Yorkshire Water Services Limited

Lundwood Sludge Treatment Facility (STF)

Application for Environmental Permit Variation

December 2023

Permit reference: EPR/VP3392ZB

Stantec

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Project Name	Environmental Permitting Support
Project No	331001762 100.2401
Report Reference	331001762 100.2401-1

Revision	Date	Description	Author	Check	Review
FINAL	31/12/2021	FINAL	E. Stewart	P. Smith	P. Duncan
FINAL 2	20/12/2023	FINAL	E. Stewart	P. Smith	P. Duncan

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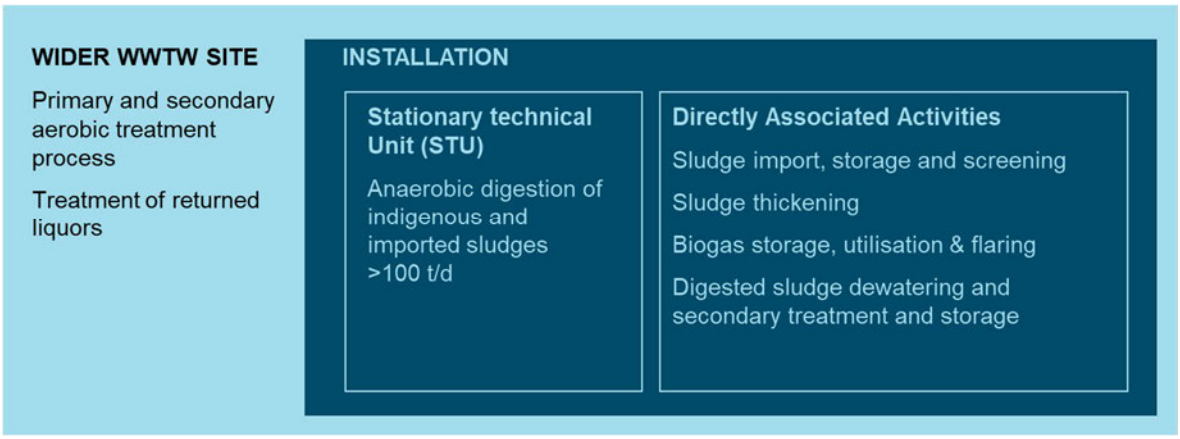
Non-technical Summary

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 digester capacity, there shall be no distinction between imported or indigenous sludges. The Yorkshire Water (YW) Lundwood Sludge Treatment Facility (STF), part of the wider Lundwood Wastewater Treatment Works (WwTW), exceeds the 100t/d capacity limit and therefore it has been agreed that an application to vary an existing permit (permit reference EPR/YP3392ZB) is required to add Schedule 5.4 Part A(1)(b)(i) for AD treatment activities currently operated on site. The site has been operating until now within the scope of a registered T21 permit exemption (reference: WEX259926) and Regulatory Position Statement (RPS) 109 in respect of Combined Heat and Power (CHP) operations burning biogas.

A summary description of activities carried out at Lundwood STF is provided below.

Figure NTS-1 Installation schematic

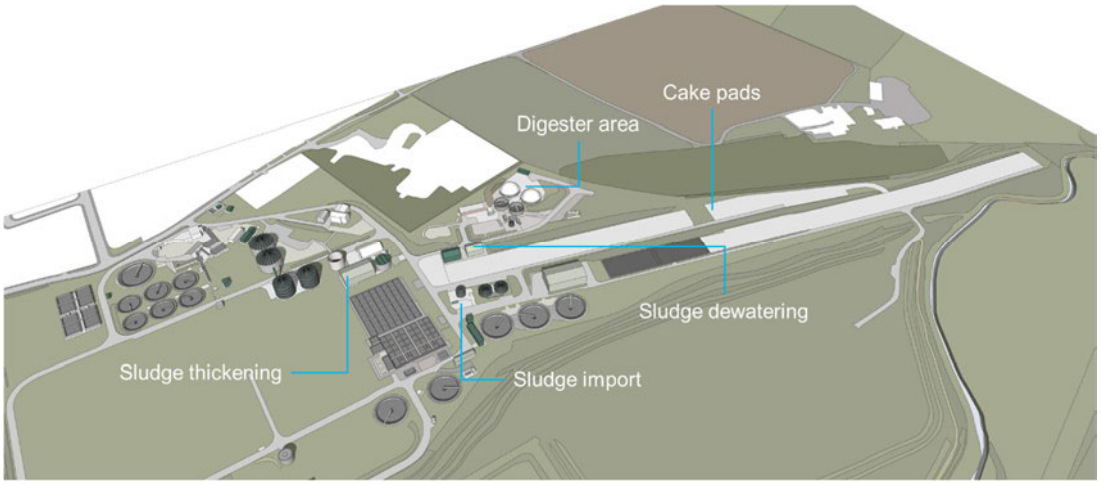


Overview of activities

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

- Sludge reception and screening,
- Raw sludge dewatering,
- 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 and / or boilers used to generate heat for the digesters,
- Digested sludge dewatering,
- Temporary storage of digested sludge prior to transfer off site for landspreading as an agricultural soil conditioning agent,
- Raw material storage and use,
- Surface water and process liquor collection and transfer to Lundwood WwTW for treatment, and
- Waste storage and transfer off site.

Figure NTS-2 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 permit 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 application.

A qualitative odour risk assessment has been undertaken for Lundwood STF. This assessment has concluded that all considered sensitive receptors are exposed to either a negligible or slight adverse odour effect indicating no receptor is exposed to a moderately adverse odour effect or worse. For the overall site, it is considered that Lundwood STF does not have an adverse odour effect on its surrounding 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.

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. In addition, a bioaerosol monitoring survey has been carried out in accordance with Environment Agency TGN M9 'Environmental Monitoring of Bioaerosols at Regulated Facilities' in order to verify the conclusions of the risk assessment. For all samples taken, results for both total bacteria and Aspergillus fumigatus were below the guidance limit. Therefore, it has been concluded that Lundwood STF installation is not a significant source of bioaerosols and no further investigation or monitoring is proposed.

An Air Emission Risk Assessment (AERA) utilising atmospheric dispersion modelling has been undertaken to support this application. Three scenarios were modelled: Scenarios A, B and C.

In relation to human receptors, for all scenarios modelled, where impacts are not classified as 'insignificant' (i.e. 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 EALs and do not constitute 'significant pollution'.

In relation to the impact of the installation on designated ecological sites, in Scenario A ('worst-case' baseline scenario), the predicted PCs from the Installation are less than 100% of the applicable annual or 24-hour C_{Le} or C_{Lo} at locally designated ecological receptor locations, except for within the Sunny Bank, Horse Carr and Storrs Wood LWS where the 24-hour mean NOx, annual mean NOx and annual acid deposition PCs exceed 100% of the C_{Le}/C_{Lo}, as do the PECs.

Additional scenarios have been modelled to test the impact of mitigation options (Scenarios B and C). The results of these additional scenarios indicate that either option would be sufficient to reduce the PCs for annual mean NOx and SO_2 concentrations, as well as nitrogen and acid deposition at ecological receptor locations such that they would be considered 'insignificant' in accordance with Environment Agency guidance.

YW commit to evaluate options to reduce air emissions impacts on the LWS as part of the proposed improvement programme.

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. This study has identified some additional mitigation measures are required in order to enhance environmental protection for the identified sensitive receptors.

Site operational controls

The Lundwood 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 ISO 14001 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.

A review of compliance Best Available Techniques (BAT) requirements contained in Best Available Techniques (BAT) Reference Document for Waste Treatment, 2018 has been undertaken. Where it has been identified that BAT is applicable and is not met (either by the stated techniques or alternative techniques) improvements are proposed. These are listed in the Proposed Improvement Programme.

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 616942

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: Yorkshire Water Services Limited

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: Refer to enclosed sheet: '5c Details of Company Directors'

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	[redacted]
AUTY, Scott (Mr)	Company Director	
BARNES, Wendy Jacqueline (Mrs)	Company Director	
DENCH, Andrew James (Mr)	Company Director	
HOULDEN, John Russell (Mr)	Company Director	
INMAN, Paul Sybray (Mr)	Company Director	
MERRICK, Andrew David (Mr)	Company Director	
MURRAY, Vanda	Company Director	
SHAW, Lucy Nicola (Mrs)	Company Director	
UNWIN, Julia (Dame)	Company Director	
WYLLIE, Andrew (Mr)	Company Director	

Source:

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

Accessed 07.09.2023

Environment Permitting Team
Yorkshire Water
Western House, Halifax Road
Bradford
BD6 2SZ

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?

1c Site details

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

Site name: Lundwood Sludge Treatment Facility

Address: Lund Lane
Barnsley

Postcode: S71 5PA

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.

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

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 UWWT derived					
Supporting information	Part A(1) (b) (i)	sludges and					
Table C2: 1		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 John

Last name Bullivant

Phone

Mobile 07790617692

Email john.bullivant@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

Document reference

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:

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.

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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 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

Date of birth (DD/MM/YY)

3 Technical ability - date of birth information

Name

Date of birth (DD/MM/YY)

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:	Section 5.4,	AD of UWWT derived				
Supporting information	Part A(1) (b) (i)	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	Lundwood 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
Refer to Section III: Supporting Information				
Table C3:2 - 2				
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	Lundwood Sludge Treatment Facility (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)	Best Available Techniques (BAT) Reference Document for Waste Treatment	All
Section 5.4 A(1)(b)(i)	Appropriate measures for the biological treatment of waste	All
DAA	TGN M1	Section III: Table C3:4b - 1
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

* 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 Figure

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	Lundwood Sludge Treatment Facility (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 Refer to Section III: 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		Lundwood Sludge Treatment Facility (STF)		
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: Supporting Information				
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

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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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
Clarity approved by Plain English Campaign

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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) Lundwood Sludge Treatment Facility (STF), which forms part of the wider Lundwood WwTW, exceeds the 100t/d capacity limit and it has therefore been agreed that a variation to an existing permit (reference number VP3392ZB) is required to add Schedule 5.4 Part A(1)b(i) for AD treatment activities.

1b Give this effluent a unique name

Lundwood 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?

1805 cubic metres

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

1846 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?

21.36 litres a second

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

1805 cubic metres

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

21.36 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)

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

✔ 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

You will need to use an Adobe Acrobat reader product to complete this form. The form may not work properly if you use a different pdf reader, such as the one built-in to your internet browser.

Fill in this part for all applications for:

- installations (excluding new permit and variation applications for intensive farming. Use application form Part B3.5 or C3.5 instead)
- waste operations
- mining waste operations
- medium combustion plant
- specified generators
- water discharges (excluding small discharges of 23m^3 per day if using Part B6.5)
- groundwater activities (excluding small discharges of 15m^3 per day or less if using Part B6.5 OR existing small discharges to Source Protection Zone1 if using Part B6.6)

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.
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 Working out charges

You must fill in this section.

You have to submit an application fee with your application. For guidance on the fee and how to pay your charges, please see our charging guidance (**https://www.gov.uk/government/publications/environmental-permitting-charges-guidance**) and associated links to the current charging scheme. You can also contact us for pre-application to help work out charges

Please that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

1 Working out charges, continued

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	Groundwater activity
1					

Table 2 – Charge type (A)

Charge activity reference	Charge activity description	What are you applying to do? For example, a new permit, minor variation, normal variation, substantial variation, surrender, low risk surrender, transfer	Amount
e.g. 1.17.3	e.g. Section 5.2 – landfill for hazardous waste	e.g. transfer application	e.g. £5,561
1.16.2.1	Sect 5.4 (a)(i) and (b)(i) - Non	New application (100% charge)	£13,984
	hazardous waste installation -		
	biological treatment AD (recovery)		
Total A			£13,984

1 Working out charges, 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			

Total charges

Total A plus total B

£16,471

2 Payment

Tick below to show how you have paid.

- Cheque
- Credit or debit card
- ✔ Electronic transfer (for example, BACS)

Cheques

You should make cheques 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. We will not accept cheques with a future date on them.

2 Payment, continued

Credit/debit cards

If you are paying by credit or with debit card we will call you. We can accept payments by Visa, MasterCard or Maestro card only.

☐ Call me to arrange payment by debit or credit card

Electronic transfer BACS

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.

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

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWBK60708010014411 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

PSCAPPYYORKSWI009

State who is paying (full name and whether this is the agent/applicant/other)

Yorkshire Water

Fee paid

£ 16471

Date payment sent (DD/MM/YYYY)

24/12/2021

3 Privacy notice

The Environment Agency runs the environmental permit application service.

See **https://www.gov.uk/guidance/environmental-permits-privacy-notice** for how we use your personal information in services to services to support environmental permitting.

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 at **https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2**.

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

☐ Please treat the specified 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 at **https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2**

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.

5 Declaration, continued

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.

✔ 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)

☐ 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 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)

Name

Title

Mrs

First name

Hazel

Last name

Morgan

on behalf of (if relevant; for example, a company or organisation and so on)

Yorkshire Water Services Limited

Position (if relevant; for example, a company or organisation and so on)

Environmental Lead Advisor

Today's date (DD/MM/YYYY)

20/12/2023

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)

5 Declaration, continued

Name

Title

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

Position (if relevant; for example, 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, contact us before you submit your application. For further information on pre-application advice, see **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit.**

You must do the following:

- ✔ Complete legibly all parts of the application 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 permit applications 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	Payment reference	BACS reference PSCAPPYYORKSWI009
All	Lundwood STF permit variation application	Supporting Information document
Form A, C2, C3, C6, F1	Lundwood permit variation application	Section I Forms (A, C2, C3, C6, F1)
Form C2, C3, C6	Lundwood permit variation application	Section II Technical Description
Form C2, C3, C6	Lundwood permit variation application	Section III Supporting Information
Form C2, C3, C6	Lundwood permit variation application	Section IV Figures (nos. 1 to 4)
Form C2, C3, C6	Lundwood permit variation application	Section V Appendices (nos. 1 to 15)

7 How to contact us

If you have difficulty 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 and supporting documents to:

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

For waste, installations, medium combustion plant and specified generators by email to
PSC@environment-agency.gov.uk

For large electronic documents (too large for email attachment) you can upload your applications to file sharing sites and send us a link to download the documents. Alternatively, you can send more than one email with documents attached.

Or by post to:

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

Crystal Mark 19132 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 (£)

From Kathy Smith
Company Secretary, Yorkshire Water

To Iain Wolsey
Adele Burns
Hazel Morgan

17th February 2023

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 Iain Wolsey, Environmental Regulation Manager, Adele Burns, Lead Advisor, Hazel Morgan, Lead Advisor 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 Company Secretary.

Kathy Smith
Company Secretary, Yorkshire Water

Section II: Technical Description

This section of the application provides a Technical Description of the activities to be operated under the permit.

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

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

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 digester capacity, there shall be no distinction between imported or indigenous sludges. The Yorkshire Water (YW) Lundwood Sludge Treatment Facility (STF), part of the wider Lundwood Wastewater Treatment Works (WwTW), exceeds the 100t/d capacity limit and therefore it has been agreed that an application to vary an existing permit is required to add Schedule 5.4 Part A(1)(b)(i) AD treatment activities currently operated on site. The site has been operating until now within the scope of a registered T21 permit exemption (reference: WEX117507) and Regulatory Position Statement (RPS) 109 in respect of Combined Heat and Power (CHP) operations burning biogas.

YW currently holds a permit for sludge conditioning activities at Lundwood WwTW. The permit was originally issued as a Waste Management Licence on 17th May 2006 (reference number EAWML/65474) and subsequently transitioned to a waste operation permit (reference number EPR/YP3392ZB) on 23rd April 2009. Sludge conditioning activities are no longer carried out on site and therefore this application will vary the permit to remove this activity and add anaerobic digestion and its directly associated activities.

Description of Site Activities

A summary description of all activities carried out at Lundwood STF is provided below.

Figure A Installation schematic

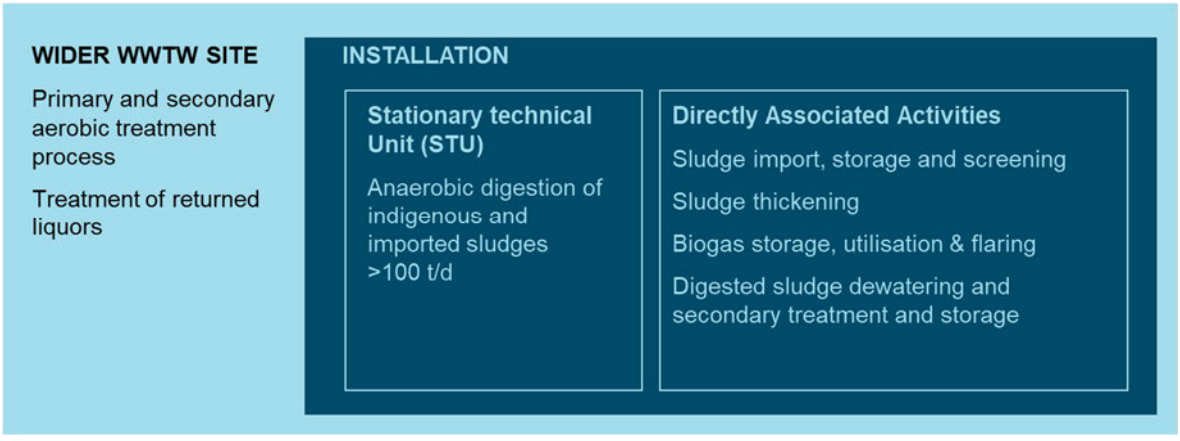


Figure B Installation overview

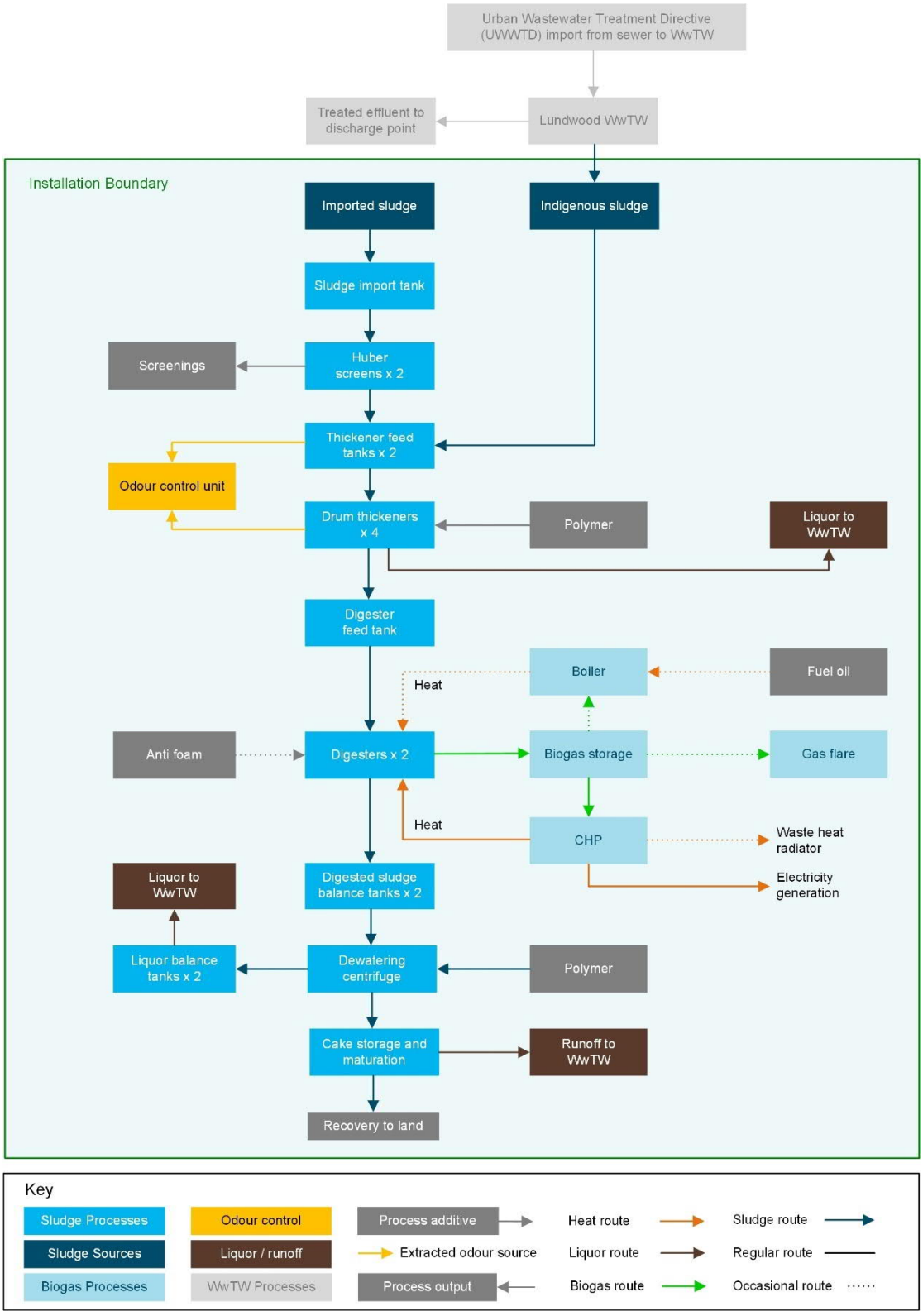
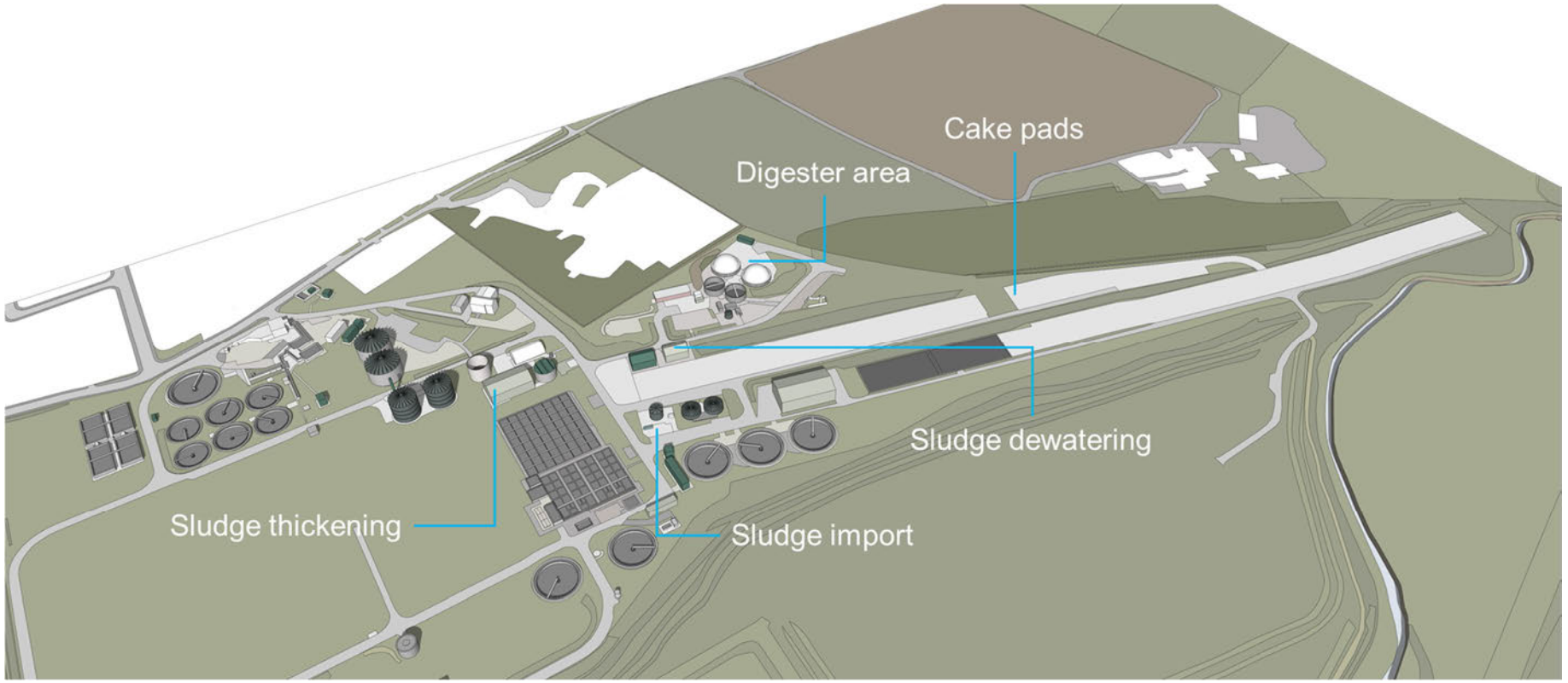


Figure C Installation illustration



Sludge reception, treatment and handling

Lundwood STF treats the following sewage sludges:

- Indigenous primary sludges and surplus activated sludge (SAS) arising from sewage treatment processes operating within the wider Lundwood WwTW that are piped directly to the STF.
- Liquid sludges generated by other YW Wastewater Treatment Works (WwTW) (with lower capacity or capability for treating sludges on-site) that are imported to Lundwood STF for additional treatment.

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 (150 m^3 covered steel tank). The maximum load is typically 28 tonnes with unloading taking up to 30 minutes. Only appropriately authorised vehicles can discharge at the site. This is controlled using a 'WaSP' logger; valves on the discharge pipework will only open when a driver presents appropriate authentication to the system. The WaSP logger records the source of the sludge, the time and date of delivery, the total volume discharged and average percentage dry solids of the load.

There are waste acceptance procedures that deal with the trade waste that is being treated through the WwTW. Some traders may also be subject to trade effluent consents. With regard to the potential for septic sludge imports to be received into the STF, a pre-acceptance process is in place to ensure that it is only received at sites that are capable of processing it without impacting the process (Refer to 'Waste Characterisation (Pre-acceptance & Acceptance' in Part III: Form C2, Question 3d Management systems, and Appendix 12).

The sludge is then screened using two Huber ROTAMAT 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).

Figure D Sludge screens

After screening, imported liquid sludge is pumped via a sub-surface concrete sump, in pipework (largely underground) to the thickener feed tanks (2 no. 1,589 m^3 covered steel tanks). These tanks are air mixed and operate in fill / draw mode with tanks changing over every 24 hours. The tanks are covered with headspace air extracted and routed to a two-stage odour control unit (see below for further details of odour control).

Indigenous SAS and primary sludge from the wider Lundwood WwTW is piped directly to the thickener feed tanks and mixed with the imported screened liquid sludge prior to onward transfer to the drum thickener building.

Figure E Thickener feed tanks and odour control unit

Sludge from the thickener feed tanks is then transferred to the thickener building via above and below ground pipework serving two thickening process streams, which operate on a duty/standby basis. Each sludge stream comprises a dedicated thickener feed pump drawing blended sludge, a polymer dosing pump drawing made-up polymer, a flocculation tank and a pair of drum thickeners (thus there are four thickeners in total). Concentrated liquid polymer is diluted with potable water, then mixed with treated final effluent as a carrier and mixed with the sludge in the flocculation tank. Each flocculation tank feeds two drum thickeners at an equal rate. The polymer encourages separation of water and sludge as the sludge is rotated in the drum to remove excess liquid. The resulting liquor is transferred to a wet well located to the west of the thickener feed tanks and from there is pumped back to the WwTW for full treatment. Each sludge stream has been sized with sufficient capacity to process site daily throughput requirements over a 16 hour period i.e. there is adequate redundant capacity in the event of plant failure.

The drum thickeners are equipped with automatic spray bars which provide continual self-cleaning. In addition, an automatic hot wash system is run periodically in accordance with the planned maintenance regime. The hot wash is designed to break down any fats that would blind the drum filter material. The automatic spray bars operate using treated final effluent and the hot wash system utilises mains potable water.

The liquid polymer delivery point is located in the roadway outside the thickener building; liquid polymer is delivered in 1m^3 IBCs and pumped from these to a 10 m^3 bulk storage tank located within the thickener building. Located above the same concrete sump bund within the thickener building as the bulk storage tank is the 5 m^3 capacity polymer solution storage tank containing the diluted polymer solution.

Odour extracted from each of the four drum thickener units is discharged to atmosphere after treatment in the odour control unit (OCU) (described in the next section). The thickener building ventilation system extracts ambient air from the building and this is also treated in the OCU.

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

- Proprietary enclosed rotating/moving sludge screens reduce odour generation risk.
- Trace heating reduces the risk of loss of containment from pipe fracture on freezing.
- The drum thickeners have a cleaning in place (CIP) system installed to ensure they operate effectively, efficiently and with reduced odour generation potential.
- Sludge thickener processing capacity includes standby plant provision to minimise potential for reduced process control in the event of mechanical or other breakdowns.
- Final treated effluent is used as a diluted polymer carrier and also for the automatic spray bar cleaning system, reducing potable water demand.
- In-line dosing of polymer ensures levels are controlled and raw materials used efficiently.
- Headspace air from the thickener feed tanks and drum thickeners is directed to the OCU.
- 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. Tanks also have an emergency overspill facility connected to site drainage (that is discharged back to the WwTW inlet) as a last line of defence to prevent overtopping.

Figure F **Site view showing raw sludge thickening area**

Odour control

An odour control unit (OCU) is operational on site. This two stage OCU comprises a biotrickling filter (with lava rock media) followed by activated carbon polishing unit. Air extracted from the following sources is transferred for treatment in the OCU prior to discharge to atmosphere via a 15m high stack:

- Thickener feed tanks; and
- Drum thickeners.

Air from the thickener building is extracted directly to the second stage of the OCU (the carbon polishing unit) where it is treated prior to discharge via the stack.

Figure G Odour control unit

The Odour Risk Assessment (Appendix 8) provides a detailed assessment of odour impacts from the STF.

Sludge digestion

The thickened sludge is transferred to the 712 m^3 digester feed tank. This tank is of concrete construction, mixed and covered. Sludge is passed forward continually from this tank to the anaerobic digesters (2 no. 2,056 m^3 concrete tanks). The digesters are located on steeply sloping ground and therefore are partly buried below ground on one side. The anaerobic digesters operate as a continuous process with sludge being added and treated sludge extracted. The two digesters have a typical feed rate of around 120 m^3/day combined; the combined maximum feed rate is 308m^3/day (at 6% dry solids) giving a 12-day retention time as required by Hazard Analysis and Critical Control Points (HACCP) controls. 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.

Figure H Anaerobic digesters

A hot water circuit provides heating to ensure optimum conditions for digester microbial activity. Potable water is heated to around 70°C by the CHP and/or boiler. This hot water then heats the digester using tube-in-tube, counter-current heat exchangers. Sludge from the digesters is continually recirculated around the heat exchangers using 2 no. (duty/standby) recirculation pumps per digester. A 3-way modulating valve on the water side moderates the amount of hot water that passes into the heat exchanger, depending on the heat demand of the digesters.

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.

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, treated final 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 treated final 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 20 litre plastic containers on a drip tray located within the digester compound prior to transfer to the integrally bunded antifoam dosing tank (approximate capacity of 0.5m^3).

Sludge extracted from the digesters is passed forward to the digested sludge balance tanks (see below for further information).

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

- Sludge pumps are on inverters where appropriate for energy efficiency, and typically operate around 75% speed.
- The plant operates under PLC (programmable logic controller) and 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.
- An 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).

Biogas storage and use

Biogas generated by the digestion process is collected and stored within the digesters. Each of the digester tanks is equipped with a membrane gas holder (700 m^3 capacity each) located over the tank providing biogas storage continuous with the tank headspace. The gas holders allow capacity to store and balance the biogas produced from the digestion process. Each roof gas holder is kept inflated by duty/standby air blowers, blowing into the inter-membrane air space, in conjunction with a pressure sustaining valve. Biogas is withdrawn, conveyed by a pipeline through the tank wall, from the gas space of each tank. Pressure relief valves (PRVs) are fitted to each pipeline. The pipelines combine into a manifold which branches to the CHP/boiler and to the flare. Condensate removal pots are installed at low points in the gas pipelines. The collected condensate is drained to Lundwood WwTW for treatment.

Biogas is used as the sole fuel source for the site CHP. The CHP facility comprises a single reciprocating engine generator set with a thermal input of approximately 413 kW and generates electricity which is used to power essential site processes. Heat from the combustion process is used to maintain the required temperature in the anaerobic digesters, with any excess being discharged using air cooled radiators.

The CHP set is located within a building with engine combustion products discharged via a 3m high (approximately) stack located to the rear of the building.

A boiler is available for use as an alternative heat source for the digesters. The boiler can be fired by either biogas or fuel oil and has a thermal input of approximately 833 kW. This is located within the same building as the CHP (in an adjacent room) and combustion products are discharged via a 3.5m high (approximately) stack located to the rear of the building. In normal operations boiler use is limited as heat recovery from the CHP engine meets the digester heat demand.

Fuel oil used as back up supply for the boilers is stored within a 35,000 litre integrally bunded steel tank.

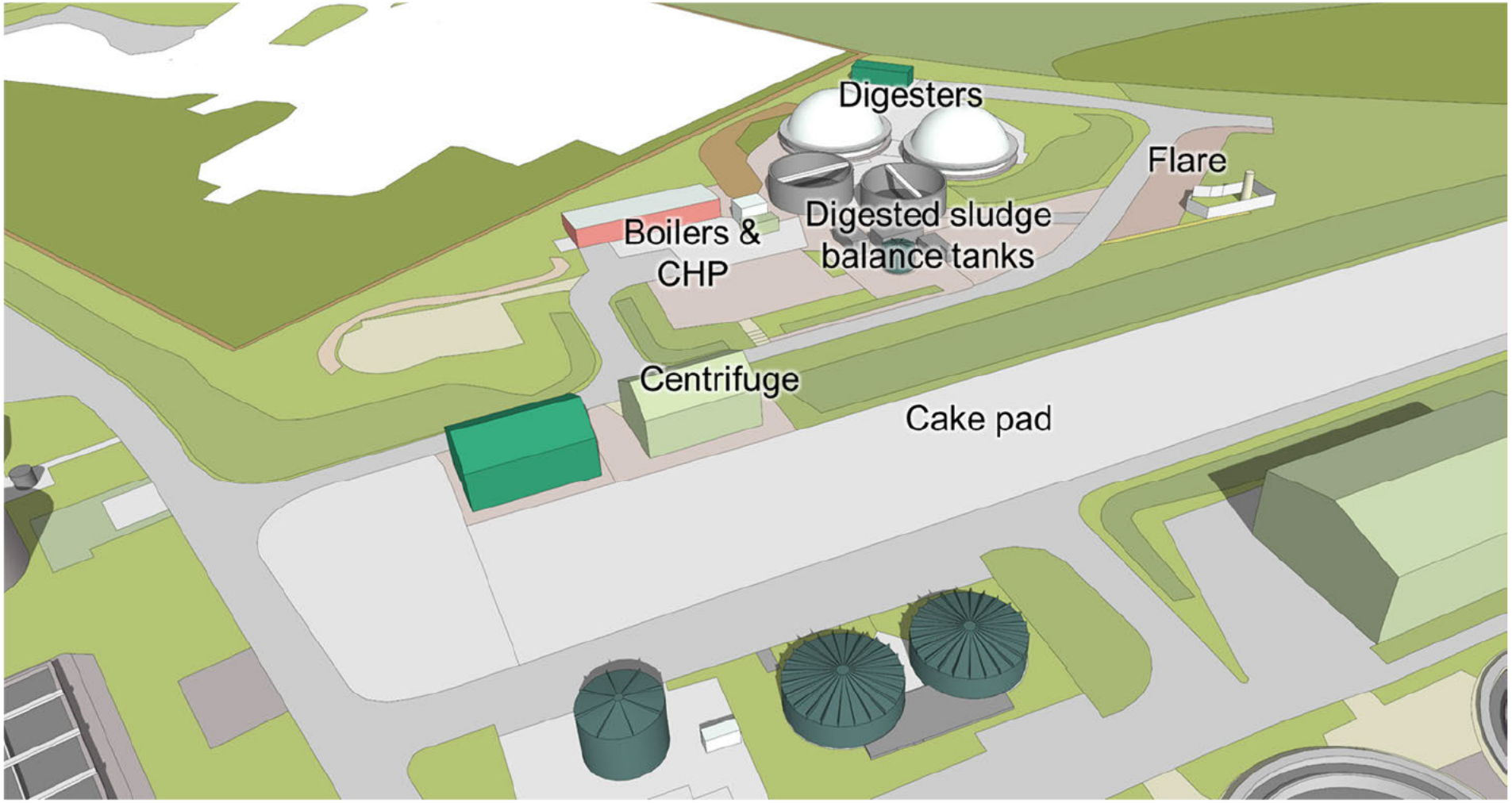
In periods where the CHP engines and boiler are unavailable or biogas generation exceeds combustion capacity, biogas is directed to the waste gas burner (575 m^3/hr capacity). This burner, although a purpose-built closed flare system, is not capable of achieving a minimum of 1,000°C with 0.3 seconds retention time at this temperature. The flare facility 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 within the biogas holder. If the gas level is high then the flare will operate, however utilisation of the gas is preferred over flaring.

The areas around the digesters and gas storage 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.

- 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.

Figure I **Site view showing digesters and areas of biogas storage and use**



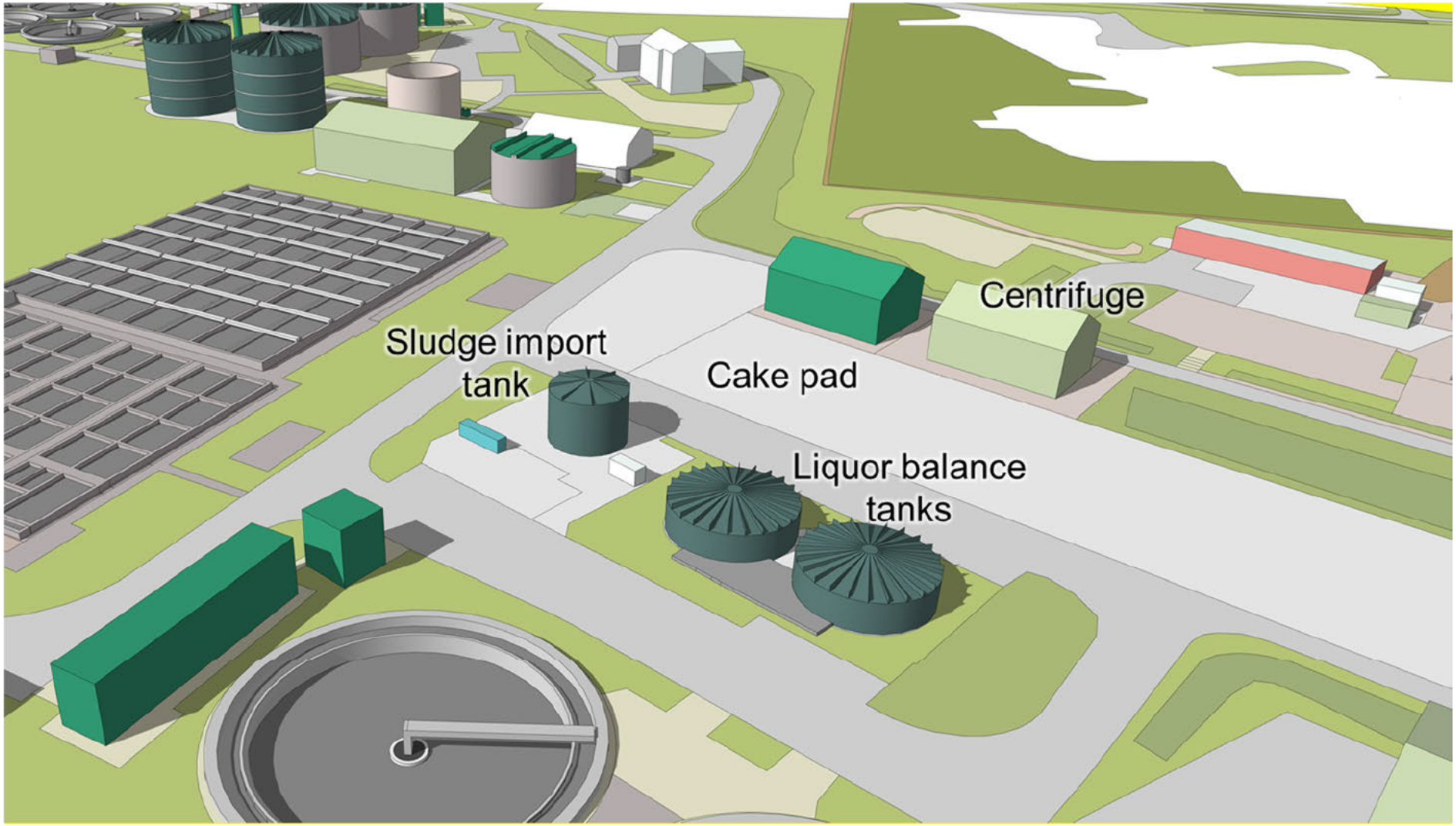
Digested sludge treatment, handling and disposal

Digested sludge is gravity fed from the digesters to the adjacent digested sludge balance tanks (2 no. concrete open topped tank with capacity of 880m³). These tanks are periodically mixed to prevent settlement and anoxic conditions. Powdered polymer stored in 750kg bags is dispensed via a hopper dosing system which feeds a polymer 'ageing' tank where the powdered polymer is mixed with potable water and transferred to a stock tank (approximate capacities of 6m^3). The polymer solution is injected into the sludge stream and taken to the digested sludge dewatering centrifuge where the sludge coagulates and supernatant liquor is removed by centrifugal forces. Dewatering liquor is transferred to two liquor balancing tanks (covered steel tanks, each with a capacity of 250 m^3) prior to transfer to the WwTW for full treatment.

The final digested and dewatered sludge cake is transferred via a conveyer from the centrifuge up over a push-wall and onto the cake pad. The area under the conveyer and adjacent sludge cake pads are an engineered impermeable surface, with water runoff collected in drains running along the bottom edge of the pad. These liquids are pumped back to the WwTW for full treatment.

Figure J Sludge cake conveyors and pad

Figure K **Site view showing sludge intake area and digested sludge dewatering area**



Once on the cake pad, sludge cake is moved by mechanical loaders into storage rows. There is no lime addition at Lundwood STF; instead, cake is stored in piles according to age and is left to mature for a minimum of six weeks in accordance with HACCP requirements. Approximately 3,000 tonnes sludge cake will normally be held on site at any one time. However, the maximum storage capacity of the cake pad is significantly greater than this, up to 12,750 tonnes; greater volumes may be stored on site in emergency/abnormal conditions such as following processing problems at other YW sites or in extreme weather conditions when landspreading operations are temporarily paused. Once maturation is complete, sludge cake is removed from site and landspread in accordance with legislative requirements. Samples of digested, matured cake are taken every 3 months, or whenever a Critical Control Point (CCP) (e.g. digestion retention time or temperature) is not within specification, and analysed for metals and pathogens to ensure HACCP standards are being met.

The cake pad may also be used to serve certain contingency functions, for both operations at Lundwood and to wider strategic regional sewage infrastructure operated by YW. The cake pad may, under exceptional circumstances (such as the failure of assets or non-availability of normal disposal routes on a temporary basis) be used for the interim storage of treated or untreated thickened or dewatered sludge on the cake pad, where that sludge originates from another YW site (or from Lundwood operations), before that material then undergoes AD treatment in the STF at Lundwood. It is recognised that such operations are abnormal and would require initiation of site contingency operating procedures, with the intention of minimising any potential short term adverse environmental effects and returning to normal operations as soon as practicable.

Best Available Techniques (BAT Summary)

- Engineered cake pad with leachate and washwater collected for treatment at the WwTW.
- An inspection and testing programme for pipes and valves is in place. This includes 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 Table C2: 1 below. A full summary of activities it is proposed will be included within this installation are provided in response to Form C3, Table C3: 1a-1 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
Lundwood 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	None – previously regulated as a waste operation.	**Removal** from permit: Sludge conditioning, phyto conditioning and processing, including storage, blending, shredding, screening, conditioning and maturation.	N/A	N/A	N/A
		Addition to permit: Anaerobic digestion of UWWT derived sludges.	None – would be regulated as part of an installation level permit	N/A	N/A	N/A
		Addition to permit: DAAs associated with anaerobic digestion: • Treatment of sludge prior to digestion (including reception, bulking, blending, physical handling, screening and thickening). • Treatment of digested sludge produced at Lundwood STF or other YW sites (including physical handling, dewatering, storage and maturation). • Biogas storage and combustion in gas engines, boilers and auxiliary flare. • As a contingency measure, interim storage of digested and undigested, thickened or dewatered sludge produced at Lundwood WwTW or other YW sites before AD treatment at Lundwood STF.	None – would be regulated as part of an installation level permit	N/A	N/A	N/A

3 Your ability as an operator

3b Technical ability

YW will ensure that there is the necessary technical competence to operate the activities included in this permit application. Technical management will be provided by John Bullivant, Yorkshire Water, his relevant qualifications can be found in Appendix 2.

The environmental permit numbers and site address for all other waste activities that John Bullivant will provide technical competence for are provided below.

Table C2: 3b Sites under the technical competence of John Bullivant

Permit number	Site address	Postcode
YP3592ZU	Aldwarke WwTW Aldwarke Lane Rotherham South Yorkshire	S65 3SR
DP3492ZX	Sandall WwTW Wheatley Hall Road Doncaster South Yorkshire	DN2 4NU

3d Management systems

YW has an established EMS, which is certified to the ISO 14001 standard. A copy of the YW ISO 14001 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 ISO 9001, ISO 14001, ISO 55001 and ISO 45001.
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 ISO 14001 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 Lundwood STF, 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 Lundwood 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 Lundwood 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 in good condition and located on impermeable hardstanding. Waste storage periods must be minimised in order to prevent unnecessary accumulation of stored wastes and to prevent deterioration of the waste or their containers which may lead to accidents or incidents with environmental consequences.

Procedures are in place to ensure waste 'duty of care' requirements are met including ensuring that waste is only removed from site by contractors properly licenced and approved for use and accompanied by a fully completed waste transfer or hazardous waste consignment note. Waste transfer and consignment note records are retained electronically or as paper copies on site.

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 Lundwood 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) will undertake 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 the CHP engines are 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 regularly whilst boiler maintenance normally requires attendance on a less frequent 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)

There are waste acceptance procedures that deal with the trade waste that is being treated through the WwTw. Some traders may also be subject to trade effluent consents.

All sludges arriving at Lundwood STF are either indigenous primary and secondary sludges from the Lundwood WwTW or imported liquid sludge 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 Lundwood STF. All sites supplying sludge to Lundwood 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.

With regard to the potential for septic sludge imports to be received into the STF via the import route, the exporting site Operator would inform the Logistics co-ordinator. The Logistics co-ordinator would then call the STF Optimisers across the region and find a receiving STF site that could cope with the sludge waste.

The following factors would be key considerations for the Optimiser on whether to accept or reject that waste:

- What the digester performance is like and whether the digester is experiencing any foaming issues. Foaming can be indicative of poor digester health and therefore a subnormal sludge load would not assist in this digester health. The load would likely be rejected in this instance.

- If the WwTw was experiencing any planned or unplanned maintenance on any key assets (activated sludge lanes, aerators etc…). Downtime of an WwTw asset can affect the final effluent performance. In this instance, the decision may be taken to reject any subnormal sludge load into the STF as the risk of high strength liquor returns into the WwTw may not be risked.
- The STF Optimiser may request samples in advance of the delivery of any subnormal load to look at the concentration of the BOD and COD load. This would be done from the holding tank at the exporting sludge site. The strength would determine whether the receiving STF was to accept the tanker load or not.

All cake (digested sludge) exported from Lundwood 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, Q 6-8) 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 Lundwood STF, have the capability of remote monitoring and remote operation of key functions. The site is manned 8 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 and in Section III, Form C3, Question 4a.

YW will undertake any air emissions monitoring, including emissions from the CHP/boiler stacks, in accordance with permit requirements (where applicable). 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 Lundwood 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 Lundwood 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 the Lundwood STF 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 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).

Lundwood 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 Lundwood 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 Lundwood 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 ISO 14001 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.

6 Environmental risk assessment

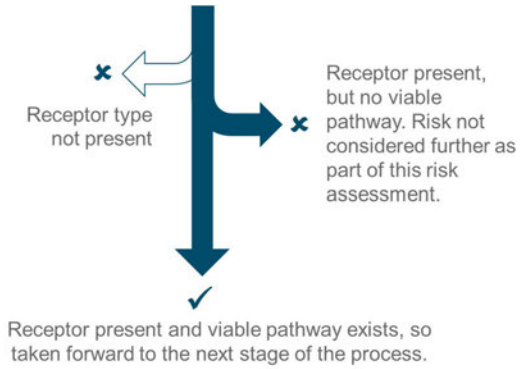
A review of environmental risks associated with activities covered by the scope of this permit application has been carried out. This review follows EA guidance on risk assessments for environmental permits[1] and adopts the approach outlined below:

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 application have been considered.

⇨**Table C2: 6-1**

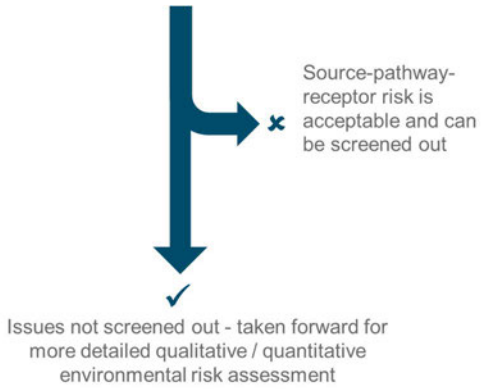
2. Identify and review the receptors (people, animals, property, vegetation and anything else that could be affected by the hazard) at risk. Within each receptor category, the closest receptor(s) has been identified along with possible pathways to link the receptor to the credible site risks from Stage 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	Raw sludge is largely contained within pipework and covered tanks to minimise odour generation potential. Displaced air (odour) from thickener feed tanks and drum thickeners is extracted and treated in a two-stage OCU comprising a biotrickling filter followed by activated carbon polishing unit prior to release to air via a stack. Digested sludge has reduced odour generation potential. Tanks containing digested sludge as well as dewatering facilities and the cake pad are not covered or treated.	✓ Further review
	Point source emissions to air from biogas combustion	CHPs, boiler, waste gas burner (flare)	Biogas generated by the digester is used as the sole fuel source for the site CHP; dual fuel boilers (biogas and fuel oil) are available for use as an alternative heat source for the digesters. In periods where the CHP and boilers are unavailable, or biogas generation exceeds combustion capacity, biogas is directed to the waste gas burner.	✓ Further review
	Point source emissions to air (non combustion).	Odour control unit	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, flare	Noise sources on site include the CHP, boilers, flare, vehicle movements (for sludge cake handling), draught fans associated with odour extraction, rotating screens, compressors and air-cooled radiators. 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.	✓ Further review

Identified risk area		Sources on site	Discussion	Identified risk
	Fugitive and diffuse emissions	Tanks, pipework and containers used for storage, treatment and digestion of sludge	Fugitive emissions (e.g. due to leaks) and diffuse emissions (e.g. from uncovered sources) include 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. Raw sludge is contained in order to reduce potential for fugitive emissions. Displaced air from some covered tanks and processing facilities are captured and transferred to an odour control unit prior to discharge to the environment. Planned maintenance and leak detection and repair programme in place in respect of fugitive emissions.	✓ Further review
	Bioaerosols	Storage and handling of sludge	Raw sludge is contained in order to reduce potential for fugitive emissions. Displaced air from some tanks and processing facilities is extracted and treated in a two-stage OCU. Digested sludge has been subject to high temperatures and treatment to kill pathogens, and disturbance of cake on the cake pad is minimal, other than initial delivery to the pad and subsequent removal from the pad. Raw and digested sludge have a high water content (approx. 60% after thickening). Potential for generation of dust and bioaerosols from these sources is considered to be low but further review is required.	✓ Further review
	Accidental Releases	All areas / all activities	Emergency/unplanned events have the potential to result in abnormal emissions of odour, noise, or 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 sewer	Process liquids	Liquids arising from STF operations that are returned to Lundwood WwTW (outside of the scope of this permit application)for treatment prior to discharge to the River Dearne. Further detail is provided in response to Form C3, Question 2 Point source emissions to water.	✓ Further review

Identified risk area		Sources on site	Discussion	Identified risk
	Point source emissions to surface, groundwater and land	Roofwater and limited other areas	The only point source emissions directly to surface water / ground is uncontaminated roof water from certain process buildings (via W1 and W2 to soakaway (infiltration drainage)). Refer to Figure 4: site drainage plan and Form C3, Question 2 Point source emissions to water. Reference should also be made to the Proposed Improvement Programme - Item 2, in respect of known drainage system issues. Process liquids and most surface / rainwater runoff is returned to Lundwood WwTW for treatment prior to discharge to the River Dearne. Risks associated with accidents and other planned incidents are considered separately.	✘ Not considered further
	Visible plumes	CHP, boiler, flare	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.	✘ 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

Identified risk area		Sources on site	Discussion	Identified risk
	Global warming potential	CHP, Boiler, flare	Anaerobic digesters generate biogas which is used in the CHP to generate electricity (used within the installation) as well as heat required for the digesters. Further energy information is provided in a detailed response to Q 6 of Form C3.	✘ Not considered further

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

Receptor type	Receptor description and distance	Pathway	Possible pathway from source							
			Odour	Air (combustion)	Air (non combustion)	Noise	Fugitive / diffuse	Bioaerosol	Accidental releases	Sewer
Human										
Residential housing - North	Nearest residential property located approximately 100m to the north of the installation boundary.	Airborne	✓	✓	✓	✓	✓	✓	✓	✗
Residential housing – East	Nearest residential property located >1km to the east of the installation boundary.	Airborne	✗	✗	✗	✗	✗	✗	✓	✗
Residential housing – South	Nearest residential property located approximately 800m to the south of the installation boundary.	Airborne	✗	✗	✗	✗	✗	✗	✓	✗
Residential housing – West	Nearest residential property located approximately 230m to the west of the installation boundary.	Airborne	✓	✓	✓	✓	✓	✓	✓	✗
Public amenity areas	There are a number of public footpaths adjacent to the boundary of the WwTW, including the Trans Pennine Trail which is located approximately 225m to the west of the installation boundary at its nearest point. Dearne Valley Park is located approximately 275m to the west of the installation boundary at its nearest point	Airborne	✓	✓	✓	✓	✓	✓	✓	✗
Schools	There are 6 schools within approximately 2km of the installation. The nearest of these is 825m to the west.	Airborne	✗	✗	✗	✗	✗	✗	✓	✗
Hospitals / healthcare facilities	There is one hospital located approximately 2km to the southwest of the installation boundary.	Airborne	✗	✗	✗	✗	✗	✗	✓	✗

Receptor type	Receptor description and distance	Pathway	Possible pathway from source							
			Odour	Air (combustion)	Air (non combustion)	Noise	Fugitive / diffuse	Bioaerosol	Accidental releases	Sewer
Industrial / commercial sites	There are a small number of industrial / commercial sites located within close proximity of the installation. This includes industrial premises located on land directed adjacent to the digesters, approximately 10m to the north. In addition, a farm is located approximately 75m to the north of the cake pad area.	Airborne	✓	✓	✓	✓	✓	✓	✓	✗
Ecological										
Habitat sites – statutory designations	Dearne Valley Wetlands SSSI is located approximately 1.6km to the north and Stairfoot Brickworks SSSIs is located approximately 1.9km to the south of the installation boundary. There are no internationally designated sites (e.g. SAC, SPA, Ramsar) within 10km of the installation.	Airborne Surface water Groundwater	✗	✓	✓	✗	✓	✗	✓	✗
Habitat sites – local sites and non statutory designations	There are a number of other designated habitat sites within 2km of the installation boundary,. This includes: • Sunny Bank, Horse Carr and Storrs Wood Local Wildlife Site (LWS) and ancient woodland (AW), part of which directly adjoins the site to the north. • Stairfoot Disused Railway LWS 525m to the southwest. • Cliff Woods LWS 1km to the west. • Carlton Marsh LWS 1.7 km to the north. • Pearsons Wood AW 850m to the southeast. • Storrs Wood AW 1.2km to the east..	Airborne Surface water Groundwater	✓	✓	✓	✓	✓	✓	✓	✗
Protected species	Possible presence of protected species on or off site.	Airborne Surface water Groundwater	✗	✓	✓	✓	✓	✗	✓	✗

Receptor type	Receptor description and distance	Pathway	Possible pathway from source							
			Odour	Air (combustion)	Air (non combustion)	Noise	Fugitive / diffuse	Bioaerosol	Accidental releases	Sewer
Environment – Other										
Global / regional atmosphere	Regional and global atmosphere.	Airborne	✗	✓	✓	✗	✓	✗	✓	✗
Ground / groundwater	Underlying groundwater classed as a Secondary A aquifer; groundwater vulnerability is classed as high; the installation is not located within a Source Protection Zone but is located within the River Dearne Nitrate Vulnerable Zone.	Unmade ground / infiltration / percolation	✗	✗	✗	✗	✗	✗	✓	✓
Surface water	An un-named drainage ditch is located directly to the south of the installation boundary. The River Dearne is located beyond this to the south. Likely hydraulic continuity between underlying groundwater and the 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, west Public amenity areas Industrial / commercial sites Habitat sites – local sites and non statutory designations	There are a number of odour sources on site including uncovered digested sludge tanks, dewatering centrifuges, thickener liquor wet well and sludge cake storage. Raw sludge odour sources are mainly covered, with odour from thickener feed tanks and drum thickeners extracted and treated in a two-stage odour control unit prior to dispersion to atmosphere. Other sources are not treated prior to dispersion. Further assessment is required.	**Yes – odour risk assessment is summarised in response to Q 6-2 below. Full assessment is included as Appendix 8.**
Point source emissions to air from biogas combustion	⇨	Airborne	⇨	Residential housing – north, west Public amenity areas Industrial / commercial sites Habitat sites –statutory designations Habitat sites – local sites and non statutory designations Protected species Global / regional atmosphere	Biogas generated by the digesters is used as the sole fuel source for the CHP. The CHP generates electricity for use on site and waste heat is used to maintain the temperature of the digesters. In periods when the CHP is not available boilers (dual fuel biogas or fuel oil) may be used to provide heat for the digesters. Any excess biogas which cannot be used by either the CHP or boiler is sent to the waste gas burner (flare). The site is not located within an air quality management area. No existing air quality impact assessment has been identified for the site. 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 6-3 below. Full assessment is included as Appendix 7.**

Source	⇨	Pathway	⇨	Receptor	Discussion	Further assessment required?
Point source emissions to air from OCU – ammonia / H_2S / other organics	⇨	Airborne	⇨	Residential housing – north, west Public amenity areas Industrial / commercial sites Habitat sites –statutory designations Habitat sites – local sites and non statutory designations Protected species Global / regional 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. The effective operation of the OCU serves as a key control for these emissions.	**A summary review of the OCU abatement plant has been provided in response to Q 6-4 below.**
Noise	⇨	Airborne	⇨	Residential housing – north, west Public amenity areas Industrial / commercial sites Habitat sites – local sites and non statutory designations Protected species	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 6-6 below. Full assessment is included as Appendix 9**
Fugitive / diffuse emissions	⇨	Airborne	⇨	Residential housing – north, west Public amenity areas Industrial / commercial sites Habitat sites –statutory designations Habitat sites – local sites and non statutory designations Protected species Global / regional 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 – qualitative risk assessment is summarised in response to Q 6-5 below. Leak detection and repair plan in place – see Appendix 13 and Form C3 Q3b**

Source	⇨	Pathway	⇨	Receptor	Discussion	Further assessment required?
Bioaerosols	⇨	Airborne	⇨	Residential housing – north, west Public amenity areas Industrial / commercial sites Habitat sites – local sites and non statutory designations	There is residential housing located within 250m of the site to the north and west. Other receptors within 250m of the installation include local wildlife sites, footpaths and a number of industrial and commercial sites. Whilst EA guidance does not consider AD as a significant source it is recognised that there are some potential bioaerosol sources within the installation (e.g. uncovered or unabated tanks and cake pad). As a precautionary principle a risk assessment and site survey has been undertaken.	**Yes – impact assessment is provided in response to Q 6-7 below.**
Accidental Releases	⇨	Airborne Overland runoff / infiltration / percolation	⇨	Residential housing – north, east, south, west Public amenity areas Schools Hospitals Industrial / commercial sites Habitat sites –statutory designations Habitat sites – local sites and non statutory designations Protected species Global / regional 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 Q 6-8 below**

Source	⇨	Pathway	⇨	Receptor	Discussion	Further assessment required?
Point source emissions to sewer	⇨	Release to River Dearne via WwTW	⇨	Ground / groundwater Surface water	All process liquids, cleaning washwater and some surface water runoff is returned to Lundwood WwTW (outside of the scope of this permit application) for full treatment prior to discharge to the River Dearne.	**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 6-9 below.**

Q 6-1 Habitat sites risk assessment

There are no European designated habitat sites within 10km of the installation.

There are two SSSIs within 2km of the site. This includes Stairfoot Brickworks, which is located approximately 1.9km to the south of the STF area. This is cited as a site of geological interest and therefore, permitted activities at Lundwood STF will not impact on the designation. The second is Dearne Valley Wetlands SSSI located approximately 1.65km to the north. This site comprises open water, wetlands and woodlands and is located upstream, on a separate tributary, to Lundwood STF outfall.

In addition, several local wildlife sites and ancient woodlands have been identified in the vicinity of the site. These are listed in Table C2: 6-2 above.

The accidents risk assessment (Q 6-8 below) and Site Condition Report (Appendix 5) consider the potential for effects on designated sites as a result of emissions to water or groundwater.

Potential effects on designated sites associated with emissions to air have been considered in the air emissions risk assessment (Appendix 7).

Q 6-2 Summary of the Odour Risk Assessment

A qualitative odour risk assessment has been undertaken to assess the risk of odours from Lundwood STF on the surrounding area. This assessment has indicated that all considered sensitive receptors are exposed to either a negligible or slight adverse odour effect indicating no receptor is exposed to a moderately adverse odour effect or worse.

The YW complaints log recorded only five complaints over the last five years for the site as a whole (i.e. the YW Lundwood WwTW and STF combined). The odour complaints are reported to be from receptors located to the north and northwest of the site. The inconsistent and infrequent nature of these complaints coupled with irregularity of timing throughout the year, suggests the complaints are likely to be attributed to ad hoc events and are not associated with “normal” operation of the site.

For the overall site, it is considered that Lundwood STF does not have an adverse odour effect on its surrounding receptors.

Notwithstanding the findings of this assessment, YW is committed to meeting BAT requirements and to further reducing odour and other diffuse emissions from uncovered / unabated sources – refer to proposed improvement programme.

Q 6-3 Summary of the Air Emissions Risk Assessment

An Air Emission Risk Assessment (AERA) utilising atmospheric dispersion modelling has been undertaken to support this application. The scope of the assessment is limited to the point source combustion emissions to air at Lundwood STF.

The AERA report (included in full as Appendix 7) outlines the approach, methodology and results in full. Three scenarios were modelled: Scenarios A, B and C.

Scenario A is an initial 'worst-case' baseline scenario whereby the CHP plant, 2 no. boilers and flare have been assumed to operate throughout the year for 24-hours a day (8,760 hours per annum). This assumption is considered conservative; 'real-world' boiler and flare usage in particular are substantially below this level of utilisation. All plant is periodically taken off-line for servicing which would also reduce total available annual operating hours.

In relation to human receptors, in Scenario A ('worst-case baseline scenario) where impacts are not classified as 'insignificant' (i.e. 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 EALs and do not constitute 'significant pollution'.

In relation to the impact of the Installation on designated ecological sites, in Scenario A ('worst-case' baseline scenario), the predicted PCs from the Installation are less than 100% of the applicable annual or 24-hour C_{Le} or C_{Lo} at locally designated ecological receptor locations, except for within the Sunny Bank, Horse Carr and Storrs Wood LWS where the 24-hour mean NOx, annual mean NOx and annual acid deposition PCs exceed 100% of the C_{Le}/C_{Lo}, as do the PECs.

Additional scenarios (Scenarios B – C) have also been modelled to test the impact of mitigation options on reducing the process contribution at ecological receptor locations. The mitigation options include limits to operating hours (using 'real-world' operating hours for all plant) and changes to the CHP stack configuration. The 'real-world' operating hours are based on run-hour data for the plant (CHP and boiler 1) from previous years and existing limits (for the flare) and are assumed to be 95% (8,322 hours per year) for the CHP, 50% (4,380 hours per year) for boiler 1 and 10% (876 hours per year) for the flare.

Since Scenario A was modelled, Boiler 2 is now non-functional and is due to be disconnected. Boiler 2 has therefore not been included in Scenarios B and C.

The results of the additional scenarios (Scenarios B and C) indicate that either a 9m high vertical CHP stack with limits to annual operating hours (95% for the CHP, 50% for boiler 1, removal of boiler 2 and 10% for the flare) or a 14m high vertical CHP stack with no limits to operating hours (but including removal of boiler 2), would be sufficient to reduce the PCs for annual mean NOx and SO_2 concentrations, as well as nitrogen and acid deposition at ecological receptor locations such that they would be considered 'insignificant' in accordance with Environment Agency guidance. In Scenario B, the predicted 24-hour mean NOx PC exceeds 100% of the C_{Le} at one ecological receptor location in the Sunny Bank, Horse Carr and Storrs Wood LWS, however, a conservative C_{Le} of 75 µg/m^3 has been used for 24-hour NOx impacts, and therefore, it is considered that the predicted 24-hour NOx PC is unlikely to result in a significant effect on the LWS in this scenario. In Scenario C, the 24-hour NOx PCs are considered to be 'insignificant' at all ecological sites.

YW will evaluate options to reduce air emissions impacts on the LWS via changes to the CHP stack (e.g. changes to stack configuration and increase to stack height) – refer to proposed improvement programme.

Q 6-4 Summary review of abatement plant

YW operates a two stage OCU at Lundwood STF, which treats odour extracted from the thickener feed tanks, drum thickeners and thickener building. This is a key abatement asset within the permitted installation.

In line with the findings of the qualitative environmental risk assessment (Tables C2: 6-1, 2 and 3 above), a review of odour emissions from the OCU abatement plant has been carried out on behalf of YW by a specialist contractor. The findings of this study have been reviewed in order to determine the need for any additional assessment or works. The findings are summarised below in Table C2: 6-4, which sets out the results of monitoring at the biofilter inlet, biofilter outlet, carbon scrubber inlet and carbon scrubber outlet at the OCU.

Table C2: 6-4 Risk based review of abatement plant effectiveness

OCU inlet and outlet odour results		Discussion
Emissions: Olfactometric results (mean of 4 samples over 2 days)		
Biofilter inlet odour (ou_E/m^3)	209,277	Equipment operating effectively with low concentrations detected at stack outlet. Air samples were collected via the lung method in accordance with BS EN 13725:2003 Air Quality - Determination of odour concentration by dynamic olfactometry. Analysis was undertaken within 30 hours of collection at a UKAS accredited laboratory.
Biofilter outlet odour (ou_E/m^3)	4,769	
Carbon inlet odour (ou_E/m^3)	3,344	
Carbon outlet odour (ou_E/m^3)	339	
Emissions: H_2S – Hydrogen Sulphide (mean of 4 samples over 2 days)		
Biofilter inlet H_2S (ppm)	35	Equipment operating effectively with very low concentrations detected at stack outlet. Sampling methodology using Jerome Hydrogen Sulphide analyser
Biofilter outlet H_2S (ppm)	0.185	
Carbon inlet H_2S (ppm)	0.106	
Carbon outlet H_2S (ppm)	0.02	
Emissions: NH_3 – Ammonia (mean of 4 samples over 2 days)		
Biofilter inlet NH_3 (ppm)	<0.1	Ammonia concentrations not present or below Limit of Detection (LOD) at all locations. Sampling methodology using Gastec hand operated gas detection tubes.
Biofilter outlet NH_3 (ppm)	<0.1	
Carbon inlet NH_3 (ppm)	<0.1	
Carbon outlet NH_3 (ppm)	<0.1	
Emissions: Total VOC (mean of 4 samples over 2 days)		
Biofilter inlet TVOC (ppm)	10.5	Equipment operating effectively with TVOC emissions not present or below Limit of Detection (LOD) at stack outlet. Sampling methodology using Phocheck Tiger PID.
Biofilter outlet TVOC (ppm)	0.1	
Carbon inlet TVOC (ppm)	0.1	
Carbon outlet TVOC (ppm)	<0.1	
Emissions: Thiols (RSH) / Mercaptans (mean of 4 samples over 2 days)		
Biofilter inlet R-SH (ppm)	2.5	Equipment operating effectively with R-SH emissions not present or below Limit of Detection (LOD) at stack outlet. Sampling methodology using Gastec hand operated gas detection tubes.
Biofilter outlet R-SH (ppm)	Trace	
Carbon inlet R-SH (ppm)	<0.1	
Carbon outlet R-SH (ppm)	<0.1	
Emissions: Dimethyl Sulphide (mean of 4 samples over 2 days)		
Biofilter inlet DMS (ppm)	Trace	DMS concentrations not present or below Limit of Detection (LOD) at stack outlet. Sampling methodology using Gastec hand operated gas detection tubes.
Biofilter outlet DMS (ppm)	<0.1	
Carbon inlet DMS (ppm)	<0.1	
Carbon outlet DMS (ppm)	<0.1	

OCU inlet and outlet odour results		Discussion
Process monitoring: OCU Airflow Rate (mean of 4 samples over 2 days)		
Biofilter inlet air volume (m^3/hr)	3,430	Equipment operating effectively. Biofilter services the thickener feed tanks and drum thickeners. The second carbon stage treats air from the biofilter and also room ventilation air from the thickener building.
Carbon inlet air volume (m^3/hr)	9,156	
Covered vessel pressure measurements		
Drum thickeners (Pa)	-1.3	The differential pressure measurements show that there is effective extraction from the two thickener feed tanks and that the drum thickeners and thickener room achieves a good level of odour containment. No odour was detectable externally around the assets served by the OCU during the survey visits
Thickener room (Pa)	- 4	
Thickener feed tank 1 (Pa)	-34.5	
Thickener feed tank 2 (Pa)	-54.3	

Results of measurements taken indicate that both stages of the OCU are working very effectively and it has been concluded that no further assessment is required in respect of point source emissions from the OCU.

Q 6-5 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 OCU on site. 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: 6-5 below summarises the BAT assessment undertaken.

Table C2: 6-5: Review of diffuse and point source emissions

Sludge source	Existing emissions controls	BAT assessment
Sludge import tank	Tank is covered, but with no headspace air extraction or treatment.	BAT partially in place – YW will connect this tank to a new OCU to provide treatment of odours from this source. Refer to proposed improvement programme.
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 4 – 8 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.	BAT not in place – skips will be covered. Refer to proposed improvement programme.
Screened sludge pumping station sump	Sump is not covered.	YW will install a fixed cover and extract and treat odour in a new OCU. Refer to proposed improvement programme.
Thickener feed tanks x 2	Tank is covered and headspace air is extracted and treated – see below for comments in relation to the OCU.	BAT in place – see below for comments in relation to the OCU.
Drum thickeners x 4	Thickener units are enclosed and located within a building. Air from thickener units is extracted and treated in OCU.	BAT in place – see below for comments in relation to the OCU.
Odour control unit for 2 no. thickener feed tanks and thickeners	Tank / thickener headspace air is extracted and treated in an OCU. Refer to Q6-4 above for review of treatment plant effectiveness. OCU will be managed and monitored in accordance with the Odour Management Plan (Appendix 10).	BAT in place
Thickener liquor wet well	Sump is not covered.	YW will install a fixed cover and extract and treat odour in existing OCU. Refer to proposed improvement programme.

Sludge source	Existing emissions controls	BAT assessment
Digester feed tank	Tank is covered	BAT partially in place – YW will connect this tank to a new OCU to provide treatment of odours from this source. Refer to proposed improvement programme.
Digesters x 2	Digesters fully sealed. LDAR plan in place. Biogas is collected burnt in site CHPs / boilers / flare.	BAT in place
Digested sludge balance tanks x 2	Tanks are not covered.	Tank will be covered. It is noted that digested sludge sources are inherently lower emissions generation potential and therefore residual biogas potential and emissions testing will be undertaken to determine the most appropriate type of cover, including emissions capture or abatement if required. Refer to proposed improvement programme.
Dewatering centrifuge for digested sludge	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 balance tanks x 2	Tank is covered, but with no headspace air extraction or treatment.	BAT partially in place - It is noted that digested sludge sources are inherently lower emissions generation potential and therefore no further mitigation is proposed.
Cake storage and maturation pad	Not covered.	No further mitigation is proposed - digested sludge sources have inherently lower emissions generation potential; the use of enclosed buildings for cake storage is constrained by the volume of waste.

Q 6-6 Summary of the Noise Impact Assessment

Potential sources of noise resulting from the activities proposed in this permit application, have been identified and assessed in Table C2: 6-6. Further detail is provided in Appendix 9. For scoring mechanism refer to Q 6-10.

Table C2: 6-6: Noise risk assessment

Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk
Noise: CHP	Residential	Airborne	Equipment is enclosed within dedicated housing and located within a building. This location on site would be partly shielded from receptors by higher land to the north and west of the building 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	Mild	Low
Noise: CHP Exhaust	Residential	Airborne	This location on site would be partly shielded from receptors by higher land to the north and west of the building 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	Mild	Low
Noise: Fans on air cooled radiators	Residential	Airborne	Fans subject to regular checks and maintenance. Plant is located such that surrounding structures partly shield potential receptors from the noise source. 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	Mild	Low
Noise: Flare	Residential	Airborne	Flare operates only when there is excess biogas. 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	Mild	Low
Noise: Vehicular movements around site	Residential	Airborne	Deliveries would take place during the daytime hours only when background sound levels are higher.	Unlikely	Mild	Low
Noise: Sludge Delivery / Pumping / screening	Residential	Airborne	Sludge import area is located such that site structures / topography provide some degree of shielding to potential receptors Deliveries would take place during the daytime hours only when background sound levels are higher.	Unlikely	Mild	Low
Noise: Centrifuge / thickening process	Residential	Airborne	Centrifuge and thickener plant are located inside dedicated buildings. Good maintenance of plant to ensure that excessive noise levels are not generated from equipment breakdown or wear and tear under Operations & Maintenance contract.	Unlikely	Mild	Low

Q 6-7 Bioaerosol 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[2], 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 Lundwood STF. Furthermore, Environment Agency guidance (2012)[3] states that:

"We do not consider that bioaerosols from anaerobic digestion are a serious concern.

However, the most recent guidance[4] 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[5]. Technical Guidance Note (TGN) M9[6] 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 100m to the north, with other residential housing approximately 230m to the west at the closest point. There are industrial / agricultural receptors located closer to the site including industrial premises adjoining the site approximately 10m to the north of the digesters compound and agricultural buildings/premises approximately 75m north of the cake pad. There are amenity / habitat areas located within 250m of the installation boundary including the Trans Pennine Trail approximately 225m to the west and Sunnybank LWS which adjoins the site to the north. Risks associated with industrial, agricultural and amenity 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).

A review of the potential for impact from bioaerosols as a result of activities at Lundwood STF has been undertaken. 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: 6-7 overleaf.

[2] Environment Agency. 2011. Composting and potential health effects from bioaerosols: our interim guidance for permit applicants. Regulatory Position Statement 031.
[3] Environment Agency. 2012. Guidance for developments requiring planning permission and environmental permits.
[4] Environment Agency, consultation draft July 2020, Appropriate measures for the biological treatment of waste.
[5] Environment Agency. 2011. Composting and potential health effects from bioaerosols: our interim guidance for permit applicants. Regulatory Position Statement 031.
[6] Environment Agency Technical Guidance Notes (TGN) M9 'Environmental Monitoring of Bioaerosols at Regulated Facilities', July 2018.

Table C2: 6-7: Review of potential bioaerosol sources and associated risk

Source	Source controls	Pathway	Receptors	Overall risk
Raw sludge intake	Sludge intake tank is covered but with no extraction and treatment. Sludge is fully enclosed within pipework when transferred between tankers and tanks.	Airborne dispersion	Residential housing within 250m, including residential areas 100m to the north and 230m to the west. Industrial / commercial sites within 250m including industrial premises 10m to the north and agricultural premises 75m to the north. Amenity areas within 250m including the Transpennine trail 225m to the west and Sunnybank LWS adjoining the site to the north, although this would only typically be used in a transitory manner.	Low
Sludge reception - screenings skips	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.	Airborne dispersion		Low
Raw sludge thickening including thickener feed tanks and drum thickeners	Sludge is fully enclosed within tanks or pipework at all times. Displaced air is extracted and dispersed to atmosphere via a two-stage odour control unit (OCU) (see separate entry below).	None		Risk not present – sludge is fully enclosed with extracted air treated in OCU
Odour control unit (OCU)	Air from thickener feed tanks, drum thickeners and thickener building is treated via a two-stage OCU comprising biofilter and activated carbon filtration prior to discharge to atmosphere. OCU subject to monitoring programme and planned maintenance to ensure effective operation.	Airborne dispersion		Very low
Emergency scenario – biogas 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.	Airborne dispersion		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.	Airborne dispersion		Very low
Digester feed tank	Digester feed tank is covered but with no extraction and treatment. Sludge is fully enclosed within pipework when transferred between tankers and tanks.	Airborne dispersion		Low
Anaerobic digesters	Sludge is fully contained during digestion process with biogas collected and combusted in CHP, boiler and/or flare.	None		Risk not present – sludge is fully enclosed

Source	Source controls	Pathway	Receptors	Overall risk
Digested sludge dewatering feed tanks (uncovered) x 2	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 in the digesters, achieving high levels of pathogen kill. Bioaerosol generation potential is therefore very low.	Airborne dispersion		Low
Digested sludge dewatering centrifuges	Digested sludge has been processed at high temperature in the digesters, 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. Centrifuges are located within a building.	Airborne dispersion	Residential housing within 250m, including residential areas 100m to the north and 230m to the west. Industrial / commercial sites within 250m including industrial premises 10m to the north and agricultural premises 75m to the north. Amenity areas within 250m including the Transpennine trail 225m to the west and Sunnybank LWS adjoining the site to the north, although this would only typically be used in a transitory manner.	Low
Digested sludge cake handling, storage and maturation – cake pad	Digested sludge has been processed at high temperature in the digesters, 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, moved into windrows for storage and is then left undisturbed until removal from site.	Airborne dispersion		Low
As a contingency measure handling and possible short-term storage of undigested sludge cake – cake 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 treatment and/or removal from site.	Airborne dispersion		Low
Vehicle tracking of materials around on the cake pad and roads, which could dry out and disperse	Washdown and wetting as required in order to reduce dust and keep pad area clean.	Airborne dispersion		Very low
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.	Airborne dispersion		Very low

Bioaerosol Monitoring Survey

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. However, there are a number of potential bioaerosol receptors located within 250m of Lundwood STF. This includes residential housing, industrial and agricultural sites and local amenity areas. Therefore, it has been identified that it is necessary to undertake bioaerosol monitoring in accordance with Environment Agency TGN M9 'Environmental Monitoring of Bioaerosols at Regulated Facilities' in order to verify the conclusions of this risk assessment.

Element Materials Technology Environmental UK Limited were commissioned by YW to complete a bioaerosol monitoring exercise at Lundwood STF. Monitoring was undertaken on 15th November 2021 using the filter method in accordance with TGN M9. Triplicate samples were collected at each of the eight selected sampling locations (four boundary locations as well as one upwind and three downwind locations) and target micro-organisms were cultured on media for the appropriate period.

For all samples taken, results for both total bacteria and Aspergillus fumigatus were below the guidance limit i.e. 1000 CFU/m^3 for total bacteria and 500 CFU/m^3 for Aspergillus fumigatus. Samples were taken within the Lundwood site area and therefore bioaerosol concentrations at nearby sensitive receptors would be lower. On this basis it can be concluded that the site posed no bioaerosol risk to any nearby sensitive receptors.

Bioaerosol Risk Assessment - conclusions

The bioaerosol risk assessment undertaken concludes that the Lundwood STF installation is not a significant source of bioaerosols. This is due to:

- All potential bioaerosol sources at Lundwood STF are wet, do not produce dust and are not readily susceptible to airborne dispersion.
- Digested sludge has been processed at high temperature via the digesters achieving high levels of pathogen kill. Bioaerosol generation potential from digested sludge sources is therefore very low.
- Undigested sludge sources are largely contained or covered. Displaced air from key assets is extracted and treated in a two-stage biofilter prior to release to atmosphere.

The findings of the risk assessment are supported by bioaerosol monitoring carried out in accordance with TGN M9 and therefore no further investigation or monitoring is proposed.

Q 6-8 Accident Management Plan

The potential for accidental releases resulting from the activities proposed in this permit application are identified and assessed in Table C2: 6-8 below. This includes a summary of measures in place to manage/reduce accident risks. Refer to Q 6-10 for the scoring mechanism.

Table C2: 6-8: 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. Core STF assets, including sludge tanks and digesters are not within flood zones. The flood map shows that a small area of the lower cake pad is in Flood Zone 2, with a risk of flooding between 1 in 100 years and 1 in 1000 years. • Materials used in sludge treatment such as polymer are stored outside of flood zone. • 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.	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?**
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 / boiler rooms. • 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 / boiler. • Gas and fire detection in the boiler / CHP rooms, and other key AD plant areas. • 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	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?**
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 most surface/yard water to WwTW for treatment. Roofwater from certain buildings is discharged to soakaway (infiltration drainage)) (W1 and W2). Other drainage areas require further investigation or repair (if they represent a pathway to ground) (see Proposed Improvement Programme Item 2). • 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** • 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 and waste oil storage tanks are fully bunded (using either fixed or mobile bunds). • Tank and pipework inspections undertaken as part of routine maintenance. • Operational procedures for refilling oil and chemical storage tanks. Spill kit 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. • Site drainage collects and returns most surface/yard water to WwTW for treatment. Roofwater from certain buildings is discharged to soakaway (infiltration drainage)) (W1 and W2). Other drainage areas require further investigation or repair (if they represent a pathway to ground) (see Proposed Improvement Programme Item 2). **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 include barriers to prevent collision with equipment. • Key digestion assets including digestion tanks are set back from road and surrounded by a fence. • Site drainage collects and returns most surface/yard water to WwTW for treatment. Roofwater from certain buildings is discharged to soakaway (infiltration drainage)) (W1 and W2). Other drainage areas require further investigation or repair (if they represent a pathway to ground) (see Proposed Improvement Programme Item 2). **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

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 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). **In the event of an incident/accident** • Investigate cause and implement preventive measures, which may include system maintenance interventions.	Unlikely	Mild	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 collects and returns most surface/yard water to WwTW for treatment. Roofwater from certain buildings is discharged to soakaway (infiltration drainage)) (W1 and W2). Other drainage areas require further investigation or repair (if they represent a pathway to ground) (see Proposed Improvement Programme Item 2). **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

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?**
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 overtopping of tanks. • Tanks also have emergency overspill facility connected to site drainage (discharged back to WwTW) as last line of defence. • 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 collects and returns most surface/yard water to WwTW for treatment. Roofwater from certain buildings is discharged to soakaway (infiltration drainage)) (W1 and W2). Other drainage areas require further investigation or repair (if they represent a pathway to ground) (see Proposed Improvement Programme). • 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 collects and returns most surface/yard water to WwTW for treatment. Roofwater from certain buildings is discharged to soakaway (infiltration drainage)) (W1 and W2). Other drainage areas require further investigation or repair (if they represent a pathway to ground) (see Proposed Improvement Programme). **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 (PPE and personal gas detectors represent the final layer of protection from a safety perspective and are not relied upon for detection). **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 is one CHP engine and two boilers with biogas firing capability, controlling requirement to flare. YW is also committed to reviewing CHP provision (refer to Proposed Improvement Programme Item 1). **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	Local air quality and global climate impacts	Air	**Preventative controls**. • Flare burns biogas in a controlled way to reduce environmental harm. • 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

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?**
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 composition and quality of feedstock is understood. • Final effluent spray / 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
Digester grit build-up, leading to reduced working volumes and inefficient digestion, leading to wear on mixing and heating equipment, including pump and pipe blockages.	Nearby human receptors Ground	Overland runoff / infiltration / drainage systems	**Preventative controls** • Digester mixing is regularly assessed as part of operational checks to ensure that it is functioning effectively. • Digester clean up required approximately every 10 years by trained professionals. **In the event of an incident/accident** • Clear up any spills and blockages. Ensure all valves are operating correctly. • Ensure mixers and pumps are operating correctly.	Unlikely	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?**
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 to the STF. Only YW sewage waste is imported to Lundwood STF, this has a consistent composition and comes from carefully controlled treatment processes. • 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 in order to minimise reoccurrence.	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, insufficient digestion and build up of H_2S and CO_2	Ground Local air quality and global climate impacts	Spread to land as part of disposal Air	**Preventative controls** • Management controls to identify potentially problematic sludges at source. • All sludge imports are from YW sites where sludge characteristics are considered 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** • 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** • Cake storage is on a pad, which under normal circumstances, has spare capacity. • Additional storage is available at nearby Yorkshire Water sites. **In the event of an incident/accident** • Monitor available storage on cake pad 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** • Under normal circumstances only digested sludge is stored on cake pad under standard operating conditions. This has less odour potential than untreated sludge. • Only likely to happen during a prolonged period of an extreme weather event. **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

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?**
Odour control unit						
Failure of components within extraction and treatment systems leading to release of partially treated or untreated odorous emissions to air	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Regular operational checks on systems and process monitoring at OCU. • Inspection and maintenance schedule to ensure reliability of extraction and treatment system. **In the event of an incident/accident** • Follow operational procedures to minimise generation of emissions until system is repaired.	Unlikely	Mild	Low risk
Failure of media within odour treatment system leading to release of partially treated or untreated, odorous emissions to air	Nearby human receptors Local air quality and global climate impacts	Air	**Preventative controls** • Regular operational checks and process monitoring at OCU. • Inspection and maintenance schedule to ensure reliability of extraction and treatment system. **In the event of an incident/accident** • Follow operational procedures to minimise generation of emissions until system is repaired.	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?**
Contamination of ground/groundwater following accidental spillage of exhausted odour control media	Ground / groundwater / surface waters	Overland runoff / infiltration / drainage systems	**Preventative controls** • Operational controls in place for removal and disposal of exhausted media. • Area surrounding odour control unit, including areas where maintenance activities are undertaken are covered by hardstanding and surface water drainage is connected to the head of the works. • Only appropriately licenced operators used to remove waste from site. **In the event of an incident/accident** • Contain media to prevent pollution. • Arrange clean up and safe disposal of media as soon as is practicable.	Unlikely	Minor/negligible	Negligible risk
CHP, 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. **In the event of an incident/accident** • Investigate cause and implement preventive measures, which may include system maintenance interventions.	Unlikely	Mild	Low risk

Q 6-9 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 some surface water runoff is collected and discharged via underground drainage systems to Lundwood WwTW for full treatment prior to discharge to the River Dearne. 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: 6-9 below. In addition to those listed in the table, other parameters may be identified in discussion with the EA and in line with EA guidance 'Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk)'. Samples will be taken from suitable location(s) upstream of the liquor return point to the WwTW inlet. Sampling and chemical analysis will be undertaken in line with EA guidance. Analysis will be carried out at a UKAS (17025) accredited laboratory.

It is proposed this sampling will be carried out monthly for a period of 12 months. The data will be used to undertake an H1 risk 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: 6-9 – Proposed analytical suite: Lundwood return liquors characterisation programme - BAT 3 and BAT 7 requirements

Substance / Parameter	Waste Treatment Process to which the BAT-AEL applies	Monitoring Frequency
Flow (m^3/day)	N/A	To be confirmed
Chemical oxygen demand (COD)	Treatment of water-based liquid waste	Monthly for 12 months
Biological oxygen demand (BOD)	N/A	Monthly for 12 months
pH	N/A	Monthly for 12 months
Conductivity	N/A	Monthly for 12 months
Temperature	N/A	Monthly for 12 months
Total nitrogen	Treatment of water-based liquid waste	Monthly for 12 months
Total phosphorus		Monthly for 12 months
Adsorbable organically bound halogens (AOX)		Monthly for 12 months
Benzene, toluene, ethylbenzene, xylene (BTEX)		Monthly for 12 months
Free cyanide (CN-)		Monthly for 12 months
Hydrocarbon oil index (HOI)		Monthly for 12 months
PFOA	All waste treatments	Monthly for 12 months
PFOS		Monthly for 12 months
Phenol index	Treatment of water-based liquid waste	Monthly for 12 months
Arsenic (expressed as As)		Monthly for 12 months
Cadmium (expressed as Cd)		Monthly for 12 months
Chromium (expressed as Cr)		Monthly for 12 months
Copper (expressed as Cu)		Monthly for 12 months
Lead (expressed as Pb)		Monthly for 12 months
Nickel (expressed as Ni)		Monthly for 12 months
Zinc (expressed as Zn)		Monthly for 12 months
Manganese (Mn)		Monthly for 12 months
Hexavalent chromium (Cr(VI))		Monthly for 12 months
Mercury (expressed as Hg)		Monthly for 12 months

Q 6-10 Risk assessment methodology

The risk assessment methodology employed for the noise impact assessment (Q 6-6) and accident management plan (Q 6-8) is summarised in Tables C2 6-10 to 6-13 below.

The overall risk rating for each of the identified risk scenarios is determined on the basis of the probability of the scenario occurring (the probability/likelihood score) and the environmental consequence(s) if the scenario were to occur (the consequence score). The probability and consequence categories used in this methodology are provided in Tables C2: 6-10 and 6-11 below.

Table C2: 6-10: Classification of Consequences

Classification	Definition
Severe	• Acute risks to human health • Short-term risk of pollution of sensitive water resource (e.g. major spillage into controlled waters) • Impact on controlled waters e.g. large-scale pollution or very high levels of contamination • Catastrophic damage to buildings or property (e.g. explosion causing building collapse) • Ecological system effects – irreversible adverse changes to a protected location. Immediate risks
Medium	• Chronic risks to human health • Pollution of sensitive water resources (e.g. leaching of contaminants into controlled waters) • Ecological system effects – substantial adverse changes to a protected location • Significant damage to buildings, structures and services (e.g. damage rendering a building unsafe to occupy, such as foundation damage)
Mild	• Non-permanent health effects to human health • Pollution of non-sensitive water resources (e.g. pollution of non-classified groundwater) • Damage to buildings, structures and services (e.g. damage rendering a building unsafe to occupy, such as foundation damage) • Substantial damage to non-sensitive environments (unprotected ecosystems e.g. crops)
Minor/Negligible	• Non-permanent health effects to human health (easily prevented by appropriate use of PPE) • Minor pollution to non-sensitive water resources • Minor damage to non-sensitive environments (unprotected ecosystems e.g. crops) • Easily repairable effects of damage to buildings, structures, services or the environment (e.g. discoloration of concrete, loss of plants in a landscaping scene)

Table C2: 6-11: Classification of probability / Likelihood

Classification	Definition
High Likelihood	An event is very likely to occur in the short term, and is almost inevitable over the long term OR there is evidence at the receptor of harm or pollution
Likely	It is probable that an event will occur. It is not inevitable, but possible in the short term and likely over the long term
Unlikely	Circumstances are possible under which an event could occur. It is by no means certain that even over a longer period such an event would take place, and less likely in the short term
Highly Unlikely	Probability is so low that it is close to zero; It is improbable that an event would occur even in the very long term

Table C2: 6-12 below provides the matrix used to identify the overall risk category using these consequence and probability categories.

Table C2: 6-12: Risk Matrix and Terminology Used for Risk Assessments

		Consequence			
		Severe	**Medium**	**Mild**	**Minor/Negligible**
Probability (Likelihood)	**High Likelihood**	Very high risk	High risk	Moderate risk	Moderate/Low risk
	Likely	High risk	Moderate risk	Moderate/Low risk	Low risk
	Unlikely	Moderate risk	Moderate/Low risk	Low risk	Negligible risk
	Highly Unlikely	Moderate/Low risk	Low risk	Negligible risk	Negligible risk

The overall risk categories are described in Table C2: 6-13 below.

Table C2: 6-13: Description of Risk Categories

Term	Description
Very high risk	Severe harm to a receptor may already be occurring OR a high likelihood that severe harm will arise to a receptor, unless immediate remedial action works / mitigation measures are undertaken.
High risk	Harm is likely to arise to a receptor, and is likely to be severe, unless appropriate remedial actions / mitigation measures are undertaken. Remedial works may be required in the short term, but likely to be required over the long term.
Moderate risk	Possible that harm could arise to a receptor but low likelihood that such harm would be severe. Harm is likely to be medium. Some remedial works may be required in the long term.
Moderate / low risk	Possible that harm could arise to a receptor, but where a combination of likelihood and consequence results in a risk that is above low, but is not of sufficient concern to be classified as medium. It can be driven by cases where there is an acute risk which carries a severe consequence, but where the exposure is unlikely.
Low risk	Possible that harm could arise to a receptor. Such harm would at worse normally be mild.
Negligible risk	Low likelihood that harm could arise to a receptor. Such harm unlikely to be any worse than mild.

Form C3 Supporting Information

1 What activities are you applying for?

Activities to be included within this installation are provided in Table C3: 1a-1 below.

Table C3: 1a-1 – Types of activities

Installation name	Schedule 1 references	Description of the Activity	Activity Capacity	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
Lundwood STF	Section 5.4 A(1) (b)(i)	**Anaerobic digestion** of indigenous and imported UWWT-derived sludges: 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	>100 tonnes per day	R3: recycling/ reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)	N/A	Total digester treatment capacity combined 308 tonnes/day[7] (at 6% dry solids), 18.5 tonnes dry solids (TDS) per day. Refer to Appendix 14 for supporting calculations spreadsheet.

Directly Associated Activities (including description)	
Import and treatment of sludges prior to digestion, including screening, mixing, thickening	R3: Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)
Secondary treatment of digestate (including physical handling and dewatering) before being recycled to agriculture, including digestate produced on site.	R3: Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)
As a contingency measure, the **interim storage** of digested and undigested sludge produced at Lundwood or other YW sites, before AD treatment at Lundwood STF.	R13: Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) D15: Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where the waste is produced)
Storage and treatment of biogas	R13: Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)

7 Digester treatment capacity has been calculated based on the known digester volume in m^3 and 12 days hydraulic retention time and then presented as tonnes per year based on an assumed 1:1 volume to weight ratio. Refer to Appendix 14 for supporting calculations spreadsheet.

Installation name	Schedule 1 references	Description of the Activity	Activity Capacity	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
			D15 Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced)			
Use of biogas as a fuel			R1: Use principally as a fuel to generate energy			
Incineration of biogas			D10: Incineration on land			
Raw material (non-waste) **storage**			No applicable waste codes			
Surface water collection, including **temporary storage**			No applicable waste codes			
Collection and treatment of odorous gases			No applicable waste codes			

Total storage capacity (tonnes)	Sludge storage capacity within STF vessels provided in Table 1a-2 overleaf.
Annual throughput (tonnes each year)[8]	**Liquid sludge (indigenous primary):** 114,091 tonnes (maximum) **Liquid sludge (indigenous SAS):** 457,778 tonnes (maximum) **Liquid sludge (import)**: 109,198 tonnes/year (maximum) Refer to Appendix 15 for supporting calculations spreadsheet.

[8] All figures have been calculated on the basis of maximum tonnes of dry solids per year, converted to m^3/year on the basis of the minimum % dry solids (which varies according to sludge source) and then presented as tonnes per year based on an assumed 1:1 volume to weight ratio. The calculation uses minimum % dry solids in order to present the maximum throughput figure. Refer to Appendix 14 for supporting calculations spreadsheet.

Table C3: 1a-2 – Storage capacities

Vessel	Nominal capacity (m^3)
Sludge import tank	150
Thickener feed tanks (x 2)	1,589 each
Digester feed tank	712
Digested sludge balance tanks (x 2)	880 each
Liquor balancing tanks (x 2)	250 each
Cake pad	
A maximum storage capacity is 12,750 tonnes. Under normal circumstances the amount of cake stored will be significantly below this quantity.	

Table C3: 1b-1 – Types of waste accepted - Imported and Indigenous wastes to the sludge AD process (digesters)

Waste Code	Description of the waste
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 02	Wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
19 02 06	Sludges from physico/chemical treatment other than those mentioned in 19 02 05, specifically sewage sludge.
19 06	Wastes from anaerobic treatment of waste
19 06 06	Digestate from anaerobic treatment of animal and vegetable waste
19 08	Wastes from waste water treatment plants not otherwise specified
19 08 05	Sludges from treatment of urban waste water

Table C3: 1b-2 – Types of waste accepted - Imported wastes for dewatering/storage only (prior to recovery)

Waste Code	Description of the waste
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 02	Wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
19 02 06	Sludges from physico/chemical treatment other than those mentioned in 19 02 05, specifically sewage sludge.
19 02 06	Sludges from physico/chemical treatment other than those mentioned in 19 02 05, specifically sewage sludge conditioned with sanitised green waste.
19 02 06	Sludges from physico/chemical treatment other than those mentioned in 19 02 05, specifically sewage sludge conditioned with wood waste.
19 02 06	Sludges from physico/chemical treatment other than those mentioned in 19 02 05, specifically sludge phyto conditioned.
19 06	Wastes from anaerobic treatment of waste
19 06 06	Digestate from anaerobic treatment of animal and vegetable waste
19 08	Wastes from waste water treatment plants not otherwise specified
19 08 05	Sludges from treatment of urban waste water

2 Point source emissions to air, water and land

A full inventory of emission points is provided in Table C3: 2-1 below and illustrated in Section IV, Figure 3. Proposals for monitoring emissions to air are provided in Table C3: 4a-1.

Table C3:2-1: Emissions Inventory to air

Emission Point Ref	Source	Grid reference	Emissions parameter	Quantity / unit		Techniques to minimise emissions
A1	CHP engine exhaust	438040 407023	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	321[9]	$mgNm^3$	Engine servicing and maintenance
			Sulphur dioxide (SO_2)	60[9]	$mgNm^3$	Sludge management techniques
			Carbon monoxide (CO)	<350[10]	$mgNm^3$	Engine servicing and maintenance
			Total VOCs (as carbon)	<1250[10]	$mgNm^3$	Engine servicing and maintenance
A2	Boiler 1 exhaust (biogas)	438034 407025	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	250[11]	$mgNm^3$	Servicing and maintenance
			Sulphur dioxide (SO_2)	200[11]	$mgNm^3$	No significant sulphur present in natural gas fuel
			Carbon monoxide (CO)	<20[10]	$mgNm^3$	Boiler servicing and maintenance
			Total VOCs (as carbon)	<10[10]	$mgNm^3$	Boiler servicing and maintenance
	Boiler 1 exhaust (fuel oil)		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	200[12]		Servicing and maintenance
			Sulphur dioxide (SO_2)	Not quantified[13]		Sludge management techniques
			Carbon monoxide (CO)	Not quantified[13]		Boiler servicing and maintenance
			Total VOCs (as carbon)	Not quantified[13]		Boiler servicing and maintenance
A3	Flare	438111 406965	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	Not quantified[13]		None - abnormal use only
			Carbon monoxide (CO)	Not quantified[13]		None - abnormal use only
			Sulphur dioxide (SO_2)	Not quantified[13]		None - abnormal use only. Sludge management techniques
			Total VOCs (as carbon)	Not quantified[13]		Flame temperature and residence

[9] Emission value of 321 mg/Nm³ for NO_x (measured emission concentration plus uncertainty) and 60 mg/Nm³ for SO_2 (MCPD ELV) presented for consistency with numbers used in the AQIA. These are stated at reference conditions: 273 degrees Kelvin, 101.3kPa, dry gas, 15% O_2. It should be noted that the CHP unit is below the MCPD threshold, and as such there are no directly relevant ELVs.
[10] No appropriate reference limit value identified. Indicative values provided based on previous measured emission values. No ELV for these determinands proposed in permit.
[11] Emission value from MCPD of 250 mg/Nm³ for NOx and 200 for mg/Nm³ SO_2 presented for consistency with numbers used in the AQIA. These are stated at reference conditions 273 degrees Kelvin, 101.3kPa, dry gas, 3% O_2). It should be noted that the boilers are below the MCPD threshold, and as such there are no directly relevant ELVs.
[12] Emission value from MCPD of 200 mg/Nm³ for NOx used, for consistency with numbers used in the AQIA. These are stated at reference conditions 273 degrees Kelvin, 101.3kPa, dry gas, 3% O_2). It should be noted that the boilers are below the MCPD threshold, and as such there are no directly relevant ELVs.
[13] No appropriate reference limit value identified and no emissions data available. No ELV for these determinands proposed in permit.

Emission Point Ref	Source	Grid reference	Emissions parameter	Quantity / unit		Techniques to minimise emissions
A4	Odour control unit	437858 407026	Odour	339[14]	ou_E/m^3	Biofilter and carbon scrubber, sludge management techniques
			Hydrogen Sulphide H_2S	0.02[14]	ppm	Biofilter and carbon scrubber, sludge management techniques
			Ammonia NH_3	<0.1[14]	ppm	Biofilter and carbon scrubber, sludge management techniques
			Total VOCs	<0.1[14]	ppm	Biofilter and carbon scrubber, sludge management techniques
			Mercaptans	<0.1[14]	ppm	Biofilter and carbon scrubber, sludge management techniques
			Dimethyl sulphide	<0.1[14]	ppm	Biofilter and carbon scrubber, sludge management techniques
N/A	PRVs - other	Various	Biogas	Not quantified – emergency use only		None - emergency use only

[14] Emissions data provided is the mean of 4 stack emission samples collected on 20 and 21/7/2021.

Emissions to sewer and water

All liquor from raw and digested sludge thickening and dewatering processes, condensate (e.g. from biogas handling) and cleaning / washdown effluent and some surface water runoff is collected and discharged via underground drainage systems to the Lundwood WwTW inlet for full treatment prior to discharge to the River Dearne. Roof water from the thickening and centrifuge building are discharged to soakaway. Discharge points are shown on Figure 3; a copy of the site drainage plan is provided as Figure 4 (Sheet 1 drainage plan and Sheet 2, drainage plan with surfacing overlay). Key sources are as follows:

- Discharge point S1 comprises liquor from the drum thickeners, drum thickener washwater and surface water runoff from the areas surrounding the thickener building, thickener feed tanks and OCU. All liquids are collected in a wet well (adjacent to S1 on Figure 3) and pumped back to Lundwood WwTW for full treatment prior to discharge to the River Dearne.
- Discharge point S2 comprises liquor from the centrifuge (which is initially collected in two liquor balance tanks prior to discharge to the drainage system), cleaning washwater as well as surface water runoff from surrounding areas, including the cake pads. These liquids combine with surface water runoff from areas of the site outside the STF installation and are gravity fed to the supernatant tank (located outside of the installation boundary) from where they are pumped back to Lundwood WwTW for full treatment prior to discharge to the River Dearne.
- Discharge points W1 and W2 are direct to soakaway. These discharges comprise only roofwater from rainwater downpipes at the thickener and centrifuge buildings.

A drainage survey has been undertaken to confirm the mapped connections. Two areas of uncertainty have been identified in respect of the drainage system in two specific areas within the installation. These are shown on Figure 4: site drainage plan and are as follows:

- Effluent and surface water runoff from the CHP/boiler compound and roadway are directed to a drain which is reported to have collapsed. This source comprises surface water runoff, and potentially condensate from the biogas pipeline feeding the boilers/CHP and boiler blowdown. YW is committed to investigating, and as required repairing the drains (prior to issue of the permit) in this area so that all liquors arising are returned to the WwTW for full treatment – refer to Proposed Improvement Plan.
- Surface water runoff from the digester area is directed to a drainage route which cannot be fully traced due to line length. Adopting a precautionary approach, as this line may also include condensate from the biogas pipeline feeding the flare, YW is committed to investigating the drains (prior to issue of the permit) to ensure that all liquors arising are returned to the WwTW for full treatment – refer to Proposed Improvement Plan.

Lundwood WwTW treats effluent from off site and from the STF, and has consent limits in place covering all outputs. 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 no monitoring data is available at this time.

YW is committed to undertake a 12-month programme of monitoring of process liquors returned to the WwTW to characterise the emissions – refer to Form C2 Q6-9 for details of the proposed monitoring programme.

Table C3: 2-2 – Emissions to sewer and water

Emission Point Ref.	Grid reference	Source	Parameter	Expected Emissions
S1	437846 407027	Thickener liquors Surface water runoff Cleaning effluent / washwaters	Suspended solids BOD Ammonia Volume	Not yet quantified. Characterisation of emissions will be undertaken in line with BAT – refer to information provided in response to Form C2 Q6-9 for more details.
S2	438079 406853	Centrifuge liquors Surface water runoff Cleaning effluent / washwaters	Suspended solids BOD Ammonia Volume	Not yet quantified. Characterisation of emissions will be undertaken in line with BAT – refer to information provided in response to Form C2 Q6-9 for more details.
W1	437999 406969	Roofwater downpipes – thickener and centrifuge buildings	Discharge comprises clean rainwater runoff only. No monitoring undertaken or proposed.	
W2	437903 406991	Roofwater downpipes – thickener and centrifuge buildings	Discharge comprises clean rainwater runoff only. No monitoring undertaken or proposed.	

3 Operating techniques

3b General requirements

Fugitive emissions management plan – Leak Detection and Repair (LDAR) programme

YW has a defined maintenance plan for biogas pipework at Lundwood STF. This includes regular visual inspections, as well as more detailed investigations such as use of a methane detecting camera to identify leaks. Any leaks identified are assigned a priority for repair, the priority recognises potential as both an environmental and safety hazard. Key section headings in the LDAR management procedure (which forms part of the EMS) include:

- Introduction, scope, responsibilities, assurance.
- LDAR considerations including summary of equipment, techniques and approaches.
- Site specific LDAR plan:
  - STF Tanks (All STF tanks including sludge storage, Anaerobic Digesters);
  - Pressure Relief Valves;
  - Biogas pipework from AD to biogas treatment and storage;
  - Biogas storage;
  - Pipework from biogas treatment to flare stack and engine;
  - Biogas Engines;
  - Boilers
  - Flare Stack;
  - Natural gas pipework.
- Strategies/standards/guidance notes, registers, references.

The majority of biogas pipework is within a secure area to reduce the risk of physical damage. A DSEAR review of the site has been completed and installed equipment is appropriate for the zone in which it is installed.

Best Available Techniques: Reducing diffuse (fugitive) emissions to air (*BAT 14*)

The design and operation of Lundwood STF ensures diffuse (fugitive) emissions to air are minimised. This includes the following measures:

- Raw sludge is contained with displaced air from certain tanks / vessels piped to an OCU for treatment prior to release to atmosphere.
- H_2S levels are monitored in the biogas and are recorded.
- Emissions of odour and organic compounds from digested material (post AD) is very low. Refer to the odour risk assessment and odour management plan (Appendices 8 and 10, respectively) for more details.
- All pipework design is subject to Water Industry Mechanical and Electrical Specifications (WIMES), which ensures correct material selection, corrosion prevention and valve type.
- Regular inspections of tanks and pipework undertaken in line with the LDAR programme.
- Biogas pipework largely above-ground, allowing easy inspection/leakage detection.
- Sludge and sludge cake is wet at all times and therefore potential for generation of dust is very limited. This is not an issue of concern (see bioaerosol risk assessment, Section 6).
- Traffic speed limits of 10mph are enforced on site.

3c Types and amounts of raw materials

Table C3: 3c-1 – Types and amounts of raw materials

Description of raw material	Use	Maximum storage capacity	Annual throughput[15]	Main hazards	Alternative
Polymer (liquid)	Coagulant used for raw sludge thickening	1 x 10m^3 tank and 1 m^3 IBC storage (~20 no.)	200 m^3	Polluting to watercourses in the event of a spillage/loss	No viable alternative
Polymer (powder)	Coagulant used for digested sludge dewatering	Storage in 750kg bags (~2 no.)	26 tonnes	Polluting to watercourses in the event of a spillage/loss	No viable alternative
Antifoam	Digester antifoaming agent	1 x 0.5m^3 tank and 20 litre containers (~700 litres)	600 litres	Polluting to watercourses in the event of a spillage/loss	No viable alternative
Boiler treatment chemicals	Boiler treatment	Not normally stored on site	<250 litres	Polluting to watercourses in the event of a spillage/loss	No viable alternative
Glycol	Antifreeze	Not normally stored on site	50 litres	Polluting to watercourses in the event of a spillage/loss	No viable alternative
Lubrication oil	Equipment lubricant	Not normally stored on site	850 litres	Polluting to watercourses in the event of a spillage/loss	No viable alternative
Gas oil	Back up fuel for boilers	35,000 litres	95,668 litres	Polluting to watercourses in the event of a spillage/loss	No viable alternative
Diesel	Fuel for mechanical loaders	1,000 litres	3,013 litres[16]	Polluting to watercourses in the event of a spillage/loss	No viable alternative

[15] Raw materials use data is estimated on the basis of typical storage volumes and data available for usage at this and at other YW STF sites.
[16] Annual throughput data includes some use outside of the installation boundary (within the wider Lundwood WwTW)

4 Monitoring

4a Describe the measures you use for monitoring emissions

Proposals for monitoring point source emissions to air and sewer are shown in Table C3: 4a-1.

Table C3: 4a-1 Proposed emissions monitoring requirements

Emission point	Parameter	Monitoring technique	Monitoring frequency
Emissions to air			
A1 CHP	NOx (NO and NO_2 expressed as NO_2)	None due to small size of plant (below MCP threshold).	
	CO		
	Sulphur dioxide (SO_2)		
	Total VOCs		
A2 Boiler 1	NOx (NO and NO_2 expressed as NO_2)	None due to small size of plant (below MCP threshold).	
	CO		
	Sulphur dioxide (SO_2)		
	Total VOCs		
A3 Flare	NOx (NO and NO_2 expressed as NO_2)	None. Flare is used only when required.	
	CO		
	Total VOCs		
A4 Odour control unit	Odour concentration	EN 13725	Annual
	H_2S	None - odour concentration proposed to be used as an alternative.	
	NH_3		
PRVs - other	No emissions monitoring proposed due to nature of release point as an essential safety mechanism with very occasional and short duration use.		
Emissions to sewer			
S1-S2 Liquors and surface water to WwTW	A 12-month programme of monitoring of return liquors is proposed in order to characterise emissions – refer to Q 6-9 Assessment of point source emissions to sewer and proposed improvement programme for more details. Any ongoing monitoring requirements will be established after this initial monitoring, and subsequent analysis and assessment, has been completed.		
Emissions to water / land			
W1 – W2 uncontaminated roof water	No monitoring programme proposed, uncontaminated roof water to infiltration drainage.		

Selected process monitoring parameters are illustrated in Table C3: 4a-2. The site is operated under full PLC SCADA control with data logging and interrogation of key parameters to maintain safe, efficient and low emissions operation.

Table C3: 4a-2 Key process monitoring provisions

Emission point / description	Parameter	Monitoring approach	Monitoring frequency
Sludge intake	Intake volume	SCADA	Continuous during unloading operations
	% dry solids	SCADA	Continuous during unloading operations
CHP (A1)	Operating hours	SCADA	Continuous data logging
	Electricity generated	SCADA	Continuous data logging
	Load required / actual (%)	SCADA	Continuous data logging
	Biogas flow / pressure to CHP	SCADA	Continuous data logging
	Heat circuit temperatures (deg. C)	SCADA	Continuous data logging
Boiler (A2 and A3)	Load required / actual (%)	SCADA	Continuous data logging
	Biogas / natural gas flow / pressure to boiler	SCADA	Continuous data logging
	Heat circuit temperatures (deg. C)	SCADA	Continuous data logging
	Heat circuit flow	SCADA	Continuous data logging
Flare compound (A4)	Biogas to flare (m^3)	SCADA	Continuous data logging
	Run hours	SCADA	Continuous data logging
Odour control unit stack (A5)	Operational status	SCADA	Indication
Biogas storage	Gas level (%)	SCADA	Continuous data logging
	Gas pressure (mb)	SCADA	Continuous data logging
	Methane %	SCADA	Continuous data logging
Digesters	Volume	SCADA	Continuous data logging
	Volatile Fatty Acids (VFAs)	Manual	Periodic
	Alkalinity	Manual	Periodic
	Process temperature	SCADA	Continuous data logging
	% solids (intake)	SCADA	Continuous data logging
	Retention (hours)	SCADA	Continuous data logging
	Temperature	SCADA	Continuous data logging
	H_2S (ppm)	SCADA	Continuous data logging
	Foam level	SCADA	Continuous data logging
Centrifuges	Dry solids (%)	Manual	Periodic
	Flow	SCADA	Continuous data logging

4b Point source emissions to air only – M1 Assessment

Although no ongoing monitoring is proposed, a recent one-off characterisation MCERTS accredited stack emission test was carried out at the site on the CHP and the main boiler against the requirements and recommendations provided in Environment Agency M1[17]. This reported that:

"The [CHP/ boiler] sampling location meets all the requirements specified in EA Guidance Note M1 and EN 15259, and therefore there are no improvement recommendations."

6 Resource efficiency and climate change

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

YW consumption and generation data is collated and stored within a web-based energy database. This enables the business to produce bespoke reports as required by internal stakeholders.

Monthly energy consumption hubs are held to review ongoing energy use and performance. These are supported with discussions regarding how asset operation can be modified, or capital intervention made, to reduce energy use. This is further supported by YW requirements under the Energy Saving Opportunity Scheme (ESOS) compliance programme. YW conducts energy surveys that are discussed with the site operational teams. The findings of the surveys are collated into a final report and presented to senior management.

YW have published performance commitments in relation to the amount of biogas that is derived from the sludge processed. The higher the efficiency of biogas production the greater the potential for electricity generation. There is a daily generation hub that seeks to identify any generation issues and rectify them promptly.

Overall annual energy and carbon performance is publicly shared via the company annual report as part of the Streamlined Energy and Carbon Reporting (SECR) requirements.

Energy is monitored and managed on a regular basis through the Energy and Recycling Team. Energy consumption and energy generation reports are run and reviewed regularly and are recorded on YW's Performance Zone. YW also participates in a number of mandatory and voluntary carbon reporting schemes. YW sets itself targets for energy consumption and energy generation at both a strategic and operational level. YW has dedicated teams which focus on:

- Maximising renewable energy generation; and
- Implementing strategic and site-specific energy efficiency projects.

[17] Environment Agency Technical Guidance Note (Monitoring) M1 (2010)

Table C3: 6a-1 below describes the measures taken on site to minimise energy use.

Table C3: 6a-1 – Energy efficiency measures

Operating and maintenance	**Documented measures in place**	
Regular testing and maintenance of biogas systems for leaks, seals, and condensate traps	Yes	Maintenance/servicing undertaken by qualified technicians and registered organisations. Records are maintained on site.
Operation of motors and drives	Yes	Regular inspections/lubrication & maintenance undertaken by qualified technicians and specialist contractors. Records are retained.
Compressed air systems	Yes	On-going leak detection and repair programme undertaken by qualified technicians.
Hot water systems	Yes	Digester system monitored constantly and inspected and tested regularly by an operator and recorded.
Lubrication to avoid high friction losses	Yes	Technicians and specialist contractors carry out regular lubrication, including CHP engine oil change, and records are maintained.
Boiler maintenance e.g. optimising excess air	Yes	Carried out as per legislative requirements and YW procedures.
Physical measures	Documented measures in place	
Sufficient insulation of heated vessels and pipework	Yes	Inspection and housekeeping to check condition of insulation; repair or replacement carried out as necessary
Provision of sealing and containment methods to maintain temperature	Yes	Anaerobic digesters are enclosed and partly buried.
Other appropriate measures	Yes	Daily operational inspections are conducted to check for aspects such as leaking tanks and pipework
Building services	Documented measures in place	
Energy efficient lighting is in place	Yes	There are limited building service requirements on site, energy efficient options are provided where readily available, and when equipment comes up for renewal
Space heating	Yes	
Hot water	Yes	
Temperature control	Yes	
Ventilation	Yes	
Draft proofing	Yes	
BAT conclusions for energy recovery	Documented measures in place	
Heat recovery (please specify where from and add more lines if appropriate)	Yes	Heat recovered from CHP engine used to maintain anaerobic digester temperature.
Heat exchangers (explain where fitted and add more lines if appropriate)	Yes	Heat exchangers are used in the CHP engine and in the anaerobic digesters.
Re-use of spent cooling water	N/A	
Minimisation of water use and re-circulating water systems for energy saving	Yes	Preference is given to the use of treated final effluent rather than mains water where water quality demand allows.
Good insulation	Yes	Boiler, anaerobic digesters and pipework are insulated
Plant layout to reduce pumping distances	Yes	Where existing layout allows

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

The main site energy sources are electricity from the public supply, fuel oil (used as a back up fuel source for the boiler) and biogas generated by the anaerobic digesters which is combusted in the CHP engine to generate electricity.

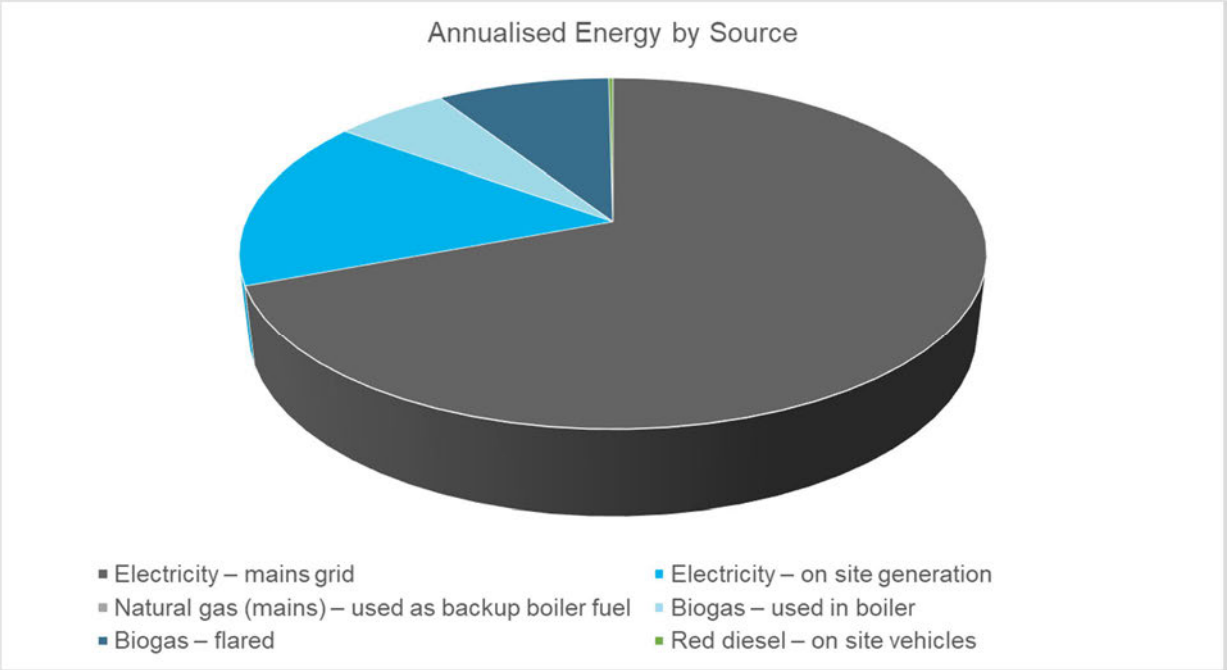
Table C3: 6b-1 shows the energy balance for the site. Electricity generated on site is used to power site equipment. There is currently no facility to export any excess to the national grid. To maintain control of energy consumption, and improve it where possible, electricity and fuel consumption is reported and reviewed on a regular basis.

Table C3: 6b-1 – Typical annual energy use

Energy Source	Energy Consumption MWh [18] [19]		
	Delivered	Primary	% of total (primary)
Electricity – mains grid [20]	4,494	10,786	64.9
Electricity – on site generation from biogas [21]	982	2,455	14.8
Gas oil used in boilers	1,028	1,028	6.2
Biogas used in boilers	916	916	5.5
Biogas flared[22]	1,392	1,392	8.4
Diesel – on site vehicles	32	32	0.2
Totals	*6,350*	*14,604*	*100*

[18] Figures presented are based on data gathered for the period 2019 to 2021, or a representative sub-set of this data where abnormal process operations, metering or other data issues exist.
[19] Gross calorific value of biomethane used in calculations was 37.706 MJ per m^3 (OFGEM 2016 / ISO 6976:1995).
[20] Electricity imported includes the use for the whole site not just the permitted activities due to metering arrangements.
[21] Delivered value derived from measured biogas methane content of 57.5%, and recorded electricity generated (no export of electricity). Does not take account of heat generated.
[22] Total annualised biogas generation was 4,763 MWh based on solids throughput and theoretical calculation, of which 2,455 MWh calculated usage in electricity generation and 916 MWh calculated usage in boiler. Biogas flared reported.

Figure C3: 6b-1 – 2020 energy by source



Global warming potential (GWP)

The CHP is operated as renewable energy generation plant; therefore there are no direct emissions of carbon dioxide (a greenhouse gas) resulting from the combustion of biogas in the CHP. However, there are direct CO_2 emissions as a result of combustion of fuel oil in the boiler.

There are also indirect emissions of CO_2 resulting from the use of imported electricity. At present, due to metering arrangements, it is not possible to apportion electricity usage to just the permitted activities within the installation, therefore site wide (Lundwood WwTW) usage is reported in this section. The CO_2 equivalent (CO_2e) emissions for the plant are set out in Table C3: 6b-2, together with overall GWP calculation.

There will be some losses of biogas (methane) from the plant (a substance with a high global warming potential, at least 21 times higher than CO_2), resulting from unquantified fugitive losses from the biogas system (see LDAR programme). These have not been included in the GWP calculation as no data is available.

Table C3:6b-2 – Global warming potential

Substance	Energy source	Energy Consumption in 2020– Primary (MWh)	CO_2 emission factor (T/MWh) [23]	Mass CO_2 released (tonnes/yr)	Global warming potential	Overall Global Warming Potential (TCO_2 / yr) [24] [25]
Carbon dioxide	Electricity (mains) imported	10,786	0.166	1,790	1	1,790
	Gas oil	1,028	0.25	257	1	257
	Biogas	4,763	0	0	0	0
	Diesel	32	0.25	8	1	8
Total GWP						2,056

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

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

The production and use of biogas to produce heat (which is used in the process) and electricity used on site, is the single greatest measure which allows the site to minimise its use of fossil fuels and maximise the use of energy, whilst recovering biological wastes. Biogas may be used in the CHP or a boiler on site and biogas flaring is used only when the CHP and boiler are unavailable or when biogas generation exceeds combustion capacity. YW are committed to reviewing the CHP provision at Lundwood STF to further reduce fossil fuel use (see Proposed Improvement Programme Item 1).

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

Information related to raw materials use and selection is provided above in response to Q3c.

Water minimisation

Water use within the installation is not significant due to the nature of operations/activities undertaken within the installation. Water is used in small quantities for domestic use within control buildings and is also used as make up fluid for chemicals (polymer) for sludge thickening and dewatering processes, as boiler feed water and for some cleaning activities e.g. thickener drums / centrifuges, washdown in some areas.

[23] Factors from https://www.gov.uk/guidance/assess-the-impact-of-air-emissions-on-global-warming
[24] These calculations do not consider the CO_2 equivalent amount which is avoided through the avoidance of releasing methane which has a much higher GWP than CO_2
[25] Does not include fugitive losses of methane, which are considered low and are not quantified (see LDAR)

Measures are in place to ensure that water is used only where necessary, and preference is given to the use of final treated effluent rather than mains water. The primary water users are listed below, along with the source of water.

Table C3:6d-1 – Water use

Use	Source
Domestic use within control / welfare building	Mains potable water
General cleaning/hosing of external hardstanding surfaces	Treated final effluent and potable for internal cleaning activities
Mixing with liquid polymer for sludge thickening and dewatering processes	Mains potable water used for product make-up. Treated final effluent is used as the carrier water during dosing.
Drum thickener cleaning	Automatic spray bars operate using treated final effluent Hot wash system utilises mains potable water
Digester anti-foam washwater spray	Treated final effluent
Boiler feed water	Mains potable water

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

Waste Minimisation

The site is designed and operated as a waste recovery plant and as such minimises waste generation from its own operations. Other than sludge cake, generation of waste is generally minimal and largely limited to packaging or scrap materials associated with engineering projects. Where practical materials are transported to site and stored in bulk or containers are returned to the supplier.

A summary of waste generated as a result of activities undertaken within the Lundwood STF is provided in Table C3 6e-1 below. Typical treatment / disposal routes are outlined; YW work with waste management contractors to ensure that waste generated as a result of STF activities is managed in line with the waste hierarchy. Recycling and recovery routes are used where possible.

Table C3 6e-1 – Waste streams

Waste Type	Nature of material	Storage arrangements	Treatment/disposal method	Annual production[26]
Waste oil	Hazardous	Stored in small containers (<50 litres) within bunded areas	Recycle	850 litres
Screenings	Non-hazardous	Stored within dedicated skips located on hardstanding	Landfill	68.4 tonnes
General waste	Non-hazardous	Stored within dedicated skips and smaller containers located on hardstanding prior to collection by approved waste contractor	Recycle or energy from waste	5.1 tonnes
Wood	Non-hazardous	Stored within a skip prior to collection by approved waste contractor	Recycle (or if contaminated may be energy from waste)	1.3 tonnes
Empty IBCs	Hazardous	Stored in a dedicated area prior to collection by approved waste contractor	Recycle or return to contractor for reuse	0.1 tonnes
Oil contaminated absorbents	Hazardous	Stored in a dedicated container within the digester compound prior to collection by approved waste contractor	Recycle	110 kgs
Oil filters	Hazardous	Stored in a dedicated container within the digester compound prior to collection by approved waste contractor	Recycle	7 kgs
Metals	Non-hazardous	Stored within a skip prior to collection by approved waste contractor	Recycle	0.3 tonnes
Mixed recycling	Non-hazardous	Stored within a skip and smaller containers prior to collection by approved waste contractor	Recycle (or if contaminated may be energy from waste)	0.2 tonnes
Antifreeze	Hazardous	Removed from site when servicing requires a change over (in 20 litre drums)	Recycle	210 litres

[26] Waste data is estimated on the basis of available waste arisings data for Lundwood STF and from waste data for comparable YW STF sites.

Best Available Techniques: Waste storage, handling and transfer (*BAT 4 and 5*)

IMS procedures specify appropriate measures to ensure compliance with applicable legislation and to control and minimise pollution risks. Controls to minimise environmental risks associated with waste storage, handling and transfer include:

- Waste materials are stored on site for the shortest practicable period of time, in suitable, fit for purpose containers located on areas of hardstanding and away from sensitive receptors such as watercourses. Waste containers are clearly labelled with their intended contents and container storage capacities are not permitted to be exceeded. Site housekeeping inspections are undertaken to ensure these standards are maintained.
- Very limited quantities of hazardous waste are generated by site activities. This is limited to items such as batteries, aerosols, waste oil and fluorescent tubes. Hazardous waste is always stored in secure containers, away from sensitive receptors and segregated from other waste types.
- Procedures are in place to ensure waste 'duty of care' requirements are met including ensuring that waste is only removed from site by contractors properly licenced and approved for use and accompanied by a fully completed waste transfer or hazardous waste consignment note. Waste transfer and consignment note records are retained electronically or as paper copies on site. Effective implementation of these procedures is supported by training for YW personnel as appropriate.
- YW work with waste management contractors to ensure that waste generated as a result of STF activities is managed in line with the waste hierarchy. Recycling and recovery routes are used where possible.
- Controls are in place to prevent pollution as a result of sludge storage and handling. Following reception on site, sludge is fully contained within tanks and pipework until it is deposited, as digested sludge cake on the cake pad. Surface water runoff from the cake pad is fully contained and is discharged back to Lundwood WwTW for treatment. Sludge storage and handling areas are located away from sensitive receptors such as the River Dearne.

Form C6 Supporting Information

3 How much do you want to discharge?

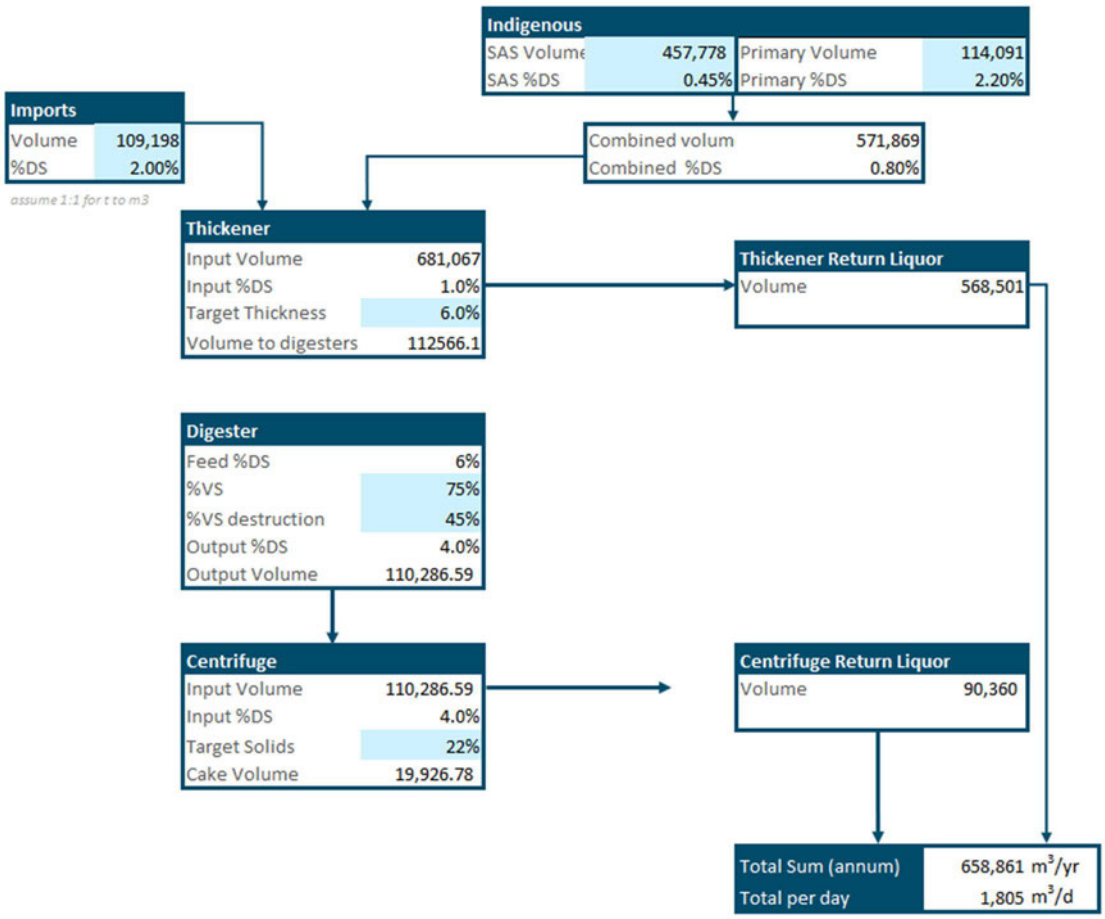
3b, c, d and f

All liquor from raw and digested sludge thickening and dewatering processes, condensate (e.g. from biogas handling), cleaning / washdown effluent and surface water runoff is collected and discharged via underground drainage systems to the Lundwood WwTW for full treatment prior to discharge to the River Dearne.

YW do not currently undertake any routine monitoring of this discharge. It is noted that these discharges include surface water runoff from hardstanding areas within the installation, including the cake pad and therefore discharges will vary according to rainfall.

Calculations have been used to estimate the volume of effluent returned to Lundwood WwTW. These values have been provided for indicative purposes and not for the purpose of deriving any permit conditions at this time. The estimated figures presented have been calculated as follows:

Process return calculation



Rainfall plus process return calculation

Cake pad surface area	13,334	m^2	→ Expected cake pad runoff (annum)	13,334,000	Litres	≈	36.53 M^3/d
Average Rainfall (annum)	1000	mm					

Source: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/north-east-england_-climate---met-office.pdf

Source: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/north-east-england_-climate---met-office.pdf

Highest monthly rainfall (mm)	92	mm			
↓					
Daily rainfall (mm) (averaged)	3.07	mm	→ Estimated cake pad runoff per day (based on highest monthly rainfall data)	40,890.93	l/d
Cake pad surface area	13,334.00	m^2		↓	
			Highest run off (cubic metres per day)	40.89	m^3/d
			+		
			Process returns	1805	m^3/d
			=		
			Sum worst case cake pad run off and process returns	**1845.99**	**m^3/d**

5a, b2 Should your discharge be made to the foul sewer?

Form C6 directs YW to answer questions 5a and 5b2. These questions cannot be answered by YW as the STF is co-located on site with the WwTW. These questions appear to be directed at applicants who wish to discharge to surface water or groundwater, which does not apply to YW (all effluent/contaminated water is returned to the WwTW).

No further information is therefore provided in relation to these specific questions.

6a, b, c How will the effluent be treated?

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, other than roof water from two buildings on site, is collected and discharged via underground drainage systems to the co-located Lundwood WwTW for full treatment prior to discharge to the River Dearne. YW do not undertake effluent treatment within the STF installation boundary.

7b, c, d, e, f, g What will be in the effluent?

All liquor from raw and digested sludge thickening and dewatering processes, condensate (e.g. from biogas handling), cleaning / washdown effluent and surface water runoff is collected and discharged via underground drainage systems to the Lundwood WwTW for full treatment prior to discharge to the River Dearne. This position has been managed for a long period within YW without a requirement for a formal discharge consent between the YW STF and the 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 undertake a period of monitoring in order to characterise the liquors returned to the WwTW. The programme of monitoring is identified in response to Form C2, Q6-9. Samples will be taken manually from a suitable location(s) upstream of the WwTW inlet, and will be submitted to a laboratory facility that can test to the appropriate standard. It is proposed this sampling will be carried out for a period of 12 months. The data will be used to complete 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 (refer to Proposed Improvement Programme below).

8d, e, f Environmental risk assessments and modelling

Refer to information provided above in response to question 7.

9a, b, d, e, f, h, i Monitoring arrangements

YW do not currently undertake any routine monitoring of effluent discharged to the co-located Lundwood WwTW. There is no flow monitoring and sampling equipment currently in place or proposed at this time. The grid reference of emission points and proposed sampling points for S1 and S2 (refer to Figure 3) are as follows:

Table C6-1 – Location of emissions and sampling points

Emission Point Ref	Location	
	Emission point	Proposed sampling point
S1	437846 407027	437846 407027
S2	438079 406853	438185 406863

10a, b, c Where will the effluent discharge to

Form C6 directs YW to answer questions 10a, b and c. These questions cannot be answered by YW as there is no option that applies to discharges from the installation. These questions appear to be directed at applicants who wish to discharge treated effluent to the receiving environment, which does not apply to YW (all effluent/contaminated water is returned to the WwTW).

No further information is therefore provided in relation to these specific questions.

Proposed Improvement Programme

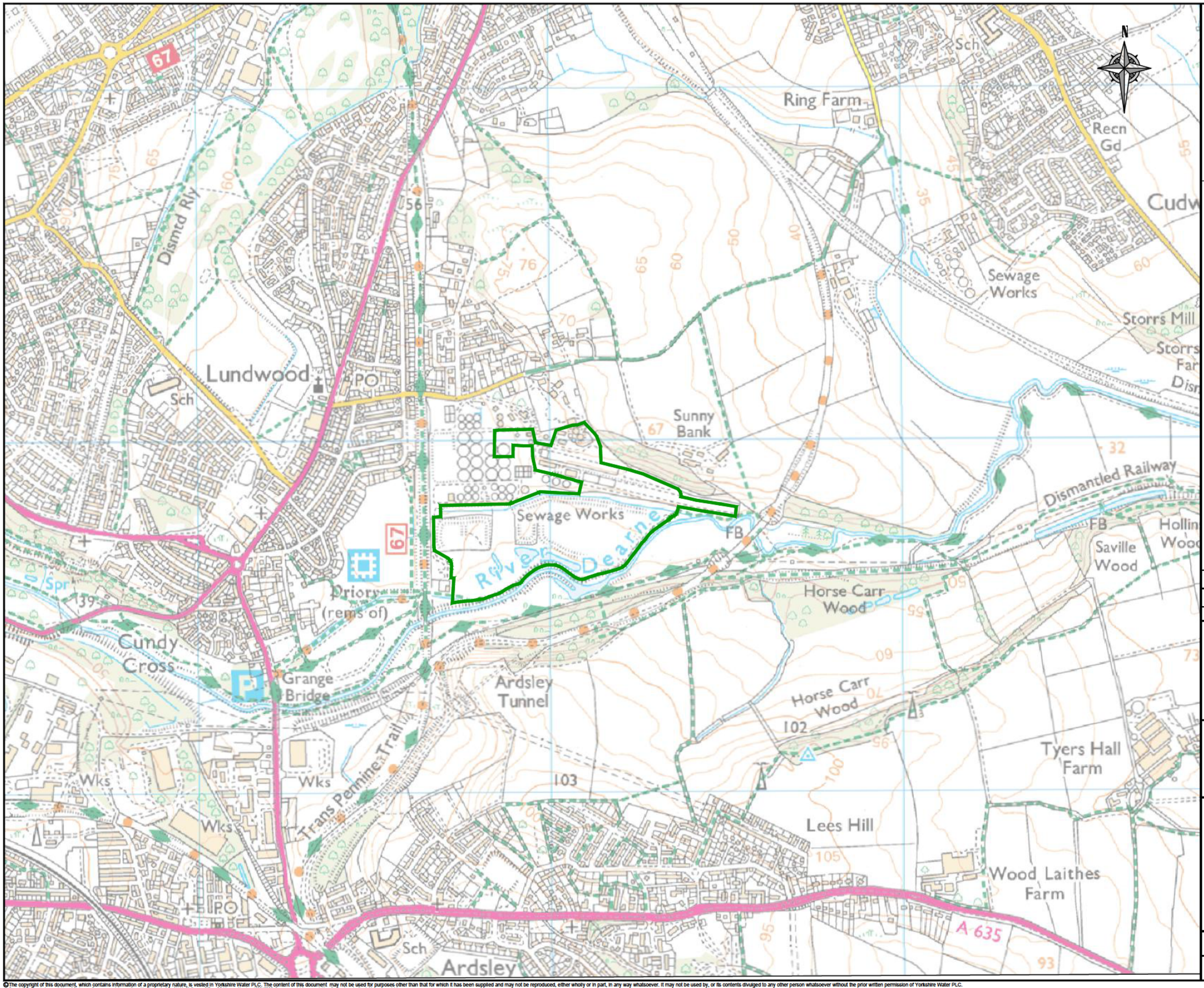
IP Ref.	Related Section	Requirement	Time from receiving permit
1	C2: 6	Evaluate options to reduce air emissions impacts on Local Wildlife Site via changes to CHP stack (e.g. changes to stack configuration and increase to stack height).	
2	C3: 2	Two areas of uncertainty have been identified in respect of the drainage system in two specific areas within the installation: • Effluent and surface water runoff from the CHP/boiler compound and roadway are directed to a drain which is reported to have collapsed. YW is committed to investigating, and as required repairing the drains in this area so that all liquors arising are returned to the WwTW for full treatment. • Surface water runoff from the digester area is directed to a drainage route which cannot be fully traced due to line length. YW is committed to investigating the drains to ensure that all liquors arising are returned to the WwTW for full treatment.	Prior to permit issue
3	Q6-5	Implement measures to reduce emissions and odour from diffuse and (non-combustion) point sources (refer to the summary of emissions abatement proposals provided in the table below).	End of 2024
4	C2: Q6-9	Complete return liquors monitoring programme followed by data analysis and assessment.	18 months
5	Appendix 11 (Containment Risk Assessment)	Engineering feasibility assessments and detailed design and construction in respect of identified containment enhancements.	End of 2024

Summary of emissions abatement proposals

Sludge source	Proposed emissions abatement
Screenings skip	YW will install a cover
Sludge import tank	Connect this tank and sump to a new OCU to provide treatment of odours from this source.
Screened sludge pumping station sump	
Thickener liquor wet well	Install a fixed cover and extract and treat odour in existing OCU.
Digester feed tank	Connect this tank to a new OCU to provide treatment of odours from this source
Digested sludge balance tanks x 2	Tanks will be covered. It is noted that digested sludge sources are inherently lower emissions generation potential and therefore residual biogas potential and emissions testing will be undertaken to determine the most appropriate type of cover, including emissions capture or abatement if required.

Section IV: Figures

Figure 1 Site Location Plan



KEY.

INSTALLATION BOUNDARY

VERSION	DRWN	CHKD	REVD		DATE
B	MD	ES	AW	FOR PERMITTING	12.23
A	MD	ES	JP	FOR PERMITTING	12.21

YorkshireWater

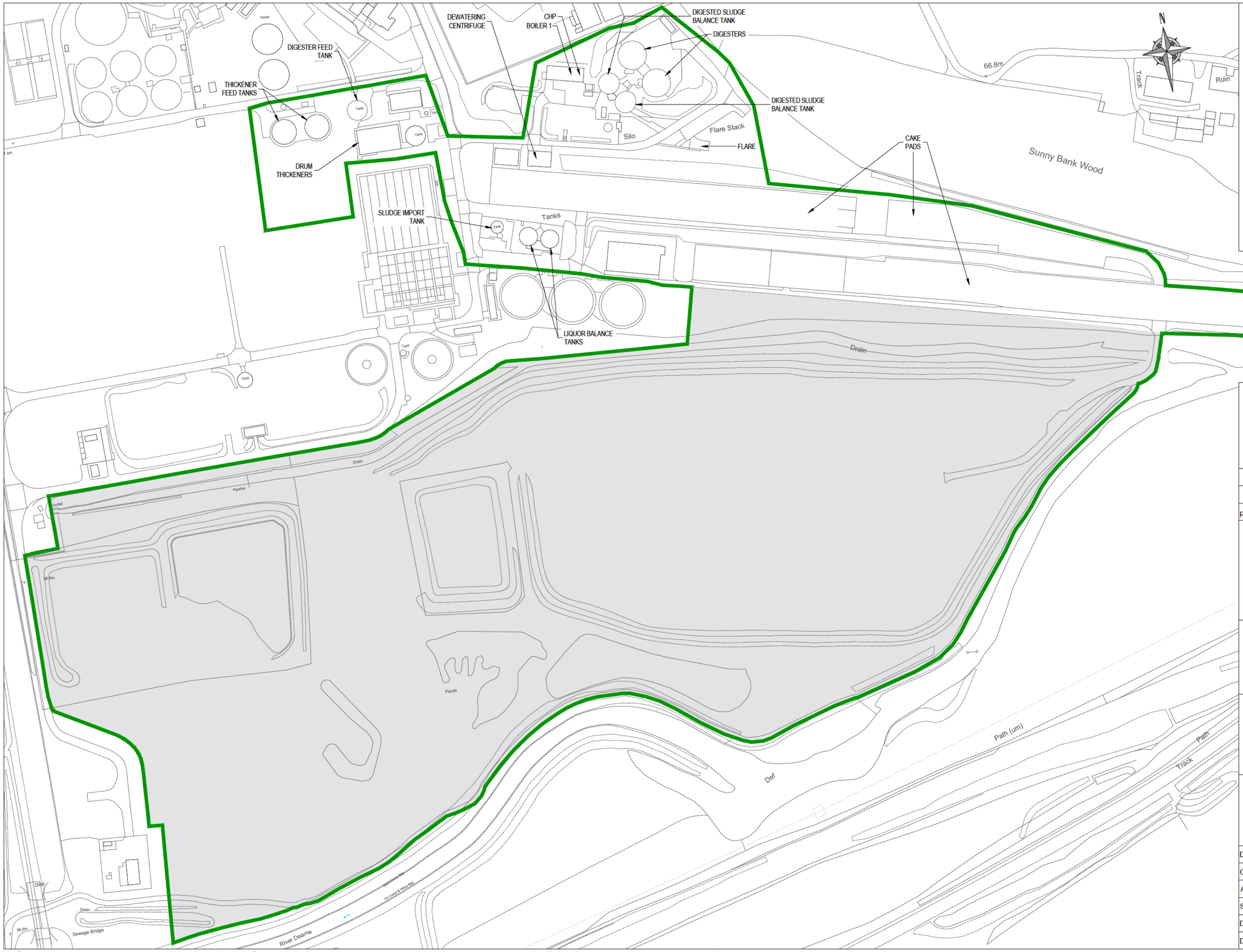
Stantec

YORKSHIRE WATER SERVICES LTD
ENVIRONMENTAL PERMITTING

LUNDWOOD SLUDGE TREATMENT FACILTY
SITE LOCATION PLAN

SCALE	SHEET SIZE
1:10,000	A3
DRAWING NUMBER	REVISION
FIGURE 1 - SITE LOCATION PLAN	B

Figure 2 Site Layout Plan



KEY.

PROPOSED INSTALLATION BOUNDARY

LEGACY AREAS OF THE INSTALLATION BOUNDARY WHERE PERMITTED ACTIVITIES ARE NO LONGER CARRIED OUT

NOTES.

THE ORIENTATION OF THIS FIGURE HAS BEEN ROTATED TO ALLOW FOR A CLEAR PRESENTATION OF THE INSTALLATION AT A SUITABLE SCALE.

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	12.12.23	MWD	FOR PERMITTING	ES	AW
A	01.12.21	MWD	FOR PERMITTING	ES	JP

YorkshireWater

Stantec

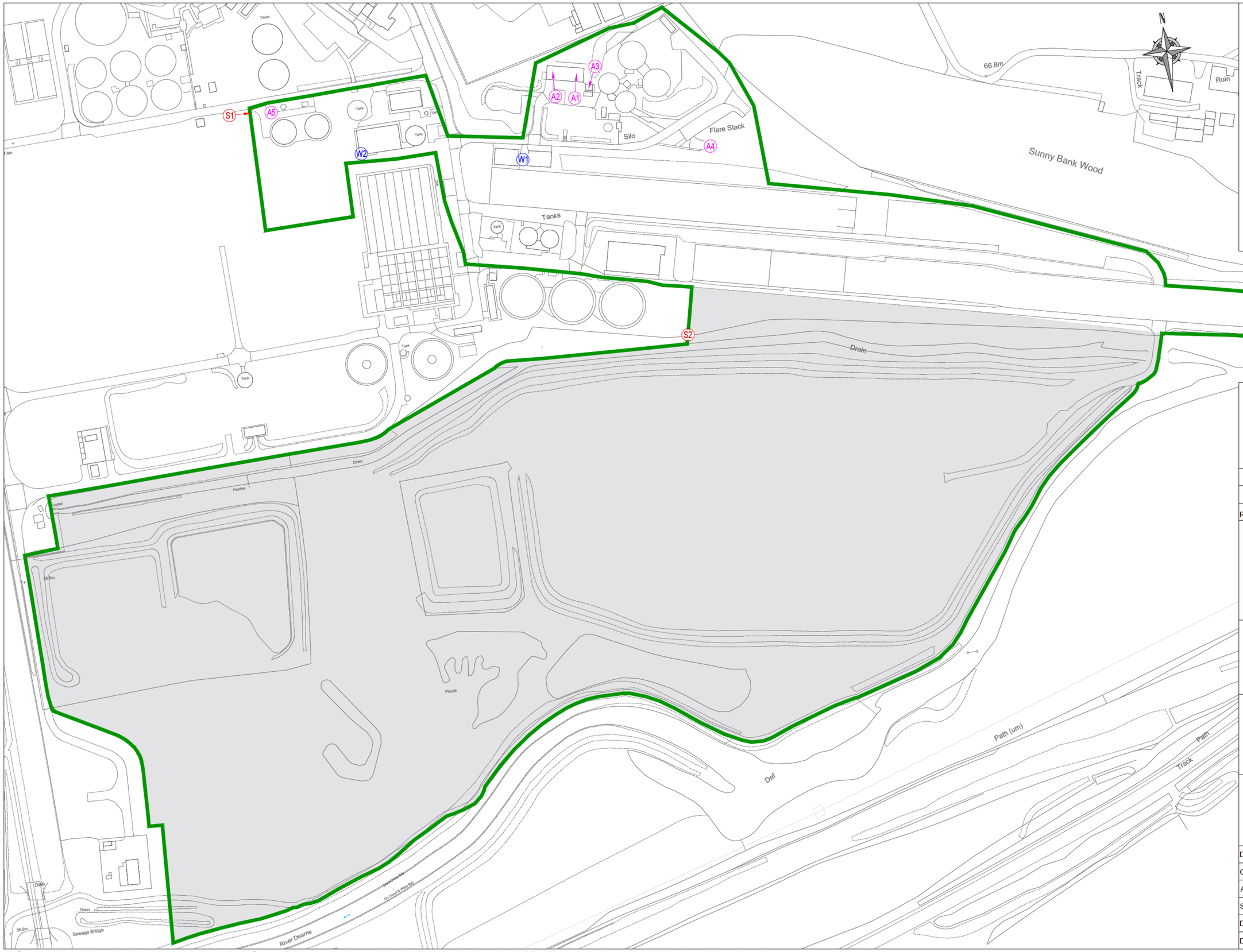
YORKSHIRE WATER SERVICES LTD
ENVIRONMENTAL PERMITTING

LUNDWOOD
SLUDGE TREATMENT FACILTY

INSTALLATION LAYOUT OVERVIEW

Drawn	MWD		12/12/2023
Checked	ES		12/12/2023
Approved	AW		12/12/2023
Scale @ A2	1:1,500	Paper Size	A2
Drawing Status	FOR PERMITTING	Rev	B
Drawing No.	FIGURE 2 - SITE LAYOUT PLAN		

Figure 3 Principal emission points



KEY.

- PROPOSED INSTALLATION BOUNDARY
- LEGACY AREAS OF THE INSTALLATION BOUNDARY WHERE PERMITTED ACTIVITIES ARE NO LONGER CARRIED OUT
- A1 CHP
- A2 BOILER 1
- A3 BOILER 2
- A4 WASTE GAS BURNER
- A5 OCU
- S1 DRAINAGE & LIQUORS TO WwTW
- S2 DRAINAGE & LIQUORS TO WwTW
- W1 ROOFWATER TO SOAKAWAY
- W2 ROOFWATER TO SOAKAWAY

NOTES.

THE ORIENTATION OF THIS FIGURE HAS BEEN ROTATED TO ALLOW FOR A CLEAR PRESENTATION OF THE INSTALLATION AT A SUITABLE SCALE.

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	12.12.23	MWD	FOR PERMITTING	ES	AW
A	01.12.21	MWD	FOR PERMITTING	ES	JP

YorkshireWater

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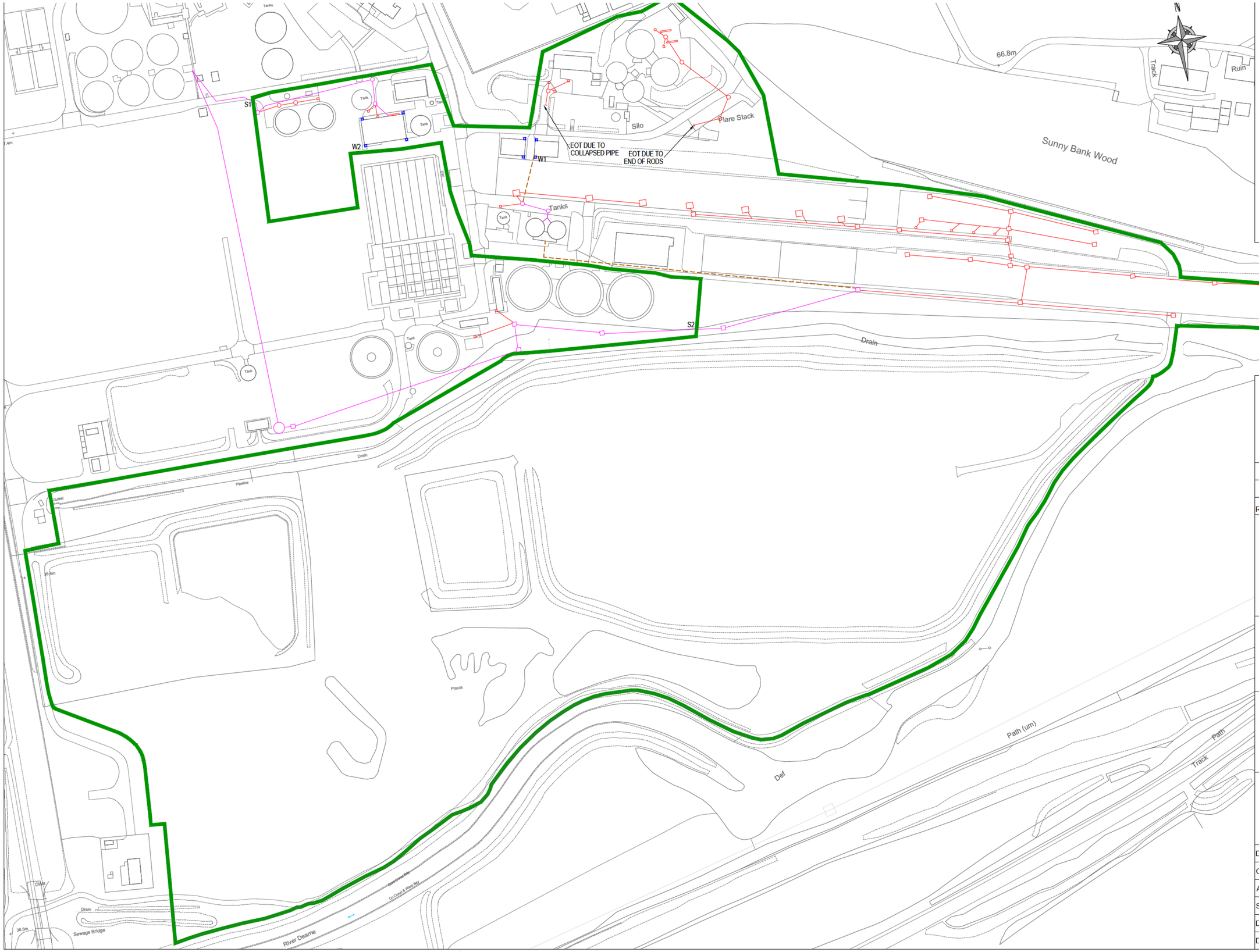
YORKSHIRE WATER SERVICES LTD
ENVIRONMENTAL PERMITTING

LUNDWOOD
SLUDGE TREATMENT FACILTY

PRINCIPAL EMISSIONS POINTS

Drawn	MWD	12/12/2023	
Checked	ES	12/12/2023	
Approved	AW	12/12/2023	
Scale @ A2	1:1,500	Paper Size	A2
Drawing Status	FOR PERMITTING	Rev	B
Drawing No.	FIGURE 3 - PRINCIPAL EMISSIONS POINT		

Figure 4 Drainage Plan



PROPOSED INSTALLATION BOUNDARY

DRAINAGE TO WwTW

COMBINED DRAINAGE & LIQUORS TO WwTW

PROCESS LIQUORS

ROOF WATER TO SOAKAWAY

S1 to S2 — EMISSIONS POINT REFERENCE, SEE FIGURE 3.

NOTES.

THE ORIENTATION OF THIS FIGURE HAS BEEN ROTATED TO ALLOW FOR A CLEAR PRESENTATION OF THE INSTALLATION AT A SUITABLE SCALE.

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	12.12.23	MWD	FOR PERMITTING	ES	AW
A	01.12.21	MWD	FOR PERMITTING	ES	JP

YorkshireWater

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YORKSHIRE WATER SERVICES LTD
ENVIRONMENTAL PERMITTING

LUNDWOOD
SLUDGE TREATMENT FACILTY

DRAINAGE LAYOUT
SHEET 1 OF 2

Drawn	MWD		12/12/2023
Checked	ES		12/12/2023
Approved	AW		12/12/2023
Scale @ A2	1:1,500	Paper Size	A2
Drawing Status	FOR PERMITTING	Rev	B
Drawing No.	FIGURE 4 - DRAINAGE LAYOUT		

KEY.

- PROPOSED INSTALLATION BOUNDARY
- DRAINAGE TO WwTW
- COMBINED DRAINAGE & LIQUORS TO WwTW
- PROCESS LIQUORS
- ROOF WATER TO SOAKAWAY

NOTES.

THE ORIENTATION OF THIS FIGURE HAS BEEN ROTATED TO ALLOW FOR A CLEAR PRESENTATION OF THE INSTALLATION AT A SUITABLE SCALE.

Rev	Date	Drawn	Description	Ch'k'd	App'd
B	12.12.23	MWD	FOR PERMITTING	ES	AW
A	01.12.21	MWD	FOR PERMITTING	ES	JP

YorkshireWater

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YORKSHIRE WATER SERVICES LTD
ENVIRONMENTAL PERMITTING

LUNDWOOD
SLUDGE TREATMENT FACILTY

DRAINAGE LAYOUT
SHEET 2 OF 2

Drawn	MWD	12/12/2023
Checked	ES	12/12/2023
Approved	AW	12/12/2023

Scale @ A2	1:1,500	Paper Size	A2
Drawing Status	FOR PERMITTING	Rev	B
Drawing No.	FIGURE 4 - DRAINAGE LAYOUT		

Section V: Appendices

Appendix 1 Relevant Offences

Form C2 / Q3a Have you, or any other relevant person, been convicted of any relevant offence?

Yorkshire Water Services Ltd Relevant Prosecutions Record

Huddersfield Magistrates' Court 9 February 2011

On the above date YW pleaded guilty to breach of Section 85 (1) and (3) of the Water Resources Act 1991.

This incident relates to the Heaton Lodge site which partially treats sewage and then transports this treated sewage to the Cooper Bridge site.

On 9 August 2009 at approximately 4.10pm, an Environment Agency officer found a discharge to the River Calder from the Heaton Lodge site. This was reported to YWS at 4.47pm but an off-duty YW colleague had already noted the discharge and reported it proactively 30 minutes earlier. An operator attended site at 4.30pm and identified the cause of the discharge to be a burst from a cracked rising main on the Heaton Lodge site.

The sludge pumps were immediately isolated, stopping the discharge some 30 – 40 minutes after it had first been noted by the off duty YW operator and the matter was escalated to senior management to inform them of the incident in line with the usual process.

YW offered to clean up the affected area but were informed by the EA officer that no clean-up was necessary. Service partners for YW attended on 10 August to locate the exact position of the main burst which was caused by excessive pressure thought to have been due to a blockage. The discharge from the main occurred in the area where it goes under the river. The area around the main was also bunded to contain any future spillages pending confirmation of the structural condition of the main. Visual inspections of the pipe work were maintained for a number of weeks following this incident as part of the site visits that are routinely undertaken.

Repairs were completed by 12 August when sludge transfer and full operations returned. The length of damaged pipe, 20m, was replaced and 75 metres of the main were jetted and CCTV was also carried out to ensure there were no other defects in the main. The total cost of the works was £16,800.

Since the incident, the main had been pressure tested to ensure the integrity of the main – no further incidents have occurred since August 2009 and the further testing did not establish any need for further repair works. The volumes and pressures pumped in this main were reduced following the incident due to a change in the process of transporting the sludge.

The evidence from the EA covered the potential effect, and the actual chemistry/biology however there's no indication that this incident affected the watercourse in terms of its flora and fauna. There was no fish kill. In fact, YWS offered to clean up the watercourse on the day of the incident and were informed that this was not necessary.

The watercourse recovered rapidly. There was no evidence put forward by the EA to suggest that the effect was medium or long term, supported by the EA's contention that a clean-up was not required.

There was no evidence that the recreational use around the discharge point had been adversely affected. The Magistrates accepted that there had been no "flaunting of the law" by the Company. They noted that there was no significant damage to flora or fauna and that the watercourse recovered rapidly. On the issue of culpability, they accepted that the Company did not deliberately break the law and they further noted that the Company did not achieve any economic gain through the commission of this offence.

YWS was fined £10,000 and ordered to pay the EA's costs of £1,164.34.

Huddersfield Magistrates' Court 9 February 2011

On the above date YW pleaded guilty to breach of Section 85 (1) and (3) of the Water Resources Act 1991. This incident occurred on what is known as the Deighton site. This site receives crude sewage and undertakes preliminary treatment in the form of screening of any debris. The main in question transports this treated sludge to the Calder Valley incinerator, at the time of this incident.

At 7.45pm on 9 September 2009, a call was received from the EA that there had been a report of sewage from a local resident and it is noted what the EA state this resident said when reporting this issue. I would ask the Court to be mindful of the terminology used and place the appropriate reliance on this when considering what the customer may or may not have meant by this comment as there is no further evidence with regard to this statement and it clearly could not relate to actual measured flow. RTS which is the alarm system used by Yorkshire Water on its assets was checked immediately for any alarms but none were found.

An operator attended site at 8.30pm and was unable to safely locate the discharge as daylight was fading and for health and safety reasons, the operator ceased his investigation. Service partners for YW had previously been isolating the pumps on a daily basis as the pumps were being commissioned and therefore these pumps were only running between the hours of 7.30am – 6.00pm at the time of this incident. On 9 September, the pumps had been turned off when the operator attended so there was not a discharge left to continue by the operator leaving site.

On the morning of 10 September, the pumps were set running again at 9.05am. The exact point of the discharge which had proved difficult to find due to the excess of overgrowth on the wall was then located. An EA officer was on site and aware that the pumps had been set to run again and at 10.15am witnessed the discharge point. The pumps were immediately stopped.

On 10 September at 11.30am, service partners for YW began the repairs to the main which resulted in a 4m length being replaced. The repairs were made difficult by the presence of a large tree adjacent to the burst. This is believed to have been a contributing factor to the cause of the burst as the tree had displaced the main. CCTV operations were also undertaken on the main, 100m to establish its overall condition with no defects found.

All sludge was tankered from site and any debris observed in the river was completely removed by YW operations. The main was subsequently flushed with treated final effluent and a full CCTV survey was undertaken with no defects identified, the main was found to be in good condition and was brought back into service on 12 September.

Following this incident, the tree and its roots were completely removed to avoid any repeat incident once YW were aware of the contribution of this tree to this incident. The entire length of the main has been cleaned out and a pressure monitor has been placed on the main so that in future, if the pressure rises due to a blockage or any problem, the pumps will cease pumping to avoid a burst. The monitor is alarmed to notify YW of a problem. Together with the cost of the repair works immediately after the incident and the further cleaning works, a total of approximately £375k has been spent on this main.

The evidence from the EA covers the potential effect, and the actual chemistry/biology however there's no indication that this incident affected the watercourse in terms of its flora and fauna.

There was no fish kill. YWS offered to clean up the watercourse and carried out these operations immediately with the agreement of the EA. No further actions were requested by the EA following their further investigations.

There was no evidence put forward by the EA to suggest that the effect was medium or long term. There was no evidence that the recreational use around the discharge point has been adversely affected. They noted that this was a Category 1 offence. It was however noted that there was no significant permanent damage to the flora or fauna. In respect of culpability, there was no deliberate pollution to the watercourse and no economic gain. They had considered all the environmental credentials and investment for the company and they also noted the significant investment in this main since the incident had occurred.

YWS was fined £12,000 and ordered to pay the EA's costs of £1,897.93.

Scarborough Magistrates' Court 6 May 2011

YWS was prosecuted for an offence that on or before 26 April 2010 it did cause a water discharge, namely the entry of waste into the Runswick Beck, Runswick Bay other than in accordance with an environmental permit contrary to Regulations 12 (1) (b) and 38 1 (a) of the Environmental Permitting (England and Wales) Regulations. This was the first offence to be prosecuted under the new regulations.

At 4:26pm on 26 April, YWS was contacted by the EA via Loop informing it of potential pollution incident at Runswick Beck. YWS was directly informed by Loop at 4.40pm and a job was raised for the standby operator who was on site for 5:05pm (some 40 minutes after the first contact).

The operator confirmed that the detention tank on site was full and the overflow was active. The pumps appeared to be running but they were failing to keep on top of the flow. No alarms had been received from the site as it was established that the ultrasonic head that records levels in the tank was inoperable as it had been removed from the tank and placed on top of the tank. The reasons for this were unknown as was both the identity of the person who removed the ultrasonic head and when this was done.

The tank was pumped down by the operator by putting both pumps on hand. The site was not designed to operate using both pumps and was on a duty standby arrangement, however, to try to solve the problem both pumps were in use. At 6:45pm, approximately two hours from the report of the incident by the EA, the discharge was stopped. The operator later noted a discharge from the rising main at Hinderwell and believed the rising main to be blocked which would have had the effect of reducing the SPS's capacity to pump in any event. As the operator had stopped the discharge, before he left site, he checked the watercourse and beach for any signs of debris. He found no such debris as the detention tank has a screened overflow.

A high-level flow was placed in the tank as a temporary indicator for any future high levels. The operator confirmed to the EA that he had stopped the discharge. The EA informed YWS that it would be attending the following day to take samples and requested a clean-up of the beck.

A job was raised for Lumsden and Carroll to clean up Runswick Beck but it did seem that the vegetation in the Beck had contained the majority of the flow. No debris was found. In agreement with the EA, only the top 20 metres of the Beck were cleaned for health and safety reasons. Investigations into YWS's own assets on 27 April established that the detention tank was full of sewage debris. The STRATE pump unit was also cleaned out.

On 28 April, the STRATE tank was cleaned out and its controls were also checked by an electrician. A large quantity of silt was found in the unit and the pumping propellers were also found to be worn. The detention tank had been cleaned out two years prior to this in accordance with our accepted process. It was cleaned out on 29 April and impellors were ordered which had to be delivered from Germany.

The rising main was found to have two of the three air valves clogged with fat and the third valve was found to be damaged – all of which were cleaned and replaced. Approximately £6k in costs was incurred in both the clean-up operation and repair and replacement of the relevant assets. Following the incident, the site was visited every other day, with daily monitoring of RTS.

Sample results taken by the EA showed a significant impact at the point of discharge. Sample results 300 metres downstream of the discharge point on 26 April, showed a lesser impact. Samples taken from the same place 300 metres downstream on 27 April showed a greatly reduced impact suggesting that the watercourse had improved significantly within 24 hours of the incident. The site now has an updated maintenance plan and the telemetry has been fully tested.

The Magistrates made the following comments: "We have listened very carefully to all that has been said today regarding this unfortunate incident at Runswick Bay. We have acknowledged that Yorkshire Water did respond exceedingly quickly. In our view, a response time of 25 minutes is exceptional. We have also noted the early guilty plea and given maximum credit for this."

YWS was fined £7,500 fine and ordered to pay the EA's costs of £1,581.67.

Rotherham Magistrates' Court 10 June 2011

YWS was prosecuted for an offence that on or before 24 April 2010 it did cause a water discharge, namely the entry of waste into the Blackwater Dyke, Aldwarke Lane, Rotherham other than in accordance with an environmental permit contrary to Regulations 12 (1) (b) and 38 1 (a) of the Environmental Permitting (England and Wales) Regulations.

At 11:05am on 26 April, YWS was informed via the EA of a discharge to Blackwater Dyke. YWS operatives were on site at Aldwarke Lane SPS at 12:30pm and found that both pumps at the site were inoperative. Pump no 1 was found to be blocked and the fuses had blown at pump no 2.

A job was immediately raised for an electrician and fitter to attend site. In the interim, straw bales were delivered to site and placed at the confluence of the Dyke and River Don to prevent solids moving into the River Don. Pump No 1 was lifted, unblocked and restored to normal operation on the same afternoon but pump no 2 was found to be burnt out so was removed from the wet well. The pumping station operated on a duty/standby basis and therefore one pump was capable of dealing with the flows.

The site was monitored overnight by standby operatives to ensure the pumping station continued to operate satisfactorily using one pump. No further issues were noted. On 27 April, a replacement pump no 2 was delivered but was not immediately fitted due to wet well restrictions. The site was monitored again overnight. Pump No 2 was installed on 28 April. On 30 April, the EA requested a clean-up of the Dyke and a recycler/vactor unit was requested which removed the surface liquids from the Dyke. No further works were required by the EA.

Aldwarke Lane SPS was monitored by telemetry, however, a telemetry failure was identified on 9 December 2009 which was not rectified until 28 April 2010. The pumping station was visited on a monthly basis prior to the incident and the last visit prior to the incident being on 1 April. The EA did not take any samples of the Dyke nor did it produce any photographs. There was therefore no evidence of the impact on the Dyke.

An employee of the EA witnessed this incident on Saturday 24 April whilst in the area socially. For reasons which had not been explained in his statement or elsewhere, he did not report this incident to any party until two days later on 26 April.

The Magistrates made the following comments: "We have been hearing a case prosecuted by the Environment Agency against Yorkshire Water. We have taken into account the statement from the Environment Agency that the breakdown of the telemetry had no bearing on the subsequent breakdown of the pumps. However, telemetry would have given an early indication of the problem and should not have taken 5 months to repair. We do however appreciate that Yorkshire Water took early action on being informed by the Environment Agency. We would have fined the company £5,000 but give maximum credit for the early guilty plea".

YWS was fined £3,750 fine and ordered to pay the EA's costs of £835.38.

Wakefield Magistrates' Court 18 July 2011

YW was prosecuted for an offence that on or before 7 April 2010 it did cause the entry of polluting matter, namely sewage waste, into the un-named tributary of the River Calder to the North of Pugneys Country Park in the district of Wakefield, a controlled water, other than in accordance with a discharge consent contrary to section 85 (1) and 85 (6) of the Water Resources Act 1991.

On 7 April at 11.38am, YWS were informed of a discharge to the tributary by the EA. An operator was sent to site and noted a problem with the Denby Dale Road CSO. Around 1.5 tonnes of fat, rags, silt and grit were removed from the CSO chamber. At the time of the incident, the CSO telemetry data was not visible due to a fault with the alarm points. Data recovered since the incident indicates that the CSO began to discharge to the site detention tank on 11 February 2010 and ceased on 7 April 2010. The flow was being returned to sewer and there is no recorded data to indicate when the discharge to the watercourse may have commenced.

On the day of the incident, a bund was created using straw bales to prevent solid material reaching the River Calder. A litter pick around the CSO outfall was also carried out. On 9 April, fat was again found to be accumulating in the CSO chamber which became partially blocked again. This blockage was cleared on the same day and the asset was proactively checked over the weekend and the watercourse also monitored.

On 12 April, the CSO and continuation sewer were completely cleansed by high pressure jetting. One storm pump was also found to be blocked, this blockage was also cleared that day. During that week, the CSO telemetry was also repaired and modified to make graphical data visible and a supplementary “pollution incident” alarm was created. On 13 April, YWS met with the EA and agreed to bund off the dyke upstream of the overflow and that the site would be monitored daily.

Since this incident, potential sources of the fact have been investigated but have not identified a source. All of these businesses who could be the potential source of the fat have been contacted to inform them of the problem and provide guidance on the correct disposal method. A cyclical monthly inspection of the asset has been raised to help identify any future accumulations of fat. This involves checking the CSO itself and a visual check of the outfall.

Prior to the incident, the Detention Tank was inspected on a routine visit on 2 March with no faults found. The pumping station was visited on 11 March which found a partial blockage in the CSO caused by fats which was removed during the same visit. The CSO itself receives a 3-monthly inspection – YWS guidance is that it should be every 6 months so the asset was already being visited more frequently.

The EA took two sets of samples on 8 April and 16 April. The former sample was taken from the point where the drain emerges from culvert into an open ditch. This sample does demonstrate an impact on the watercourse. The second sample taken by the outfall itself some 9 days after the incident was reported, show significantly lower levels for all of the components tested on 8 April. A number of photographs have also been provided.

YWS was fined £10,500 and ordered to pay the EA's costs of £2,324.67.

Calderdale Magistrates’ Court 4 January 2012

On 4 January 2012 YWS pleaded guilty to an offence that on or before 1 April 2011 it failed to comply with Schedule 1, Conditions 11 (a) and 9 (a) (iii) of an environmental permit for waste water treatment and discharge, number WRA7510 in that the levels of biochemical oxygen demand and suspended solids discharged from the works were in excess of the permitted maximum amounts allowed under the said permit and caused pollution of the River Calder contrary to Regulations 12 (1) (a) and 38 (2) of the Environmental Permitting (England and Wales) Regulations 2010 and Section 2 of the Pollution Prevention and Control Act 1999. The levels of BOD were 3.6mg/l over the levels normally permitted to be discharged to the watercourse being 73.6 mg/l rather than 70 mg/l or under.

The works in question suffered greatly as a result of the intense winter of 2010/11. The weather had affected a great deal of authorities and the public alike. By way of background, during this period maintenance work in the area, including this sewage treatment works, increased by 374% in January and 240% in February. The impact on the Copley works was severe. A number of assets were affected at the works which resulted in the increase in the levels of sludge being held back for treatment which resulted in the breach of the permit. It can be described almost as a domino effect on preceding treatment assets caused by the winter which then impacted the operation of the centrifuges which were required to operate consistently in a manner for which they are not designed.

A centrifuge is a large drum which is motorised and spins very fast like a washing machine. Wet sludge enters the drum and is spun such that the water is removed and the thickened sludge is passed forward as a cake. It is one part of the overall treatment process at the works.

At the works, there are two centrifuges and the design is for them to operate on what is known as a duty/standby basis. The importance of that is that only one centrifuge is ever required to operate. The standby is there to be called into operation should a problem arise with the duty asset.

The centrifuges are maintained on a 6-monthly basis by a specialist contractor and were last inspected on 3 February 2011 and in July 2010 prior to that. An issue was identified with one of the centrifuges which in turn led to its removal for repair on 10 February leaving one still in situ which is still within the design capacity.

The remaining centrifuge continued to operate at a lower continuous level of operation. It is important to note that this asset did not fail. However, as it was struggling to maintain required levels, a decision was made to bring in a further centrifuge unit which eventually ran on a 24-hour basis, 7 days a week. This arrived on site on 2 April. The levels of BOD on 10 March were 136mg/l. By 1 April 2011, YW had reduced the level of BOD by 50% to 73.6mg/l, 3.6mg/l over the permitted levels of discharge i.e. the levels which are set by the EA that can be safely discharged without any impact. Therefore, clearly the activity by YW had made a significant impact to the BOD levels.

This incident came to the prosecution's attention as a result of self-reporting by YW, there was no attempt to conceal the events on site nor any potential impact on the watercourse. YW were proactive in their communication to the EA to ensure there was full visibility of what was occurring on site. The EA attendance on site was solely in response to the YW contact.

There was no evidence from the EA of any impact on the watercourse other than the sample results provided and some photographic evidence. The sample results show that the levels of BOD were 3.6mg/l over the levels normally permitted to be discharged to the watercourse. It was submitted therefore that taking this into account, the impact on the watercourse was minimal given the close proximity of the final sample result to what is allowed to be safely discharged in all normal circumstances. Any impact in any event was short term if at all.

There was no fish kill nor is there any evidence submitted by the EA of any damage to flora/fauna or impact on recreational or amenity value.

The Yorkshire Water response was timely and effective with costs of approximately £60k being incurred as an immediate and subsequent consequence of the incident. Since the incident occurred, a full root cause analysis was undertaken resulting in a full review of the maintenance procedures to equipment upstream as it were of the centrifuge assets. Those assets were already on an appropriate system of inspection and maintenance which was adhered to prior to this incident. A further new action is a robust two-phase escalation process to reinforce monitoring levels on site in terms of sludge levels which now instigate new actions within the company. A new team leader has also been brought to the site to give more focus to these sorts of issues.

Yorkshire Water self-reported this incident to the EA and fully cooperated with them under interview. Yorkshire Water now has an understanding as to the impact of such a severe winter event which had not previously been seen for in excess of 30 years.

A fine of £5,000 was imposed against a maximum of £50,000. Costs were also awarded to the EA in the sum of £1,593.98.

Bradford Magistrates' Court 20 March 2012

On 20 March 2012 YWS pleaded guilty to 3 offences all contrary to Regulation 38(2) of the Environmental Permitting (England and Wales) Regulations 2010 as follows:

1. Between 17 April and 3 June 2011 at Copley Sewage Treatment Works there was a failure to comply with the permit in that the works were not operated in accordance with that permit through the storage of sludge in external areas.
2. Between 1 April and 24 June 2011 at South Elmsall Sewage Treatment Works there was a failure to comply with the permit in that sludge originating from Copley works and Wheldale works was stored and treated at the site.
3. Between 1 April and 24 June 2011 at South Elmsall Works there was a failure to comply with the permit through the storage of sludge in external areas for more than 2 days and was not stored in sludge skips.

The works at Copley suffered greatly as a result of the intense winter of 2010/11 which affected a great deal of authorities and the public alike.

By way of background, during this period maintenance work in the area, including this sewage treatment works, increased by 374% in January and 240% in February of 2011. The impact on the Copley works was severe. A number of assets were affected at the works which resulted in the increase in the levels of sludge being held back for treatment which resulted in a discharge outside of the permit for Copley. The Company having seen this discharge occur wished to take all measures to repeat a discharge to the watercourse outside of permitted levels.

There were 3 offences before the court relating to permits at 2 sites Copley and South Elmsall sewage treatment works (STW). The background to all 3 offences is as described above. As a result of the issues being seen on site against the backdrop of the situation referred to, a Company Response Management Team (CRMT) was set up on 5 April to make risk based assessments and decisions on the process to be undertaken to deal with the sludge storage. Both sites have permits to regulate the storage of sludge, at Copley, there is an internal storage area and at South Elmsall, the sludge is permitted to be stored externally in skips for no more than 2 days. The offences were not financially motivated. The Company having set up a CRMT which consists of senior management and operators alike, considered all options for the storage of this sludge. The usual process would have been to send the sludge to the Calder Valley incinerator. This incinerator was undergoing its annual programme of planned maintenance between 1-18 April. This is done on an annual basis with no previous impact on operations.

The other appropriate option was another site which due to potential employee risk, had been temporarily closed down pending works to remove that risk.

The final potential option, other than that taken, was to take this matter to landfill. As an environmental option, due to this not being a particularly environmentally friendly option against all others, the decision was taken not to do so. Therefore, the option to store this substance elsewhere or indeed to use alternative containers was not appropriate or indeed a viable option. In all the circumstances, considering availability and indeed environmental impact, the decision taken was the only decision available so it certainly was not a decision taken without full consideration and assessment of the company's responsibilities both with regards to its regulatory duties but also its duties to the environment.

Offence 1:

The internal storage area was full to capacity by 14 April. The decision was made to store the overflow externally which could be safely stored on areas which were considered appropriate to avoid any external impact via drainage or ground impact. Bales of hay were also placed around the stored substance to protect against any issues in the event of rainfall and to protect against seepage outside of these areas. As soon as the incinerator was available, the sludge was removed from site starting from 23 April and completely removed by 3 June with the vast majority having been removed by 27 May.

Offence 2:

This relates to the transporting of sludge from Copley and Wheldale STW to South Elmsall STW. The sludge was only stored on site but no treatment actually took place. In respect of this offence, during the Environment Agency's (EA) own visit report of 11 May 2011, it was deemed that this was "a non-compliance which has no potential environmental impact". The sludge was transported from Wheldale to South Elmsall from 1 April to ensure as much storage was available at Copley as possible.

Offence 3:

It is permitted to store sludge externally at South Elmsall although it is accepted that this should be carried out by virtue of the use of skips and for no more than 2 days. The background explained above explains the duration and it is estimated that approximately 38 skips would have been required for this storage. As the company was continually making arrangements for transporting of this sludge appropriately and it was not known where 38 skips could have been obtained from, the option was taken to store the substance on the ground which was protected from any escape from the site whether by virtue of drains or ground contamination.

The removal of sludge from Copley was prioritised but as soon as possible with complete removal in accordance with the date on the summons.

The context of these incidents was to be considered amongst Yorkshire Water's regional operations. The issues explained on these sites due to the winter and its longstanding impact were felt regionally. Had the Company been in a position to consider any other options, it would have done so but was heavily constricted by events occurring which were caused by issues outside its control.

Effect on environment

There is no evidence from the EA of any impact on the environment save for reference to complaints of odour which the company does not seek to disregard or indeed argue against the impact. The EA's own guidance on incident classification for odour for significant effects is in summary, odour offensive and persistent enough to cause significant effect on human senses… which lead to some disturbance and significantly more intrusive than normal background and potentially with a significant effect on amenity value. There were two odour complaints on 3 May for South Elmsall over the period of external storage for the duration between 1 April to 24 June. There were 6 complaints from the same two customers over the period of external storage for Copley between 17 April and 3 June.

It was submitted that the odour complaints did not fall within this classification and therefore the incidents should be considered against the EA's own guidance of what constitutes a significant impact.

Further the considered actions taken by Yorkshire Water with regard to actual storage areas were to avoid an impact to the environment via a discharge to a watercourse or otherwise as previously seen.

The response by Yorkshire Water

It was submitted that the Yorkshire Water response was as timely and effective as possible in all the circumstances considering the options available in respect of the shut down for planned and unplanned reasons, of the usual process sites. Costs of approximately £55k were incurred as an immediate and subsequent consequence of the incident. Since these incidents occurred, the level of resource focused on audits and compliance has been increased with further training to be provided for responsible managers and teams.

Yorkshire Water now has an understanding as to the impact of such a severe winter event and the impact this had on assets and resulting operations such as the storage of sludge.

Following the EA's visit on 5 May, an action plan was agreed with them for South Elmsall in which Yorkshire Water confirmed that no additional material would be added to that already in placer and it was fully communicated that all of the cake would be removed by 4 July. There was no requirement by the EA at that stage to remove this material any quicker.

For the Copley site, from 10 May, the Company was in contact with the EA regarding its plans for removal of the sludge from the site. To this extent, in respect of both sites, from 5 May onwards, Yorkshire Water was in regular communication informing them of their plans and next steps.

A fine of £17,000 was imposed per offence against a maximum of £50,000. Costs were also awarded to the EA in the sum of £3,935.70.

Huddersfield Magistrates' Court 25 September 2012

On 25 September 2012 YWS pleaded guilty to one offence contrary to Regulations 12 and 38 (2) of the Environment Permitting (England and Wales) Regulations 2010 as follows:

That on or before 14th June 2011 at Huddersfield (Upper Brighouse) Sewage Treatment Works, Yorkshire Water Services Limited did fail to comply with an Environmental Permit, namely conditions 9 and 10 of Schedule 7 of the conditions of consent to discharge number WRA7409 in that a standby pump was not present.

Upper Brighouse is part of a complex of waste water treatment works which treats effluent from Huddersfield town and the surrounding area. Upper Brighouse is subject to conditions contained within permit number WRA7409. In particular, the discharge of settled sewage in an emergency is subject to conditions set out in Schedule 7 to permit WRA7409. Conditions 9 and 10 provide:-

> "9. The duty pump(s) shall be maintained in good working order, and at least one standby pump shall be provided and maintained.
>
> 10. Standby pump(s) shall automatically activate should the duty pump(s) become inoperative for reasons other than power failure. The pumping station shall be maintained so that the pump shall automatically reactivate as soon as is practical after the power is restored after interruption to the supply".

Conditions 9 and 10 relate to an interstage pumping station at Upper Brighouse. There are three pumps available within the pumping station. Pump A acts as a duty pump which pumps flows forward to treatment, pump B is used intermittently to assist the duty pump at times of high flow following heavy rainfall and pump C acts as the standby pump.

At the end of October 2010 pump A failed and could not be repaired in situ. The pump was removed and sent to the manufacturer for assessment. A decision was taken at that time, based on an assessment of operational risk not to source an alternative pump as pump B was capable of pumping flows to treatment and that pump C (formerly the standby pump) could be used as the assist pump. The permit does not, in any event, specify that an assist pump has to be provided. At the end of January 2011 the manufacturer (Hydrosteel) confirmed that the pump was capable of being repaired and gave a lead time for the work of approximately 3 weeks. As there had been no operational difficulties with the pumping arrangements at Upper Brighouse, the decision not to source a temporary third pump was not reviewed.

As with most large organisations, YWS operates a dedicated work and job scheduling system (SAP). The system has been in place for approximately 10 years and is used to schedule and allocate individual jobs. Each job is given its own individual SAP number but there is no overall unique number given to the whole life of a problem or a piece of work, so that a job such as the removal, repair and reinstatement of a pump is not given a single unique SAP reference number which allows it to be traced and remain "visible" until completed in its entirety. Instead, the current operation of the SAP system breaks jobs down into individual stages with each stage having to be separately scheduled and being capable of being completed without there being visibility for the whole job.

The repaired pump was returned to site at the beginning of March and a job raised for its installation. Throughout this period, there were no operational difficulties with the pumping arrangements and again, the decision to use two pumps was not reviewed. A pump was installed at the interstage pumping station in early May however, that pump that was not correctly rated and had to be removed. On 14th June prior to the correct pump (the repaired pump A) being installed, pump B developed an electrical fault which meant that although it was running and showing on the monitoring system as running, it was not actually pumping. At the same time, pump C which was acting as the assist pump, developed a mechanical failure. The failure of pumps B and C resulted in a discharge of settled storm sewage into the River Calder. That discharge was permitted under the terms of condition 3 of Schedule 7 to consent number WRA7409.

Effect on the Environment

There was no impact on the environment as a result of this offence.

Response by Yorkshire Water

YWS had, prior to the instigation of the prosecution, identified limitations within its current organisational working practices and structures and the current use of the SAP system for allocating and assigning jobs. A review and a programme for change (Operating for Excellence) commenced in 2011 and aims to ensure across all of YWS's business and operational functions that there are effective systems and processes in place, so that there is greater clarity and visibility as to how, when and why decisions are taken and work programmed. One of the issues to be taken into account in considering the criticality of a particular asset will be ensuring full permit compliance can be achieved and maintained. The Operating for Excellence project, which commenced in September 2011, is now in its pilot phase. In relation to Engineering & Reliability, one of the outcomes identified to date, is the need for there to be a central engineering reliability hub to allow improvements in the way that workflows are managed within operational teams including scheduling, planning and procurement.

The Magistrates made no comment when imposing the fine and costs award, save for confirming that the company had been given credit for an early guilty plea. A fine of £1,200.00 was imposed against a maximum of £50,000.00. Costs were also awarded to the Environment Agency in the sum of £913.42.

01 October 2013

Beverley magistrates' court in connection with an offence contrary to Regulation 12 and 38 of the EPR 2010 on 12 October 2011 at Beverley Waste Water Treatment Works, Beverley.

Fine - £4,000.
Costs - £1,248.70.

01 October 2013

Beverley magistrates' court in connection with an offence contrary to Regulation 12 and 38 of the EPR 2010 on 18 April 2012 at Beverley Waste Water Treatment Works.

20 February 2014

Wakefield magistrates' court in connection with an offence contrary to Regulation 12 and 38 of the EPR on 06 March 2013 at Wash Dyke, Pontefract (Sowgate Lane SPS).

19 January 2016 – Shay Lane Pumping Station

Shay Lane pumping station Single offence of causing a water discharge activity contrary to Regulation 12 and 38 of the EPR 2010 05 October 2013.

Negligent Harm 2 £600,000 £24,000.

28 April 2016 – Naburn WWTW

3 charges of contravening Regulations 12 and 38 EPR 2010:

1. Discharge of polluted water from Naburn WwTW into the River Ouse on 23 August 2013.

2. Failure to provide and maintain at least one standby pump at Naburn WwTW between March and October 2013.

3. Failure to provide and maintain at least one standby pump at Naburn WwTW between 17 August and 29 September 2014 See under "Offence(s).

Charges 1 and 2 - high degree of negligence.

Charge 3 – Reckless.

Charges 1 and 2 – Harm 3.

Charge 3 – Harm 4 Charges 1 and 2 - £500,000.

Charge 3 - £600,000.

17 August 2016 – Sherwood CSO

Single offence of causing a water discharge activity contrary to Regulation 12 and 38 of the EPR 2010 12 April 2013.

Negligent Harm 2 £350,000 £30,000.

13 July 2017 – Hinderwell WWTW

Single offence of causing a water discharge activity contrary to Regulation 12 and 38 of the EPR in July 2015.

Culpability – Reckless.
Harm – 2.
Fine - £600,000.

27 November 2017 – Sandy Lane (aka Belle Vue) Pumping Station, Doncaster

Single offence of causing a water discharge activity contrary to Regulation 12 and 38 of the EPR in 24 / 25 April 2014.

Culpability – Negligent.
Harm – 3.
Fine - £45,000.

8 September 2021 – Potteric Carr Nature Reserve (Balby STW)

Sheffield magistrates' court in connection with two offences on 28 March 2017 at Mother Drain at Potteric Carr Nature Reserve (Balby STW). Yorkshire Water pleaded guilty to a water discharge activity contrary to Reg 12 and 38 of the EPR and a breach of condition of the environmental permit. A fine of £150,000 was imposed against offence 1.

November 2017 – Sandy Lane (AKA Belle Vue) Pumping Station, Doncaster

Single offence of causing a water discharge activity contrary to Regulation 12 and 38 of the EPR in 24 / 25 April 2014.

Culpability – Negligent

Harm – 3

Fine - £45,000

Costs - £24,762.56

08 September 2021 – Balby Wastewater Treatment Works (Sheffield Magistrates' Court)

Two offences:

(1) causing a water discharge activity contrary to Regulation 12 and 38 of the EPR on 27 March 2017

(2) breaching condition 11 of EPR on 29 March 2017.

Culpability: Negligent

Harm: 3

Fine: £150,000 (starting point £225,000 – 1/3 credit given for guilty plea at earliest opportunity)

Costs: £36,506.35

(NB – fine made for breach of reg.12 and 38 of EPR. No separate penalty was made for the breach of condition).

Dale Road Sewage Pumping Station (Leeds Crown Court)

One offence of causing a water discharge activity contrary to Regulation 12 and 38 of the EPR on 28 January 2022.

Culpability: Negligent

Harm: 2 (agreed)

Fine: £233,000 (full credit given for guilty plea at earliest opportunity)

Costs: £18,766.06 (plus victim surcharge of £170)

Leeds Magistrates' Court – 18 July 2022 at 10.00am – (DJ Kitson)
George Street Detention Tank, Bradford, West Yorkshire Discharging into Bradford Beck

SUMMARY**:**
Three offences:

Charge 1 – Causing a water discharge activity between 20-25 August 2018 contrary to reg 38 of EPR 2016.

Charge 2 – Causing a water discharge activity between 01 September 2017 and 31 August 2018 contrary to above.

Charge 3 – Between 1st September 2017 and 7th June 2019, at George Street, Bradford…failed to comply with the following conditions of Schedule No1 of environmental permit WRA8215:

- Condition 8(b) by failing to return the sewage return pumping station to normal operation as soon as reasonably practicable.
- Condition 9, by failing to provide at least one stand-by pump;
- Condition 12, by failing to maintain all pumps and associated controls in good working order; and
- Condition 14, by failing to maintain the overflow in an efficient operational condition,

Penalty: £1,623,032.79 as follows:

Charge	Culpability	Harm	Fine (£)
1	Reckless	Category 3	750,375
2	Reckless	Category 3	750,375
3	Reckless	Category 3	100,000

EA costs - £22,112.79

Victim surcharge - £170

Appendix 2 Technical Competence

CIWM

Continuing Competence Certificate

This certificate confirms that

John Bullivant

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 04/08/2023

TMNH	Treatment - Non Hazardous Waste
TSNH	Transfer - Non Hazardous Waste
AD	Anaerobic Digestion

Expiry Date: 04/08/2025

Verification date: 26/07/2023

Authorised:

Professional Services Director

Learner ID: 30109

Certificate No.: 5231569

Date of Issue: 04/08/2023

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

Scan code on reverse to authenticate that this is a genuine paper

wamitab

Qualification Title:

WAMITAB Level 4 Medium Risk Operator Competence for Non-Hazardous Waste Treatment and Transfer

Qualification Accreditation Number:

601/8528/4

This Certificate is awarded to

John Bullivant

Verification date: 30/03/2021

Authorised:

Katie Cockburn
Director of Qualifications and Standards

Learner ID: 30109

Certificate No.: 5176778

Date of Issue: 06/04/2021

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Cymwysterau Cymru Qualifications Wales
Recognised awarding body

Regulation

The qualifications regulators logos on this certificate indicate that the qualification is accredited only for England, Wales and Northern Ireland. Qualifications Wales regulates this qualification where it is awarded to learners assessed wholly or mainly in Wales.

00155675

Units achieved by

John Bullivant

Units gained:

		Level
A/508/0756	Maintain health and safety in the waste resource management industry	L4
F/508/0757	Manage the environmental impact of work activities	L4
F/508/0760	Manage the movement, sorting and storage of waste	L4
J/508/0887	Manage the reception of non-hazardous waste	L3
K/508/0980	Manage transfer and disposal from non-hazardous waste treatment and recovery operations	L4
M/508/0995	Manage site operations for the treatment of non-hazardous waste	L4

Verification date: 30/03/2021

Authorised:

Learner ID: 30109

Certificate No.: 5176778

Date of Issue: 06/04/2021

Katie Cockburn
Director of Qualifications and Standards

Corff dyfarnu cydnabyddedig
Recognised awarding body

The qualifications regulators logos on this certificate indicate that the qualification is accredited only for England, Wales and Northern Ireland. Qualifications Wales regulates this qualification where it is awarded to learners assessed wholly or mainly in Wales.

00155676

Operator Competence Certificate

Title:

Non-Hazardous Waste Treatment and Transfer

This Certificate is awarded to

John Bullivant

Verification date: 30/03/2021

Authorised:

Director of Qualifications and Standards

Learner ID: 30109

Certificate No.: 5176778

Date of Issue: 06/04/2021

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

This certificate is jointly awarded by WAMITAB and the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.

00155677