Blackburn WwTW Sludge Treatment Facility EPR/XP3638LJ

Environmental Permit Variation Application

Blackburn WwTW Sludge Treatment Facility

Application Support Document

May 2025

Contents

1. Introduction

The purpose of this Application Support Document (ASD) is to provide supplementary information to support an environmental permit (EP) variation application for EP XP3638LJ to include the storage, treatment and transfer of imported sludge at Blackburn Wastewater Treatment Works (WwTW). This application is being made under the Environmental Permitting (England and Wales) Regulations 2016 (the EPR 2016).

The address of the installation is:
Blackburn WwTW Sludge Treatment Facility
Cuerdale Lane
Samlesbury
Lancashire
PR5 0UY

NGR: SD 60385 29537

United Utilities Water Limited (UUW) operates a non-hazardous sludge treatment facility at the Blackburn WwTW. The permitted treatment process comprises:

- the import of raw sludge from satellite sites by tanker
- screening of imported sludge
- storage of imported sludge in tanks
- thickening of imported sludge in two gravity belt thickeners (GBTs)
- import of raw cake from satellite sites and reliquification prior to treatment
- thickening of indigenous sludge in three rotating drum thickeners
- enhanced enzymic hydrolysis (EEH) of the combined thickened sludge streams, followed by anaerobic digestion (AD) and centrifugation of digested sludge
- storage of biogas and combustion in two CHP engines
- lime treatment of digested cake
- storage of digested cake.

This variation application is to permit the following additional activities:

- import and temporary storage of digested cake from other UUW sites prior to treatment by liming
- import of digested sludge from other UUW sites and storage prior to transfer off site (no treatment).

The additional activities will take place on the existing (and permitted) infrastructure.

The application support document describes these activities and how BAT will be applied to the storage, treatment and transfer operations.

2. Non-Technical Summary

The Blackburn WwTW permit EPR/XP3638LJ currently permits the biological treatment of sludge and directly associated activities, as per Table S1.1 of the permit, for the recovery of sludge to land. The directly associated activities includes the dewatering of digested indigenous sludge to form a cake and further treatment of this cake by the addition of lime. Lime treatment is undertaken in accordance with the Biosolids Assurance Scheme (BAS) standard for the application of biosolids to agricultural land.

This permit variation is to add the following additional activities:

- import and temporary storage of digested cake from other UUW sites prior to treatment by liming to enable recovery by agricultural land spreading
- import of digested sludge from other UUW sites and storage prior to transfer off site for agricultural land spreading (no on-site treatment).

The activities will take place on the existing (and permitted) infrastructure within the existing permit boundary. No extension to the permit boundary is required. The cake will be stored and treated on an existing concrete pad.

There are no direct emissions to air, land or water from the proposed additional activities. Wastewater will be generated in the form of leachate/ surface water run off, as the cake will be stored in the open. Run off from the cake pad is directed via a central shallow drain into the main site drainage system at Emission Point W14, which is already permitted. All discharges to the site drainage system are returned to the head of the WwTW for treatment.

Permitted sample point S2 (the site drainage pump well), is considered to provide representative samples for emissions from the cake pad. Monitoring of the wastewater emissions shall be undertaken at S2 in accordance with the sampling programme submitted to the EA in relation to Permit Improvement Condition IC5a to characterise the wastewaters discharged to Blackburn WwTW.

During the liming process fugitive releases of ammonia will occur giving rise to some localised odours. These are expected to dissipate quickly in the atmosphere and will not give rise to odour beyond the WwTW site boundary. However, the liming plant operator will ensure that odour neutralising spray equipment is permanently available so that it can be mobilised rapidly if odour levels are detected above background.

Infrequent waste streams will arise from maintenance of the liming plant and equipment. These waste streams will be managed in accordance with standard UUW environmental procedures.

3. Application Form C2 Supporting Information

Application Form C2 has been submitted to support this variation to a bespoke permit.

3.1. Question 2b and Table 1: Changes to Existing Activities

The sludge treatment facility at Blackburn WwTW is permitted under S5.4 A(1) (b) (i) of the EP Regulations for the recovery 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 and directly associated activities (permit reference number: EPR/XP3638LJ).

This permit variation is to add the following additional activities:

- import and temporary storage of digested cake from other UUW sites prior to treatment by liming to enable recovery by agricultural land spreading
- import of digested cake from other UUW sites and temporary storage prior to transfer off site for agricultural land spreading (no on-site treatment).

The activities will take place on the existing (and permitted) infrastructure within the existing permit boundary. No extension to the permit boundary is required.

The new activities to be added to the permit are summarised in Table 3.1.1 below.

Table 3.1.1: New Activities to be Added

Description of activities for waste operations		
Temporary storage of digested WwTW cake	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	From the receipt of digested cake for temporary storage prior to transfer off site. Storage of waste shall take place on an impermeable surface with a sealed drainage system.
Physical treatment of non-hazardous waste for the purpose of recycling	R3: Recycling/reclamation of organic substances which are not used as solvents	Physical treatment by mixing digested cake with lime to achieve 'Enhanced' pathogen kill prior to dispatch off site.

3.2. Question 3a to 3d: Technical Competence and Management Systems

Technically competent management is provided by UUW's Environmental Regulatory Advisers (ERAs). A copy of the relevant COTC certificate and the continuing competency certificate for the site's ERA are provided at Appendix A.

United Utilities environmental management system (EMS) is certified to ISO14001, which covers the management system of UUW Limited for all activities involved in the provision of utility services, including the proposed permitted waste activities. A copy of the ISO14001 certificate is provided at Appendix B - the certification covers all activities and locations therefore specific sites are not listed.

3.3. Question 5a: Site Plans

The following site plans are provided with this permit variation application:

- Figure 1 - updated Wastewater Emissions Points Plan
- Figure 2 - updated Process Flow Diagram
- Figure 3 - Wind Rose for Blackburn WwTW
- Figure 4 - Location of the nearest sensitive receptor (NSR) to the cake pad
- Figure 5 - Location of upwind (UW) and downwind (DW) bioaerosol sampling locations

3.4. Question 5b: Site Condition Report

This variation does not require a change to the permit boundary. A Site Condition Report (SCR) is therefore not required.

3.5. Question 5b: Non-Technical Summary of Your Application

Please see Section 2 of this report.

3.6. Question 5f: Adding an Installation

No installation activities are to be added under this variation application.

3.7. Question 6: Environmental Risk Assessment

Please see Section 11 of this report for a risk assessment and management plan.

4. Application Form C3 Supporting Information

Application Form C3 has been submitted to support this variation of a bespoke installation permit.

4.1. Section 1: What Activities Are You Applying to Vary?

Please refer to Section 3.1 and Table 3.1.1.

Storage Capacity/ Annual Throughput

Under the permit, the maximum annual throughput for anaerobic digestion shall not exceed 2,628,000 tonnes.

The total quantity of imported waste accepted at the site for storage and lime treatment shall be 40,000 tonnes a year. In addition, up to 110,000 tonnes of waste per year may be accepted at the site for temporary storage prior to transfer off site.

A maximum quantity of 6,000 tonnes of digested cake may be stored on the northern pad if the liming plant is not in operation. If the liming plant is in operation, this figure is reduced to 5,000 tonnes.

Types of Waste Accepted

The site is permitted to accept the following waste types:

- EWC 19 02 06: sewage sludges from physico/chemical treatment
- EWC 19 08 05: sludge from the treatment of urban wastewater

The following additional waste type is requested under this permit variation:

- Digested dewatered cake (19 06 06)

4.2. Section 2: Point Source Emissions to Air, Water and Land

Point Source Emissions to Air

The existing air emission points retain their current monitoring requirements.

There are no new point source emissions to air associated with this variation application.

Please refer to Sections 8 and 11.1 for details of odour assessment and management.

Point Source Emissions to Water (other than sewers)

There are no point source emissions to water associated with the proposed activities.

Surface water from the sealed drainage system will be routed into the WwTW's flow to full treatment downstream of the storm overflow.

Point Source Emissions to Sewers, Effluent Treatment Plant or Other Transfers Off-site

The following emission point is representative of run off from the waste transfer and treatment activities subject to this variation:

- W14 – run-off from the imported waste transfer and liming cake bay.

The location of this emission discharge point is shown on the wastewater emissions point plan (Figure 1).

The proposed location to provide a representative sample for this emission is:

- S2 - Site drainage pump well (all installation drainage and discharges into it).

This sample point (shown on Figure 1) is considered to be adequate for monitoring the wastewater discharges returned to the WwTW since S2 picks up all discharges to the drainage system (including W14 – run-off from the imported digested cake pad).

There are no point source emissions to sewer or other transfers.

Point Source Emissions to Land

There are no point source emissions to land associated with the proposed activities.

4.3. Question 3a: Technical Standards

An updated Process Flow Diagram is provided as Figure 3. Please refer to Section 5 for a description of the operating techniques for the proposed activities.

Please refer to Section 10 of this report for the BAT assessment.

4.4. Question 3b: General Requirements

Please refer to Section 11 for the Environmental Risk Assessment and Management Plan. The assessment shows that the:

- risk of emissions of substances not controlled by emission limits is low; and
- risk of noise and vibration resulting from the changes is very low.

Please refer to Sections 8 and 11.1 for details of odour assessment and management.

4.5. Question 3c: Types and Amounts of Raw Materials

There will be no change to the raw materials associated with the waste activities currently permitted. There will be no new raw materials introduced with the activities under this permit variation.

The same lime product (calcium hydroxide) will be used for mixing with imported cake as for indigenous cake. The maximum storage volume of lime and annual usage tonnage will not increase (see Table 4.5.1).

Table 4.5.1: Types and Amounts of Raw Materials

Description	Raw Material	Maximum Amount	Annual Throughput	Use of Material
Physical treatment for the purpose of recycling	Lime (calcium hydroxide)	36m^3	1,260 tonnes	Mixed with imported digested cake to produce an biosolids for agricultural land spreading

4.6. Question 4a: Measures you use for Monitoring Emissions

The existing air emission points retain their current monitoring requirements.

There are no new point source emissions to air associated with this variation application.

There are fourteen wastewater emission points from the installation, as shown on Figure 1. The following emission point is representative of run off from the waste transfer and treatment activities subject to this variation:

- W14 – run-off from the imported cake transfer and liming pad.

The proposed location to provide representative samples of this emission is:

- S2 - Site drainage pump well (all installation drainage and discharges into it).

This sample point (shown on Figure 1) is considered to be adequate for monitoring the wastewater discharges returned to the WwTW since S2 picks up all discharges to the drainage system (including W14).

Monitoring of the wastewater emissions shall be undertaken at S2 in accordance with the sampling programme submitted to the EA in accordance with Permit Improvement Condition IC5a to characterise the wastewaters discharged to Blackburn WwTW.

4.7. Question 6a-b: Energy Efficiency

Energy consumption for the WwTW as a whole is monitored and tracked via the site environmental dashboard. Energy usage will be reported annually in accordance with Permit Table S4.3 Performance Parameters.

Periodic targets for energy improvements will be identified as part of the annual energy review, which identifies opportunities for improvement and sets out the site's energy management strategies and energy balance record.

4.8. Question 6d-e: Raw Materials and Waste

Powdered lime (calcium hydroxide) is mixed with digested cake to produce a biosolids product suitable for agricultural land spreading. Please refer to Table 4.5.1: Types and Amounts of Raw Materials above for raw material usage.

Only very small quantities of waste are generated associated with the activities subject to this permit variation. The only routine waste stream will be packaging associated with the delivery of powdered lime. Infrequent waste streams will arise from maintenance of the liming plant and equipment. These waste streams will be managed in accordance with standard UUW environmental procedures.

5. Application Form C6 Supporting Information

Form C6 'Point Source Emission to Water from an Installation' has been completed.

6. Application Form B4 Supporting Information

Application Form B4 has been completed to support the addition of a new waste operation to the installation permit.

6.1. Question 1a-c: Types of waste accepted

This variation application is to support the addition of the following waste activities to the installation permit, as also detailed in Table 3.1.1.

The total waste storage capacity associated with the waste activities (i.e. the maximum amount of waste in tonnes stored at any one time on the cake pad) is 6,000 tonnes.

Table 6.1.1- Waste operations which do not form part of an Installation

Name of the waste operation	Description of the waste operation	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies)	Non-hazardous waste treatment capacity (if this applies)
Blackburn sludge transfer hub	Temporary storage of imported digested WwTW cake	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	Not applicable	Not applicable
Blackburn sludge liming plant	Physical treatment for the purpose of recycling	R3: Recycling/ reclamation of organic substances which are not used as solvents	Not applicable	40,000 tonnes per year

The following additional waste type is requested under this permit variation.

Table 6.1.2- Types of waste accepted and restrictions

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

6.2. Question 2: Point source emissions to air, water and land

Please refer to Section 4.2 of this document for emission sources.

6.3. Question 3a-c: Operating techniques

Please refer to Section 4.3 of this document for Technical Standards.

Please refer to Section 4.4 of this document for General Requirements.

6.4. Question 4a-b: Monitoring

Please refer to Section 4.6 of this document for measures used for Monitoring Emissions.

7. Variation Technical Description and Operations

7.1. Pre-acceptance

Waste characterisation and pre-acceptance is provided for each imported waste stream. This is provided through completion of the "WwTW Sludge Waste Declaration Form". The Sludge Waste Declaration Form is completed by a representative of the WwTW production site or production area with knowledge and authority to provide this information (e.g. Process Controller, Technical Officer, Production Manager, or Area Production Manager).

The characterisation provided on the Sludge Waste Declaration Form is required in order for a technical assessment of the waste to be completed. This will determine an import's suitability for processing at Blackburn WwTW sludge treatment facility and, if deemed suitable, how this will be processed. The characterisation includes but is not limited to:

- Waste source details (i.e. WwTW name and location)
- Waste description
- EWC code (checked to confirm it is listed on the permit)
- Physical form and any physical contaminants
- Estimated volumes, frequency and annual quantities
- Details of any representative analysis or provision of a suitable sample to enable analysis.

The information on the Sludge Waste Declaration Form shall be reviewed if the waste changes, the process generating the waste changes or at least annually.

Following completion of the Sludge Waste Declaration Form, this information will be reviewed by an appropriate Technical Resource representing the sludge treatment site. This may be the Process Controller, Technical Officer, Production Manager or Production Engineer. The technical assessment shall:

- Confirm that the import is a permitted import for Blackburn WwTW sludge treatment facility.
- Consider all the details provided for the source import stream and identify if any further information or parameters are required.
- Technically assess the parameters detailed (including any analysis listed on the WwTW Sludge Waste Declaration Form) and assess these against any known restrictions, limits or processing requirements.

Not all parameters listed within the Sludge Waste Declaration Form may be appropriate for inclusion or needed for the technical assessment. The relevant parameters will be determined by the technical resource completing the assessment.

These factors will be considered in order to ensure the incoming waste can be treated effectively and give rise to no additional environmental risks or nuisance.

The Technical Assessment will confirm if the proposed import is suitable for acceptance and treatment at the sludge treatment facility. This will be recorded and the appropriate production sites (i.e. personnel at the import and export) shall be informed.

Where there are any changes following a pre-acceptance review, this will be noted and instructed to the relevant teams as required to ensure the required changes are implemented. The review is the Operator's technical assessment of the information provided by the Waste Producer and analysis that is available, in order to confirm suitability to accept.

The Technical Assessment will be recorded on the WwTW sludge treatment facility Technical Review Form.

In addition to the Sludge Waste Declaration Form, a pre-acceptance assessment form is maintained for each waste stream under the Biosolids Assurance Scheme (BAS) to fulfil the requirements relating to Animal By-Product material.

All pre-acceptance records for waste accepted at the site will be kept for a minimum of 3 years.

7.2. Waste Acceptance

The sludge treatment facility Production Manager is responsible for the approval of incoming waste with technical support provided by the Process Controllers, Production Engineer or Bioresources Technical Officer as required.

Imports comprise truck/ trailer imports of cake from other UUW treatment works. All imports will have undergone pre-acceptance characterisation and technical evaluation as detailed in Section 7.1 above.

Imported cake transported from other WwTWs by truck/trailer comprises digested, thickened sludge. Cake is off-loaded into segregated bays within the northern cake pad.

All incoming loads are pre-arranged via the UUW Sludge Production Planning team who will schedule the appropriate imports and the number of imports to the sludge treatment facility. The volume of imports will be managed in line with sludge processing capabilities and capacities and take account of site indigenous sludge volumes.

Sampling of cake imports on a day to day basis is not required as the material will have been characterised at pre-acceptance and, given its nature, is not subject to significant variation in composition. Where there are operational or technical reasons to carry out sampling, this will be undertaken either by individually (spot sampling) or combined (process sampling) for monitoring purposes.

Truck/trailered imports that are scheduled for acceptance are off-loaded and the following information is recorded:

- Date accepted
- Source-site details
- Intended acceptance route
- Load reference number (imported loads only)
- Quantity received
- Solids content (where probe fitted)

Imported loads will not be accepted if the load does not conform to the norm or if there are grounds for rejection as detailed in Section 7 of the Waste Characterisation and Acceptance Procedure (WwP/I/3006/05/04).

7.3. Waste Storage, Treatment and Processing

The storage, treatment and processing activities subject to this variation are described below. An updated Process Flow Diagram is provided as Figure 2.

7.4. Indigenous Cake Storage

Indigenous digested sludge arising from the permitted anaerobic digestion process is dewatered in the Press House and deposited onto the adjacent Press House Cake Bay (see Figure 1). Sludge is temporarily stored in this cake bay and will either be:

- transported off site as conventional sludge for land spreading; or
- treated with lime and transported off site as enhanced sludge for land spreading.

Indigenous cake will only be stored in this area and will not be mixed with imported sludge. A maximum volume of 1,000 tonnes will be stored in this cake bay. Indigenous cake would only be moved to the northern cake pad if there was a prolonged HACCP failure whereby special arrangements would be made to clean and prepare a segregated area.

The Press House Cake Bay is concrete surfaced with concrete retaining walls and is laid to a fall so that run off is captured by the site drainage system. Surface water drainage is returned to the WwTW flow to full treatment.

Photo 1 – Press House cake bay

7.5. Imported Cake Storage and Transfer

Digested cake from other UUW WwTWs will be imported and temporarily held in a designated bay on the northern cake pad before being transferred off-site.

A proportion of the imported cake may be treated with lime as described in Section 7.6.

A maximum quantity of 6,000 tonnes will be stored on the northern cake pad if the liming plant is not in operation. This will be reduced to 5,000 tonnes if the liming plant is operating.

Cake with different physical qualities will not be mixed, nor will biological (enhanced vs conventional or HACCP complaint vs non-compliant) on the pad. Cake with different qualities will be stored in different bays within the pad to avoid cross-contamination. This is a BAS requirement.

The cake pad is concrete surfaced and the bays will be segregated using concrete 'Legato' blocks. Cake will be stored in accordance with a Site-Specific Instruction (SSI) which details the bay arrangements. Further, all operators, delivery drivers will be inducted and informed about the storage locations prior to work commencing. The storage bays will be clearly signed.

7.6. Liming Process

A proportion of the imported digested cake will be treated with lime to produce an enhanced product for land spreading under the Biosolids Assurance Scheme (BAS).

The mobile liming plant mixes cake with powdered lime to achieve the required pathogen kill. Lime is stored in an enclosed 34 tonne silo for use in the treatment process. The silo operates on a volumetric distribution dial, with the resulting discharged lime having been calibrated prior to treatment commencing. The throughput of cake is calibrated by taking a known weight of cake and timing how long it takes to run through the plant in relation to the graduated settings on the speed dials.

The digested cake is fed in via a cake hopper that is loaded using a telehandler in a dedicated bucket. The lime is transferred by auger and mixes with the cake in the transfer screws that convey the cake into the mixing chamber, and it is then further incorporated by ploughshare paddles that are connecting to a rotating central lateral shaft which moves the combined product through the chamber, mixing it further as it passes through. The mixed cake and lime is then discharged by conveyor into a bay for mechanical windrowing.

The plant can process 20 tonnes of cake per hour. Up to 40,000 tonnes of cake can be processed per year.

Mixing with lime raises the pH to 12 which, when held for a period of two hours, achieves the required pathogens reduction. The process is controlled by a dedicated Hazard Analysis and Critical Control Points (HACCP) Plan with defined critical control points. Further information is provided in Section 7.7 Process Controls.

After completing the liming treatment in the Lime Treatment Plant, cake is stored in the Lime Treated Cake Bay. Processed cake is transferred to a stockpile on the cake pad via a conveyor. As the volume increases treated material is moved away from the conveyor drop zone and into storage with the telehandler using a clean bucket.

The bays are concrete surfaced and concrete 'A' frame panels separate lime treated cake from untreated cake. The fall on the pad is away from the treated cake, minimising the risk of run-off from the untreated storage area causing contamination.

The permit currently includes the liming of indigenous digested cake. Indigenous cake would only be moved to the northern cake pad if there was a prolonged HACCP failure whereby special arrangements would be made to clean and prepare a segregated area.

7.7. Process Controls

The digested cake liming process, as described in Section 7.6, is controlled by a dedicated Hazard Analysis and Critical Control Points (HACCP) Plan.

Under BAS, to qualify for Conventionally treated biosolids, the treatment process must be able to achieve at least a 2 $\log_{10}$ (i.e. 99%) reduction in *E. coli* numbers as per the HACCP Process Validation Procedure and, through routine sampling, a Maximum Allowable Concentration (MAC) of 100,000 *E. coli/*gram dry solids in the end product.

The liming plant can produce treated sludge to Enhanced standard by increasing the lime inclusion rate to 6%. To qualify for Enhanced treated biosolids, the treatment process must be able to achieve at least 6 $\log_{10}$ (i.e. 99.9999%) reduction in *E. coli* numbers as per the HACCP Process Validation Procedure (subject to 2.3j) and, through routine sampling, a Maximum Allowable Concentration (MAC) of 1,000 *E.coli/*gram dry solids in the end product and be free from *Salmonella* spp. on completion of the treatment process.

Mixing the cake with 6% by weight of lime raises the pH to 12 which virtually eliminates any remaining pathogens which may be present in the sludge when held for a period of two hours.

Enhanced cake will be stored separately in a clearly identified windrow, away from any conventional treated cake on the pad. The following control measures will be implemented:

- Different cake products (untreated/ treated) will be stored on the identified locations of the storage/ treatment area as per the site plan.
- For any changes in bay arrangement, before the start of liming operations, storage locations for different cake products will be identified and labelled. The site plan will be updated with any changes made and briefed to all the plant operators and delivery/ export drivers.
- Lime treated cake must only be stored in the “Treated Cake Storage” area.
- The calibration of the liming plant and pH meter will be tracked and arranged by the Liming Team and all certificates will be stored on the SharePoint.

The HACCP sets out critical control points (CCPs) and the process to be taken in the event of a breach of a CCP. In the case of a CCP Critical Limit Breach, the UUW Bioresource Agricultural Services and Regulatory Services will be informed immediately. The process will be stopped, and the cake quarantined. Non-compliant cake is to be labelled as such. Monitoring of the CCPs will continue until the process returns to operating within the Critical Limits.

The equipment associated with the lime treatment process is owned (or rented) and operated by a third-party operator on behalf of United Utilities.
The operation of the liming treatment process is the joint responsibility of UU Agriculture Services and the liming operator. Table 7.7.1 sets out the roles and responsibilities of the different parties involved.

Table 7.7.1 Roles and responsibilities of different parties

No	Task	Primary Responsibility
1	Process validation	Liming Operator/United Utilities
2	HACCP plan	Liming Operator/United Utilities
3	Treated cake transport	United Utilities
4	Lime mixing & associated record keeping	Liming Operator
5	CCP testing on liming operation + associated record keeping	Liming Operator
6	Any CCP breach	Liming Operator to escalate to Agricultural Services / site Operations
7	Calibration of the Critical Control Point (CCP) & associated record keeping Liming Operator	Liming Operator / United Utilities
8	MAC sampling, analysis & associated record keeping	United Utilities
9	Leading corrective actions in an event of Maximum Allowable Concentration (MAC) failure and associate record keeping.	United Utilities
10	Limed treated Biosolids recycling	United Utilities
11	Permit Compliance	United Utilities

7.8. Containment and Drainage

The cake bays are concrete surfaced with retaining walls constructed from inter-locking concrete 'Legato' blocks. Run off from the northern cake pad is directed via a central shallow drain into the main site drainage system at Emission Point W14.

All surface water drains within the permit boundary discharge into a pumping chamber which is returned to the head of the WwTW as part of the site's current containment strategy.

7.9. Storage of Hazardous Substances

A 40 KvA diesel generator is used to provide power to the lime mixing plant. The only hazardous substance associated with the permit variation activities is diesel used in the mobile generator. There is no increase in fuel storage from the currently permitted activities shown in Table 7.9.1.

Table 7.9.1: Hazardous Substances Risk Assessment

Hazardous Substance	Capable of Causing Pollution?	Maximum volume stored	Pollution Prevention Measures Assessment	Risk of Soil & Groundwater Contamination
Fuel oil – serving mobile generator for the liming process.	Yes	2,000 litres	Stored externally in a bunded fuel cell (cube) with isolation valves fitted.	Low

7.10. Monitoring and Maintenance

The site operates under an EMS manual detailing the Standard Operating Procedures (SOP's) and Site-Specific Instructions (SSI's) applicable to each process. These instructions have been designed to ensure safe and effective operation and to minimise known hazards from the installation and include procedures for maintenance, training and accident response.

The Production Manager will review the EMS for the installation and arrange the necessary updates to include the operations, inspection and maintenance of the plant. The Production Manager will also arrange staffing resources and training for operation, monitoring and maintenance of the plant.

All scheduled and reactive maintenance of the liming plant and equipment will be undertaken by the third-party operator on behalf of United Utilities.

The waste transfer and liming activities will be overseen by a Technical Officer from the Bioresources team. They will ensure that only personnel with relevant training and skill cards for the plant and equipment will be used.

Site inspection tours will be carried out weekly by the cake pad supervisor and monthly by the site's Environmental Regulatory Advisor (ERA). These tours will include housekeeping inspections focussing on the quantity and condition of the cake being stored, segregation, signage and odour levels.

7.11. Process Emissions and Monitoring

There are no point source emissions to air associated with the proposed activities.

Wastewater emissions will be generated in the form of surface water run off/ leachate from the open storage of cake on the concrete pad. Run off from the northern cake pad is directed via a central shallow drain and southern perimeter drain into a manhole on the main site drainage system at Emission Point W14, as shown on Figure 1. This emission point was previously identified in the permit application.

The proposed location to provide a representative sample for run off from the northern cake pad is:

- S2 - Site drainage pump well (all installation drainage and discharges into it).

This sample point (shown on Figure 1) is considered to be adequate for monitoring the wastewater discharges returned to the WwTW since S2 picks up all discharges to the drainage system (including W14).

Monitoring of the wastewater emissions shall be undertaken in accordance with the sampling programme to be agreed with the EA under Permit Improvement Condition IC 5a to characterise the wastewaters discharged to Blackburn WwTW.

8. Odour Management

An Odour Management Plan (OMP) is established for Blackburn WwTW and subject to regular review. The objective of the OMP is to provide guidance to all Operations and Maintenance staff regarding practices that will minimise the risk of odour emissions being discharged from the Blackburn site. The OMP has been updated to include the activities subject to this permit variation (see Appendix C).

Digested cake storage is considered to have a low odour potential. During the liming process fugitive releases of ammonia will occur giving rise to some localised odours. These are expected to dissipate quickly in the atmosphere and will not give rise to odour beyond the WwTW site boundary. However, the liming plant operator will ensure that odour neutralising spray equipment is permanently available so that it can be mobilised rapidly if odour levels are detected above background.

The WwTW is situated in an agricultural area. There are a number of isolated farms and residential properties, a brewery, a restaurant and a hotel within 1km of the installation boundary. The closest receptor is an agricultural building at Cowells Farm, Cuerdale Lane, 260m to the west north west.

The typical storage retention time in the cake storage areas is 5 days.

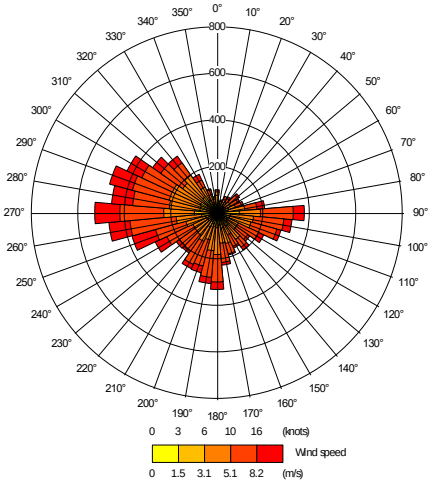
Odour monitoring and the procedure for response in the event of an odour complaint are documented in the OMP.

9. Bioaerosols Risk Assessment

Imported digestated cake will be stored in the open on the cake pad. Up to 6,000 tonnes of cake may be stored on the pad at any one time if the liming plant is not in operation. The cake pad and segregated bays are bounded by concrete walls. The cake piles will not exceed the height of the walls. The height of the cake at the walls would be up to 1.75m while the wall height is 2.4m. The water/wastewater industry understands that there is a low level risk of bioaerosol emissions associated with digested cake material.

The main pathway for bioaerosols transport is air movement and wind. Numerical Weather Prediction (NWP) meteorological data for the Blackburn WwTW shows the prevailing wind direction is from the west/ north west, and less frequently from the east and south west. Met office data records a spring baseline median windspeed of 3.84km at a height of 10m above local ground level.

Blackburn NWP meteorological data, 2019



Blackburn NWP meteorological data, 2020

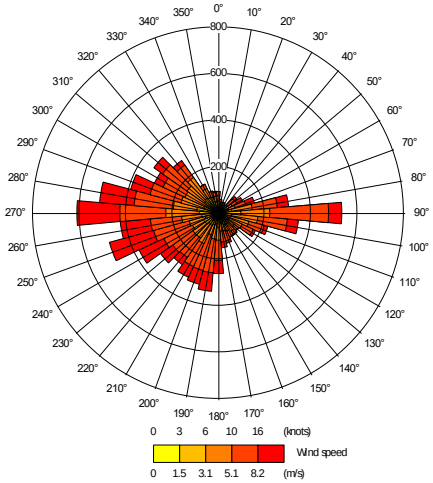


Figure 3: Wind Rose for Blackburn WwTW

Because of the dilution effect in the open air, bioaerosol concentrations fall away rapidly with distance from the source. It has been shown by research (RR786 - Bioaerosol emissions from waste composting and the potential for workers' exposure) that by 100 to 200m away, the bioaerosol concentration has mostly returned to background levels. By 50m and 100m distances downwind of the process, bioaerosol concentrations were substantially reduced by comparison to those level measurements at source. RR786 confirmed previous published studies which showed that at a distance of 250m from composting activity, in most cases, the bioaerosol concentrations will be reduced to background levels.

EA guidance indicates that sensitive receptors are considered to be people likely to be within 250 metres of the operational area (source of release) for prolonged or frequent periods. This term would therefore apply to dwellings (including any associated gardens) and to workplaces where workers would frequently be present. It does not apply to the operators of the facility as their health is covered by Health and Safety legislation.

Whilst bioaerosols monitoring does not form part of the IED permit conditions, the requirement has been reassessed based on screening distances from the cake pad to the closest receptor. A farmhouse and buildings are present approximately 260m to the east, however the farmyard is in closer proximity (approximately 240 - 250m) where it cannot be ruled out that a worker may be present for more than 6 hours at any one time. The location of the nearest sensitive receptor (NSR) is shown in Figure 4 below. This is the only sensitive receptor within 250m of the cake pad.

The topography of the intervening land between the cake pad and the farm is relatively flat with few natural barriers to the transportation of bioaerosols by the wind, although the farm is at a slightly higher elevation.

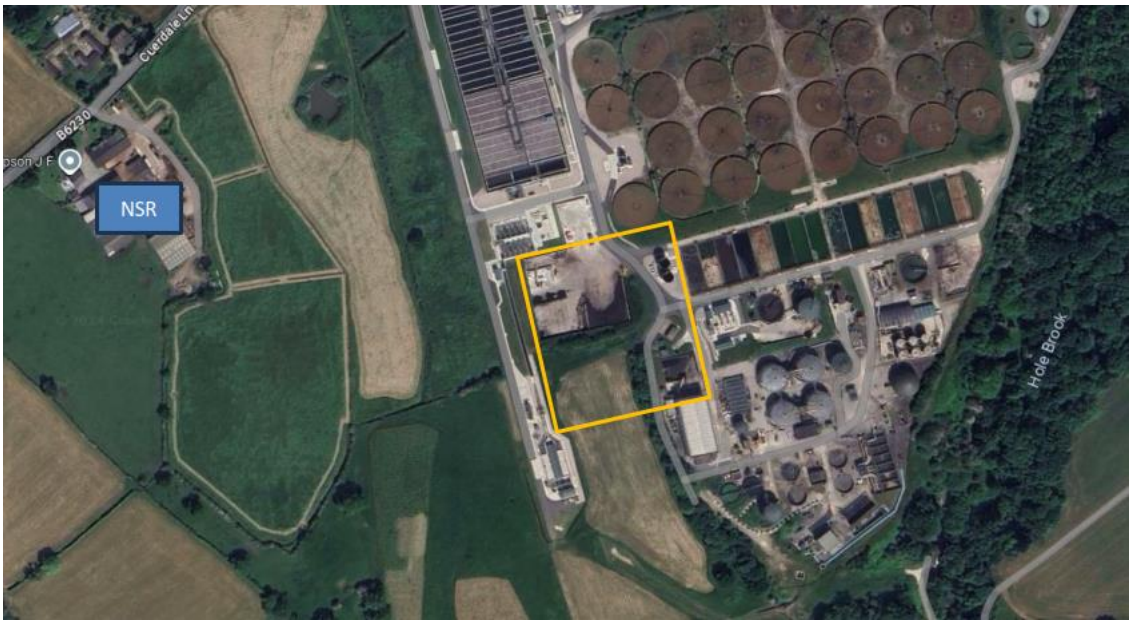


Figure 4: Location of the nearest sensitive receptor (NSR) to the cake pad

Given that the potential source is considered to represent a low magnitude risk of release, the screening provided by the cake pad walls and the intervening distance to the farmyard, it is considered that the risk of exposure to a worker at this property from bioaerosols emitted from the site is likely to be negligible. However, to confirm this UUW commissioned ambient bioaerosol monitoring.

The monitoring was undertaken by a contractor in accordance with EA Technical Guidance Note (Monitoring) M9: Regulatory Position Statement (RPS) 209 – Bioaerosol monitoring at regulated facilities on 1 April 2025. The monitoring locations are shown on Figure 5.

Samples were collected using the filter option of the guidance document M9. The upwind sample was taken further away from the centre of the operational area than recommended in the guidance. This was to ensure the sample represented a true upwind value. The downwind samples were placed closer to the operational area due to the site fencing and private property preventing access.

Meteorological conditions were recorded with a portable weather station positioned at a suitable location within the site boundary. The prevailing wind direction on the day of monitoring was from the east/ south east (i.e. towards the NSR).

On the day of sampling, it was noted that the cake pad was approximately 40% full and an excavator was observed moving cake and loading it into trucks to be taken off site.

Results for the downwind samples at all locations indicated results below the threshold reference value of 1,000 cfu/m^3 for mesophilic bacteria. Results for Aspergillus fumigatus (AF) were also below the threshold reference value of 500 cfu/m^3 at all locations.

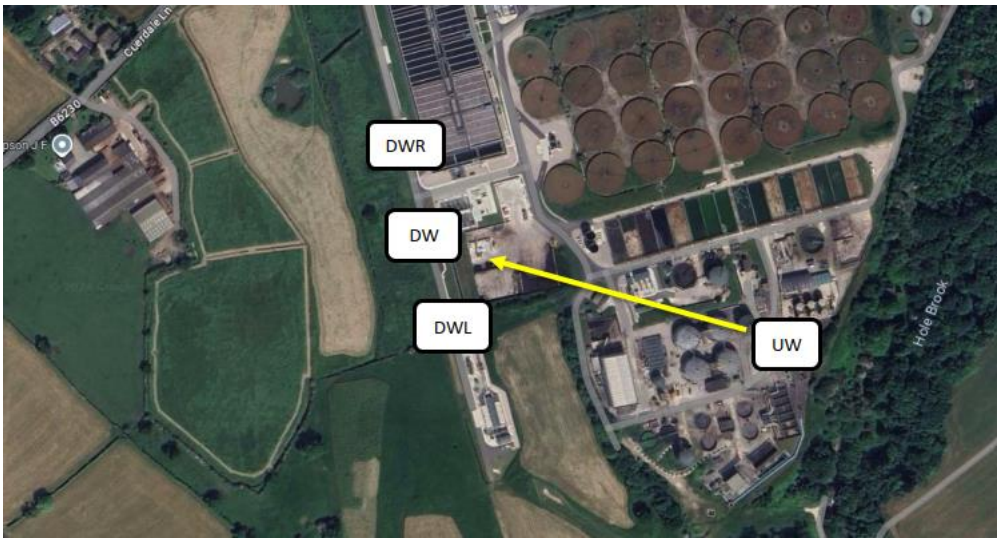


Figure 5: Location of upwind (UW) and downwind (DW) bioaerosol sampling locations

10. Application Form F1 Charges

The EA Permitting Team has advised that the following charges are applicable to this variation application:

- Normal variation charge – (Charging scheme 1.16.2.1) – 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 involving biological treatment - £6,992
- New activity charge – (Charging scheme 1.16.12) – Physical treatment of non-hazardous waste (relating to the storage of digested sludge) - £7,930
- Component charge: Habitats assessment (Charging scheme 1.19.2): £779
- Component charge: Emissions management plan – Bioaerosols Risk Assessment (Charging scheme 1.19.5): £1,241
- Component charge: Odour management plan (Charging scheme 1.19.6): £1,246

The total application fee has therefore been calculated as £18,188.

As an application fee of £4,196 has already been paid on 8th January 2025, the outstanding balance of £13,992 has been paid (refer to Form F1).

11. Appropriate Measures Assessment

As the variation application is to support the addition of a new waste operation to the installation permit, an assessment in relation to the non-hazardous and inert waste: appropriate measures for permitted facilities guidance has been undertaken and is presented in Table 11.1.1 below.

An Environmental Risk Assessment for the installation is contained in Section 11 of this document.

Table 11.1.1: Assessment against Appropriate Measures for Waste Storage & Treatment

Relevant Appropriate Measures (AM) reference:		Description
AM 2.1	Management System	*You must have an up-to-date written management system, and activities at your facility must follow it.* UUW operates the site under a fully certified ISO14001 management system. A copy of the ISO14001 certificate and a management systems summary is provided in Appendix B.
AM 2.2	Staff Competence	*Your facility must be operated at all times by an adequate number of staff with appropriate training, qualifications and competence. You must keep records of training, qualifications and relevant experience.* The waste transfer and liming activities will be overseen by a Technical Officer from the Bioresources team. They will plan the activities and decide which bay material to be deposited in. A UU operator or contractor will undertake and supervise the waste transfer loading/ off-loading activities. Liming of digested sludge will be undertaken by a 3rd party contractor. The Bioresources Technical Officer will ensure that only personnel with relevant training and skill cards for the plant and equipment will be used. Personnel conducting the waste transfer and liming activity will be provided with the contact details for the site ERA who can be contacted for advice. *If you operate a 24-hour process, you must have:* • *remote or telemetric systems to make sure an alarm would be raised in the event of an incident during unmanned hours* • *appropriate personnel on call to deal with these incidents* • *You must explain these procedures in your management system.* The liming process is not a 24-hour operation. *The design, installation and maintenance of infrastructure, plant and equipment must be carried out by competent people.* The key equipment subject to this variation application is the liming plant. The equipment is owned (or rented) and operated by a third-party operator on behalf of UU. The operation of the liming treatment process is the joint responsibility of UU Agriculture Services and the liming operator. Table 7.9.1 sets out the roles and responsibilities of the different parties involved.

Relevant Appropriate Measures (AM) reference:		Description
		You must have appropriately qualified managers for your waste activity who are members of a government approved technical competence scheme and who attend the facility as set out in our attendance guidance. Technically competent management is provided by UUW's Environmental Regulatory Advisers (ERAs). A copy of the relevant COTC certificate and the continuing competency certificate for the site's ERA are provided at Appendix A. *Staff carrying out waste acceptance checks, including sampling and analysis of waste, must be appropriately trained and competent* Waste acceptance checks are undertaken in accordance with Blackburn's Waste Characterisation and Acceptance Procedure SSI (WwP/I/3006/05/04). The Production Manager is responsible for the approval of incoming waste with technical support provided by the Process Controllers, Production Engineer or Technical Officer as required. Staff training needs and competencies are identified by role and through personal development plans. Annual audits on contractors are undertaken by the Bioresources Technical Officer. This includes personnel competencies and skill cards.
AM 2.3	Accident Management Plan	*As part of your written management system you must have a plan for dealing with any incidents or accidents that could result in pollution, including near misses. The accident management plan must identify and assess the risks the facility poses to human health and the environment.* An Accident Management Plan for the permitted activities (ref. WwP/I/3006/01/03) was submitted with the original permit application. This describes the requirements, procedures and actions to be taken in the event of an environmental accident at the Blackburn sludge treatment facility and supports and aligns with other key documents forming the management system. The site-specific Accident Management Plan is a live document that forms part of the site's Environmental Management System, which is regularly reviewed and updated. Any operational problem that cannot be dealt with by normal operational procedures is classed as an Incident and the UUW Incident Management Procedure and associated Standard Operating Procedure (WP/S/001/30/01 Incident Response) followed. All actions and communications are recorded using form WwP/F/001/31/08 Site Diary Log. *You must assess the risk of accidents and their possible consequences.* Refer to Section 12.4 of this Application Support document for an assessment of potential accident scenarios associated with the activities subject to this permit variation. H&S audits are conducted quarterly by the Bioresources team leader.

Relevant Appropriate Measures (AM) reference:		Description
AM 2.4	Contingency Plans and Procedures	*You must implement a contingency plan so that you:* • *comply with all of your permit conditions and operating procedures during maintenance or shutdown at your facility, including disruption at other facilities that would affect supplies to your facility or the removal of waste from it* • *do not exceed limits in your permit and continue to apply appropriate measures for storing and handling waste* • *stop accepting waste unless you have a clearly defined method of recovery or disposal and enough permitted capacity* The primary contingency arrangement would be the storage of material at other permitted UU transfer stations such as Halewood. Third party storage options would also be explored.
AM 2.5	Facility decommissioning	*You must consider the decommissioning of the facility at the design stage and make suitable plans to minimise risks during decommissioning.* Upon decommissioning of the waste transfer and treatment activity, all residual cake will be removed from site for land spreading or further treatment at another UUW facility. The cake pad area will be cleaned down using potable water with run off directed to the site drainage system for return to the WwTW, as per current arrangements. Any unused lime will be removed from site for re-use at another UUW facility or appropriately disposed of.
AM 3.1 & 3.2	Waste Pre-acceptance and Acceptance	*You must implement waste pre-acceptance procedures so that you know enough about a waste (including its composition) before it arrives at your facility. Your pre-acceptance procedures must follow a risk-based approach.* The waste received (digested sludge cake) is produced by the same operator (UUW) from other UUW WwTW works and thus the waste streams are well known and controlled. United Utilities Bioresources is responsible for the movement of all UUW sludges produced. The applicability of pre-acceptance and acceptance procedures are considered to be low risk in terms of process safety, occupational safety and environmental impacts. Blackburn's Waste Characterisation and Acceptance Procedure SSI details that each incoming waste stream will be subject to pre-acceptance checks and records will be retained in electronic format for a minimum of 3 years. One new waste codes EWC 19 06 06 for the import of digested dewatered cake is proposed under this variation.
AM 3.3	Quarantine	*Your facility must have a dedicated waste quarantine area or areas which you use to temporarily store waste being rejected, or non-conforming waste whilst it is being assessed.* In the case of a CCP Critical Limit Breach for lime treated cake, the UUW Bioresource Agricultural Services and Regulatory Services will be informed immediately. The process will be stopped, and the cake

Relevant Appropriate Measures (AM) reference:		Description
		quarantined. Non-compliant cake is to be stored in a segregated bay on the cake pad and labelled as such. Monitoring of the CCPs will continue until the process returns to operating within the Critical Limits.
AM 3.4	Waste Tracking	*You should use an electronic or equivalent system to hold up-to-date information about the available capacity of different parts of your facility, for example reception, quarantine, treatment and storage areas. Your system must hold all the information generated during: pre-acceptance, acceptance, non-conformance or rejection, storage, repackaging, treatment, removal off site.* United Utilities Bioresources monitors and tracks all movements of UUW sludges between wastewater treatment works. A proportion of the imported digested cake will be treated with lime to produce an enhanced product for land spreading under the Biosolids Assurance Scheme (BAS). Cake quality is controlled by a dedicated Hazard Analysis and Critical Control Points (HACCP) Plan, as described in Section 7.7. Treated cake is removed off site for agricultural land spreading. The movement of cake is coordinated regionally. A list of potential outlets is maintained and includes suitably regulated storage, enhanced treatment (e.g. lime treatment to increase the scope of onward recovery options); recovery (deposit) and, as a contingency only, disposal facilities (e.g. permitted landfill sites). The availability of potential outlets is constantly reviewed in line with legislative developments and local market changes (e.g. closure of an outlet site).
AM 4.0	Waste Storage	*You must have waste storage and handling procedures. You must store and handle waste in a way that makes sure you prevent and minimise pollution risks by using appropriate measures.* The waste transfer and lime treatment process will be undertaken in accordance with a Site-Specific Instruction (SSI) which details the arrangement for waste receipt, handling, storage, treatment, cleaning, sampling and dispatch from site. *You must store waste in locations that minimise the unnecessary handling of waste.* The cake pad is located in the northern section of the Blackburn WwTW with good access from the main internal roadway for vehicles to deposit imported cake and remove stored/ treated cake. Cake is unloaded and loaded from vehicles using a telehandler. A dedicated bucket is utilised for the movement of lime treated cake. There is adequate space on the cake pad for segregation and storage of the proposed quantities. *Waste handling must be carried out by competent staff using appropriate equipment.* Refer to AM 2.2.

Relevant Appropriate Measures (AM) reference:		Description
		Where possible, you should locate storage areas away from watercourses and sensitive perimeters. You must store all waste within the security protected area of your facility to prevent unauthorised access and vandalism. The activities will take place on the existing (and permitted) infrastructure within the existing permit boundary. No extension to the permit boundary is required. *You must clearly document in your management system the maximum storage capacity of your facility and its designated storage areas. You must regularly monitor the quantity of stored waste against the allowed maximum capacities, and not exceed them.* Relevant management system documents will be updated to reflect the revised permit limits in terms of storage capacity and throughput. *You should clearly mark all waste storage areas and provide signs indicating the type of waste stored there.* Cake will be stored in accordance with a Site-Specific Instruction (SSI) which details the bay arrangements. Further, all operators, delivery drivers will be inducted and informed about the storage locations prior to work commencing. The storage bays will be clearly signed. *You must thoroughly clean storage bays and containers on a regular basis to prevent the build-up of aging waste, which will be a source of odour and attract vermin.* A pressure washer is available to clean down the cake pad and concrete block walls. *You must inspect storage areas, containers and infrastructure regularly to make sure there is no loss of containment*. Site inspection tours will carried out weekly by the cake pad supervisor and monthly by the site's Environmental Regulatory Advisor (ERA). These tours will include housekeeping inspections focussing on the quantity and condition of the cake being stored, segregation, signage and odour levels.
AM 4.1	Waste Segregation	*You should keep different types of waste segregated if contamination would inhibit the recovery of the waste.* The cake pad will be segregated into clearly demarked bays by concrete A frame panels and 'Lego' blocks. Lime treated cake is segregated from untreated cake. The fall on the pad is away from the treated cake, minimising the risk of run-off from the untreated storage area causing contamination. Cake with different physical qualities will not be mixed, nor will biological (enhanced vs conventional or HACCP complaint vs non-compliant) on the pad. Cake with different qualities will be stored in different bays within the pad to avoid cross-contamination. This is a BAS requirement.

Relevant Appropriate Measures (AM) reference:		Description
AM 5	Waste Treatment	*You must fully understand, monitor and optimise your waste treatment process to make sure that you treat waste effectively and efficiently. The treated output material must meet your expectations and be suitable for its intended disposal or recovery route.* Lime treatment is undertaken in accordance with the Biosolids Assurance Scheme (BAS) standard for the application of biosolids to agricultural land. The digested cake liming process, as described in Section 7.6, is controlled by a dedicated Hazard Analysis and Critical Control Points (HACCP) Plan. The liming plant can produce treated sludge to Enhanced standard by using a lime inclusion rate of 6%. *You must have accurate and up-to-date written details of your treatment activities* The lime treatment process will be undertaken in accordance with a Site-Specific Instruction (SSI) which details the liming equipment, lime dosing rates, handling requirements, cleaning protocols and treated cake storage and sampling arrangements. A process flow diagram is included in Figure 2.
AM 6.1	Enclosure within Buildings	*Enclosing activities within buildings can be an appropriate measure for preventing and minimising emissions of pollution, given that an appropriately designed building will reduce a range of types of pollutants, in particular, noise, dust and odour. A partially enclosed building may be an appropriate measure on its own, or together with other appropriate measures, depending on the site-specific circumstances.* *If your waste treatment activities are likely to cause (or are causing) significant pollution at sensitive receptors which cannot be addressed by alternative measures, then you must carry out that waste treatment activity within an enclosed building.* The open storage and lime treatment of indigenous digested cake is already a permitted activity at the Blackburn sludge treatment facility. This variation application seeks to extend this activity to imported digested cake. The cake pad for the waste transfer and treatment activity is within the current permit boundary and is already utilised for indigenous cake storage. UUW understand that there is currently no Environment Agency requirement to cover digested cake storage areas, as per the recent review of sludge treatment activities under the IED implementation. However, options for temporary covering of cake using tarpaulin roofing is being considered to keep it dry and minimise run off.
AM 6.2	Point Source Emissions to Air	There are no channelled emissions to air i.e. point source emissions from the proposed activities subject to this permit variation.

Relevant Appropriate Measures (AM) reference:		Description
AM 6.3	Fugitive Emissions to Air	*You must use appropriate measures to prevent and minimise fugitive emissions to air, including dust, mud and litter, odour and noise and vibration.* The potential for dust emissions is relatively low as the cake typically has a dry solids content of around 25%. The walls of the cake bays provide shelter from the wind and stockpiles will not exceed the height of the walls. In very dry conditions where it is assessed that there is a risk of dust generation, equipment for damping down with water will be available. The potential for dust emissions from powdered lime are minimised by off loading directly into the storage silo and the use of enclosed equipment (mixing chamber and transfer auger). The site operates an Odour Management Plan (OMP). The OMP is a 'live' document and is reviewed annually or in response to a change in site activities. Accordingly, the OMP has been updated to reflect the changes subject to this permit variation application. Digested cake is stored in the open. Digested cake storage is considered to have a low odour potential. During the liming process fugitive releases of ammonia will occur giving rise to some localised odours. These are expected to dissipate quickly in the atmosphere and will not give rise to odour beyond the WwTW site boundary. The storage time will be minimised and is typically 5 days. Odour neutralising spray equipment is permanently available so that it can be mobilised rapidly in the event of odour levels are detected above background. The facility does not currently operate a formal noise and vibration management plan. The permitted activity is not inherently noisy and there is no history of noise complaints at the site. The liming equipment is already in operation for the treatment of indigenous digestate cake.
AM 6.4	Point Source Emissions to water (including sewer)	*You must identify the main chemical constituents of your facility's point source emissions to water and sewer as part of your inventory of emissions.* *You must assess the fate and impact of the substances emitted to water and sewer following the Environment Agency's risk assessment guidance.* There are no direct emissions to water from the sludge treatment activities. Run off of surface water/ leachate from the cake pad is directed to the site surface water drainage system. Run off from the cake pad is directed via a central shallow drain and southern perimeter drain into a manhole on the main site drainage system at Emission Point W14, as shown on Figure 1. This emission point was previously identified in the permit application.

Relevant Appropriate Measures (AM) reference:		Description
		The wastewater is returned to the WwTW for full treatment, before being discharged (indirectly) via the WwTW final effluent into the River Darwen via Hole Brook following biological treatment. The proposed location to provide a representative sample for the wastewater emissions from the cake pad is: • S2 - Site drainage pump well (all installation drainage and discharges into it). This sample point (already permitted) is considered to be adequate for monitoring the wastewater discharges returned to the WwTW since S2 picks up all discharges to the drainage system (including W14). Monitoring of the wastewater emissions shall be undertaken at S2 in accordance with the sampling programme to be agreed with the EA under Permit Improvement Condition IC 5a to characterise the wastewaters discharged to Blackburn WwTW.
AM 6.5	Fugitive Emissions to Land and Water	*You must use appropriate measures to control potential fugitive emissions and make sure that they do not cause pollution. You must design appropriate surfacing and containment or drainage facilities for all operational areas.* ***Drainage*** *Your drainage infrastructure must: prevent incompatible wastes coming into contact with each other and make sure that fire cannot spread.* Whilst it is important to separate the cake for traceability and quality purposes, there is no risk of chemical or physical incompatibility creating a safety hazard. Sewage cake presents a low combustion risk. *You must store and treat all waste on an impermeable surface with contained drainage that meets CIRIA 736 or an equivalent approved standard. The impermeable surfaces must have sealed construction joints. These requirements do not apply in designated areas where the waste being stored or handled does not pose any significant risk of contaminating surface water or ground water.* The cake pad is entirely concrete surfaced. The integrity of the concrete is monitored through regular visual inspection and any damage or loss of integrity reported via the AIRLINE reporting system and added to the risk register. Uncontaminated surface water run-off is not segregated; it is returned to the WwTW flow to full biological treatment. This forms part of the current containment strategy for the site. The cake pad is graded and provided with surface water channels that direct run off to the site's main surface water drainage system. ***Containment*** • *You must provide bunds for all tanks containing liquids (whether waste or otherwise) that could be harmful to the environment if*

Relevant Appropriate Measures (AM) reference:		Description
		spilled. Bunds must meet CIRIA 736 or an equivalent approved standard. • *All above-ground tanks must be kept on an impermeable surface with contained drainage that meets CIRIA 736 or an equivalent approved standard.* • *You must provide secondary containment that meets CIRIA 736, or an equivalent approved standard, for all drums and other mobile containers which: are greater than 200 litres in capacity and are kept outside and/or contain liquids (waste or otherwise) that could be harmful to the environment if spilled.* There is no bulk storage of liquids or chemicals associated with the waste transfer/ treatment activities. Lime is stored in powdered form in an enclosed storage silo. *You must comply with the oil storage regulations.* 2,000 litres of fuel for the mobile generator supporting the liming equipment is stored externally in a bunded fuel cell (cube) with isolation valves fitted. *You must have a documented inspection and maintenance programme for impermeable surfaces and containment facilities and keep records to demonstrate its implementation.* The integrity of the concrete is monitored through regular visual inspection and any damage or loss of integrity reported via the AIRLINE reporting system and added to the risk register. The site ERA conducts monthly inspections of the cake pad area. ***Buffer Storage Capacity*** *You must provide appropriate buffer storage capacity at your facility to store waste waters.* The only wastewater generated from the waste transfer/ treatment activities is leachate/ contaminated surface water run off which is discharge into the site's surface water drainage system via local catchment drains along the perimeter of the cake pad. Buffer storage of wastewater is not required. ***Washing & Cleaning*** *You must take appropriate measures to prevent emissions from washing and cleaning activities, including:* • *containing and directing spray, liquid effluent and wash-waters to foul sewer or collecting them in a sealed system for offsite disposal – you must not discharge them to surface or storm drains* • *where possible, using biodegradable and noncorrosive washing and cleaning products* • *storing all detergents, emulsifiers and other cleaning agents in suitable bunded or containment facilities, within a locked*

Relevant Appropriate Measures (AM) reference:		Description
		storage area, or in a building away from any surface water drains • *preparing cleaning or disinfection solutions in contained areas of the site and never in areas that drain to the surface water system or groundwater* A pressure washer is available to clean down the cake pad and concrete block walls as required. Only potable water will be used. There is no requirement to use any cleaning chemicals. Wash water will be directed into the catchment drains on the cake pad and into the main site surface water drainage system for return to the WwTW for full biological treatment. ***Spillages*** • *You must produce and implement a spillage response plan and train staff to follow it and test it. You must make sure your spillage response plan includes information about how to recover, handle and correctly dispose of waste produced from a spillage.* • *You must stop spillages from entering drains, channels, gullies, watercourses and unmade ground.* • *You must keep spill kits at locations close to areas where a spillage could occur and make sure relevant staff know how to use them.* The powdered lime is delivered in bulk and transferred into an enclosed storage silo. Should any spills occur, the lime will be promptly swept/ shovelled up for reuse. Regular inspections of the liming operation will be undertaken by site staff. The site operates an Emergency and Spill Response Procedure and operational staff are trained in its implementation.
AM 6.6	Pests	*You must manage waste in a way that prevents pests. If you expect pests will cause pollution, hazard or annoyance at sensitive receptors you must create, use and regularly review a pest management plan.* An external Contractor (Rentokill) is contracted to monitor the site for pest activity. There are no sensitive receptors in close proximity to the site and a Pest Management Plan is not required for the permitted sludge treatment facility.
AM 7.1	Emissions to Air	There are no point source emissions to air associated with this variation application. *You must monitor fugitive emissions of dust and particulates if they are likely to cause pollution at sensitive receptors, or if this has been substantiated.* Please refer to AM6.3. The risk of dust emissions is considered to be low and dust monitoring is not proposed.

Relevant Appropriate Measures (AM) reference:		Description
AM 7.2	Medium Combustion Plant Directive	The Medium Combustion Plant requirements are not relevant to this application. One 40 KvA mobile diesel generator is used to provide power to the lime mixing plant. The operation of this generator was included in the original permit application.
AM 7.3	Emissions to Water and Sewer	*Your facility's emissions inventory must include information about the relevant characteristics of point source emissions to water or sewer.* *For relevant emissions to water or sewer identified by the emissions inventory, you must monitor key process parameters (for example, waste water flow, pH, temperature, conductivity or BOD) at appropriate locations.* Run off from the cake pad was included in the original permit application as Emission Point W14. As per AM6.4, monitoring of the wastewater emissions shall be undertaken at S2 in accordance with the sampling programme to be agreed with the EA under Permit Improvement Condition IC 5a to characterise the wastewaters discharged to Blackburn WwTW.
AM 8	Process Efficiency	*For your installations facility, you must monitor and review the annual quantity of: water, energy and raw materials used, residues and waste water produced.* Energy consumption for the WwTW as a whole is monitored and tracked via the site environmental dashboard. As part of the permit requirements, UUW will report annual energy consumption and raw material usage to the EA and will conduct periodic reviews to consider where future energy and raw material savings can be delivered. The only raw material usage is in the lime treatment process. Lime is mixed in accordance with the ratios required to meet BAS. The silo operates on a volumetric distribution dial, with the resulting discharged lime having been calibrated prior to treatment commencing. In this way, the excessive addition of lime is prevented. Calibration of the liming plant and pH meter will be tracked and arranged by the Liming Team. There is no requirement for water addition to the lime treatment process. Potable water will be used for cleaning and damping down, as required. All wastewater streams are recirculated back to the head of the works for full biological treatment.
AM 9	Waste minimisation, recovery and disposal	*You must have and implement a residues management plan that:* *minimises the generation of residues, that is solid waste arising from the treatment of waste* *optimises the reuse, regeneration, recycling or energy recovery of residues, including packaging*

Relevant Appropriate Measures (AM) reference:		Description
		makes sure you properly dispose of residues where recovery is technically or economically impractical A Residues Management Plan (WwP/I/3006/25/24) is maintained for the Blackburn sludge treatment facility and was submitted with the original permit application. This document forms part of the company's Environmental Management System and is reviewed and updated periodically. All cake biosolids are spread to agricultural land for beneficial benefit. Leachate/ surface water run-off is discharged into the site drainage system which is returned to the WwTW flow for full biological treatment. This is a circular process. Powdered lime is supplied in bulk and pumped directly into the storage silo. Packaging is not routinely generated as a result of the activities subject to this variation application.

12. Environmental Risk Assessment and Management Plan

12.1. Odour Risk Assessment

Regular inspections of the facility for fugitive emissions will be undertaken by site staff.

Table 12.1.1: Odour Risk Assessment

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**Overall Risk***
Fugitive emissions from digested cake storage	Local residents: the closest receptor is an agricultural building at Cowells Farm, Cuerdale Lane, 260m to the west north west of the northern cake pad.	Air	The cake is stored temporarily on a cake pad. This is inspected and monitored regularly by staff.	Very Low	Localised odour annoyance	Not significant
Fugitive emissions from cake liming		Air	Mixing digested cake with lime in an open hopper.	Low to Moderate	Localised odour annoyance	Not significant

12.2. Fugitive Emissions Risk Assessment

Regular inspections of the facility for fugitive emissions will be undertaken by site staff.

Table 12.2.1: Fugitive Emissions Risk Assessment

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Open storage of digestate cake generating bioaerosols	A farmhouse and buildings are present approximately 260m to the east, however the farmyard is in closer proximity (approximately 240 - 250m) where it cannot be ruled out that a worker may be present for more than 6 hours at any one time.	Air	The water/wastewater industry understands that there is a low level of risk of bioaerosols from this material. The cake pad and segregated bays are bounded by concrete walls. The cake piles will not exceed the height of the walls. The height of the cake at the walls would be up to 1.75m while the wall height is 2.4m. The walls will provide some screening from wind dispersion.	Low	Potential impacts upon human health	Not Significant

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Dust from stockpiles of cake	Local residents: the closest receptor is an agricultural building at Cowells Farm, Cuerdale Lane, 260m to the west north west of the northern cake pad.	Wind-blown dust	The cake is inherently a moist substance and will not be stored for long periods. The walls of the cake bays provide shelter from the wind and stockpiles will not exceed the height of the walls. In very dry conditions where it is assessed that there is a risk of dust generation, equipment for damping down with water will be available.	Very low as long as the risk management measure is adhered to.	Complaints from local residents.	Very low
Dust arising from the handling of powdered lime	Local residents: the closest receptor is an agricultural building at Cowells Farm, Cuerdale Lane, 260m to the west north west of the northern cake pad.	Wind-blown dust	The potential for dust emissions from powdered lime are minimised by off loading directly into the storage silo and the use of enclosed equipment (mixing chamber and transfer auger).	Very low as long as the risk management measure is adhered to.	Complaints from local residents.	Very low
Run-off from stockpiles of cake	Surrounding drainage	Surface water drainage	The cake is stored on concrete surfaced areas in concreted walled bays. Run off is directed into the site drainage system. All drainage leads to the surface water drainage sump from where it is pumped to the WwTW to receive full biological treatment.	Very low	Pollution of surface water and/or groundwater	Very low

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Vermin and birds	Local residents and on-site workers	Airborne transportation and potential contact (Weil's disease)	Appropriate measures include setting traps and other measures to prevent and minimise nuisance from scavenging birds and animals if necessary. An external Contractor (Rentokill) is contracted to monitor the site.	Low	Harm to human health	Low
Waste and/or mud on local roads	Road users outside of Blackburn WwTW	Vehicles transporting sludge and cake to and from site	Appropriate measures include clearing waste and mud arising from the activities from affected areas outside the site.	Very low	Complaints from users of the public highway. Accidents	Very low
Leaks/spillages from treatment process and plant	Surface waters	Surface run off and entry into drainage system	There is no above or below ground pipework associated with the activities subject to this variation application. All cake handling plant and equipment is above ground and any defects resulting in spillage will be evident through regular operator visual inspection. All storage and treatment areas are concrete surfaced.	Low	Contamination of surface waters	Very low

12.3. Noise and Vibration Risk Assessment

Table 12.3.1: Noise and Vibration Risk Assessment

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Vehicle movements associated with the delivery of sludge and removal of cake.	Local residents: the closest receptor is an agricultural building at Cowells Farm, Cuerdale Lane, 260m to the west north west of the northern cake pad.	Air	Appropriate measures taken to ensure levels of noise and vibration likely to cause annoyance outside the site are prevented or minimised.	Very low, likely to be unnoticeable.	Complaints if noise excessive	Very low
Treatment process and associated activities including machinery noise	Local residents: the closest receptor is an agricultural building at Cowells Farm, Cuerdale Lane, 260m to the west north west of the northern cake pad.	Air	The lime treatment process is not inherently noisy.	Very low, likely to be unnoticeable	Complaints if noise excessive	Very low

12.4. Accidents

Table 12.4.1: Accidents

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**Overall Risk**
Spillage of cake	Ground / Groundwater / surface water	Runoff through site surface Runoff into site drainage	The site transfer roadways and cake bays are hard surfaced. All surface water drainage at the site is returned to the WwTW for treatment. Clayey glacial till is present at thicknesses exceeding 22.5m beneath the site and the risk to controlled waters from a sludge spillage at Blackburn is considered to be insignificant.	Very low	Pollution of the environment, harm to human health	Very low
Accidental fire causing the release of polluting material to air (smoke or fumes) water or land.	Local human population and local environment.	Air transport of smoke. Contaminated firewater by direct run-off from site and via surface water drains.	Sewage cake presents a low combustion risk.	Very low	Pollution of the environment, harm to human health	Very low
Spillage of lime	Ground / Groundwater / surface water	Runoff through site surface	The powdered lime is delivered in bulk and transferred into an enclosed storage silo.	Very low	Contamination of soils, ground and surface waters	Not significant

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**Overall Risk**
		Runoff into site drainage	Should any spills occur, the lime will be promptly swept/ shovelled up for reuse. Regular inspections of the liming operation will be undertaken by site staff.			
Flood	Ground / Groundwater / surface water	Ground	Regular inspections of the facility will be undertaken by site staff. Weather is monitored and appropriate actions will be undertaken in accordance with the Site Operational Procedures.	Low	Permitted waste types are non-hazardous so any waste washed off site will add to the volume of the local post-flood clean-up workload, rather than the hazard.	Not significant

12.5. Designated/Protected Sites

Table 12.5.1: Designated/Protected Sites

Table 12.5.1 details the location of designated/protected sites within the conservation screening report provided by the Environment Agency dated 26 January 2021.

Site Type	Site Name	Distance from Installation	At Risk from Activities?
European Habitats Sites	Marine Conservation Zone (MCZ) Ripple Estuary	10 km	No – see Table 9.5.2
SSSIs	Beeston Brook Pasture and Darwen River Section	Within 500 metres	As above
Ramsar	NA	-	-
Local Nature Sites	NA	-	-
Local Wildlife Sites	• Wild Bottom's Wood • Coppice Farm Pasture • Crook Hey Wood • Heatley Wood • Knight's Farm • Darwen River Section Woods (Including Sharples Wood and Kiln Wood) • Mason's Wood • Knipe Wood • Hermitage Meadows • Huntley Wood • Goose House Wood • Bezza Brook Woods • River Ribble from London Road Bridge Preston, in West, to County Boundary, in East • Brewery Wood • Preston New Road A59T • Brockholes Quarry • Wood by St. Mary's Church, Samlesbury Wood	2 km	As above

Site Type	Site Name	Distance from Installation	At Risk from Activities?
	• Seed Park • Bezza Lane • Spring Wood • Beeston Wood • Beeston • Brook Fields • Carr Wood • Paradise Wood and Fleetwood Hall Wood • Roach Bridge Woods • Roach Road Wood • Cuerdale and Walmsley Fold Woods		
Ancient Woodland	• Cuerdale Wood East • Samlesbury Wood • Seed Park • Spring Wood • Goose House Wood • Riverside Wood • Smith Fold Wood • Carr Wood • Beeston Wood • Jeffery Wood • Heatley Wood	2km	As above
Air Quality Designation	NA	-	-

Table 12.5.2: Risk from onsite activities

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Treatment process and associated activities	Beeston Brook Pasture and Darwen River Section is a SSSI within 500m of the site. Protected species - European eel anguilla migratory route	Water	The site drainage is sent to the head of the works for full biological treatment.	Low	Damage to vegetation and potential toxicity to animal species (European eel Anguilla and migration)	Not significant

Figure 1: Wastewater Emissions Points Plans

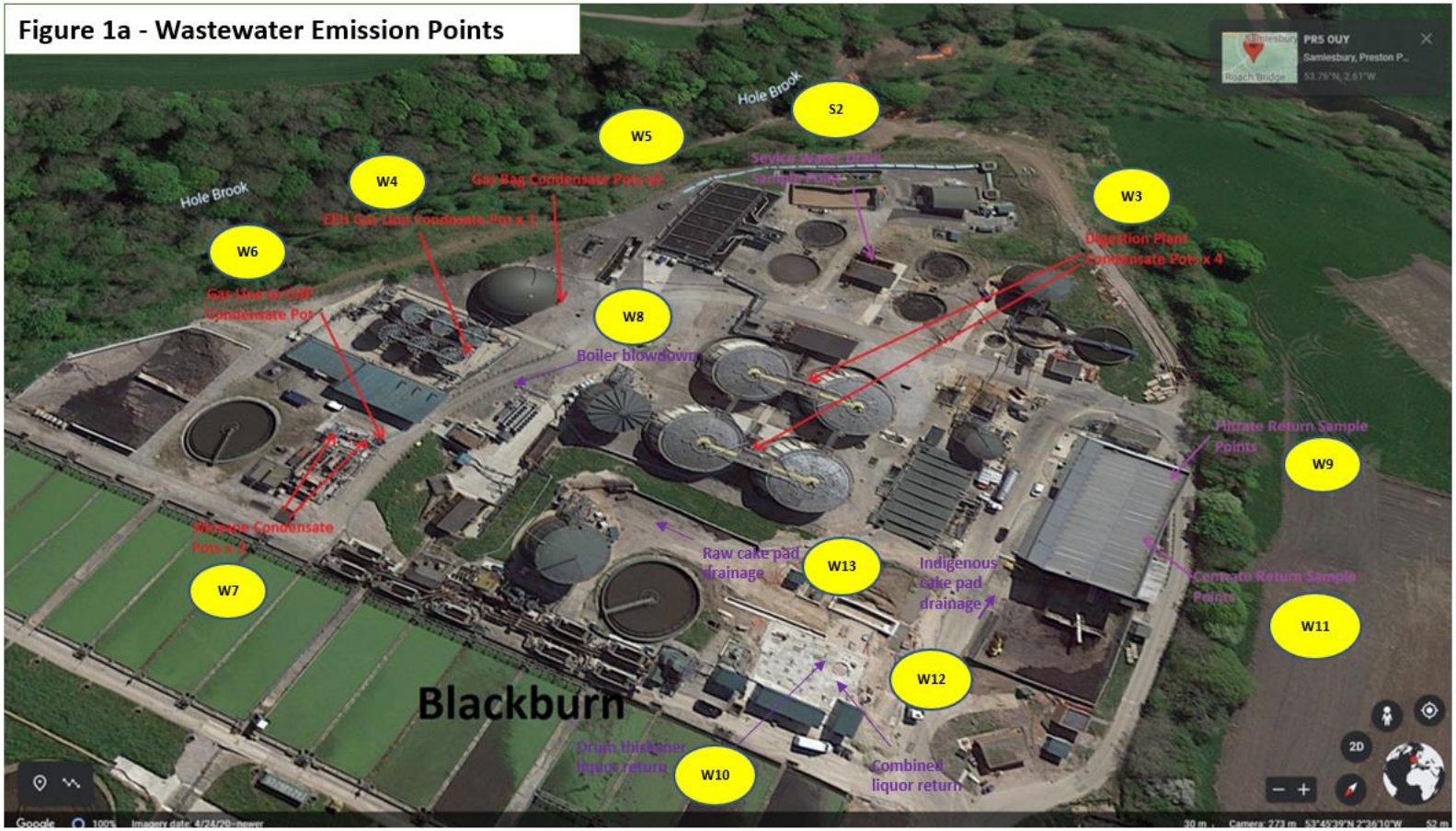


Figure 1b - Wastewater Emission Points

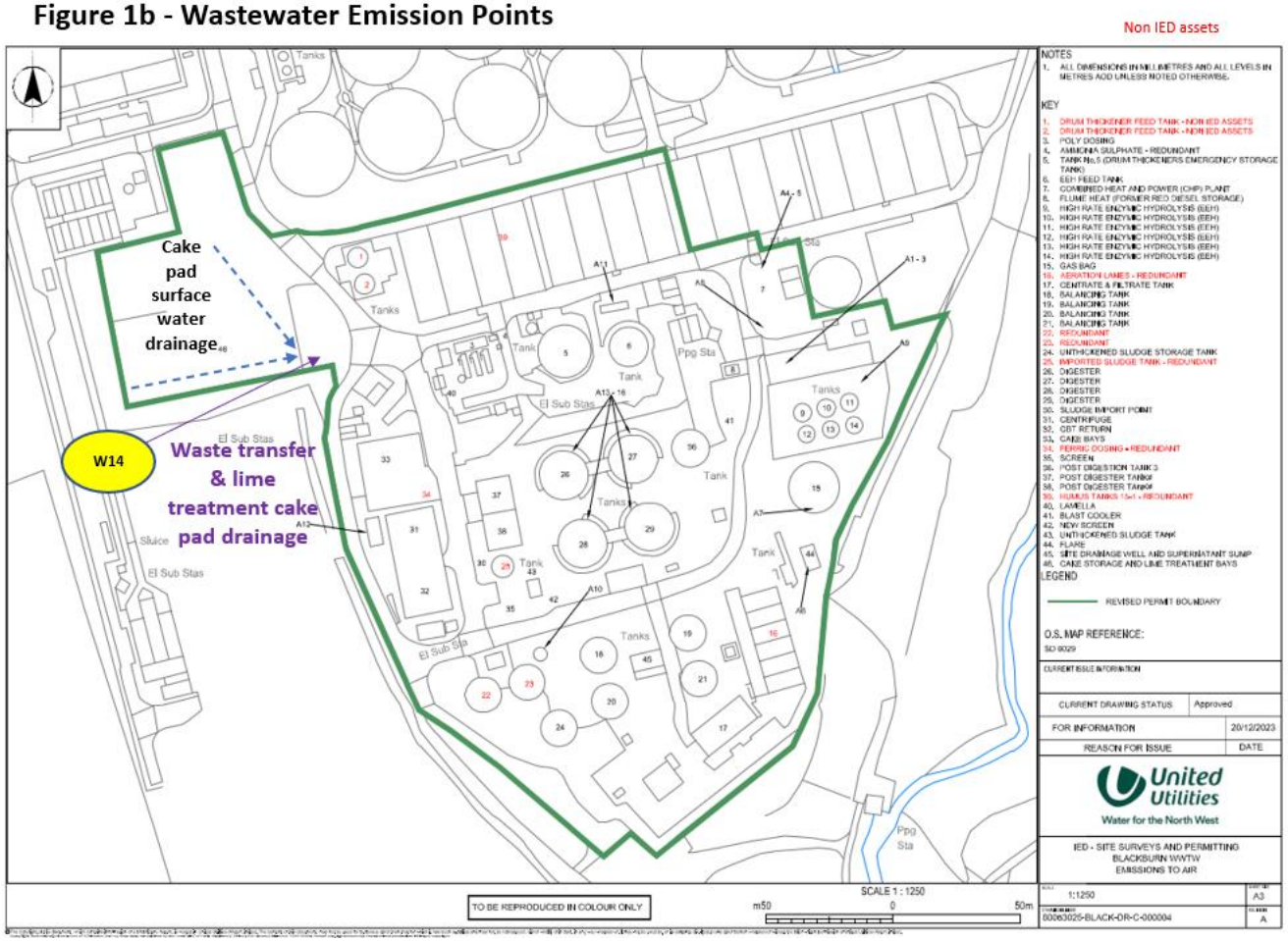


Figure 1c - Wastewater Emissions Representative Sampling Locations

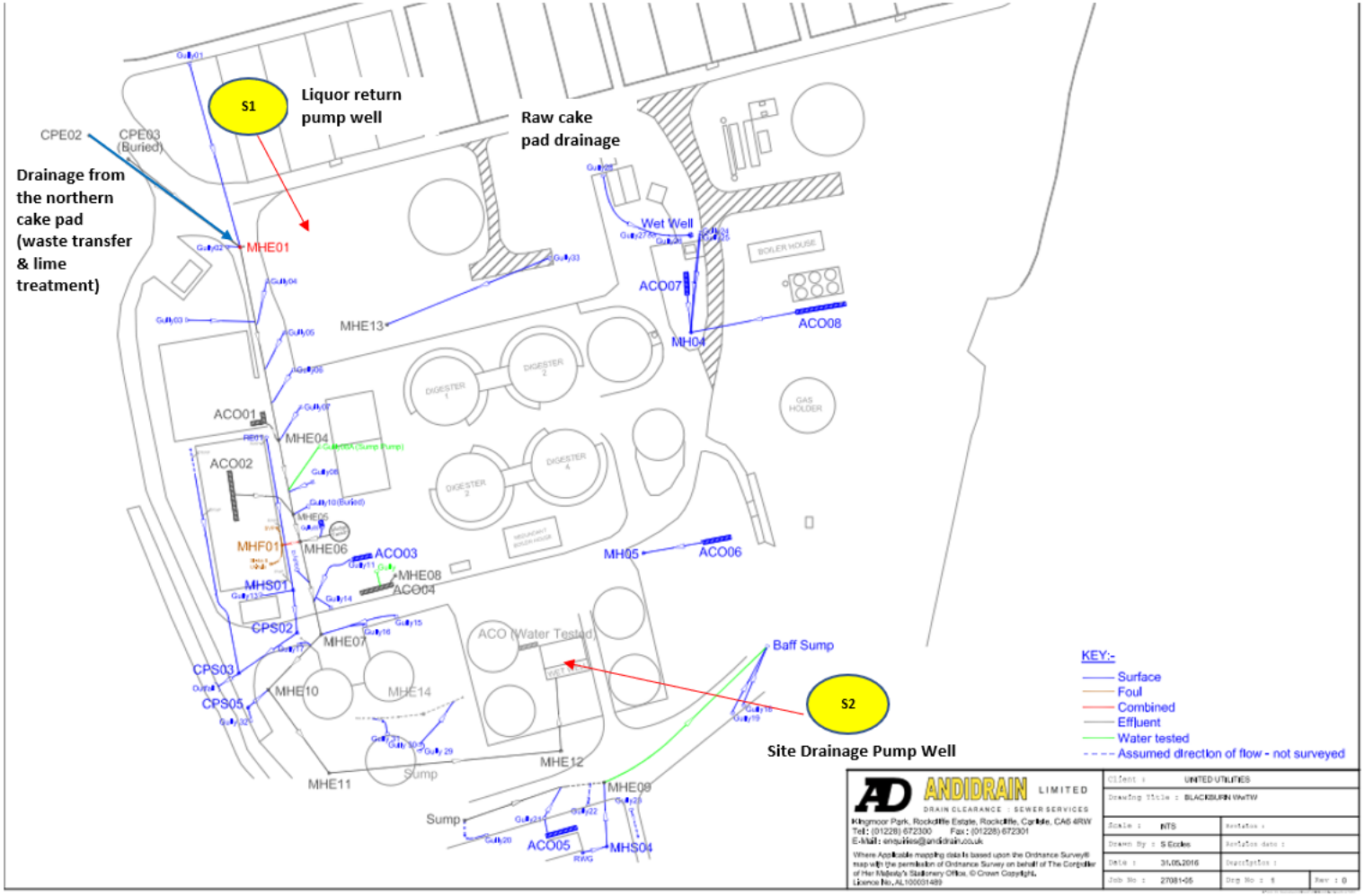
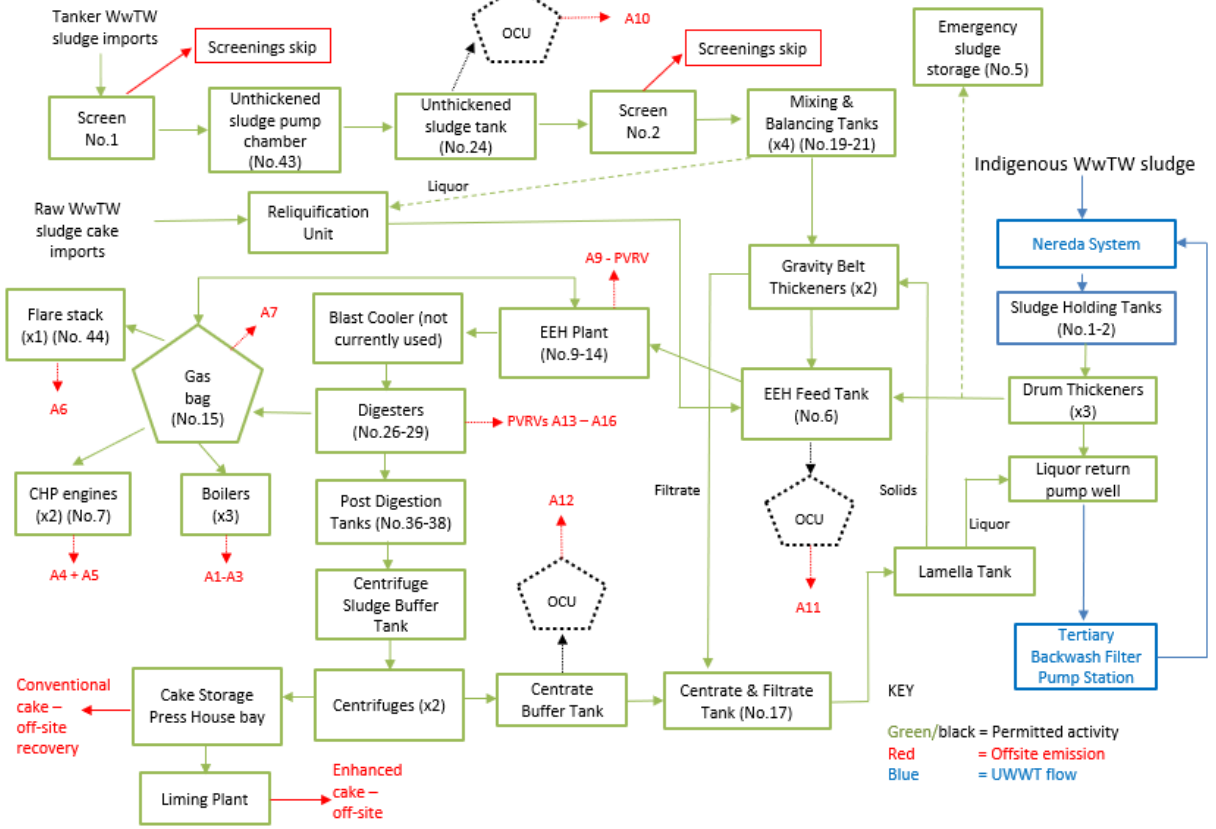
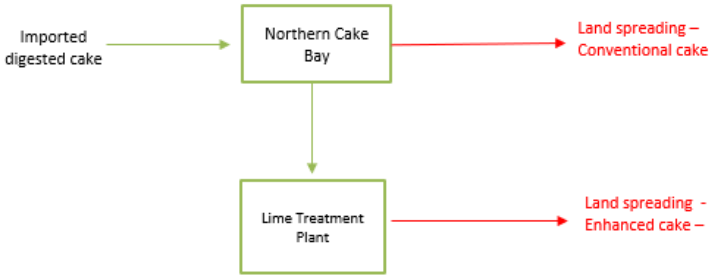


Figure 2: Process Flow Diagram

Blackburn WwTW Sludge Treatment Installation (Part 1)



Blackburn WwTW Sludge Treatment Installation (Part 2)



Appendix A: Certificate of Technical Competence (CoTC)

wamitab

Qualification Title:

WAMITAB Level 4 Medium Risk Operator Competence for Anaerobic Digestion

Qualification Accreditation Number:

601/8515/6

This Certificate is awarded to

Christopher Donald Maggs

Verification date: 24/04/2019
Authorised:

Learner ID: 14299
Certificate No.: 5143068
Date of Issue: 24/04/2019

Chris James
WAMITAB Chief Executive Officer

Regulated by Ofqual

Corff dyfarnu cydnabyddedig
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.

00141288

wamitab

Credit certificate
This certificate determines credit awarded to:

Christopher Donald Maggs

Units gained:

		Credit Value	Credit Level
A/508/0756	Maintain health and safety in the waste resource management industry	4	L4
F/508/0757	Manage the environmental impact of work activities	3	L4
F/508/0760	Manage the movement, sorting and storage of waste	5	L4
J/508/0887	Manage the reception of non-hazardous waste	6	L3
A/508/1003	Manage site operations for the anaerobic digestion of non-hazardous waste	6	L4
T/508/0979	Manage transfer and disposal from anaerobic digestion operations	5	L4

Verification date: 24/04/2019
Authorised:

Learner ID: 14299
Certificate No.: 5143068
Date of Issue: 24/04/2019

Chris James
WAMITAB Chief Executive Officer

Regulated by Ofqual

Corff dyfarnu cydnabyddedig
Cymwysterau Cymru Qualifications Wales
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.

00141289

Continuing Competence Certificate

This certificate confirms that

Christopher Maggs

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 28/01/2025

AD	Anaerobic Digestion
TSH	Transfer - Hazardous Waste
TMH	Treatment - Hazardous Waste

Expiry Date: 28/01/2027

Verification date: 27/01/2025
Authorised:

Responsible Officer

Learner ID: 14299
Certificate No.: 5272301
Date of Issue: 28/01/2025

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

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

Appendix B: Management System Summary & ISO14001 Certificate

Management System - Summary

May 2025

Blackburn WwTW Sludge Treatment Facility EPR/XP3638LJ Environmental Permit Variation Application

Introduction

As part of its application for a variation to the environmental permit for the Blackburn WwTW Sludge Treatment Facility, United Utilities Water Limited (UUW) is required to provide details of the management system it will provide for the facility, including a summary of the management system. This document provides that summary.

UUW was awarded certification to BS EN ISO14001:2004 for its Environmental Management System in October 2004 and has maintained this certification. A copy of the latest certificate is provided with this document. In addition, UUW also holds certification to BS EN ISO 9001:2015; this is the quality assurance document management system which supports the ISO 14001 and other written procedures for delivering the key aspects of the ISO 14001. Together these form the backbone of UUW's Environmental Management System (EMS).

In accordance with the Environment Agency (EA) guidance "Develop a management system: environmental permits" on the gov.uk website, the following sections summarise the management system (MS) that will be provided for Blackburn WwTW Sludge Treatment Facility under our ISO 14001 EMS.

Site Infrastructure Plan

The permit application included a scaled location plan, a scaled site boundary plan that identified the different elements of the waste treatment process, a process flow diagram and drainage plans. The MS will include suitable plan(s) that meet the requirements of the EA guidance.

Site Operations

The site operations and how they are controlled are detailed within the Application Support Document of the permit application package. The MS will include all necessary information about site operations and waste storage and management.

No fire prevention plan is required.

Site Equipment and Maintenance Plan

As detailed in the Application Support Document of the permit application package, the site operates under an EMS manual detailing the Standard Operating Procedures (SOP's) and Site Specific Instructions (SSI's) applicable to each process. These instructions have been designed to ensure safe and effective operation and to minimise known hazards from the installation and include procedures for maintenance, training and accident response.

The Production Manager will review the EMS for the installation and arrange the necessary updates to include the operations, inspection and maintenance of the new plant. The Production Manager will also arrange staffing resources and training for operation, monitoring and maintenance of the new plant.

Blackburn Wastewater Treatment Works Environmental Management System Summary

All scheduled maintenance will be set up on the Master Asset Management System (MAMS)SAP and all proactive and reactive maintenance undertaken will be recorded on MARS against the requirements of the plan. For changes to activities, please see Tables 1a and 1b in Section 3.

Contingency Plans

The MS will include contingency plans detailing what actions UUW will take to minimise the impact on the environment for each of the following scenarios:

- breakdowns
- enforced shutdowns
- any other changes in normal operations that may result in an impact on the environment

Many of these have already been detailed within the Environmental Risk Assessment and Management Plan provided in the Application Support Document of the permit application package.

Accident Prevention and Management Plan

An Accident Prevention and Management Plan for the operation of the installation, to assess the potential for all foreseeable accidents that may impact upon the installation, has already been prepared and submitted. The plan takes into consideration the requirements of the EA guidance, including scenarios described within Section 2.8 of the Guidance Note S5.06 (Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste) and uses the H1 risk assessment methodology to assess:

- likelihood of the accident happening
- consequences of the accident happening
- measures to be taken to avoid the accident happening
- measures to be taken minimise the impact if the accident does happen

In accordance with our ISO 14001 procedures, UUW will record, investigate and respond to accidents or breaches of any permit conditions.

Contact Information

As with all our other sites holding waste and/or installations environmental permits, we display a notice board at or near the site entrance providing the following information:

- the company name, site name and permit number
- emergency contact details
- a statement that the site is permitted by the Environment Agency

Complaints Procedure

In accordance with its ISO 14001 accreditation, UUW has a well-established complaints recording and investigation procedure. This procedure is applied at all other UUW permitted sites and will form part of the MS for this installation.

Blackburn Wastewater Treatment Works Environmental Management System Summary

Managing Staff Competence and Training Records

In accordance with its ISO 14001 accreditation, the MS will detail the management and responsibilities for the operations of the installation, including details of technically competent management (CoTC holders). UUW procedures for checking staff and contractors required training and/or qualifications will be applied at this installation and all training and qualifications will be recorded.

Keeping Records

In accordance with our ISO 14401 and ISO 9001 accreditations, UUW will hold and maintain all records appropriate to the operation and management of the installation, including (but not limited to):

- copies of all permits
- risk assessments
- all management system plans
- odour management plan
- site operating procedures
- staff competence and training
- environmental monitoring
- compliance checks, findings of investigations and actions taken
- complaints made, findings of investigations and actions taken
- audits of management system, findings (reports) and actions taken
- management reviews and changes made to the management system

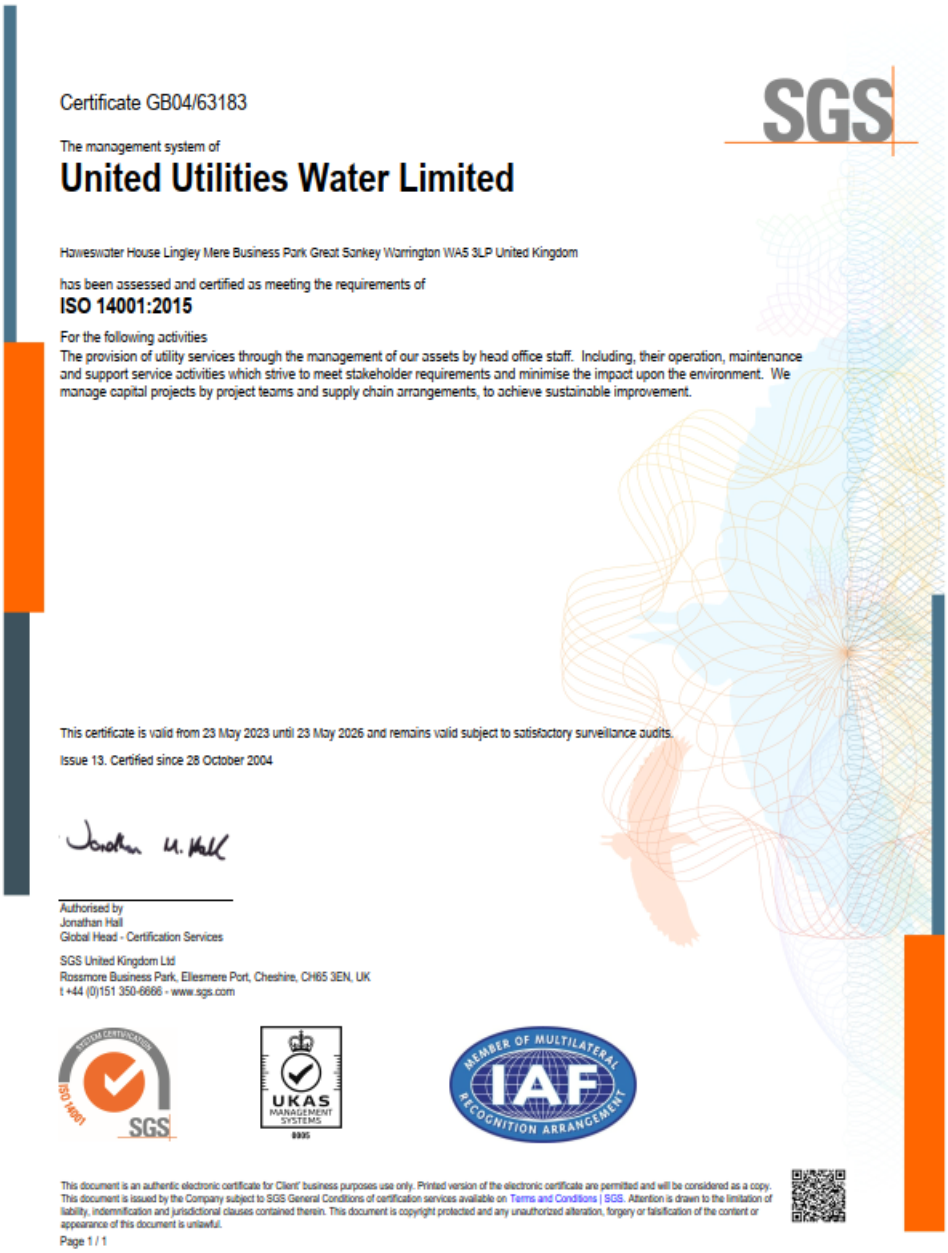
In accordance with the Duty of Care for waste, records will also be kept of all waste movements.

Management System Reviews

The MS for the installation will be subject to regular review and updating. All reviews and any resulting changes will be recorded.

Blackburn Wastewater Treatment Works
Environmental Management System Summary

ISO14001:2015 Certificate



Certificate GB04/63183

The management system of

United Utilities Water Limited

Haweswater House Lingley Mere Business Park Great Sankey Warrington WA5 3LP United Kingdom

has been assessed and certified as meeting the requirements of

ISO 14001:2015

For the following activities

The provision of utility services through the management of our assets by head office staff. Including, their operation, maintenance and support service activities which strive to meet stakeholder requirements and minimise the impact upon the environment. We manage capital projects by project teams and supply chain arrangements, to achieve sustainable improvement.

This certificate is valid from 23 May 2023 until 23 May 2026 and remains valid subject to satisfactory surveillance audits.

Issue 13. Certified since 28 October 2004

Authorised by
Jonathan Hall
Global Head - Certification Services

SGS United Kingdom Ltd
Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN, UK
t +44 (0)151 350-6666 - www.sgs.com

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Appendix C: Odour Management Plan