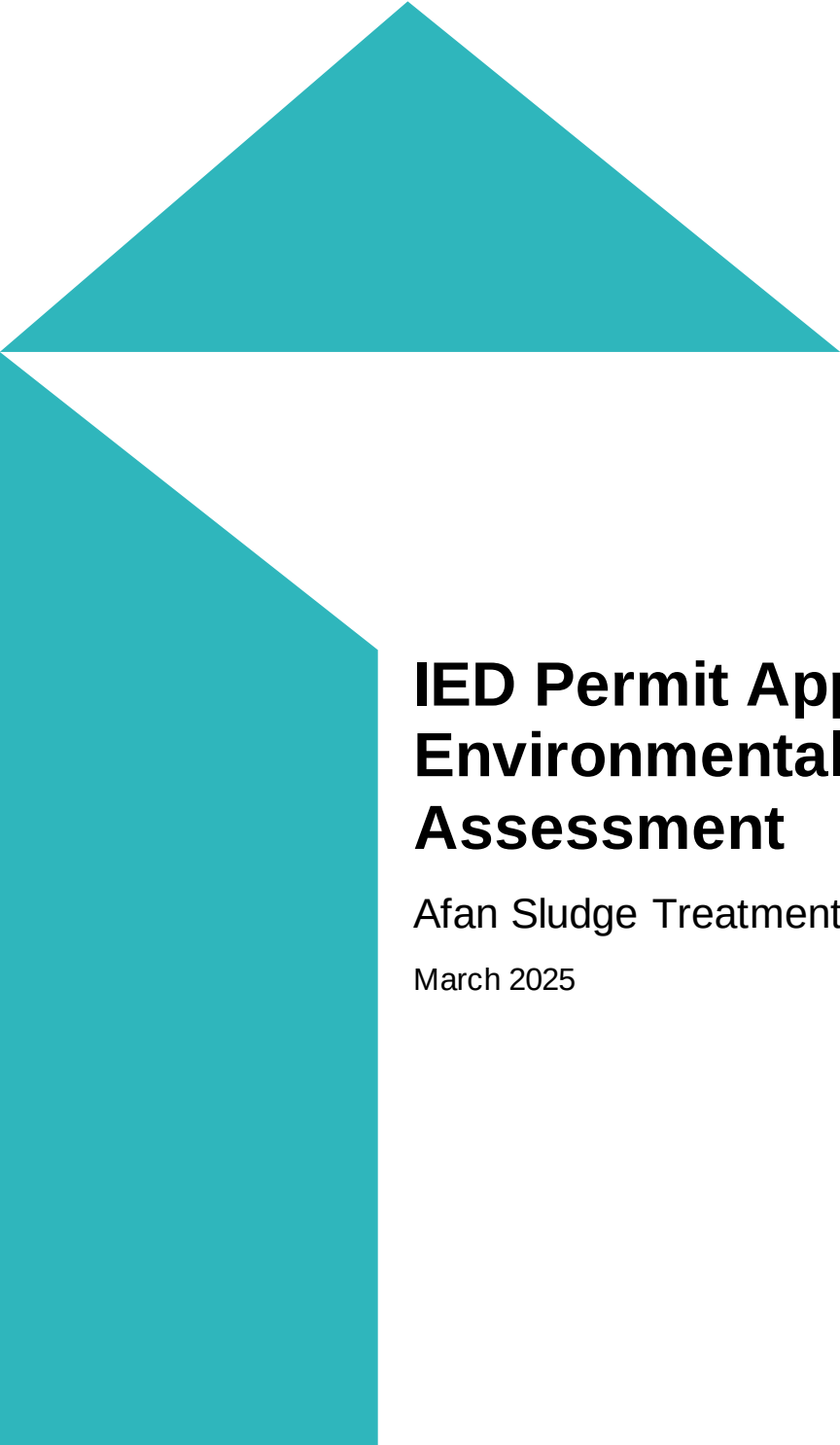
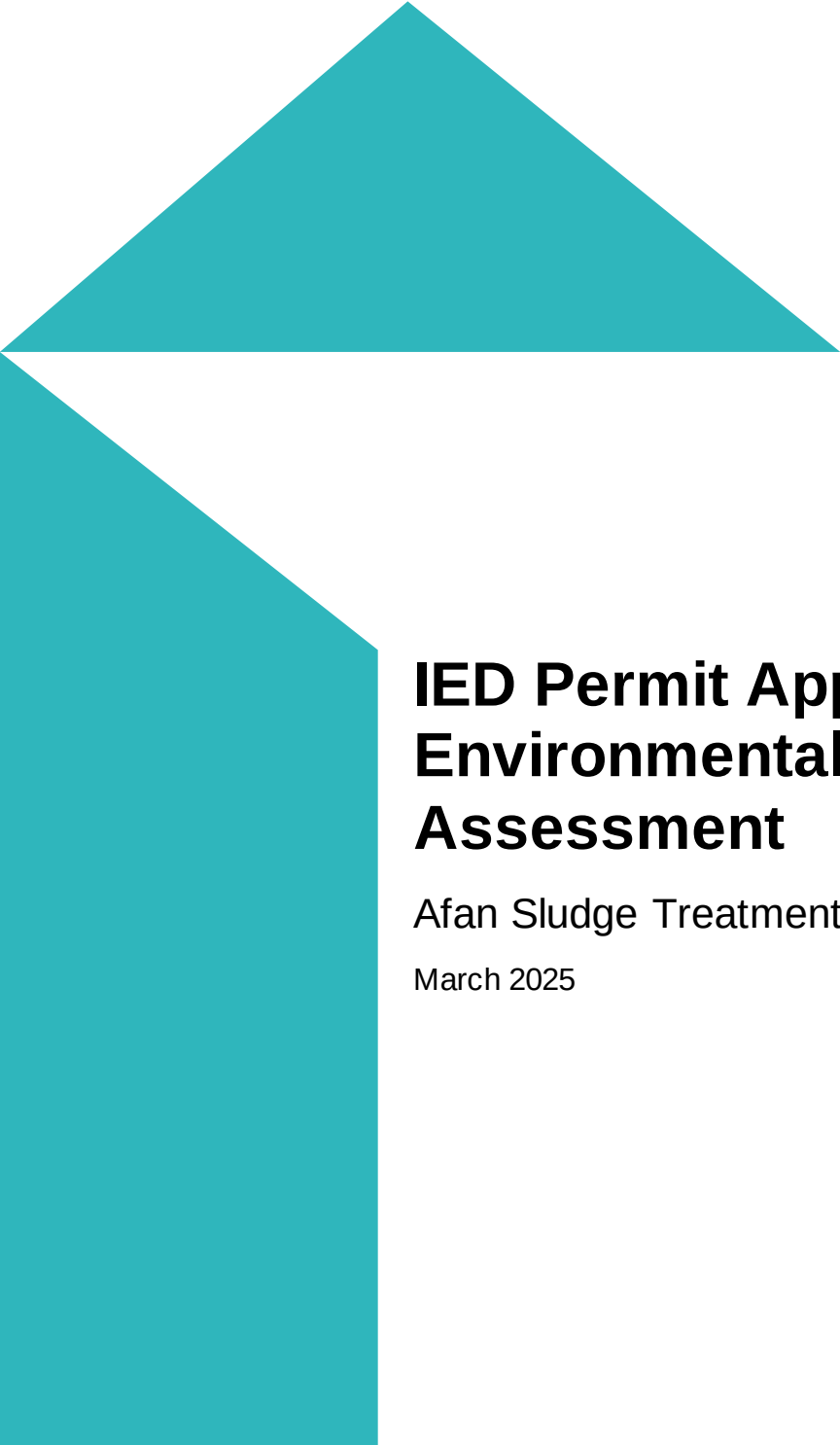




IED Permit Application Environmental Risk Assessment

Afan Sludge Treatment Centre

March 2025



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Mott MacDonald
4th Floor
Mountbatten House
Grosvenor Square
Southampton SO15 2JU
United Kingdom

T +44 (0)23 8062 8800
mottmac.com

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1 Introduction

This document has been prepared to support the application to vary an existing bespoke Environmental Permit (EPR/ZP3032KQ) for the Afan Wastewater Treatment Works (WwTW) and Sludge Treatment Centre (STC). The STC is herein referred to as 'the Site', as the application includes the STC within the permit boundary. As part of the application for a varied Environmental Permit, operators must assess the risk to the environment and potential harm to human health from the activities they propose to undertake. This document provides the environmental risk assessment (ERA) considered relevant to the facility in accordance with the Environment Agency's 'Risk assessments for your environmental permit' guidance¹.

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

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

¹ Environment Agency (2023). Risk assessments for your environmental permit. Accessed via <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit#risk-assessments-for-bespoke-permits> May 2024.

2 Site Setting

2.1 Location

Activity address: Afan Wastewater Treatment Works, Phoenix Wharf, Harbour Road, Port Talbot, SA13 1RA

National Grid Reference: SS 76061 87329

The boundary of the Site is shown in green in document reference 100123523_SiteLayoutPlan_AFA March 2025.

2.2 Geology

The Site is located in an area of 'Landscaped Ground' which refers to the area of reclaimed land. Although no 'Made Ground' is indicated underlying the Site, it is likely that some is present as a result of the development activities on site.

The Site lies upon an area of Blown Sand, comprising sand. These superficial deposits formed up to 2.6 million years ago in the Quaternary Period. Immediately to the east of the Site are Tidal Flat Deposits, and adjacent to the west are Marine Beach Deposits.

The bedrock geology for the Site is South Wales Middle Coal Measures Formation and further underlain by the South Wales Lower Coal Measures Formation, which both comprise mudstone, siltstone and sandstone. These sedimentary bedrocks formed approximately 299 to 359 million years ago in the Carboniferous Period.

2.3 Hydrogeology

The Blown Sands superficial aquifer underlying the Site is designated as a Secondary A aquifer. The Marine Beach Deposits are classified as a Secondary Undifferentiated aquifer.

The South Wales Middle Coal Measures formation is designated as a Secondary A aquifer.

The north of the Site lies within an area of groundwater flooding capability with potential flooding at the surface. Directly north of the Site there is potential for flooding of property situated below ground level.

The Site is not located within a groundwater Source Protection Zone (SPZ), or within a Drinking Water Safeguarding Zone for surface water or groundwater.

2.4 Hydrology

The Bristol Channel flows approximately 430m west of the site boundary, with the beach starting 125m west of the site boundary.

The beach associated with the Bristol Channel is located adjacent to the south-western corner of the Site, with a tidal mark seen approximately 40m west from the Site. The outline of a pond is also seen approximately 40m to the north-east of the Site, although this is noted to be dry on recent aerial photography.

No streams or rivers lie within 250m of the Site.

2.5 Protected Areas

Ecological sensitive receptors are shown in Appendix A.

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

- Kenfig Special Area of Conservation (SAC) is 4.3km to the southeast,
- Glaswelltiroedd Cefn Cribwr / Cefn Cribwr Grasslands (SAC) is 9.7km to the southeast,
- Crymlyn Bog/Cors Crymlyn (Ramsar and SAC) is 8.5km to the northwest.

There are no Sites of Special Scientific Interest or priority habitats present within 2km of the Site.

2.6 Other Notable Features

The Site is situated in a generally industrial area. It is bounded to the north and east by part of Tata Steel, separated by a railway line.

The nearest residential properties to the Site are located approximately 1.7km north-east of the boundary.

The Site is not located within a Nitrate Vulnerable Zone (NVZ).

3 Environmental Risk Assessment

3.1 Methodology

The ERA has been undertaken by identifying hazards and source-pathway-receptors and assigning a probability of exposure and a severity of consequence. These are assigned as described in Table 3.1 and Table 3.2 and are based on the generic risk assessments used for standard rules applicable to anaerobic digestion operations including use of the resultant biogas.

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

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

Table 3.1: Severity Index

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

Table 3.2: Probability Index

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

Table 3.3: Magnitude of Risk

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

3.2 Risk Assessment

3.2.1 Introduction

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

- Point source and fugitive emissions to air;
- Point source and fugitive emissions to water and land;
- Noise and vibration;
- Odour;
- Litter, mud and debris;
- Vermin and insects (pests);

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

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

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

3.2.2 Point Source and Fugitive Emissions to Air

3.2.2.1 Air quality

The Combined Heat and Power (CHP) units and boilers are currently permitted under the existing bespoke Environmental Permit (EPR/ZP3032KQ).

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

As combustion activities are not being changed on site as a result of the permit variation and associated processes, it is not anticipated that updated Air Dispersion Modelling (ADM) will be required. Overall impacts of all air pollutants associated with the variation are considered to be low. As part of the original permit application, the dispersion of all substances from the combustion plant in Table 3.4 were assessed through the use of the H1 methodology and additional dispersion modelling was carried out for the Site to determine the operational effect on human health. The air dispersion modelling predicted that for all of the pollutants modelled that no national air quality standards were predicted to be exceeded, even with the two worst case scenarios considered within the study. Monitoring of the emissions to air is carried out as per EPR/ZP3032KQ.

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

Table 3.4: Combustion plant details

	CHP 1	CHP 2	Boiler 1	Boiler 2
Emission Point (number)	A1	A2	A3	A4
Source	CHP engine stack	CHP engine stack	Boiler stack	Boiler stack
Date that MCP became operational/was commissioned	2011	2011	2011	2011
Thermal input (MWth)	3.75	3.75	3.9	3.9
Stack height (m)	24	24	24	24
Fuel used (biogas, diesel etc)	Biogas	Biogas	Biogas/ natural gas	Biogas/ natural gas
Estimated total hours of operation per year	6635	5288	40.5	40.5

	CHP 1	CHP 2	Boiler 1	Boiler 2
MCPD and SG Regs status	Existing MCP Tranche A SGs	Existing MCP Tranche A SGs	Existing MCP	Existing MCP

Note: Medium Combustion Plant (MCP), Medium Combustion Plant Directive (MCPD) and Specified Generator (SG)

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 six months.

The emission points are shown in drawing reference 100123523_SiteLayoutPlan_AFA March 2025, details of the parameters and quantities have been outlined in section 6.3.1 of 100123523_MSD_AFA_March 2025.

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

Additional emissions from the Site include:

- Water vapor from the hot water storage tanks, steam condensate and gases are either recaptured back into the THP process or captured in the foul gas drum and discharged into the digester.
- Water vapour from the blowdown vessel. There is a vent to atmosphere on the hot water storage tanks to ensure the tank is never pressurised;
- Pressure relief valves and devices are located on the steam system, boilers and on the gas holder. These are vented to atmosphere;
- There are a number of potential emissions from the biogas condensate pots; however, low level alarms have been fitted to notify the operator if the seal has been broken.

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

Pressure relief valves (PRVs) are inspected daily.

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

Pressure relief valves will be used in emergencies only, and are not part of normal operation, all PRVs and breather vents are fitted in appropriate locations. PRVs on the Cambi plant (THP and anaerobic digestion process) have abatement in a form of a Caisson where releases are captured and directed through pipework to ground level.

3.2.2.2 Bioaerosols

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

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

The sensitive receptors in relation to the Site are shown in Appendix A. The Site lies within a heavily industrialised area. Sensitive receptors have been identified in Figure A.34, there are no key sensitive receptors within 250m of the Site (see Figure . Despite Tata Steel and Tarmac being adjacent to the STC, it is understood that the areas within closest vicinity of the Site are expected to have low levels of possible staff activity, with the Tata offices being located over 1km from the Site boundary. At the distance and limited time of exposure the risk of exposure is low, and therefore the risk is managed through measures stated in Appendix B. Therefore, a bioaerosols risk assessment has not been undertaken. A technical note confirming the reasoning for this is provided in document reference 100123523_BioRA_AFA September 2024.

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

3.2.2.3 Abatement of other fugitive emissions to air

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

3.2.3 Point source and fugitive emissions to water and land

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

3.2.3.1 Emissions to water (other than sewers)

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

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

Clean, uncontaminated roof water from the main sludge treatment building and cake barn will be diverted and discharged to a soakaway outside of the bund.

There will be no direct discharge of wastewater to controlled waters. All surface water (excluding clean, uncontaminated roof water) and process liquors within the STC is collected in the drainage system and sent, by way of the liquor returns well and pumping station, for full treatment in the adjacent Afan WwTW via the SBR pumping station (aka head of works). Surface water and roof water outside of the STC boundary is not considered.

There are no direct potentially contaminated discharges to groundwaters. Condensate from the flare, CHP and the biogas is returned, by way of the liquor returns well and pumping station, for full treatment in the adjacent Afan WwTW via the SBR pumping station.

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.

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.

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

Any liquid waste will either be reused or discharged to the drainage system of the adjacent Afan WwTW and STC and will undergo treatment through the works prior to being discharged under an existing water discharge permit. On-site WwTW effluent will meet the requirements of the existing environmental permit for discharges to water. The water used at the Site will be contained in a closed circuit; all wastewater streams will either be recycled within the process or captured and rerouted to the adjacent WwTW.

Discharges will be minimal, typically arising from periodic maintenance/cleaning operations. As such, there are no direct potentially contaminated discharges to controlled surface waters and no significant impacts. All waste water and surface waters, (STC liquors, roof and surface waters) that fall within the bund, are captured by the on-site drainage system, passed through the liquors returns well and pumped to the SBR pumping station (aka head of works) to be sent for full treatment at the adjacent Afan WwTW. A drainage plan of the Site is presented in document 100123523_DrainagePlan_AFA March 2025.

Clean, uncontaminated roof water from the main sludge treatment building and cake barn will be diverted and discharged to a soakaway outside of the bund.

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

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

The stormwater drainage of potentially contaminated areas from within the site boundary is routed back via the liquors returns well and pumped to the SBR pumping station to be sent for full treatment at the adjacent Afan WwTW.

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 be required.

3.2.3.3 Emissions to land

Clean, uncontaminated roof water from the main sludge treatment building and cake barn will be diverted and discharged to a soakaway outside of the bund.

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.

3.2.4 Noise and Vibration

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

Initial screening has been carried out for the Site. Since the Site is not undergoing changes to equipment and vehicle movements prior to application submission, a Noise Impact Assessment (NIA) is not considered to be required in respect of this application. Appropriate mitigation for noise and vibration impacts are provided in Appendix B. The sensitive receptors located within 1km of the Site are shown in Figure A.3 of Appendix A.

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.

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

3.2.5 Odour

A review of the nearest human receptors has been undertaken to establish the level of odour risk to the receptors before and after mitigation. Sensitive receptors to odour are users of the adjacent land, which may vary in their sensitivity to odour. There are no residential sensitive human receptors within 500m of the Site. There is potential that people could be working at Tata Steel, and Tarmac which are the closest receptors to the site boundary, however they are not considered to be a significant sensitive human receptor to odour due to the low frequency of human occupancy in that area during work hours.

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

72 odour complaints have been received, from within a 5mile radius, in the last 5years. Given the industrial nature of the area surrounding the Site it is difficult to confirm whether these have been substantiated as coming from the STC and/or the WwTW.

The thermal hydrolysis plant (THP) on site 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 odour emissions.

All sludge treatment activities are undertaken in enclosed buildings or tanks. The Site also has two odour control units (OCUs) to mitigate the risk of odour. One extracts from the cake import hopper, the indigenous cake silo, the THP feed silo and the centrifuges. using a carbon filter system. The other which extracts odorous air from the belt press and cake bays and comprises a sulphuric acid scrubber. Media life and condition is reviewed on a regular basis although it is anticipated that media should last a minimum of two years. There are no proposed works to be undertaken on the Site in respect of this permit application, therefore, the activities on-site are not anticipated to increase the off-site impact or result in adverse impact upon nearby sensitive receptors or the amenity of the area surrounding the Site.

Olfasense will undertake a site visit to conduct a quantitative odour impact assessment and will produce an updated report for the STC.

DCWW, with support from Olfasense, will develop the odour management plan (OMP), based on the outcome of this assessment, in accordance with the H4 guidance.

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

3.2.6 Particulate Matter, litter, mud and debris

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

leaving the Site have also been addressed, in addition to the sensitivity of nearby receptors and the effectiveness of existing measures to reduce the escape of dust.

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

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

The sludge and wastewater treatment processes of the Site are enclosed. Although the Site has been screened as being within 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.

Sludge cake is imported to the Site in covered vehicles. The dewatered sludge is transferred to cake pumps with a screw conveyor, and the cake is transferred to a cake storage and collection area. Cake is stored within a cake barn which comprises 3 cake bays, the cake bays are enclosed within the cake barn. The cake barn has a 4 day retention and approx. 450m³ total cake bay storage capacity.

3.2.7 Pests

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

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

Pests are not considered to be an issue since the waste types handled on-site do not attract them, contractors regularly check the Site for pests and appropriate mitigation is in place. Since the residual risk is considered to be very low, a Pest Management Plan is not considered to be necessary.

3.2.8 Human health and environment safety

3.2.8.1 Visual impacts

A treatment works has been on the Site for over 20 years 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.

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

3.2.8.2 Site security

Activities are managed and operated in accordance with the EMS. Access to the Site is restricted by a 3m palisade fence and electric front gate. The Site also benefits from a CCTV system, and intruder detection alarms. 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.

Afan Facilities WwTW is located within Tata Steel Works, Port Talbot. All visitors to the Tata site must sign in at the visitor's centre and also obtain a vehicle pass to allow access through the

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

3.2.8.3 Flood risk

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

The Site is located within a 'very low risk' flood zone with a risk of flooding from rivers, the sea, surface water and small water courses of less than 0.1% each year.

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

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

3.2.8.4 Emergency response and Accident Management Plan

Complaints and notification of incidents at the Site are managed as stated in 100123523_MSD_AFA_March 2025.

DCWW have an Environmental Management System (EMS) Policy. In line with the EMS Policy, the Afan STC will be operated in accordance with the DCWW Quality Management System (IMS). The Site operates under a set of site-specific Emergency Procedures which is incorporated into DCWW's Environmental Management System (where applicable) to prevent and manage environmental related accidents. The Emergency Procedures are distributed to key staff, to supervise the implementation of the Plan, and shared with external contacts (emergency services and the NRW). The Emergency Procedures are accompanied by a site plan that identifies the locations of designated storage areas (and their maximum storage capacity), location of spill kits and fire extinguisher and storage locations and hazards posed by chemical substances. Further details of the emergency procedures is detailed in document reference 100123523_AMP_AFA_March 2025.

A CIRIA 736 risk assessment was undertaken by Mott MacDonald Bentley (MMB). The following assets were assessed during this risk assessment:

- cake import area
- thermal hydrolysis plant (THP) feed silo
- THP
- digesters; and
- digested sludge holding tank

The risk assessment concluded that the probability and risk of failure from the assessed tanks is very low and any associated loss of inventory volume would be contained within the adjacent

hardstanding area and proposed secondary containment solution, with flood gate design philosophy, providing 110% containment, as identified in the ADBA risk assessment.

The CIRIA risk assessment is detailed in the following documents, which have been provided with this application.

- B16399-123532-XX-AB-MA-ZA-OA0038 - Flood Gates Control Philosophy September 2024
- B16399-123532-ZZ-XX-AS-ZA-CI1012 - Afan ADBA Assessment October 2024
- B16399-123532-ZZ-XX-RP-WA-HY1008 - Afan WwTW Sludge Containment Assessment September 2024

3.2.9 Natural habitats and ecology

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

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

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

Initial screening has been carried out for the Site, the high-level results of which are shown in Table 3.5. 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 Afan WwTW STC

Natural habitats and ecology	Afan WwTW STC
Statutory designated European sites within 10km of the Site boundaries	
Special Areas of Conservations (SAC)	3
Special Protection Areas (SPA)	

Sites of Community Importance (SCI)	
Ramsar sites	1
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)	
Non-statutory designated sites within 2km of the Site boundaries	
Local Wildlife Sites (LWS)	
Ancient Woodlands	
Country Parks	
Sites of Importance for Nature Conservation (SINC)	
Priority habitats within 2km of the Site boundaries	
Priority habitats	
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 three SACs, and one Ramsar site located within 10km of the site. However, it is considered unlikely that a Habitats Regulations Assessment (HRA) would be required for the Site because Environment Agency best practice methods will be followed, during the operation of the facility to prevent significant effects to designated habitats. These are described in Appendix B.

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

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

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

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

A. Environmental Constraint Maps

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

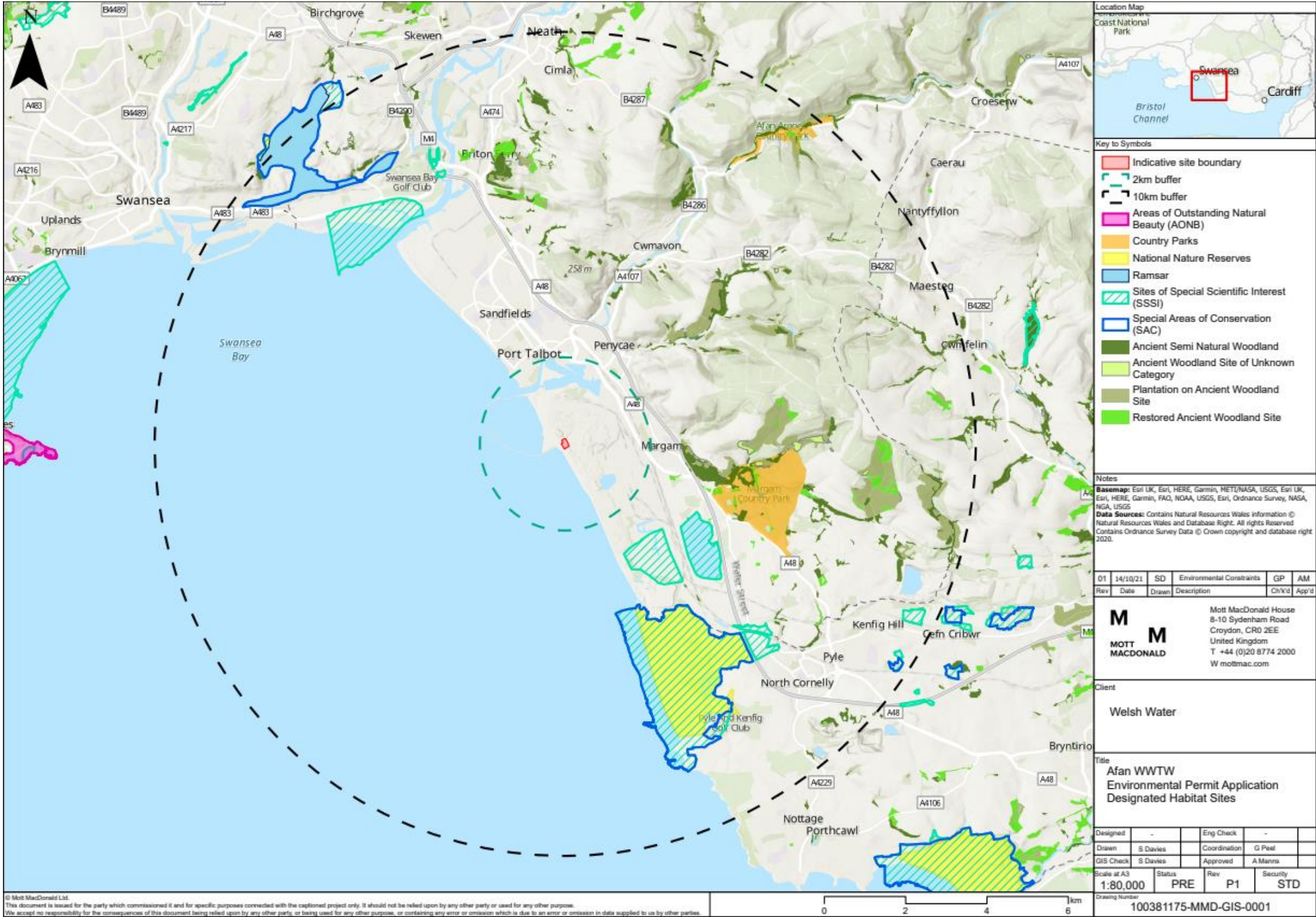


Figure A.2: Designated heritage sites within 1km of the Site

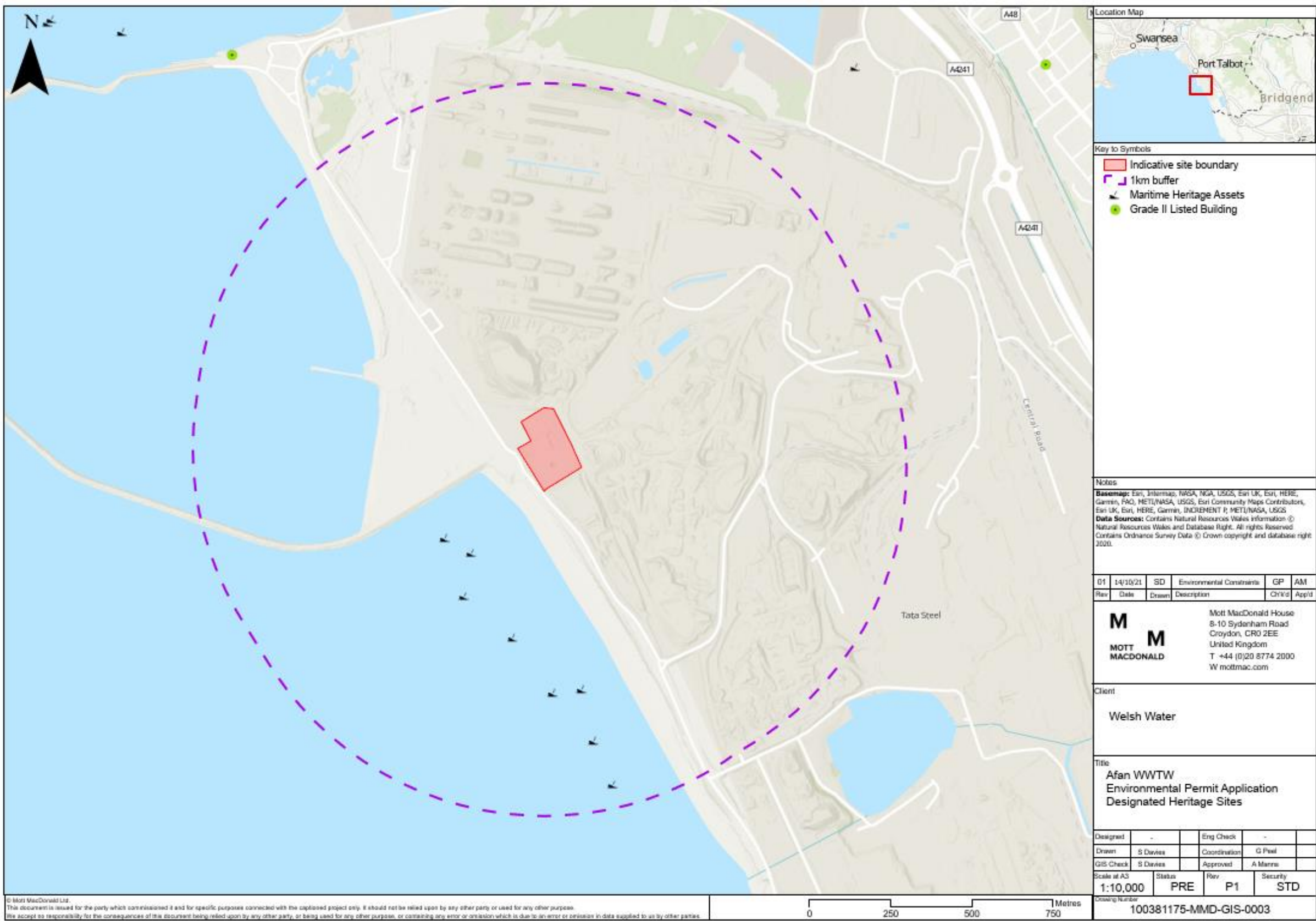


Figure A.3: Sensitive receptors within 1km of the Site

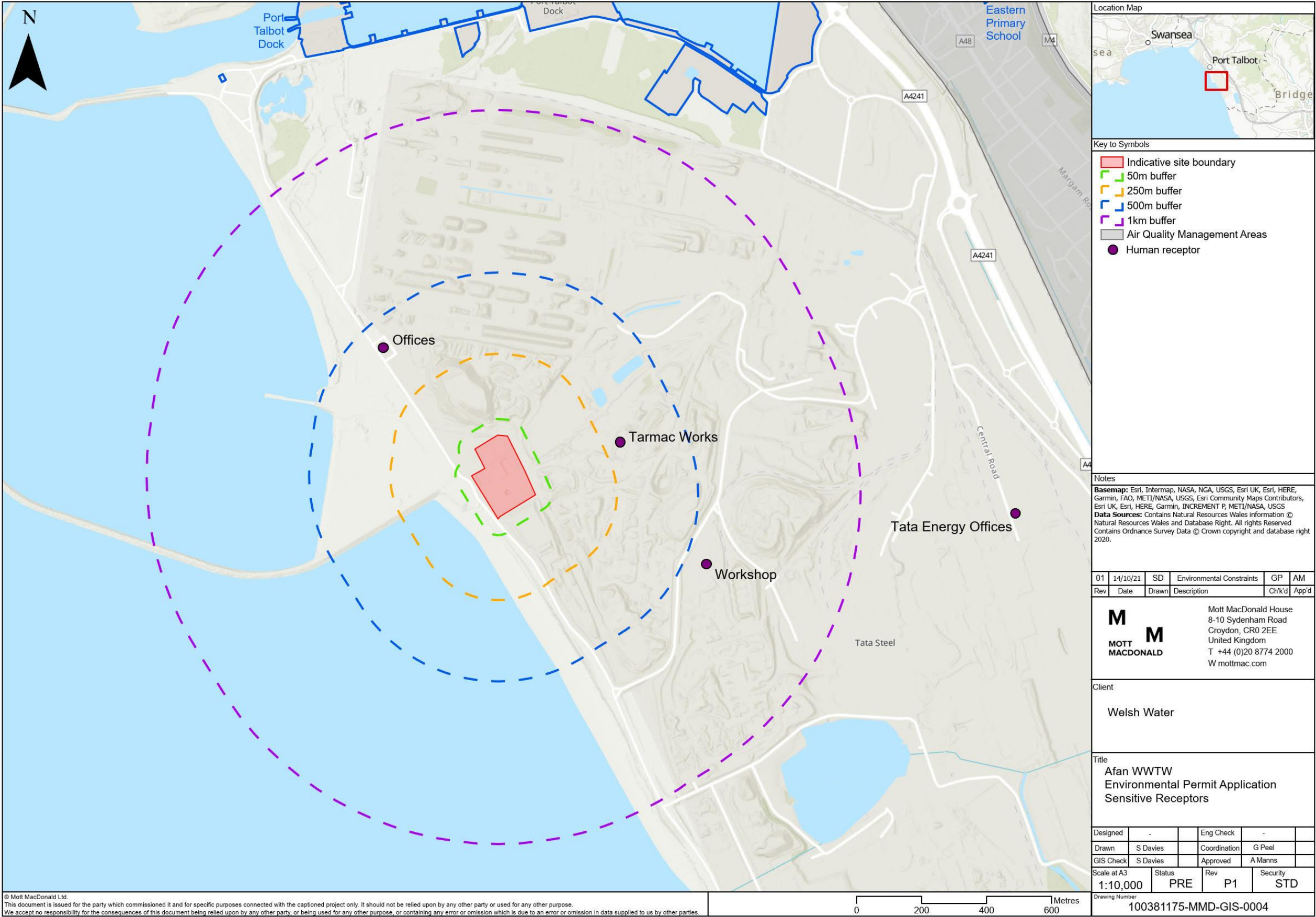
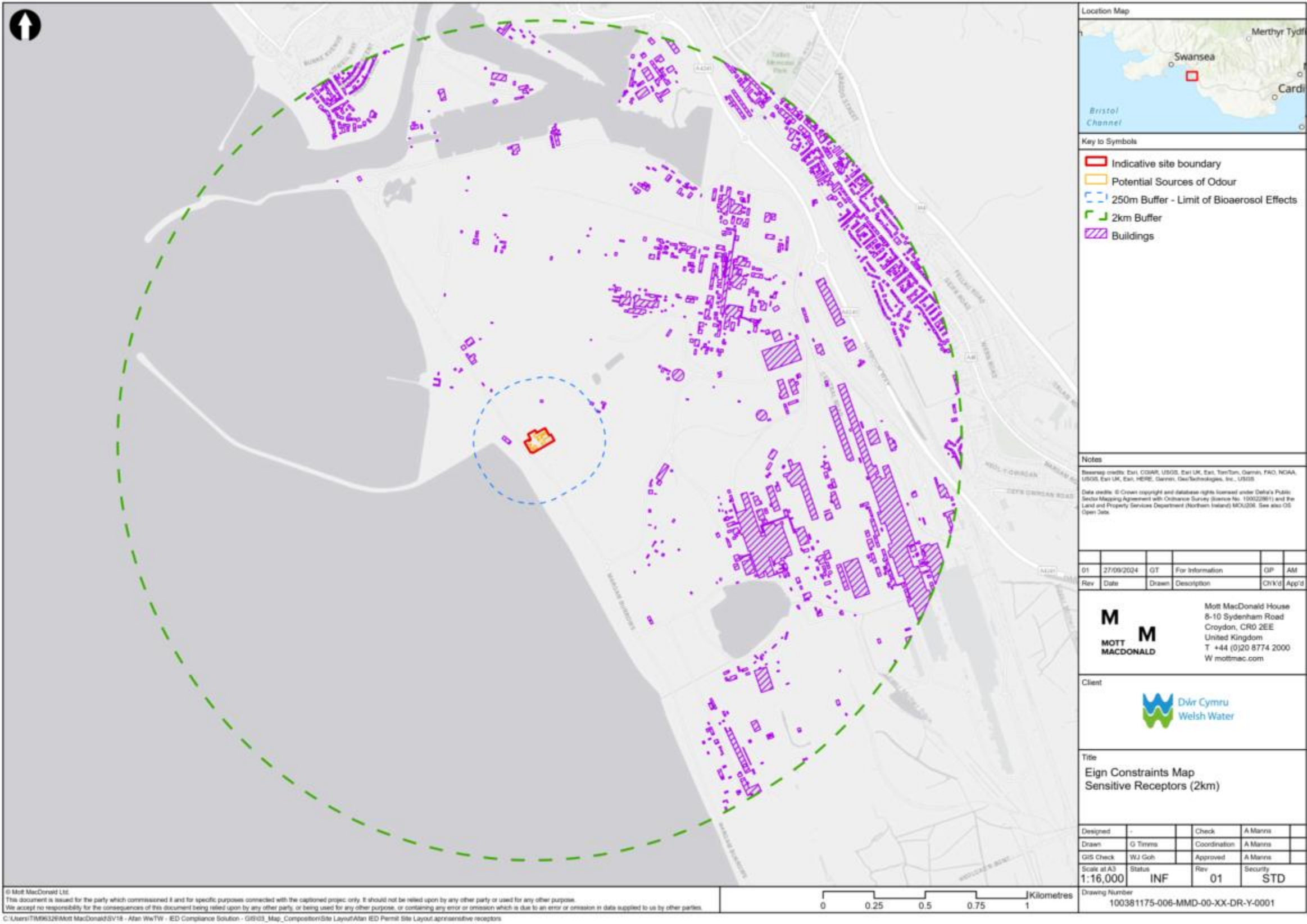


Figure A.4: Sensitive receptors within 2km of the Site



B. Environmental Risk Assessment Tables

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
Emissions to air									
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 1.7km, and industrial receptor is adjacent to the site boundary (Tata Steel). The Site has two Combined Heat and Power (CHP) units and boilers, 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. 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. As combustion activities are not being changed on Site as a result of the proposal and the CHP engines are already permitted, it is not anticipated that Air Quality Dispersion Modelling is required. 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 be required.	Low
Local human population	Release of biogas	Harm to human health - respiratory irritation and illness by inhaling H₂S 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. The nearest residential receptor is 1.7km, and industrial receptor is adjacent to the site boundary (Tata Steel).	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. Pressure relief valves are inspected daily, with date, time duration of pressure, relief events and calculated annual mass release recorded upon the pressure relief valves being used. The gas holder is equipped with a level transmitter which is used to determine the volume of biogas in the gas holder, where the level of the gas holder is a low low or a high high level, an alarm is raised on the SCADA system. Point source emissions to air will be monitored to ensure emission limits for biogas are not exceeded, in accordance with permit requirements and any relevant TGNs including M2.	Low
Domestic properties, local human population, local amenity, site staff, visitors and offices.	Releases of particulate matter (dust) when transporting cake off-site	Nuisance, loss of amenity.	Air transport then deposition	Low	Low	Low	Local residents and surrounding environment are often sensitive to dust. Dust may be produced from dirt deposits from vehicles or other users of the haul road and treatment. Digested cake is	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	Low

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
Haul roads, public highways.							stored in a cake barn in 3 cake bays, the cake bays and covered and enclosed within the cake barn. The waste types used on-site are unlikely to cause dust emissions.	roads are swept, as required, to reduce the likelihood of dust becoming airborne. There are no additional dust suppression techniques e.g. mist spray etc employed on Site as this is not considered necessary. Waste treated within the THP is not likely to generate significant 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 nearest receptor is Tata Steel (adjacent), however the permitted waste is non-hazardous sludge in liquid and cake form. The nature of waste and the 'wet' processes undertaken on-site are not likely to cause a release of bio-aerosols. Potential for release at waste reception and maturation (handling and storage of cake)	Digested cake is stored in a cake barn in 3 cake bays, the cake bays and covered and enclosed within the cake barn. Multiple control measures are in place at the Site which restrict the Source-Pathway-Receptor link by reducing and containing emissions of bioaerosols from these processes. Key operations take place within a closed system, including covered tanks, pipework and machinery. The anaerobic digestion vessels are sealed and biogas is extracted from the vessels. This minimises the risk of bioaerosols affecting operational staff. Biofilters are regularly checked for efficiency. Odour control units are airtight and treats air released to remove bioaerosols. The process is monitored and regularly maintained. Combustion of biogas occurs at very high temperatures in the CHP, boilers and flare, which would destroy bioaerosols.	Low
Emissions to Water and Land									
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	Medium	Low	The Bristol Channel is adjacent to the Site and the nearest sensitive receptor. However, the potential for spillage from digestion tanks and storage vessels is considered low and processes on-site are generally contained. Potential for leaks from digestion 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 (to 110% containment) is in place around storage areas of all wastes and raw materials and surrounding the STC and WwTW. In addition, portable bunds (where chemicals are stored in containers or are required to be moved around), are also used, where necessary, to provide additional pollution control measures on the site. Portable bunds are also provided, (if chemicals are to moved around the Site), in addition to constructed bunds and the proposed 110% secondary containment and flood gate design philosophy. All transfer of digestate and material takes place under supervision and with flow rate control.	Low

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
							Permeable ground surfacing currently surrounds the digesters. Site infrastructure and hardstanding are generally in a good condition. Quantities of liquids and raw materials stored on Site are generally low.	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. Raw materials and liquids/chemicals are stored in suitable locations on-site and are appropriately bundled. 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. Site Manager ensures the programme of Planned Preventative Maintenance is implemented effectively to minimise the probability of equipment malfunction. Control of substances hazardous to health (COSHH) assessment undertaken for all raw materials. All condensate from the CHP, flare stacks and biogas system along with surface and roof water (clean and potentially contaminated) and STC liquors, discharge into a sealed system and are returned via the liquors returns well and pumped to the SBR pumping station to be sent for full treatment at the adjacent Afan WwTW. 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. An AMP is prepared and will be implemented and followed to further reduce risks if incidents occur.	
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 Blown Sands superficial aquifer underlying the Site is designated by the Environment Agency as a Secondary A aquifer. The Marine Beach Deposits are classified as a Secondary Undifferentiated aquifer.	All sludge treatment processes are covered or enclosed. A CIRIA 736 risk assessment was undertaken by Mott MacDonald Bentley (MMB). The following assets were assessed during this risk assessment: • cake import area • thermal hydrolysis plant (THP) feed silo • THP • digesters; and • digested sludge holding tank The risk assessment concluded that the probability and risk of failure from the assessed tanks is very low and any associated loss of inventory volume would be contained within the adjacent hardstanding area. Secondary containment will be constructed that meets	Low

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
							The South Wales Middle Coal Measures formation is designated as a Secondary A aquifer. Quantities of liquids stored are generally low.	the 110% containment requirements outlined in CIRIA 736. An automatically controlled flood gate shall be installed in the proximity of the STC entrance/exit in order to provide appropriate sludge containment, in the event of a catastrophic failure of the digesters or associated equipment, whilst still enabling the site to operate effectively during normal operating conditions. An additional control philosophy has been provided to support the use of a flood gate in this location. Existing impermeable hardstanding and vehicular barriers mitigate the risks from loss of containment. Spill kits are available near some of the chemical storage. All transfer of digestate and material takes place under supervision and with flow rate control. All primary tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives. Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of loss of tank/pipe integrity. Activities to be managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the site diary including actions taken. All condensate is discharged into a sealed system and passed through the liquors returns well and pumped to the SBR pumping station to be sent for full treatment at the adjacent Afan WwTW. An AMP will be implemented and followed to further reduce risks if incidents occur.	
Groundwater, land and surface water	Damage to drainage system	Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Medium	Medium	Medium	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. An AMP will be implemented and followed to further reduce risks if incidents occur.	Medium
Groundwater, land and surface water	Flooding of Site	If waste is washed off site it may contaminate natural habitats downstream.	Flood waters	Low	Medium	Low	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-	The drainage network sends water to the adjacent Afan WwTW for treatment. There are no direct potentially contaminated discharges to controlled surface waters.	Low

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
							flood clean up and may be hazardous to human health. Area is not historically known to flood.	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.	
Noise and Vibration									
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	Medium	Low	Local residents and site staff are often sensitive to noise and vibration. No sensitive human receptors within 250m of the site boundary. The nearest sensitive receptor, a tarmac works, is approximately 300m from the site, and will have noisy operations of its own. There is also a storage area for use by Tata steel within 100m, however this is low occupancy. The area surrounding Afan WwTW will be generally noisy due to industrial land use.	The Site will be operational 24/7 and limits vehicle speed to 15mph on site. The potential noise impacts of the Afan STC will be in a high level assessed by way of a comparison of: Predictions of noise impact based on reference measurements of the same types of equipment installed at similar facilities and a simple propagation model; and Representative baseline noise levels obtained from published strategic noise maps Site will only accept imports within existing operating hours (fully complying with Site's planning conditions). Vehicles do not exceed the site speed limit of 15mph and will not generate a great amount of noise. The main truck movements are away from residential housing and other sensitive receptors. Noise kept to a minimum during operating hours. Exceptional noisy operation 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	Medium	Low	Local residents and site staff often sensitive to noise and vibration. No sensitive human receptors located within 250m of the site boundary. The nearest sensitive receptor, a tarmac works, is approximately 300m from the site, and will have noisy operations of its own. There is also a storage area for use by Tata steel within 100m , however this is low occupancy. The area	The potential noise impacts of the Afan STC will be in a high level assessed by way of a comparison of: Predictions of noise impact based on reference measurements of the same types of equipment installed at similar facilities and a simple propagation model; and Representative baseline noise levels obtained from published strategic noise maps Fans and condensate traps will be checked for water and fans and extraction systems checked. 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	Low

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
							surrounding Afan WwTW will be generally noisy due to industrial land use. No noise complaints received.	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. All other STC site operations are either covered or enclosed. The THP unit design for external use yet processes and any noise will be enclosed. It is not expected to generate excessive noise levels. Noise and vibration shall be minimised and not cause nuisance. 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. Where equipment is to be replaced choose quiet plant and the provision of silencing 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									
Local human population.	Odour from site activities	Nuisance, loss of amenity (e.g. disruption during outdoor activities)	Air transport then inhalation.	Medium	Medium	Medium	Local residents and staff sensitive to odour. The nature of the waste may cause odour issues during reception of wastes, from release of biogas and from digestate, hence control measures have been adopted. There are no residential receptors within 500m of the Site, and the nearest other human sensitive receptor is the materials storage area at Tata Steel (adjacent).	Emissions shall be free from odorous compounds. Non-point source emissions of biogas shall be minimised using appropriate measures. Odours are likely to be generated and released due to nature of the wastes. Odours are controlled by two odour control units that extract from the import facility and belt press area. All sludge treatment activities are undertaken in enclosed buildings or tanks. The site also has two odour control units (OCUs) to mitigate the risk of odour. One extracts from the cake import hopper, the indigenous cake silo, the THP feed silo and the centrifuges. using a carbon filter system. The other which extracts odorous air from the belt press and cake bays and comprises a sulphuric acid scrubber. Media life and condition is reviewed on a regular basis although it is anticipated that media should last a minimum of two years. All abatement systems are designed, monitored and maintained to treat specified emissions and off gases. Other odour mitigation measures implemented on-site	Low

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
								include placing covers on containers, limiting the height of rising sludge. 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. All storage tanks are covered or enclosed. All sludge is processed as soon as it is discharged to the STC. Olfasense will undertake a site visit to conduct a quantitative odour impact assessment and will produce an updated report for the STC. DCWW, with support from Olfasense, and has developed the odour management plan (OMP), based on the outcome of this assessment, in accordance with the H4 guidance. In addition, DCWW have requested Olfasense to support site operation teams to undertake regular checks on the OCU's for the first 6months, so they understand what checks and NRW reporting is required in the future. Digested cake is stored in a cake barn in 3 cake bays, the cake bays and covered and enclosed within the cake 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 complaint's procedure.	
Local human population, domestic properties, site offices.	Spillage of odorous materials including oils, fuels, chemicals. Failure to clean up spillages. Contaminated spill equipment not disposed of appropriately.	Nuisance, loss of amenity.	Air transport then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. Waste processes on-site are generally conducted within sealed units. Accidental major spillages are unlikely to occur and cause an odour nuisance/	Procedures for dealing with spillages are covered in the EMS. The Site Manager shall ensure all relevant staff are appropriately trained to use the spill kits and that all spillages are cleaned up immediately. All areas of the Site are to be cleaned regularly; Site Manager to oversee regular cleaning schedule, all staff trained on importance of good housekeeping and site cleanliness. All spills are recorded in the site diary including actions taken.	Low

Data and information				Judgement			Action (by permitting)		
Receptor	Source	Hazard	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
Local human population, domestic properties, site offices	Fugitive release of H ₂ S	Nuisance, loss of amenity	Air transport then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. Fugitive release, not expected to occur under normal operating conditions.	Activities are managed and operated in accordance with the EMS (and include inspection and maintenance of equipment, including engine management systems). H ₂ S point source emissions to air are controlled in accordance with emission limits.	Low
Litter, mud and debris									
Local human population, livestock and wildlife, domestic properties and local amenity.	Waste and litter on local and internal roads. Vehicles entering and leaving Site.	Nuisance, loss of amenity and road traffic accidents.	Air transport then deposition.	Low	Low	Low	Local residents, surrounding environment and animals sensitive to litter. There is some potential for litter to be generated from general site activities but limited potential for it to leave the site boundary. Sludge that is delivered to the Site is transported in tankers.	All vehicles leaving the Site which are transporting waste are to be covered to prevent waste/materials being blown from them. 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. Regular inspections for litter and debris are undertaken. Nuisance management measures are included in the EMS and the site-specific management plan.	Low
Local human population.	Vehicles depositing mud and debris arriving/ leaving the Site.	Nuisance, loss of amenity, road traffic accidents.	Vehicles entering/ leaving the Site.	Low	Low	Low	Road safety issues – local residents often sensitive to mud on the road. Limited potential for mud and debris. 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									
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	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Pest control measures are implemented. The Site has four visits per year, by a contractor (once a quarter).	Low

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
							contractors regularly check the Site for pests.	Rat boxes are used around the Site, where appropriate. 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.	
Human health and environmental safety									
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	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. Access to storage tanks is probable with a risk of drowning. 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. DCWW is currently working on an accredited Competency Management System under the Competent Operator Scheme to replace the need to have WAMITAB qualified staff to cover the technical competent management requirements. DCWW hopes to have this completed in the next 6 months. 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. Training includes awareness raising of the potential on-site hazards and health and safety measures to adhere to. Preventative measures will be under continuous review as part of the EMS procedures. Activities are managed and operated in accordance with the EMS – this includes site security measures to prevent unauthorised access. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification.	Low

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
								Activities are managed and operated in accordance with the EMS. Lighting is provided at all reception facilities to give good visibility at all times of the day and night. The Site is manned 24 hour, 365 days a year. Key sludge treatment and wastewater treatment activities undertaken within enclosed systems. 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.	
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	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. Permitted waste types limited to sludges and liquids.	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. The key sludge treatment and WTW 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 – 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 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.	Medium
Local human population and local environment	Explosion of pressurised tanks due to equipment and/or process failure.	Respiratory irritation, illness and nuisance to local population. Fatality/injury to staff, fire fighters. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and		Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke, fumes and material released from tanks may cause irritation, illness or nuisance to local residents and site staff. Impact from the tank explosion may cause external damages to other equipment, buildings	The EMS includes procedures relating to maintenance and inspection of bunding of tanks. Site Manager shall ensure the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. 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	Medium

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
		deterioration of land and water quality.					located close to the epicentre of the explosion.	safes are in place to prevent over heating or over-pressurisation of the system. Emergency operating procedures are in place and detailed in the Site's Operational Continuity Plan. An accident management plan is part of the EMS and includes measures for security, fire and spill management. Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of tanks. Smoking only permitted in designated areas. An AMP will be implemented and followed to further reduce risks if incidents occur.	
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters.	Air transport	Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water.	The key sludge treatment and WwTW processes are undertaken within enclosed systems such as the AD and biogas systems.	Medium
	Equipment failure	Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land.	Spillages and contaminated firewater by direct run-off from site across ground surface, via surface water drains, ditches etc.				Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff.		
Local human population and local environment.	Arson and/or vandalism causing the release of pollution materials to air (smoke and fumes), water or land	Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Indirect run-off via the soil layer	Low	High	Medium	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.	Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes site security measures to prevent unauthorised access, fire explosions and spill management. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification. Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual. Smoking is only permitted in designated areas. 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 WwTW. 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 WwTW. 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	Medium

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
								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 discharging to the WwTW is required. The site has pumped return from the liquor returns well to the SBR pumping station so a mechanism to stop the pump and ensure no hydraulic link (syphoning) is required. Implementation of these measures will ensure no firewater returns to the WwTW without appropriate controls including sampling/testing. Further design development is underway to determine the most appropriate solution to address this requirement and ensure compliance. 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. 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. An AMP has been prepared and will be implemented and followed to further reduce risks if incidents occur.	
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.	Low	Medium	Low	Possible contamination to air, land, groundwater and surface water.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented.	Low

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
			Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.					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 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. Senior site-based management have direct responsibility for implementing risk management measures. An AMP has been prepared and will be implemented and followed to further reduce risks if incidents occur.	
Ecology									
Protected nature conservation sites - European and national designated sites	Any, but principally NOx	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	Low	Low	Physical disturbance and emissions to air, water or land may cause harm to and deterioration of nature conservation sites. There are a number of European designated sites, located within 10km of the Site, (identified in Appendix A Figure A.1) so potential impacts on receptors are likely.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Storage of high ammonia bearing material will be covered at all times. Emission limits for stack gases are specified. 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	Any, but principally NOx	Harm to protected species through the disturbance or removal of habitats		Low	Low	Low	Physical disturbance and emissions to air may cause harm to protected species. No changes to Site operations are proposed as part of the application.	An AMP has been prepared and will be implemented and followed to further reduce risks if incidents occur.	Low

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
amphibians, bats, badgers, hazel dormice and great crested newts									

