MOTT MACDONALD

Canterbury Sludge Treatment Centre Environmental Permit Application

Environmental Risk Assessment
790101_ERA_CAN

February 2024

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Issue and Revision Record

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A	September 2021	Natalia Cunningham	Shannon Stone	Anita Manns	First draft
B	October 2021	Natalia Cunningham	Shannon Stone	Anita Manns	Second draft
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Contents

Tables

1 Introduction

1.1 Background and scope

This document has been prepared to support the application for the substantial variation of Environmental Permit EPR/NP4698HN into a bespoke Waste Installation Environmental Permit (hereafter referred to as 'the Permit'), for the Canterbury Wastewater Treatment Works (WTW) and Sludge Treatment Centre (STC) ('the Site') on behalf of Southern Water Services Limited ('Southern Water') or 'the Operator'). The Site also holds T21, S1, S2, U6 and D5 exemptions.

As part of the application for an 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 Site in accordance with the Environment Agency's 'Risk assessment for your environmental permit'[1].

1.2 Assumptions and limitations

The assessment of effects has been based on information sourced from relevant and applicable legislation, guidance and websites. It is assumed that all guidance documents produced by the Environment Agency are up to date and correct at the time of writing.

[1] Environment Agency (2023) Risk assessments for your environmental permit. Available online at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

2 Site setting

2.1 Location

Activity address: Sturry Road, Canterbury, Kent CT2 0AA

National grid reference: TQ 1680 5970

A plan outlining the boundary of the scheme is provided in 790101_MSD_SiteLayoutPlan_CAN February 2024.

2.2 Geology

The Site is underlain by superficial deposits of Alluvium, associated with the Great Stour river. Alluvium is normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel.

The bedrock geology consists of the Thanet Formation, this comprises glauconite-coated, nodular flint at its base, overlain by pale yellow-brown, fine-grained sand that can be clayey and glauconitic. Rare calcareous or siliceous sandstones may be present. Underlying the Thanet Formation if the White Chalk subgroup.

2.3 Hydrogeology

The superficial deposits of the Alluvium, encountered underlying the Site, have been designated as a Secondary (undifferentiated) aquifer. These aquifers are defined by the Environment Agency as layers that were previously designated as both minor and non-aquifer units in different locations due to the variable characteristics of the rock type.

The bedrock geology of the Thanet Formation underlying the Site is designated as a Secondary A aquifer, defined by the Environment Agency as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. This is likely in hydraulic continuity with the deeper Principal aquifer of the Chalk.

2.4 Hydrology

An outflow from ponds/wetland in the northwest of the Site flows in the Great Stour river, 15m north of the Site area. A second drain is marked to flow off-site from the south east corner, flowing east along Sturry Road (A28) and joins the Great Stour 475m east of the Site.

Off-site natural streams/ditches are present all leading into the Great Stour.

The entire Site area is located within Flood Zone 2 (between 1 in 100 and 1 in 1000 annual probability of flooding).

There are no water abstractions reported to have been issued within 250m of the Site area.

2.5 Protected Areas

The European designated habitat sites located within 10km of the Site include:

- Blean Complex Special Area of Conservation (SAC), 4km from the Site;
- Tankerton Slopes and Swalecliffe SAC, approximately 8km from Site;
- Stodmarsh SAC, Special Protection Area (SPA) and Ramsar site, 1.2km from the Site;

- Outer Thames Estuary SPA, approximately 8.6km from Site;
- The Swale SPA and Ramsar site, 8.7km from the Site; and
- Thanet Coast and Sandwich Bay SPA and Ramsar site, 7.9km from the Site.

The national statutory designated sites located within 2km of the Site are as follows:

- West Blean and Thornden Woods Site of Special Scientific Interest (SSSI), approximately 532m from Site;
- Chequers Wood and Old Park SSSI, 543m from the Site;
- Sturry Pit SSSI, 994m from the Site;
- Stodmarsh SSSI, 1km from the Site;
- Shelford/Beecham Woods Ancient Woodlands, 431m from the Site;
- Little Hall and Kemberland woods Site of Importance for Nature Conservation (SINC), 933m from the Site;
- Great Stour River, Ashford to Fordwich SINC is present on-site;
- Brickhouse Wood SINC 933m from the Site; and
- Trenley Park Wood, Fordwich SINC 1.5km from the Site.

The priority habitats within 2km of the Site are listed below;

- Deciduous woodland, 59m from the Site;
- Good quality semi-improved grassland, 395m from the Site;
- Lowland dry acid grassland, 544m from the Site;
- Lowland fens, 1km from the Site;
- Undefined priority habitat 1km from the Site;
- Reedbeds, 1.2km from the Site; and
- Traditional orchard, 508m from the Site.

Further discussion on impacts to natural habitats and ecology is provided in section 3.2.9 and Appendix B.

2.6 Other notable features

2.6.1 Properties

As shown in Figure A.4 in Appendix A, the closest potentially sensitive human receptors is a car dealership, there are also two residential areas located within 500m of the Site.

3 Environmental risks

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. This matrix is shown in Table 3.3 and is intended to illustrate the general approach to scoring.

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

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		
Severity index	**Low**	**Medium**	**High**
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

3.2 Risk assessment

3.2.1 Introduction

This section of the report identifies the potentially sensitive receptors within the vicinity of the Site and assesses the environmental 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 C. 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

An Air Quality Risk Assessment has been undertaken to assess the impacts from point sources emissions to air from the Site (document reference 79101_AQRA_CAN February 2024.

The operation of the flare will be prioritised for during emergencies only, 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 annually.

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.

3.2.2.2 Bio-aerosols

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.

The sensitive receptors in relation to the Site are shown in Appendix B. The Site lies within 250m of two sensitive human receptors therefore, a bioaerosols risk assessment has been undertaken and is provided with the supporting documents of the permit application (Document 790101_ERA_BioaRA_CAN February 2024).

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 bioaerosol risk assessment concluded that the Site poses an acceptable level of risk of bioaerosol release and the STC activities do not endanger human health or the environment. This is primarily due to the control measures in place at the Site which are considered to be effective at reducing and containing emissions of bio-aerosols, inhibiting the pathway between source and receptor. Subsequently, since the Site is found to be low to medium risk, a Bioaerosol Management Plan is not required.

Best practice methods will be followed, during operation of the Site, 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” and are described in Appendix B.

3.2.2.3 Abatement of other fugitive emissions to air

Environment Agency best practice guidance 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 the potential point source and fugitive emissions to water, sewers, land or groundwater is provided in Appendix B.

The Substantial Pollution Incident register in Landmark's Envirocheck report (Reference No: 281423046_1_1) has been used to provide details of the pollution incidents within the past five years. According to the report there has been no substantiated pollution incidents recorded within 250m of the Site within the last five years. Two Category 3 pollution incidents (minor incidents) were recorded in the Operator's pollution incident report in the last five years (2019-2023), Both incidents were recorded in 2019, however, the incidents have been confirmed as not substantiated or related to the STC.

3.2.3.1 Emissions to water (other than sewers)

Two pollution Category 3 (minor incident) were recorded in the Southern Water's pollution incident report in 2019. However, both incidents have been confirmed as not substantiated or related to the STC.

The Site is located within an area with potential for groundwater flooding of property situated below ground level. The entire Site area is located within Flood Zone 2 (between 1 in 100 and 1 in 1000 annual probability of flooding), and is located in an area with potential for extreme flooding from rivers or sea without defences.

The drainage from the Site is rerouted to the head of the works. There are no direct potentially contaminated discharges to controlled surface waters.

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

There are no direct potentially contaminated discharges to groundwaters.

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 Canterbury WTW and will undergo treatment through the works before being discharged under an existing water discharge permit. On-site WTW effluent will meet the requirements of the existing discharge permit. 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 WTW.

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 WTW. A drainage plan of the Site is presented in document reference 790101_MSD_DrainagePlan_CAN.

The stormwater drainage of potentially contaminated areas from within the Site boundary will be routed into the sewage treatment process with no discharge outside of the Site. There will therefore be no risk of polluted runoff affecting off-site features due to the creation of a new hardstanding area.

Due to the anticipated very low levels of contamination of the water and the volumes involved, no monitoring of its composition is proposed prior to discharge to the WTW.

Any areas of the Site, where there is a risk of contamination of surface water, groundwater or discharge of process waters are located on impermeable concrete surface. All surface water from these areas drain to the WTW internal drainage system and are returned to the head of the works for treatment prior to discharge as final effluent.

3.2.3.3 Emissions to land

There will be no point source emissions to land as part of the activities carried out on-site.

Condensate is collected in condensate pots which return to the inlet, CHP condensate is collected in a container.

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 considered to be negligible, therefore, due to adequate containment of the materials within suitable storage vessels, the provision of bunding and the presence of a contained drainage system.

3.2.4 Noise and vibration

The Site has received one noise complaint in the last five years. The complaint was received in 2021.

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. 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.4 of Appendix A.

Since noise and vibration impacts are considered to be appropriately mitigated in the ERA, a Noise and Vibration Management Plan is also not considered to be required.

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. Three are located within 500m as shown in Figure A.4 in Appendix A.

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

The Site has received two odour complaints in the last five years from 2019 to 2023, in 2021 and 2022. The complaints were from two properties, one property per complaint.

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.

The Site has an Odour Management Plan (OMP), amended in February 2024, which identifies potential odour emissions from Site operations and procedures to manage, control and minimise odour impacts. It sets out the procedures for engaging with neighbours and how the Operator will manage complaints, and the actions to be taken in the case of pollution events. The OMP also describes the monitoring and maintenance procedures to maintain the control measures.

The OMP was written in accordance with the Environment Agency's H4 Odour Management guidance (2011). The level of odour risk from the Site is considered to be low, as shown in Appendix B and the OMP provides sufficient mitigation. The Odour Management Plan can be found in document reference 790101_ERA_OdourMP_CAN February 2024.

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 (EMS308) 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
- Within 250m of a sensitive receptor when treating biowaste

The key sludge and wastewater treatment processes of the Site are enclosed. Sludge cake is understood to be stored in the open in minor quantities on the Site, but mitigation is in place to prevent dust emissions from presenting a risk (see Appendix B).

Although the Site has been screened as being within 500 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.

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 experiences the following pests; seagulls, pigeons, rats, rabbits and foxes. A pest contractor performs monthly Site visits for rat and pigeon control.

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 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

The Site has been in the current location since the 1960s. The Site is generally surrounded by external hedges and trees which are 10-25ft in height. The largest feature on-site is the storm tank, which is located in the south-west corner. The site is located 2.75km to the northeast of

the centre of the town of Canterbury. To the north, the Great Stour river is located approximately 15m north of the site area, and beyond this, the South Eastern railway is located 150m north of the site, with grazing fields between. Immediately adjacent to the west of the site area, the Vauxhall Industrial Estate is present, including a steel stockpiling centre located immediately adjacent to the site. To the south of the site, a park and ride area is located 70m away with a park adjacent. To the east of the site is a car dealership, with agricultural fields beyond, including an agricultural development comprising greenhouses 180m east of the site area.

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 management system. Access to Site and waste is restricted by 2m high chain link security fencing with barbed wire top in the east of Site to the north of the aeration lane and in the south of Site, and palisade fencing in the west of the Site. The river which borders the north and eastern parts of the Site also acts as a natural barrier. 2m high dual swing manual metal entry gates secure the main access and are closed at all times when not in use and locked out of hours. The Site is staffed 0700-2000 Monday-Friday and 0700-1700 on weekends. The Site also benefits from a CCTV system (normal and thermal), with cameras positioned in key locations around the Site, including one Automatic Number Plate Recognition (ANPR) camera on the main gate. 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. Repairs are undertaken in accordance with the EMS requirements.

Other risks relating to human health and the environment are presented in Appendix B.

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 the Environment Agency and relates to the flood risk from surface water, rivers and the sea.

The Site is located within an area with potential for groundwater flooding of property situated below ground level. The entire Site area is located within Flood Zone 2 (between 1 in 100 and 1 in 1000 annual probability of flooding), and is located in an area with potential for extreme flooding from rivers or sea without defences

The drainage from the Site is rerouted to the head of the works. There are no direct potentially contaminated discharges to controlled surface waters.

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.

There has not been any reported flooding issues from the Site in the last five years.

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 (defined here as a detailed assessment involving bespoke hydraulic modelling work) is unlikely to be required. When proposed changes to the Site do occur these are understood to be either of a relatively minor nature or are unlikely to significantly alter existing development footprints.

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), Kent Wildlife Trust Reserves 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), data from Kent Wildlife Trust (KWWT), Kent & Medway Biological Records Centre (KMBR). 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.

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 Canterbury STC

Natural habitats and ecology	Canterbury
Statutory designated European sites within 10km of the site boundaries	
Special Areas of Conservation (SAC)	3
Special Protection Areas (SPA)	4
Sites of Community Importance (SCI)	
Ramsar sites	3
Statutory designated national sites within 2km of the site boundaries	
Sites of Special Scientific Interest (SSSIs)	4
Marine Conservation Zones (MCZs)	
National Nature Reserves (NNRs)	
Local Nature Reserve (LNRs)	
Areas of Outstanding Natural Beauty (AONBs)	
Non-statutory designated sites within 2km of the site boundaries	
Local Wildlife Sites (LWS)	

Ancient Woodlands	1
Country Parks	
Sites of Importance for Nature Conservation (SINC)	4
Kent Wildlife Trust Reserves	1
Priority habitats within 2km of the site boundaries	
Priority habitats	7
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 boundaries	
Species of nesting birds within a 200m buffer of the site boundaries	
Bats: within a 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 a 500m buffer of the site boundaries and terrestrial habitat within 10m	

Three SACs, four SPAs and three Ramsar sites are located 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.

There are four SSSIs within 2km of the Site, the closest of which is West Blean and Thornden woods located 532m from the Site.

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 and groundwater, 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.

One ancient woodland, four SINCs and seven priority habitats are located within 2km of the Site. In particular, Great Stour River, Ashford to Fordwich is located on-site. It is considered unlikely that Site activities will impact these habitat sites however. This is covered in Appendix B along with appropriate mitigation.

It is considered 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.

The application is to permit anaerobic digestion activities in order to meet the Industrial Emissions Directive (IED). The site has been operating in its current capacity for a number of years and mitigation measures already in place directly or indirectly prevent or limit harm to existing habitats and species, as shown in Appendix B. No changes to operations are proposed

and therefore the current risks posed to these habitats and species are likely to improve upon granting of the permit.

A. Environmental Constraints Maps

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

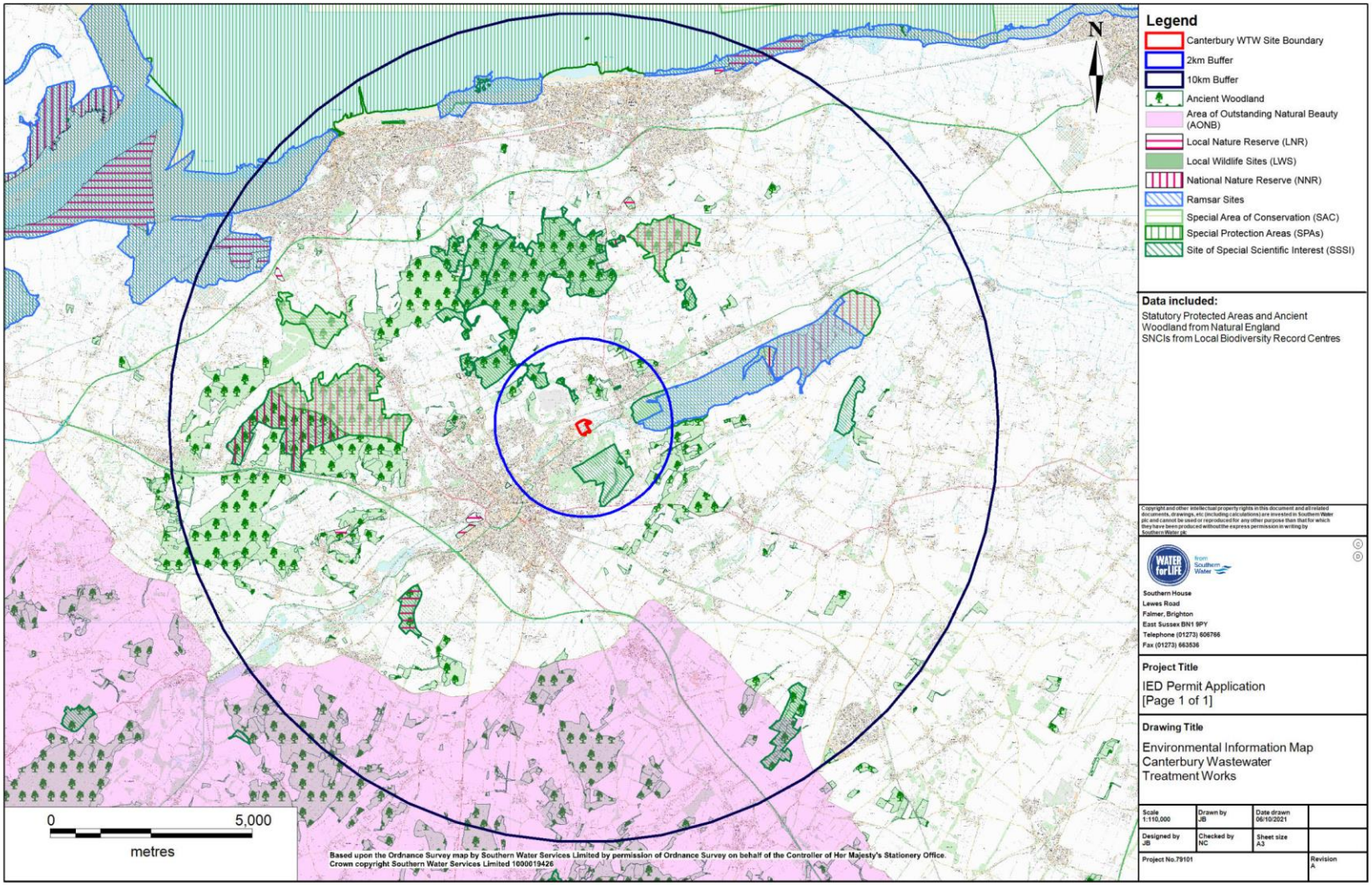


Figure A.2: Non-statutory designated habitat sites within 2km of the Site

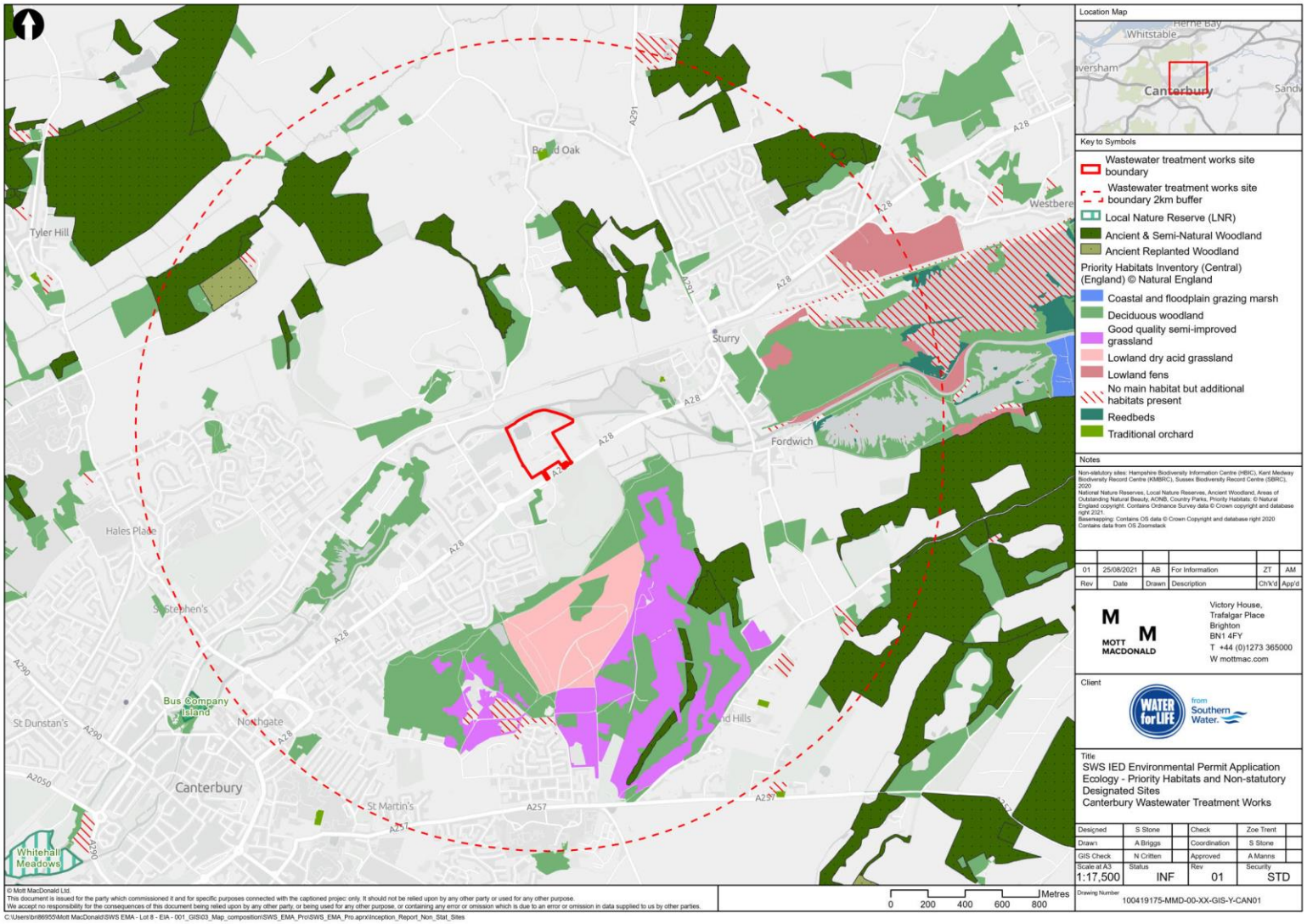


Figure A.3: Designated heritage sites within 1km of the Site

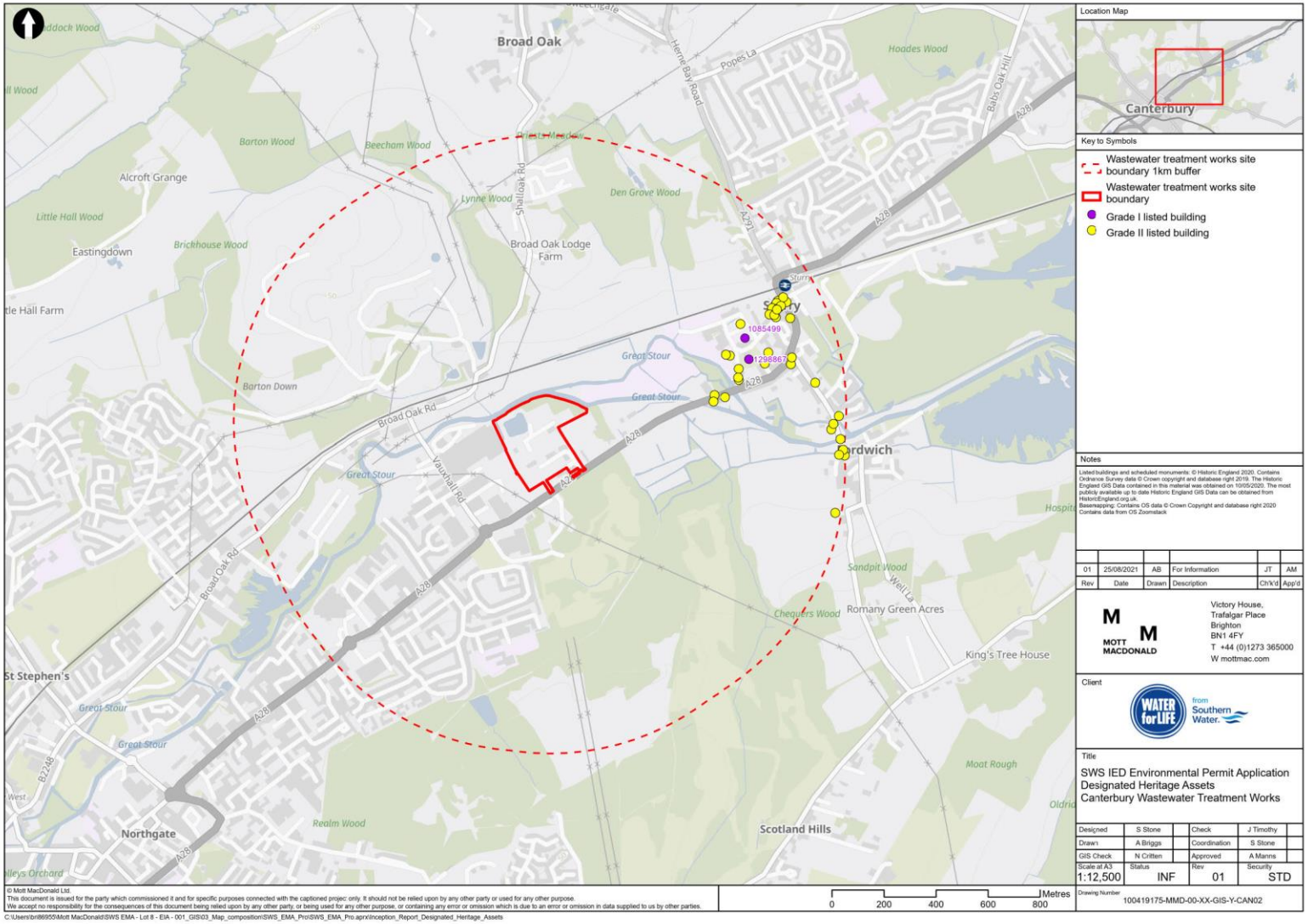
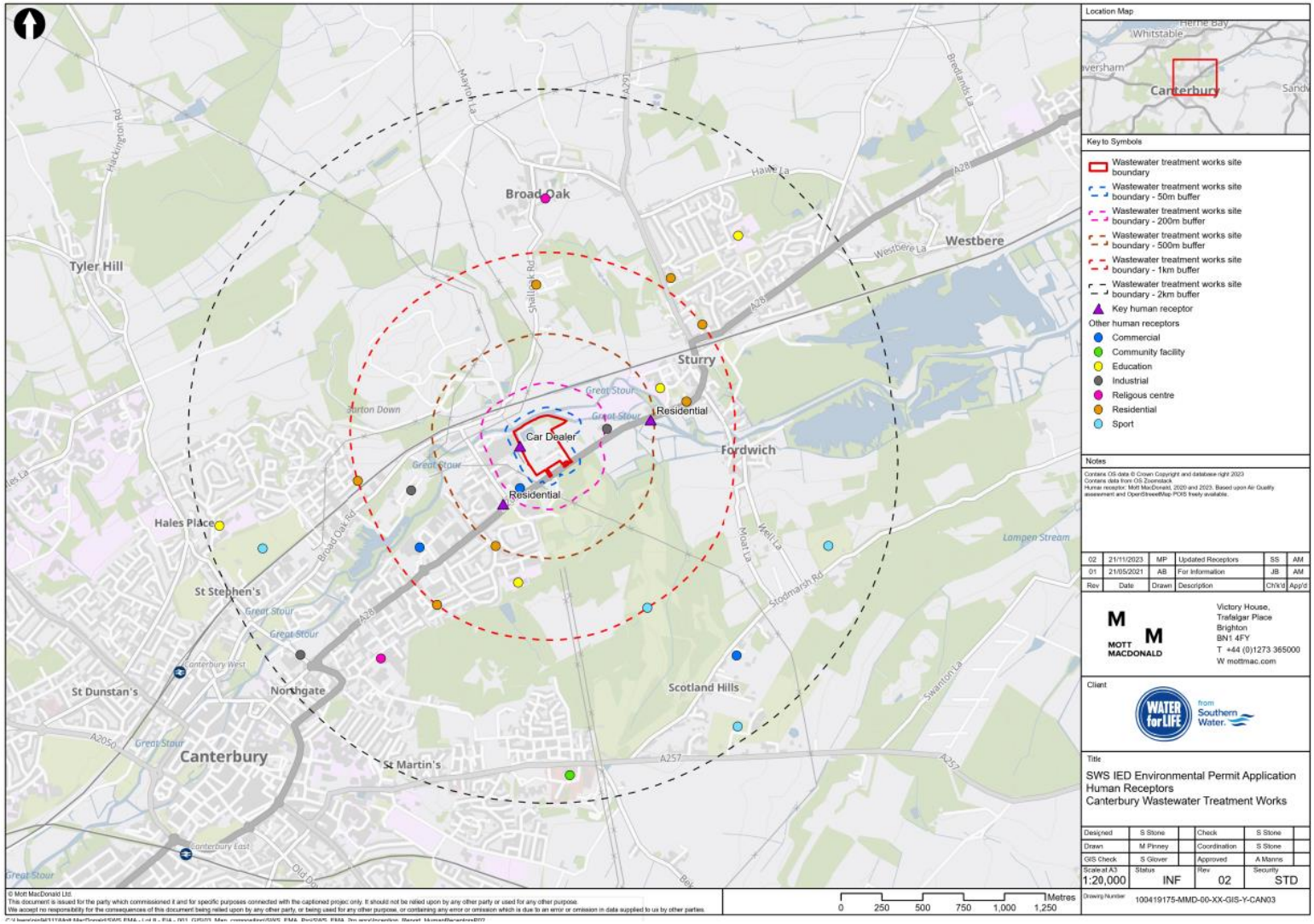


Figure A.4: Sensitive receptors within 2km of the Site



B. Environmental Risk Assessment Tables

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 NO2, SO2, CO, NH3 and other gases	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Medium	Low	There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed.	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, where suitable and available.. NOx and GHG emissions are controlled by emission limits. 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.	Low
Local human population	Release of unburnt biogas	Harm to human health - respiratory irritation and illness. Release of potent climate change gases.	Air transport	Medium	High	High	There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed. There is one flare present on-site, which is used 5-10x per day, currently running for 5-6hrs per day.	Activities shall be managed and operated in accordance with the EMS and will include measures covering inspection and maintenance of equipment, including engine management systems. 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.	Low
Domestic properties, local human population, local amenity, site staff, visitors and offices. Haul roads, public highways.	Releases of particulate matter (dust) from cake storage bays and Transport off-site	Nuisance, loss of amenity.	Air transport then deposition	Medium	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 and storage of cake. Cake is stored in seven cake bays and is moved around the Site via an uncovered trailer and telehandler. Cake bays have 2m high walls, and are generally in good condition, there is some cracking in the cake bays. The waste types used on-site are unlikely to cause dust emissions. Therefore the magnitude of risk is considered to be low.	No wastes consisting solely of dusts are accepted. General operations at the Site do not create dusty materials. Cake is stored in open bays, but this material is not dusty by nature even when it is dry. Vehicles, equipment, impermeable surfaces and internal roads are swept and washed down, as required, to reduce the likelihood of any dust becoming airborne. There are no additional dust suppression techniques e.g. mist spray etc employed on-site as this is not considered necessary. Vehicles removing cake from site are kept covered, whilst in transport to prevent the escape of waste. There are seven cake storage bays on-site, six of the cake bays take approximately four weeks to fill, the seventh cake bay takes approximately seven weeks to fill. Once in the bay cake is not disturbed. The bays are emptied approximately every four weeks, and it takes three days to empty each bay. Cake is removed by a haulier and is covered during transportation. All vehicles have their wheels washed with a hose before leaving the Site.	Low

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**
								Lime treatment, which is not frequently required, is not undertaken on windy days due to the nature of the lime being a fine material.	
Local human population.	Release of microorganisms (bioaerosols).	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Medium	Low	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. PST's, aeration lanes, FST's, cake storage bays and the inlet works are uncovered. Emergency situations such as a failure of the flare or CHP/boilers could result in uncontrolled emissions of bioaerosols.	Multiple control measures are in place at the Site which reduce and contain emissions of bioaerosols from the processes on-site by inhibiting the pathway between source and receptor. Most of the key operations take place within a closed system, including covered tanks centrifuges, 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. The PSTs, aeration lanes and FST's are uncovered, however these involve 'wet' processes so the risk of resuspension of bioaerosols is minimised. Any emergency event would be temporary and infrequent due to the extensive monitoring and maintenance programmes undertaken at the Site as well as the emergency procedures and warning systems in place. Odour control unit is airtight and treats air released to remove bioaerosols. The process is monitored and regularly maintained. Gas holder is air-tight to prevent uncontrolled release of bioaerosols. SCADA system in place to detect leaks. Combustion of biogas occurs at very high temperatures in the CHP, boilers and flare, which would destroy bioaerosols. Stringent loading and unloading procedures are in place for receipt of sludge and liquor. Lorry and tanker drivers are required to hose down any spillage after each loading or unloading and clean contaminated wheels before leaving site. A Bio-aerosol Risk Assessment has been undertaken to assess the risks of bio-aerosols from the site. This identifies that bio-aerosol risks are low-medium.	Low

Emissions to water and land									
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.	Tank failure, spillages of digestate and/or liquids including oil Damage to drainage system. Spillage of raw materials or sludge/liquor during delivery/storage Contaminated run off from cake storage e.g. containing suspended solids.	Acute or chronic effects to aquatic life, contamination and deterioration of water quality.	Direct run-off from the Site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Medium	High	High	Potential for leaks from digestions tanks, storage vessels/bays and drainage system which may cause contamination or deterioration of surface water quality. The whole Site is generally in reasonable condition, with digesters and tanks noted as being in good condition. PSST's, thickened sludge storage tank (TSST) and digesters are not bunded. There is also some holes in the non-operational upper part of the TSST. There is slight cracking in the cake bays, all drainage is rerouted to the head of the works. The drainage surrounding the cake bays was noted as not being in great condition during the site visit, puddles in the bays frequently occur when drains are blocked. The two cake bays do not get fully filled to keep the drainage gulley's clear. Gas oil tank, and ferric chloride tank are bunded. The condition of the drainage and underground pipework is unknown. Quantities of liquids stored are generally low. An outflow from ponds/wetland in the northwest of the Site flows in the Great Stour river, 15m north of the Site area. A second drain is marked to flow off-site from the south east corner, flowing east along Sturry Road (A28) and joins the Great Stour 475m east of the Site. Off-site natural streams/ditches are present all leading into the Great Stour. However, no substantiated pollution incidents to water have been recorded in the last five years.	The site drainage plan is documented and all staff are trained in the event of emergency or accident. Impermeable surface and secondary containment, in the form of constructed bunds or portable bunds, is in place around storage areas of all wastes and surrounding the STC and WTW. Bunding will also be implemented for all raw material storage. As part of the BAT requirements and in accordance with the recommendations of the Construction Industry Research and Information Association (CIRIA) standard 736 risk assessment, damaged bunding and hardstanding are to be repaired throughout the Site. All transfer of digestate and material takes place under supervision and with flow rate control. All tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives. Digestion tanks are built to appropriate standard and require appropriate bunding. Cake bays are generally in good condition, there is some cracking in the 2m high walls. There are seven cake storage bays on-site, six of the cake bays take approximately four weeks to fill, the seventh cake bay takes approximately seven weeks to fill. Once in the bay cake is not disturbed. The bays are emptied approximately every four weeks, and it takes three days to empty each bay. Cake is removed by a haulier and is covered during transportation. All vehicles have their wheels washed with a hose before leaving the Site. Activities are managed and operated in accordance with the EMS. Spill procedures are in place under EMS363 and 364 as well as a pollution prevention procedure EMS360 All spillages are recorded in the site diary including actions taken. Site Manager ensures the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of equipment malfunction.	Medium
Abstraction from watercourse downstream of facility (for agricultural or potable use).	Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids.	Acute effects, closure of abstraction intakes.	Direct run-off from site across ground surface, via surface water drains, ditches etc. then abstraction.	Low	Medium	Low	Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off. No abstraction is undertaken from nearby watercourses.		Low

Emissions to water and land									
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**
Groundwater, land and surface water	Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids. Sludge/liquid spillages as a result of loss of tank/pipe integrity/ carelessness during transfer or overfilling	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes. 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 at borehole or intake.	Medium	Medium	Medium	Potential for leaks from digestion tanks and storage vessels. The Site is in reasonable condition, there is some slight cracking of the roads and cake bays. The drainage surrounding the cake bays was noted as not being in great condition during the site visit, puddles in the bays occur when drains are blocked. The two cake bays do not get fully filled to keep the drainage gulley's clear. Tanks are in good condition, with the exception of the TSST which has some holes in the upper non-operational part of the tank. Quantities of liquids stored are generally low.	Control of substances hazardous to health (COSHH) assessment undertaken for all raw materials. Both clean and contaminated surface water is directed to a pumping station which recirculates it back into the system. The stormwater drainage of potentially contaminated areas from within the Site boundary is routed into the head of the works with no discharge outside of the site boundary. 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. The condensate is clean, uncontaminated water and is small in quantity.	Low
Groundwater, land and surface water	Spillage of sludge/liquids during transfer of imported and indigenous/unknown sludge and liquids from tankers	Acute or chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes. 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.	Low	Medium	Low	Potential for spillage during transfer of liquid/sludge from tankers. Sludge reception area is in good condition, the area is concreted, but there is no bunding.	Impermeable surface required for storage of all waste. The site accepts tankered commercial and Cess sludge wastes, on average there are 14 tankers per day, though this number can fluctuate slightly. Liquid sludge is also imported from eight satellite sites. The liquid sludge is pumped from a tanker directly into the imported sludge storage tank. Tanker deliveries are substantially increased if there is an issue with a nearby pumping station. Tankers are unloading via hose into the imported sludge storage tank. Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented to reduce spills when transferring liquids/sludges from tankers. Established procedures in place for the acceptance of tankered trade waste (EMS387), waste duty of care (EMS380), operational waste procedures (EMS381) and waste rejection (EMS488). Compliance with the waste duty of care requirements to ensure waste accepted meets the permit conditions and relevant legislation.	Low
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.	Low	Medium	Low	Condition of underground pipework is unknown. There is no leak detection of underground pipework on the Site.	Site Manager ensures the programme of (planned preventative maintenance) PPM is implemented effectively and inspections are carried out frequently to minimise the probability of damage to the drainage system.	Low

Emissions to water and land									
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**
Groundwater, land and surface water	Flooding of site.	If waste is washed off-site it may contaminate natural habitats downstream.	Flood waters	Medium	Medium	Medium	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. The Site is located within an area with potential for groundwater flooding of property situated below ground level. The entire Site area is located within Flood Zone 2 (between 1 in 100 and 1 in 1000 annual probability of flooding), and is located in an area with potential for extreme flooding from rivers or sea without defences. There has not been any reported flooding issues from the Site in the last five years.	The drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters. Activities to be managed and operated in accordance with a management system and management plans and procedures implemented, including the removal of spilled waste and other pollutants (such as use of spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.	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.	Noise and vibration from the following activities: Vehicles delivering/ removing wastes and materials Vehicles arriving/ leaving the Site.	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground.	Low	Low	Low	Local residents and site staff often sensitive to noise and vibration. There are three human receptors within 500m of the Site, including one place of work (car dealer) and two residential areas. No noise complaints have been received within the last five years.	Site will only accept imports within existing operating hours established in current Environmental Permit (fully complying with site's planning conditions). Vehicles do not exceed the site speed limit of 10mph and will not generate a great amount of noise. The main truck movements are away from residential housing and other sensitive receptors. Noise and vibration shall be minimised and not cause nuisance. Noise kept to a minimum during operating hours. Exceptional noisy operations e.g. construction – inform residents. Noise complaints to be investigated and actioned and remedial measures will be undertaken. All complaints are recorded in the site diary including actions taken.	Low
Local human population.	Noise and vibration from the following activities: Waste treatment, processing. Plant boilers and engines.	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground.	Low	Low	Low	Local residents and site staff often sensitive to noise and vibration. Majority of site operations are fully enclosed. There are three human receptors within 500m of the Site, including one place of work (car dealer) and two residential areas. One noise complaint has been received within the last five years.	Limitation of operating hours established in current Environmental Permit (fully complying with site's planning conditions). Fans and condensate traps will be checked for water and fans and extraction systems checked. Flare usage is kept to a minimum to reduce noise impact. The design has been developed to minimise noise off-site. All equipment is maintained either in-house or by a sub-contractor such that noise and vibration are maintained within the required limits and to manufacturers recommendations. Where equipment is to be replaced, preference will be given to procuring quiet plant and silencing equipment. Proper maintenance of plant and equipment. 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. Any complaints received are investigated and actioned in line with the complaint's procedure. All complaints are recorded in the site diary including actions taken.	Low

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.	Low	Medium	Low	Local residents often sensitive to odour. Wide range of waste may cause odour issues at reception from wastes, release of biogas and from digestate hence control measures adopted. The Site has only received two complaints in the last five years, the latest being in 2022. There are multiple sensitive receptors within 500m of potential odour source.	Odours are likely to be generated and released due to the nature of the wastes. All sludge treatment processes, and sludge storage tanks are covered or enclosed except for the cake bays. Odour is controlled via one current odour control unit (OCU). The OCU extracts odorous air from the sludge building, sludge reception, pre-thickened sludge storage tanks, thickeners and thickened sludge storage tank. Leak detection (methane gas analyser) is also installed on biogas holder/s to ensure any leaks from the inner bag are detected. Any leaks detected on the biogas system would always be fixed immediately by Southern Water due to the process safety risk of posed by biogas. Other odour mitigation measures implemented on-site include placing covers on containers and limiting the height of rising sludge. The removal of biosolids off-site will be undertaken as soon as practically possible whilst considering prevailing weather conditions. Odour is monitored to ensure emissions are free of odorous compounds. The Site's Odour Management Plan, amended in February 2024, identifies potential odour emissions from site operations and procedures to manage, control and minimise odour impacts. 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. Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Cake bays are generally in good condition, there is some cracking in the 2m high walls. There are seven cake storage bays on-site, six of the cake bays take approximately four weeks to fill, the seventh cake bay takes approximately seven weeks to fill. Once in the bay cake is not disturbed. The bays are emptied approximately every four weeks, and it takes three days to empty each bay. Cake is removed by a haulier and is covered during transportation. All vehicles have their wheels washed with a hose before leaving the Site. All waste is imported and exported in covered lorries or contained in tankers. Any complaints received are investigated and actioned in line with the complaint's procedure.	Low

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, domestic properties, site offices.	Spillage of odorous materials including oils, fuels, chemicals. Failure to clean up spillages. Contaminated spill equipment not disposed of appropriately.	Nuisance, loss of amenity.	Air transport then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour.	Procedures for dealing with spillages are covered in the EMS under EMS363 and 364 for the Site. There is also a Field Event Co-ordinators (FEC) Manual which provides spillage procedures for EP sites (FEC322). The Site Manager shall ensure all relevant staff are appropriately trained to use the spill kits and that all spillages are cleaned up immediately. 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. All spills are recorded in the site diary including actions taken.	Low
Local human population, domestic properties, site offices	Fugitive release of H2S	Nuisance, loss of amenity	Air transport then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. Fugitive release, not expected to occur under normal operating conditions.	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. A specialist unit equipped with carbon filters is used for air treatment and abatement to reduce odours and the generation of other gaseous compounds.	Low

Litter, mud and debris									
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, livestock and wildlife, domestic properties and local amenity.	Waste and litter on local and internal roads. Vehicles entering and leaving Site.	Nuisance, loss of amenity and road traffic accidents.	Air transport then deposition.	Low	Low	Low	Local residents, surrounding environment and animals sensitive to litter. There is some potential for litter to be generated from general site activities but limited potential for it to leave the site boundary. Sludge that is delivered to the Site is transported in tankers.	All vehicles leaving the Site which are transporting waste are to be covered to prevent waste/materials escaping from them. All waste produced from general site activities is carefully managed and kept in enclosed containers, or inside a building, prior to removing from site. Other mitigation measures include litter picking, and quarterly site walkarounds. All waste is removed by an external contractor when required. Regular inspections for litter and debris are undertaken. Nuisance management measures are included in the EMS and the site-specific management plan. Details of the procedures SWS follows with regards to the control of mud and debris and potentially polluting leaks and spillages can be found in EMS 360 and EMS 381.	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	Road safety issues - local residents often sensitive to mud on the road. Limited potential for mud and debris.	Activities shall be managed and operated in accordance with a site-specific management plan with overarching procedures set out in the EMS. Details of the procedures SWS follows with regards to the control of mud and debris and potentially polluting leaks and spillages can be found in EMS 360 and EMS 381. Any mud or sludge arising from activities on-site is cleared up promptly. The wheel wash station is currently not operational, however a hose is used to clean wheels of cake export. The cake yard is hosed and swept to keep clean as and when it is needed. Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Vehicle routes are to be inspected regularly and swept when necessary. All vehicles leaving the Site, transporting waste/ cake are to be covered to prevent waste/materials being blown from them.	Low

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	Permitted wastes are unlikely to attract scavenging animals and birds but certain areas may become nesting / breeding sites. The waste types handled on-site do not attract pests and contractors regularly check the Site for pests. Therefore, the magnitude of risk is considered to be low. The Site experiences the following pests; seagulls, pigeons, rats, rabbits and foxes.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Pest control measures are implemented under EMS227. A pest contractor performs monthly site visits for rat and pigeon control, more frequent visits can be arranged if needed. All reports of pests are sent to the contractor who will investigate and report findings and outcomes and detail any actions required. Ensure waste cannot be accessed by scavengers. All waste produced from general site activities are 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. Regular inspection and maintenance of boundary fencing and buildings is carried out to prevent access to the Site. Well established and proven operational controls and procedures are in place, including regular inspection and monitoring of the Site for pests by contractors.	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**
Local human population and local environment.	Flooding of the Site.	If waste is washed off-site it may contaminate buildings / gardens / natural habitats downstream.	Flood waters	Medium	Medium	Medium	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. The Site is located within an area with potential for groundwater flooding of property situated below ground level. The entire Site area is located within Flood Zone 2 (between 1 in 100 and 1 in 1000 annual probability of flooding), and is located in an area with potential for extreme flooding from rivers or sea without defences. There has not been any reported flooding issues from the Site in the last five years.	Area is not known to flood and the drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters. Activities to be managed and operated in accordance with a management system and management plans and procedures implemented, including the removal of spilled waste and other pollutants (such as use of spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.	Low
Local human population and / or livestock after gaining unauthorised access to the installation.	All on-site hazards: machinery, wastes and vehicles.	Bodily injury, death	Direct physical contact.	Low	Medium	Low	Potential injury to on-site personnel as a result of vehicle movements or equipment malfunction or misuse. Direct physical contact is minimised by activity being carried out within enclosed digesters so a low magnitude risk is estimated. Contact with waste is minimal with exception of leaks or spills from unloading of tanker and transfer of filter cake	Overall management of the site is overseen by an experienced member of staff holding an appropriate Certificate of Technical Competence (CoTC) awarded by the Waste Management Industry Training and Advisory Board. This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours. All operational staff are fully trained in the site operating procedures and Southern Water's safety and environmental management procedures and are kept up to date on changes. Training includes awareness raising of the potential on-site hazards and health and safety measures to adhere to. Preventative measures will be under continuous review as part of the EMS procedures. Activities are managed and operated in accordance with the EMS – 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. Access to Site and waste is restricted by 2m high chain link security fencing with barbed wire top in the east of Site to the north of the aeration lane and in the south of Site, and palisade fencing in the west of the Site. The river which borders the north and eastern parts of the Site also acts as a natural barrier. 2m high dual swing manual metal entry gates secure the main access and are closed at all times when not in use and locked out of hours. The Site is staffed 0700-2000 Monday-Friday and 0700-1700 on weekends. The Site also benefits from a CCTV system (normal and thermal), with cameras positioned in key locations around the Site, including one Automatic Number Plate Recognition (ANPR) camera on the main gate.	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**
								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. Repairs are undertaken in accordance with the EMS requirements. Key sludge treatment and wastewater treatment activities undertaken within enclosed systems. On average there are six tankers per day of commercial imports, but can be up to ten. There are 6-12 tankers per day of domestic CESS, but this can increase to 60 is a nearby pumping station has broken. On average ten tankers (220m3) per day deliver sludge. Vehicle movements around the Site vary depending on what activities are being undertaken. Cake is moved to cake bays once a trailer is full. Cake is removed from the bays frequently during specific land spreading windows – typically throughout the summer months. Waste is removed as required. Therefore, frequent vehicle movements are typically undertaken only by Site staff and maintenance contractors. Operator has produced a hazard review and risk assessment documents relating to this and other types of potential incidents, within the EMS, H&S and O&M manuals.	
Local human population and local environment.	Explosion of biogas 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. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	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	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. An explosion could cause injury to local residents and site staff from flying debris. 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. Permitted waste types limited to sludges and liquids.	The key sludge treatment and WTW processes are undertaken within enclosed systems such as the anaerobic digestion (AD) and biogas systems. STC sludge storage tanks are covered and not considered a fire risk. 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. 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. 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. Site Manager shall ensure the programme 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.	Low
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,		Low	Medium	Low	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,		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**
		liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.					buildings located close to the epicentre of the explosion.	Emergency operating procedures are in place. Adequate firefighting measures are implemented on-site. Access to Site and waste is restricted by 2m high chain link security fencing with barbed wire top in the east of Site to the north of the aeration lane and in the south of Site, and palisade fencing in the west of the Site. The river which borders the north and eastern parts of the Site also acts as a natural barrier. 2m high dual swing manual metal entry gates secure the main access and are closed at all times when not in use and locked out of hours. The Site is staffed 0700-2000 Monday-Friday and 0700-1700 on weekends. The Site also benefits from a CCTV system (normal and thermal), with cameras positioned in key locations around the Site, including one Automatic Number Plate Recognition (ANPR) camera on the main gate. 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 the Site. Repairs are undertaken in accordance with the EMS requirements. 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 (EMS362, H&S204 and H&S440). Firewater is diverted through the drainage system to the head of the works or to storm overflow allowing for contaminated fire water to be contained on-site and treated through the wastewater treatment system. There is also safety zoning of areas under the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)/ Potentially Explosive Atmospheres (PEXA) on-site and smoking is only permitted in designated areas.	
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land. Equipment failure	Respiratory irritation, illness and nuisance to local population. Injury to staff or 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.	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	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. 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. Risk of accidental combustion of waste is minimal.	The key sludge treatment and WTW processes are undertaken within enclosed systems such as the AD and biogas systems. STC sludge storage tanks are covered and not considered a fire risk. Activities are managed and operated in accordance with the EMS, H&S and O&M manuals including, fire and spill management. 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. 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	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**
							Permitted waste types limited to sludges and liquids	environmental fire risk assessment procedures are provided in the EMS, H&S manual and Safety Instruction Book (SIB) (EMS362, H&S204, H&S440, and SIB603). There is also Safety zoning of areas under DSEAR/PEXA on-site and Smoking is only permitted in designated areas. Firewater is diverted through the drainage system to the head of the works or to storm overflow allowing for contaminated fire water to be contained on-site and treated through the wastewater treatment system. Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS and Safety Instruction Book (SIB) includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents. Site Manager shall ensure the programme of 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. Adequate firefighting measures are implemented on-site.	
Local human population and local environment.	Arson and/or vandalism causing the release of pollution materials to air (smoke and fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or vandals/arsonists. 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.	Air transport Spillages and contaminated firewater by 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	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. 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. Risk of accidental combustion of waste is minimal. Permitted waste types limited to sludges and liquids	The key sludge treatment and WTW processes are undertaken within enclosed systems such as the AD and biogas systems. STC sludge storage tanks are covered but and not considered a fire risk. 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. 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. 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 (EMS362, H&S204 and H&S440). There is also Safety zoning of areas under DSEAR/PEXA on-site and Smoking is only permitted in designated areas. 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	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**
								maintenance and inspection of bunding of tanks, spills and environmental incidents. Site Manager shall ensure the programme of 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. Adequate firefighting measures are implemented on-site. Access to Site and waste is restricted by 2m high chain link security fencing with barbed wire top in the east of Site to the north of the aeration lane and in the south of Site, and palisade fencing in the west of the Site. The river which borders the north and eastern parts of the Site also acts as a natural barrier. 2m high dual swing manual metal entry gates secure the main access and are closed at all times when not in use and locked out of hours. The Site is staffed 0700-2000 Monday-Friday and 0700-1700 on weekends. The Site also benefits from a CCTV system (normal and thermal), with cameras positioned in key locations around the Site, including one Automatic Number Plate Recognition (ANPR) camera on the main gate. 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 the Site. Repairs are undertaken in accordance with the EMS requirements. Firewater is diverted through the drainage system to the head of the works or to storm overflow allowing for contaminated fire water to be contained on-site and treated through the wastewater treatment system.	
Local human population and local environment.	Operator Error	Pollution to air, land, surface water and groundwater and human health	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	Medium	Low	Possible contamination to air, land, groundwater and surface water.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. All equipment is checked under preventative maintenance plans and is checked and calibrated as per the manufacturer's instructions. Overall management of the Site is overseen by an experienced member of staff holding an appropriate Certificate of Technical Competence (CoTC) awarded by the Waste Management Industry Training and Advisory Board. This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours. All operational staff are fully trained in the Site operating procedures and Southern Water's safety and environmental management procedures and are kept up-to-date on changes.	Low

Human health and environmental safety									
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								Training includes awareness raising of the potential implications of failure to control operations and the potential impact on the environment. Preventative measures will be under continuous review as part of the EMS procedures. Emergency operating procedures are in place and detailed in the Site's Operational Contingency Plan. Senior site-based management have direct responsibility for implementing risk management measures.	

Natural habitats and ecology									
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	Medium	Low	Physical disturbance and emissions to air, water or land may cause harm to and deterioration of nature conservation sites. Three SACs, four SPAs and three Ramsar sites are located within 10km of the Site. There are four SSSIs within 2km of the Site, the closest of which is West Blean and Thornden woods located 532m from the Site.	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. BAT and appropriate additional mitigation measures set out in the EMS (EMS323, EMS223. EMS228 and EMS220), have been taken to prevent or where that is not practicable, to minimise, those emissions. As required by the Southern Water EMS various housekeeping and waste management practices are in place to monitor waste emissions. These include segregation of wastes according to their classification and nature, labelling waste and using designated storage containers.	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	Medium	Low	Physical disturbance and emissions to air may cause harm to protected species. The proposal for the Permit does not involve the removal of vegetation, or structural modification to built structures. It is considered unlikely, therefore, that Site activities would lead to the disturbance or removal of terrestrial habitats. One ancient woodland, four SINCs and seven priority habitats are located within 2km of the Site. In particular, Great Stour River, Ashford to Fordwich is located on-site. Public records suggest both Barbel, and Daubenton's Bat could be present on-site. No evidence of bats has been noted on-site.		Low