any extra detail that you think would help to accurately describe what you want to do.
3. By 'capacity', we mean:

- the total incineration capacity (tonnes every hour) for waste incinerators
- the total landfill capacity (cubic metres) for landfills
- the total capacity (cubic metres) for the recovery of hazardous waste on land
- the total treatment capacity (tonnes each day) for waste treatment operations
- the total storage capacity (tonnes) for waste storage operations
- the processing and production capacity for manufacturing operations, or
- the thermal input capacity for combustion activities

4. Fill this in as a separate line and give an accurate description of any other activities associated with your schedule 1 activities. You cannot have Directly Associated Activities (DAAs) as part of a mobile plant application.
5. By 'total storage capacity', we mean the maximum amount of waste, in tonnes, you store on the site at any one time.

Types of waste accepted

For those installations that take waste, for each line in Table 1a (including DAAs), fill in a separate document to list those wastes you will accept on to the site for that activity. Give the List of Wastes catalogue code and description (see https://www.gov.uk/government/publications/waste-classification-technical-guidance).

If you need to exclude waste from your activity or facility by restricting the description, quantity, physical nature, hazardous properties, composition or characteristic of the waste, include these in the document. Send it to us with your application form.

Please provide the reference for each document.

You can use Table 1b as a template.

If you want to accept any waste with a code ending in *99*, you must provide more information and a full description of the waste in the document, (for example, detailing the source, nature and composition of the waste). Where you only want to receive specific wastes within a waste code you can provide further details of the waste you want to receive. Where a waste is dual coded you should use both codes for the waste.

Document reference of this extra information — Refer to Section III: Supporting Information Table C3 – 1b

1 What activities are you applying to vary?, continued

Table 1b – Template example – types of waste accepted and restrictions

Waste code	Description of the waste
Example	Example
02 01 08*	Agrochemical waste containing hazardous substances
18 01 03*	Infectious clinical waste, not contaminated with chemicals or medicines – human healthcare (may contain sharps) for alternative treatment
17 05 03*/17 06 05*	Non-hazardous soil from construction or demolition contaminated with fragments of asbestos cement sheet

1c Recovery of hazardous waste on land

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

No ☑ Now go to question 2

Yes ☐

Have you written a waste recovery plan (WRP) that shows that you will use waste to perform the same function as non waste materials you would have used?

No You must write a WRP to support your application.

Yes

Have we advised you during pre-application discussions that we believe the activity is waste recovery?

No

Yes

Have there been any changes to your proposal since the discussions?

No

Yes

Please send us a copy of your current waste recovery plan that complies with our guidance at https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-recovery-plans-and-deposit-for-recovery-permits. You need to highlight any changes you may have made since your pre-application discussions.

Document reference

Please note that there is an additional charge for the assessment or re assessment of a waste recovery plan that must be submitted as part of this application. For the charge see https://www.gov.uk/government/publications/environmental-permitting-charges-guidance/environmental-permitting-charges-guidance

2 Point source emissions to air, water and land

Fill in Table 2 below with details of the point source emissions that result from the operating techniques at each of your installations.

Fill in one table for each installation, continuing on a separate sheet if necessary.

Table 2 – Emissions (releases)

Installation name	Aldwarke Sludge Treatment Facility (STF)			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
Refer to Section III: Supporting Information				
Table C3:2 – 1				
Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
Not applicable				
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
Refer to Section III: Supporting Information				
Table C3: 2 – 2				
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit
Not applicable				

You will also need to complete application form part C6 if your variation includes changing or adding a point source emission(s) to:

- water
- groundwater or
- sewer

Supporting information

3 Operating techniques

3a Technical standards

Fill in Table 3a for each activity at the installation you refer to in Table 1a above and list the 'Best Available Techniques' you are planning to use. If you use the standards set out in the relevant BAT conclusion(s), BAT reference document(s) (BREF) and/or technical guidance(s) (TGN) there is no need to justify using them within your documents in Table 3a.

For Part A(2) activities refer to https://www.gov.uk/government/collections/integrated-pollution-prevention-and-control-sector-guidance-notes and for Part B and Schedule 14 activities see https://www.gov.uk/government/collections/local-air-pollution-prevention-and-control-lappc-process-guidance-notes

You must justify your decisions in a separate document if:

- there is no technical standard
- the technical guidance provides a choice of standards, or
- you plan to use another standard

This justification could include a reference to the Environmental Risk Assessment provided in part C2 (general bespoke permit) of the application form.

For each of the activities listed in Table 1a, the documents in Table 3a should summarise:

- the operations undertaken
- the measures you will use to control the emissions from your process, as identified in your risk assessment or the relevant BAT conclusions, BREF or technical guidance
- how you will meet other standards set out in the relevant BAT conclusions document, BREF or technical guidance

Table 3 – Technical standards

Fill in a separate table for each activity at the installation.

Installation name	Aldwarke STF	
Description of the schedule 1 activity or directly associated activity	Best available technique (BATC, BREF or TGN reference) (see footnote below)	Document reference (if appropriate)
Section 5.4 A(1)(b)(i)	BAT Reference Document for Waste Treatment, 2018	Section II Technical Description
Section 5.4 A(1)(b)(i)	Appropriate measures for the biological treatment of waste, consultation draft July 2020	Section II Technical Description
Section 5.4 A(1)(b)(i)	H4 Odour Management	Section V: Appendix 8, 10
Section 5.4 A(1)(b)(i)	H5 Site Condition Reports	Section V: Appendix 5
Section 5.4 A(1)(b)(i)	Noise & vibration management: Environmental permits	Section V: Appendix 9
DAA	Guidance Monitoring stack emissions: measurement locations (formerly TGN	Section III: Q4

* Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

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. Give the document references you use for each plan, diagram and description.

Document reference: Refer to Section II Technical Description, Section IV Figures

3a1 Does your permit (in Table 1.2 Operating Techniques or similar table in the permit) have references to any of your own documents or parts of documents submitted as part of a previous application for this site?

No ☑ Now go to 3b

Yes ☐ Please tell us in a separate document what document references are no longer valid or have been superseded and why

Please also tell us below the reference number you have given the document and send it in with your application

Document reference

3b General requirements

Fill in a separate Table 4 for each installation.

Table 4 – General requirements

Name of the installation	Aldwarke STF
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	Document reference or references Not required – see risk assessment
Where the technical guidance or your risk assessment shows that odours are an important issue, send us your odour management plan	Document reference or references Refer to Section V: Appendix 10
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)	Document reference or references Not required – see risk assessment

For guidance on risk assessments for your environmental permit see https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

3c Types and amounts of raw materials

Fill in Table 5 for all schedule 1 activities. Fill in a separate table for each installation.

Table 5 – Types and amounts of raw materials

Name of the installation		Aldwarke STF – Refer to Section III: Supporting Information		
Capacity (See note 1 below)				
Schedule 1 activity	Description of raw material and composition	Maximum amount (tonnes) (See note 2 below)	Annual throughput (tonnes each year)	Description of the use of the raw material including any main hazards (include safety data sheets)
See Section III: Table C3:3c – 1				

Notes

1 By 'capacity', we mean the total storage capacity (tonnes) or total treatment capacity (tonnes each day).

2 By 'maximum amount', we mean the maximum amount of raw materials on the site at any one time.

Use a separate sheet if you have a long list of raw materials, and send it to us with your application form. Please also provide the reference of this extra sheet.

Document reference: Refer to Section III: Supporting Information

3d Information for specific sectors

For some of the sectors, we need more information to be able to set appropriate conditions in the permit. This is as well as the information you may provide in sections 5, 6 and 7. For those activities listed below, you must answer the questions in the related document.

Table 6 – Questions for specific sectors

Sector	Appendix
Combustion	See the questions in appendix 1
Chemicals	See the questions in appendix 2
Incinerating waste	See the questions in appendix 3
Landfill and recovery of hazardous waste on land	See the questions in appendix 4

General information

Complete section 4 if you are proposing to change or add an emission point(s).

4 Monitoring

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

You should also describe any environmental monitoring. Tell us:

- how often you use these measures
- the methods you use
- the procedures you follow to assess the measures

Document reference: Refer to Section III: Supporting Information

4b Point source emissions to air only

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

No ☐
Yes ☑

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 ☐
Yes ☑

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

No ☐
Yes ☑

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

No ☐
Yes ☑

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

No ☐
Yes ☑

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

No ☐
Yes ☑

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

No ☐
Yes ☑

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

No ☑
Yes ☐

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.

Document reference of the assessment: Refer to Section III: Supporting Information

5 Environmental impact assessment

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

No ☑ Now go to question 6

Yes ☐ Please provide a copy of the environmental statement and, if the procedure has been completed:

- a copy of the planning permission
- the committee report and decision on the EIA

Document reference of the copy

6 Resource efficiency and climate change

If the site is a landfill or a recovery of hazardous waste on land activity, you only need to fill in this section if the application includes gas engines.

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

Document reference of the description Refer to Section III: Supporting Information

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

Document reference of the description Refer to Section III: Supporting Information

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

No ☑ Describe the specific measures you use for improving your energy efficiency

Document reference of the description Refer to Section III: Supporting Information

Yes ☐ Please give the date you entered (or the date you expect to enter) into the agreement (DD/MM/YYYY)

Please also provide documents that prove you are taking part in the agreement.

Document reference of the proof

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

Document reference of the justification Refer to Section III: Supporting Information

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

If you produce waste, describe how you recover it. If it is technically and financially impossible to recover the waste, describe how you dispose of it while avoiding or reducing any effect it has on the environment.

Document reference of the description Refer to Section III: Supporting Information

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How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19107
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Date received (DD/MM/YYYY)

Payment received?

No ☐

Yes ☐ Amount received

£

Our reference number

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 4.

Appendix 1 – Specific questions for the combustion sector

1 Identify the type of fuel burned in your combustion units (including when your units are started up, shut down and run as normal). If your units are dual fuelled (that is, use two types of fuel), list both the fuels you use

Fill in a separate table for each installation.

Installation reference			
Type of fuel	When run as normal	When started up	When shut down
Coal	☐	☐	☐
Gas oil	☐	☐	☐
Heavy fuel oil	☐	☐	☐
Natural gas	☐	☐	☐
WID waste	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Landfill gas	☐	☐	☐
Other	☐	☐	☐

Notes

1. Not covered by Industrial Emissions Directive 2010/75/EU.
2. 'Biomass' is referred to The Renewables Obligation Order 2002 (https://www.legislation.gov.uk/uksi/2002/914/contents/made)

Give extra information if it helps to explain the fuel you use.

Document reference

Appendix 1 – Specific questions for the combustion sector, continued

2 Give the composition range of any fuels you are currently allowed to burn in your combustion plant

Fill in a separate table for each installation, continuing on a separate sheet if necessary

Fuel use and analysis					
Installation reference					
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%				
Moisture	%				
Ash	% wt/wt dry				
Sulphur	% wt/wt dry				
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry				
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry				
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry				
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg				

Appendix 1 – Specific questions for the combustion sector, continued

3 If NOx factors are necessary for reporting purposes (that is, if you do not need to monitor emissions), please provide the factors associated with burning the relevant fuels

Fill in a separate table for each installation.

Installation reference	
Fuel	NOx factor (kgt^{-1})
Fuel 1	
Fuel 2	
Fuel 3	
Fuel 4	

Note: kgt^{-1} means kilograms of nitrogen oxides released for each tonne of fuel burned.

4 Will your combustion plant be subject to Chapter III of the Industrial Emissions Directive 2010/75/EU?

No ☐ Now fill in application form part F

Yes ☐

5 What is your plant?

an existing one ☐ A plant licensed before 1 July 1987

a new one ☐ A plant licensed on or after 1 July 1987 but before 27 November 2002, or a plant for which an application was made before 27 November 2002 and which was put into operation before 27 November 2003

a new-new one ☐ A plant for which an application was made on or after 27 November 2002 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

6 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

Fill in a separate table for each installation.

Installation reference	
Type of plant	Number within installation
Existing	
New	
New-new	
Gas turbine (group A)	
Gas turbine (group B)	

Appendix 1 – Specific questions for the combustion sector, continued

7 If you run an existing plant, have you submitted a declaration for the 'limited life derogation' set out in Article 33 of Chapter III of the Industrial Emissions Directive?

No ☐ Now go to question 9

Yes ☐

8 Have you subsequently withdrawn your declaration?

No ☐

Yes ☐

9 List the existing large combustion plants (LCPs) which have annual mass allowances under the National Emission Reduction Plan (NERP), and those with emission limit values (ELVs) under the LCPD

Installation reference	
LCPs under NERP	LCPs with ELVs

10 Do you meet the monitoring requirements of Chapter III of the Industrial Emissions Directive?

No ☐

Yes ☐ Document reference

11 Are you substantially refurbishing an existing installation according to the meaning given in Article 14 of the Energy Efficiency Directive?

No ☐

Yes ☐ Now go to question 12

12 Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference of the CBA

Appendix 2 – Specific questions for the chemical sector

1 Please provide a technical description of your activities

- The description should be enough to allow us to understand:
- the process
- the main plant and equipment used for each process
- all reactions, including significant side reactions (that is, the chemistry of the process)
- the material mass flows (including by products and side streams) and the temperatures and pressures in major vessels
- the all emission control systems (both hardware and management systems), for situations which could involve releasing a significant amount of emissions – particularly the main reactions and how they are controlled
- a comparison of the indicative BATs and benchmark emission levels standards: technical guidance notes (TGNs) (see https://www.gov.uk/government/collections/technical-guidance-for-regulated-industry-sectors-environmental-permitting); additional guidance 'The production of large volume organic chemicals' (EPR 4.01); 'Speciality organic chemicals sector' (EPR 4.02); 'Inorganic chemicals sector' (EPR 4.03); and best available techniques reference documents (BREFs) for the chemical sector

Document reference

2 If you are applying for a multi-purpose plant, do you have a multi-product protocol in place to control the changes?

No ☐

Yes ☐ Provide a copy of your protocol to accompany this application

Document reference

3 Does Chapter V of the Industrial Emissions Directive (IED) apply to your activities?

No ☐

Yes ☐ Fill in the following

3a List the activities which are controlled under the IED

Installation reference	
Activities	

3b Describe how the list of activities in question 3a above meets the requirements of the IED

Document reference

Appendix 3 – Specific questions for the waste incineration sector

If you are proposing to accept clinical waste, please complete your answer to question 3a 'Technical standards' with reference to relevant parts of our healthcare waste appropriate measures guidance (see https://www.gov.uk/guidance/healthcare-waste-appropriate-measures-for-permitted-facilities)

1a Do you run incineration plants as defined by Chapter IV of the Industrial Emissions Directive (IED)?

No ☐ You do not need to answer any other questions in this appendix

Yes ☐ IED applies

1b Are you subject to IED as

An incinerator? ☐

A co-incinerator? ☐

2 Do any of the installations contain more than one incineration line?

No ☐ Now go to question 4

Yes ☐

3 How many incineration lines are there within each installation?

Fill in a separate table for each installation.

Installation reference		
Number of incineration lines within the installation		
Reference identifiers for each line		

You must provide the information we ask for in questions 4, 5 and 6 below in separate documents. The information must at least include all the details set out in section 2 ('Key Issues') of S5.01 'Incineration of waste: additional guidance' (under the sub heading 'European legislation and your application for an EP Permit'). See https://www.gov.uk/government/collections/technical-guidance-for-regulated-industry-sectors-environmental-permitting.

You must answer questions 7 to 13 on the form below.

4 Describe how the plant is designed, equipped and will be run to make sure it meets the requirements of IED, taking into account the categories of waste which will be incinerated

Document reference

5 Describe how the heat created during the incineration and co-incineration process is recovered as far as possible (for example, through combined heat and power, creating process steam or district heating)

Document reference

Appendix 3 – Specific questions for the waste incineration sector, continued

6 Describe how you will limit the amount and harmful effects of residues and describe how they will be recycled where this is appropriate

Document reference

For each line identified in question 3, answer questions 7 to 13 below

Question 3 identifier, if necessary

7 Do you want to take advantage of the Article 45 (1)(f) allowance (see below) if the particulates, CO or TOC continuous emission monitors (CEM) fail?

No ☐

Yes ☐ This allows 'abnormal operation' of the incineration plant under certain circumstances when the CEM for releases to air have failed. Annex VI, Part 3(2) sets maximum half hourly average release levels for particulates (150 mg/m3), CO (normal ELV) and TOC (normal ELV) during abnormal operation.

Describe the other system you use to show you keep to the requirements of Article 13(4) (for example, using another CEM, providing a portable CEM to insert if the main CEM fails, and so on).

8 Do you want to replace continuous HF emission monitoring with periodic hydrogen fluoride (HF) emission monitoring by relying on continuous hydrogen chloride (HCl) monitoring as allowed by IED Annex VI, Part 6 (2.3)?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you control hydrogen chloride and keep it to a level below the HCl ELVs.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

9 Do you want to replace continuous water vapour monitoring with pre-analysis drying of exhaust gas samples, as allowed by IED Annex VI, Part 6 (2.4)?

Under this you do not have to continuously monitor the amount of water vapour in the air released if the sampled exhaust gas is dried before the emissions are analysed.

No ☐

Yes ☐ Please give your reasons for doing this

10 Do you want to replace continuous hydrogen chloride (HCl) emission monitoring with periodic HCl emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen chloride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

11 Do you want to replace continuous HF emission monitoring with periodic HF emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

12 Do you want to replace continuous SO_2 emission monitoring with periodic sulphur dioxide (SO_2) emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for sulphur dioxide if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

13 If your plant uses fluidised bed technology, do you want to apply for a derogation of the CO WID ELV to a maximum of 100 mg/m³ as an hourly average, as allowed by IED Annex VI, Part 3?

No ☐

Does not apply ☐

Yes ☐ Please give your reasons for doing this

14 Are you substantially refurbishing an existing installation according to the meaning given in Article 14 of the Energy Efficiency Directive?

No ☐

Yes ☐ Please go to question 15

Document reference of the CHP-ready assessment

15 Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference of the CBA

Appendix 4 – Specific questions for the landfill sector and recovery of hazardous waste on land activities

1. For the landfill sector, provide your Environmental Setting and Installation Design (ESID) report and any other risk assessments to control emissions.

For recovery of hazardous waste on land activities, provide your Environmental Setting and Site Design (ESSD) report and any other risk assessments to control emissions

Document reference

2. For recovery of hazardous waste on land activities, provide your Waste Acceptance Procedures (including Waste Acceptance Criteria)

Document reference

Refer to our guidance at
https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-acceptance-procedures-for-deposit-for-recovery

3. Provide your hydrogeological risk assessment (HRA) for the site

Document reference

4. Provide your outline engineering plan for the site

Document reference

5. Provide your stability risk assessment (SRA) for the site

Document reference

6. Provide your landfill gas risk assessment (LFGRA) for the site

Document reference

We have developed guidance on these assessments and their reports which can be found at
https://www.gov.uk/government/collections/environmental-permitting-landfill-sector-technical-guidance

7. For recovery of hazardous waste on land activities, have you completed a monitoring plan for the site?

No ☐ Please refer to the section of your ESSD that explains why this is unnecessary for your site

Document reference of this evidence

Yes ☐ Document reference

8. Have you completed a proposed plan for closing the site and your procedures for looking after the site once it has closed?

No ☐ If you have answered 'no' for recovery of hazardous waste on land activities, refer to the section of your ESSD that explains why this is unnecessary for your site

Document reference of this evidence

Yes ☐ For landfill you must provide a closure and aftercare plan

Document reference

Form C6

Application for an environmental permit Part C6 – Variation to a bespoke water discharge activity or groundwater activity (point source discharge), or point source emission to water from an installation

Environment Agency

Fill in this part of the form, together with part C2 and part F1, if you are applying to vary (change) the conditions or any other part of the permit for a water discharge or groundwater activity.

Fill in this part of the form, together with parts C2, C3 and F1 if you are applying to vary or add a point source emission to water, groundwater or sewer from an installation.

Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it.

The form can be:

1) **saved onto a computer and then filled in.**
2) **printed off and filled in by hand. Please write clearly in the answer spaces.**

It will take less than three hours to fill in this part of the application form.

Contents

About the effluent – details and type

From the list below, choose which type of effluent you are applying for on this form and answer the questions shown in Table 1.

You must fill in a separate copy of this form and the appropriate appendix or appendices for each type of effluent you plan to discharge.

Table 1 – About the effluent

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Sewage effluent (non-water company)	1.3.3 Sewage effluent discharge with a volume up to and including 5 m^3/day to surface water from domestic household or organisation operating for charitable purposes		All	a, b, c, d	b, f	-	a, b	All	-	b*, f*	a, b, c, f*, h, i	All
	1.3.4 Sewage effluent discharge with a volume up to and including 5 m^3/day to groundwater from domestic household or organisation operating for charitable purposes		All	a, b, c, d	b, f	-	a, b	All	-	d, f*	a, b, c, f*, h, i	All
	1.3.5 Sewage effluent discharge with a volume up to and including 5 m^3/day to surface water (not requiring specific substances assessment)		All	a, b, c, d	b, f	-	a, b	All	-	b*, f*	a, b, c, f*, h, i	All
	1.3.6 Sewage effluent discharge with a volume up to and including 5 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b, c, d	b, f	-	a, b	All	-	d, f*	a, b, c, f*, h, i	All
	1.3.7 Sewage effluent discharge with a volume greater than 5 m^3/day up to and including 15 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b, c, d	b, f	-	a, b	All	-	d, f*	a, b, c, f*, h, i	All

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Sewage effluent (non-water company)	1.3.8 Sewage effluent discharge with a volume greater than 15 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b, c, d	b, f	-	a, b	All	-	d, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.9 Sewage effluent discharge to groundwater requiring specific substances assessment (any volume)		All	a, b, c, d	b, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.10 Sewage effluent discharge with a volume greater than 5 m^3/day up to and including 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b, c, d	b, f	-	a, b	All	-	b*, f*	a, b, c, f*, h, i	All
	1.3.11 Sewage effluent discharge with a volume greater than 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b, c, d	b, f	-	a, b	All	-	b*, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.11 Sewage effluent discharge to surface water requiring specific substances assessment (any volume)		All	a, b, c, d	b, f	-	a, b	All	b, c, d, e	b*, c, f*	a, b, c, d*, e*, f*, h, i	All
Water company WwTW treated sewage effluent	1.3.5 Sewage effluent discharge with a volume up to and including 5 m^3/day to surface water (not requiring specific substances assessment)		All	a, b	a, f (b is optional)	-	-	All	-	a, b*, f*	a, b, c, f*, h, i	All
	1.3.6 Sewage effluent discharge with a volume up to and including 5 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b	a, f (b is optional)	-	-	All	-	a, d, f*	a, b, c, f*, h, i	All

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Water company WwTW treated sewage effluent	1.3.7 Sewage effluent discharge with a volume greater than 5 m^3/day up to and including 15 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b	a, f (b is optional)	-	-	All	-	a, d, f*	a, b, c, f*, h, i	All
	1.3.8 Sewage effluent discharge with a volume greater than 15 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b	a, f (b is optional)	-	-	All	-	a, d, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.9 Sewage effluent discharge to groundwater requiring specific substances assessment (any volume)		All	a, b	a, f (b is optional)	-	-	All	a, b, c, d, e	a, d, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.10 Sewage effluent discharge with a volume greater than 5 m^3/day up to and including 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b	a, f (b is optional)	-	-	All	-	a, b*, f*	a, b, c, f*, h, i	All
	1.3.11 Sewage effluent discharge with a volume greater than 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b	a, f (b is optional)	-	-	All	-	a, b*, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.11 Sewage effluent discharge to surface water requiring specific substances assessment (any volume)		All	a, b	a, f (b is optional)	-	-	All	a, b, c, d, e	a, b*, c, f*	a, b, c, d*, e*, f*, h, i	All
Settled storm sewage	1.3.19 Combined sewer overflow		All	a, b	-	a, b, c, d, f, g, h, i, j, k	-	All	-	a, b*, d*, f*	b, g, h, i	All

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Storm sewage	1.3.19 Combined sewer overflow		All	a, b	-	a, b, c, e, f, g, h, i, j, k	-	All	-	a, b*, d*, f*	b, g, h, i	All
Emergency overflow	1.3.20 Emergency overflows		All	a, b	-	a, l, m, n, o	-	All	-	a, b*, d*, f*	b, g, h, i	All
Trade and/or non-sewage – known volume	1.3.12 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume up to and including 5 m^3/day (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	b*, d*, f*	b, f*, h, i	All
	1.3.13 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume greater than 5 m^3/day (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	b*, d*, f*	b, d*, e*, f*, h, i	All
	1.3.14 Trade and/or non-sewage effluent discharge to surface water or groundwater requiring specific substances assessment (any volume)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	b*, c, d*, f*	b, d*, e*, f*, h, i	All
Trade and/or non-sewage – rainfall-dependent	1.3.12 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume up to and including 5 m^3/day (not requiring specific substances assessment)		All	a, b	b, e, f	-	-	All	b, c, d, e	b*, d*, f*	b, f*, h, i	All
	1.3.13 Trade and/or non-sewage effluent discharge to surface water or groundwater with a volume greater than m^3/day (not requiring specific substances assessment)		All	a, b	b, e, f	-	-	All	b, c, d, e	b*, d*, f*	b, d*, e*, f*, h, i	All

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Trade and/or non-sewage – rainfall-dependent	1.3.14 Trade and/or non-sewage effluent discharge to surface water or groundwater requiring specific substances assessment (any volume)		All	a, b	b, e, f	-	-	All	b, d, e	b*, c, d*, f*	b, d*, e*, f*, h, i	All
Mixed effluent (sewage combined with trade and/or non-sewage) – known volume	1.3.5 Sewage effluent discharge with a volume up to and including 5 m^3/day to surface water (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	b*, f*	a, b, c, f*, h, i	All
	1.3.6 Sewage effluent discharge with a volume up to and including 5 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, f*, h, i	All
	1.3.7 Sewage effluent discharge with a volume greater than 5 m^3/day up to and including 15 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, f*, h, i	All
	1.3.8 Sewage effluent discharge with a volume greater than 15 m^3/day to groundwater (not requiring specific substances assessment		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	d, f	a, b, c, d*, e*, f*, h, i	All
	1.3.9 Sewage effluent discharge to groundwater requiring specific substances assessment (any volume)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, d*, e*, f*, h, i	All

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Mixed effluent (sewage combined with trade and/or non-sewage) – known volume	1.3.10 Sewage effluent discharge with a volume greater than 5 m^3/day up to and including 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	b*, f*	a, b, c, f*, h, i	All
	1.3.11 Sewage effluent discharge with a volume greater than 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	b*, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.11 Sewage effluent discharge to surface water requiring specific substances assessment (any volume)		All	a, b, c, d	b, c, f	-	a, b	All	b, c, d, e	b, c, d	a, b, c, d*, e*, f*, h, i	All
Mixed effluent (sewage combined with trade and/or non-sewage) containing rainfall-dependent effluent	1.3.5 Sewage effluent discharge with a volume up to and including 5 m^3/day to surface water (not requiring specific substances assessment)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	b*, f*	a, b, c, f*, h, i	All
	1.3.6 Sewage effluent discharge with a volume up to and including 5 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, f*, h, i	All
	1.3.7 Sewage effluent discharge with a volume greater than 5 m^3/day up to an including 15 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, f*, h, i	All
	1.3.8 Sewage effluent discharge with a volume greater than 15 m^3/day to groundwater (not requiring specific substances assessment)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, d*, e*, f*, h, i	All

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Mixed effluent (sewage combined with trade and/or non-sewage) containing rainfall-dependent effluent	1.3.9 Sewage effluent discharge to groundwater requiring specific substances assessment (any volume)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	d, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.10 Sewage effluent discharge with a volume greater than 5 m^3/day up to and including 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	b*, f*	a, b, c, f*, h, i	All
	1.3.11 Sewage effluent discharge with a volume greater than 50 m^3/day to surface water (not requiring specific substances assessment)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	b*, f*	a, b, c, d*, e*, f*, h, i	All
	1.3.11 Sewage effluent discharge to surface water requiring specific substances assessment (any volume)		All	a, b	b, c, d, e, f	-	a, b	All	b, c, d, e	b*, c, f*	a, b, c, d*, e*, f*, h, i	All
Trade – returned abstracted water (including ground source heating and cooling)	1.3.15 Cooling water or thermal discharge to surface water or groundwater (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	-	All	b, c, d, e, f, g	b*, d*, f*	a*, b, d*, e*, f*, h, i	All
	1.3.16 Cooling water or thermal discharge to surface water or groundwater requiring specific substances assessment		All	a, b, c, d	b, c, f	-	-	All	b, c, d, e, f, g	b*, c, d*, f*	a*, b, d*, e*, f*, h, i	All
	1.3.17 Aquaculture (not requiring specific substances assessment)		All	a, b, c, d	b, c, f	-	-	All	b, c, d, e	b*, d*, f*	a*, b, d*, e*, f*, h, i	All
	1.3.18 Aquaculture requiring specific substances assessment		All	a, b, c, d	b, c, f	-	-	All	b, c, d, e	b*, c, d*, f*	a*, b, d*, e*, f*, h, i	All

Type of effluent	Charge band	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Effluent and/or contaminated surface water run-off arising from the operation of an installation	No additional charge, as already included as part of the installation variation application charge	✔	a, b, d	c	b, c, d, f		a, b2	a, b, c	b, c, d, e, f, g	d*, e*, f	a, b, d, e, f, h, i	a, b, c

* Check the relevant question and our guidance notes on part C6 to see if you need to give an answer.

1 About the variation you are applying for

1a Give a brief description of the changes you want to make to your permit

The Yorkshire Water (YW) Esholt Sludge Treatment Facility (STF), which forms part of the wider Esholt WwTW, exceeds the 100t/d capacity limit and it has therefore been agreed that a variation to an existing permit (reference number EPR/VP3130GZ) is required to add Schedule 5.4 Part A(1)b(i) for AD treatment activities.

1b Give this effluent a unique name

Esholt Sludge Treatment Facility

You must use this name to identify this effluent throughout this application and all associated documents.

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

☐ Yes

☐ No

1d Have you obtained all the necessary permissions in addition to this environmental permit to be able to carry out the discharge (see C6 guidance notes for more details)?

✔ Yes

No

N/A

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

2a What date do you want the permit for this effluent to start?

(DD/MM/YYYY)

Please note that charges will start on this date, even if you have not started to discharge, unless you contact us to change (delay) the start date (see the guidance notes on part C6). The start date cannot be before the permit is issued and cannot be changed (delayed) after it has already passed.

2b Is the discharge time limited?

Yes Please give the date you expect the discharge to end but please note that your permit will not end on that date and you will still need to notify us to surrender the permit

(DD/MM/YYYY)

No

2c Will the discharge take place all year?

✔ Yes

No Please give details of the months when you will make the discharge

2d Will the discharge take place on more than six days in any year?

☐ Yes

☐ No

3 How much do you want to discharge?

3a What is the daily dry weather flow?

[ ] cubic metres

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

[7758] cubic metres

Show how you calculated the figure given in the box below and continue on a separate sheet if necessary, giving a reference for the extra sheet

Refer to Section III: Supporting Information

Document reference

[Refer to Section III: Supporting Information]

3c What is the maximum rate of discharge?

[89.8] litres a second

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

[7757] cubic metres

3e What is the maximum rate of rainfall dependent discharge?

[ ] litres a second

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

Document reference

[Refer to Section III: Supporting Information]

4 Intermittent sewage discharges

4a For each answer to b to o below, show how you worked out the figure on a separate sheet

Document reference

4b What is the total volume of the off-line/storm tank storage?

cubic metres

4c What is the total volume of on-line storage?

cubic metres

4d What is the pass forward flow at the settled storm overflow setting?

litres per second

4e What is the pass forward flow at the storm overflow setting?

litres per second

4f Is the discharge screened?

☐ Yes Answer the relevant questions from 4g to 4j

☐ No Now go to 4k

4g What is the mesh screen spacing?

millimetres

4h What is the minimum screen capacity flow through the mesh screen?

litres per second

4i What is the bar screen spacing?

millimetres

4j What is the minimum screen capacity flow through the bar screen?

litres per second

4k Is the overflow constructed to good engineering design?

☐ Yes

☐ No On a separate sheet explain what standards the overflow has been constructed to

Document reference

4l What is the emergency storage capacity of the sewer and wet well?

cubic metres

4m What is the storage time within the sewer and the wet well above the top water level at dry weather flow?

hours and minutes

4n What is the pass forward flow at the pumping station?

litres per second

4o For intermittent emergency overflows you must provide a document setting out the key protection measures you will provide

Document reference for pumping station key protection measures

5 Should your discharge be made to the foul sewer?

Foul sewer means public or private foul sewer.

Before answering these questions, you must read the guidance notes to part C6.

You will also need to contact your sewerage undertaker (usually your local water company) and you may need to check if it is possible to connect to a private foul sewer.

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

Refer to Section III metres

5b To assess whether it is reasonable to discharge your effluent into the foul sewer, please answer 5b1 or 5b2

5b1 Discharges from domestic properties

Multiply the number of properties served by the sewage treatment system by 30 metres.

Number of domestic properties served by the sewage treatment system

x 30 metres =

0 metres

5b2 Discharges from all other premises including trade effluent

Divide the volume of the discharge (in cubic metres) by 0.75 and then multiply this figure by 30 metres

Volume of the discharge (answer to question 3b)

Refer to Section III cubic metres / 0.75 =

0 x 30 =

0 metres

Is your answer to question 5b1 or 5b2 above greater than the distance to the nearest foul sewer (answer to 5a)?

☐ No You do not need to explain why you cannot discharge your effluent into the foul sewer at this point. However, we may request this information from you when we determine your application. Now go to question 6.

☐ Yes You must explain on a separate sheet why you cannot discharge your effluent into the foul sewer, giving a reference for the extra sheet. Before you submit the application, you must explore the possibility of connecting to the foul sewer, and send us evidence that you have approached the sewerage undertaker, including their formal response regarding connection, if relevant. You must also show the extra cost of connecting to a sewer compared with the treatment system you propose, and details of any physical obstacles such as roads, railways, rivers or canals.

We will only agree to the use of private treatment systems within sewered areas if you can demonstrate that:

- the additional cost of connecting to the foul sewer would be unreasonable
- connection is not practically feasible, or
- the proposed private treatment system can be shown to significantly benefit the environment

We are unlikely to grant a permit for a discharge of treated domestic sewage in circumstances where a private sewerage system is being proposed due to a lack of capacity in the nearest public sewerage network.

The guidance notes to part C6 will help you understand what information you need to provide in order to answer this question.

Document reference for where you have given this justification

6 How will the effluent be treated?

6a Do you treat your effluent?

Yes Now go to question 6b

✔ No You must explain why the effluent will not be treated

Document reference for where you have given this justification

Refer to Section III: Supporting Information

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

For installations with point source emission to water or sewer, there is no need to duplicate information already provided in part C3 form. Where this information is already provided, give the document reference and go to question 7.

Document reference

Refer to Section III: Supporting Information

Table 2 – Treatments carried out on your effluent

Order of treatment	Code number	Description
First		
Second		
Third		
Fourth		

Continue on a separate sheet if you need more rows. If you prefer, you can also send us an overall design for the whole treatment process.

Document reference

Refer to Section III: Supporting Information

7 What will be in the effluent?

For all applications, whether to surface water, or onto or into ground, you should still check to see if your discharge is likely to contain any of the specific substances listed in the guidance documents on 'Risk assessment for treated sewage or trade effluent discharges to surface water or groundwater' (see https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit).

Answer the relevant questions for your discharge below.

7a Are any of the specific substances listed in 'Risk assessment for treated sewage or trade effluent discharges to surface water or groundwater' likely to enter the sewerage system upstream of the discharge through any authorised or known inputs?

☐ Yes

☐ No

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?

☐ Yes

☐ No

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?

☐ Yes

☐ No

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'?

☐ Yes

☐ No

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.

Document reference

Refer to Section III: Supporting Information

7f What is the maximum temperature of your discharge?

Refer to Section III degrees Celsius

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

Refer to Section III increase in degrees Celsius

_____ decrease in degrees Celsius

8 Environmental risk assessments and modelling

You may need to carry out an environmental risk assessment or modelling to support your application. Please answer all the questions that are relevant to your discharge. If an environmental risk assessment or modelling is required, you must send it to us with your application.

8a Sewer modelling report (for discharges of final effluent from a water company WwTW or intermittent sewage discharges)

You must carry out sewer modelling following the guidance 'Surface water pollution risk assessment for your environmental permit' at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit.

Send us details of how the modelling was carried out and the outcome.

Document reference for the sewer modelling report

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

You must carry out modelling following the guidance 'Surface water pollution risk assessment for your environmental permit' at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit. Send us details of how the modelling was carried out and the outcome.

Document reference for the modelling report

8c Discharges to freshwater (non-tidal) rivers

If the discharge contains, or potentially contains, any specific substances, you must carry out screening following the guidance 'Surface water pollution risk assessment for your environmental permit' at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit. The guidance notes on part C6 outline the information you must provide.

Have you answered yes to any of 7a to 7d?

☐ Yes Send us the completed screening tool, along with the raw data used to create the summary statistics

Document reference for the screening tool and raw data

☐ No

8d Discharges to groundwater

You must carry out a groundwater quantitative risk assessment following the guidance in 'Groundwater risk assessment for your environmental permit' at https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit. Send us details of how the modelling was carried out and the outcome.

For groundwater remediation schemes you must send us a site-specific remediation strategy that has been agreed with the local Environment Agency Groundwater and Contaminated Land Team.

Document reference for the groundwater remediation report

N/A

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

If the discharge contains, or potentially contains, any specific substances, you must carry out screening following the guidance (see https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit). The guidance notes on part C6 outline the information you must provide.

Have you answered yes to any of 7a to 7d?

☐ Yes Send us the completed screening tool, along with the raw data used to create the summary statistics. Where the discharge is via sewer, include sewage treatment reduction factors in the calculations.

Document reference for the screening tool and raw data

Refer to Section III: Supporting Information

There is no need to duplicate information already provided in part C3 form. Where this information is already provided, give the document reference above.

8f Environmental impact assessment

Have you carried out an environmental impact assessment?

Yes Send us details of how the assessment was carried out and the outcome

Document reference for the environmental impact assessment

✔ No

9 Monitoring arrangements

Note: If your effluent has a maximum volume of no more than 50 cubic metres a day you do not need to complete question 9d or 9e.

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

N/A

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

Refer to Section III: Supporting Information

9c Do you have an Urban Waste Water Treatment Directive final effluent sampling point?

☐ Yes Please provide the national grid reference

☐ No

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

Refer to Section III: Supporting Information

9e Does the flow monitor have an MCERTS certificate?

Yes Please give the certificate number

✔ No

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

Yes Please provide the national grid reference

✔ No

9g Do you have an event duration monitoring point(s)?

☐ Yes Please provide the national grid reference

☐ No

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

Document reference for the plan

Refer to Section III: Supporting Information

9i Do you intend to do your own effluent monitoring?

Yes

✔ No

10 Where will the effluent discharge to?

10a Mark in Table 3 where this effluent discharges to and fill in the relevant appendix or appendices.

You must use the name you gave to this effluent in answer to question 1b of this form when filling in your relevant appendix or appendices.

Table 3 – Where the effluent discharges to

Receiving environment		Relevant appendix
Borehole or well	☐	1
Into land (for example, through a drainage system)	☐	2
Onto land	☐	3
Tidal river, tidal stream, estuary or coastal waters	☐	4
Non-tidal river, stream or canal	☐	5
Lake or pond	☐	6

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

Yes Give details, on a separate sheet, of the circumstances under which each outlet would be used by this effluent

Document reference

Refer to Section III: Supporting Information

✔ 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.

You must give us all the details we need for each of the discharge points used by this effluent.

11 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: https://www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

- ☐ Yes please
- ☐ No thank you

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

- ☐ No
- ☐ Yes

Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 6.

Appendix 1 – Discharges to a borehole or well (or other deep structure)

If you are discharging the effluent to a borehole or well or other deep structure (such as concrete rings, natural swallow hole or deep soakage pit) you must ensure that the discharge is indirect to groundwater. Direct discharges to groundwater cannot be permitted. We will undertake a groundwater quantitative risk assessment on your behalf in line with the guidance 'Groundwater risk assessment for your environmental permit' at https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit.

For us to do this you must answer the following questions relevant to your application and provide us with additional information as summarised in Table 4.

Without this information we will be unable to complete the risk assessment and it is likely your application will be rejected.

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1.1 Give the discharge point a unique name

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

1.2 Give the national grid reference of the discharge point

1.3 Is the discharge to ground via a

- ☐ Well
- ☐ Borehole
- ☐ Other deep structure Please give details (e.g. concrete ring structure, shaft, natural swallow hole, soakage pit etc.)

1.4 What is the diameter of the borehole, well or other deep structure that the effluent will be discharged into?

metres

1.5 Is the borehole, well or other structure already constructed?

- ☐ Yes Now answer questions 1.6 to 1.9
- ☐ No Now answer questions 1.10 to 1.12

Existing borehole, well or other deep structure

1.6 What is the total depth to the bottom of the existing well, borehole or other structure?

_____ metres below ground level

If you are unaware of the actual depth please estimate the depth based on the following categories:

☐ 0–5 metres

☐ 5–10 metres

☐ Greater than 10 metres

☐ Uncertain

What evidence is the estimated depth above based on?

_____

1.7 Does the well, borehole or other structure extend into groundwater?

☐ Yes – always contains water

☐ Sometimes – water is present occasionally

☐ No – never contains water

If groundwater is always, or sometimes, present, what is the highest level that the standing water reaches?

☐ Measured

_____ metres below ground level

☐ Estimated

_____ metres below ground level

1.8 Please provide any records, diagrams or borehole logs you may have that could help us understand:

- the method of construction (including any solid casings or linings used)
- the likely depth of the deep structure
- the local groundwater conditions

Please provide photocopies where possible. If it is not possible (for example, if the documents are large or bulky) please summarise any additional information you have on a separate sheet.

Document reference for the records, diagrams, or borehole logs

_____

1.9 If any maintenance has been carried out on your well, borehole or other deep structure (for example, to aid effective drainage), please give details below

Please now answer question 1.13

Proposed borehole, well or other deep structure that has not yet been constructed

1.10 Please tell us why you are unable to install a shallow engineered drainage system. This information forms an important part of our permit determination process. Which methods of shallow disposal have you considered, and why did you decide these were not feasible to take forward? Please answer questions 1.10a and 1.10b to provide the results of soakage tests and summarise in the box any relevant information supporting your decisions (for example, permission refusals from landowners or physical constraints, or land availability or proximity to buildings).

1.10a What was your percolation value (Vp) result?

⌊_____⌋ seconds per millimetre

You must show in Table 4 how you worked out the percolation value.

Table 4 – Percolation value

	Trial 1	Trial 2	Trial 3	Average
Hole 1				
Hole 2				
Hole 3				
Hole 4				

1.10b If a shallow engineered drainage system were feasible, what would be the required surface area of your infiltration system?

square metres

Supporting information to explain why you are unable to install a shallow engineered drainage system can be appended to your application.

Document reference for these details

1.11 Please tell us the type of deep structure (for example, borehole, well, deep soakage pit) you propose to install

What will the total depth be?

metres below ground level

1.12 Please tell us the reason this depth has been selected and, if you are aware of any relevant existing information on local water levels, please also tell us the depth to groundwater (in metres below ground level). What measures will you undertake to ensure the discharge is not direct into groundwater? If the discharge will be direct to groundwater explain why you cannot make it indirect. Direct discharges to groundwater cannot be permitted.

Proximity of your discharge to other receptors

1.13 Is the borehole, well or other deep structure where the discharge is being/will be made within 50 metres of any other well, spring or borehole used to supply water for drinking water or food production purposes?

☐ Yes Please show the location of the well, spring or borehole you identified in answer to question 1.13 on the plan you have provided for section 4 of the main application form. Please now answer question 1.14

☐ No Please now answer question 1.15

1.14 Please tell us about the water supply (or supplies) used for drinking water or food production purposes identified in question 1.13 above; for example, the name of the property or properties served by the water supply, what they use the water for (drinking water, food production) and where they are in relation to your discharge

1.15 What is the distance to the nearest watercourse (for example, surface water, river, stream or ditch)?

⌊_____⌋ metres

Please tell us whether you have considered discharging to surface water and why this is not feasible

In Table 5 please provide any further information required for us to complete a groundwater quantitative risk assessment on your behalf in line with the guidance 'Groundwater risk assessment for your environmental permit' at https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit. Without this information we will be unable to carry out a hydrogeological risk assessment on your behalf.

Table 5 summarises the information required to allow us to undertake a hydrogeological risk assessment of your discharge to a deep infiltration system. Without this information your application will be rejected. You will already have provided some of this information earlier in this application form. We also need you to provide additional information indicated by a tick (✓) in Table 5. For further guidance on the additional information required please search for 'Groundwater risk assessment for your environmental permit' at https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit and the guidance notes on part C6. You may require the advice of an environmental consultant to collate this information.

For some of the risk assessment inputs we are better placed to provide the information and will do so for those parameters indicated by an asterisk (*) as far as possible. However, if you wish to provide site-specific information for those parameters with an asterisk you are welcome to do so.

Table 5 – Further information required for the Environment Agency to complete a groundwater quantitative risk assessment on your behalf

Information	Description	Existing structure	Proposed structure	Information supplied?
Information supplied by the applicant This has already been requested earlier in the application form				Information you have already supplied on the application form
National grid reference of the discharge point		Appendix 1 Q2	Appendix 1 Q2	
Volume of effluent (m^3 per day)		Q3b	Q3b	
Type of effluent treatment	Septic tank, package treatment plant, other	Q6	Q6	
Type of deep infiltration system	Borehole, well, concrete ring structure, other	Appendix 1 Q3	Appendix 1 Q3	
Diameter of deep infiltration system (metres)		Appendix 1 Q4	Appendix 1 Q4	
Depth to the base of deep infiltration structure (metres)		Appendix 1 Q6	Appendix 1 Q11	
Depth to water table (metres)	Is discharge above or below water table?	Appendix 1 Q7, Q8	Appendix 1 Q12	
Justification for a deep infiltration system	Why are you unable to install a shallow infiltration system? What other options for disposal have been considered? Provide full details of the infiltration tests undertaken plus results	Appendix 1 Q8 if available	Appendix 1 Q10	
Information supplied by the applicant This is additional information we need from you that is not provided elsewhere on the application form. Site data should be given where it is already available. If not, you can submit the relevant literature values quoting the source of the data and justification of the values you have selected. Please tick the right-hand column to confirm you have provided this essential information.				

Information	Description	Existing structure	Proposed structure	Information supplied?
Concentration of relevant substances entering the infiltration system	For discharges of domestic effluent we will routinely assess the concentration of nitrogen species, particularly the ammonium concentration	✓	✓	☐
Length of screened borehole section below the water table (metres)	Depth in metres of the borehole screened section that is below the water table (This applies only to boreholes that have groundwater in the base)	✓	✓	☐
Calculated area of infiltration system (square metres)	Explain how the area of the infiltration system has been calculated – this is especially relevant if a non-circular system is used	✓	✓	☐
Unsaturated zone parameters	The following represent the strata above the water table: • hydraulic conductivity (metres per day) • water-filled porosity (per cent) • bulk density (grammes per cubic centimetre)	✓	✓	☐
Saturated zone parameters	The following represent the strata above the water table: • hydraulic conductivity (metres per day) • water-filled porosity (per cent) • bulk density (grammes per cubic centimetre) • hydraulic gradient of the water table (fraction)	✓	✓	☐
Information provided by the Environment Agency where possible You are free to provide this information if you wish, or in some specific cases we may need to ask for this at a later stage. Please tick if you have provided this information (optional).				

Information	Description	Existing structure	Proposed structure	Information supplied?
Environmental standard	The relevant environmental standard or compliance value against which we will assess your effluent discharge	*	*	☐
Half-life for degradation of the substance (days)	If you wish to know more about these parameters see 'Groundwater risk assessment for your environmental permit' at https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit	*	*	☐
Soil water partition coefficient (litres per kilogramme)		*	*	☐
Mixing zone thickness (metres)		*	*	☐
Distance to compliance point (metres)		*	*	☐

Appendix 2 – Discharges into land

Answer the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

2.1 Give the discharge point a unique name

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

2.2 Give the national grid reference of the discharge point

2.3 Is your infiltration system new or existing?

☐ New Now go to question 2.5

☐ Existing Now go to question 2.4

2.4a When was it built?

2.4b Now answer questions 2.5–2.8 if you are able to, if not leave them blank and go to question 2.9

2.5 Is your infiltration system designed and built to British Standard 6297:2007 + A1:2008 or the British Standards in force at the time of installation?

☐ Yes

☐ No Please provide details, on a separate sheet, of the design criteria used for your infiltration system

Document reference

2.6 On what date did you carry out a percolation test and dig a trial hole in line with British Standard 6297:2007 + A1:2008?

(DD/MM/YYYY)

2.7 What is your percolation value (Vp) result?

seconds per millimetre

You must show in Table 6 how you worked out the percolation value. Please also provide your test sheets and any field notes or observations made regarding ground conditions.

Table 6 – Percolation value

	Trial 1	Trial 2	Trial 3	Average
Hole 1				
Hole 2				
Hole 3				
Hole 4				

2.8 Please show us how you have calculated the area (A) of your infiltration system

p ⌊_____⌋ x

Vp ⌊_____⌋ x

0.25 for septic tanks =

A ⌊0_____⌋ square metres

or

p ⌊_____⌋ x

Vp ⌊_____⌋ x

0.20 for package treatment plants =

A ⌊0_____⌋ square metres

p Population based on maximum occupancy

Vp Percolation value in seconds/mm

2.9 If known, mark on the plan you have provided the extent of the infiltration system. Please write on the plan the length and width of the sides in metres.

2.10 Is any part of your infiltration system within 50 metres of a well, spring or borehole?

☐ No

☐ Yes Identify the location of the well, spring or borehole on the plan you have provided and answer question 2.11

2.11 Is the well, spring or borehole you have identified used to supply water?

☐ No

☐ Yes You must describe what the water supplied is used for

2.12 Is any part of your infiltration system within 10 metres of a watercourse?

☐ No

☐ Yes Identify the location of the watercourse on the plan you have provided for section 4 of part C2

Appendix 3 – Discharges onto land

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

3.1 Give the discharge point a unique name

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

3.2 Give the national grid reference of the discharge point

3.3 Select from the table below the type of area where the effluent is disposed of

Area type		
Unlined reed bed	☐	
Unlined grass plot	☐	
Unlined wetland	☐	
Other	☐	Please specify below

3.4 What is the surface area of the land used for your disposal?

square metres

3.5 Is any part of your infiltration system within 50 metres of a well, spring or borehole?

☐ No

☐ Yes Identify the location of the well, spring or borehole on the plan you have provided and answer question 3.6

3.6 Is the well, spring or borehole you have identified used to supply water?

☐ No

☐ Yes You must describe what the water supplied is used for

3.7 Is any part of your infiltration system within 10 metres of a watercourse?

☐ No

☐ Yes Identify the location of the watercourse on the plan you have provided for section 4 of part C2

Appendix 4 – Discharges to tidal river, tidal stream, estuary or coastal waters

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

4.1 Give the discharge point a unique name

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

4.2 Give the national grid reference of the discharge point

4.3 Give the name of the tidal river, tidal stream, estuary or area of coastal water if you know it

4.4 Is the discharge into a

- ☐ Tidal river
- ☐ Tidal stream
- ☐ An estuary
- ☐ Coastal water

4.5 Does the discharge reach the watercourse by flowing through a surface water sewer?

- ☐ Yes Give the national grid reference where the discharge enters the surface water sewer
- ☐ No

4.6 Is the discharge point above the mean low water spring tide mark?

- ☐ Yes Please explain, on a separate sheet, why the discharge cannot be made below this point

  Document reference
- ☐ No

4.7 How is the effluent dispersed?

For example, open pipe or diffuser system

If diffuser system go to question 4.8

4.8 Give details, on a separate sheet, of the design of the diffuser system

Document reference

4.9 Is the discharge made to a roadside drain or ditch?

☐ No

☐ Yes If yes, it is your responsibility to ascertain whether the relevant highways authority is responsible for the roadside drain or ditch. If it is, you need to secure the appropriate permissions from the relevant highways authority before submitting an application for an environmental permit to the Environment Agency. A copy of the written permission from the relevant highways authority must be submitted with the environmental permit application.

Document reference for the written permission from the relevant highways authority

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

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

5.1 Give the discharge point a unique name

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

5.2 Give the national grid reference of the discharge point

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

5.4 Is the discharge into a

- ☐ Non-tidal river
- ☐ Stream
- ☐ Canal

5.5 Does the discharge reach the watercourse or canal by flowing through a surface water sewer?

- ☐ Yes Give the national grid reference where the discharge enters the surface water sewer
- ☐ No

5.6 Does the watercourse dry up for part of the year?

- ☐ No
- ☐ Yes How many months per year is the watercourse dry?

Do you agree to install perforated pipe work before the discharge point?

The discharge must be made via a perforated pipe. Any section of that pipe which lies within 10 metres of the bank of any watercourse shall be perforated, but this perforated section shall not extend more than 10 metres from the bank of any watercourse.

- ☐ Yes
- ☐ No

5.61 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)

Watercourse typically becomes dry in:

January	☐	May	☐	September	☐
February	☐	June	☐	October	☐
March	☐	July	☐	November	☐
April	☐	August	☐	December	☐

Watercourse typically flows again in:

January	☐	May	☐	September	☐
February	☐	June	☐	October	☐
March	☐	July	☐	November	☐
April	☐	August	☐	December	☐

5.6.2 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?

5.7 Is the discharge made to a roadside drain or ditch?

☐ No

☐ Yes If yes, it is your responsibility to ascertain whether the relevant highways authority is responsible for the roadside drain or ditch. If it is, you need to secure the appropriate permissions from the relevant highways authority before submitting an application for an environmental permit to the Environment Agency. A copy of the written permission from the relevant highways authority must be submitted with the environmental permit application.

Document reference for the written permission from the relevant highways authority

Appendix 6 – Discharges to a lake or pond

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

6.1 Give the discharge point a unique name

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

6.2 Give the national grid reference of the discharge point

6.3 Give the name of the lake or pond if you know it

6.4 Select from the following table the type of lake or pond you will be discharging to and answer the relevant questions

Type of lake or pond		Relevant questions
Lake or pond which is not connected to a river or watercourse	☐	Permit not required*
Lake or pond which is not connected to a river or watercourse, where you have had a notice served under paragraph 5 of Schedule 21 of the Environmental Permitting (England and Wales) Regulations 2016	☐	6.5, 6.6, 6.7
Lake or pond that discharges into a river or watercourse	☐	6.5, 6.6, 6.7

* Unless a Notice has been served under paragraph 5 of Schedule 21 of the Environmental Permitting (England and Wales) Regulations 2016

6.5 What is the surface area of the lake or pond?

square metres

6.6 What is the maximum depth of the lake or pond?

metres

6.7 What is the average depth of the lake or pond?

metres

Form F1 (including letter of authorisation)

Application for an environmental permit Part F1 – Charges and declarations

Fill in this part for all applications for installations, waste operations, mining waste operations, water discharges, point source groundwater discharges and groundwater discharges onto land. Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it.

The form can be:

1) **saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.**
2) **printed off and filled in by hand. Please write clearly in the answer spaces.**

It will take less than two hours to fill in this part of the application form.

Contents

Each individual who is applying for their name to appear on the permit must complete the declaration in section 5. You will have to print a separate copy of the declaration page for each additional individual to complete.

1 Working out charges

You must fill in this section.

You have to submit an application fee with your application. You can find out the charge by searching for 'Environment Agency charging scheme and guidance: environmental permits' at www.gov.uk/government/organisations/environment-agency.

Please remember that the charges are revised on 1 April each year and that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Table 1 – Type of application (fill number of activity being applied for in each column)

Installation	Waste	Mining waste	Medium Combustion Plant (MCP)/Specified Generator (SG)	Water discharge/point source discharge to groundwater	Groundwater spreading onto land
1	1				

Table 2 – Charge type (A)

Charge activity reference	Charge activity description	What are you applying to do? E.g. new, minor variation, normal variation, substantial variation, surrender, low risk surrender, transfer	Amount
e.g. 1.17.3	e.g. Sect 5.2 landfill for hazardous waste	e.g. transfer	e.g. £5,561
1.16.2.1	Sect 5.4 (a) (i) and (b)(i) - Non hazardous waste	100%fee	£ 13,984.00
	installation - biological treatment		
Total A			£ 13,984.00

1 Working out charges (you must fill in this section), continued

Table 3 – Additional assessment charges (B)

Part 1.19 Charges for plans and assessments			Tick appropriate
Reference	Plan or assessment	Charge	
1.19.1	Waste recovery plan	£1,231	☐
1.19.2	Habitats assessment (except where the application activity is a flood risk activity)	£779	☑
1.19.3	Fire prevention plan (except where the application activity is a farming installation)	£1,241	☐
1.19.4	Pests management plan (except where the application activity is a farming installation)	£1,241	☐
1.19.5	Emissions management plan (except where the application activity is a farming installation)	£1,241	☑
1.19.6	Odour management plan (except where the application activity is a farming installation)	£1,246	☑
1.19.7	Noise and vibration management plan (except where the application activity is a farming installation)	£1,246	☐
1.19.8	Ammonia emissions risk assessment (intensive farming applications only)	£620	☐
1.19.9	Dust and bio-aerosol management plan (intensive farming applications only)	£620	☐
	Advertising	£500	☐
Total B			£ 3,266.00

Total charges

Total A plus total B £ 17,250.00

2 Payment

Tick below to show how you have paid.

Cheque ☐

Postal order ☐

Cash ☐ Tick below to confirm you are enclosing cash with the application

Credit or debit card ☐

Electronic transfer (for example, BACS) ☑

Remittance number PSCAPPYYORKSWI015

Date paid (DD/MM/YYYY) 20/01/2023

How to pay

Paying by cheque, postal order or cash

Cheque details

Cheque made payable to

Cheque number

Amount £

You should make cheques or postal orders payable to 'Environment Agency' and make sure they have 'A/c Payee' written across them if it is not already printed on.

Please write the name of your company and application reference number on the back of your cheque or postal order. **We will not** accept cheques with a future date on them.

We do not recommend sending cash through the post. If you cannot avoid this, please use a recorded delivery postal service and enclose your application reference details. Please tick the box below to confirm you are enclosing cash.

I have enclosed cash with my application ☐

2 Payment, continued

Paying by credit or debit card

If you are paying by credit or debit card we can call you. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro card only.

Please call me to arrange payment by debit or debit card ☐

Paying by electronic transfer BACS reference

If you choose to pay by electronic transfer you will need to use the following information to make your payment.

Company name	Environment Agency
Company address	SSCL (Environment Agency), PO Box 797, Newport Gwent, NP10 8FZ
Bank	RBS/NatWest
Address	London Corporate Service Centre, CPB Services, 2nd Floor, 280 Bishopsgate, London EC2M 4RB
Sort code	60-70-80
Account number	10014411
Account name	EA RECEIPTS
Payment reference number	PSCAPPXXXXXYYY

You need to create your own reference number. It should begin with PSCAPP (to reflect that the application is for a permitted activity) and it should include the first five letters of the company name (replacing the X's in the above reference number) and a unique numerical identifier (replacing the Y's in the above reference number). The reference number that you supply will appear on our bank statements.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWK60708010014411 and our SWIFTBIC number is NWBKGB2L.

If you do not quote your reference number, there may be a delay in processing your payment and application.

Provide a unique reference number for the application, i.e. do not only use the company name only		PSCAPPYYORKSWI015
State who is paying (full name and whether this is the agent/ applicant/other)		Yorkshire Water Services Limited (the applicant)
Fee paid	£	17,250.00
Date payment sent (DD/MM/YYYY)		20/01/2023

Now read section 3 below

You should also email your payment details and reference number to ea_fsc_ar@gov.sscl.com.

3 Privacy notice

The Environment Agency runs the environmental permit application service.

We are the data controller for this service. A data controller determines how and why personal information is processed.

Our personal information charter explains:

- your rights
- what we do with your personal information

We're allowed to process your personal information because we have official authority as the environmental regulator. We need this information to carry out a task in the public interest that is set out in law. As the data controller, when you apply for an environmental permit, we have a legal obligation to process your personal data under the Environmental Permitting Regulations. The second lawful basis for processing your personal data is to comply with this legal obligation.

We need your personal information to process your environmental permit application. If you do not give us this information we cannot issue a permit to you. After we've issued a permit to you, we use your personal information:

- to check that you're complying with your permit
- during any potential enforcement action

What personal information we collect

If you're the individual applicant, director or company secretary of a company applying or a technically competent manager we need your:

- name
- date of birth

3 Privacy notice, continued

- address
- email address

If you're the agent, consultant, employee responsible for the activity or the employee responsible for billing and invoicing we need your:

- name
- address
- email address

If you're the applicant we need details of any:

- convictions
- bankruptcy

We also collect any questions or feedback you leave, including your email address if you contact us.

Your responsibility with other people's personal information

If you've included personal information about other people on your application, you must tell them. You must provide them with a copy of this privacy notice so that they know how their personal information will be used.

What we do with your personal information

We use your personal information to help us decide whether to issue you with a permit.

The information (except dates of birth) is available online on our consultation website during the consultation period. This website is available to everyone so your information may be seen outside the European Economic Area.

After consultation we put all the information (except dates of birth) you give us in your application on our public register.

If you can demonstrate that any information you send us is commercially or industrially confidential, we'll consider withholding that information from our public register.

If you think that the information you'll send us may be a threat to national security you must contact the Secretary Of State before you apply. You must still send us that information with your application. We will not include this information on our public register unless the Secretary of State decides it can be included.

See the environmental permitting guidance for guidance on national security.

We may use your email address to contact you for user research to improve our service. You don't have to take part in the research.

Where your personal information is processed and stored

We store and process your personal information on servers in the UK. We will not host your personal information outside the European Economic Area.

We do not use your personal information to make an automated decision or for automated profiling.

How long we keep your personal information

We keep your personal information while your permit is in use and for 7 years after you surrender your permit. If the permit is for a landfill site, we keep the data for 10 years after surrender.

Removing personal information from the public register

We will remove your personal information from the public register if:

- you withdraw your application
- we refuse your application and the time limit for appealing the decision has expired or an appeal is dismissed
- the information is no longer relevant for public participation purposes under the Environmental Permitting Regulations

Contact

Our Data Protection Team gives independent advice. They monitor how the Environment Agency uses your personal information.

If you have questions or concerns about how we process personal information, or to make a complaint or request relating to data protection, please contact:

Address: Data Protection Team
Environment Agency
Horizon House
Deanery Road
Bristol
BS1 5AH

3 Privacy notice, continued

Email: dataprotection@environment-agency.gov.uk

You can also make a complaint to the Information Commissioner's Office (ICO).

The ICO is the supervisory authority for data protection legislation. The ICO website has a full list of your rights under data protection legislation.

Now read section 4 below

4 Confidentiality and national security

Confidentiality

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application. You can find guidance on confidentiality in 'Environmental permitting guidance: core guidance', published by Defra and available via our website at www.gov.uk/government/organisations/environment-agency.

Only tick the box below if you wish to claim confidentiality for your application

Please treat the information in my application as confidential ☐

National security

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Secretary of State and you must still include the information in your application. We will not include the information in the public register unless the Secretary of State decides that it should be included.

You can find guidance on national security in 'Environmental permitting guidance: core guidance', published by Defra and available via our website at www.gov.uk/government/organisations/environment-agency.

You cannot apply for national security via this application.

Now fill in section 5

5 Declaration

If you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

Each individual (or individual trustee) who is applying for their name to appear on the permit must complete this declaration. You will have to print a separate copy of this page for each additional individual to complete.

If you are transferring all or part of your permit, both you and the person receiving the permit must make the declaration. You must fill in the declaration directly below; the person receiving the permit must fill in the declaration under the heading 'For transfers only'.

Note: we will issue a letter to both current and new holders to confirm the transfer. If you are changing address we will need to send this letter to your new address; therefore please tell us your new address in a separate letter.

If you are unable to trace one or more of the current permit holders please see below under the transfers declaration.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

I confirm that my standard facility will fully meet the rules that I have applied for (this only applies if the application includes standard facilities) ☐

Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well) ☑

Tick this box if you do not want us to use information from any ecological survey that you have supplied with your application (for further information please see the guidance notes on part F1) ☐

5 Declaration, continued

Name

Title (Mr, Mrs, Miss and so on)	Mrs
First name	Hazel
Last name	Mogan
on behalf of (if relevant; for example, a company or organisation and so on)	Yorkshire Water Services Limited
Position (if relevant; for example, in a company or organisation and so on)	Environmental Lead Advisor
Today's date (DD/MM/YYYY)	20/01/2023

For transfers only – declaration for person receiving the permit

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

I declare that the information in this application to transfer an environmental permit to me is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

Note: If you cannot trace a person or persons holding the permit you may be able to transfer the permit without their declaration as above. Please contact us to discuss this and supply evidence in your application to confirm you are unable to trace one or all of the permit holders.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well)	☐

Name

Title (Mr, Mrs, Miss and so on)	
First name	
Last name	
on behalf of (if relevant; for example, a company or organisation and so on)	
Position (if relevant; for example, in a company or organisation and so on)	
Today's date (DD/MM/YYYY)	

Now go to section 6

6 Application checklist

You must fill in this section.

If your application is not complete we will return it to you. If you aren't sure about what you need to send, speak to us before you submit your application.

You must do the following:

Complete legibly all parts of this form that are relevant to you and your activities	☑
Identify relevant supporting information in the form and send it with the application	☑
List all the documents you are sending in the table below. If necessary, continue on a separate sheet. This separate sheet also needs to have a reference number and you should include it in the table below	☑
For new permits or any changes to the site plan, provide a plan that meets the standards given in the guidance note on part F1	☑
Provide a supporting letter for any claim that information is confidential	☐
Get the declaration completed by a relevant person (not an agent)	☑
Send the correct fee	☑

6 Application checklist, continued

Question reference	Document title	Document reference
Form F, 2	Payment reference	BACS reference PSCAPPYYORKSWI015
All	Esholt STF permit variation application	Supporting Information document
Form A, C2, C3, C6, F1	Esholt STF permit variation application	Section I Forms (A, C2, C3, C6, F1)
Form C2, C3, C6	Esholt STF permit variation application	Section II Technical Description
Form C2, C3, C6	Esholt STF permit variation application	Section III Supporting Information
Form C2, C3, C6	Esholt STF permit variation application	Section IV Figures (nos. 1 to 4)
Form C2, C3, C6	Esholt STF permit variation application	Section V Appendices (nos. 1 to 16)

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, or you would like us to review a decision we have made, please let us know. More information on how to do this is available at: https://www.gov.uk/government/organisations/environment-agency/about/complaints-procedure.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

8 Where to send your application

For how many copies to send see the guidance note on part F1.

Please send your filled in application form to:

For water discharges by email to PSC-WaterQuality@environment-agency.gov.uk

For waste and installations by email to PSC@environment-agency.gov.uk

Or

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Do you want all information to be sent to you by email?

Please tick this box if you wish to have all communication about this application sent via email (we will use the details provided in part A) ☑

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

From Liz Barber
Chief Executive, Yorkshire Water

To Adele Burns
Sarah Maiden
Hazel Morgan

10th August 2021

Strategy and Regulation Sub Delegation

In accordance with the Yorkshire Water Services Limited Delegation Scheme, the following specific sub delegation will now apply within Strategy and Regulation.

I authorise Adele Burns, Lead Advisor, Hazel Morgan, Lead Advisor and Sarah Maiden, Environmental Permitting Team Leader power to submit applications for:

Environmental Permits;
Environmental Permitting Exemptions;
And variations, transfers and surrenders to the same.

Abstraction Licenses;
Transfer Licenses;
Impounding Licenses;
And variations and surrenders to the same.

On behalf of the company.
This Sub Delegation is authorised by the Chief Executive Officer.

Liz Barber
Chief Executive

Section II: Technical Description

This section of the application provides a Technical Description of the activities to be operated at the site.

The Information provided in this section should be viewed in parallel with:

- Section I: Application Forms
- Section III: Supporting Information

1.1 Introduction and overview

This application is being made due to changes to the Environment Agency (EA) interpretation of the environmental permitting exclusion for Urban Wastewater Activities (under Environmental Permitting (England and Wales) Regulations 2016 (EPR) Schedule 1, Part 2, Chapter 5, Section 5.4). The EA interpretation now requires that anaerobic digestion (AD) plants with a treatment capacity of over 100 tonnes/day (t/d) are classified as installations for the purposes of EPR. Furthermore, it has been determined that, in calculating sludge treatment capacity, there shall be no distinction between imported or indigenous sludges. Therefore, the Yorkshire Water (YW) Esholt Sludge Treatment Facility (STF) exceeds the 100t/d capacity limit, and it has been agreed that a variation to an existing permit is required to add Schedule 5.4 Part A(1)(b)(i) for AD treatment activities.

1.2 Permitting History

YW holds an environmental permit for the Combined Heat and Power (CHP) plant at Esholt; this was issued as a waste operation permit on 7th December 2012 (permit reference number EPR/VP3130GZ/V004). The scope of this permit includes biogas cleaning, storage and combustion in engines, boilers and/or flare. The permit also covers import of sludge from Wastewater Treatment Works (WwTW) for the generation and utilisation of biogas.

This application will vary this CHP permit; CHP and sludge intake activities will transition from being permitted waste operations to being DAAs to anaerobic digestion (i.e. DAAs to a Schedule 1 listed activity). The installation boundary in this area will also be extended to include the land occupied by sludge digestion activities, as well as an area of land to the southeast which is used for digested sludge treatment and handling.

This application also includes adoption of Medium Combustion Plant Directive (MCPD) Emission Limit Values for existing combustion plant (including appropriate monitoring provisions) from the relevant phase in date for the plant in question.

YW holds a completely separate waste operations permit covering sludge conditioning activities (permit reference number DP3192ZP). This permit will remain entirely separate with the intention of surrendering it in the future (the permit cannot currently be surrendered as legacy sludge phyto-conditioning (SPC) material remains on site on the SPC pad to the northwest of the digestion area).

A composting operation is active on an area of land to the south / southwest of the proposed new installation boundary. This permit was established via a partial transfer of permit reference DP3192ZP and is held by a third-party operator (Biowise). This permit will also remain entirely separate from the new STF permit, although it is noted that surface water runoff from the composting operation joins with surface water runoff from the cake pad. Further information is provided in response to Form C3 Q 2 Point Source Emissions to Sewer.

1.3 Description of Site Activities

A summary description of all activities carried out within the Esholt STF, and its relationship to the wider WwTW site, is provided below.

Figure A Installation schematic

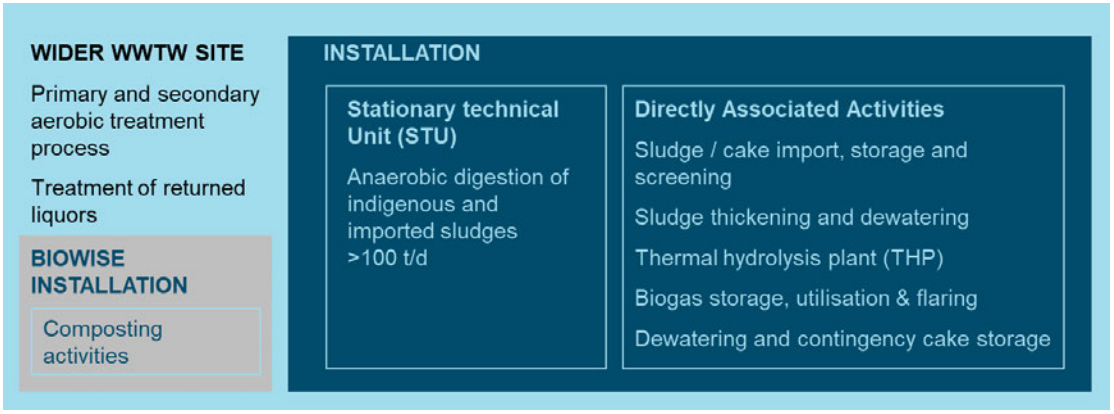


Figure B Installation overview

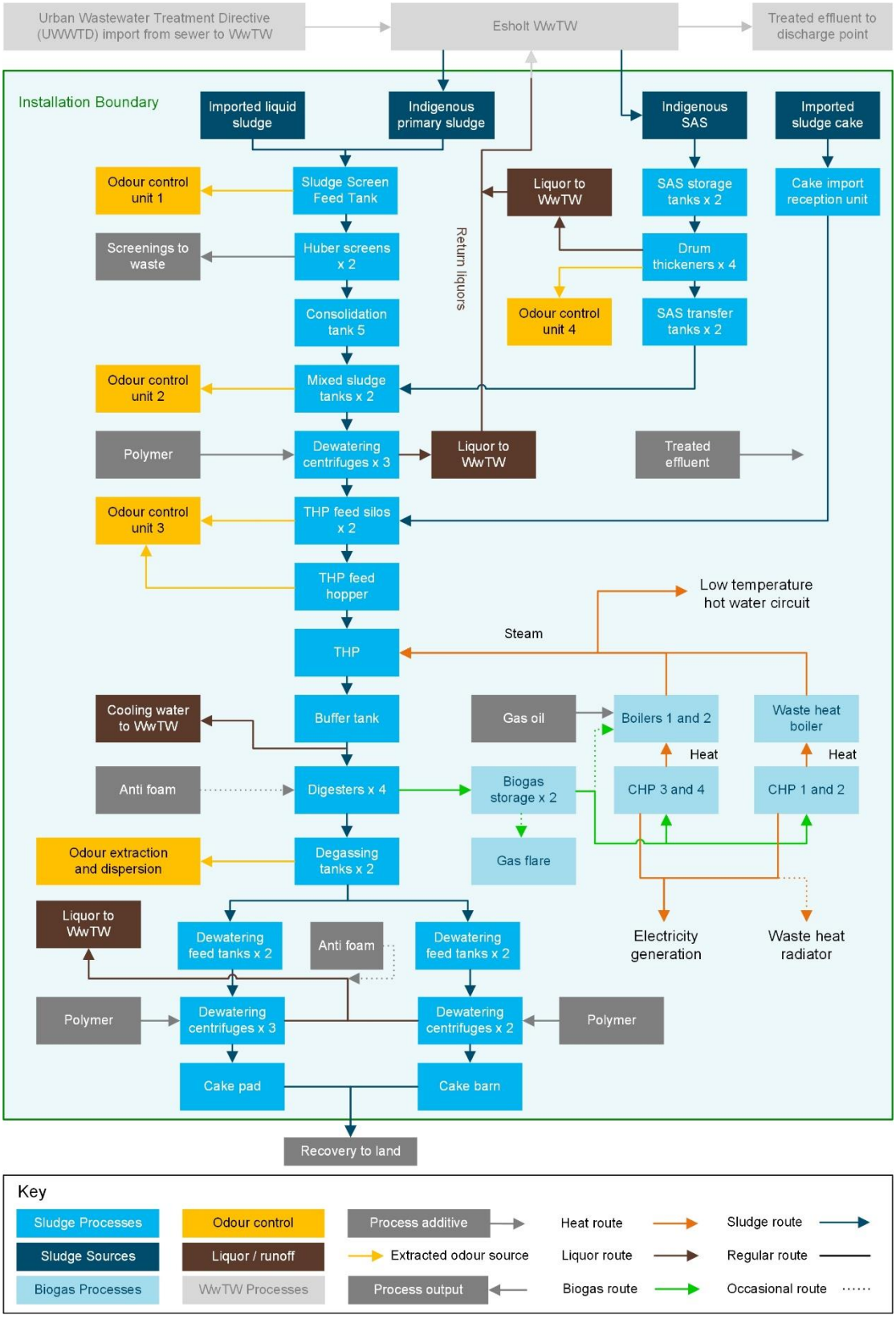
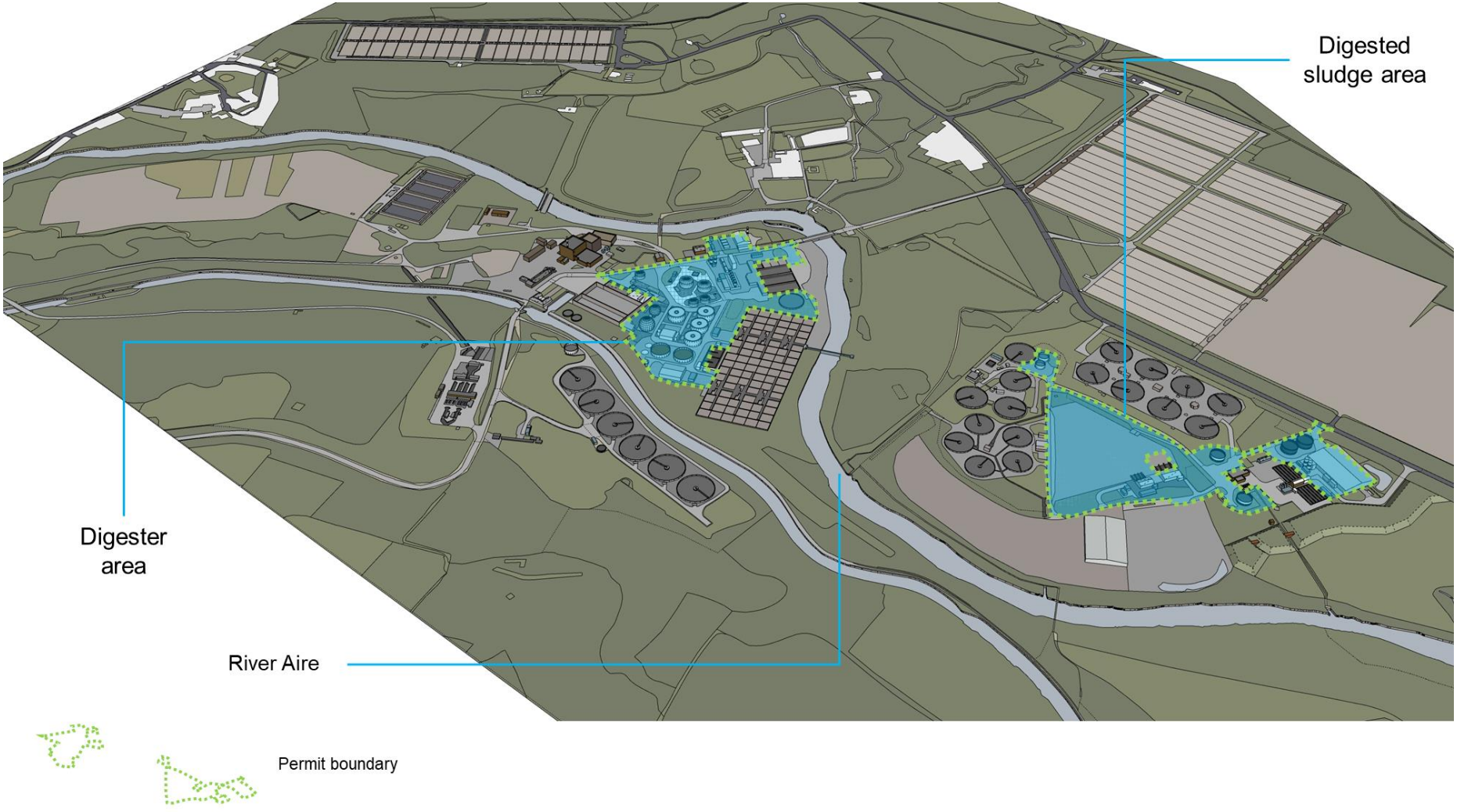


Figure C Installation illustration



1.4 Sludge reception, treatment and handling

Sewage sludges and sludge cake treated within the STF originates from several sources:

- Indigenous sewage sludges, including indigenous primary sludge and indigenous surplus activated sludge (SAS) arising from sewage treatment processes operated within the wider Esholt WwTW are piped directly to the STF.
- Sewage sludges generated by smaller YW sewage works (with lower capacity or capability for treating sludges on-site) are imported to Esholt STF for additional treatment. This may be received in the form of either liquid sludge or sludge cake.

Imported liquid sludge and indigenous primary sludge

Liquid sludge and sludge cake are delivered to the site by tanker / covered tipper lorry, the maximum load typically being 28 tonnes with unloading routinely taking up to 30 minutes. Only appropriately authorised vehicles can discharge at the site. This is controlled using 'WaSP' loggers, valves on the discharge pipework will only open when a driver presents appropriate authentication to the system. The WaSP loggers record the source of the sludge, the time and date of delivery, the total volume discharged and average percentage dry solids of the load.

Figure D Sludge unloading area via WaSP loggers

Imported liquid sludge is delivered to site by tanker. The tanker unloads at the dedicated sludge import area and sludge is pumped (using vehicle mounted pumps) into the sludge screen feed tank (655 m^3 concrete tank) where it is mixed with indigenous primary sludge pumped directly via underground pipework from Esholt WwTW. Headspace air from this tank is routed to a local Odour Control Unit (referred to as OCU 1). This is currently operated as a dispersion only stack. YW is committed to refurbishing and reinstating this OCU to provide effective odour abatement – refer to the proposed improvement programme. The sludge is screened using two Huber enclosed rotating screens. Screenings drop into a skip and are disposed of off-site (see Part III: Form C3, Question 6e for more details of waste streams).

YW is planning to improve sludge screening at Esholt STF. This project will comprise the following:

- Replace existing Rotamat rotating Huber screens with enclosed Huber strain presses. This will occupy approximately the same footprint as the existing screens.
- Addition of a hydrocyclone grit removal system. It is proposed that this additional process stage, to be added between the sludge import screens and Consolidation Tank 5 will be located adjacent to the consolidation tank gallery building within the proposed installation boundary area.

These process changes/additions are designed to improve sludge screening efficiency, provide enhanced fugitive odour emissions control, and in the case of the hydrocyclone, to reduce the potential for downstream process disruption caused by sludge contamination.

After screening, sludge is pumped via a sub-surface pipework, to Consolidation Tank 5 (2,500 m^3 uncovered concrete tank) (referred to on site as 'Consol 5') where sludge is blended and mixed using air injection.

Indigenous SAS

Liquid surplus activated sludge (SAS) is pumped directly from the co-located Esholt WwTW to two SAS storage tanks (2 x 2000 m^3 uncovered concrete tanks). These tanks are air mixed and operate on a fill/draw basis over a 24 hour period.

Sludge from the SAS tanks is transferred to the drum thickener building, via above and below ground pipework. There are four individual drum thickeners (with separate pipes feeding them) located within the building, these are operated manually as and when the process requires.

Liquid polymer is delivered to site either by tanker (bulk delivery) or is delivered in 1 m^3 IBCs. The bulk tanker delivery point is located on the eastern side of the building. Bulk polymer deliveries are transferred into a 10 m^3 bunded GRP bulk storage tank located within the thickener building and from there are transferred to the 3 m^3 bunded GRP polymer prep tank. IBC deliveries directly feed the liquid polymer prep tank. Liquid polymer is diluted with potable water within the 3 m^3 bunded GRP polymer prep tank before being transferred to the adjacent 3 m^3 bunded GRP polymer make up tank. Both the make-up and prep tanks are located within a common bund. A spillage within any of the three polymer tanks would be manually removed from the bunds and disposed of outside of the installation site. From the make up tank the polymer solution is injected into the sludge stream within the flocculation tank (one flocculation tank per pair of drum thickeners) with final treated effluent added as a 'carrier' before being transferred to thickener drums. The polymer encourages separation of

water from the sludge as the sludge is rotated in the drum to remove excess liquid. The thickener liquors are returned via the liquor return supernatant pumping station (uncovered below ground sump) to Esholt WwTW for full treatment. The thickened sludge is passed forward to the SAS transfer tanks (see below for further detail).

The drum thickeners are equipped with automatic spray bars which provide continual self-cleaning. The automatic spray bars operate using treated final effluent. A manual jet wash is available for additional cleaning requirements; this system utilises potable water. A full drum cloth clean is also carried out periodically (approximately every 1-2 months, as required).

Air is extracted from the drum thickeners and treated in a carbon filter OCU (referred to hereafter as OCU 4) prior to dispersal via twin dispersal stacks, approximately 7 m high and located to the north end of the SAS thickener building. Ambient air from the building is passively dispersed via louvre vents; ambient building air is not odorous under normal operating conditions due to the direct drum extraction.

The thickened sludge is then transferred to the SAS transfer tanks (2 x 400 m^3 uncovered concrete tanks). Thickened sludge tanks is mixed via pumps.

From the SAS transfer tanks the thickened SAS is then pumped to the mixed sludge tanks where it is mixed with indigenous primary and imported liquid sludges which are pumped from Consol tank 5. There are two covered concrete mixed sludge tanks with a capacity of 1,200 and 1,130 m^3 respectively. The mixed sludge tanks have an air mixing system to prevent settlement and septicity. Air from these tanks is extracted and routed to a local OCU (OCU 2). This is currently operated as a dispersion only stack. YW is committed to refurbishing and reinstating this OCU to provide effective odour abatement – refer to the proposed improvement programme.

Sludge dewatering

From the mixed sludge tanks, sludge is transferred to three dewatering centrifuges. A polymer solution is introduced to the sludge stream to encourage separation of water and sludge within the centrifuges. This polymer is stored as a dry powder within a silo (15 tonne storage capacity) and is mixed with towns (potable) water within the polymer mixing tank (25 m^3 capacity) located adjacent to the centrifuges. The liquid centrate is transferred via the liquor pumping station and returned for full treatment within Esholt WwTW.

Imported sludge cake

Imported sludge cake is tipped from an enclosed wagon to the dedicated sludge cake reception unit which is enclosed when tipping operations are not taking place. Sludge is moved from the sludge cake hopper and is rewetted with final treated effluent (to target ~21% dry solids) and pumped to the Thermal Hydrolysis Process (THP) feed silos (refer to description below for further detail of these process tanks and the THP itself). The sludge cake is rewetted to provide feedstock consistency and mobility. Transfer lines are trace heated and insulated to reduce the risk of freezing and pipe rupture.

Figure E Sludge cake reception facility

Dewatered sludge is passed forward to the THP feed silos (2 no. 210 m^3 steel tanks) where it is combined with re-wetted imported sludge cake. Feedstock from THP feed silos is then transferred to the THP feed hopper (16.2 m^3 steel tank). Headspace air from the THP feed silos and feed hopper is extracted and routed to a local OCU (OCU 3). This is currently operated as a dispersion only stack. YW is committed to refurbishing and reinstating this OCU to provide effective odour abatement – refer to the proposed improvement programme.

Best Available Techniques (BAT) Summary: Sludge reception, treatment & handling

- Controlled unloading processes with tankers contracted via approved supplier(s).
- Trace heating to pipework reduces the risk of loss of containment from pipe fracture on freezing.
- Trace heating is provided to key instrumentation such as tank level gauges to prevent freezing and reduce the risk of false readings.
- In-line dosing of polymer ensures levels are controlled and raw materials used efficiently.
- Tank mixing using air injection to avoid settlement, blockage or gas production.
- PLC controlled plant and largely automated. PLC includes level sensors to reduce risk of tank overtopping, resulting in contamination and potential odour generation.
- YW Environmental Management Procedures (EMPs) are in place covering the import process (refer to Section III, Form C2, Q3d Management Systems).

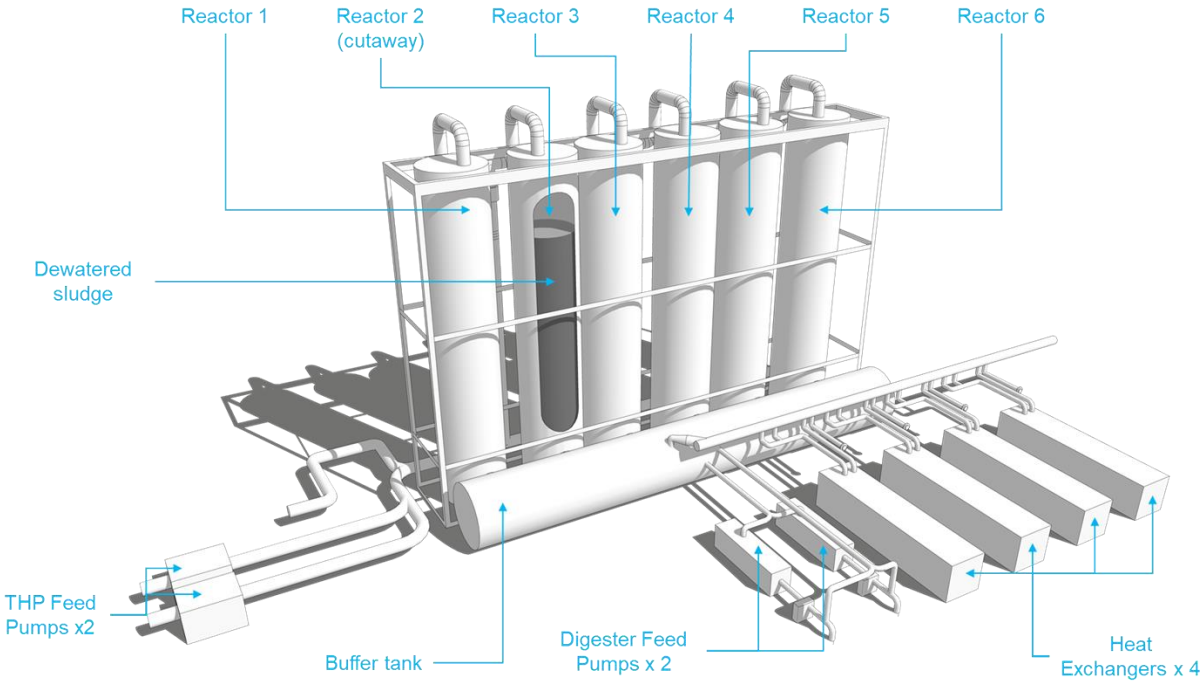
1.5 Thermal Hydrolysis Plant (THP)

At Esholt STF, thermal hydrolysis technology is used prior to anaerobic digestion to enhance sludge treatment; the process acts to make the sludge more biodegradable, increasing biogas production within the digesters and assisting with pathogen kill in the final product. The THP at Esholt comprises 6 no. 22.7 m^3 reactor vessels, which operate in pairs. Each pair of reactors operates a batch process as follows: a reactor pair is filled with dewatered sludge and heated to around 165 °C using steam generated by boilers (refer to Section 1.7 below). The reactors are held at this temperature for 30 mins and act like a pressure cooker to break down organic matter in the sludge making it more digestible for the microbes in the anaerobic digester. After 30 minutes the steam is flashed out to the next pair of reactors (as a pre-heat stage) and the reactor tanks are emptied. Activity within each pair of reactors is staggered with one pair being filled, one pair undergoing active reaction and the final pair being emptied at any one time. Steam is transferred from one pair of reactors to the next to supplement boiler steam supply and maximise operational efficiencies. The plant is equipped with safety features including pressure relief vents and rupture discs, which operate at a lower pressure to the PRVs, to allow emergency venting of steam and prevent damage to equipment.

The THP achieves 96% pathogen kill, in combination with the normal anaerobic digestion process, this eliminates the need for post-digester liming or cake storage and maturation prior to landspreading.

There is a facility to extract sludge, at approximately 21% dry solids, from process pipework prior to the THP. This is undertaken as a contingency in the event that there are operational problems within the THP that limits its processing capacity. Due to constant generation of sewage sludge by the WwTW, if needed dewatered sludge can be removed from pipework prior to the THP and stored temporarily on the conditioning pad (description of this area is provided below). The dewatered sludge is then fed back into the process when processing capacity is restored.

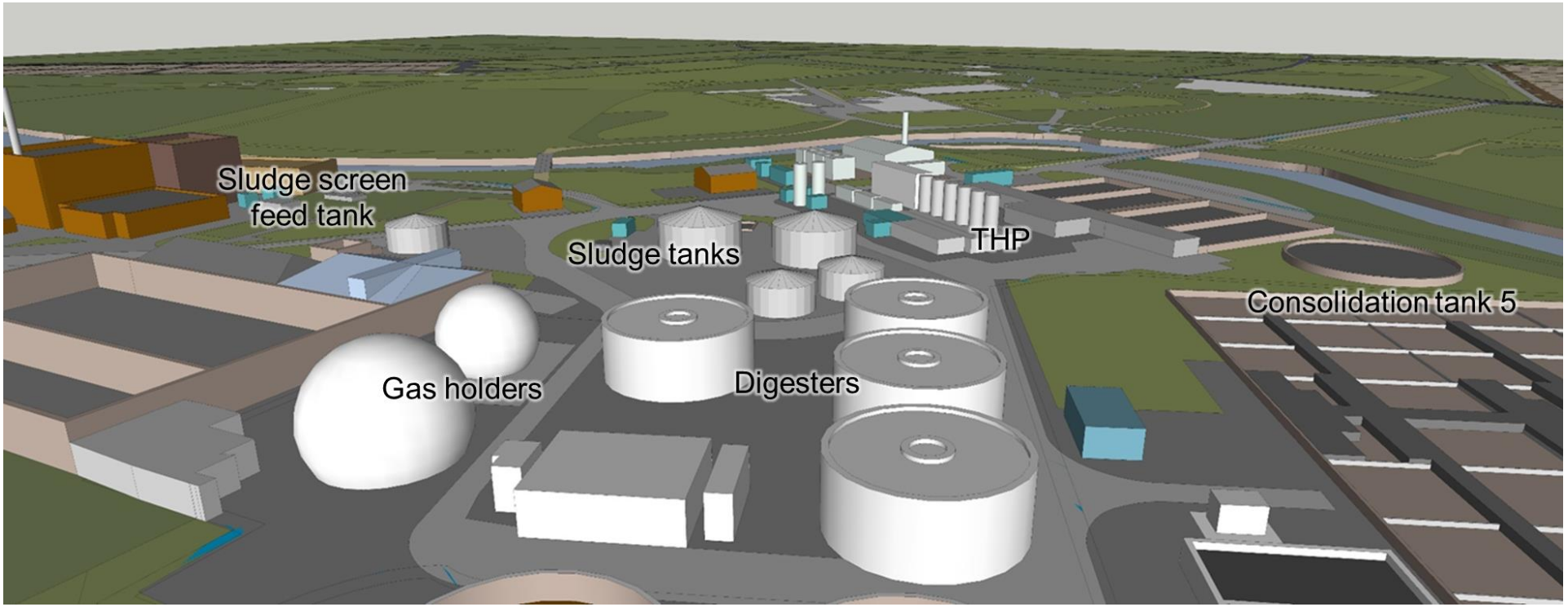
Figure F Thermal Hydrolysis Plant



1.6 Sludge digestion

Following THP, sludge is transferred to a steel buffer tank (39.5 m^3) and from there is passed forward via digester feed lines to the digesters. Heat exchangers are located within the digester feed lines to reduce sludge temperature to the optimal temperature range for mesophilic anaerobic digestion activity (37-43 °C). Cooling water is discharged to the WwTW for treatment. There are 4 no. aluminium-clad and insulated concrete digester tanks located on site, each with a capacity of 3,533 m^3. The anaerobic digesters operate as a continuous process with sludge being continually fed into the base of the digester and treated sludge being displaced from the top. The digesters operate independently of each other, and each have a maximum feed rate of around 106 tonnes / day dry solids (at 10% dry solids) or 1,060 m^3 /day. Digester retention time is determined by the feed rate (which is dependent on other site operations such as the THP), but is typically 10-11 days. The digesters are mixed by gas mixing systems, which utilise biogas from the headspace of each digester; the gas is compressed and then reintroduced using an array of mixing nozzles on the floor of the digester. The digesters do not require any supplementary heating due to the temperature of the sludge being passed forward from the THP.

Figure G AD area configuration



Grit build-up within digesters is a normal feature of operation, the digesters are cleaned out (including accumulated grit) every 10 years as part of the planned periodic inspection which also includes an internal and external inspection of tank integrity and replacement of instrumentation and gas mixing equipment as required. The planned hydrocyclone (to be added between the sludge import screens and Consolidation Tank 5) will help to reduce future grit build up, although internal cleaning will still be required.

An automatic anti-foam dosing system is in place to control digester foaming. This system uses a radar level probe in the digester headspace and compares this to the pressure level sensor at the bottom of the digester to determine the depth of foam. Upon detection of foam, final treated effluent is sprayed into the digester head space through nozzles in the digester roof. If this is not effective in breaking up the foam, a chemical anti-foam is mixed with final treated effluent and dosed into the headspace of the digester via the same spray nozzles. This system includes operator-adjustable dosing setpoints and failsafe systems; if the foam level continues to increase mixing systems are inhibited and if this continues the digester feed will be inhibited. Antifoam is stored in an 1m^3 IBC located on a bunded spill pallet.

Sludge extracted from the digesters is fed to the degassing tanks (2 no. 685 m^3 GRP coated concrete tanks) prior to onward processing. These tanks are equipped with air mixing to introduce oxygen and prevent the anaerobic generation of methane. The tanks are covered and headspace air is extracted and discharged via a stack, approximately 5 m high. YW is committed to route this tank air extraction to the biogas system – refer to the proposed improvement programme.

Best Available Techniques (BAT) Summary: Sludge digestion (*BAT 38*)

- THP increases digestibility of sludge, leading to enhanced biogas production and higher quality digestate. It also removes the need for extended cake maturation or liming to achieve the necessary pathogen target levels.
- Sludge pumps are on inverters for energy efficiency, and typically operate around 75% speed.
- Digested sludge transfer pumps are fitted with vent lines to prevent build-up of potentially explosive biogas.
- Plant operation is largely automated.
- YW procedures are in place covering the digestion process management.
- Monitoring is undertaken to check that the digestion process is healthy and stable. This includes temperature, solids, volatiles, fatty acids and pH, as well as biogas quality (Refer to Section III, Form C2 Q4a for further information on process monitoring).
- Foam levels are actively monitored, and an anti-foam system is used as required.
- Monitoring instrumentation including high level probes and pressure sensors linked to automatic PLC controlled pumps and other equipment to avoid potential loss of containment.
- A risk-based inspection and testing programme for above and below ground vessels, pipes and valves is in place. This incorporates a combination of visual examinations and non-destructive testing (e.g. ultrasonic thickness measurements).

1.7 Biogas storage and use

Biogas generated by the digester is piped to one of two double membrane biogas holders on site, one of these has a capacity of 2,380m^3 and the other a capacity of 1,040m^3. The biogas holders provide gas buffering capability in order to allow for fluctuations in gas production.

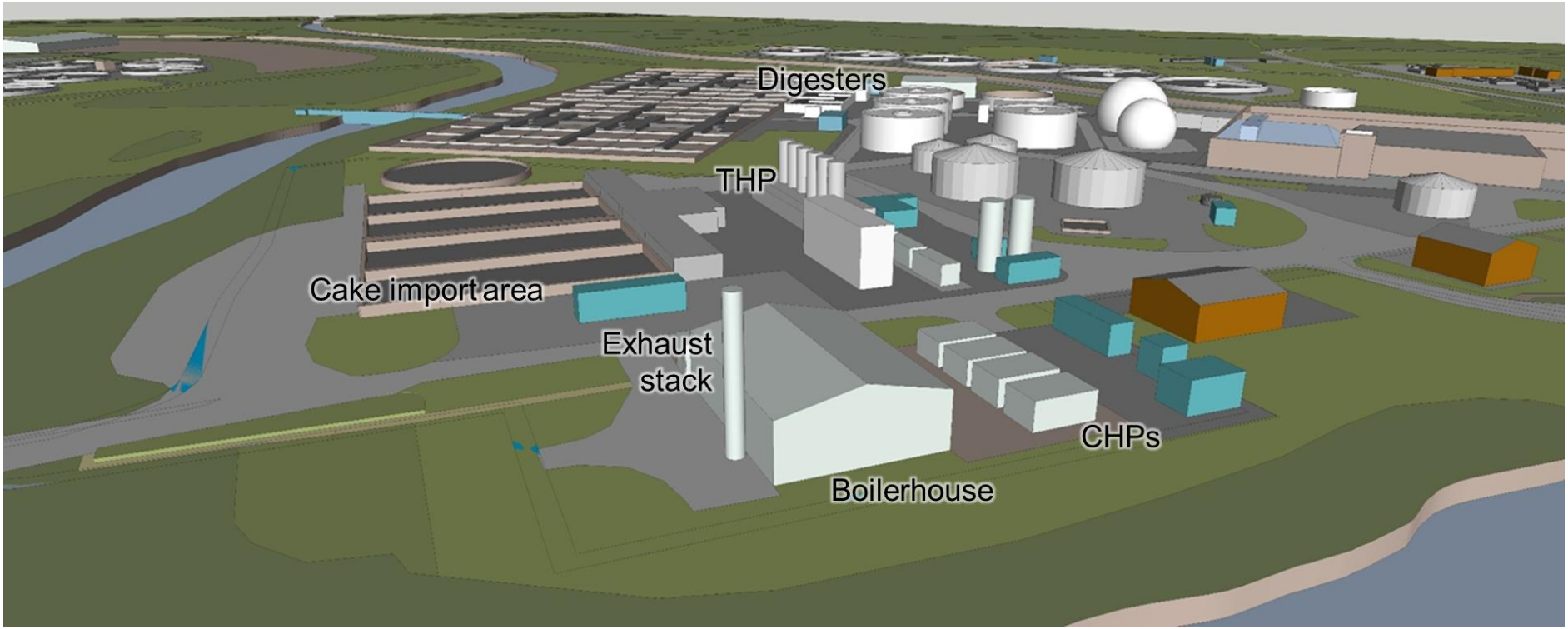
Each gasholder has an ultrasonic level detector to monitor the level of the inner membrane and hence the volume of gas stored. The level detectors are used to control the start and stop of the CHP, composite boilers and waste gas burner. There is a methane gas detector fitted between the two membranes to detect any leaks in the system and alert the plant operators.

Pressure relief valves (PRVs) are located on the inlet biogas pipeline serving each biogas holder as well as outer membrane vent valves on each holder. PRVs are also located at the digesters (2 no. at each digester). These valves are an essential safety mechanism and will release gas to atmosphere in the event of a build of pressure preventing damage to equipment. The digester valves are also an 'anti-vacuum' design to prevent tank damage from negative pressures. Additional gas release valves are installed at various points, for instance between the degassing tanks and centrifuge feed tanks. The primary purpose of these is to prevent air-locking within pipework and subsequent loss of pumping.

Excess liquids within the biogas system are removed via condensate traps. These are located at various points in the system including on pipework between the digesters and biogas holders, prior to the waste gas burner, and prior to the CHPs and boilers. These collected liquids are transferred to the WwTW for treatment.

YW propose to install a biogas dehumidifier unit to further enhance condensate removal from pipework prior to the CHP engines. This scheme is subject to further investigation but is likely to comprises a heat exchanger system to cool the biogas and thereby enhance condensate removal.

Figure H CHP compound configuration



Biogas, via a gas booster, is currently used as the sole fuel source for the CHP units operating at Esholt STF; no natural gas or other alternative fuel is available. The CHP facility comprises four reciprocating engine generator sets. Two of these engines (referred to as CHP 1 and 2) have a thermal input of 1.53MW and two (referred to as CHP 3 and 4) have a thermal input of 3.63MW each. The CHPs generate electricity which is used to power essential site processes. Heat from the combustion process is used in waste heat recovery boiler stages, with any excess being discharged using air cooled radiators.

There are two 6.2MW Cochran Low NO_x composite steam raising boilers on site which generate steam for the THP as well as hot water which feeds the low temperature hot water (LTHW) ring main. These composite boilers combine direct firing of gas oil and the capability to receive waste heat from the exhaust gases fed from CHPs 3 and 4. The combined heat input is used for steam raising. The primary fuel for the boiler direct firing stage is currently low sulphur gas oil, with biogas as a backup fuel source. When operating at full capacity the digesters are able to generate sufficient biogas to fuel all four CHPs. The boilers may be fired by biogas in the event that one or more the CHPs is unavailable.

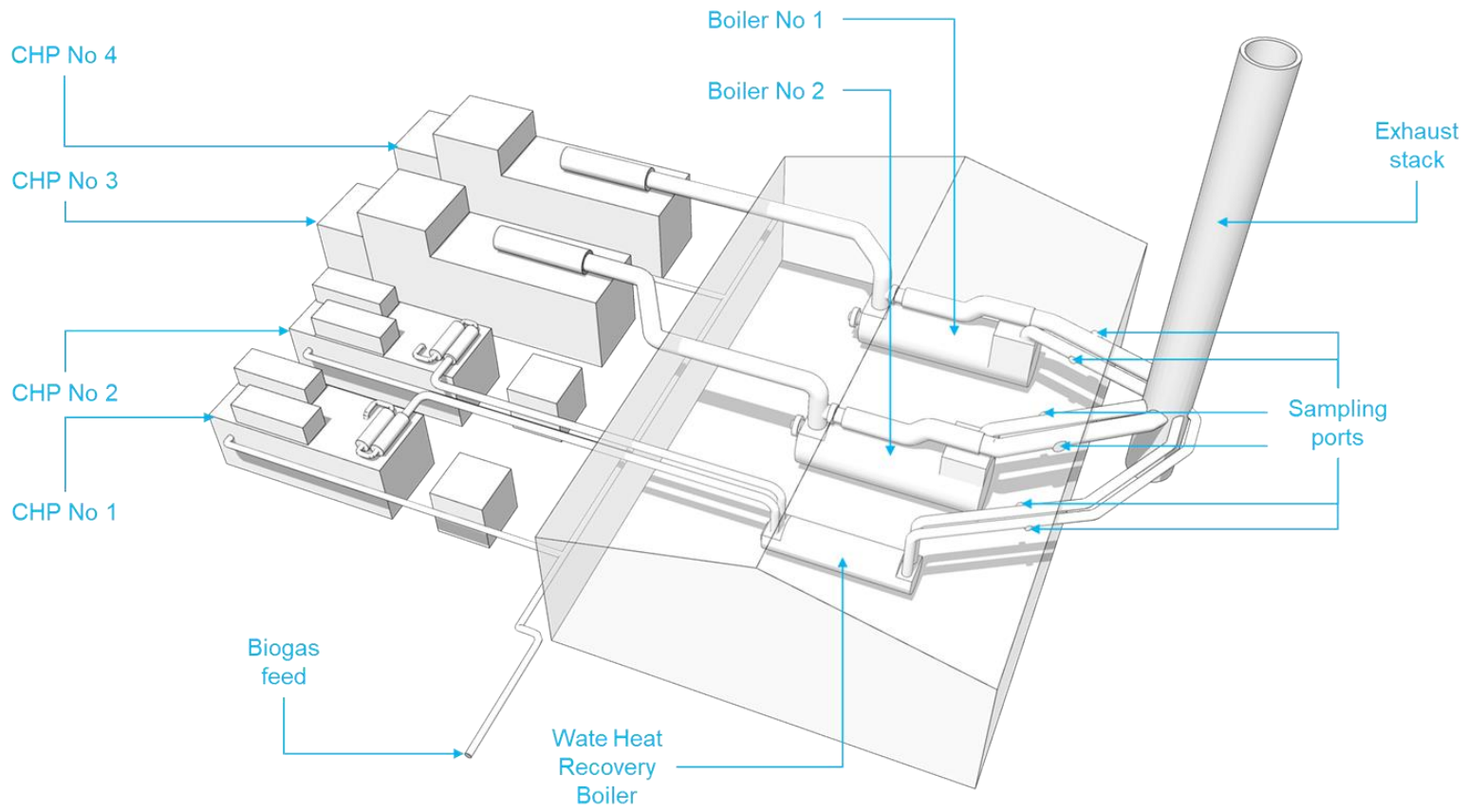
YW is proposing to bring a gas connection onto site to provide mains natural gas for operation of these steam raising boilers. This solution would replace gas oil as the main fuel source for the boilers (with biogas continuing to provide the back-up fuel source). It is also proposed that CHP1 will be converted to natural gas as its sole fuel source. The remaining three CHP engines would continue to operate with biogas as the sole fuel source. Air dispersion modelling has been undertaken to assess emissions following these change – refer to Appendix 7.

Gas oil for the boilers is stored in a 108 m^3 steel tank. This tank includes an integral bund providing secondary containment for the main tank and its fill point. Tertiary containment is provided around the tank filling area in the form of a low roll over bund with drain gully inside. The arrangement is compliant with the Oil Storage Regulations (2001). In addition to the two composite boilers a waste heat recovery (WHR) boiler operates on site. This has no direct firing capacity but recovers heat from CHP 1 and 2 exhaust gases to generate steam for the THP as well as hot water which also feeds the LTHW ring main.

The LTHW ring main receives recovered heat from the engine systems via heat exchangers. This is exported to provide space heating for the adjacent Esholt Hall conference centre owned and operated by YW as well as pre-heating biogas feed to the CHPs. Each engine is fitted with an air-cooled radiator to allow excess heat not required by the LTHW system. This allows the engines to run at full load independently of the demand of the LTHW system and steam generating plant, if necessary.

CHP engine and boiler combustion products are discharged via a 15 m high stack located adjacent to the boilerhouse. Contained within a single windshield are 6 exhaust stacks. These are: CHPs 1 and 2 (via waste heat boiler), CHP 3 and 4 (via or bypassing boiler 1 and 2 economisers) and exhaust stacks for boilers 1 and 2.

Figure I Combustion stack configuration



In periods where biogas generation exceeds CHP engine and boiler capacity (e.g. in the event of multiple plant shutdown/failures) biogas is directed to the waste gas burner. Since there are four CHP engines and two steam boilers with biogas firing capability, flaring rarely occurs. The flare facility comprises a 3,400m³/hr enclosed thermal combustor with 7.5m high exhaust stack and is located at a safe distance from the digesters and other biogas handling and treatment activities. Flare stack operation is automated based on gas level. If the gas level is high then the flare will operate, however utilisation of the gas is preferred over flaring. The flare provides 0.3 second retention time at 1,000 °C.

Figure J Waste gas burner

The areas around the digesters and gas storage and use are classified as a potentially explosive atmosphere, with strict provisions on the control of potential ignition sources in line with requirements of the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).

Best Available Techniques (BAT) Summary: Biogas utilisation and flares
(*BAT 15 and 16*)Flame arrestors are fitted to the biogas flare system to reduce the risk of fire / explosion.

- Flare burns at 1,000 deg. C with 0.3 second retention time.
- The flare is regularly checked to ensure that it ignites correctly when required and gas flow to the flare is constantly monitored using inline meters.
- Biogas holder provides gas buffering and allowance for fluctuations in gas production.
- Flow meters installed on gas utilisation under PLC control to maximise utilisation efficiency.
- The plant operates under PLC and is largely automated.
- YW procedures are in place covering biogas management.
- Heat is utilised on site in the THP and digestion process, waste heat, via the LTHW circuit serves off-site users.

1.8 Digested sludge treatment, handling and disposal

Digested sludge is pumped from the degassing tanks located adjacent to the anaerobic digesters to the digested sludge dewatering facility via a combination of above and below ground pipes, including a short section crossing the River Aire. The pipe crosses the river alongside the STF access roadway and is located at road level, on the far side and downstream of the road bridge barrier. The height above the river and roadside barrier provides protection for the pipe in the event of serious flooding which may bring large debris down river (refer to Part III, Q 6-5 Accident Management Plan).

There are two separate sets of facilities for digested sludge dewatering. The first of these, which is used preferentially, is known as the sludge export facility. Sludge is transferred from the degassing tanks to two export dewatering feed tanks, each of which is of steel construction and 1,604 m^3 capacity. These tanks are not covered and have air mixing systems to prevent settlement and inhibit generation of methane. Powdered polymer stored within a 25 m^3 storage silo, or liquid polymer stored in IBCs located within a GRP kiosk, is mixed with potable water within a polymer mixing tank. The polymer solution is injected into the sludge stream and taken to one of two export centrifuges where the sludge coagulates and supernatant liquor is removed by centrifugal forces. Dewatered liquor drops from the centrifuges into the export centrate sump and is pumped back to the WwTW for treatment.

The final digested and dewatered sludge cake is transferred via conveyers from the centrifuges up over a push-wall and into the covered sludge cake export barn. The whole area under the conveyer and sludge cake barn is an engineered impermeable surface, with water runoff draining to the WwTW for treatment.

Figure K Export cake barn

In addition to the export dewatering facility there is a second dewatering area, which provides additional capacity for digested sludge treatment and handling. This takes place in what is known as the conditioning area. When the THP/digestion plant are running at full capacity, sludge would typically be diverted to this second dewatering facility for approximately 5-10 minutes in each hour. During these periods, sludge is transferred from the degassing tanks to two conditioning feed tanks, each of which is of concrete construction and have a capacity of 1,200 and 1,130 m^3. These tanks are not covered and have air mixing both to prevent settlement and inhibit generation of methane.

Powdered polymer stored in 750kg bags are suspended over a hopper dosing system which feeds a make-up tank where the powdered polymer is mixed with potable water and transferred to an ageing tank and finally a storage tank. The polymer solution is injected into the sludge stream and taken to one of three centrifuges where the sludge coagulates and supernatant liquor is removed by centrifugal forces. Dewatered liquor drops from the centrifuges into the centrate sump and is pumped back to WwTW for treatment.

The final digested and dewatered sludge cake is transferred via conveyers on to the cake pad. The area under the conveyer and cake pad is an engineered impermeable surface, with water runoff draining the head of the works for treatment.

The digested sludge cake produced by this facility does not require liming or storage to ensure adequate pathogen kill and is suitable for immediate despatch from site to be landspread for agricultural benefit. The THP stage increases destruction of volatile sludge components within the digester, meaning that the final sludge cake has reduced odour generation potential.

The conditioning cake pad also serves certain contingency functions, both for operations at Esholt and for the wider strategic regional sludge treatment infrastructure operated by YW. The cake pad may on a temporary basis be used for interim storage of digested sludge cake produced at other YW sites, in circumstances such as the failure of assets or non-availability of normal disposal routes. It may also be used for interim storage of raw undigested sludge cake from Esholt or from other YW sites before being treated at Esholt STF, treated at another YW STF or sent off site to an alternative treatment/disposal route (subject to all applicable regulatory constraints).

Best Available Techniques (BAT Summary)

- Lagging on above ground pipework, including pipework running over the river, provides temperature management to ensure that flow is maintained reducing the risk of viscosity increases or expansion associated with cold temperatures, reducing the risk of pipe fracture and loss of containment.
- Digested sludge transfer pumps are fitted with vent lines to prevent build up potentially explosive biogas.
- Engineered cake pads with leachate and washwater collected for treatment at the WwTW.
- An inspection and testing programme for pipes and valves is in place. This includes biennial surveys using in-pipe crack detection technology.

Section III: Supporting Information

This part of the application provides detailed responses to questions in Section I: Application Forms, where further space is required to provide the necessary information.

Responses are provided only where further information is required, and the questions numbers are as stated in the application forms.

The information provided in this section should be viewed in parallel with:

- Section I: Application Forms
- Section II: Technical Description

Form C2 Supporting Information

2 About your proposed changes

Proposed changes to current activities within this installation are provided in C2: Table 1 below. A full summary of activities it is proposed will be included within this installation are provided in response to Form C3, Table 1a later in this section.

Table C2: 1 - Changes to existing activities

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operation	Description of the mining waste operations	Description of water discharge activity	Description of groundwater activity
Esholt STF	Section 5.4 A(1) (b)(i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment	**Addition**: Anaerobic digestion of indigenous and imported UWWT-derived sludges.	None – will be regulated as an installation level permit	N/A	N/A	N/A
		Addition: DAA associated with anaerobic digestion: Treatment of sludge prior to digestion (including reception, bulking, blending, physical handling, screening, dewatering and heat treatment (THP)).	None – will be regulated as an installation level permit	N/A	N/A	N/A
		Addition: DAA associated with anaerobic digestion: Treatment and storage of digested sludge (including physical handling and dewatering) produced at Esholt or other YW sites.	None – will be regulated as an installation level permit	N/A	N/A	N/A
		Addition permit: DAAs associated with anaerobic digestion: Interim storage of undigested sludge produced at Esholt or other YW sites, before treatment on site or treatment and recovery / disposal at another location.	None – will be regulated as an installation level permit	N/A	N/A	N/A
		Addition permit: DAAs associated with anaerobic digestion: Interim storage of digested sludge produced at Esholt or other YW sites, before recovery or disposal at another location.	None – will be regulated as an installation level permit	N/A	N/A	N/A

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operation	Description of the mining waste operations	Description of water discharge activity	Description of groundwater activity
		Adoption of Medium Combustion Plant Directive (MCPD) Emission Limit Values for existing combustion plant (including appropriate monitoring provisions) from the relevant phase in date for the plant in question (refer also to Appendix 12)	None – will be regulated as an installation level permit	N/A	N/A	N/A
		None – currently regulated as a waste level permit	**Transition** the following waste activities listed in VP3130GZ to installation level permit (as DAAs): • Import of sludges • Storage and treatment of biogas • Use of biogas as a fuel in combustion plant Incineration of biogas	N/A	N/A	N/A

3 Your ability as an operator

3b Technical ability

YW have relevant technical competence to operate the activities at the site, including those included in this permit variation. Technical management will be provided by David Shaw, Yorkshire Water; his primary and continuing competency assessment certificates can be found in Appendix 2.

The environmental permit numbers and site address for all other waste activities that David Shaw provides technical competence for are provided in Table C2: 3b below.

Table C2: 3b Sites under the technical competence of David Shaw

Permit number	Site address	Postcode
KP3036LW	Lemonroyd STF Fleet Lane Oulton Leeds	LS26 8AB
VP3730GB	Mitchell Laithes (Dewsbury) STF Dewsbury	WF12 9BB
KP3536LL	Neiley STF Newmill Road Brockholes	HD9 7AL
KP3836LT	South Elmsall STF Chapel Lane South Elmsall	WF9 2SW
FB3809MM	Knostrop STF Knowsthorpe Lane Leeds	LS9 0PJ
EPR/CP3897LT	Blackburn Meadows STF Alsing Road Sheffield South Yorkshire	S9 1HF
EPR/WP3030GC	Hull Sludge Treatment Facility Hull Waste Water Treatment Works Hull Road Kingston upon Hull	HU12 8EY

3d Management systems

YW has an established EMS, which is certified to the ISO14001 standard. A copy of the YW ISO14001 certificate is provided as Appendix 3. The EMS forms part of a wider corporate Integrated Management System (IMS) which also incorporates quality management, health and safety management, asset management, organisational resilience and business continuity requirements. The management system follows an asset life cycle approach, from design through to decommissioning.

Corporate level management system processes are in place, which are supplemented by site-specific documented procedures and processes. YW's IMS is structured as shown in Table C2: 3d-1 below.

Table C2: 3d-1 Overall IMS structure

Level 1 - IMS Manual	
	YW's IMS manual is a set of documents including records which describe the scope, policy, objectives and overall management responsibility within YW and specifically addresses the requirements of ISO9001, ISO14001, ISO55001 and ISO45001.
Level 2 - Generic Manuals	
	The level 2 generic manuals detail policies and procedures, concerning the operation and maintenance of systems giving the purpose, scope, responsibilities and operational requirements.
Level 3 - Site Specific Manuals	
	The level 3 site specific manuals detail site specific information and procedures, concerning operations, giving the purpose, scope and responsibilities. Document control procedures are in place to ensure IMS and associated documents and records are identified, controlled, maintained and retained appropriately. Key records maintained in accordance with IMS procedures include training records, internal audit reports, waste transfer and consignment notes, complaint records, risk assessments, legislative records, permits, consents and associated documentation, accident and incident records and monitoring and measurement data.

A summary of the EMS is provided on the following pages, focusing in more detail on how this is applied to the management of sludge treatment operations.

Scope and Policy

The YW EMS has been certified to ISO14001 since 2004. The certified EMS scope covers:

"The management and operation of clean and waste water assets and associated services".

YW's top level commitment to environmental and quality performance can be found in the Quality & Environmental Policy; a copy of the policy is provided as Appendix 4.

Quality and Environmental Policy

Chief Executive of Yorkshire Water Services Ltd approves and is **accountable** for implementation

Responsibility of **all employees** to comply

Covers **all YW activities**, including the Esholt site, and applies to all individuals who are employed by, or carry out work on behalf of YW including contractors, temporary staff and agency workers

Key Roles and Responsibilities

YW has a central team responsible for the implementation of the overall IMS; the YW Bioresources team are responsible for maintaining ongoing compliance and managing the Esholt STF.

YW personnel have role statements which provide details of the responsibilities and accountability of individual roles.

Planning Actions

YW has established appropriate forums and mechanisms for the identification and management of risk, including senior leadership teams and governance groups. Actions are cascaded throughout the organisation as appropriate.

In relation to environmental issues, climate change risk assessments are carried out as well as consideration of extreme weather and climate resilience work. Environmental aspects and impacts have been identified and are recorded using the company's software platform for recording risks (currently the '4Risk' system).

YW is committed to comply with all relevant legislation, regulations and any other requirements to which the organisation subscribes. Legislation is analysed so that its relevance to the activities, aspects, products and services of YW are understood, communicated and applied. Registers of relevant legislation and other requirements are maintained and managed via the Evaluation of Compliance (EoC) process held on SharePoint.

Management requirements that arise from risk assessments and evaluation of compliance processes are taken into account in planning operational control and emergency preparedness procedures.

General Operational Controls (Environmental)

Operational facilities, including the Esholt STF, are managed in accordance with procedures laid down within the EMS. This includes procedures to identify and control environmental issues arising from YW's activities, including specific environmental permit requirements.

Procedures specify environmental best practice requirements, including for example storage of chemicals and oils within a bund (with 110% capacity) which must be maintained in good condition, located inside a building wherever possible, on hardstanding and away from watercourses and site drains. Waste must be segregated appropriately, and waste containers must be located on impermeable hardstanding.

YW has developed a biodiversity policy, underpinned by specific processes and procedures, to deliver programmes of work that aim towards a biodiversity net gain. This policy is applicable to contractors delivering work on behalf of YW.

Maintenance (Planned)

A planned maintenance system is in operation at Esholt STF covering all electrical and mechanical equipment and calibration of instrumentation and control system. A list of all plant items is stored on the Asset Inventory System (AI2) and the frequency, scope and records of planned maintenance and calibration are stored on SAP. Job cards for planned maintenance are produced through the SAP system giving the necessary work instruction. Planned maintenance requirements are initially based on recommendations provided in Operations and Maintenance (O&M manuals).

Total Care Plans (TCPs) are produced for all sites and are reviewed at set intervals. TCP reviews set future planned maintenance frequency, the work to be carried out during the planned maintenance and identifies critical and life expired plant items. This is based on the review of the plant item's history and on condition monitoring results.

An inspection and testing programme for above and below ground vessels, pipes and valves is in place. This programme of work to detect any deterioration or weakness of assets typically incorporates a combination of visual examinations and non-destructive testing (e.g. ultrasonic thickness measurements). The frequency of inspection is in accordance with risk-based requirements, which also varies according to the condition of the asset. A clear process to address any identified defects, with assigned responsibilities, is in place.

In addition to planned maintenance activities described above, a programme of daily, weekly and monthly visual inspections and checks are undertaken. This includes, for instance, visual inspections of general site condition and housekeeping including spills and biogas leaks, checks for abnormal heat, noise and vibration, checking the operation of pumps and monitoring instrumentation, checking calibrations are in date etc. Any abnormal observations are recorded in the site logbook.

Odour checks are carried out in accordance with the Odour Management Plan (see Appendix 10).

The designated Technically Competent Manager (TCM) also undertakes monthly inspections of the site to identify any potential issues and arrange resolution as necessary. These inspections are recorded and the information is retained by YW.

Maintenance of the CHP, boilers and de-watering plant are undertaken by specialist contractors. All activities are closely managed from site to ensure that all YW H&S and environmental policies are met. Regular maintenance of plant such as CHP engine is undertaken in accordance with requirements specified by the equipment manufacturer including routine planned inspections and more in-depth servicing. The frequency of servicing is based on a combination of running hours and condition monitoring data. CHP contractors are on site weekly whilst boiler maintenance normally requires attendance on a quarterly basis. Maintenance contracts include provision for reactive/emergency activities and management of spares.

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

Maintenance (Reactive)

Plant breakdowns are responded to on the basis of a risk assessment matrix (RAM) and prioritised according to consequence of failure and likely time to failure occurring. Amongst other attributes, the RAM takes into account impact to environment, health and safety, cost and flooding.

Site operational staff are responsible for requesting breakdown maintenance and repairs. Any reactive work that achieves a high priority on the RAM is called through to the Engineering Service Desk for progression. These jobs are treated as schedule busters and are progressed accordingly.

Records of all maintenance (planned and reactive) and calibration are retained on the SAP work management system.

Waste Characterisation (Pre-acceptance & Acceptance)

All sludges arriving at Esholt STF are either indigenous primary and secondary sludges from the Esholt WwTW or imported sludge and sludge cake from other YW sites. As a result, the composition of the sludge is very stable, consistent, and is well understood. The volume and source of imports to the site is recorded by WaSP loggers. These also ensure that only appropriately authorised drivers can discharge at the Esholt STF. All sites supplying sludge to Esholt have been reviewed to ensure that the typical sludge they produce is suitable and safe for anaerobic digestion. Sludge production problems are rare, but operators and tanker drivers are trained to identify contaminated sludges at source and stop them being transferred to the digestion site. Spot checks are carried out on imported sludges to ensure they are within acceptable parameters and safe for the digestion process. The Waste Pre-acceptance and Acceptance procedure is included as Appendix 13.

All cake (digested sludge) exported from Esholt has to meet stringent HACCP requirements, including regular sampling to assess safety.

Emergency Preparedness and Response

YW has developed processes to identify, respond to and control emergency situations that may cause adverse environmental consequences. Spill kits are readily accessible at locations where there is a risk of spillage (e.g. delivery, storage and areas of use). Spill control toolbox talks are provided to staff. This includes information about how to prevent and control pollution incidents from accidental spills of oils, fuels, sludge and chemicals.

Contingency plans help minimise potential environmental impacts; this includes emergencies arising from breakdowns, enforced shutdowns, abnormal circumstances such as flooding as well as major fire and spill/loss of containment events. Refer also to the Accident management plan (see Section III; C2, Q6-5) and the Secondary Containment Risk Assessment (Appendix 11).

The YW Business Continuity Plan is in place to define and prioritise critical business functions, details the immediate response requirements for a critical incident and details strategies and actions to be taken to ensure business continuity.

All Bioresources sites, including Esholt, have the capability of remote monitoring and remote operation of key functions. A security guard is present on site 12 hours per day Monday to Friday and CCTV security cameras are located across the site with monitoring provided 24/7 by the YW Service Delivery Centre. All buildings are alarmed and high-risk equipment is provided with secondary fencing for added security.

Monitoring

Process monitoring is undertaken for all key processes on site. This includes monitoring of operational parameters of plant and equipment to ensure it is operating effectively and efficiently. Further details are provided in Section II Technical Description.

Air emissions monitoring, including emissions from the CHP/boiler stack, is undertaken in accordance with permit requirements. Further details are provided in Section III, Form C3, Question 4a. Odour monitoring is described in Appendix 10: Odour Management Plan.

Environmental performance monitoring includes monitoring electricity and gas use, biogas generation, electricity generation, water use and waste arisings. Further details are provided below in Section III, Form C3, Questions 6a, b, c, d and e.

Training, Awareness and Competence

YW maintains processes to ensure that all those working for or on behalf of YW are suitably trained to fulfil their roles efficiently. Assessment of competence and identification of individual training needs is carried out through mutual discussion between the individual and their manager as part of the company performance management process, a fundamental part of which is the competency framework and progression plans which are available for every role in the organisation.

All YW employees receive IMS awareness training, delivered online at induction and periodically thereafter. This includes awareness of the environmental policy and understanding key environmental hazards and risks and the need to comply with IMS requirements.

Staff who work at the Esholt STF receive specific training in the plant's operation and the potential environmental impact of the process as well as health and safety. Plant operators 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. Toolbox talks are used to provide information and training to site staff, including information about environmental requirements/activities and legislative and compliance requirements. Training records for programmes and courses managed centrally are held on the company Learning Management System. Records for specific training managed locally at the Esholt site is held by individual managers and/or on the Leaning Management System.

Communication

Communication plans are in place to communicate business performance based on the company's 'Big Goals', company objectives and performance commitments, aligned to the quality, safety, environmental and asset management requirements.

The company intranet, called the Hive, provides regular news updates for YW personnel and holds a wide range of information that employees can access. Other key communication channels include regular corporate newsletters, business unit-specific newsletters, and update sessions and events held by senior business leaders. 'Safeguard' communications are used to issue notifications such as Safety Alerts, Toolbox Talks and Lessons Learned from incident investigations to personnel across the business.

At a Esholt site level environmental information is communicated primarily via toolbox talks and noticeboards.

Contractors

YW has specific procedures in place for the management of contractors regarding health, safety and environmental requirements. This includes procedures to ensure contractors have the required skills and environmental competencies to carry out works at this site. Initially, contractors are assessed by the procurement department for inclusion on the approved supplier list, which includes health and safety and environmental criteria for example, waste documentation such as waste carrier's licence/training certificates. Even when the contractors are on the approved supplier list, they are still further assessed for each specific contracted activity. The contractor is required to submit a risk assessment method statement (RAMS) prior to any commencement of work, identifying how work is to be undertaken and the associated risks. The RAMS must be approved by the Site Manager or an assessor who is competent at reviewing a RAMS, 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. Contractors must also complete a site induction, which remains valid for up to a year, covering health, safety and environmental requirements whilst on site.

Environmental Improvement

Yorkshire Water's IMS objectives are documented with the 'Big Goals' and 'Performance Commitments' which are available and communicated via the company intranet. Planning to achieve IMS objectives is monitored and reported internally (via Performance Zone) and externally (via the Annual Report).

Esholt STF has daily and weekly performance targets including sludge throughput, gas quality, electricity generation and electricity consumption targets. Performance against these targets is reviewed at daily meetings and corrective actions taken as required.

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

The Innovations Team at YW undertakes regular monitoring and review of new and innovative technologies and equipment to ensure the business continually improves its operations and activities. This includes consideration of cleaner technologies and improved environmental performance. Sectoral and cross-section benchmarking also takes place as required.

Incidents, non-compliance and complaints

Processes have been developed by YW to identify, respond to and control situations that may cause actual or potential non-conformities. Non-conformities may be identified through internal audits/inspections or may be detected through other means. Incidents are managed in accordance with the Incident Management policy and procedures and Emergency Planning manual. In the event of a significant incident a root cause analysis is conducted. Actions are identified, reported, recorded and communicated to prevent reoccurrence.

Complaints are typically received by YW central Customer Services team, where all complaints are logged on the ICE system. Complaints relevant to Esholt STF are passed on to the Site Manager for further investigation. The Site Manager is responsible for ensuring that any complaint is investigated and, if found to be justified, that work is undertaken to resolve the issue, including liaising with the relevant regulatory bodies where appropriate. The Customer Service Team ensure an appropriate response to the complainant in a timely manner including, if and as appropriate, detailing the reason behind the issue and the actions taken to resolve the matter.

All complaints information is recorded on the ICE system in order that this can be monitored, reviewed and analysed.

Auditing

YW operates an internal audit programme delivered by trained internal auditors or suitably qualified external consultants or contractors. This includes the following:

- IMS auditing/inspections undertaken by the IMS Team.
- Regular combined quality, health and safety and environmental inspections performed at all operational sites, including Esholt STF.
- Assurance and improvement programme to ensure the health, safety, environmental and technical compliance of contractors delivering capital schemes.
- Audits of contractors delivering repair and maintenance activities.

YW is also subject to regular audits by external auditors to ensure continuing adherence to ISO14001 requirements.

Management Review

A formal Management Review of YW's IMS is undertaken and recorded at least once a year. The purpose of these meetings is to ensure the IMS' continuing suitability, adequacy and effectiveness as well as to assess opportunities for improvement and the need for changes to the management system, including the policy and objectives.

Neighbouring operators

The land immediately to the southwest of the conditioning pad is leased by a third party operator (Biowise) for the operation of an open windrow composting (OWC) facility. Whilst there is no technical connection between the Biowise OWC facility and the STF, surface water drainage from the OWC plant passes under the conditioning pad and mixes with surface water runoff from the conditioning pad at the leachate pumping station (located on the edge of the conditioning pad). From here the effluent is transferred to Esholt WwTW for full treatment.

YW and Biowise have communication mechanisms in place including:

- Both parties hold contact details for key operational contacts on the neighbouring site.
- Any accidents and incidents with potential to impact on the other party (e.g. spills, abnormal operational activities/works) will be communicated to the neighbouring site promptly.

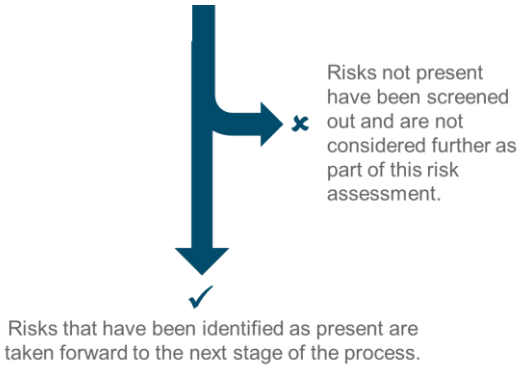
Periodic meetings will be held between Biowise and YW to discuss issues arising, including accidents, incidents, complaints and any other issue of relevance to each environmental permit.

6 Environmental risk assessment

A review of environmental risks associated with activities covered by the scope of this variation application has been carried out. This review follows EA guidance on risk assessments for environmental permits[1] and adopts the approach outlined below:

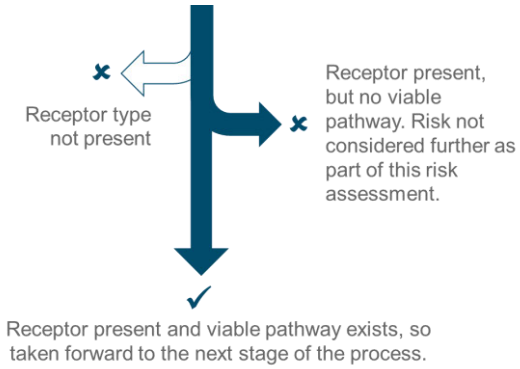
1. Identify and consider risks, and the sources of the risks, and assess whether these require further assessment or can be screened out. Only risks arising from processes that are within scope of this permit variation application have been considered.

⇨**Table C2: 6-1**



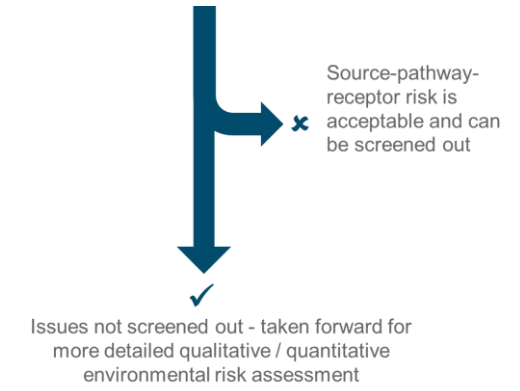
2. Identify and review the receptors (people, animals, property and anything else that could be affected by the hazard) at risk. Within each receptor category, the closest receptor(s) has been identified along with possible pathways to link the receptor to the credible site risks from Stage 1.

⇨**Table C2: 6-2**



3. Assess risks relevant to the specific activity and check they are acceptable and can be screened out –provides a summary of the risk-pathway-receptor assessment.

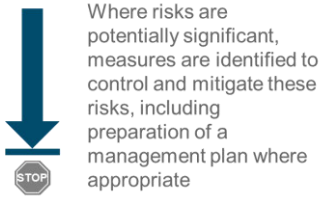
⇨**Table C2: 6-3**



4. Qualitative and quantitative risk assessments for risks which cannot be screened out.

⇨**Q 6-1 to 6-9**

⇨**Appendices 7, 8 and 9**



[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit (accessed February 2021)

Table C2: 6-1: Identification of Environmental Risks

Identified risk area		Sources on site	Discussion	Identified risk
	Odour	Odour extraction stacks, fugitive releases from tanks, screenings and sludge/cake import, conditioning pad and cake barn	Following sludge import, raw sludge is largely contained to minimise odour generation potential. Displaced air (odour) from most tanks and processing facilities are extracted and dispersed to air via a stack. In addition, there are some unabated odour sources and fugitive emissions. Odour emissions (fugitive) from digested sludge and cake handling facilities are low. YW is committed to improvements to reduce diffuse odour emissions – refer to Proposed Improvement Programme.	✓ Further review
	Point source emissions to air. Emissions deposited from air to land	Odour extraction and dispersion points	Processing of sewage sludges can result in emissions of various compounds with potential human health or ecological impacts. These include Volatile Organic Compounds (VOCs), hydrogen sulphide (H_2S), ammonia, and other organics including mercaptans. Adopting a precautionary approach, these emissions have been further reviewed. These compounds can also be highly odorous; this aspect is considered separately.	✓ Further review
	Noise	Motors, pumps, blowers, compressors, conveyors, vehicle movements, site personnel CHP, Boiler, waste gas burner	Procedures are in place to ensure effective planned maintenance and minimisation of noise and vibration from noise sources associated with sludge treatment and handling facilities. Whilst the CHP, boiler and waste gas burner are already included within the scope of the existing installation, these sources have also been considered for completeness.	✓ Further review
	Fugitive and diffuse emissions	Tanks, pipework and containers used for storage, treatment and digestion of sludge	Anaerobic digestion tanks are fully sealed and biogas is captured and transferred to CHP, boiler and/or flares (see point source emissions to air). Raw and digested sludge is contained in uncovered tanks and has the potential for fugitive emissions, including Volatile Organic Compounds (VOCs), hydrogen sulphide (H_2S), ammonia, methane and other organics including mercaptans. These compounds can also be highly odorous; this aspect is considered separately. Planned maintenance and leak detection and repair programme in place in respect of fugitive emissions. YW is committed to cover tanks in order to reduce diffuse odour emissions – refer to Proposed Improvement Programme.	✓ Further review

Identified risk area		Sources on site	Discussion	Identified risk
	Bioaerosols	Storage and handling of sludge	Raw and digested sludge have a high water content (approx. 60% after thickening). Digested sludge (post THP and digester) have been subject to high temperatures and treatment to kill pathogens and disturbance of cake on the conditioning pad and within the cake barn is minimal, other than initial delivery to the pad and subsequent removal from the pad. Potential for generation of dust and bioaerosols from this source is considered to be low.	✓ Further review
	Accidental Releases	All areas / all activities	Emergency/unplanned events have the potential to result in abnormal emissions of odour, noise of emissions to air, land or water. This includes spillages of potentially contaminative liquids e.g. sludge, chemicals, oils and releases of biogas.	✓ Further review
	Point source emissions to air. Emissions deposited from air to land	CHP, boiler, waste gas burner (flare)	All combustion plant emission points are already included within the scope of the existing installation (permit ref VP3130GZ). A table of point source emissions to air is included in Table C3:2-1. No change to these emissions are proposed for existing / current operations. However, YW is proposing to bring a gas connection onto site to provide mains natural gas for operation of these steam raising boilers. This solution would replace gas oil as the main fuel source for the boilers (with biogas continuing to provide the back-up fuel source). It is also proposed that CHP1 will be converted to natural gas as its sole fuel source. The remaining three CHP engines would continue to operate with biogas as the sole fuel source. An Air Emission Risk Assessment (AERA) utilising atmospheric dispersion modelling has been undertaken to support this proposed change of fuel.	✓ Further review
	Point source emissions to sewer	Surface water run-off, cleaning washwater and liquor from sludge thickening and dewatering facilities	All process liquids, cleaning washwater and most surface water runoff (with the exception of some uncontaminated roof water runoff which is discharged to soakaway) is returned to Esholt WwTW (outside of the scope of this permit application) for treatment prior to discharge to the River Aire.	✓ Further review
	Point source emissions to surface, groundwater and land	None	The only point source emissions to surface water, groundwater or land within the scope of the permit, is the discharge of roofwater runoff from the boilerhouse and cake barn via emission points W1, W2 and W3. These discharges comprise only clean rainwater runoff and therefore no further assessment is required. All process liquids and all other surface water runoff is returned to Esholt WwTW for treatment prior to discharge to the River Aire. Risks associated with accidents and other planned incidents are considered separately.	✘ Not considered further

Identified risk area		Sources on site	Discussion	Identified risk
	Visible plumes	CHP, Boiler, waste gas burner	The nature of the combustion sources is such that plume moisture levels will be low and thus in normal operations, and for the majority of weather conditions, plume visibility is expected to be very low. Excess steam is occasionally released from the THP, but this is occasional and localised. CHP, Boiler and waste gas burner are already included within the scope of the existing installation and no changes are proposed. No further assessment is required.	✘ Not considered further
	Adapting to climate change	All areas / all activities	Required only for new bespoke permit applications.	✘ Not considered further
	Litter	Storage and handling of sludge in open air	The nature of waste treated on site does not result in litter.	✘ Not considered further
	Vermin and Pests	Storage and handling of sludge in open air	The activities within the installation do not give rise to significant pest or vermin issues.	✘ Not considered further
	Dust	Storage and handling of sludge in open air	The facility handles wet wastes which do not result in dusts.	✘ Not considered further
	Global warming potential	CHP, Boiler, waste gas burner	All combustion plant emission points are already included within the scope of the existing installation, the biogas fuel is renewable. Further energy information is provided in a detailed response to Q6 of Form C3.	✘ Not considered further

Table C2: 6-2: Identification of sensitive receptors and pathways

Receptor type	Receptor description and distance[2]	Pathway	Possible pathway from source							
			Odour	Air (non combustion)[3]	Air (combustion)[3]	Noise	Fugitive / diffuse	Bioaerosol	Accidental releases	Sewer
Human										
Residential housing - North	Digester area: Nearest residential properties located approximately 160m to the north (adjacent to Esholt Hall). Digested sludge area: Nearest residential property located approximately 450m to the north.	Airborne	✓	✓	✓	✓	✓	✓	✓	✗
Residential housing – East	Digester area: Nearest residential property located approximately 315m to the northeast and 900m to the southeast. Digested sludge area: Nearest residential property located approximately 450m to the east.	Airborne	✓	✓	✓	✓	✓	✗	✓	✗
Residential housing – South	Digester area: Nearest residential property located approximately 820m to the south. Digested sludge area: Nearest residential property located approximately 450m to the south.	Airborne	✓	✓	✓	✓	✓	✗	✓	✗
Residential housing – West	Digester area: Nearest residential property located approximately 650m to the southwest. Digested sludge area: Nearest residential property located approximately 770m to the west.	Airborne	✓	✓	✓	✓	✓	✗	✓	✗

2 Note that nearest receptors have been identified separately from each of the two main areas on site: the digester area (including sludge reception, screening and handling, THP and digester, CHP/boilers and biogas storage and handling) and the digested sludge area (including digested sludge dewatering and sludge storage and handling).
3 Note that these sources are present at the digester area only.

Receptor type	Receptor description and distance[2]	Pathway	Possible pathway from source							
			Odour	Air (non combustion)[3]	Air (combustion)[3]	Noise	Fugitive / diffuse	Bioaerosol	Accidental releases	Sewer
Public amenity areas including public footpath / cycleway	National Cycle Network route crosses YW land directly to the West, but outside of, the installation boundary. The surrounding land use is generally wooded, with footpaths and is likely to provide local ecological and amenity interest.	Airborne	✓	✓	✓	✓	✓	✓	✓	✗
Schools	There are 10 schools within approximately 2km of the site, and 2 sites within 1km. The nearest of these is 785m to the southeast of the digested sludge area.	Airborne	✓	✓	✓	✓	✓	✗	✓	✗
Hospitals	There are no hospitals within 2 km of the site. There is 1 hospital approximately 5 km from the site.	Airborne	✗	✗	✗	✗	✗	✗	✗	✗
Industrial / commercial sites	YW-owned Esholt Hall is located approximately 140m to the northeast of the digester area. Home Farm Industrial Park (comprising a number of office units) is located approximately 315m to the northeast of the digester area.	Airborne	✓	✓	✓	✓	✓	✓	✓	✗
Ecological										
Habitat sites – statutory designations	There is one internationally designated site within 10km of the installation (a SAC/SPA) and one nationally designated site within 2km; this is a SSSI designated for geological reasons.	Airborne	✗	✗	✓	✗	✗	✗	✓	✗
Habitat sites – local sites and non statutory designations	The surrounding land use is generally wooded, with footpaths and is likely to provide local ecological interest.	Airborne Surface water Groundwater	✗	✓	✓	✗	✓	✗	✓	✓

Receptor type	Receptor description and distance[2]	Pathway	Possible pathway from source							
			Odour	Air (non combustion)[3]	Air (combustion)[3]	Noise	Fugitive / diffuse	Bioaerosol	Accidental releases	Sewer
Protected species	Possible presence of protected species on or off site.	Airborne Surface water Groundwater	✗	✓	✓	✗	✓	✗	✓	✗
Environment – Other										
Global atmosphere	Local, regional and global atmosphere.	Airborne	✗	✓	✓	✗	✓	✗	✓	✗
Local atmosphere	Local atmosphere. Site is not located within an AQMA.	Airborne	✗	✓	✓	✗	✓	✗	✓	✗
Ground / groundwater	Underlying groundwater classed as a Secondary A aquifer; groundwater vulnerability classed as medium-high. Groundwater source protection zone located 1.2km to the northeast	Unmade ground / infiltration / percolation	✗	✗	✗	✗	✗	✗	✓	✓
Surface water	River Aire directly adjacent to installation boundary. Likely hydraulic continuity between underlying groundwater and river.	Overland runoff / infiltration / percolation	✗	✗	✗	✗	✗	✗	✓	✓

Table C2:6-3: Assess risks: screening assessment

Table C2.6-3 below sets out the screening assessment for environmental risks.

Source	⇨	Pathway	⇨	Receptor	Discussion	Further assessment required?
Odour	⇨	Airborne	⇨	Residential housing – north, east, south, west Public amenity areas including public footpath/cycleway Schools Industrial /commercial sites	There are a number of odour sources on site include sludge intake and screening, uncovered tanks, dewatering centrifuges, dewatering liquor handling and temporary sludge cake storage. Whilst many odour sources are covered, with odour extraction and dispersion to atmosphere, there are residual odour risks and therefore further assessment is required.	**Yes – odour impact assessment is summarised in response to Q 6-2 below. Full assessment is included as Appendix 8.**
Point source emissions to air from vent stacks – ammonia / H_2S / other organics	⇨	Airborne	⇨	Residential housing – north, east, south, west Public amenity areas including public footpath/cycleway Schools Industrial /commercial sites Habitat sites – local sites and non-statutory designations Protected species Global atmosphere Local atmosphere	Off gases and vapours collected from tank headspace and displacement air can contain substances potentially harmful to human health (e.g. H_2S) and also substances which can contribute to nutrification of habitat sites (ammonia) potential. Odour extraction and dispersion serves as the primary control for these emissions.	**Yes – a review of emissions of substances from point sources (excluding odour and combustion) is summarised in response to Q 6-3 below.**

Source	⇨	Pathway	⇨	Receptor	Discussion	Further assessment required?
Point source emissions to air from fuel combustion	⇨	Airborne	⇨	Residential housing – north, east, south, west Public amenity areas including public footpath/cycleway Schools Industrial /commercial sites Habitat sites – statutory designations Habitat sites – local sites and non-statutory designations Protected species Global atmosphere Local atmosphere	Biogas generated by the digesters is used as the sole fuel source for the CHPs. The CHPs generate electricity for use on site and waste heat is used to provide supplementary heat for the boilers. In periods when the CHPs are not available then the boilers may be fired using biogas (biogas is a back-up fuel supply for the boilers). Any excess biogas which cannot be used by either the CHPs or boilers is sent to the waste gas burner (flare). An air quality impact assessment, including air dispersion modelling is therefore required in order to assess the significance of emissions to air from the process on potentially sensitive receptors, against relevant air quality standards and assessment levels.	**Yes – air quality impact assessment is summarised in response to Q 6-4 below. Full assessment is included as Appendix 7.**
Noise	⇨	Airborne	⇨	Residential housing – north, east, south, west Public amenity areas including public footpath/cycleway Schools Industrial /commercial sites	There are fixed and mobile noise sources within the installation. Whilst these are not considered to represent a significant contribution to off-site noise levels, there remains some potential to affect the identified off-site receptors and therefore further assessment is required.	**Yes – qualitative risk assessment is summarised in response to Q 6-5 below. Full assessment is included as Appendix 9**

Source	⇨	Pathway	⇨	Receptor	Discussion	Further assessment required?
Fugitive / diffuse emissions – ammonia / H2S / methane / other organics	⇨	Airborne	⇨	Residential housing – north, east, south, west Public amenity areas including public footpath/cycleway Schools Industrial /commercial sites Habitat sites – local sites and non-statutory designations Protected species Global atmosphere Local atmosphere	It is recognised that this a potentially significant issue in the sector, a leak detection and repair plan is in place covering the installation.	**Yes – a review of diffuse emissions (excluding odour) is summarised in response to Q 6-3 below. In relation to fugitive emissions, proposed BAT controls include a leak detection and repair plan – Refer to Form C3 Q3b and Appendix 14**
Bioaerosols	⇨	Airborne	⇨	Residential housing – north Public amenity areas including public footpath/cycleway. Industrial/commercial sites	The majority of residential neighbours are located outside of screening range (250m) for a static receptor location. Relevant sensitive exposure locations are those where there is potential for exposure over an extended period. Whilst EA guidance does not consider AD as a significant source it is recognised that there are some potential low-level sources within the installation (e.g. uncovered tanks and cake pad). As a precautionary principle a risk assessment has been undertaken.	**Yes – risk assessment is provided in response to Q6-6 below.**

Source	⇨	Pathway	⇨	Receptor	Discussion	Further assessment required?
Accidental Releases	⇨	Airborne Overland runoff / infiltration / percolation	⇨	Residential housing – north, east, south, west Public amenity areas including public footpath/cycleway Schools Industrial /commercial sites Habitat sites – statutory designations Habitat sites – local sites and non-statutory designations Protected species Global atmosphere Local atmosphere Ground/groundwater Surface water	Pollution prevention infrastructure, operational control and management techniques (including as part of the EMS) are in place to prevent accidents and other unplanned events with environmental consequences, or, in the event that these do occur to minimise or mitigate the environmental impacts.	**Yes – accident management plan is provided in response to Q6-7 below**
Point source emissions to sewer	⇨	Release to River Aire via WwTW	⇨	Habitat sites – local sites and non-statutory designations Ground/groundwater Surface water	All process liquids, cleaning washwater and surface water runoff is returned to Esholt WwTW (outside of the scope of this permit application) for full treatment prior to discharge to the River Aire.	**Yes - YW is committed to undertaking a period of monitoring in order to characterise the liquors returned to the WwTW. Further detail is provided in response to Q 6-8 below.**

Q 6-1 Habitats risk assessment requirements

There is one European designated habitat site (South Pennine Moors SAC and SPA) within 10km of the installation, approximately 5.2km to the north-west of the site. There is one nationally designated conservation site within 2km of the installation, Yeadon Brickworks and Railway Cutting SSSI which is located approximately 1.5km of the site; this is cited as a site of geological interest.

Impacts on designated habitat sites are considered as part of the air quality risk assessment (see Appendix 7 and summary provided in Q6-4 below). Due to the nature and scale of activities undertaken and the distance from the installation, permitted activities at Esholt will not impact on any of the designated sites identified.

Q 6-2 Summary of the Odour Impact Assessment

A qualitative odour risk assessment has been undertaken for Esholt STF considering twenty-eight process activities across two separate areas on site and potential odour effect on ten receptors. The assessment has been based on a Source-Pathway-Receptor approach and is primarily based upon professional judgement.

The risk assessment has indicated that two of the sensitive receptors considered are potentially exposed to a moderate adverse odour effect with the remaining eight receptors potentially exposed to either a slight adverse or negligible adverse odour effect. The two receptors exposed to a moderate adverse odour effect are Esholt Hall and Home Farm Industrial Park, located to the north-east of the site with both receptors representing residential receptors. YW has not received any odour complaints from these locations. Furthermore, a sniff test odour survey carried out at the boundary of the site in June 2021 (see Appendix B of Appendix 8) did not detect any odour at the boundary closest to these sensitive receptors.

All sensitive receptors to the south of the STF are considered to have a negligible odour effect, attributed to the receptor distance from the site and subsequent ineffective odour pathway. Sniff testing from the odour survey highlighted that whilst cake odours were observed local to the cake pad, these were secondary to the odours coming from the compost area. No cake odours were observed downwind of the cake pad supporting the theory that if the process is healthy and sludge cake stockpiling is managed effectively, this would not be considered a future risk of odour at surrounding receptors.

For the overall site, it is considered that Esholt STF does not have an adverse odour effect on its surrounding receptors. However, based on the significant number of odour complaints received by the local environmental health officer, these complaints need to be investigated and determined if the STF is a contributing factor or if emissions are attributed to another source. Appropriate levels of monitoring of the STF should be undertaken to ensure a healthy process is maintained and that there is no deterioration in odour emissions from the site

Notwithstanding the findings of this assessment, YW is committed to meeting BAT requirements and to further reducing odour and other diffuse emissions from uncovered tanks and unabated odour dispersion stacks – refer to Q6-3 below and proposed improvement programme.

Q 6-3 Review of emissions of substances from diffuse and point sources (excluding odour and combustion)

It is recognised that emissions of organic compounds may arise from uncovered sludge sources (including uncovered tanks and the cake pad) as well as from the air extraction and dispersion stacks. This includes ammonia, hydrogen sulphide, volatile organic compounds (VOCs) and methane. Odour is considered separately (refer to Appendix 10 – Odour Management Plan). Furthermore, it is noted that BAT conclusion 14d specifies that diffuse emissions should be contained, collected and treated. Table C2: 6-4 summarises the emissions mitigation measures currently in place and proposals for further mitigation, where required.

Table C2: 6-4: Review of diffuse and point source emissions

Sludge source	Existing emissions controls	BAT assessment
Sludge screens	Sludge screens are covered / contained. Residence time and hours of operation of the intake sludge screens is limited (each delivery is processed within approximately 15 mins; approximately 10 deliveries per day) and therefore emissions are not considered to be significant.	No further mitigation is proposed due to small footprint and short term / intermittent nature of emissions from this source.
Screenings skips	Skips are not covered but are emptied regularly.	No further mitigation is proposed due to small footprint of this source.
Sludge screen feed tank	Tank is covered, extracted and dispersed – see below for comments in relation to the dispersal stack.	BAT in place – see below for comments in relation to the OCU.
Odour dispersion stack for sludge screen feed tank (OCU 1)	OCU is no longer operational and is currently acting as a dispersion stack.	YW will refurbish / reinstate this OCU to ensure effective treatment of odours from this source. Refer to proposed improvement programme.
Consolation tank 5	Tank is not covered.	YW will install a fixed tank cover and extract and treat odour in a new OCU. Refer to proposed improvement programme.
Mixed sludge tanks (2 no.)	Tank is covered, extracted and dispersed – see below for comments in relation to the dispersal stack.	BAT in place – see below for comments in relation to the OCU.
Odour dispersion stack for mixed sludge tanks (OCU 2)	OCU is no longer operational and is currently acting as a dispersion stack.	YW will refurbish / reinstate this OCU to ensure effective treatment of odours from this source. Refer to proposed improvement programme.
Sludge cake reception storage vessels	Cake reception containers are covered and passively vented to air.	YW will connect the sludge cake reception storage vessels to an existing OCU (OCU 3). Refer to proposed improvement programme.
SAS storage tanks (2 no.)	Tanks are not covered. SAS has inherently lower emissions generation potential. Monitoring data collected at other YW sites (uncovered SAS storage tanks/sump at Caldervale, Sandall and Mitchell Laithes) is provided below: H_2S: 0.005 – 0.035 ppm (10 samples collected in total) Ammonia: <0.1 ppm at all three sites (10 samples collected in total) TVOC: <0.1 ppm at all three sites (10 samples collected in total)	YW commit to • Undertake emission monitoring at these tanks (as minimum this will include H_2S, ammonia, TVOCs and methane). The purpose of the monitoring is to confirm that emissions from these SAS tanks are consistent with low emissions measured at other YW sites. • Assuming low emissions can be confirmed, cover these tanks with floating plastic balls. Refer to proposed improvement programme.
SAS thickeners	Thickener units are enclosed and located within a building. Air from thickener units is extracted and treated in a single stage carbon filter.	BAT in place – see below for comments in relation to the OCU.

Sludge source	Existing emissions controls	BAT assessment
OCU 4 (SAS thickeners)	Carbon filter	Single stage OCU in operation and no operational issues are reported. However, no monitoring data is currently available. An assessment of the effectiveness of this OCU will be carried out. YW will undertake any refurbishment work that may be required in order to ensure effective OCU operation.
SAS transfer tanks (2 no.)	Tanks are not covered. SAS has inherently lower emissions generation potential. Monitoring data collected at other YW sites (uncovered SAS storage tanks/sump at Caldervale, Sandall and Mitchell Laithes) is provided below: H2S: 0.005 – 0.035 ppm (10 samples collected in total) Ammonia: <0.1 ppm at all three sites (10 samples collected in total) TVOC: <0.1 ppm at all three sites (10 samples collected in total)	YW commit to • Undertake emission monitoring at these tanks (as minimum this will include H_2S, ammonia, TVOCs and methane). The purpose of the monitoring is to confirm that emissions from these SAS tanks are consistent with low emissions measured at other YW sites. • Assuming low emissions can be confirmed, cover these tanks with floating plastic balls. Refer to proposed improvement programme.
Thickener liquor sump	Sump is not covered.	YW will install a fixed tank cover and extract and treat odour in an existing OCU (OCU 4). Refer to proposed improvement programme.
Dewatering centrifuges for raw sludge	Centrifuge units are enclosed and located within a cabin.	No further mitigation is proposed due to small footprint of this source.
Centrate pumping station – raw sludge centrifuges	Sump is not covered.	YW will install a fixed cover and extract and treat odour in an existing OCU (OCU 3)
THP feed silos	Tank is covered, extracted and dispersed – see below for comments in relation to the dispersal stack.	BAT in place – see below for comments in relation to the OCU.
THP hopper	Tank is covered, extracted and dispersed – see below for comments in relation to the dispersal stack.	BAT in place – see below for comments in relation to the OCU.
Odour dispersion stack for THP feed silos and THP hopper (OCU 3)	OCU is no longer operational and is currently acting as a dispersion stack.	YW will refurbish / reinstate this OCU to ensure effective treatment of odours from this source. Refer to proposed improvement programme.
Degassing tanks	Tank is covered, extracted and dispersed – see below for comments in relation to the dispersal stack.	BAT in place – see below for comments in relation to the air extraction and dispersion stack.
Dispersion stack for degassing tanks	No OCU or other air treatment / abatement in place.	Existing tank air extraction to be routed to biogas system. Biogas from these tanks to be collected and utilised. Refer to proposed improvement programme.
Dewatering feed tanks (4 no.)	Tanks are not covered.	Cover tanks with floating plastic balls. It is noted that digested sludge sources are inherently lower emissions generation potential and that these tanks are located a significant distance from the biogas system.

Sludge source	Existing emissions controls	BAT assessment
Dewatering centrifuges for digested sludge (5 no. in 2 locations)	Centrifuge units are enclosed and located within a cabin.	No further mitigation is proposed due to small footprint of this source and inherently lower emissions generation potential of digested sludge sources.
Liquor pumping station – Export centrate sump	Sump is not covered.	YW will install a fixed cover for this sump. It is noted that digested sludge sources have inherently lower emissions generation potential and therefore no emissions treatment is required.
Leachate pumping station	Sump is not covered.	YW will install a fixed cover for this sump. It is noted that digested sludge sources have inherently lower emissions generation potential and therefore no emissions treatment is required.
Liquor balancing tanks (digested sludge liquor) (2 no.)	Tanks are not covered.	Cover tanks with floating plastic balls. It is noted that digested sludge sources are inherently lower emissions generation potential

Q 6-4 Summary of the Air Emissions Risk Assessment

All combustion plant emission points are already included within the scope of the existing installation. A table of point source emissions to air is included in Table C3:2-1. No changes to these emissions are proposed for existing / current operations. However, YW is proposing to bring a gas connection onto site to provide mains natural gas for operation of these steam raising boilers. This solution would replace gas oil as the main fuel source for the boilers (with biogas continuing to provide the back-up fuel source). It is also proposed that CHP1 will be converted to natural gas as its sole fuel source. The remaining three CHP engines would continue to operate with biogas as the sole fuel source. An Air Emission Risk Assessment (AERA) utilising atmospheric dispersion modelling has been undertaken to support this proposed change of fuel.

The AERA report (included in full as Appendix 7) outlines the approach, methodology and results in full. A number of worst-case assumptions were used to ensure a conservative assessment, including continuous operation of the boilers and CHPs (which is not a typical real world operating scenario). The results of the assessment have been interpreted in accordance with the requirements of the EA to identify if impacts represent 'significant pollution' as required by the EA to determine an EP application. The AERA has been undertaken in accordance with relevant legislation, policy and guidance.

Emissions of NOx (in the form of nitrogen dioxide (NO_2)) and SO_2 were assessed against the relevant Air Quality Standards for NO_2 and SO_2 for the protection of human health. An assessment was also carried against the relevant Critical Levels (C_{Le}) for NOx and SO_2, and Critical Loads (C_{Lo}) for nitrogen and acid deposition which are designed for the protection of designated ecological sites.

The assessment concludes that, in relation to human health, in both current and future operating scenarios, where impacts are not classified as 'insignificant' (i.e. process contribution (PC) less than 1% of the EAL for long-term concentrations or 10% for short-term) the predicted impacts of the installation do not lead to any exceedances of Environmental Assessment Level (EALs) and do not constitute 'significant pollution'.

In relation to the impact of the installation on ecologically sensitive sites, at all locally designated sites, in both current and future operating scenarios, the predicted PCs from the installation are less than 100% of the applicable annual C_{Le} or C_{Lo}. At the South Pennine Moors SAC the predicted PC's in both scenarios are less than 1% of the applicable CLe or CLe and therefore can be considered 'insignificant'. Therefore, the impacts of the Installation are considered 'insignificant' at all designated ecological sites.

Q 6-5 Summary of the Noise Impact Assessment

Potential sources of noise resulting from the activities proposed in this variation application, have been identified and assessed in Table C2: 6-5. Further detail is provided in Appendix 9. For scoring mechanism refer to Q 6-9.

Table C2:6-5: Noise risk assessment

Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk
Noise: CHP	Residential / Place of Worship / Commercial	Airborne	The equipment is containerised in a high performance acoustically treated enclosure and designed for external applications. Good maintenance of plant to ensure that excessive noise levels are not generated, under Operations & Maintenance contract. Regular checks of noise mitigation measures fitted to items 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.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low
Noise: CHP and Boiler Exhausts			Enclosure mounted high performance exhaust silencer with elevated stack vent point. Good maintenance of plant to ensure that excessive noise levels are not generated, under Operations & Maintenance contract. Regular checks of noise mitigation measures fitted to items 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.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low
Noise: Digesters (Gas Mix Compressors)			Compressors on the gas mixing are potentially noisy but are located in acoustic enclosures and/or have integrated acoustic controls. Good maintenance of plant to ensure that excessive noise levels are not generated, under Operations & Maintenance contract. Regular checks of noise mitigation measures fitted to items 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.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low
Noise: Fans on air cooled radiators			Fans of a low noise specification and subject to regular checks and maintenance. Good maintenance of plant to ensure that excessive noise levels are not generated from equipment breakdown or wear and tear (e.g. fan motor bearing failure), under Operations & Maintenance contract.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low
Noise: Waste Gas Burner			Waste gas burner operates only when CHPs are unavailable. Good maintenance of plant to ensure that excessive noise levels are not generated from equipment breakdown or wear and tear (e.g. fan motor bearing failure), under Operations & Maintenance contract.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low
Noise: Vehicular movements around site			Vehicles will be screened from receptors for the majority of their operations. Due to the layout of this area, vehicle movements would be transient and typically associated with passing movements only.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low
Noise: Air Mix Compressors			Good maintenance of plant to ensure that excessive noise levels are not generated, under Operations & Maintenance contract. Regular checks of noise mitigation measures fitted to items 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.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low
Noise: THP			Potential for noise from steam venting. Occurs intermittently. Good maintenance of plant to ensure that excessive noise levels are not generated, under Operations & Maintenance contract. Regular checks of noise mitigation measures fitted to items 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.	Unlikely - The risk management actions will prevent significant impact at nearest receptors	Mild – Minor nuisance impacts	Low

Q 6-6 Bioaerosol risk assessment

Bioaerosols are defined as micro-organisms suspended in the air and can include bacteria, fungi and viruses, or parts of living organisms, such as spores and plant pollen. Bioaerosols are usually smaller than 10µm in diameter and can cause human health impacts such as allergic responses and inflammation. Bioaerosols are naturally present in the air, but they are also associated with organic waste treatment processes including composting, mechanical biological treatment, and potentially some aspects of anaerobic digestion (AD) which are widely used in the UK.

There is minimal regulatory guidance available for assessing bioaerosol emissions from AD facilities. Regulatory Position Statement 031[4], states that bioaerosol concerns would normally be associated with composting activities, and in particular:

'Operations…likely to result in the uncontrolled release of high levels of bioaerosols' are defined as including '*the shredding of waste and the turning of waste in the sanitisation, stabilisation and maturation stages of composting where these operations are not contained or are not subject to exhaust ventilation and scrubbing/filtering'*.

These activities do not take place at Esholt STF. Furthermore, Environment Agency guidance (2012)[5] states that:

"We do not consider that bioaerosols from anaerobic digestion are a serious concern.

However, the most recent guidance[6] requires that biological waste treatment facilities provide a site-specific bioaerosol risk assessment if there are sensitive receptors within 250m of activities, regardless of the specific processes carried out at a site. It is noted that the consensus from various studies is that bioaerosols from composting activities decline rapidly within the first 100 metres from a site and generally decline to background levels within 250m[7]. Technical Guidance Note M9[8] states that receptors located more than 250m away should be discounted as they are not likely to be affected.

The nearest residential housing is located approximately 160m to the north of the digester area, adjacent to, and within the grounds of YW-owned Esholt Hall. Esholt Hall itself is noted as a potential industrial/commercial receptor location. The building has previously been used as a conference centre and is now being redeveloped for use as a YW staff training academy. Risks associated with industrial/commercial receptors are likely to be less significant due to the relatively shorter duration of exposure (i.e. on the basis of approximately 8 hour/day, 5 days / week working pattern, or less in the case of visitors to these sites). The prevailing wind direction is towards the west[9], further reducing potential to impact on these locations. The Biowise process operations have not been considered as a receptor, as they form part of the multi-operator installation. In any event, Biowise undertake bioaerosol monitoring in line with TGN M9 monitoring guidance. There are no other residential or industrial/commercial receptors within 250m of the installation boundary.

A precautionary approach has been taken within this application and consideration has been given to the potential for impact from bioaerosols as a result of activities at Esholt STF. This review follows a source-pathway-receptor model to evaluate risk, giving consideration to the characteristics of the waste material, plant design and the operational controls in place to mitigate the risks from bioaerosols. This is summarised in Table C2: 6-5 overleaf.

[4] Environment Agency. 2011. Composting and potential health effects from bioaerosols: our interim guidance for permit applicants. Regulatory Position Statement 031.
[5] Environment Agency. 2012. Guidance for developments requiring planning permission and environmental permits.
[6] Environment Agency, consultation draft July 2020, Appropriate measures for the biological treatment of waste.
[7] Environment Agency. 2011. Composting and potential health effects from bioaerosols: our interim guidance for permit applicants. Regulatory Position Statement 031.
[8] Environment Agency TGN M9 'Environmental Monitoring of Bioaerosols at Regulated Facilities', July 2018,
[9] Based on meteorological data 2007-2011 from the Bingley No. 2 weather station, located approximately 11km to the southwest of the site. This meteorological data set was used in the 2012 air quality impact assessment.

Table C2: 6-6: Review of potential bioaerosol sources and associated risk

Source	Source controls	Pathway	Receptors	Overall risk
Raw sludge reception	Sludge is enclosed throughout; sludge is pumped from tankers or via pipelines to receiving enclosed storage tanks. Displaced air is extracted and dispersed to atmosphere (see separate entry below). Unloading activities occur infrequently. The distance between this source and the nearest residential receptor is >250m.	None	**Digester area receptors:** Residential housing located approximately 160m to the north of the digester area installation boundary, but at greater distance from individual sources. Esholt Hall (currently being redeveloped for use as a YW staff training academy) located approximately 140m to the north of the digester area installation boundary, but at greater distance from individual sources. There are no other residential or industrial/commercial receptors, and no schools or hospitals within 250m of bioaerosol sources.	No risk present – sludge is fully enclosed
Sludge cake reception facility	Unloading activities occur infrequently and are of short duration. Cake is delivered by covered wagon. Cake reception tank is covered when tipping is not taking place. Material disturbance is short lived during tipping operations only. Sludge cake is wet, does not produce dust and is not readily susceptible to airborne dispersion. The distance between this source and the nearest residential receptor is approximately 215m, which combined with the infrequent nature of tipping, makes this source low risk.	Airborne dispersion		Low
Sludge reception - screenings skip	Screenings are not subject to regular disturbance and are stored in relatively small quantities (2 x skips). Screenings are wet, do not produce dust and are not readily susceptible to airborne dispersion. The distance between this source and the nearest residential receptor is >250m.			Low
Sludge handling – screening, dewatering, THP and digestion	Sludge is fully enclosed within tanks or pipework at all times. Displaced air is extracted and dispersed to atmosphere (see separate entry below).	None		No risk present – sludge is fully enclosed
Consolidation tank 5 (uncovered)	Sludge is liquid in nature, does not produce dust and is not readily susceptible to airborne dispersion. Consolidation tank 5 is located to the south of the digester area and therefore at a greater distance from the receptors identified to the north of the site. The distance between this source and the receptors is >250m and therefore the receptor is unlikely to be affected.	Airborne dispersion		Low

Source	Source controls	Pathway	Receptors	Overall risk
SAS storage and transfer tanks (uncovered)	Sludge is liquid in nature, does not produce dust and is not readily susceptible to airborne dispersion. SAS storage and transfer tanks are located to the southwest of the digester area and therefore at a greater distance from the receptors identified to the north of the site. The distance between this source and the receptors is > 250m and therefore the receptors are unlikely to be affected.		**Digester area receptors:** Residential housing located approximately 160m to the north of the digester area installation boundary, but at greater distance from individual sources. Esholt Hall (currently being redeveloped for use as a YW staff training academy) located approximately 140m to the north of the digester area installation boundary, but at greater distance from individual sources. There are no other residential or industrial/commercial receptors, and no schools or hospitals within 250m of bioaerosol sources.	Low
SAS thickeners and thickener OCU (OCU 4)	Sludge is enclosed within thickeners or pipework at all times. Displaced air is extracted and treated by a carbon filter prior to released to atmosphere.			Very low
Odour extraction and dispersion stacks x 4	Sludge is liquid in nature, does not produce dust and is not readily susceptible to airborne dispersion. The distance between these sources and the nearest residential receptor is >250m other than OCU3 (THP feed silos) which is approximately 235m. Overall, any effects are likely to be not significant. YW is committed to undertaking improvements to existing OCUs to ensure effective operation (refer to proposed improvement programme). OCUs will be subject to monitoring programme and planned maintenance to ensure effective operation.			Low
Emergency scenario – bio-gas venting	As the sludge digestion process is a wet process, biogas is unlikely to contain significant concentrations of bioaerosols. Venting events infrequent and short-lived.			Very low
Emergency scenario – Sludge spillage	Sludge is wet, does not produce dust and is not readily susceptible to airborne dispersion. Events occur infrequently and in almost all cases will involve small quantities of sludge. Major/catastrophic loss is highly unlikely to occur. Emergency response procedures are in place to ensure such incidents are responded to promptly and spilt material is cleaned up.			Very low

Source	Source controls	Pathway	Receptors	Overall risk
Digested sludge dewatering feed tanks (uncovered) x 4	Sludge is wet, does not produce dust and is not readily susceptible to airborne dispersion. Sludge contained within the dewatering feed tanks has been processed at high temperature via THP and AD achieving high levels of pathogen kill. Bioaerosols generation potential is therefore very low.	Airborne dispersion	**Digested sludge area receptors:** There are no residential housing, schools or hospitals, or industrial/commercial receptors within 250m of bioaerosol sources associated with the digested sludge area.	Very low
Digested sludge dewatering centrifuges	Digested sludge has been processed at high temperature via THP and AD achieving high levels of pathogen kill. Bioaerosol generation potential is therefore very low. Sludge cake is wet (approximately 25% solids content), does not produce dust and is not readily susceptible to airborne dispersion.			Very low
Digested sludge cake handling (and, as a contingency measure, possible short-term storage) – conditioning pad	Digested sludge has been processed at high temperature via THP and AD achieving high levels of pathogen kill. Bioaerosol generation potential is therefore very low. Sludge cake is wet (approximately 25% solids content), does not produce dust and is not readily susceptible to airborne dispersion. The cake is delivered to the cake pad and is then left undisturbed until moving to the cake barn or removal from site.	Airborne dispersion		Very low
Digested sludge cake handling (and, as a contingency measure, possible short-term storage) – cake barn	Digested sludge has been processed at high temperature via THP and AD achieving high levels of pathogen kill. Bioaerosol generation potential is therefore very low. Sludge cake is wet (approximately 25% solids content), does not produce dust and is not readily susceptible to airborne dispersion. The cake is delivered to the cake pad and is then left undisturbed until removal from site. The cake barn roof and half height walls further reduce susceptibility to airborne dispersion.			Very low
As a contingency measure handling and possible short-term storage of undigested sludge cake – conditioning pad	Sludge cake is wet (approximately 25% solids content), does not produce dust and is not readily susceptible to airborne dispersion. The cake is delivered to the cake pad and is then left undisturbed until removal from site.			Low
Vehicle tracking of materials around on the cake pad and	Regular washdown and wetting in order to reduce dust and keep pad area clean.			Very low

Source	Source controls	Pathway	Receptors	Overall risk
roads, which could dry out and disperse				
Emergency scenario – Sludge cake spillage	Sludge is wet (approximately 25% solids content), does not produce dust and is not readily susceptible to airborne dispersion. Events occur infrequently and in almost all cases will involve small quantities of sludge. Major/catastrophic loss is highly unlikely to occur. Emergency response procedures are in place to ensure such incidents are responded to promptly and spilt material is cleaned up.			Very low

Bioaerosol monitoring

As there are a small number of residential and workplace receptors within 250m of the installation boundary, YW has undertaken quantitative bioaerosols monitoring in accordance with Technical Guidance Note M9 'Environmental Monitoring of Bioaerosols at Regulated Facilities'. This monitoring exercise was carried out by Element Materials Technology Environmental UK Ltd on 22nd and 23rd August 2022. Sampling was undertaken at nine locations on site, with three parallel samples collected per location. The median concentration of total bacteria and of *Aspergillus fumigatus* in the three parallel samples collected were found to be below the guidance limit (1000 and 500 CFU/m^3 respectively) at seven of the sampling locations. At two locations the median concentration of total bacteria exceeded the guidance limit. The median recorded concentrations were 1,500 and 1,750 CFU/m^3 of total bacteria at locations SP5 and SP7 respectively. At no location did the median concentration of *Aspergillus fumigatus* exceed the guidance limit. It is noted that one location (SP5) is adjacent to the large activated sludge plant (ASP) associated with the Esholt STW. As ASPs are vigorously aerated, a bioaerosol contribution from this source (outside of the permit boundary) is possible.

Bioaerosol Risk Assessment - conclusions

The bioaerosol risk assessment undertaken concludes that the Esholt STF installation is not considered to be a significant source of bioaerosols and the likelihood of bioaerosols causing negative impacts at nearby receptors is low or very low. This is due to:

- All potential bioaerosol sources at Esholt STF are wet, do not produce dust and are not readily susceptible to airborne dispersion.
- All potential receptors are located greater than 250m from the installation boundary other than the residential housing and training centre, which form part of the YW-owned Esholt Hall complex; these buildings are located approximately 140-160m from the installation boundary. However, this location is at a greater distance from potential bioaerosol sources; in most cases the distance is greater than 250m (where below this, other factors such as frequency of use and forced air dispersion limit the potential for negative effects).
- The consensus of studies is that bioaerosols decline to background levels within 250m and guidance states that receptors located more than 250m away should be discounted as they are not likely to be affected.
- Digested sludge has been processed at high temperature via THP and AD achieving high levels of pathogen kill. Bioaerosol generation potential from digested sludge source is therefore very low.

Notwithstanding the findings of the risk assessment, exceedances of the guidance limit for total bacteria were detected at two out of nine locations sampled during bioaerosol monitoring. Therefore, it is proposed that further monitoring and assessment is undertaken to better understand this data and to assess the likely source(s) and any mitigation measures that may be necessary. This further work will comprise:

- Two further monitoring exercises (6 monthly bioaerosol monitoring over 12 months).
- Data analysis to establish any trends in terms of location and operational activities being undertaken on site.
- Review of site activities to identify appropriate mitigation measures. It is noted that YW already proposes mitigation measures including tank covering and OCU refurbishment, in order to comply with BAT requirements, and that these will contribute to a reduction in bioaerosol risks.

The monitoring data and findings of the data analysis and recommendations for improvements (e.g. mitigation measures and/or further monitoring) will be reported to the Environment Agency within 18 months.

Q 6-7 Accident Management Plan

The potential for accidental releases resulting from the activities proposed in this variation application are identified and assessed in Table C2: 6-7 below. This includes a summary of measures in place to manage/reduce accident risks. Refer to Q 6-9 for the scoring mechanism.

Table C2: 6-7: Potential accidental releases and associated risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Site Wide - general						
Flooding leading to damage to site processes and/or mobilisation of polluting materials	Ground / groundwater / surface waters	Floodwaters / Infiltration	**Preventative controls** • Flood risk review undertaken. Parts of the STF installation lie within Flood Zone 2 (land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding), and parts lie within Flood Zone 1 (Land having a 1 in 100 or greater annual probability of river flooding). • The site is built on a gradient. Major process tanks are constructed significantly above river level. • Materials are stored in appropriately sealed containers (preferably bulk or semi-bulk), or proprietary secondary containment cabinets, such that the risk of contents being mobilised or containers being washed away in a flood event is low. • Vulnerable Asset Protection Plan specifically details flooding actions including how river levels should be monitored and what actions are required. • **In the event of an incident/accident** • Initiate site emergency plan. • Remove mobile fuel/ chemical sources away from flood risk, if appropriate and safe to do so.	Likely	Medium	Moderate risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Flooding due to drain blockages and/or excessive rainfall causing localised on-site surface water flooding leading to damage to site processes and/or mobilisation of polluting materials	Ground / groundwater / surface waters	Floodwaters / Infiltration	**Preventative controls** • Drains are monitored for blockages and cleaned as required. • Materials are stored in appropriately sealed containers (preferably bulk or semi-bulk), or proprietary secondary containment cabinets, such that the risk of contents being mobilised or containers being washed away in a flood event is low. • Vulnerable Asset Protection Plan specifically details flooding actions. • Planned maintenance / inspection of site drainage systems. **In the event of an incident/accident** • Initiate site emergency plan. • Remove mobile fuel/ chemical sources away from flood risk, if appropriate and safe to do so.	Unlikely	Mild	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Fire	Nearby human receptors Local air quality and global climate impacts Ground / groundwater / surface waters	Air Overland runoff / infiltration / drainage systems	**Preventative controls** • Regular maintenance of equipment; LDAR programme in place. • Fire alarms are fitted in CHP cabinets and boiler house • DSEAR assessment has been completed for site and only appropriate ATEX rated equipment may be used in high risk areas. • Access controls in place for digester compound and portable gas monitor use required when inside compound. • Site does not treat combustible wastes. Sludge is wet. • Gas slam shut valves on biogas feeds to the CHP / boilers. • Gas and fire detection in the boiler house and CHP enclosure, and other key AD plant areas. • Gas oil tank is located outside of the boiler house and CHP compound. • Lightning protection provided for biogas storage. **In the event of an incident/accident** • Follow site emergency procedure. • Hydrants connected to a final effluent supply can be used by the fire service. • Excess biogas created by the site will be burnt through the flare.	Highly unlikely	Severe	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Failure to contain firewater following fire / explosion event leading to localised on site surface water flooding leading to damage to site processes and/or mobilisation of polluting materials	Ground / groundwater / surface waters	Floodwaters / Infiltration	**Preventative controls** • Site drainage collects and returns surface/yard water to WwTW for treatment (with the exception of roofwater from two buildings) (see Figure 5). • Site drainage systems, hardstanding, sumps, storm tanks etc will minimise flow of firewater to receptors. **In the event of an incident/accident** • Initiate site emergency procedure.	Highly unlikely	Medium	Low risk
Excessively low temperatures leading to blockages or damage to pipework, valves or equipment and unplanned release of gas with fire / explosions risks and/or release of potentially polluting liquids	Nearby human receptors Local air quality and global climate impacts Ground / groundwater / surface waters	Air Overland runoff / infiltration / drainage systems	**Preventative controls** • 'Winterisation' procedures. • Bunding provided to environmentally critical plant and equipment. • Current YW technical standards include trace heating for vulnerable pipework. **In the event of an incident/accident** • Isolate systems as appropriate and initiate fire, spill and emergency response procedures, cleaning up spill and disposal of wastes appropriately. • Carry out repairs (as required).	Unlikely	Mild	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Generalised or localised power failure leading to failure of pumps / control systems and escape of sludge and/or biogas	Nearby human receptors Local air quality and global climate impacts Ground / groundwater / surface waters	Air Overland runoff / infiltration / drainage systems	**Preventative controls** • Site has a dual power supply to minimise risk of power failure. • Process for recovering from power failure has been planned and recorded. • In the event of power failure, sludge transfers will stop but this will not affect security of containment e.g., tanks will not overflow. **In the event of an incident/accident** • Halt sludge imports to site. • Confirm backup power supply is online. • Confirm that all systems are operating normally.	Unlikely	Mild	Low risk
Vandalism / site security failure leading to unplanned release of gas with fire / explosions risks and/or release of potentially polluting liquids (chemicals, oils, sludges)	Nearby human receptors Local air quality and global climate impacts Ground / groundwater / surface waters	Air Overland runoff / infiltration / drainage systems	**Preventative controls** • High level of security on site with 24 hr security monitoring, secure entry gate systems and locked cabs and control units. • In addition to perimeter fencing around site, key digestion equipment sits within a separate fenced area. • Storage containers bunded. **In the event of an incident/accident** • Isolate systems as appropriate and initiate fire, spill and emergency response procedures, cleaning up spill and disposal of wastes appropriately. • Carry out repairs (as required). • Review security measures on site.	Highly unlikely	Mild	Negligible risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Failure of chemical or oil containment due to deterioration of storage containers, pipework or valves leading to spillage	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • All oil storage (including gas oil fuel) and waste oil storage tanks are fully bunded (using either fixed or mobile bunds). • Joints external to containment minimised and fully welded. • Tank and pipework inspections undertaken as part of routine maintenance. • Operational procedures for refilling oil and chemical storage tanks. Spill kit to be available at tanks. • Any oil spilt around engines during maintenance will be cleaned up and disposed of appropriately. **In the event of an incident/accident** • Isolate systems as appropriate and initiate spill response procedure, cleaning up spill and disposal of wastes appropriately. • Carry out repairs (as required). • Review systems to prevent recurrence.	Unlikely	Mild	Low risk
Failure of chemical or oil containment during delivery	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • Delivery procedures inc. supervision by site staff, check on space available in receiving tank. • Storage containers bunded. • Chemical/oil storage only in area surrounded by hardstanding with all drainage directed to WwTW. **In the event of an incident/accident** • Follow incident plan.	Unlikely	Mild	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Vehicle impact leading to loss of pressurised gas and explosion / fire risk or loss of liquid containment (chemicals, oils, sludges)	Nearby human receptors Contribution to local air pollution and global warming Ground / groundwater / surface waters	Air	**Preventative controls** • Site speed limits in place to reduce chance and consequence of collision. • Tanker discharge point and access to this area are controlled by manned security point at main site entrance. • Key areas including sludge cake reception area have barriers to prevent collision with equipment. • Key digestion assets including digestion tanks are set back from road and surrounded by a fence. • Site drainage will capture spills related to pipe failure. **In the event of an incident/accident** • Isolate systems as appropriate and initiate fire, spill and emergency response procedures, cleaning up spill and disposal of wastes appropriately. • Carry out repairs (as required)	Highly unlikely	Medium	Low risk
Excessive noise from plant or equipment e.g., due to equipment deterioration or failure	Nearby human receptors	Air	**Preventative controls** • Procurement controls mean plant are selected to comply with relevant noise limits. • Regular maintenance completed to ensure equipment operates within normal noise parameters. • Acoustic enclosures / controls on some noise generating plan (e.g. compressors) • Sensitive receptors not located within close proximity to the site. Refer to Table C2:6-2 for summary of sensitive receptors. **In the event of an incident/accident** • Investigate cause and implement preventive measures, which may include system maintenance interventions.	Unlikely	Mild	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
THP						
Excessive gas pressure in vessels causing pipework/tank rupture	Nearby human receptors Ground / groundwater / surface waters	Air Overland runoff / infiltration / drainage systems	**Preventative controls** • Operators are trained to operate site within design parameters. • Process has automated processes in place to prevent dangerous occurrences. • Alarms alert operators if a hazardous situation is developing. **In the event of an incident/accident** • Pressure relief valves are fitted to tanks to protect against damage from excess pressure.	Unlikely	Medium	Moderate/Low risk
Site wide - sludge pipework, tanks, valves						
Spillage of sludge during transfer / handling activities	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • Staff training on system operation. • Hardstanding in key/high risk areas. • Site drainage returns surface runoff to WwTW. **In the event of an incident/accident** • Isolate systems as appropriate and initiate spill response procedure, cleaning up spill and disposal of wastes appropriately.	Likely	Minor / negligible	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Failure (cracks, splitting) of underground pipework (e.g. fuel, chemicals, sludge, site drains)	Ground / groundwater / surface waters	Infiltration	**Preventative controls** • Existing underground pipework will be periodically surveyed using in-pipe crack detection technology. • Where new pipework at the site has to be underground, the containment provision will be risk assessed and appropriate design specification implemented, which may include secondary containment and leak detection. **In the event of an incident/accident** • Damaged pipe will be isolated. • Spill management procedure will be followed. • Repairs to damaged pipework will be arranged.	Unlikely	Medium	Moderate/Low risk
Minor failure of sludge storage tanks / digester tanks e.g., tank overtopping, pipework leaks	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • High level probes to prevent overfilling of tanks, overflow pipework is in place as a failsafe. • Trace heating is provided to tank level gauges to prevent freezing and reduce the risk of false readings. • Site is monitored on a daily basis. • Infrastructure maintenance and inspections. • Protective measures as for sludge spillage. • Site drainage returns to WwTW for safe processing. • Refer to Appendix 11 for details of secondary containment risk assessment. **In the event of an incident/accident** • Isolate systems as appropriate and initiate spill response procedure, cleaning up spill and disposal of wastes appropriately. • Arrange repairs.	Likely	Minor / negligible	Minor risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Major failure of digester or other sludge storage tank or associated pipework leading to large scale sludge loss/spillage	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • Design and construction of assets is governed by relevant YW technical standards to ensure it is fit for purpose. • Infrastructure maintenance and inspections. • Existing and planned bunding/secondary containment (Refer to Appendix 11 secondary containment risk assessment). • Site drainage returns to WwTW for safe processing. **In the event of an incident/accident** • Cancel all sludge deliveries to site. • Isolate systems as appropriate and initiate spill response procedure, cleaning up spill and disposal of wastes appropriately.	Highly unlikely	Severe	Moderate/Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Biogas pipework, valves, vents						
Failure of biogas pipework, valves and biogas holder (corrosion, cracks, material defects etc) leading to **minor** release of biogas and slight fire / explosion risk	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Design and construction of pipework is governed by relevant YW technical standards to ensure it is fit for purpose. • Most biogas pipework operates at low pressures. • Pipework/gas holders protected from excessive pressure by pressure relief valves. • Pipework is above ground where possible to facilitate inspection and maintenance. • Maintenance schedule defined as part of LDAR strategy at site. • Requirements around use of ATEX rated equipment control risk of leak leading to fire/explosion. **In the event of an incident/accident** • Consider need to isolate pipework. • Consider need to initiate emergency response procedures. Arrange repair to affected asset.	Unlikely	Minor / negligible	Negligible risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Failure of biogas pipework, valves and biogas holder (corrosion, cracks, material defects etc) leading to **major** release of biogas and fire/ explosion risk	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Design and construction of pipework is governed by relevant YW technical standards to ensure it is fit for purpose. • Most biogas pipework operates at low pressures. Pipework/gas holders protected from excessive pressure by pressure relief valves. • Pipework is above ground where possible to facilitate inspection and maintenance. • Maintenance schedule defined as part of LDAR strategy at site. • Standard operational H&S requires staff to wear personal gas monitors at all times, these will detect large scale leakage from pipes. • Requirements around use of ATEX rated equipment control risk of leak leading to fire/explosion. **In the event of an incident/accident** • Immediately follow safety control mechanisms in place to isolate pipework / equipment. • Consider need to initiate emergency response procedures.	Highly Unlikely	Medium	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Breakdown or other damage to on site gas consumers e.g. CHP/boilers leading to disposal of biogas without energy recovery	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Site is designed to minimise risk of uncontrolled release to air. • Operational and maintenance controls in place to ensure reliability of equipment and minimise requirement to send biogas to flare. • There are four CHP engines and two steam boilers with biogas firing capability, therefore flaring rarely occurs. **In the event of an incident/accident** • Any remaining capacity on on-site gas storage will fill. • Once gas storage is full flare will operate, ensuring proper combustion of biogas. • If flare fails, gas will vent through PRVs to prevent damage to site gas system.	Unlikely	Mild	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Failure of flare leading to release of unburnt biogas to atmosphere	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Flare only used as backup in event of problems elsewhere on site. • Flare selected to give minimum 0.3s retention at 1,000C ensuring full combustion of biogas. • Operational and maintenance controls in place to minimise requirement to send biogas to flare. • Flare has control system that ensures ignition e.g., flame detection. • Maintenance programme in place to ensure that flare is always in good operational condition. **In the event of an incident/accident** • Raise urgent maintenance request for repairs to flare. • If flare fails, valve will automatically shut down flow of gas to flare. • Once all site gas containment is full, pressure will release through PRVs to prevent damage to equipment and uncontrolled release of biogas.	Unlikely	Mild	Low risk
Incorrect setting or damage to emergency pressure relief valves leads to premature release of gas or valve fails to reseat after release leading to uncontrolled release of biogas to atmosphere	Local air quality and global climate impacts	Air	**Preventative controls** • Inspection and maintenance of PRVs carried out on a routine basis to ensure they are set and operate correctly. • Checks on PRVs part of normal operational routine. • Over-pressure alarms in control system will alert site staff to incidents that could trigger PRV release. **In the event of an incident/accident** • Follow management procedures to ensure that the valves are re-seated/pressure setting adjusted rapidly and without putting staff at risk.	Unlikely	Minor / negligible	Negligible risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Digester foaming blocks gas lines, leading to release of biogas and/or foam through PRVs	Local air quality and global climate impacts	Air	**Preventative controls** • Feed rate to digesters is controlled to prevent organic overloading. • Digester mixing is regularly assessed as part of operational checks to ensure that it is functioning effectively. • Feedstock assessment ensures that nature and quality of feedstock is understood. • Anti-foam system is fitted to digesters to control foaming. **In the event of an incident/accident** • Follow site procedures for dealing with foaming. • Investigate cause and implement preventive measures. • Ensure that PRVs are not blocked with foam and operating correctly to protect tanks. • Ensure PRVs reseat once pressure in headspace returns to normal levels.	Unlikely	Mild	Low risk
Spillage / loss of containment of liquids	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • Checks on condensate traps and valves are part of regular operational routine. • Condensate runs to site drainage for treatment. • Digester operation is controlled to minimise risk of foaming, which could lead to blockages on condensate system. **In the event of an incident/accident** • Clear up any spills. • Ensure all valves are operating correctly.	Unlikely	Minor / negligible	Negligible risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Sludge treatment processes						
Import of sludge which does not meet waste acceptance criteria leading to disruption to sludge treatment processes	Ground	Spread to land as part of disposal	**Preventative controls** • YW control all sites supplying sludge. Only sewage sludge is imported to Esholt STF, this has a consistent composition and comes from carefully controlled treatment processes. • Prior to initial acceptance of sludge from a new YW site, a screening assessment will be completed to confirm it is safe and stable. • JRP- WaSP system records the dry solids, volume and origin of every import brought to site. • Site operators and tanker drivers are trained to identify problem sludges and divert them to alternative sites for treatment. **In the event of an incident/accident** • Digester health will be investigated to understand cause of problem and best route to resolution. • Digestate being removed from digesters will be subject to enhanced monitoring to ensure that there is no environmental risk. Note this is also a HACCP requirement. • Where relevant the Environment Agency will be alerted that a problem has occurred. • The root cause of the problem will be investigated and procedures updated so that the incident cannot recur.	Unlikely	Minor / negligible	Negligible risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Failure/blockage of sludge screening facility leading to spillage and excess odour emissions	Ground Air	Overland runoff / infiltration / drainage systems Odour to air	**Preventative controls** • Design and construction controls ensure equipment is correctly specified for task. • Maintenance to ensure reliable operation of equipment. • Imports are from YW sites which gives control over content. • Hardstanding around import facility prevents spills travelling to land. • Site drainage will collect spills and return to WwTW for treatment. **In the event of an incident/accident** • Stop imports. • Clean up spill. • Unblock screens.	Likely	Minor / negligible	Low risk
Sludge contamination leading to inhibition of microbial activity / process disruption and insufficient digestion	Ground	Spread to land as part of disposal	**Preventative controls** • Management controls to identify potentially problematic sludges at source. • All sludge imports are from YW sites where sludge characteristics are very stable. • Contamination levels would need to be very severe to significantly impact digestion processes due to the very large digester volume. **In the event of an incident/accident** • Assess digester content to decide best route to normal digester health. • Sample cake prior to export from site to confirm it is safe to spread to land. • Review acceptance procedures.	Highly Unlikely	Medium	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Excessive feeding of digester leads to reduced retention time and failure to meet pathogen kill requirements	Ground / groundwater / surface waters	Spread to land as part of disposal	**Preventative controls** • THP prior to digestion achieves high pathogen kill and improves sludge digestibility. • Staff training • Digesters have a maximum feed interlock ensuring that a set daily feed volume cannot be exceeded. This limit has been calculated to ensure digester stability and environmental safety. • HACCP monitoring. **In the event of an incident/accident** • Turn off digester feed. • Stop additional sludge imports until normal operational situation returns.	Highly Unlikely	Medium	Low risk
Failure of dewatering process leading to discharge to cake pad of cake with high water content	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • Liquid runoff from sludge cake pad collected and directed to WwTW for treatment. System has large storage and handling capacity. **In the event of an incident/accident** • Switch off centrifuge and identify cause of problem.	Unlikely	Minor/negligible	Negligible risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Temporary cessation of land spreading e.g. due to extreme weather conditions, leading to build up of digested sludge cake	Local air quality and global climate impacts	Air	**Preventative controls** • Esholt cake storage is normally within a covered barn, which under normal circumstances, has spare capacity. If this becomes full, a cake storage pad is available to hold excess production. • Additional storage is available at nearby Yorkshire Water sites. **In the event of an incident/accident** • Monitor available storage in cake barn and reduce/stop sludge imports as required. • Divert sludge imports to alternative YW sites for storage.	Likely	Minor/negligible	Low risk
Very warm weather leading to increase in odour generation from sludge cake	Local air quality	Air	**Preventative controls** • Only likely to happen during a prolonged of extreme weather event. • Sludge cake secondary maturation or lime addition not required at this site due to THP. Cake is normally removed from site promptly. **In the event of an incident/accident** • Initial response would be to review operating times and avoid cake generation during problematic weather events, considering both temperature and wind. • If this was not sufficient, YW would look to remove cake from site and store elsewhere.	Likely	Minor/negligible	Low risk
Odour extraction and dispersal						

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Failure of components within extraction and dispersal systems leading to reduced dispersion of odorous emissions to air	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Regular operational checks on systems (e.g. fan operation). • Inspection and maintenance schedule to ensure reliability of extraction system. **In the event of an incident/accident** • Follow operational procedures to minimise generation of emissions until system is repaired.	Unlikely	Mild	Low risk
CHPs, Boilers and other gas consumers						
Excessive emissions to air from boilers and CHP e.g., due to equipment failure, poor performance or malfunction leading to incomplete or inefficient combustion	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Planned preventative maintenance in place for equipment to ensure assets continue to meet original specification on emissions. • Site operational knowledge supported through contracts with specialist providers. • Regular emissions monitoring timetable in operation to confirm required performance level is maintained. **In the event of an incident/accident** • Investigate cause and implement preventive measures, which may include system maintenance interventions.	Unlikely	Mild	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Pipe Bridge						
Rupture due to impact	Surface waters	Air	**Preventative controls** • Pipes are attached to the downstream side of road bridge. This is of a substantial concrete construction. • The river is not navigable by boats, no risk of impact from river traffic. • Site flood protection plan dictates that process is stopped once river level reaches pre-determined level. Pumps will not be actively moving sludge across bridge in high water situations. **In the event of an incident/accident** • Pressure sensors will automatically stop pumps moving flow over pipe bridge.	Highly Unlikely	Medium	Low risk
Rupture due to freezing	Surface waters	Air	**Preventative controls** • Insulation fitted to pipes. • Trace heating fitted to all pipes at risk of freezing including sludge, wash water and potable water. • **In the event of an incident/accident** • Pressure sensors will automatically stop pumps moving flow over pipe bridge.	Unlikely	Mild	Low risk

What harm can be caused and who can be harmed			Managing the risk	Assessing the risk (after preventative controls)		
Hazard	**Receptor**	**Pathway**	**Risk management**	**Probability of exposure**	**Environmental Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains?**
Rupture due to pressure	Surface waters	Air	**Preventative controls** • Air release valves fitted to pipework. • Pumps that have potential to generate high pressures e.g. progressive cavity pumps will be fitted with high pressure cut out sensors. • Maintenance and inspection regime to confirm integrity of pipes. **In the event of an incident/accident** • Pressure sensors will automatically stop pumps moving flow over pipe bridge.	Highly unlikely	Medium	Low risk

Q 6-8 Assessment of point source emissions to sewer

All liquor from raw and digested sludge thickening and dewatering processes, condensate (e.g. from biogas handling), cleaning / washdown effluent and all surface water runoff (with the exception of roofwater from two buildings) is collected and discharged via underground drainage systems to Esholt WwTW for full treatment prior to discharge to the River Aire. This position has been managed for a long period within YW without a requirement for a formal discharge consent between YW STF and YW WwTW. The WwTW treats effluent from off site and from the STF, and has consent limits in place covering all outputs. Therefore, there has been no requirement to separately characterise or assess the outputs from the STF, or any effects of these on receiving waters, separately from the wider WwTW. As such there is no such information available at this time.

YW is committed to undertaking a period of monitoring in order to characterise the liquors returned to the WwTW. The programme of monitoring is identified in Table C2: 6-8 and C2: 6-9 below. Samples will be taken manually from suitable location(s) upstream of the liquor return point to the WwTW inlet, and will be submitted to a laboratory facility that can test to the appropriate standard. Sampling and chemical analysis will be undertaken in line with EA guidance: 'Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk)'. Analysis will be carried out at a UKAS (17025) accredited laboratory and those undertaking the sampling and analysis will be by accredited to MCERTs.

It is proposed this sampling will be carried out for a period of 12 months. The data will be used to undertake an environmental impact assessment in accordance with Environment Agency guidance. The findings of the monitoring, analysis and impact assessment will be provided to the Environment Agency within 18 months of permit issue. Any requirements for ongoing monitoring will be established after this has been completed.

Table C2: 6-8 – Proposed analytical suite: Esholt return liquors characterisation programme - BAT 3 and BAT 7 requirements

Substance / Parameter	BAT-AEL	Waste Treatment Process to which the BAT-AEL applies	Monitoring Frequency	Monitoring Standard
Flow (m^3/day)	N/A	N/A	Monthly for 12 months	MCERTS
Chemical oxygen demand (COD)	N/A	Treatment of water-based liquid waste	Monthly for 12 months	BS ISO 15705
Biological oxygen demand (BOD)	N/A	N/A	Monthly for 12 months	BS EN 1899-1 and -2
Zahn-Wellens test	N/A	N/A	Monthly for 12 months	N/A
Total organic carbon (TOC)	N/A	Treatment of water-based liquid waste	Monthly for 12 months	EN 1484
pH	N/A	N/A	Monthly for 12 months	BS ISO 10523
Total suspended solids (TSS)	N/A	Treatment of water-based liquid waste	Monthly for 12 months	EN 872
Conductivity	N/A	N/A	Monthly for 12 months	ISO 7888 / BS EN 27888
Temperature	N/A	N/A	Monthly for 12 months	Calibrated probe
Total nitrogen	N/A	Treatment of water-based liquid waste	Monthly for 12 months	EN 12260, EN ISO 11905-1
Total phosphorus	N/A	Treatment of water-based liquid waste	Monthly for 12 months	Various EN standards available (i.e. EN ISO 15681-1 and -