

IED Permit Application Environmental Risk Assessment

Eign STC

December 2022

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1 Introduction

This document has been prepared to support the application to vary the existing bespoke waste Environmental Permit to an Installation Environmental Permit (hereafter referred to as 'the Permit'), EPR/UP3735GH, for the Eign Sludge Treatment Centre (STC) ('the Site') on behalf of Dŵr Cymru Welsh Water (DCWW) ('the Operator').

As part of the application for a varied Environmental Permit, operators must assess the risk to the environment and potential harm to human health from the activities they propose to undertake. This document provides the environmental risk assessment (ERA) considered relevant to the facility in accordance with the Environment Agency's 'Risk assessments for your environmental permit' guidance¹.

The risk assessment has been produced to address the additional risk associated with the variation, which encompasses increasing the permit boundary to cover the existing anaerobic digesters and associated STC activities.

The risk assessment sets the requirements for the management of the permitted operations at the site including emission control measures. All control measures within the rules must be adhered to in order to obtain the permit.

¹ Environment Agency (April 2022). Risk assessments for your environmental permit. Accessed via <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit#risk-assessments-for-bespoke-permits> July 2022.

2 Site Setting

2.1 Location

Activity address: Eign Wastewater Treatment Works, Outfall Works Road, Hereford, Herefordshire, HR1 1RY.

National Grid Reference: SO52070 38767.

The boundary of the Site is shown in green in document reference B16564-0AG964-ZZ-XX-DR-ZA-DH0010_LayoutEmissionDrainagePlan_EIG.

2.2 Geology

BGS GeoIndex (British Geological Survey, 2022) indicates made ground completely underlying the site, of ~2.5m thickness. BGS mapping (British Geological Survey, 2000) indicates Alluvium underlying the site. BGS borehole scans indicate that Alluvium was encountered between 1.38 and 5.61m below ground level (bgl), with a maximum thickness of 4.24m, described as soft, very silty to firm clay oxidising brown, containing fine to coarse gravel, fine to coarse grey to brown sand, stones, decaying wood fragments and some organics.

2.3 Hydrogeology

The superficial deposits of the Alluvium, River Terrace Deposits, and the bedrock geology of the Raglan Mudstone Formation, are designated as Secondary A aquifers, defined as “permeable layers capable of supporting water supplies at a local rather than regional strategic scale, and in some cases forming an important source of base flow to rivers” (Environment Agency, 2018).

The site is not located within 250m of a Source Protection Zone (SPZ).

Thirty-six discharge consents have been registered within 250m of the site. Each licence was registered to Dŵr Cymru Welsh Water, and the receiving water was the River Wye.

The Site is not located within a groundwater Source Protection Zone (SPZ).

2.4 Hydrology

The River Wye is located 5m north-east of the site boundary. The site is located within Flood Zone 3 – an area with a high probability of surface water flooding. The site also lies in an area with the potential for groundwater flooding of property situated below ground level and at the surface.

The WwTW has an internal drainage system which returns effluent to the head of the works prior to discharge into the River Wye. Under the Water Framework Directive (WFD), the River Wye is designated as “Moderate” for Ecological Quality, and “Fail” for Chemical.

2.5 Protected Areas

Ecological sensitive receptors are shown in Appendix A.

There are two Nitrate Vulnerable Zones (NVZ) on-site, these are:

- Hereford region NVZ; and
- River Wye – Bredwardine Br to Hampton Bishop.

The River Wye is designated as a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC), with the latter designation being given by both Natural England and Natural Resource Wales.

2.6 Other Notable Features

The site comprises Eign Sludge Treatment Centre (STC) that is situated within the wider Eign Wastewater Treatment Works (WwTW). The Works have occupied the land since approximately 1890, with upgrades in 1948 and 1978.

The site is bounded by a meander in the River Wye from north-east. Public footpaths run parallel to the River Wye. Past this bounding, there are residential areas to the north and south. To the west and east there are grasslands.

The nearest sensitive receptors to the site are residential developments which are located approximately 430m to the northeast of the site and 650m to the northwest. The nearest commercial/industrial facilities are located approximately 370m to the southeast of the Site.

River Wye is both a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) and lies approximately 5m from the site. A Site of Importance for Nature Conservation (SINC) is located adjacent to the site.

3 Environmental Risk Assessment

3.1 Methodology

The ERA has been undertaken by identifying hazards and source-pathway-receptors and assigning a probability of exposure and a severity of consequence. These are assigned as described in Table 3.1 and Table 3.2 and are based on the generic risk assessments used for standard rules “SR2012 No11 and No12”, “SR2009 No 4” and “SR2008 No 19”, applicable to anaerobic digestion operations including use of the resultant biogas.

The probability and severity scores are then combined within a matrix to give an overall magnitude of the risk. The magnitude of risk uses professional judgement and site-specific knowledge and, as such, the general pattern in Table 3.3 is not necessarily applicable to all risks.

Risks are categorised as either low, medium or high; this ranges from being a nuisance in some instances to potential health risks in others.

Table 3.1: Severity Index

Table Severity of harm	Severity index
Impact to people or designated receptor	High
Impact to non-designated receptor	Medium
All other impacts	Low

Table 3.2: Probability Index

Likelihood of harm occurring	Probability index
Harm is near certain or very likely to occur	High
Harm is likely to occur	Medium
Harm is unlikely	Low

Table 3.3: Magnitude of Risk

Magnitude of risk	Probability index		
	Low	Medium	High
Severity index			
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

3.2 Risk Assessment

3.2.1 Introduction

This section of the ERA identifies potentially sensitive receptors within to on site processes and assesses the risks within the following categories:

- Point source and fugitive emissions to air;
- Point source and fugitive emissions to water and land;
- Noise and vibration;
- Odour;
- Litter, mud and debris;

- Vermin and insects (pests);
- Human health and environment safety (i.e. visual impacts, site security, flood risk); and
- Natural habitats and ecology.

The methodology used to assess and screen the environmental risks for each category is discussed in turn in the following subsections. The need for further detailed assessments and/or management plans, where applicable, is also elucidated upon.

An assessment of the overall and residual risk is provided in Appendix B. For each hazard there is the identification of the pathway and receptor and the mitigation proposed in order to reduce the residual risk.

3.2.2 Point Source and Fugitive Emissions to Air

3.2.2.1 Air quality

The Combined Heat and Power (CHP) units and boilers are currently permitted under the existing bespoke Environmental Permit (EPR/UP3735GH).

For potential human health effects, the pollutant of key concern is NO₂, although emissions of SO₂ and CO have also been considered. Effects of atmospheric concentrations of NO₂ and SO₂ have also been assessed with respect to sensitive ecological sites. The method of the assessment has taken a conservative approach by assuming worst case conditions for a number of aspects including emissions characteristics, operating scenarios and metrological conditions.

As combustion activities are not being changed on site as a result of the permit variation and associated processes, it is not anticipated that updated Air Dispersion Modelling (ADM) will be required. Overall impacts of all air pollutants associated with the variation are considered to be low. As part of the original permit application, the dispersion of all substances from the combustion plant in EPR/UP3735GH were assessed through the use of the H1 methodology and additional dispersion modelling was carried out for the Site to determine the operational effect on human health. Monitoring of the emissions to air is carried out as per EPR/UP3735GH.

The Site has been operating for over 20 years and therefore the existing site activities are already part of the background air quality for the area. There are no changes to the existing activities and processes on Site as a result of this permit variation application that will impact the background pollution levels.

The operation of the flares will be prioritised for during emergencies, such as during CHP maintenance or downtime. In any other scenarios the imports of the biogas to the CHP unit will be controlled to reduce the time of operation of the flare where possible. Maintenance of the flare is undertaken every six months.

The emission points are shown in drawing reference B16564-0AG964-ZZ-XX-DR-ZA-DH0010_LayoutEmissionDrainagePlan_EIG, details of the parameters and quantities have been outlined in section 6.3.1 of B16564-0AG964-ZZ-XX-DM-ZA-DH0019_MSD_EIG.

The existing approaches and relevant procedures presented in the Environmental Management System (EMS) and operational procedures are considered to adequately address the emissions that may present a risk, and, therefore, an Emissions Management Plan (EMP) is not considered to be required.

Additional emissions from the Site include:

- Water vapour from the blowdown vessel. There is a vent to atmosphere on the hot water storage tanks to ensure the tank is never pressurised;

- Pressure relief valves and devices are located on the steam system, boilers and on the gas holder. These are vented to atmosphere;
- There are a number of potential emissions from the biogas condensate pots; however, low level alarms have been fitted to notify the operator if the seal has been broken.

The additional emissions identified are considered to represent a negligible amount to the overall emissions of the Site and are not considered to contain pollutants considered detrimental to the environment.

Pressure relief valves (PRVs) are visually inspected daily.

The gas holder is equipped with a level transmitter which is used to determine the volume of biogas in the gas holder, where the level of the gas holder is a low or a high level, an alarm is raised on the SCADA system.

Pressure relief valves will be used in emergencies only, and are not part of normal operation, all PRVs and breather vents are fitted in appropriate locations.

3.2.2.2 Bioaerosols

According to the Environment Agency guidance 'bioaerosol monitoring at regulated facilities (Jan 2018)', a bioaerosol risk assessment is required if a facility is within 250m of a sensitive receptor.

For new permits there is a requirement to monitor in accordance with Technical Guidance Note (TGN) M9 'environmental monitoring of bioaerosols at regulated facilities' if the Site is within 250m of a sensitive receptor. The TGN lists sources of bioaerosols and refers to ambient and point sources of emissions.

The sensitive receptors in relation to the Site are shown in Appendix A.

Sensitive receptors have been identified in Figure A.3, there are no sensitive receptors within 250m of the Site. At the distance and limited time of exposure the risk of exposure is low, and therefore the risk is managed through measures stated in Appendix B.

Despite no sensitive receptors within 250m of the Site boundary, a bioaerosols risk assessment has still been undertaken (document reference B16564-0AG964-ZZ-XX-DM-ZA-DH0030_BioA_EIG). Details on risk management of bioaerosols is stated in Appendix B.

Best practice methods will be followed during operation of the facility, to prevent the release of bioaerosols. These include methods and principles outlined in the Environment Agency's "Guidance on the evaluation of bioaerosol risk assessments for composting facilities"² and are described in Appendix B.

3.2.2.3 Abatement of other fugitive emissions to air

Environment Agency best practice methods will be followed, during operation of the facility, to prevent the release of fugitive emissions. These are described in Appendix B.

3.2.3 Point source and fugitive emissions to water and land

An assessment of the risks from potential point source and fugitive emissions to water, sewers, land or groundwater is provided in Appendix B.

²Drew, G.H., Deacon, L.J., Pankhurst, L., Pollard, S.J.T. and Tyrrel, S.F. (2009). Guidance on the evaluation of bioaerosol risk assessments for composting facilities. Environment Agency.

The Substantial Pollution Incident register in Landmark's Envirocheck report (Document reference: 100381175_006_EC) has been used to provide details of pollution incidents within the past five years.

3.2.3.1 Emissions to water (other than sewers)

The Substantial Pollution Incident register in Landmark's Envirocheck report (Document reference: 100381175_006_EC) has been used to provide details of pollution incidents within the past five years. There have been four pollution incidents to controlled waters recorded within 250m of the site. Of these, three were designated as Category 3 (minor incident), with the fourth designated as Category 2 (significant incident). This significant incident occurred approximately 175m north of the site involving effluent/slurry on 16th March 1991 (incident reference 265).

There are no groundwater source protection zones (SPZ) or groundwater abstractions within 250m of the Site.

All drainage water including surface or foul water is captured by the drainage network which returns all water to the head of the works for treatment.

There will be no direct discharge of wastewater to controlled waters from the STC.

There are no direct potentially contaminated discharges to groundwaters. Condensate from the flare, CHP and the biogas is captured in a sealed container and is returned to the head of the WwTW. The condensate is clean, uncontaminated and discharges are small in volume.

Accidental releases of materials to the environment are controlled through adequate containment measures and working procedures.

The existing approaches and relevant procedures presented in the EMS and operational procedures are considered to adequately address the emissions that may present a risk, and therefore, an EMP is not considered to be required.

3.2.3.2 Emissions to sewers, effluent treatment plants or other transfers off-site

There will be no point source emissions or direct discharges to controlled waters or public sewers, as part of the permit operation. Any liquid waste will either be reused or discharged to the drainage system of the adjacent Eign WwTW and will undergo treatment through the works prior to being discharged under an existing water discharge permit. On-site WwTW effluent will meet the requirements of the existing environmental permit for discharges to water. The water used at the Site will be contained in a closed circuit; all wastewater streams will either be recycled within the process or captured and rerouted to the adjacent WwTW.

Discharges will be minimal, typically arising from periodic maintenance/cleaning operations. As such, there are no direct potentially contaminated discharges to controlled surface waters and no significant impacts. All drainage (surface water or foul water) will be captured by the on-site drainage system, and returned to the head of the WwTW. A drainage plan of the Site is presented in document B16564-0AG964-ZZ-XX-DR-ZA-DH0010_LayoutEmissionDrainagePlan_EIG.

Spillages will be minimised by the use of spill trays where required. Emergency procedures will be written into the management system to minimise the risk of a significant impact from accidental spillages.

All drainage (surface water or foul water), including gas condensate collected within digesters will be captured by the onsite drainage system and returned to the WwTW via a return pumping station.

The stormwater drainage of potentially contaminated areas from within the site boundary is routed back to the head of the works.

The existing approaches and relevant procedures presented in the EMS and operational procedures are considered to adequately address the emissions that may present a risk, and, therefore, an EMP is not considered to be required.

3.2.3.3 Emissions to land

All raw materials are handled and stored within the confines of the buildings on-site, or in intermediate bulk containers (IBCs) in bunded areas, with the exception of biogas which is contained within the gas handling system. Releases of raw materials to land are, therefore, considered to be negligible due to adequate containment of the materials within the suitable storage vessels, the provision of bunding and the presence of a contained drainage system.

3.2.4 Noise and Vibration

No noise complaints have been received at the Site in the last five years.

Initial screening has been carried out for the Site. Since the Site is not undergoing changes to equipment and vehicle movements prior to application submission, a Noise Impact Assessment (NIA) is not considered to be required in respect of this application, however an assessment has been provided in document reference B16564-0AG964-ZZ-XX-DM-ZA-DH0014_ERA_NOISE_EIG.

Appropriate mitigation for noise and vibration impacts are provided in Appendix B. The sensitive receptors located within 1km of the Site are shown in Figure A.3 of Appendix A.

Main sources of noise at the STC would likely be the boilers and the CHP units, the boilers are housed within a building, and the CHP units are designed within pre-built acoustic enclosures.

The potential noise impacts of the Eign STC will be in a high level assessed by way of a comparison of:

- Predictions of noise impact based on reference measurements of the same types of equipment installed at similar facilities and a simple propagation model; and
- Representative baseline noise levels obtained from published strategic noise maps

3.2.5 Odour

A review of the nearest human receptors has been undertaken to establish the level of odour risk to the receptors before and after mitigation. Sensitive receptors to odour are users of the adjacent land, which may vary in their sensitivity to odour.

The nearest sensitive receptors to the site are residential developments which are located approximately 430m to the northeast of the site and 650m to the northwest. The nearest commercial/industrial facilities are located approximately 370m to the southeast of the Site.

Current odour mitigation measures to prevent and reduce odours beyond the site boundary from receipt of waste, transfer across the Site, treatment and storage of waste have been assessed and are detailed in Appendix B.

No odour complaints have been received at the Site in the last three years.

All sludge treatment activities are undertaken in enclosed buildings or tanks. The Site also has an Olfasense odour control unit (OCU) to mitigate the risk of odour. This is a two-stage treatment system, with a wet biofilter as the first stage and carbon polishing filter as the second stage. The system also has duty and standby fans with a design flow rate of 1.5m³/s. The OCU

extracts from the sludge thickening building and sludge balance tanks. Media life and condition is reviewed on a regular basis although it is anticipated that media should last a minimum of two years. There are no proposed works to be undertaken on the Site in respect of this permit application, therefore, the activities on-site are not anticipated to increase the off-site impact or result in adverse impact upon nearby sensitive receptors or the amenity of the area surrounding the Site.

Olfasense have conducted a quantitative odour impact assessment and report for the STC (document reference B16564-0AG964-ZZ-XX-DM-ZA-DH0021_ERA_OIA_EIG).

DCWW, with support from Olfasense, have developed an odour management plan (OMP), based on the outcome of this assessment, in accordance with the H4 guidance (document reference B16564-0AG964-ZZ-XX-DM-ZA-DH0015_MSD_OMP_EIG).

In addition, DCWW have requested Olfasense to support site operation teams to undertake regular checks on the OCU's for the first six months, so they understand what checks and NRW reporting is required in the future. In the interim, DCWW will continue to follow the existing odour management as described in Appendix B.

3.2.6 Particulate Matter, litter, mud and debris

Appendix B describes the aspects of the Site that generate litter, mud and debris within and outside the site boundary and assesses their risk to the environment. Current waste management and site cleaning procedures have been assessed in the ERA table in Appendix B to justify whether additional measures could be required. Measures to prevent debris and dust leaving the Site have also been addressed, in addition to the sensitivity of nearby receptors and the effectiveness of existing measures to reduce the escape of dust.

The need for a Dust Management Plan is triggered if the keeping and/or treating of biowaste in the open including the finished material is located:

- In, or within 2km of, an air quality management area for PM10;
- Within 500m of a sensitive receptor such as a home, school, hospital or nursing home, food preparation facility or similar; or
- Within 250m of a sensitive receptor when treating biowaste

The sludge and wastewater treatment processes of the Site are enclosed. Although the Site has been screened as being within 250 metres of sensitive receptors (see Appendix A), a Dust Management Plan is not considered to be required since operations and waste types used on-site cause minimal dust emissions and appropriate mitigation is in place.

Sludge cake is imported to the Site in covered vehicles. Cake is stored within a cake silo (240m³), there is also an emergency cake bay which can be utilised when necessary (200m³ capacity).

3.2.7 Pests

Discussions with the Site operator during a site visit have addressed whether the Site activities are likely to attract pests, what measures are in place to deter pests and how effective these are. These are covered in Appendix B.

The site has quarterly visits, by a contractor (Pied Piper Wales). If there is an increase in pest issues, then a request is made for extra contractor visits.

Pests are not considered to be an issue since the waste types handled on-site do not attract them, contractors regularly check the Site for pests and appropriate mitigation is in place. Since

the residual risk is considered to be very low, a Pest Management Plan is not considered to be necessary.

3.2.8 Human health and environment safety

3.2.8.1 Visual impacts

A treatment works has been on the Site for over 20 years. There will be no changes in heights or general configuration following the submission of the permit application and so visual impact from the Site is considered very low.

Since no changes to the Site will occur prior to submission of this permit application, there will not be any changes in heights and configuration of the placement of equipment which could be noticed by nearby receptors.

3.2.8.2 Site security

Activities are managed and operated in accordance with the EMS. Access to the Site is restricted by a 2.4m mesh fence and a second 1.8m chain link fence. Access to the site is through a 3m cantilever mesh which requires authorised key cards to open and is fitted with an intercom system for visitor access. The Site also benefits from a CCTV system, and intruder detection alarms which covers the Site entrance and access road.

Regular inspections of the boundary fencing, and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to Site.

On arrival at site, visitors must sign the visitor's book located in the entrance to the main office building.

The site is manned over the following operational hours:

- 07:00 to 15:00 Monday to Thursday
- 07:00 to 14:00 Fridays
- 07:00 to 12:00 Saturday
- Sundays and Bank holidays as required

3.2.8.3 Flood risk

Initial screening was undertaken to determine the flood risk for the Site. The data utilised for this study was published online by Natural Resources Wales and related to the flood risk from surface water, rivers and the sea.

The site is located within Flood Zone 3 – an area with a high probability of surface water flooding. The site also lies in an area with the potential for groundwater flooding of property situated below ground level and at the surface.

Activities are managed and operated in accordance with a management system and management plans, and procedures implemented include (but not limited to) the removal and clean-up of spilled waste material, including sludge, cake etc. and other pollutants (which may also include removal used spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.

Access to site floods at a river level of 5.2m, which occasionally happens during prolonged heavy rainfall events. This is not known to cause issues with site operations.

Since no changes to the Site are planned prior to application submission, and no impacts to flood pathways or sensitive receptors are anticipated, a full flood risk assessment (FRA) (defined here as a detailed assessment involving bespoke hydraulic modelling work) is unlikely

to be required. When proposed changes do occur these are understood to be either of a relatively minor nature or are unlikely to significantly alter existing development footprints.

3.2.8.4 Emergency response and Accident Management Plan

Complaints and notification of incidents at the Site are managed as stated in section 5.4.1 of B16564-0AG964-ZZ-XX-DM-ZA-DH0019_MSD_EIG.

DCWW have an Environmental Management System (EMS) Policy. In line with the EMS Policy, the EIG STC will be operated in accordance with the DCWW Quality Management System (IMS). The Site operates under a set of site-specific Emergency Procedures which is incorporated into DCWW's Environmental Management System (where applicable) to prevent and manage environmental related accidents. The Emergency Procedures are distributed to key staff, to supervise the implementation of the Plan, and shared with external contacts (emergency services and the NRW). The Emergency Procedures are accompanied by a site plan that identifies the locations of designated storage areas (and their maximum storage capacity), location of spill kits and fire extinguisher and storage locations and hazards posed by chemical substances. Further details of the emergency procedures is detailed in document reference B16564-0AG964-ZZ-XX-DM-ZA-DH0011_AMP_EIG.

3.2.9 Natural habitats and ecology

Ecological features that are situated within set distances of the site boundary have been identified and screened. For the following ecological features, the Study Area was defined as the following:

- Statutory designated European sites: Special Areas of Conservation (SAC), candidate Special Areas of conservation (cSAC), Special Protection Areas (SPA), potential Special Protection Areas (pSPA), Sites of Community Importance (SCI) and Ramsar sites within 10km of the site boundary;
- Statutory designated national sites: Sites of Special Scientific Interest (SSSIs), Marine Conservation Zones (MCZs), National Nature Reserves (NNRs), Local Nature Reserve (LNRs), Areas of Outstanding Natural Beauty (AONB) within 2km of the Site boundary;
- Non-statutory designated sites: Local Wildlife Sites (LWS), Ancient Woodlands, Country Parks, Sites of Importance for Nature Conservation (SINC), National Nature Reserves (Wales) within 2km of the site boundary;
- Priority habitats: within 2km of the Site boundary. Priority habitats are those listed under Section 41 of the Natural Environment and Rural Communities Act (2006) and include deciduous woodland, grassland, heathland, reedbed, vegetated shingle, wood-pasture and parkland, marshes, mudflats and fens; and
- Granted European Protected Species (EPS) within 2km of the site boundary. Licences available on Multi-Agency Geographic Information for the Countryside (MAGIC). Accurate to within the nearest 100-200m depending on local council survey data accuracy.

No ecological field surveys have been completed to inform this screening. This screening identifies the likelihood of ecological features being present or further investigation being required. Best practice methods will be followed to mitigate against impacts to habitats, including those identified in section 2.5 Protected Areas. These are described in Appendix B.

Initial screening has been carried out for the Site, the high-level results of which are shown in Table 3.4. Where habitat sites are situated within the study area surrounding the Site, the relevant cells are highlighted in red and indicate the number of habitats sites located therein. Cells highlighted in green indicate that relevant habitat sites are not located within the specified study area. For cells highlighted in orange, there is potential for these protected species to be present within the study area.

Table 3.4: Results of initial screening of natural habitats and ecology for Eign WwTW STC

Natural habitats and ecology	Eign WwTW/STC
Statutory designated European sites within 10km of the Site boundaries	
Special Areas of Conservations (SAC)	1
Special Protection Areas (SPA)	
Sites of Community Importance (SCI)	
Ramsar sites	
Statutory designated national sites within 2km of the Site boundaries	
Sites of Special Scientific Interest (SSSIs)	1
Marine Conservation Zones (MCZs)	
National Nature Reserves (NNRs)	
Local Nature Reserves (LNRs)	
Areas of Outstanding Natural Beauty (AONBs)	
Non-statutory designated sites within 2km of the Site boundaries	
Local Wildlife Sites (LWS)	
Ancient Woodlands	4
Country Parks	
Sites of Importance for Nature Conservation (SINC)	1
Protected species	
Common nesting birds, common reptiles, terrestrial and aquatic invertebrates, common amphibians: within a 10m buffer of the Site boundaries	
Wintering birds: within a buffer of up to 500m of the Site	
Species of nesting birds: within 200m buffer of the Site boundaries	
Bats: within 50m buffer of the Site boundaries	
Badgers: within a 30m buffer of the Site boundaries	
Hazel dormice: within a 20m buffer of the Site boundaries	
Great crested newts – ponds within 500m buffer of the Site boundaries and terrestrial habitat within 10m	

There is one SAC within 10km of the site. However, it is considered unlikely that a Habitats Regulations Assessment (HRA) would be required for the Site because Environment Agency best practice methods will be followed, during the operation of the facility to prevent significant effects to designated habitats. These are described in Appendix B.

Any potential impacts to statutory designated European and national habitat sites have been considered in the ERA following review of the following site-specific information:

- Discharges to water, groundwater and emissions to air and land, and from dust, noise and vibration, from all activities on-site, particularly from the anaerobic digestion processes;
- Pollution prevention and mitigation measures, including for emissions and spills; and
- Site plans detailing storage arrangements and drainage plans.

It is considered very unlikely that site activities would lead to the disturbance or removal of terrestrial habitats, and therefore, protected species surveys are not considered to be required for the Site.

The proposal for a varied permit does not involve the removal of vegetation, or structural modification to built structures therefore, a Preliminary Ecological Appraisal is not considered to be required for the Site.

A. Environmental Constraint Maps

Figure A.1: Statutory designated habitat sites within 10km of the Site

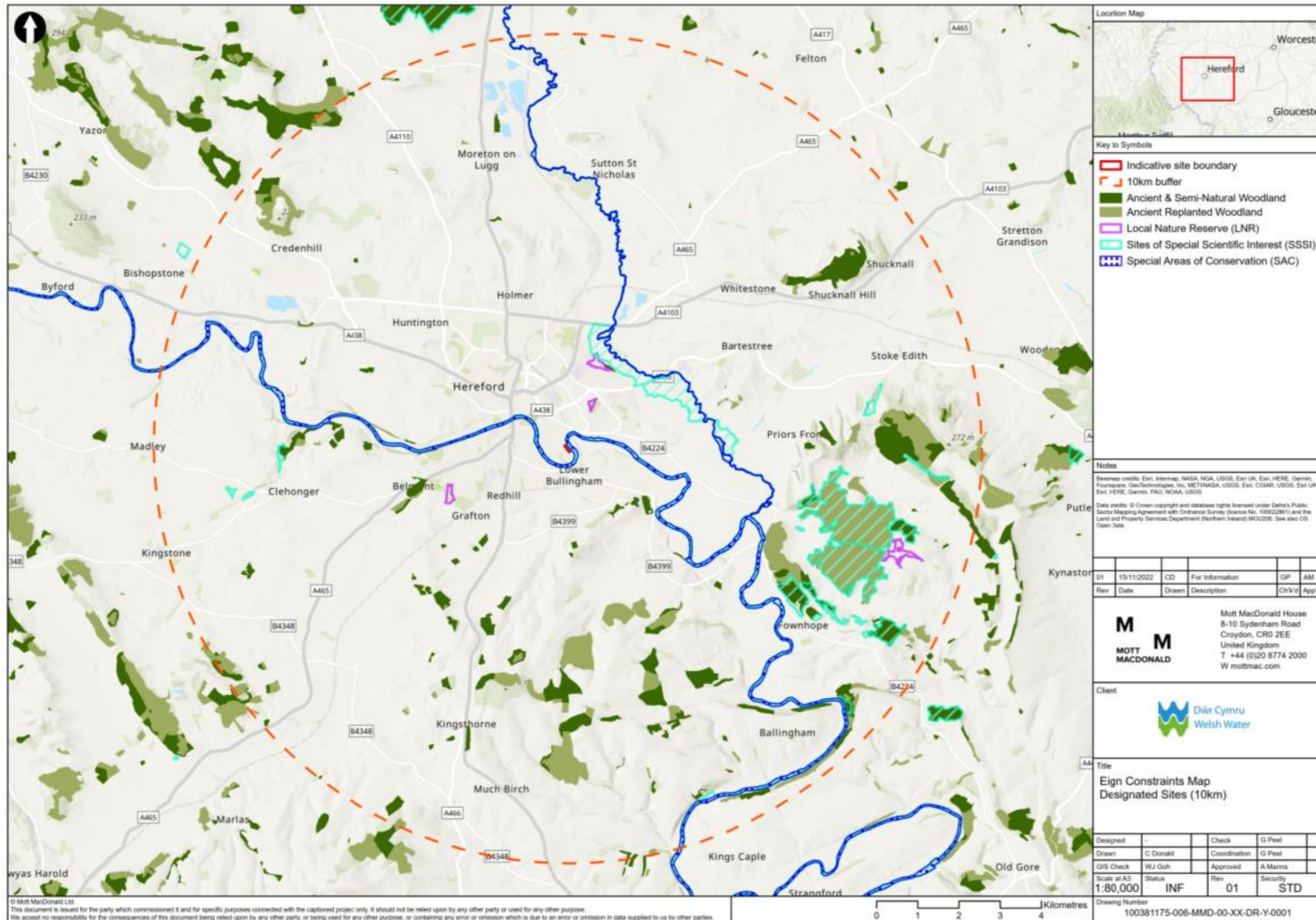


Figure A.2: Non-Designated sites within 10km of the Site

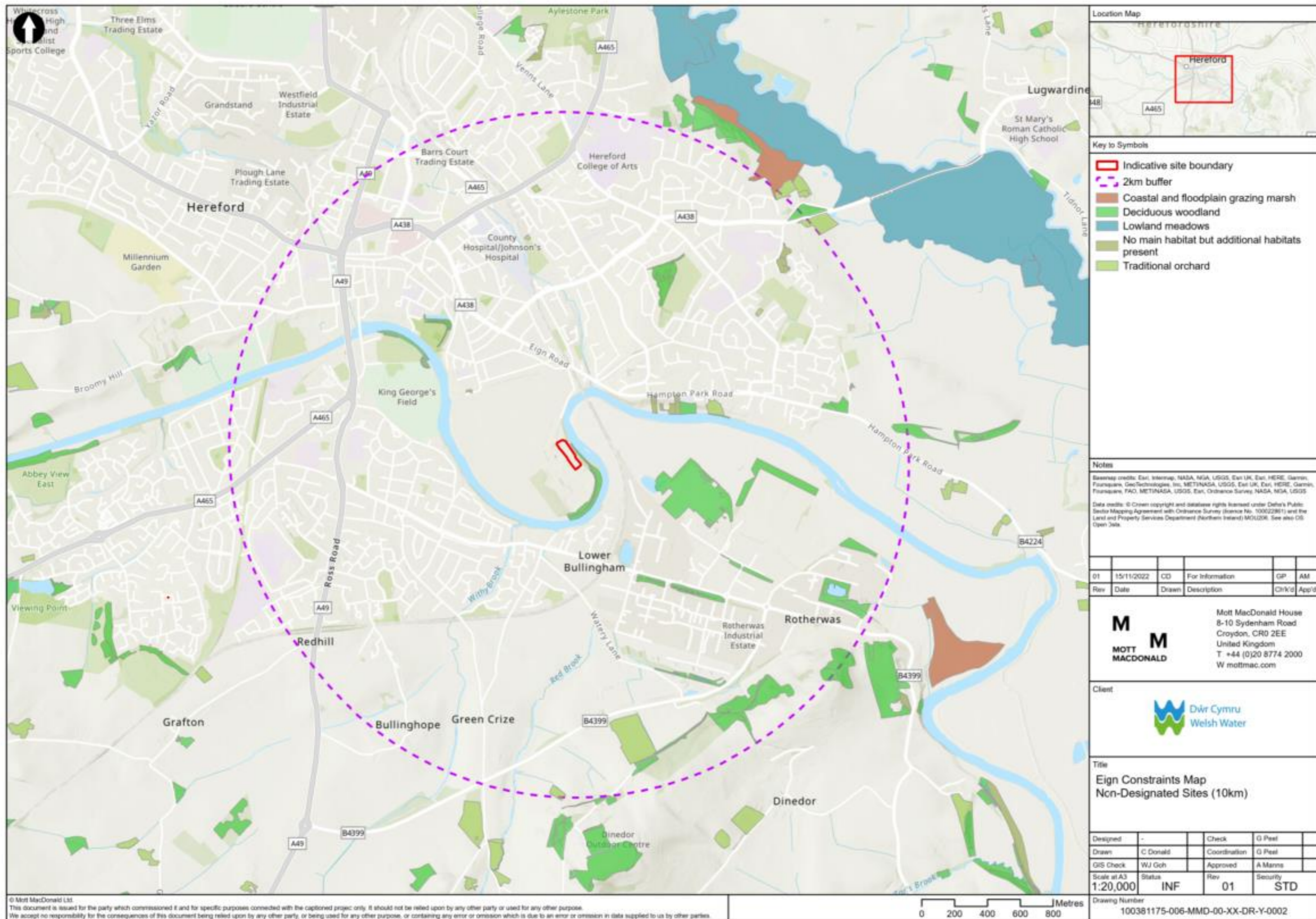
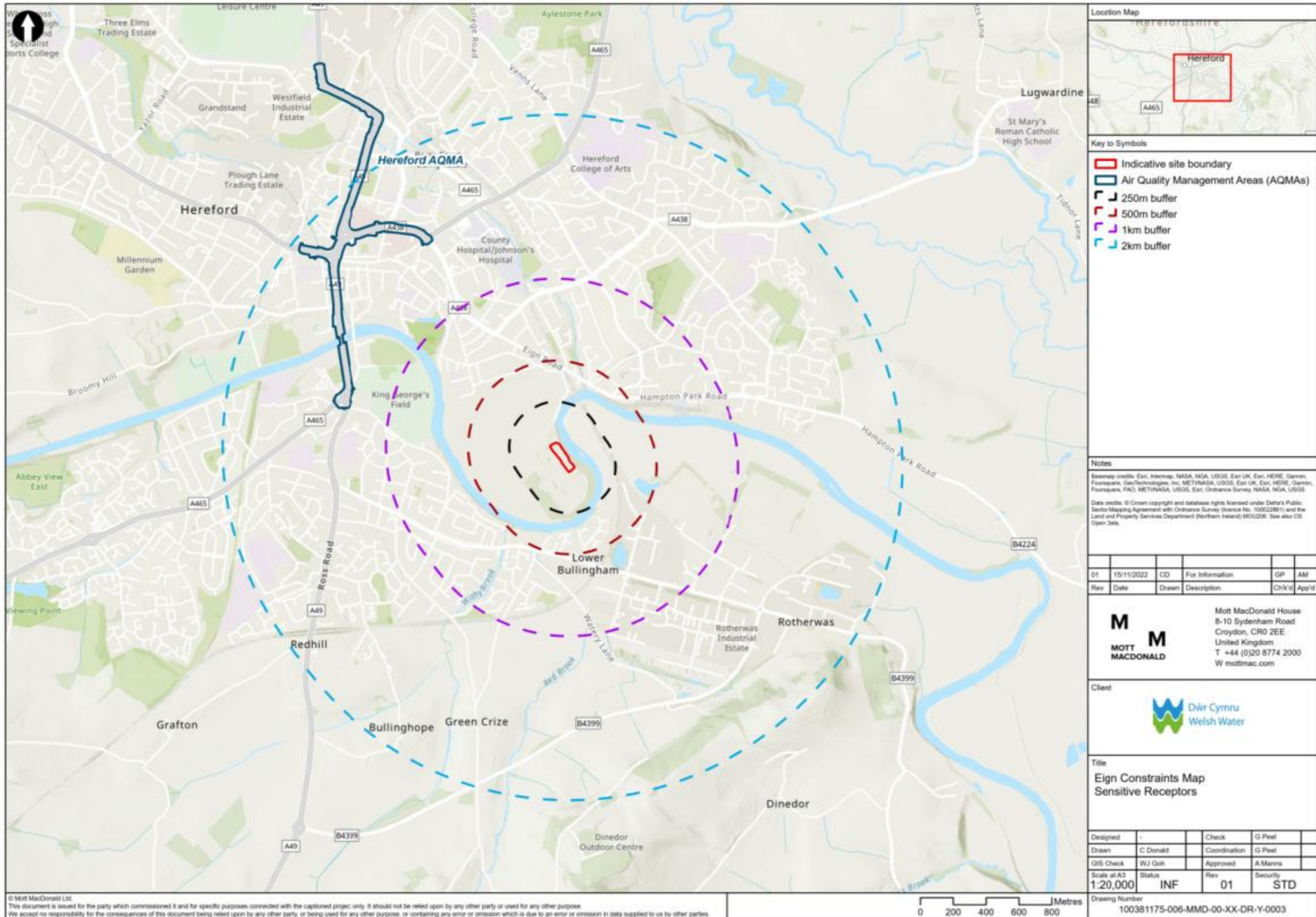


Figure A.3: Sensitive receptors within 1km of the Site



B. Environmental Risk Assessment Table

Emissions to air									
Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population	Releases of NO ₂ , SO ₂ , CO, H ₂ S, NH ₃ and other gases	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Medium	Low	<p>There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed.</p> <p>The nearest sensitive receptors to the site are residential developments which are located approximately 430m to the northeast of the site and 650m to the northwest. The nearest commercial/industrial facilities are located approximately 370m to the southeast of the Site.</p> <p>The Site has two Combined Heat and Power (CHP) units and boilers, as sources of air emissions.</p>	<p>Activities will be managed and operated in accordance with the EMS. This will include regular inspection and maintenance of associated equipment. Point source emissions to air will be monitored in line with the permit requirements and any relevant TGNs including M2 and will meet Monitoring Certification Scheme (MCERTS) standards.</p> <p>Storage of high ammonia bearing material will be covered at all times. Any emissions of substances harmful to human health not controlled by emission limits (excluding odour and noise) shall not cause pollution.</p> <p>As combustion activities are not being changed on Site as a result of the proposal and the CHP engines are already permitted, it is not anticipated that Air Quality Dispersion Modelling is required.</p> <p>The existing approaches and relevant procedures presented in the EMS and operational procedures are considered to adequately address the emissions that may present a risk, and, therefore, an EMP is not considered to be required.</p>	Low
Local human population	Release of biogas	<p>Harm to human health - respiratory irritation and illness by inhaling H₂S present in the biogas.</p> <p>Release of potent climate change gases.</p>	Air transport	Low	High	Medium	<p>There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed.</p> <p>There are two flares present on Site, which is used to burn excess biogas or when the CHP engine is down for maintenance. This activity is already permitted.</p> <p>The nearest sensitive receptors to the site are residential developments which are</p>	<p>Activities shall be managed and operated in accordance with the EMS and will include measures covering operation, inspection and maintenance of equipment, including engine management systems.</p> <p>Pressure relief valves are inspected daily, with date, time duration of pressure, relief events and calculated annual mass release recorded upon the pressure relief valves being used.</p>	Low

						located approximately 430m to the northeast of the site and 650m to the northwest. The nearest commercial/industrial facilities are located approximately 370m to the southeast of the Site.	The gas holder is equipped with a level transmitter which is used to determine the volume of biogas in the gas holder, where the level of the gas holder is a low low or a high high level, an alarm is raised on the SCADA system. Point source emissions to air will be monitored to ensure emission limits for biogas are not exceeded, in accordance with permit requirements and any relevant TGNs including M2.		
Domestic properties, local human population, local amenity, site staff, visitors and offices. Haul roads, public highways.	Releases of particulate matter (dust) when transporting cake off-site	Nuisance, loss of amenity.	Air transport then deposition	Low	Low	Low	Local residents and surrounding environment are often sensitive to dust. Dust may be produced from dirt deposits from vehicles or other users of the haul road and treatment. Digested cake is stored in a cake silo. The waste types used on-site are unlikely to cause dust emissions.	No wastes consisting solely of dusts are accepted. General operations at the Site do not create dusty materials. Vehicles, equipment and impermeable surfaces are swept and washed down when necessary. Internal roads are swept, as required, to reduce the likelihood of dust becoming airborne. There are no additional dust suppression techniques e.g. mist spray etc employed on Site as this is not considered necessary. Powdered polymer used in the thickening and dewatering activities has the potential to generate dust. All polymer is stored and used within a building which will contain dust emissions.	Low
Local human population.	Release of microorganisms (bioaerosols).	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Medium	Low	There are no sensitive human receptors within 250m of the Site boundary and the permitted waste is non-hazardous sludge in liquid and cake form. The nature of waste and the 'wet' processes undertaken on-site are not likely to cause a release of bio-aerosols. Potential for release at waste reception and maturation (handling and storage of cake).	Digested cake is stored in a cake silo and is enclosed. Multiple control measures are in place at the Site which restrict the Source-Pathway-Receptor link by reducing and containing emissions of bioaerosols from these processes. Key operations take place within a closed system, including covered tanks, pipework and machinery. The anaerobic digestion vessels are sealed and biogas is extracted from the vessels. This minimises the risk of bioaerosols affecting operational staff. Biofilters are regularly checked for efficiency. Odour control units are airtight and treats air released to remove	Low

Emissions to Water and Land				Judgement			Action (by permitting)		
Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
All surface waters close to and downstream of the Site.	<p>Tank failure, spillages of digestate and/or liquids including oil</p> <p>Damage to drainage system.</p> <p>Spillage of raw materials or sludge/liquor during delivery/storage</p> <p>Contaminated run off from cake storage e.g. containing suspended solids.</p>	Acute or chronic effects to aquatic life, contamination and deterioration of water quality.	<p>Direct run-off from the Site across ground surface, via surface water drains, ditches etc.</p> <p>Indirect run-off via the soil layer</p> <p>Transport through soil/groundwater then extraction/ abstraction at borehole or intake.</p>	Low	Medium	Low	<p>The River Wye is adjacent to the Site and the nearest sensitive receptor. However, the potential for spillage from digestion tanks and storage vessels is considered low and processes on-site are generally contained.</p> <p>Potential for leaks from digestion tanks, storage vessels/bays and drainage system which may cause contamination or deterioration of surface water quality.</p> <p>Permeable ground surfacing currently surrounds the digesters.</p> <p>Site infrastructure and hardstanding are generally in a good condition.</p> <p>Quantities of liquids and raw materials stored on Site are generally low.</p>	<p>The site drainage plan is documented, and all staff are trained in the event of emergency or accident.</p> <p>Impermeable surface and secondary containment, in the form of constructed bunds or portable bunds, is in place around storage areas of all wastes and raw materials and surrounding the STC and WWTW.</p> <p>All transfer of digestate and material takes place under supervision and with flow rate control.</p> <p>All tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives.</p> <p>Digestion tanks are built to an appropriate standard.</p> <p>Raw materials and liquids/chemicals are stored in suitable locations on-site and are appropriately bundled.</p> <p>Activities are managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the site diary including actions taken.</p> <p>Site Manager ensures the programme of Planned Preventative Maintenance is implemented effectively to minimise the probability of equipment malfunction.</p> <p>Control of substances hazardous to health (COSHH) assessment undertaken for all raw materials.</p> <p>All condensate from the CHP, flare stacks and biogas system</p>	Low

							<p>discharges into a sealed system and are returned to the head of the works.</p> <p>The condensate is clean, uncontaminated water and is small in quantity.</p> <p>Contaminated surface water is recirculated back to the head of the works.</p> <p>The stormwater drainage of potentially contaminated areas from within the Site boundary is recirculated into the head of the works.</p> <p>Regular inspections of the site drainage systems and other equipment are undertaken, with any repairs and maintenance carried out if necessary. All complaints and other incidents are recorded in the site diary including actions taken.</p> <p>An AMP will be implemented and followed to further reduce risks if incidents occur.</p>		
Groundwater, land and surface water	<p>Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids.</p> <p>Sludge/liquid spillages as a result of loss of tank/pipe integrity/ carelessness during transfer or overfilling</p>	<p>Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or abstraction intakes.</p> <p>Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.</p> <p>Pollution of water or land.</p>	Transport through soil/groundwater then extraction at borehole or intake.	Low	Medium	Low	<p>Potential for leaks from digestion tanks and storage vessels.</p> <p>Site infrastructure and hardstanding is generally in a good condition. Quantities of liquids stored are generally low.</p> <p>The superficial deposits of the Alluvium, River Terrace Deposits, and the bedrock geology of the Raglan Mudstone Formation, are designated as Secondary A aquifers, defined as "permeable layers capable of supporting water supplies at a local rather than regional strategic scale, and in some cases forming an important source of base flow to rivers"</p> <p>Quantities of liquids stored are generally low.</p>	<p>All sludge treatment processes are covered or enclosed.</p> <p>Existing impermeable hardstanding and vehicular barriers mitigate the risks from loss of containment.</p> <p>Spill kits are available near some of the chemical storage.</p> <p>All transfer of digestate and material takes place under supervision and with flow rate control.</p> <p>All primary tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives.</p> <p>Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of loss of tank/pipe integrity.</p> <p>Activities to be managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the site diary including actions taken.</p>	Low

								<p>All condensate is discharged into a sealed system and returned to the head of the works.</p> <p>An AMP will be implemented and followed to further reduce risks if incidents occur.</p>	
Groundwater, land and surface water	Damage to drainage system	Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Medium	Medium	Medium	<p>Presence of pipework below ground.</p> <p>There is no leak detection of underground pipework on the Site.</p>	<p>Site Manager ensures the programme of PPM is implemented effectively and inspections are carried out frequently to minimise the probability of damage to the drainage system.</p> <p>Activities to be managed and operated in accordance with the EMS.</p> <p>An AMP will be implemented and followed to further reduce risks if incidents occur.</p>	Medium
Groundwater, land and surface water	Flooding of Site	If waste is washed off site it may contaminate natural habitats downstream.	Flood waters	Low	Medium	Low	<p>Permitted waste types are sludges/bio-solids, which may contain pathogens, so any waste washed off site will add to the volume of the local post-flood clean up and may be hazardous to human health.</p> <p>The River Wye is located 5m north-east of the site boundary. The site is located within Flood Zone 3 – an area with a high probability of surface water flooding.</p> <p>Access to site floods at a river level of 5.2m, which occasionally happens during prolonged heavy rainfall events. This is not known to cause issues with site operations.</p>	<p>The drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters.</p> <p>Activities are managed and operated in accordance with a management system and management plans and procedures implemented, including (but not limited to) the removal and clean-up of spilled waste material, including sludge, cake etc. and other pollutants (this may also include removal of used spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.</p>	Low

Noise and Vibration									
Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population.	<p>Noise and vibration from the following activities:</p> <p>Vehicles delivering/ removing wastes and materials</p> <p>Vehicles arriving/ leaving the Site.</p>	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground.	Low	Medium	Low	<p>Local residents and site staff are often sensitive to noise and vibration.</p> <p>No sensitive human receptors within 250m of the Site boundary.</p>	<p>The Site will be operational 24/7 and limits vehicle speed to 15mph on site.</p> <p>The potential noise impacts of the Eign STC will be in a high-level assessment by way of a comparison of:</p>	Low

						<ul style="list-style-type: none"> • Predictions of noise impact based on reference measurements of the same types of equipment installed at similar facilities and a simple propagation model; and • Representative baseline noise levels obtained from published strategic noise maps <p>Site will only accept imports within existing operating hours (fully complying with Site's planning conditions). Vehicles do not exceed the site speed limit of 15mph and will not generate a great amount of noise.</p> <p>The main truck movements are away from residential housing and other sensitive receptors.</p> <p>Noise kept to a minimum during operating hours.</p> <p>Exceptional noisy operations e.g. construction – inform residents.</p> <p>Noise complaints to be investigated and actioned and remedial measures will be undertaken.</p> <p>All complaints are recorded in the site diary including actions taken.</p>			
Local human population.	<p>Noise and vibration from the following activities:</p> <ul style="list-style-type: none"> Waste treatment, processing. Plant boilers and engines. 	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground.	Low	Medium	Low	<p>Local residents and site staff often sensitive to noise and vibration.</p> <p>No sensitive human receptors located within 250m of the Site boundary.</p> <p>No noise complaints received.</p>	<p>The potential noise impacts of the Eign STC will be on a high-level assessment by way of a comparison of:</p> <ul style="list-style-type: none"> • Predictions of noise impact based on reference measurements of the same types of equipment installed at similar facilities and a simple propagation model; and • Representative baseline noise levels obtained from published strategic noise maps <p>Fans and condensate traps will be checked for water and fans and extraction systems checked.</p> <p>Flare usage kept to a minimum to reduce noise impact. The design has been developed to minimise noise off-site. The operator will maintain all equipment either in house or by a sub-contract such that noise and vibration are maintained</p>	Low

								<p>within the limits of the inputs to the sound model.</p> <p>All other STC site operations are either covered or enclosed.</p> <p>Noise and vibration shall be minimised and not cause nuisance.</p> <p>Where equipment is to be replaced choose quiet plant and the provision of silencing equipment.</p> <p>There is no equipment on-site that can cause vibration nuisance at the local receptors. Nonetheless, equipment is turned off when not in use, where appropriate.</p> <p>Any complaints received are investigated and actioned in line with the complaint's procedure.</p> <p>All complaints are recorded in the site diary including actions taken.</p>	
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Odour									
Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population.	Odour from site activities	Nuisance, loss of amenity (e.g. disruption during outdoor activities)	Air transport then inhalation.	Medium	Medium	Medium	<p>Local residents and staff sensitive to odour. The nature of the waste may cause odour issues during reception of wastes, from release of biogas and from digestate, hence control measures have been adopted.</p> <p>There are no residential sensitive receptors within 250m of the Site boundary.</p>	<p>Emissions shall be free from odorous compounds. Non-point source emissions of biogas shall be minimised using appropriate measures.</p> <p>Odours are likely to be generated and released due to nature of the wastes.</p> <p>All sludge treatment activities are undertaken in enclosed buildings or tanks.</p> <p>The Site has one odour control unit (OCU). This is a two-stage treatment system, with a biofilter as the first stage and carbon polishing filter as the second stage. The system also has duty and standby fans with a design flow rate of 1.5m³/s. The OCU extracts from the sludge thickening building and sludge balance tanks. Media life and condition is reviewed on a regular basis although it is anticipated that media should last a minimum of two years.</p> <p>All abatement systems are designed, monitored and maintained</p>	Low

		<p>to treat specified emissions and off gases. Other odour mitigation measures implemented on-site include placing covers on containers, limiting the height of rising sludge.</p> <p>Using appropriate measures, non-point source emissions of biogas shall be minimised. All available measures and Best Available Techniques will be implemented. All abatement systems are designed, monitored and maintained to treat specified emissions and off gases.</p> <p>Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution.</p> <p>All storage tanks are covered or enclosed. All sludge is processed as soon as it is discharged to the STC.</p> <p>Olfasense have conducted a quantitative odour impact assessment and for the STC.</p> <p>DCWW, with support from Olfasense, have developed an odour management plan (OMP), based on the outcome of this assessment, in accordance with the H4 guidance.</p> <p>In addition, DCWW have requested Olfasense to support site operation teams to undertake regular checks on the OCU's for the first 6 months, so they understand what checks and NRW reporting is required in the future.</p> <p>Digested cake is stored in a cake silo which is enclosed.</p> <p>All waste is imported and exported in covered lorries or contained in tankers.</p> <p>Any complaints received are investigated and actioned in line with the complaint's procedure.</p>	
<p>Local human population, domestic properties, site offices.</p> <p>Spillage of odorous materials including oils, fuels, chemicals.</p> <p>Failure to clean up spillages.</p>	<p>Nuisance, loss of amenity.</p> <p>Air transport then inhalation.</p>	<p>Local residents and staff often sensitive to odour.</p> <p>Waste processes on-site are generally conducted within sealed units.</p> <p>Procedures for dealing with spillages are covered in the EMS.</p> <p>The Site Manager shall ensure all relevant staff are appropriately trained to use the spill kits and that</p>	<p>Low</p>

Contaminated spill equipment not disposed of appropriately.							Accidental major spillages are unlikely to occur and cause an odour nuisance.	<p>all spillages are cleaned up immediately.</p> <p>All areas of the Site are to be cleaned regularly; Site Manager to oversee regular cleaning schedule, all staff trained on importance of good housekeeping and site cleanliness.</p> <p>All spills are recorded in the site diary including actions taken.</p>	
Local human population, domestic properties, site offices	Fugitive release of H ₂ S	Nuisance, loss of amenity	Air transport then inhalation.	Low	Medium	Low	<p>Local residents and staff often sensitive to odour.</p> <p>Fugitive release, not expected to occur under normal operating conditions.</p>	<p>Activities are managed and operated in accordance with the EMS (and include inspection and maintenance of equipment, including engine management systems). H₂S point source emissions to air are controlled in accordance with emission limits.</p>	Low
Litter, mud and debris									
Data and information				Judgment			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population, livestock and wildlife, domestic properties and local amenity.	<p>Waste and litter on local and internal roads.</p> <p>Vehicles entering and leaving Site.</p>	Nuisance, loss of amenity and road traffic accidents.	Air transport then deposition.	Low	Low	Low	<p>Local residents, surrounding environment and animals sensitive to litter.</p> <p>There is some potential for litter to be generated from general site activities but limited potential for it to leave the site boundary.</p> <p>Sludge that is delivered to the Site is transported in tankers.</p>	<p>All vehicles leaving the Site which are transporting waste are to be covered to prevent waste/materials being blown from them.</p> <p>All waste produced from general site activities is kept in enclosed containers, or inside a building, prior to removing from site. Grit and screenings are stored in skips associated with relevant infrastructure. All waste is removed by an external contractor when required.</p> <p>Regular inspections for litter and debris are undertaken.</p> <p>Nuisance management measures are included in the EMS and the site-specific management plan.</p>	Low
Local human population.	Vehicles depositing mud and debris arriving/ leaving the Site.	Nuisance, loss of amenity, road traffic accidents.	Vehicles entering/ leaving the Site.	Low	Low	Low	<p>Road safety issues – local residents often sensitive to mud on the road.</p> <p>Limited potential for mud and debris.</p>	<p>Activities shall be managed and operated in accordance with a site-specific management plan with overarching procedures set out in the EMS.</p>	Low

							Waste is either pumped onto site or transported in sealed tanks or containers.	<p>Any mud or sludge arising from activities on-site is cleared up promptly.</p> <p>There are no wheel washing facilities on the Site, but vehicles can be washed down with hoses and impermeable surfaces are swept and washed down, when necessary.</p> <p>Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution.</p> <p>Vehicle routes are to be inspected regularly and swept when necessary.</p> <p>All vehicles leaving the Site, transporting waste/ cake are to be covered to prevent waste/materials being blown from them.</p>	
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Pests

Data and information **Judgement** **Action (by permitting)**

Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population.	Vermin, birds and insects	Harm to human health from wastes carried off-site and faeces. Nuisance and loss of amenity.	Air transport and over land.	Low	Low	Low	<p>Permitted wastes are unlikely to attract scavenging animals and birds but may become nesting / breeding sites.</p> <p>The waste types handled on-site do not attract pests and contractors regularly check the Site for pests.</p>	<p>Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented.</p> <p>Pest control measures are implemented. The Site has four visits per year, by a contractor (once a quarter). Rat boxes are used around the Site, where appropriate.</p> <p>All reports of pests are sent to the contractor who will investigate and report findings and outcomes and detail any actions required.</p> <p>Ensure waste cannot be accessed by scavengers. All waste produced from general site activities is kept in enclosed containers, or inside a building, prior to removing from Site. Doors of buildings are to remain closed at all times when not in use.</p> <p>Regular inspection and maintenance of boundary fencing and buildings is carried out to prevent access to the Site.</p> <p>Well established and proven operational controls and procedures</p>	Low

Human health and environmental safety				Judgement			Action (by permitting)		
Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population and /or livestock after gaining unauthorised access to the installation.	All on-site hazards: machinery, tanks, wastes and vehicles.	Bodily injury Risk of drowning	Direct physical contact.	Low	Medium	Low	<p>Potential injury to on-site personnel as a result of vehicle movements or equipment malfunction or misuse.</p> <p>Direct physical contact is minimised by activity being carried out within enclosed digesters, so a low magnitude risk is estimated.</p> <p>Access to storage tanks is probable with a risk of drowning.</p> <p>Contact with waste is minimal with exception of leaks or spills from unloading of tanker and transfer of filter cake.</p>	<p>All operational staff are fully trained in the site operating procedures and safety and environmental management procedures and are kept up to date on changes.</p> <p>Training includes awareness raising of the potential on-site hazards and health and safety measures to adhere to.</p> <p>Activities are managed and operated in accordance with the EMS – this includes site security measures to prevent unauthorised access.</p> <p>No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification.</p> <p>Lighting is provided at all reception facilities to give good visibility at all times of the day and night.</p> <p>Access to the Site is restricted by a 2.4m mesh fence and a second 1.8m chain link fence. Access to the site is through a 3m cantilever mesh which requires authorised key cards to open and is fitted with an intercom system for visitor access. The Site also benefits from a CCTV system, and intruder detection alarms which covers the Site entrance and access road.</p>	Low
Local human population and local environment.	Explosion of biogas and AD causing the release of polluting materials to air (smoke or fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land.	<p>Air transport</p> <p>Direct run-off from site across ground surface, via surface water drains, ditches etc.</p> <p>Indirect run-off via the soil layer</p>	Low	High	Medium	<p>Emissions to air, land or water may cause harm to and deterioration of air, land or water.</p> <p>Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff.</p> <p>An explosion could cause injury to local residents and site staff from flying debris.</p>	<p>Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings.</p> <p>The key sludge treatment and WTW processes are undertaken within enclosed systems such as the AD and biogas systems.</p>	Low

		Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Transport through soil/ groundwater then abstraction.				Permitted waste types limited to sludges and liquids.	Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes site security measures to prevent unauthorised access. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification.	
Local human population and local environment	Explosion of pressurised tanks due to equipment and/or process failure.	Respiratory irritation, illness and nuisance to local population. Fatality/injury to staff, fire fighters. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.		Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke, fumes and material released from tanks may cause irritation, illness or nuisance to local residents and site staff. Impact from the tank explosion may cause external damages to other equipment, buildings located close to the epicentre of the explosion.	Fire detection equipment is installed in the CHP containers and the boiler building which activates an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. The EMS includes procedures relating to maintenance and inspection of bunding of tanks. Site Manager shall ensure the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Emergency operating procedures are in place and detailed in the Site's Operational Continuity Plan. An accident management plan is part of the EMS and includes measures for security, fire and spill management. Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of tanks. Smoking only permitted in designated areas. An AMP will be implemented and followed to further reduce risks if incidents occur.	Low
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc.	Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water.	The key sludge treatment and WwTW processes are undertaken within enclosed systems such as the AD and biogas systems.	Low

Equipment failure	<p>Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land.</p> <p>Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.</p>	<p>Indirect run-off via the soil layer</p> <p>Transport through soil/ groundwater then abstraction.</p>				<p>Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff.</p> <p>Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings.</p> <p>Risk of accidental combustion of waste is minimal.</p> <p>Permitted waste types limited to sludges and liquids.</p>	<p>Activities are managed and operated in accordance with the EMS, H&S and O&M manuals including, fire and spill management</p> <p>Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers.</p> <p>A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual.</p> <p>Smoking is only permitted in designated areas.</p> <p>Firewater is diverted through the drainage system to the head of the works to be contained on site and treated through the wastewater treatment system.</p> <p>Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents.</p> <p>Site Manager shall ensure the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions.</p> <p>Emergency operating procedures are in place.</p> <p>An AMP will be implemented and followed to further reduce risks if incidents occur.</p>	
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<p>Local human population and local environment.</p>	<p>Arson and/or vandalism causing the release of pollution materials to air (smoke and fumes), water or land</p>	<p>Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or vandals/arsonists.</p> <p>Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land.</p> <p>Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.</p>	<p>Air transport</p> <p>Spillages and contaminated firewater by direct run-off from site across ground surface, via surface water drains, ditches etc.</p> <p>Indirect run-off via the soil layer</p> <p>Transport through soil/ groundwater then abstraction.</p>	<p>Low</p>	<p>Medium</p>	<p>Medium</p>	<p>Emissions to air, land or water may cause harm to and deterioration of air, land or water.</p> <p>Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff.</p> <p>Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings.</p> <p>Risk of accidental combustion of waste is minimal.</p> <p>Permitted waste types limited to sludges and liquids.</p>	<p>The key sludge treatment and WwTW processes are undertaken within enclosed systems such as the AD and biogas systems.</p> <p>Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes site security measures to prevent unauthorised access, fire explosions and spill management. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification.</p> <p>Access to the Site is restricted by a 2.4m mesh fence and a second 1.8m chain link fence. Access to the site is through a 3m cantilever mesh which requires authorised key cards to open and is fitted with an intercom system for visitor access. The Site also benefits from a CCTV system, and intruder detection alarms which covers the Site entrance and access road.</p> <p>Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers.</p> <p>A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual.</p> <p>Firewater is diverted through the drainage system to the head of the works to be treated through the wastewater treatment system.</p> <p>Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of</p>	<p>Low</p>
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Local human population and local environment.	Operator Error	Pollution to air, land, surface water and groundwater and human health	<p>Air transport</p> <p>Direct run-off from site across ground surface, via surface water drains, ditches etc.</p> <p>Indirect run-off via the soil layer</p> <p>Transport through soil/ groundwater then abstraction.</p>	Low	Medium	Low	<p>Possible contamination to air, land, groundwater and surface water.</p> <p>Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented.</p> <p>All equipment is checked under preventative maintenance plans and is checked and calibrated as per the manufacturer's instructions.</p> <p>Overall management of the site is overseen by an experienced member of staff with relevant technical competence to operate the activities at the Site, in the form of a Competency Management System (CMS). This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours.</p> <p>All operational staff are fully trained in the site operating procedures and safety and environmental management procedures and are kept up to date on changes.</p> <p>Training includes awareness raising of the potential implications of failure to control operations and the potential impact on the environment.</p>	Low

Human health and environmental safety									
Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Protected nature conservation sites - European and national designated sites	Any, but principally NOx	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	Low	Low	Physical disturbance and emissions to air, water or land may cause harm to and deterioration of nature conservation sites. There are a number of European designated sites, located within 10km of the Site, (identified in Appendix A1) so potential impacts on receptors are likely.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Storage of high ammonia bearing material will be covered at all times. Emission limits for stack gases are specified.	Low
Protected species, including nesting birds, wintering birds, common reptiles, terrestrial and aquatic invertebrates, common amphibians, bats, badgers, hazel dormice and great crested newts	Any, but principally NOx	Harm to protected species through the disturbance or removal of habitats		Low	Low	Low	Physical disturbance and emissions to air may cause harm to protected species. No changes to Site operations are proposed as part of the application.	BAT and appropriate additional mitigation measures set out in the EMS have been taken to prevent or where that is not practicable, to minimise, those emissions. An AMP will be implemented and followed to further reduce risks if incidents occur.	Low

