



Howdon Sludge Treatment Centre IED Environmental Permit Application

Environmental Risk Assessment
100105164_ERA_HOW v2

February 2023

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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/KP3394ZE, for the Howdon Sewage Treatment Works (STW) and Sludge Treatment Centre (STC) ('the Site') on behalf of Northumbrian Water Limited ('Northumbrian 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 (March 2021). Risk assessments for your environmental permit. Accessed via <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit#risk-assessments-for-bespoke-permits> October 2021.

2 Site Setting

2.1 Location

Activity address: Northumberland Dock Road, Wallsend, Newcastle, Tyne and Wear, NE28 0QD.

National grid reference: NZ 33598 66357.

A plan showing the boundary of the scheme is provided in document reference 100105164_SiteLocationLayoutPlan_HOW v5.

2.2 Geology

2.2.1 Artificial Geology

Mapped artificial geology in the west of the Site comprises Made Ground deposits, indicating that the deposits are at least 2.5m thick in the area. Made Ground of less than 2.5m in thickness can also be expected in the east of the Site due to previous development on-site.

Historical mapping also indicates that the south and east of the Site were previously part of Northumberland Dock, which was partially infilled to form the artificially constructed area of disused land, on which the Site is located. Extensive earthworks have also been undertaken in the Site, suggesting that the ground will be significantly reworked. The Site is bounded on the upper eastern edge of the Site by an artificially raised embankment.

2.2.2 Superficial Geology

Superficial geology in the east of the Site consists of Tidal River or Creek Deposits comprising clay, silt and sand Holocene in age. Tidal River or Creek Deposits also run along the south of the Site associated with River Tyne. Areas of Pelaw Clay Member are mapped immediately to the north of the Site and Till, Devensian in age, lies approximately 700m to the northeast of the Site consisting of Diamicton.

2.2.3 Bedrock

Solid geology at the Site comprises of Pennine Middle Coal Measures (PMCM) formation which consists of interbedded sequences of mudstone, siltstone and sandstone together with coal seams, Westphalian in age. The Envirocheck geological maps indicate some faulting of this bedrock running from the north-west to south-east on the western and eastern boundaries of the Site.

2.3 Hydrogeology

The superficial deposits underlying the Site are classified as a combination of Unproductive Strata, Secondary Undifferentiated aquifers and unknown (lakes and landslip), indicating that they are not of significant value. The bedrock (PMCM) consists of siltstone, mudstones and sandstones of varying permeability. The PMCM formation is classed as a Secondary A superficial aquifer with low vulnerability.

There are no Source Protection Zones (SPZs) (of any level) within at least a 5km buffer of the Site.

There are no boreholes used for drinking water supply within 1km of the Site. However, there are two abstraction points one located approximately 400m south of the Site used for mineral washing and the second approximately 1km west of the Installation which is used for industrial water used for dust suppression.

2.4 Hydrology

The Site is located on the northern banks of the River Tyne, approximately 75m inland. The remaining part of the historical Northumberland Dock lies approximately 50m to the east.

The Site is located in an Environment Agency zone 1 flood risk area. Areas within zone 1 have 1 in a 1,000 chance of river or sea related flooding. However, the area approximately 50m to the east and 80m to the south of the Site is located within a zone 3 flooding risk area due to the proximity of the River Tyne. Areas within flood zone 3 have been shown to be at a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from rivers/ the sea.

2.5 Protected Areas

Ecological sensitive receptors are shown in Appendix A.

There are no sites of Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar sites within 10km of the Site boundary, demonstrated in Figure A.1.

No SSSIs are present within 2km of the Site boundary.

There are approximately 45 priority habitats within 2km of the Site. These comprise the following:

- 31 No. deciduous woodlands
- 11 No. mudflats
- 2 No. no main habitat but additional habitats present
- 1 No. good quality semi-improved grassland

These are geographically illustrated in Figure A.2.

2.6 Other notable features

As shown in Figure A.4 in Appendix A, there are 14 sensitive receptors located within 500m of the Site, 7 of which are within 250m. Those located within 250m are as follows:

- Land located directly to the east of the site is occupied by the 'Chemson Ltd' chemical works
- Breedon Concrete Plant directly to the south of the Site
- Residential properties to the west and northwest of the Site
- Commercial/industrial land use to the west of the Site (Heating Trade Supplies Group)
- A restaurant to the west of the Site (Sambuca)
- A playground to the west of the Site
- A commercial property to the northwest of the Site

There are also three Grade II listed buildings within 1km of the Site, as shown in Figure A.3 in Appendix A.

3 Environmental risks

3.1 Methodology

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

The probability and severity scores are then combined within a matrix to give an overall magnitude of the risk. This matrix is shown in Table 3.3 and is intended to illustrate the general approach to scoring.

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

Table 3.1: Severity Index

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

Table 3.2: Probability Index

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

Table 3.3: Magnitude of Risk

Severity index	Probability 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 ERA identifies potentially sensitive receptors within to on-site processes and assesses the risks within the following categories:

- Noise and vibration;
- Odour;
- Particulate matter;
- Litter, mud and debris;
- Abatement of other fugitive emissions to air;
- Vermin and insects (pests);
- Emissions to water and land;

- Human and Environment Safety; and,
- Habitats and ecology.

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

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

3.2.2 Point source and fugitive emissions risk

3.2.2.1 Air quality

The CHP units and generators are currently permitted under the permit number EPR/YP331HQ, which allows for the operation of Tranche A and Tranche B Specified Generators aggregated to <50MWth at a specified location.

The permit variation in 2019 allows Northumbrian Water to operate the following at Howdon STW and STC:

- A waste operation for the combustion of biogas from the sewage works and associated natural gas fuelled steam boilers (these can also be fuelled by biogas and gasoil)
- One new medium combustion plant (MCP) rated between 1 and <50MWth but aggregated to <50MWth, which was put in operation on or after 20/12/2018 at a specified location; and/or

The three dual fuel CHP engines are classified as Tranche A generators and MCPs and are required to be permitted under Schedule 25A and 25B by 01/01/2029 and comply with emission limits by 01/01/2030.

Air dispersion modelling (ADM) was undertaken for the 2019 permit variation to assess the point sources to air from the natural gas engine, in accordance with the Environment Agency's guidance on air quality modelling at the time of the permit variation was granted². A worst-case approach was assessed to ensure that any air quality impacts are more likely to be over-estimated than under-estimated. Air quality monitoring has also been undertaken from September 2020 to January 2022³. 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 Advanced Anaerobic Digestion (AAD) plant and associated processes. The back-up generator was not included in the ADM, however, this is for emergency use only and, therefore, it is not considered necessary to further assess.

The biomethane plant has one point source emission point, from the AAD odour control unit (OCU), which will release carbon dioxide and trace amounts of contaminants (methane, hydrogen sulphide, Volatile Organic Compounds) to the atmosphere. Prior to being released to the atmosphere, the off-gas passes through an activated carbon filter in the AAD OCU with an efficiency greater than 98% to remove contaminants. The purpose of the biogas upgrader is to remove carbon dioxide to produce biomethane in line with the Quality Protocol for Biomethane (WRAP and Environment Agency, December 2013)⁴. Prior to leaving the upgrade plant, the biomethane will be enriched with propane (to raise the calorific value) and an odorant is added before the biomethane is injected into the network.

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

³ See document references 100105164_AirQualityMonitoringSep20toSep21_HOW, 100105164_AirQualityMonitoringNov21_HOW, and 100105164_AirQualityMonitoringJan22_HOW

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/292518/QP_Biomethane_final_to_publish.pdf

Since the off-gas passes through an activated carbon filter, in the AAD odour control unit to remove contaminants with an efficiency greater than 98%, only trace amounts of contaminants within the off-gas are released to the atmosphere. A H1 assessment for the purpose of screening the biomethane plant has been undertaken, presented in document reference 100105164_ERA_H1_HOW. Emissions of such contaminants are considered insignificant in terms of their impact on local air quality, human health and the environment, and consequently these have been screened out from requiring detailed modelling.

The operation of the flare will be prioritised during emergencies, such as during CHP maintenance or downtime. In any other scenarios, imports of the biogas to the CHP unit will be controlled to reduce the time of operation of the flare, where possible. The flare is monitored through a site wide SCADA system and maintenance of the flares is undertaken every 6 months by Uniflare.

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 Emissions Management Plan (EMP) is not considered to be required.

Table 3.4: Combustion plant details

	CHP 1	CHP 2	CHP 3	CHP 4	Back-up Generator	Composite Boiler 1	Composite Boiler 2	Composite Boiler 3
Make/Model number	MWM TCG 2020 V20	MWM TCG 2020 V20	MWM TCG 2020 V20	MTU 16v4000	Volvo Penta TWD1643GE	Cochran ST49	Cochran	Cochran
Date that MCP became operational/was commissioned	24 October 2011	24 October 2011	24 October 2011	15 February 2019	24 October 2011	24 October 2011	24 October 2011	24 October 2011
Thermal input (MWth)	4.8	4.8	4.8	4.5	1.7	2.2	2.2	2.2
Stack height (m)*	25	25	25	13	5	25	25	25
Fuel used (biogas, diesel etc)	Natural gas (biogas in an emergency)	Natural gas (biogas in an emergency)	Natural gas (biogas in an emergency)	Natural gas	Diesel	Biogas and natural gas	Biogas and natural gas	Biogas and natural gas
Estimated total hours of operation per year	Not restricted	Not restricted	Not restricted	Not restricted	6	2,550	1,736	4,681
MCPD and SG Regs status	Tranche A Existing MCP	Tranche A Existing MCP	Tranche A Existing MCP	Tranche B Existing MCP	Excluded Specified Generator Existing MCP	Existing MCP	Existing MCP	Existing MCP

Note: *The stack for CHPs 1 to 3 is the same as that for the composite boilers

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. A bioaerosol risk assessment has, therefore, been produced as part of the application as both residential and industrial sensitive receptors are present within 250m of the Site boundary. See document reference 100105164_ERA_BioA_HOW v4.

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 facilities⁵" (2009).

3.2.2.3 Abatement of other fugitive emissions to air

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.

3.2.3.1 Emissions to water (other than sewers)

The Site is not located within a groundwater SPZ.

Drainage from the apron drains on-site, sends water to the head of the works for treatment. Surface water drains lead to a pumping station before being sent to the head of the works.

There will be no point source emissions from the Site. There are no direct potentially contaminated discharges to controlled surface waters.

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. Drainage from the apron drains on-site, sends water to the head of the works for treatment. Surface water drains lead to a pumping station before being sent to the head of the works.

Any liquid waste will either be reused, or discharged to the drainage system of the adjacent Howdon STW, and will undergo treatment through the works before being discharged under an existing water discharge permit into the River Tyne (a saline estuary). On-site STW effluent will meet the requirements of the existing discharge permit. The water used at the Site will be contained in a closed circuit; all wastewater streams will either be recycled within the process or captured and rerouted to the adjacent STW.

Discharges will be minimal, typically arising from periodic maintenance and cleaning operations. As such, there are no direct potentially contaminated discharges to controlled surface waters

⁵ 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.

and no significant impacts. A drainage plan of the Site is presented in document reference 100105164_MSD_DrainagePlan_HOW v2.

3.2.3.3 Emissions to land

The condensate from the CHP exhaust, gas bag and digester is recirculated back to the head of the works. Discharges will be minimal, typically arising from periodic maintenance and cleaning operations, and is captured in spill trays.

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

3.2.4 Noise and vibration

Initial screening has been carried out for the Site. Noise Impact Assessments (NIAs) have been undertaken in 2010, 2014 and 2017, the latter two relating to the biomethane plant and blowers respectively. Since the Site is not undergoing changes to equipment or vehicle movements, prior to application submission, an NIA is not considered to be required.

The Site is situated in a largely industrial area. Human receptors have been identified within 250m of the Site boundary, however, providing vehicle movements in and out of the Site are restricted to normal working hours and maintenance activities continue at the current rate, it is unlikely that noise and vibration sourced from on-site plant will cause a nuisance.

An assessment of the overall and residual risk from noise and vibration is provided in Appendix B.

A Noise and Vibration Management Plan is, therefore, not considered to be required.

3.2.5 Odour

A review of the nearest human receptors has been undertaken to establish the level of odour risk to the receptors before and after mitigation. There are residential and industrial sensitive human receptors within 500m of the Site.

All sludge treatment activities are undertaken in enclosed buildings or tanks. The Site also has three odour control units to mitigate the risk of odour, one which extracts from the strategic tanks. There is also a biofilter which extracts from the raw centrifuge, post digestion sludge tank and cake import facility. The biomethane plant has a carbon filter for emergency or secondary abatement.

An Odour Management Plan has been submitted as part of this application, see document reference 100105164_OMP_HOW v3.

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

3.2.6 Particulate matter, litter, mud and debris

The need for a dust management plan is triggered if the keeping and/or treating of biowaste in the open, including the finished material, is located:

- In, or within 2km of, an air quality management area for PM10;

- Within 500m of a sensitive receptor such as a home, school, hospital or nursing home, food preparation facility or similar; or
- Within 250m of a sensitive receptor when treating biowaste

The sludge and wastewater treatment processes of the Site are enclosed. Sludge cake is understood to be stored in a silo and is covered when transported. Although the Site has been screened as being within 500 metres of sensitive receptors (see Appendix A), a Dust Management Plan is not considered to be required since operations, and waste types, used on-site cause minimal dust emissions and appropriate mitigation is in place.

3.2.7 Pests

Birds, vermin and insects (pests) are not considered to be an issue since the waste types handled on-site do not attract them. Rat traps are in place on-site and external pest control contractors are called upon, when required. Since the residual risk is not deemed to be medium or higher, a Pest Management Plan is not considered to be necessary.

3.2.8 Human health and environmental safety

3.2.8.1 Visual impacts

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

3.2.8.2 Site security

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

Access to Site and waste is restricted by a 2m steel palisade fence. The Site is accessed by a 24 hour manned security barrier entrance and monitored by CCTV cameras. The Site is staffed 24 hours a day, 7 days a week. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system.

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.

3.2.8.3 Flood risk

Initial screening was undertaken to determine the flood risk for the Site. The data utilised for this study was published online, by the Environment Agency, and relates to the flood risk from surface water, rivers and the sea.

The Site is predominantly located within a Flood Zone 1, which is an area with a low probability of flooding from rivers or the sea (less than 1 in 1,000 annual probability). However, the area approximately 50m to the east and 80m to the south of the Site is located within a Flood Zone 3 area, due to the proximity of the River Tyne. Areas within Flood Zone 3 have been shown to be at a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from rivers/ the sea. However, there have not been any reported flooding issues from the Site previously.

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 for the purpose of this application.

3.2.8.4 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), 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) licences available on Multi-Agency Geographic Information for the Countryside (MAGIC), within 2km of the Site boundary. Geographic Information for the Countryside (MAGIC). Accurate to within the nearest 100-200m depending on local council survey data accuracy.

No ecological field surveys have been completed to inform this screening. This screening identifies the likelihood of ecological features being present or further investigation being required.

Initial screening has been carried out for the Site; the high-level results of which are shown in Table 3.5. 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 3.5: Results of initial screening of natural habitats and ecology for Howdon STC

Natural habitats and ecology	Howdon STC
Statutory designated European sites within 10km of the Site boundary	
Special Areas of Conservation (SAC)	
Special Protection Areas (SPA)	
Ramsar sites	
Statutory designated national sites within 2km of the Site boundary	
Sites of Special Scientific Interest (SSSIs)	
Marine Conservation Zones (MCZs)	
National Nature Reserves (NNRs)	
Local Nature Reserve (LNRs)	
Areas of Outstanding Natural Beauty (AONBs)	
Non-statutory designated sites within 2km of the Site boundary	
Local Wildlife Sites (LWS)	
Ancient Woodlands	

Natural habitats and ecology	Howdon STC
Country Parks	
Sites of Importance for Nature Conservation (SINC)	
Priority habitats within 2km of the Site boundary	
Priority habitats	45
Protected species	
Granted European Protected Species (EPS) licences: within 2km of the Site boundary	1 (bats)

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

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

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

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

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

A. Environmental Constraints Maps

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

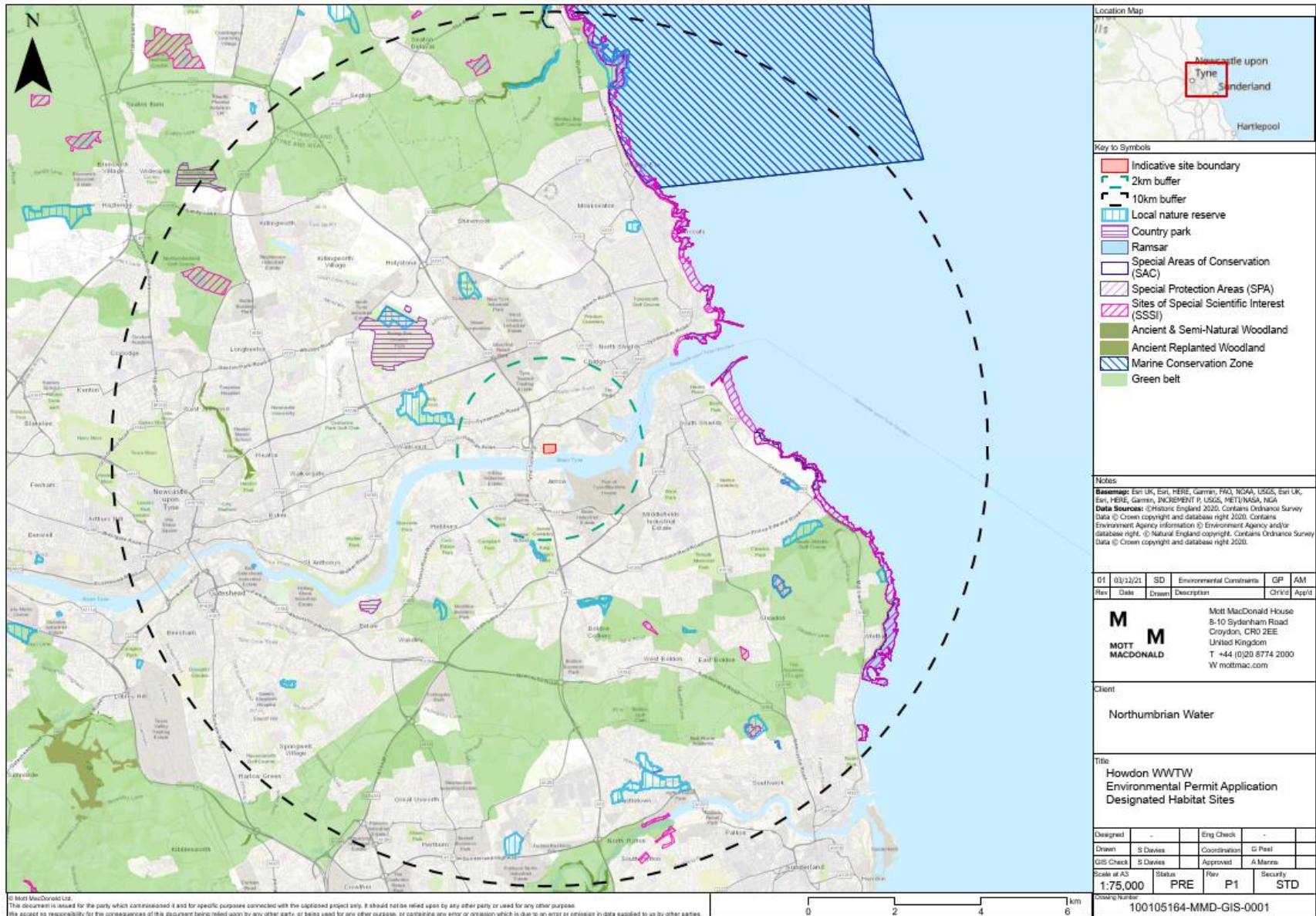


Figure A.2: Non-statutory designated habitat sites within 2km of the Site

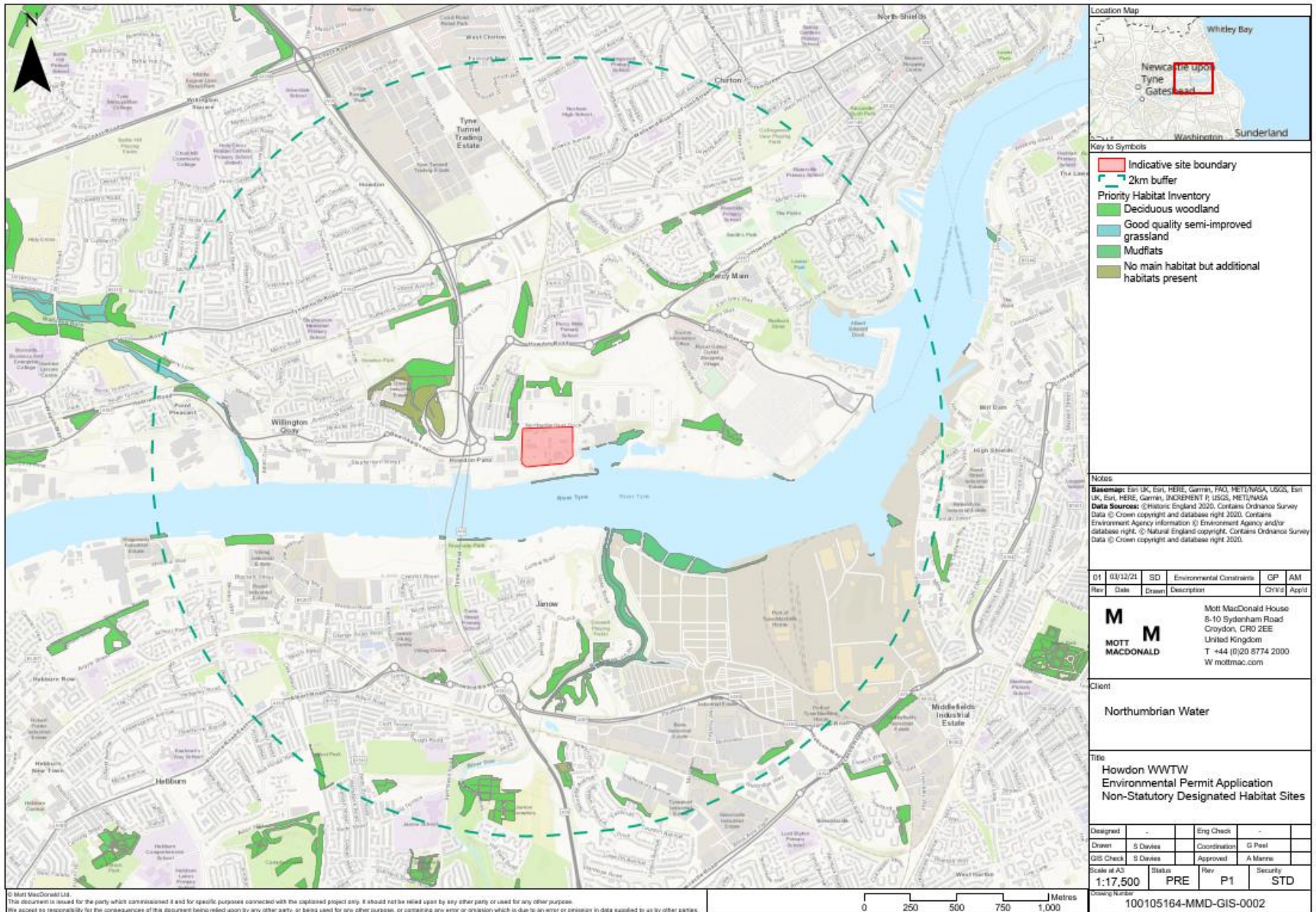


Figure A.3: Designated heritage sites within 1km of the Site

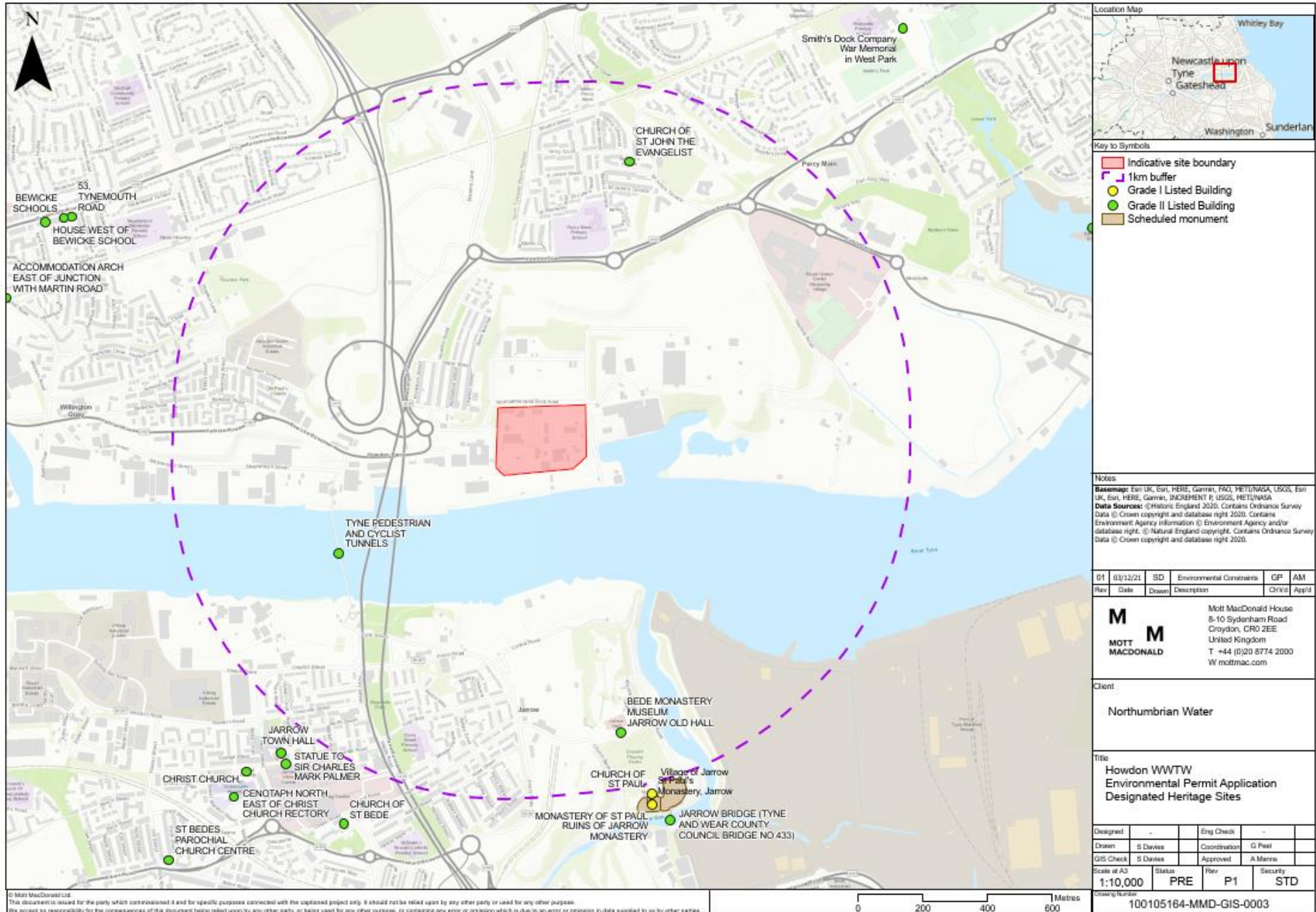
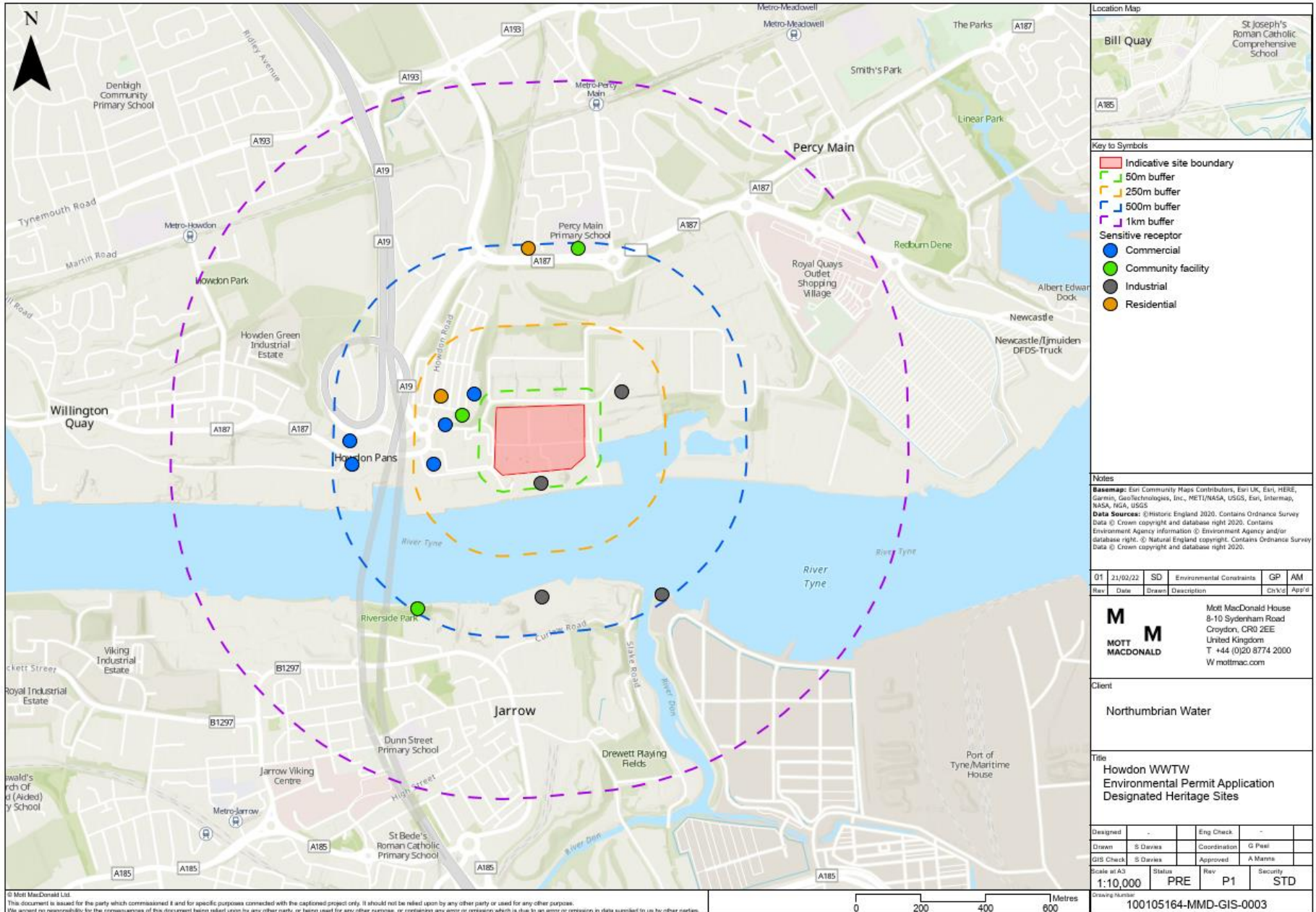


Figure A.4: Sensitive receptors within 1km of the Site



B. Environmental Risk Assessment Table

Emissions to air									
Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population.	Releases of NO ₂ , SO ₂ , CO, H ₂ S, NH ₃ and other gases	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Medium	Low	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 nearest residential receptor is 350m northwest of the Site boundary, and an industrial receptor is adjacent to the Site boundary. The Site has 3 No. advanced anaerobic digesters, 1 No. CHP and boiler stack, 3 No. dual fuel Combined Heat and Power (CHP) units, 1 No. natural gas engine, 3 No. composite boilers, 3 No. odour controls units, 1 No. flare stack, 2 No. gas holders, and 1 No. AD biofilter as sources of air emissions.	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. 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 biogas	Harm to human health - respiratory irritation and illness by inhaling H ₂ S present in the biogas. Release of potent climate change gases.	Air transport	Low	High	Medium	There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed. There is one flare present on-site, which is used to burn excess biogas or when the CHP engine is down for maintenance. This activity is already permitted.	Activities shall be managed and operated in accordance with the EMS and will include measures covering operation, inspection and maintenance of equipment, including engine management systems. Point source emissions to air will be monitored to ensure emission limits for biogas are not exceeded, in accordance with permit requirements and any relevant TGNs including M2.	Low
Domestic properties, local human population, local amenity, site staff, visitors and offices. Haul roads, public highways.	Releases of particulate matter (dust) from cake storage bays Transport of cake off-site	Nuisance, loss of amenity.	Air transport then deposition	Low	Low	Low	Local residents and surrounding environment are often sensitive to dust. Dust may be produced from dirt deposits from vehicles or other users of the haul road and treatment and storage of cake in silos. There are no cake bays on-site, cake is stored in a cake import facility containing 1 No. large 500 tonne silo with storage space for a maximum of two silos (60m ³). The waste types used on-site are unlikely to cause dust emissions. Therefore, the magnitude of risk is considered to be low.	No wastes consisting solely of dusts are accepted. General operations at the Site do not create dusty materials. Vehicles, equipment and impermeable surfaces are swept and washed down when necessary. Internal roads are swept, as required by a third party contractor, to reduce the likelihood of dust becoming airborne. There are no additional dust suppression techniques e.g. mist spray etc employed on-site as this is not considered necessary. 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.	Low
Local human population.	Release of microorganisms (bioaerosols).	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Medium	Medium	Medium	The permitted waste is non-hazardous sludge in liquid and cake form. The nature of waste and the 'wet' processes undertaken on-site are not likely to cause a release of bio-aerosols. Potential for release at waste reception and maturation (handling and storage of cake). Emergency situations such as failure of the flare of CHP/boilers could result in uncontrolled emissions of bioaerosols.	Storage of cake is carried out in a silo and is covered during transport. 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. Key operations take place within a closed system, including covered tanks, pipework and machinery. The anaerobic digestion vessels are sealed and biogas is extracted from the vessels. This minimises the risk of bioaerosols affecting operational staff. Biofilters are regularly checked for efficiency. 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 units are airtight and treats air released to remove bioaerosols. The process is monitored and regularly maintained. Gas holders are 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.	Low

Emissions to Water and Land				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
								Stringent loading and unloading procedures are in place for receipt of sludge and liquor. Lorry and tanker drivers are required to hose down any spillage after each loading or unloading and clean contaminated wheels before leaving Site. A Bio-aerosol Risk Assessment has been undertaken to assess the risks of bio-aerosols from the Site. This identifies that across all sources, there is a 'very low' or 'low' probability of exposure due to the nature of the processes and control measures in place which would prevent uncontrolled releases of bioaerosols.	
All surface waters close to and downstream of the Site.	Tank failure, spillages of digestate and/or liquids including oil Damage to drainage system. Spillage of raw materials or sludge/liquor during delivery/storage Contaminated run off from cake storage e.g. containing suspended solids.	Acute or chronic effects to aquatic life, contamination and deterioration of water quality.	Direct run-off from the Site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Low	High	Medium	Potential for leaks from digestion tanks, storage vessels/bays and drainage system which may cause contamination or deterioration of surface water quality. Impermeable ground surfacing currently surrounds the digesters. Site infrastructure and hardstanding are generally in a good condition. Where hardstanding is in place, all water flows to the drainage network which diverts all water to the head of works. Quantities of liquids and raw materials stored on-site are generally low. Raw materials are stored in bunded areas. The potential for spillage from digestion tanks and storage vessels is considered low and processes on-site are generally contained. The Site is adjacent to the River Tyne which lies to the south of the Site. No pollution incidents to controlled waters were recorded within 250m in the last five years.	The Site drainage plan is documented and all staff are trained in the event of emergency or accident. Impermeable surface and secondary containment, in the form of constructed bunds or portable bunds, is in place around storage areas of all wastes and raw materials and surrounding the STC and STW. 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 an appropriate standard. There is one cake storage silo on-site, which is only ever filled to 80% capacity. Cake is moved through covered pipes and conveyors. Raw materials and liquids/chemicals are stored in suitable locations on-site and are appropriately bunded. Activities are managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the Site diary including actions taken. Spill kits are available near some of the chemical storage. Site Manager ensures the programme of Planned Preventative Maintenance is implemented effectively to minimise the probability of equipment malfunction.	Low
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.	Abstraction from watercourse downstream of facility (for agricultural or potable use).	Low	Medium	Low	Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off. No abstraction is undertaken from nearby watercourses. No pollution incidents to controlled waters were recorded within 250m in the last five years.	Control of substances hazardous to health (COSHH) assessment undertaken for all raw materials. All condensate from the CHP, flare stack and biogas system discharges into a sealed system and are returned to the head of the works.	Low
Groundwater, land and surface water	Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids. Sludge/liquid spillages as a result of loss of tank/pipe integrity/ carelessness during transfer or overfilling	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction at borehole or intake.	Low	Medium	Low	Potential for leaks from digestion tanks and storage vessels. Site infrastructure and hardstanding is generally in a good condition. Quantities of liquids stored are generally low.	The condensate is clean, uncontaminated water and is small in quantity. Both clean and contaminated surface water is directed to a pumping station which recirculates it back into the system. The stormwater drainage of potentially contaminated areas from within the Site boundary is routed into the head of the works with no discharge outside of the Site boundary. Regular inspections of the Site drainage systems and other equipment are undertaken, with any repairs and maintenance carried out if necessary. All complaints and other incidents are recorded in the Site diary including actions taken.	Low
Groundwater, land and surface water	Damage to drainage system	Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Low	Medium	Low	Presence of pipework below ground. There is no leak detection of 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. Activities to be managed and operated in accordance with the EMS.	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	<p>Permitted waste types are sludges/bio-solids, which may contain pathogens, so any waste washed off-site will add to the volume of the local post-flood clean up and may be hazardous to human health.</p> <p>The Site is located within a Flood Zone 1 (less than 1 in 1,000 annual probability). However, the area approximately 50m to the east and 80m to the south of the Site is located within a Flood Zone 3 area due to the proximity of the River Tyne. Areas within flood zone 3 have been shown to be at a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from rivers/ the sea. However, there have not been any reported flooding issues from the Site previously and therefore the magnitude of risk is considered to be low.</p>	<p>The drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters.</p> <p>Activities are managed and operated in accordance with a management system and management plans and procedures implemented, including (but not limited to) the removal and clean-up of spilled waste material, including sludge, cake etc. and other pollutants (this may also include removal of used spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.</p>	Low
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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	<p>Local residents and Site staff are often sensitive to noise and vibration.</p> <p>There are seven sensitive receptors within 250m of the Site boundary. The Chemson chemical plant is located directed to the east of the Site and residential properties to the west.</p> <p>No noise complaints have been received in the last five years and therefore the magnitude of risk is low.</p>	<p>Site will only accept imports within existing operating hours (fully complying with Site's planning conditions). Vehicles do not exceed the Site speed limit of 10mph and will not generate a great amount of noise.</p> <p>The main truck movements are away from residential housing and other sensitive receptors.</p> <p>Noise and vibration shall be minimised and not cause nuisance. Noise kept to a minimum during operating hours.</p> <p>Exceptional noisy operations e.g. construction – inform residents. Noise complaints to be investigated and actioned and remedial measures will be undertaken.</p> <p>All complaints are recorded in the Site diary including actions taken.</p>	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	<p>Local residents and Site staff often sensitive to noise and vibration.</p> <p>Majority of Site operations are enclosed.</p> <p>There are seven sensitive receptors within 250m of the Site boundary. The Chemson chemical plant is located directed to the east of the Site and residential properties to the west.</p> <p>No noise complaints received.</p>	<p>Fans and condensate traps will be checked for water and fans and extraction systems checked.</p> <p>Flare usage kept to a minimum to reduce noise impact. The design has been developed to minimise noise off-site. The operator will maintain all equipment either in house or by a sub-contract such that noise and vibration are maintained within the limits of the inputs to the sound model.</p> <p>All other STC Site operations are either covered or enclosed. Where equipment is to be replaced, preference will be given to procuring quiet plant and silencing equipment.</p> <p>There is no equipment on-site that can cause vibration nuisance at the local receptors. Nonetheless, equipment is turned off when not in use, where appropriate.</p> <p>Any complaints received are investigated and actioned in line with the complaints procedure.</p> <p>All complaints are recorded in the Site diary including actions taken.</p>	Low

Odour

Data and information

				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population.	Odour from site activities	Nuisance, loss of amenity (e.g. disruption during outdoor activities)	Air transport then inhalation.	Medium	Medium	Medium	<p>Local residents and staff sensitive to odour. Wide range of waste may cause odour issues during reception of wastes, release of biogas and from</p>	<p>Odours are likely to be generated and released due to nature of the wastes. The Site also has two odour control units to mitigate the risk of odour, one which extracts from the strategic tanks. There is also a biofilter which extracts from the raw centrifuge,</p>	Low

							<p>digestate, hence control measures have been adopted.</p> <p>There have been 41 odour complaints from 2017-2020, with the number of complaints decreasing to 11 from 2019 to 2020. Northumbrian Water has undertaken numerous works from 2020-21 to improve odour mitigation, including refurbishment of the odour scrubbers, AAD plant OCU biofilter and the OCU in the sludge thickening and strategic storage area.</p> <p>There are seven sensitive receptors within 250m of the Site boundary. The Chemson chemical plant is located directed to the east of the Site and residential properties to the west.</p>	<p>post digestion sludge tank and cake import facility. The gas to grid plant has a carbon filter for emergency or secondary abatement.</p> <p>All abatement systems are designed, monitored and maintained to treat specified emissions and off gases. Other odour mitigation measures implemented on-site include placing covers on containers, limiting the height of rising sludge.</p> <p>Odour is monitored to ensure emissions are free of odorous compounds.</p> <p>The Site's Odour Management Plan, which was reviewed and updated in March 2022, identifies potential odour emissions from Site operations and procedures to manage, control and minimise odour impacts.</p> <p>Using appropriate measures, non-point source emissions of biogas shall be minimised. All available measures and Best Available Techniques will be implemented. All abatement systems are designed, monitored and maintained to treat specified emissions and off gases.</p> <p>Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution.</p> <p>All storage tanks are covered or enclosed. All sludge is processed as soon as it is discharged to the STC.</p> <p>Cake is stored in a silo and remains covered during transportation. Processes on-site are carried out indoors, with very little exposed to air, shutters are kept closed on buildings unless something is moving through them.</p> <p>All waste is imported and exported in covered lorries or contained in tankers.</p> <p>Any complaints received are investigated and actioned in line with the complaints investigation procedure.</p>		
Local human population, domestic properties, site offices.	Spillage of odorous materials including oils, fuels, chemicals. Failure to clean up spillages. Contaminated spill equipment not disposed of appropriately.	Nuisance, loss of amenity.	Air transport then inhalation.	Low	Medium	Low	<p>Local residents and staff often sensitive to odour.</p> <p>Waste processes on-site are generally conducted within sealed units.</p> <p>There are 14 sensitive receptors within 500m of the Site, five commercial places of work, four industrial land uses, three community facilities and two residential areas.</p>	<p>Procedures for dealing with spillages are covered in the EMS.</p> <p>The Site Manager shall ensure all relevant staff are appropriately trained to use the spill kits and that all spillages are cleaned up immediately.</p> <p>All areas of the Site are to be cleaned regularly; Site Manager to oversee regular cleaning schedule, all staff trained on importance of good housekeeping and Site cleanliness.</p> <p>All spills are recorded in the Site diary including actions taken.</p>	Low	
Local human population, domestic properties, site offices	Fugitive release of H ₂ S	Nuisance, loss of amenity	Air transport then inhalation.	Low	Medium	Low	<p>Local residents and staff often sensitive to odour.</p> <p>There are 14 sensitive receptors within 500m of the Site, five commercial places of work, four industrial land uses, three community facilities and two residential areas.</p> <p>Fugitive release, not expected to occur under normal operating conditions.</p>	<p>Activities are managed and operated in accordance with the EMS (and include inspection and maintenance of equipment, including engine management systems).</p> <p>H₂S point source emissions to air are controlled in accordance with emission limits.</p> <p>Specialist units are used for air treatment and abatement to reduce odours and the generation of other gaseous compounds.</p>	Low	
Litter, mud and debris										
Data and information				Judgment			Action (by permitting)			
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude		Risk management	Residual risk
Local human population, livestock and wildlife, domestic properties and local amenity.	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	<p>Local residents, surrounding environment and animals sensitive to litter.</p> <p>There is some potential for litter to be generated from general site activities but limited potential for it to leave the Site boundary.</p> <p>Sludge that is delivered to the Site is transported in tankers.</p>		<p>All vehicles leaving the Site which are transporting waste are to be covered to prevent waste/materials being blown from them.</p> <p>All waste produced from general site activities is kept in enclosed containers, or inside a building, prior to removing from Site. Bins for general waste and recyclable waste are located outside the office, grit and screenings are stored in skips associated with relevant infrastructure. All waste is removed by an external contractor when required.</p> <p>Regular inspections for litter and debris are undertaken.</p>	Low

								Nuisance management measures are included in the EMS and the site-specific management plan.	
Local human population.	Vehicles depositing mud and debris arriving/ leaving the Site.	Nuisance, loss of amenity, road traffic accidents.	Vehicles entering/ leaving the Site.	Low	Low	Low	Road safety issues – local residents often sensitive to mud on the road. Limited potential for mud and debris. Waste is either pumped onto site or transported in sealed tanks or containers.	Activities shall be managed and operated in accordance with a site-specific management plan with overarching procedures set out in the EMS. Any mud or sludge arising from activities on-site is cleared up promptly. There are no wheel washing facilities on the Site, but vehicles can be washed down with hoses and impermeable surfaces are swept and washed down, when necessary. Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Vehicle routes are to be inspected regularly and swept when necessary. All vehicles leaving the Site, transporting waste/ cake are to be covered to prevent waste/materials being blown from them.	Low

Pests

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

Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
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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 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. Rat boxes are in place on-site and external pest control contractors are called upon when required. 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 is kept in enclosed containers, or inside a building, prior to removing from Site. Doors of buildings are to remain closed at all times when not in use. 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 in place, including regular inspection and monitoring of the Site for pests by contractors.	Low
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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
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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). However, the area approximately 50m to the east and 80m to the south of the Site is located within a Flood Zone 3 area due to the proximity of the River Tyne. Areas within flood zone 3 have been shown to be at a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from rivers/ the sea. However, there have not been any reported flooding issues from the Site previously and therefore the magnitude of risk is considered to be low.	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.	
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Local human population and / or livestock after gaining unauthorised access to the installation.	All on-site hazards: machinery, tanks, wastes and vehicles.	Bodily injury Risk of drowning	Direct physical contact.	Low	Medium	Low	<p>Potential injury to on-site personnel as a result of vehicle movements or equipment malfunction or misuse.</p> <p>Direct physical contact is minimised by activity being carried out within enclosed digesters, so a low magnitude risk is estimated.</p> <p>Contact with waste is minimal with exception of leaks or spills from unloading of tanker and transfer of filter cake.</p>	<p>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.</p> <p>All operational staff are fully trained in the Site operating procedures and safety and environmental management procedures and are kept up to date on changes.</p> <p>Training includes awareness raising of the potential on-site hazards and health and safety measures to adhere to.</p> <p>Preventative measures will be under continuous review as part of the EMS procedures.</p> <p>Activities are managed and operated in accordance with the EMS – this includes site security measures to prevent unauthorised access. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification.</p> <p>Access to Site and waste is restricted by a 2m high steel palisade fence. The Site is accessed by a 24 hour manned security barrier entrance and monitored by CCTV cameras. There is another barrier entrance adjacent to the former Chemson site. The Site is staffed 24 hours a day, 7 days a week. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system.</p> <p>Lighting is provided at all reception facilities to give good visibility at all times of the day and night.</p> <p>The Site is staffed 24 hours a day, 7 days a week.</p> <p>Key sludge treatment and wastewater treatment activities undertaken within enclosed systems.</p> <p>Under current conditions six tankers per day deliver sludge to the Site.</p> <p>Vehicle movements around the Site vary depending on what activities are being undertaken. Cake is stored undercover. Cake is removed from Site frequently during specific land spreading windows – typically throughout the summer months. Waste is removed as required. Therefore, frequent vehicle movements are typically undertaken only by Site staff and maintenance contractors.</p>	Low
Local human population and local environment.	Explosion of biogas and AD causing the release of polluting materials to air (smoke or fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. 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	<p>Emissions to air, land or water may cause harm to and deterioration of air, land or water.</p> <p>Smoke and fumes may cause irritation, illness or nuisance to local residents and Site staff.</p> <p>An explosion could cause injury to local residents and Site staff from flying debris.</p> <p>Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings.</p> <p>Permitted waste types limited to sludges and liquids.</p>	<p>The key sludge treatment and STW processes are undertaken within enclosed systems such as the AD and biogas systems. Sludge storage tanks are covered and enclosed.</p> <p>Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes Site security measures to prevent unauthorised access. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification.</p> <p>Fire detection equipment is installed in the CHP containers and the boiler building which activates an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers.</p> <p>The EMS includes procedures relating to maintenance and inspection of bunding of tanks.</p>	Low
Local human population and local environment	Explosion of pressurised tanks due to equipment and/or process failure.	Respiratory irritation, illness and nuisance to local population. Fatality/injury to staff, fire fighters. Potential for uncontrolled release of fugitive emissions of gaseous,		Low	Medium	Low	<p>Emissions to air, land or water may cause harm to and deterioration of air, land or water.</p> <p>Smoke, fumes and material released from tanks may cause irritation, illness or nuisance to local residents and Site staff.</p> <p>Impact from the tank explosion may cause external damages to other equipment, buildings located close to the epicentre of the explosion.</p>	<p>Site Manager shall ensure the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions.</p> <p>Emergency operating procedures are in place and detailed in the Site's Operational Continuity Plan.</p>	Low

		liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.						Adequate firefighting measures are implemented on-site. An accident management plan is part of the EMS and includes measures for security, fire and spill management. Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of tanks. Access to Site and waste is restricted by a 2m high steel palisade fence. The Site is accessed by a 24 hour manned security barrier entrance and monitored by CCTV cameras. There is another barrier entrance adjacent to the former Chemson site. The Site is staffed 24 hours a day, 7 days a week. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system. Smoking 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 STW processes are undertaken within enclosed systems such as the AD and biogas systems. 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 and H&S manual. Smoking is only permitted in designated areas. Firewater is diverted through the drainage system to the head of the works allowing for contaminated fire water to be contained onsite and treated through the wastewater treatment system. Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents. Site Manager shall ensure the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Emergency operating procedures are in place. Adequate firefighting measures are implemented on-site.	Low
Local human population and local environment.	Arson and/or vandalism causing the release of pollution materials to air (smoke and fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or vandals/arsonists. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Air transport Spillages and contaminated firewater by direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and Site staff. Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings. Risk of accidental combustion of waste is minimal. Permitted waste types limited to sludges and liquids.	The key sludge treatment and STW processes are undertaken within enclosed systems such as the AD and biogas systems. 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, fire explosions and spill management. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification. Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers.	Low

									<p>A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on-site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual.</p> <p>Smoking is only permitted in designated areas.</p> <p>Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents.</p> <p>Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions.</p> <p>Emergency operating procedures are in place.</p> <p>Adequate firefighting measures are implemented on-site.</p> <p>Access to Site and waste is restricted by a 2m high steel palisade fence. The Site is accessed by a 24 hour manned security barrier entrance and monitored by CCTV cameras. There is another barrier entrance adjacent to the former Chemson site. The Site is staffed 24 hours a day, 7 days a week. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system.</p> <p>Lighting is provided at all reception facilities to give good visibility at all times of the day and night.</p> <p>The Site is staffed 24 hours a day, 7 days a week.</p> <p>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.</p>	
Local human population and local environment.	Operator Error	Pollution to air, land, surface water and groundwater and human health	<p>Air transport</p> <p>Direct run-off from site across ground surface, via surface water drains, ditches etc.</p> <p>Indirect run-off via the soil layer</p> <p>Transport through soil/ groundwater then abstraction.</p>	Low	Medium	Low	<p>Possible contamination to air, land, groundwater and surface water.</p> <p>Given the level of operator controls which are in place and management plans, it is considered the probability and magnitude will be low.</p>	<p>Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented.</p> <p>All equipment is checked under preventative maintenance plans and is checked and calibrated as per the manufacturer's instructions.</p> <p>Overall management of the Site is overseen by an experienced member of staff 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.</p> <p>All operational staff are fully trained in the Site operating procedures and safety and environmental management procedures and are kept up to date on changes.</p> <p>Training includes awareness raising of the potential implications of failure to control operations and the potential impact on the environment.</p> <p>Preventative measures will be under continuous review as part of the EMS procedures.</p> <p>Emergency operating procedures are in place.</p> <p>Senior site-based management have direct responsibility for implementing risk management measures.</p>	Low	
Human health and environmental safety										
Data and information				Judgement				Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management		Residual risk

Protected nature conservation sites - European and national designated sites	Any, but principally NOx.	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	Medium	Low	Physical disturbance and emissions to air, water or land may cause harm to and deterioration of nature conservation sites. There are no European designated sites located within 10km of the Site.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Storage of high ammonia bearing material will be covered at all times. Emission limits for stack gases are specified. BAT and appropriate additional mitigation measures set out in the EMS have been taken to prevent or where that is not practicable, to minimise, those emissions.	Low
Protected species, including nesting birds, wintering birds, common reptiles, terrestrial and aquatic invertebrates, common amphibians, bats, badgers, hazel dormice and great crested newts	Any, but principally NOx.	Harm to protected species through the disturbance or removal of habitats		Low	Medium	Low	Physical disturbance and emissions to air may cause harm to protected species. The proposal for the Permit does not involve the removal of vegetation, or structural modification to built structures. It is considered very unlikely, therefore, that Site activities would lead to the disturbance or removal of terrestrial habitats. There are no statutory designated national sites and non-statutory designated sites present within 2km of the Site boundary. However, there are 46 priority habitats within 2km of the site.	As required by the Northumbrian 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

