MOTT MACDONALD

Goddards Green Sludge Treatment Centre Environmental Permit Application

Environmental Risk Assessment

December 2024

790101_ERA_GOD

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Issue and Revision Record

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1 Introduction

1.1 Background and scope

This document has been prepared to support the application for the substantial variation of a bespoke waste operation Environmental Permit to a bespoke Waste Installation Environmental Permit (hereafter referred to as “the Permit”), reference EPR/WP3695HW, for the Goddards Green (WTW) and Sludge Treatment Centre (STC) (‘the Site’) on behalf of Southern Water Services Limited (‘Southern Water’ or ‘the Operator’).

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 assessments 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: Cuckfield Road, Goddards Green, West Sussex, RH17 5AL.

National grid reference: TQ 28947 20659

A plan outlining the boundary of the scheme is provided in 790101_MSD_SiteLayoutPlan_GOD December 2024.

2.2 Geology

The Site is not located on an area of mapped artificial deposits, which comprise deposits greater than 2.5m in thickness, however a cover of made ground is likely to be present on the site associated with the development of the site infrastructure.

The northern half of the site lies upon an area of River Terrace Deposits (sand and gravel) formed during the Quaternary period, whilst superficial deposits in the southern half of the site are mapped to be absent. Alluvium is mapped adjacent to the north of the site associated with Holmbush Gill (labelled as the River Adur further downstream).

The Site lies upon the Weald Clay Formation predominantly comprising mudstone but with interbedded layers of ironstone clay.

2.3 Hydrogeology

The aquifers in the superficial deposits are classified by the Environment Agency as Secondary A aquifers (medium vulnerability) whilst the bedrock aquifer is classified as Unproductive Strata.

No water abstractions or source protection zones (SPZ) are located within 1km of the site.

2.4 Hydrology

The Adur East (Goddards Green) (also named Holmbush Gill on mapping) flows east to west adjacent to the northern boundary of the site. The Environment Agency overall classification for this watercourse in 2019 was poor (poor ecological and fail chemical).

The site is located in an Environment Agency Zone 1 flood risk area. Areas within zone 1 have a 1 in a 1,000 chance of river or sea related flooding. However, the land just north of the site is located within a zone 3 which indicates a high risk of flooding.

2.5 Protected areas

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

The national statutory designated sites located within 2km of the Site include:

- Pond Lye Local Wildlife Site (LWS) is located 0.09km from the Site
- The Shaw Wood ancient woodland is located 0.15km from the Site
- Great Wood and Copyhold Hanger LWS is located 1.5km from the Site
- High Weald Area of Natural Beauty (AONB) is located 1.9km from the Site

The priority habitats located within 2km of the Site include:

- Deciduous woodland is located 0.02km from the Site

- Good quality semi-improved grassland is located 0.1km from the Site
- No main habitat but additional habitats present are located 0.16km from the Site
- A traditional orchard is located 0.19km from the Site.

2.6 Other notable features

As shown in Figure A 4 in Appendix A, the Site is located in a largely agricultural area with a place of work located to the south and a residential area to the west. Sensitive receptors are found within 250m of a potential emission source, in some cases downwind of the prevailing wind direction. The receptor closest to a potential emission source is a place of work (warehouses), which is located approximately 180m south of the PSTs. The closest residential receptors to the Site are located on Cuckfield Road, approximately 170m to the northwest of the site.

The Site is within a lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level).

The Site is located in a nitrate vulnerable zone (NVZ).

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 No4” and “SR2008 No19”, 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 OBJ	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 any potentially sensitive receptors within the vicinity of the Site and assesses the environmental risks with 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 risk 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 CHP units and generators are currently permitted under the permit number EPR/JP3137QB, which allows for the operation of one biogas fuelled CHP engine, one diesel generator and one small back-up generator which may only be operated for testing purposes for no more than 50 hours annually.

The permit allows Southern Water to operate the following at Goddards Green WTW and STC:

- One biogas fuelled CHP engine. The engine has a rated thermal input of 1.79 MWth and was brought fully into operation in 2017 and is classed as a Tranche B Generator. The Tranche B Generator will operate for 8,760 hours per annum.
- Two boilers with an aggregated thermal input of 1.76MWth. The boilers operate as duty and standby and are only put into operation when the CHP unit is not operational. The boilers have been operational prior to December 2018 and are therefore classed as existing Medium Combustion Plant.
- One 1.73MWth diesel fired generator, which is used for triad avoidance, emergency use and testing. This generator came into operation in 1990 and is classed as a Tranche A generator. The Tranche A Generator will operate for up to 100 hours per annum.
- A 0.43MWth back-up generator that operates during emergency situations only. This is classed as an excluded generator and is not part of the Site's Specified Generator.

Point sources to air were assessed 2019 as part of the application for (EPR/JP3137QB) document reference ED11464108 _R1 Issue Number 2), and in accordance with the Environment Agency's guidance on air quality modelling at the time of the permit was granted[2] A worst-case approach was assessed to ensure that any air quality impacts are more likely to be over-estimated than under-estimated. The conclusions that the Site does not pose significant risk of exceedances of relevant Air Quality Objectives for the protection of human health and Critical Levels and Critical Loads for ecological habitats remain relevant as combustion activities are not being changed on-site as a result of permitting the anaerobic digestion (AD) plant and associated processes.

[2] Environment Agency (2018). Emissions from specified generators: Guidance on dispersion modelling for oxides of nitrogen assessment from specified generators. Version 1

The existing boiler was not included in the modelled analysis, because running the CHP for a full year is a more conservative approach. As such, to avoid double-counting, the boiler was not included in the assessment.

Further air quality modelling has been undertaken for this permit variation to include the new steam boiler associated with the Thermal Hydrolysis Plant (THP) (Document reference 790101_MSD_AirQualityDispersionReport_GOD). For gridded and human health receptors, the emissions of NOx and SO_2 have been considered in accordance with Environment Agency guidance. The method of the assessment has taken a conservative approach by assuming worst-case conditions for factors such as emission characteristics, the operating envelope and meteorological conditions.

Southern Water has confirmed (November 2024) that the two boilers within the permit EPR/JP3137QB are no longer operational and will not be returned to operation. The steam boiler will take over any back up heating requirements. In addition, the 0.43MWth back-up generator is also non-operational and is due to be replaced by a 0.64MWth generator, sourced from the Horsham WwTW, This generator will only operate during emergency situations. This generator is a DAA to the STC, but is classed as an excluded generator and is not part of the Site's Specified Generator.

An addendum to the 790101_MSD_AirQualityDispersionReport_GOD will be made identifying the changes to the combustion plant at Goddard's Green and assessment of any impacts as a result. This addendum is presented in the form of a technical note as 790101_MSD_AQRA addendum_GOD November 2024.

The 1.73MWth diesel fired generator, which is used for emergency use and testing, is not a DAA to the STC. This generator came into operation in 1990 and is classed as a Tranche A. Therefore, permit EPR/JP3137QB, will be varied to remove the CHP, boilers and 0.43MWth standby generator, as these would form part of the IED application. Permit EPR/JP3137QB, will only be applicable for the 1.73MWth diesel generator.

No exceedances of the Environmental Quality Standards are predicted as a result of the operation of the Site at locations of relevant public exposure. The air quality effects are highly localised and the impact at sensitive human health receptors is insignificant in accordance with Environment Agency guidance. The Site is not considered to conflict with the relevant air quality regulations.

The operation of the flare 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 6 months.

Southern Water acknowledges that the flare is appropriate for emergency use (such as breakdown and maintenance). Southern Water confirms that they plan to keep the existing CHP and flare at Goddard's Green, as it meets the Site's requirements for biogas combustion. However, work is likely to be required to be fully BAT compliant for access, ports and measuring/monitoring devices.

Gas modelling shows the site is not expected to flare outside of maintenance or emergency scenarios.

The available gas modelling shows flaring would be for around 0.2% of the year for maintenance activities.

The existing flare and CHP are to be retained at this site but additional work is anticipated to be required to fully meet BAT (note, this is with respect to non-emissions or frequency of flare use

considerations, eg. access to testing ports). The detail of this is under review and any identified scope will be completed in AMP8.

The Goddards meter is currently not operating as required (fault) and is scheduled for replacement under BAU by Ops, this is not linked to IED timescales/scope.

This site has been undertaking THP commissioning, this poses an additional challenge in collation and reporting of data for steady-state operation (BAU).

Temperature data is available (but direct recording of operating hours is not), this data infers there was a maximum potential of 1222 hours operation for the last year (7.17%) however this does not reflect actual hours as the data records an occurrence within a given hour, when in reality the flare is highly unlikely to operate for the full hour, thus overestimating the flare use.

The meter replacement will ensure all required signals for data collation and reporting are provided.

The flare use data forms part of wider data collation and reporting (IT) system improvements planned to meet BAT 2c for inventory, BAT 11 energy and has an influence on BATs 15b, 16b and 21c for incident reporting (re. PVRVs and gas system management).

Further information is being collated in line with discussions with the SSD LIA (KS) on 3/12/24 and will be provided in due course (regarding asset replacement plans and timescales but will be provided for all sites even though no asset replacements are required here).

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 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.

The sensitive receptors in relation to the Site are shown in Appendix A. The Site lies within 250m of sensitive human receptors and, therefore, a bioaerosols risk assessment has been undertaken and is provided with the supporting documents of the permit application (Doc reference 790101_ERA_BioRA_GOD March 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 bioaerosols 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 bioaerosols, inhibiting the pathway between source and receptor. Subsequently, since the Site is found to be very low to low risk, a Bioaerosol Management Plan is not required.

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"[3] 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.

The Substantial Pollution Incident register in Landmark's Envirocheck report (285126393_1_1) has been used to provide details of pollution incidents within the past five years. According to the report, there have been no pollution incidents to controlled waters recorded within 1km of the Site in the past five years, that are confirmed or substantiated as being related to the STC.

3.2.3.1 Emissions to water (other than sewers)

No pollution incidents to water were reported in Southern Water's Site incident report in the last five years.

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 system is captured in a sealed container and is returned to the head of the WTW. 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 adjacent Goddards Green WTW and will undergo treatment through the works prior to being discharged under an existing water discharge permit. On-site WTW 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 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

[3] [2] Drew, 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.

drainage system, and returned to the head of the WTW via a return pumping station. A drainage plan the Site is presented in document reference 790101_MSD_DrainagePlan_GOD.

The surface water 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.

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.

The liquor treatment plant (LTP) is a biological process in the form of Cyclic Activated Sludge System (CASS). This treats liquors received from the STC.

The CASS Liquor Treatment Plant (LTP) has a maximum throughput of 1200m^3/day (≈1,200 wet tonnes/day) and consists of three storage volumes.

Liquor treatment plant is a tank with capacity of 2500m^3. This consists of four aeration blowers (operating on duty/assist/assist/standby) connected to diffusers in the bottom of the tank. This tank is uncovered and is being reviewed for the technical feasibility of covering it.

Liquor storage tank is formed of two concentric tanks operating independently. The centre tank being a raw liquor buffer tank of capacity 1342m^3 is covered and connected to an OCU 3. The outside tank being an uncovered treated liquor buffer storage of capacity 1284m^3. The total tank volume is 2626m^3 as listed elsewhere in the permit (and used for containment calculations).

Combined liquors (from drum thickeners, strain-presses and sludge cake bays) are received into the raw liquor buffer tank, transferred to, and through, the liquor treatment plant, and back to the treated liquor buffer storage area.

The treated liquor is discharged into the main inlet flume (oxidation ditch distribution chamber) in the WtW and continues through the treatment process.

3.2.3.3 Emissions to land

There are no point source emissions to land, as part of the activities carried out on the Site. 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 present of a contained drainage system.

3.2.3.4 Noise and vibration

The Site has received eight noise complaints in the past five years, five of which were received in 2020. Complaints received in 2020 related to alarms sounding from the WTW assets and it was reported that such sounds kept a resident awake. In order to reduce noise disturbance from alarms on site, most are turned off except the gate, ferric bund and fire alarm.

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. Appropriate mitigation for noise and vibration impacts are provided in Appendix B. The sensitive receptors located within 2km 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 not considered to be required.

3.2.4 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. There is one sensitive receptor located within 250m of the site, which is located approximately 180m southwest of the Primary Settlement Tanks (PSTs) and is 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 is located to the north of the A2300, off Cuckfield Road, and lies in a semi-rural location approximately 3km north-west of Burgess Hill. The Site is surrounded by agricultural land to the north, east and west of the Site, and an industrial estate beyond the A2300 to the south of the Site.

The Site has not received any odour complaints in the past five years (2019-2023).

The THP is designed to reduce odour emissions from the Site's sludge treatment process, improve sludge quality and enhance gas yields from the STCs Anaerobic Digestion facility (AD). The outcome will mean that new housing developments in the area will be more greatly protected from odours emissions.

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), updated in November 2024 which identifies potential odour emissions from the site operations and procedures to manage, control and minimise odour impacts. It sets out the procedures for engaging with neighbours and how the Operators 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 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_GOD December 2024.

3.2.5 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; and
- Within 250m of a sensitive receptor when treating biowaste.

All key sludge and wastewater treatment processes of the Site are enclosed, only the aeration lanes and Final Settlement Tanks (FSTs) are open.

Sludge cake is stored in a large cake bay in the Dutch barn.

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

3.2.6 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.

Pest control measures are implemented under EMS227. The site has 12 visits per year, by a contractor, where rats are the primary issue. 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 low, a Pest Management Plan is not considered to be necessary.

3.2.7 Human health and environment safety

3.2.7.1 Visual impacts

The WTW Site was built in 1989 and the STC was added in 2001. The Site is surrounded by agricultural land to the north, east and west of the Site, and an industrial estate beyond the A2300 to the south of the Site.

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.

The Site is surrounded by agricultural and industrial land and is located away from residential properties, visual impacts from the Site are therefore, considered to be low.

3.2.7.2 Site security

Activities are managed and operated in accordance with the management system.

The Site is fully enclosed by chain link fencing approximately 6ft in height with barbed wire along the top, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The Site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system, there are 8 CCTV cameras which comprise a combination of thermal imaging and number plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), 2 cover the large fuel tank and generator (CCTV and thermal) and two cover the hydrogen peroxide store under the archimedean screws. All monitored and controlled from control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night. 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.

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

3.2.7.3 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 related to the flood risk from surface water, rivers and the sea.

The site is located within Flood Zone 1 (less than 1 in 1,000 annual probability).

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 spiled 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.

There are no known issues with flooding at the Site, and no historical floods have been recorded.

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 changed 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 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), Sussex 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 Sussex Wildlife Trust , or Sussex Biodiversity Record Centre (SBRC) depending on location of site. 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 Goddards Green STC

Natural habitats and ecology	Goddards Green STC
Statutory designated European sites within 10km of the Site boundaries	
Special Areas of Conservations (SAC)	
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)	
Marine Conservation Zones (MCZs)	
National Nature Reserves (NNRs)	
Local Nature Reserves (LNRs)	
Areas of Outstanding Natural Beauty (AONBs)	1
Non-statutory designated sites within 2km of the Site boundaries	
Local Wildlife Sites (LWS)	2
Ancient Woodlands	1
Country Parks	
Sites of Importance for Nature Conservation (SINC)	
Sussex Wildlife Trust Reserves	
Priority habitats within 2km of the Site boundaries	
Priority habitats	4
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 are no SACs, SPAs or Ramsar sites located within 10km of the site. Therefore, a Habitats Regulations Assessment (HRA) is not 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.

One AONB is located within 2km of the site boundary. High Weald is located approximately 1859m from the site boundary. The Shaw Wood Ancient Woodland is located 152m from site, however it is considered unlikely that the Site activities will impact these habitat sites. 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.

A. Environmental constraints maps

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

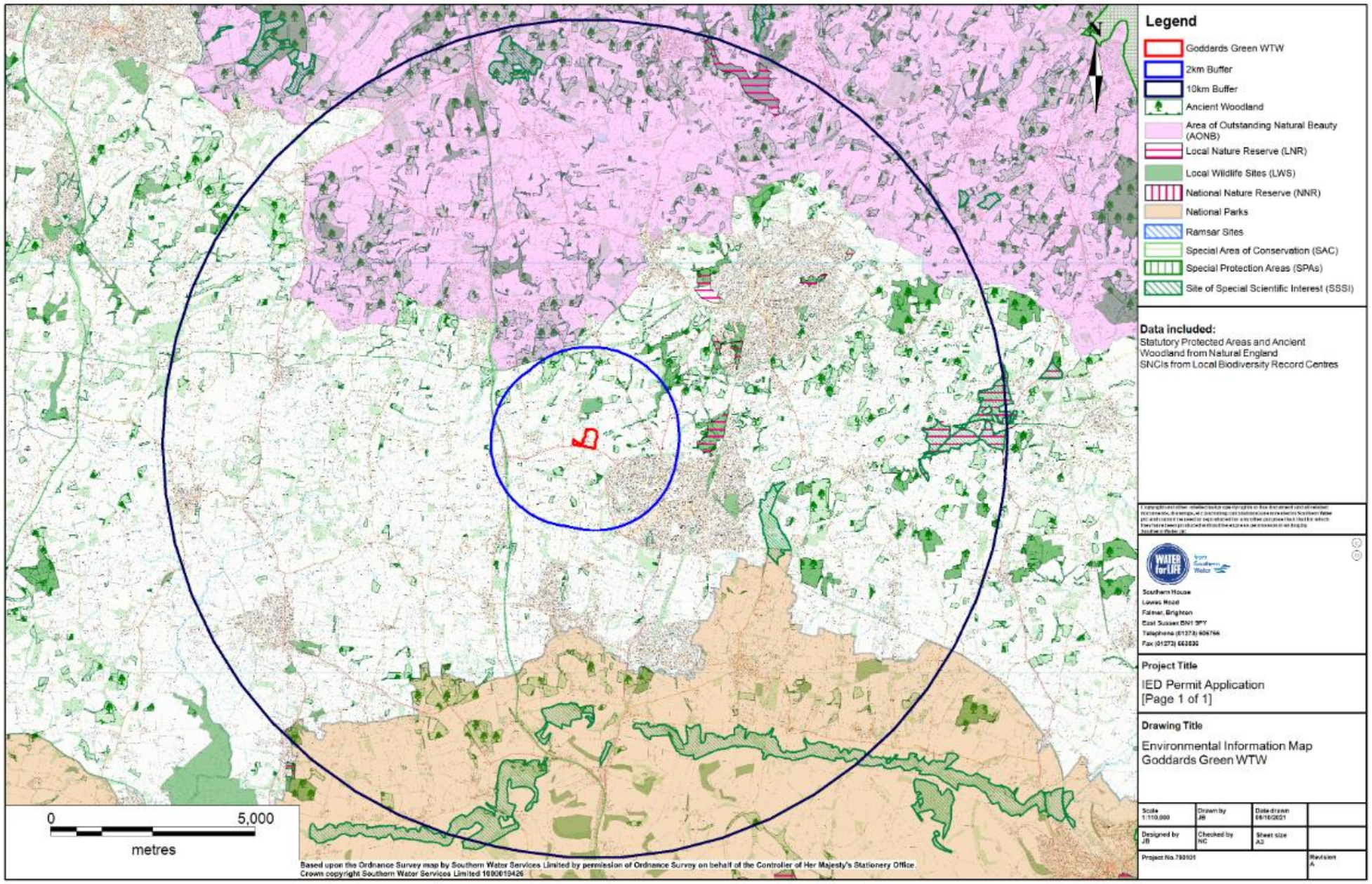


Figure A 2: Non-statutory designated habitat sites within 2km of the Site

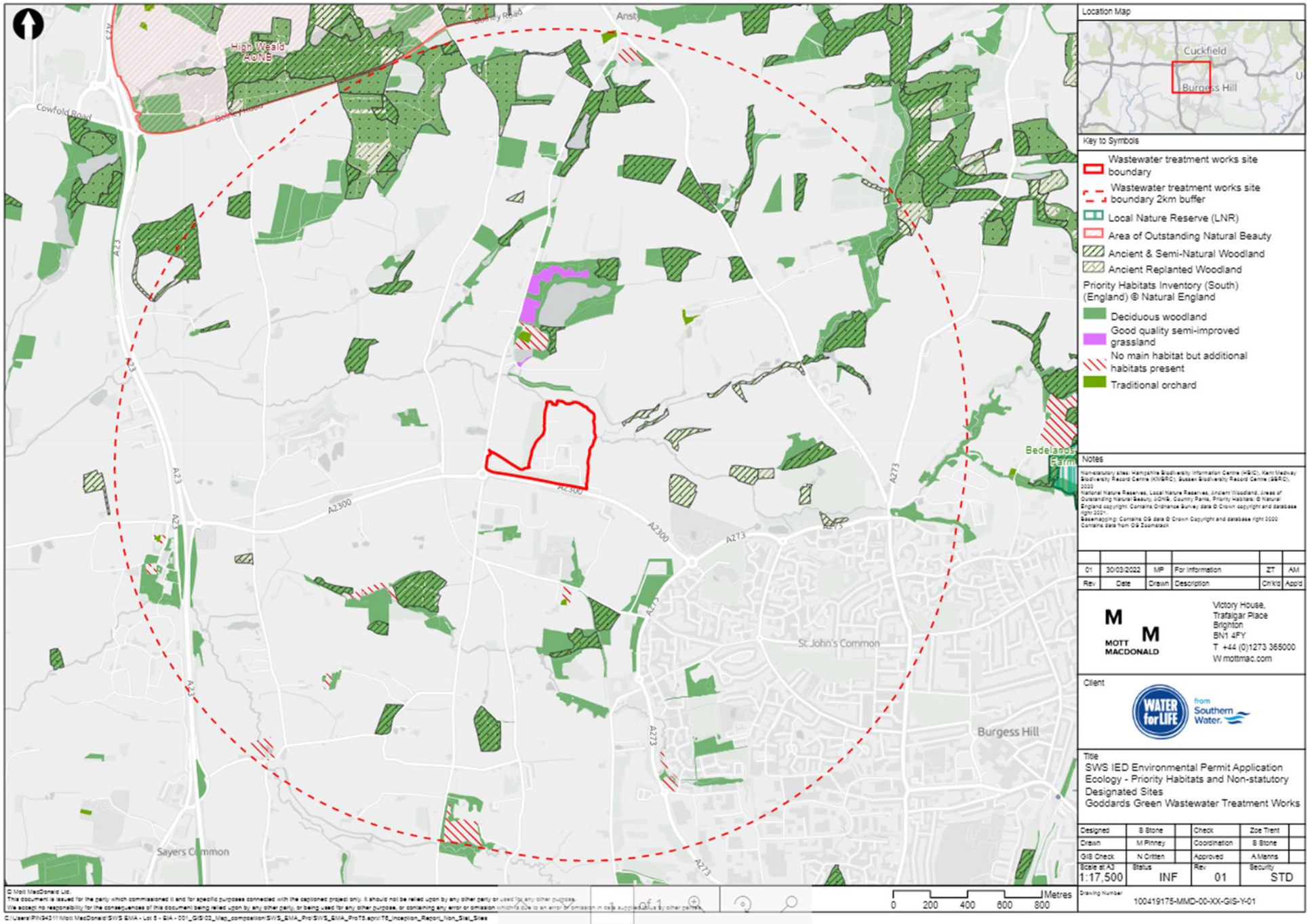


Figure A 3: Designated heritage sites within 1km of the Site

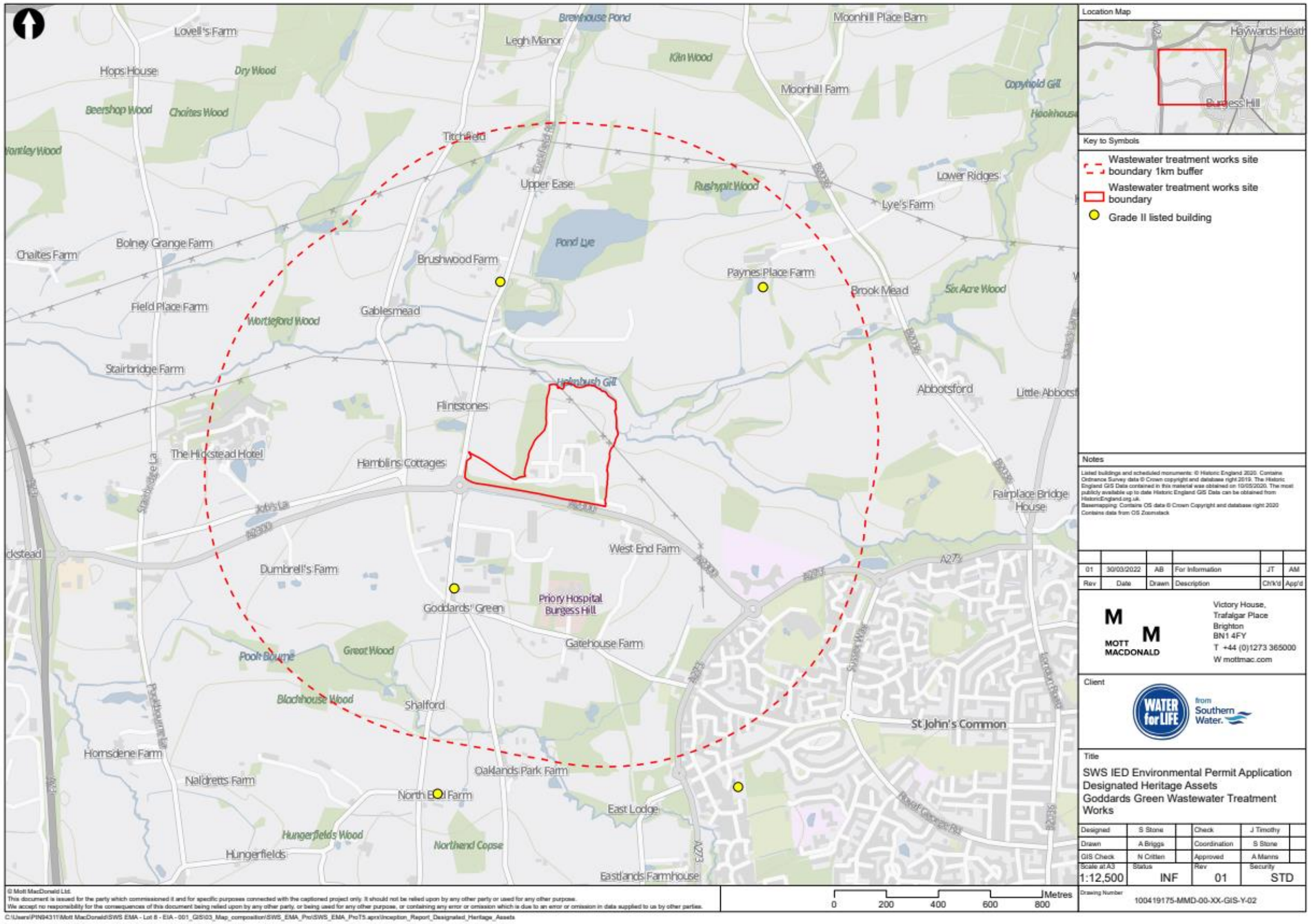
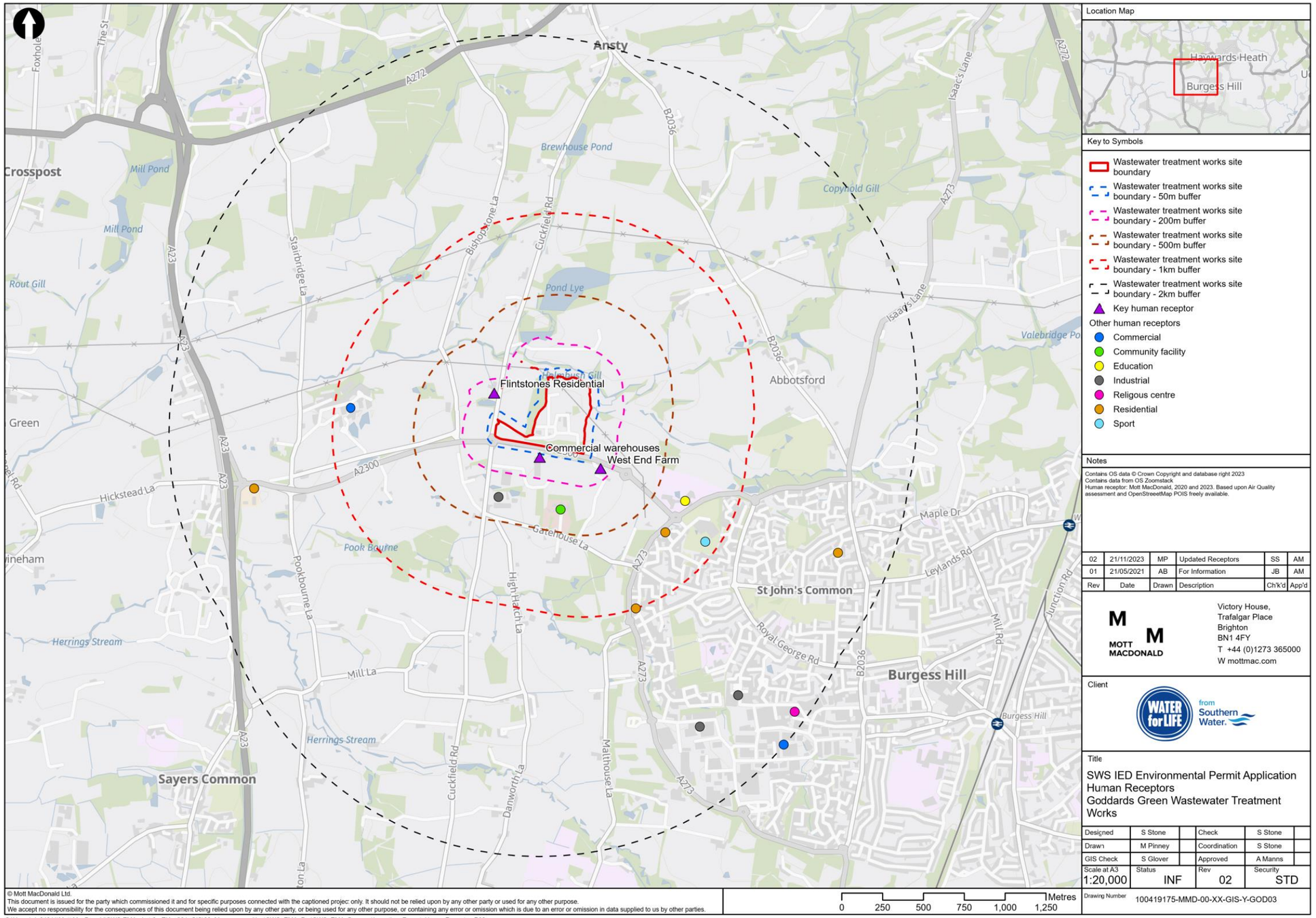


Figure A 4: Sensitive receptors within 2km of the Site



B. Environmental risk assessment table

Table B 1: Environmental risk assessment table

Emissions to air									
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	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. The operation of the flare will be prioritised for during emergencies, such as during CHP maintenance or downtime. In any other scenario the imports of the biogas to the CHP unit will be controlled to reduce the time of operation of the flare where possible.	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 TGN's including M2. There are pressure release valves on: 2 x per digester (4 total) 2 x gas holder (2 total) 1 x per THP vessel (6 total) 2 x per PDST (4 total) Operational record including date, time duration of pressure relief events and calculated annual mass release. Linked to SCADA. The flare is appropriate for emergency use (such as breakdown and maintenance). There is no plan to replace the existing CHP and flare at Goddard's Green as it meets the Site's requirements for biogas combustion. However, work is likely to be required to be fully BAT compliant for access, ports and measuring/monitoring devices.	Medium
Domestic properties, local human population, local amenity, site staff, visitors and offices. Haul roads, public highways.	Releases of particulate matter (dust) from cake and storage bays and Transport off-site	Nuisance, loss of amenity.	Air transport then deposition	Medium	Low	Low	Local residents and the 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. Sludge cake is stored in a large cake bay in the Dutch barn. Waste types on site are unlikely to cause significant 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 dust materials. Vehicles, equipment and impermeable surfaces are swept and washed down when necessary. Internal roads are swept, as required, to reduce the likelihood of any dust becoming airborne. Vehicles removing cake from site are kept covered, whilst in transport to prevent the escape of waste. All key sludge and wastewater treatment processes of the Site are enclosed, only the aeration lanes and FSTs are open.	Low

								Liquid lime solution is dosed into digested liquid sludge into centrifuge feed prior to the dewatering stage, it is therefore not dusty by nature. Waste treated within the THP is not likely to generate dust emissions. 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.	
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. There is one sensitive receptor within 250m of the Site, a place of work (warehouse). All key sludge and wastewater treatment processes of the Site are enclosed. The uncovered operations such as the aeration lanes are 'wet' processes and so resuspension and probability of exposure of bioaerosols is minimised. Emergency situations such as 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 STC operations take place within a closed system, covered tanks or buildings, including enclosed centrifuges, CHP and sludge reception, 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. Cake is removed daily from the site, but can be anywhere from 5-7 days weekly. Imported sludge cake is tipped directly into the strain press inside a shuttered building which is connected to the OCU. All telehandlers importing sludge cake are covered and the cake is transferred straight into the strain press. 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. Appropriate wash up facilities are also provided for drivers to clean the vehicles after loading or unloading in sludge storage bays and loading points, hose wash facilities are used at waste receptions 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 very low to low.	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.	Aquatic or chronic effects to aquatic life, contamination, and water	Direct run-off from the Site across ground surface, via	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 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	Medium

	Damage to drainage system. Spillage of raw materials of sludge/liquor during delivery/storage. Contaminated run off from cake storage e.g. containing suspended solids.	deterioration of water quality.	surface water drains, ditches etc. Indirect run-off via the soil layer. Transport through soil/groundwater then extraction/ abstraction at borehole or intake.				The hardstanding and pavement across the site is in reasonable condition. Parts of the site are bunded including storage areas for raw materials and waste stored on-site, however there are areas of gravel and grassland across the site. There is gravel to the rear of the digester bunds and some plant growth at the concrete joins suggesting they may not be fully sealed or bunded. Where hardstanding is in place, all water flows to the drainage network which diverts all water to the head of works. There are also some grassed areas adjacent to hardstanding, including at a low point in the southern part of the Site. Holes in some of the tanks have been patched. A pond exists on the site. Anecdotally this has had runoff from the site (including potential contaminants) enter it. Quantities of liquids stored are generally low. The nearest river to the Site is The Adur East (Goddards Green) (also named Holmbush Gill on mapping) flows east to west adjacent to the northern boundary of the site. There is one pond on-site. No substantiated pollution incident to air or land has been recorded within 250m of the Site.	around storage areas of all wastes and raw materials surrounding the STC. There is a waste area to the south of the main building where all skips are and bins are stored on a hardstanding area. Barriers such as bollards are provided in front of storage vessels, including those within the THP activity, to prevent accident impact by vehicles. Additional containment around digesters and other storage vessels is subject to a risk assessment and will be undertaken as part of the BAT requirements and in accordance with the Construction Industry Research and Information Association (CIRIA) standard 736. Hardstanding is planned to be constructed (based on the recommendations of the CIRIA risk assessment) around the digesters. 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. Sludge cake is stored in a large cake bay in the Dutch barn. 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. 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 surface 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.	
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 etc. then abstraction.	Low	Medium	Low	Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off. No groundwater abstractions are present on-site. No substantiated pollution incident to air or land has been recorded within 250m of the Site		Low
Groundwater, land and surface water	Spillages 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.	Low	Medium	Low	Potential for leaks from digestion tanks and storage vessels. Site infrastructure and hardstanding is generally in good condition. There are some grassed areas adjacent to the hardstanding which may enter the ground, including at a low point of the site in the south. The hardstanding and pavement across the key areas of the site is in good condition, with no cracks. Quantities of liquids stored are generally low.		Low
Groundwater, land and surface water	Spillages 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	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 is not currently imported into site but this permit application seeks to include it. It will be imported in 20 tankers per day (at peak) and will be unloaded via a hose. Sludge cake is delivered in sealed containers and is tipped into the strain press. Cake is transported around the site via conveyors.	Impermeable surface required for storage of all waste. 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 waste duty of care (EMS380), operational waste procedures (EMS381) and waste rejection (EMS488).	Low

		and deterioration of land and water quality. Pollution of water or land.						Compliance with the waste duty of care requirements to ensure waste accepted meets the permit conditions and relevant legislation. All liquid run off will be captured in the drainage network and returned to head of works.	
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	There is no leak detection of underground pipework on the Site at present. Condition of underground pipework is unknown. A Leak Detection and Repair Plan has been developed for underground pipework on the Site.	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.	Low
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	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. Area is not known to flood, and there have been no previous floods recorded on the Site.	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 are often sensitive to noise and vibration. Eight noise complaints have been received in the last five years (2019-2023). Complaints received in 2020 were reported by a single complaint in regard to alarm systems being heard at the complaints' property. There is one sensitive receptor within 250m of the Site, a place of work	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. The THP unit design for external use and uncovered. It is not expected to generate excessive noise levels. 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. Eight noise complaints have been received in the last five years (2019-2023), five of which were received in 2020. Complaints received in 2020 were reported by a single complainant in regards to alarm systems being heard at the complainants' property. There is one sensitive receptor within 250m of the Site, a place of work	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. Most noise-emitting equipment is enclosed. There are no noise mitigation measures on-site due to the rural location. 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.	Low

								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.	
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 not received any odour complaints in the last past five years (2019-2023), There is one sensitive receptor within 250m of the Site, a place of work	Odours are likely to be generated and released due to the nature of the wastes. There are three odour control units (OCU) on Site. There is OCU 1 serves the centrifuges and drum thickeners and the thickened sludge tank. OCU 2 treats cess reception and OCU 3 treats THP silo, auxiliary sludge storage tanks, imported cake and sludge reception, blending tank, the THP centrifuges and the raw liquor tank. The OCUs are connected to the site's SCADA system which records emissions data. The Site also has automated Hydrogen Sulphide monitors that detect failures of the odour control system and alarm at high level. The majority of key STC processes on-site are enclosed with the exception of LTP, with very little exposed to air, shutters are kept closed on buildings unless something is moving through them. Asset currently open/uncovered will be subject to a risk assessment. Gases generated across the THP activity are cooled and condensed within a sealed system with the non-condensable fraction being injected into the digester feed line. Odour is monitored to ensure emissions are free of odorous compounds. The Site's Odour Management Plan, which was produced in March 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. Sludge cake is stored in a large cake bay in the Dutch barn. All waste is imported and exported in covered lorries or contained in tankers. Any complaints received are investigated and actioned in line with the complaints procedure.	Low
Local human population, domestic properties, site offices.	Spillages of odorous materials including oils, fuels, chemicals. Failure to clean up spillages.	Nuisance, loss of amenity.	Air transport, then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. There are three sensitive receptors within 500m of the Site: a commercial warehouse, a residential area and a farm.	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.	Low

	Contaminated spill equipment not disposed of appropriately.							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.	
Local human population, domestic properties, site offices.	Fugitive release of H_2S.	Nuisance, loss of amenity.	Air transport, then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. There are three sensitive receptors within 500m of the Site: a commercial warehouse, a residential area and a farm. 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). H_2S 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 environmental 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. Cake 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. Established procedures in place for the waste duty of care (EMS380). All waste produced from general site activities is kept in enclosed containers, or inside a building, prior to removing from site. 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 plant. Details of the procedures Southern Water follows with regards to the controls of mud and debris and potentially polluting leaks and spillages can be found in EMS 360 and EMS 381. A Residue Management Plan has been produced for the Site which identifies the waste types generated and appropriate storage arrangements on Site.	Low
Local human population	Vehicles depositing mud and debris arriving/ leaving the Site.	Nuisance, loss of amenity and 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 Southern Water 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. All hardstanding is cleaned and swept on a regular basis. There is a wheel wash located on-site, hose wash facilities are available at waste receptions. 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 where necessary.	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	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Pest control measures are implemented under EMS227. The waste site adjacent to the Site uses birds of prey to deter birds, the presence of pigeons and gulls is reduced. The site has 12 visits per year, by a contractor, and netting is used on the Site, where appropriate to deter pigeons. If there is an increase in pest issues, then a request is made for extra contractor visits. 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	Low	Medium	Low	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 a Flood Zone 1 (less than 1 in 1,000 annual probability, and there have not been any reported flooding issues from the Site previously.	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. Southern Water is working towards an accredited Competency Management System to ensure Sites continue to operate appropriately. All operational staff are fully trained in the site operating procedures and Southern Water 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	Low

								contractor is permitted on-site without a suitable permission to work and qualification. The Site is fully enclosed by chain link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system, there are 8 CCTV cameras which comprise a combination of thermal imaging and number plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), 2 cover the large fuel tank and generator (CCTV and thermal) and two cover the hydrogen peroxide store under the archimedean screws. All monitored and controlled from control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night. 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. 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. Vehicle movements around the Site vary depending on what activities are being undertaken. 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 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 AD and biogas systems. Sludge storage tanks are covered and enclosed. 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	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		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.		Low

		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	Medium	Low	Impact from the tank explosion may cause external damages to other equipment, buildings located close to the epicentre of the explosion.	fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. The THP process operates at high temperatures (up to 160 degrees) and high pressure (6 bar). All plant and materials are designed for this environment and fail safes are in place to prevent over heating or over-pressurisation of the system Emergency operating procedures are in place. Adequate firefighting measures are implemented on-site. The Site is fully enclosed by chain link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system, there are 8 CCTV cameras which comprise a combination of thermal imaging and number plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), 2 cover the large fuel tank and generator (CCTV and thermal) and two cover the hydrogen peroxide store under the archimedean screws. All monitored and controlled from control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night. 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, 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.	
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. Permitted waste types limited to sludges and liquids.	The key sludge treatment and WTW processes are undertaken within enclosed systems Storage tanks are enclosed and covered. 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 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	Low

								DSEAR/PEXA on site and Smoking is only permitted in designated areas. Adequate firefighting measures are implemented on-site. Firewater within a newly bunded area will be contained by the bund and allow for appropriate disposal. There will be no gravity hydraulic connection from the bund to the drainage system/return to head of works. Manual intervention by an operator will be required to start the pumps and remains subject to the pre-acceptance (sample/test) procedure to ensure the water is appropriate for discharge to head of works. In the event of an incident, depending on the nature of the contamination (firewater in this context) the product will be held within the bund and be subject to alternative disposal methods. Depending on the scale and nature of the incident this may include temporary holding in road tankers to facilitate safe recovery activities. The detail regarding this procedure remains subject to further evaluation as solutions are designed and implemented. Firewater use on other process/equipment areas (which either have existing, or will be provided with new, impermeable surfaces) will drain to site drainage systems. A robust means of isolating the site drainage from returning to the head of works is required. Where sites have pumped return to head of works stopping the pump and ensuring no hydraulic link (syphoning) is required. Where return to head of works is (or could be) gravity returned, a new isolation valve is required which is to be shut in the event of an incident. Implementation of these measures will ensure no firewater returns to the WtW without appropriate controls including sampling/testing. Further design development is underway to determine the most appropriate solution to address this requirement and ensure compliance. 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.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.	
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 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.	The key sludge treatment processes are undertaken within enclosed systems such as AD and biogas systems. Storage tanks are covered and enclosed except LTP. 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	Low

				Permitted waste types limited to sludges and liquids	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, 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.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. 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. The Site is fully enclosed by chain link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system, there are 8 CCTV cameras which comprise a combination of thermal imaging and number plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), 2 cover the large fuel tank and generator (CCTV and thermal) and two cover the hydrogen peroxide store under the archimedean screws. All monitored and controlled from control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night. 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 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 within a newly bunded area will be contained by the bund and allow for appropriate disposal. There will be no gravity hydraulic connection from the bund to the drainage system/return to head of works. Manual intervention by an operator will be required to start the pumps and remains subject to the pre-acceptance (sample/test) procedure to ensure the water is appropriate for discharge to head of works. In the event of an incident, depending on the nature of the contamination (firewater in this context) the product will be held within the bund and be subject to alternative	

								disposal methods. Depending on the scale and nature of the incident this may include temporary holding in road tankers to facilitate safe recovery activities. The detail regarding this procedure remains subject to further evaluation as solutions are designed and implemented. Firewater use on other process/equipment areas (which either have existing, or will be provided with new, impermeable surfaces) will drain to site drainage systems. A robust means of isolating the site drainage from returning to the head of works is required. Where sites have pumped return to head of works stopping the pump and ensuring no hydraulic link (syphoning) is required. Where return to head of works is (or could be) gravity returned, a new isolation valve is required which is to be shut in the event of an incident. Implementation of these measures will ensure no firewater returns to the WtW without appropriate controls including sampling/testing. Further design development is underway to determine the most appropriate solution to address this requirement and ensure compliance.	
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. Given the level of operator controls which are in place and management plans, it is considered the probability and magnitude will be low.	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 safety and environmental management procedures and are kept up-to-date on changes. 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.	Low
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. One AONB, two LWS, and one Ancient Woodland are located within 2km of the Site, There are 4 priority habitats within 200m of the site, the the closes	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 water drains, ditches etc. Indirect run-off via the soil layer. Transport through soil/ groundwater then abstraction.	Low	Medium	Low	Physical disturbance and emission to air, water or land may cause harm to and deterioration of nature conservation sites. However, impacts to these sites are unlikely.	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

being a deciduous woodland 19m from the Site.							
Protected species, including nesting birds, wintering birds, common reptiles, terrestrial and aquatic invertebrates, common amphibians, bats, badgers, hazel dormice and great crested newts. There are 11 granted European protected species (EPS) within 1km for the site, with great crested newts found on site.	Any, but principally NOx.	Harm to protected species through 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.	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

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