Cyfoeth Naturiol Cymru
Natural Resources Wales

Natural Resources Wales Permitting Decisions

Dwr Cymru Cyfyngedig (Afan Sludge Treatment Facility) Decision Document

Application for a Substantial Variation

The application number is: PAN-027050

The permit variation number is: EPR/ZP3032KQ/V005

The operator is: Dwr Cymru Cyfyngedig

The Installation is located at: Afan Sludge Treatment Centre, Afan Waste Water Treatment Centre, Harbour Road, Phoenix Walk, Port Talbot Steelworks, Port Talbot, SA13 1RA

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise, we have accepted the applicant's proposals.

Contents

Contents 3
1. Executive summary 5
1.1. Application summary 5
1.2. Our decision 6
2. Receipt of the application 6
3. Confidential information 6
4. Legislation 6
5. Consultation 7
5.1. Consultation on the Application 7
5.2. Draft Permit Consultation 8
6. Requests for information 8
7. The Installation 9
7.1. The existing permitted activities 9
7.2. What the installation will do 10
8. Operation of the installation 12
8.1. Operator competence 12
8.2. Environmental Management System 12
9. Operating Techniques 14
9.1. Secondary Containment System 15
9.2. Wastewater streams and indirect water discharges 22
9.3. Waste gas streams and odour management 24
10. The site 28
10.1. Site Plan 28
10.2. Site Condition Report 28
10.2.1. Site protection: potentially polluting substances and prevention measures 28
11. Environmental Risk Assessment 28
11.1. Assessment of impact on air quality 29
11.2. Assessment of impact to surface and ground water 30
11.3. Emissions to sewer 30
11.4. Fugitive emissions 30
11.5. Assessment of odour impact 31
11.6. Noise and vibration assessment 33
12. Impact on National Site Network Sites, SSSIs and non-statutory sites 35
12.1. The National Site Network 35
12.2. Sites of Special Scientific Interest (SSSI) 35

12.3. Non-statutory conservation sites 35
13. The Permit Conditions 36
13.1. Incorporating the variation 36
13.2. Emission Limits 36
13.3. Monitoring 36
13.4. Reporting 37
13.5. Waste Types 37
13.6. Improvement conditions 37
14. OPRA 38
ANNEX 1: Improvement Conditions 39
ANNEX 2: Consultation Reponses 49
1. Advertising and consultation on the Application 49

1. Executive summary

1.1. Application summary

The Industrial Emissions Directive (IED) came into force on 06/01/2011 and was transposed into UK law on 20/02/2013. It introduced an updated list of industrial activities that require an environmental permit. Among the changes was the inclusion of the recovery of non-hazardous waste through biological treatment, where the treatment capacity exceeds 75 tonnes per day. However, activities already regulated under the Urban Waste Water Treatment Directive (UWWTD) were excluded.

Initially, UK environmental regulators considered whether this exclusion extended to non-hazardous waste recovery activities operated by water and sewage companies. As a result, the requirement for such existing operations to apply for a permit was temporarily deferred. Following further assessment, all UK regulators concluded that the exemption under the UWWTD did not apply and water and sewage companies were instructed to apply for environmental permits for the relevant sites.

The operator, Dwr Cymru Cyfyngedig, has applied to vary permit number EPR/ZP3032KQ to add the sites' Anaerobic Digestion (AD) plant to the permit (also referred to as the Sludge Treatment Centre (STC)). The activity requires permitting under IED and as such an application has been made to add the following installation activity listed in Part 1 of Schedule 1 of Environmental Permitting Regulations (EPR) to their existing permit:

- *Section 5.4A(1) (b) (i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment.*

A throughput capacity of 488 tonnes per day has been applied for.

The existing permit is for a standalone waste facility which permits the operation of a Combined Heat and Power (CHP) facility at the Afan Wastewater Treatment Works (WwTW). The WwTW is permitted under a standalone water discharge permit (EPR/BP0284701).

The AD plant treats sludge from the Afan WwTW and imported dewatered undigested cake. The activity includes the physio-chemical and anaerobic digestion treatment process and the storage of waste for recovery purposes.

1.2. Our decision

We are minded to issue the permit variation for Afan Sludge Treatment Centre operated by Dwr Cymru Cyfyngedig.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

2. Receipt of the application

The application was accepted as duly made on 25/07/2025**.** This means we considered it was in the correct form and contained sufficient information for us to begin our determination, but not that it necessarily contained all the information we would need to complete that determination.

3. Confidential information

The applicant made no claim for commercial confidentiality, and we have not received information in relation to the application that appears to be confidential in relation to any party.

4. Legislation

The variation will be issued, under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- a waste operation subject to Environmental Permitting Regulations
- subject to aspects of the Well-Being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016 which also have to be addressed.

We address the legal requirements directly where relevant in the body of this document. All applicable European directives have been considered in the determination of the application.

NRW is satisfied that this decision is consistent with its general purpose of pursuing the sustainable management of natural resources (SMNR) in relation to Wales, and applying the principles of SMNR. In particular, NRW acknowledges that it is a principle of sustainable management to take action to prevent significant damage to ecosystems. We consider that, in issuing the permit a high level of protection will be delivered for the environment and human health through the operation of the Installation in accordance with the permit conditions.

Our decision on whether to issue or refuse an EPR permit is defined by legal requirements. In our decision-making, we must ensure that our determination considers all relevant statutory requirements and provides the required level of protection to the environment. This involves assessment of impacts to air, water, land and any ecological receptors from the proposed activities.

The environmental permitting regime and NRW's role as the environmental permitting authority under EPR, applies only to the control of the permitted activities within the boundary of the installation. NRW's function is to assess pollution risk arising from operations on-site, which are capable of being controlled under the environmental permit. In addition, and so as to comply with its general public law duty, NRW's decisions must be reasonable, proportionate and procedurally correct.

5. Consultation

5.1. Consultation on the Application

We have carried out consultation on the application in accordance with the Environment Permitting Regulations (EPR), our statutory Public Participation Statement (PPS) and our Regulatory Guidance.

A copy of the application is available on the public register for anyone to view. We advertised the application to the public by a notice placed on our website directing

people to the public register, advising them of how they could arrange for copies to be made if required and how they can provide comments.

We also consulted with the following bodies, which includes those with whom we have "Working Together Agreements":

- Public Health Wales
- Health and Safety Executive
- Neath Port Talbot Planning
- Neath Port Talbot Environmental Health

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly. The consultation started 28/02/2025 and ended on 28/03/2025. A summary of consultation comments and our response to the representations we received can be found in Annex 2. We have taken all relevant representations into consideration in reaching our decision.

5.2. Draft Permit Consultation

We are now carrying out consultation on our draft decision. This consultation will begin on 29/05/2026 and will end on 25/06/2026.

6. Requests for information

Further information was requested during determination by way of a Schedule 5 Notice requiring the applicant to provide further information relating to:

- Odour Impact Assessment
- The Siloxane Removal Plant
- Surface Water Management
- Discharges to Sewer
- The Cake Barn
- Containment

The Schedule 5 Notice was sent on 25/02/2025 with a deadline for response of 02/04/2025.

The applicant's initial response to the Schedule 5 Notice was provided on 02/04/2025. The additional information supplied did not satisfy the requirements of the Schedule 5 Notice and further information was requested on 17/04/2025 with additional information explaining why the initial response was not sufficient. The deadline for response date was extended to 02/05/2025. The applicant provided further information on 01/05/2025 which we considered satisfied the request of the Schedule 5 Notice.

A secondary Schedule 5 Notice was sent on 14/07/2025 requiring the applicant to provide further information relating to:

- The secondary containment system
- Process flow diagram
- Inventory or waste water and waste gas streams
- Odour

The applicant's initial response to the Schedule 5 Notice was provided on 15/08/2025 although we queried some of the information submitted. Additional information supplied on 03/10/2025 satisfied the requirements of the Schedule 5 Notice.

An informal information request was made via email on 02/04/2026 and 12/04/2026, to which a satisfactory response was received on 17/04/2026.

A copy of the information notices and e-mails requesting further information were placed on our public register as were the responses when received.

7. The Installation

7.1. The existing permitted activities

The existing permit is for a waste operation for the following recovery activity:

- R1: Burning of waste as a fuel

The activity relates to a Combined Heat and Power (CHP) facility which combusts biogas for the production of steam, hot water and electricity. The CHP consists of 2 x engines each with a thermal input of 3.745 MWth and 2 x auxiliary boilers each with a thermal input of 3.9 MWth.

7.2. What the installation will do

Following this variation, the waste operation permit will become an installation permit. The AD plant will become the primary activity which is listed in Part 2 of Schedule 1 to the Environmental Permitting Regulations:

- Section 5.4 Part A(1)(b)(i): Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving one or more of the following activities and excluding activities covered by Council Directive 91/271/EEC (i) biological treatment

An installation may also comprise “directly associated activities”, which at this Installation include will include storage of waste, physical treatment of waste, digestate storage, raw material storage, biogas storage, the siloxane removal plant, steam and electrical power supply, emergency flare operation, odour abatement and surface water collection system.

These activities are also waste recovery and disposal activities and are associated with the following waste codes:

- R1: Use principally as a fuel or other means to generate electricity (combustion of biogas)
- R3: Recycling/reclamation of organic substances which are not used as solvents (AD, physical pre-treatment of physical waste, waste liquid storage, waste oil storage and digestate storage)
- R13: Storage of waste pending any of the operations numbered R1 to R3 (excluding temporary storage, pending collection, on the site where it was produced) (AD, digestate storage)
- D9: Physico-chemical treatment which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12 (e.g. evaporation, drying, calcinations etc (AD)
- D10: Incineration on land (emergency flare operation)

Together, these listed and directly associated activities comprise the Installation.

The AD plant treats sewage sludge from the Afan WwTW and imported dewatered undigested sludge cake. The daily throughput will be limited to 488 tonnes per day.

Sludge from the Afan WwTW is transferred to 2 centrifuges where polymer is added for thickening. Imported sludge cake is received into a 'cake import centre' which consists of 2 enclosed hoppers. From here, sludge from both sources is transferred to the Thermal Hydrolysis Plant (THP).

The THP is a sealed process which comprises of a pulper, 4 reactor tanks and a flash tank. Air from the on-site sludge cake silo, enclosed hopers and the THP is extracted to an odour control system ("OCU1"). Steam and condensate are either recaptured back into the THP process or captured in foul gas drum and discharged into the final digester. Treated sludge from the THP is diluted using disinfected final effluent and then cooled.

Following this process, sludge is pumped into 2 anaerobic digestors and digested for a minimum of 13 days. From here, polymer is added and digested sludge is pumped to an open aerated digested sludge holding tank and then to a belt press building where 4 belt presses are located for dewatering. The resultant dewatered sludge cake is discharged into 4 cake bays. Air from the belt presses and cake bays are extracted via a second odour control system ("OCU2"). From the cake bays, cake is transferred to a roofed cake storage pad and then exported off-site periodically by road trailer for use as fertiliser.

The process generates biogas which is stored in 2 dual membrane gas storage bags. A dedicated siloxane removal unit (with virgin carbon) treats the biogas before it is transferred to the CHP engines and combusted in 2 3.745 MWth rated thermal input spark ignition engines. Electricity produced is used by the adjacent, separately permitted WwTW with any surplus transferred to the distribution network. High grade heat is recovered from the CHP engine exhaust and used to generate low pressure steam, whilst low grade heat from the cooling jacket is used to generate hot water for reuse in the AD process. Additional heat demand is met by 2 supplementary fired waste heat boilers (3.9 MWth input each).

The engines and boilers are classed as existing Medium Combustion Plant (MCP) as they were operational before 20 December 2018. However, as their capacities are equal to or greater than 1 MWth and less than or equal to 5 MWth, the Medium Combustion Plant Directive (MPCD) requirements do not need to be permitted until 1 January 2029 and complied with until 1 January 2030.

8. Operation of the installation

8.1. Operator competence

The applicant is the sole operator of the Installation. We are satisfied that the applicant is the person who will have control over the operation of the Installation after the permit the variation is issued; and that they will be able to operate the Installation so as to comply with the conditions included in the permit, if issued. The decision was taken in accordance with EPR RGN 1 Understanding the meaning of operator[1].

Technical competency is required for the proposed activities. Evidence of an accredited Competency Management System has been provided. The operator satisfies the criteria in RGN 5 on Operator Competence[2].

8.2. Environmental Management System

The applicant has stated in the application that they will implement an Environmental Management System (EMS) that will meet the requirements for an EMS in our "How to comply with your environmental permit" guidance[3].

The application indicated the EMS was ISO14001 certified however the certificate provided indicated the certification has expired. The operator is in the process of re-instating the certification and has provided a copy of the auditors' letter recommending approval for re-certification.

Permit condition 1.1 will require the operator to have a written management system in place.

[1] RGN 1 Understanding the meaning of 'operator' (naturalresources.wales)
[2] regulatory-guidance-note-5-operator-competence.pdf (naturalresources.wales)
[3] Natural Resources Wales / Guidance to help you comply with your environmental permit

We have reviewed the application and are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions.

Accident management

The EMS includes an Accident Management Plan which the applicant has submitted as part of this application. We have reviewed this and are satisfied that appropriate controls are in place to help reduce the occurrence and impact of any accidents that occur.

In order to ensure that the management system proposed by the applicant sufficiently manages the residual risk of accidents, permit condition 1.1.1a requires the implementation of a written management system which addresses the pollution risks associated with, amongst other things, accidents.

Efficient use of raw materials, water and energy

Having considered the information submitted in the application, we are satisfied that the applicant will ensure that raw materials, water and energy is used as efficiently as possible.

The operator will be required to report energy usage under condition 4.2 and Schedule 4 of the permit. This will enable us to monitor energy recovery efficiency at the Installation.

Avoidance, recovery or disposal of wastes produced by the activities

Having considered the information submitted in the application, we are satisfied that the waste hierarchy referred to in Article 4 of the Waste Framework Directive (WFD) will be applied to the generation of waste and that any waste generated will be treated in accordance with this Article.

We are satisfied that waste from the Installation that cannot be recovered will be disposed of offsite using a method that minimises any impact on the environment. Permit condition 1.4.1 of the permit will ensure that this position is maintained.

Fire Prevention and Mitigation

In line with current NRW Fire Prevention and Mitigation Plan Guidance, a Fire Prevention and Mitigation Plan is not required for this activity which is wet anaerobic digestion. However, the applicant has prepared and provided Emergency procedures for fire as part of their Accident Management Plan.

Site Security

Having considered the information submitted in the application, we are satisfied that appropriate infrastructure and procedures are in place to ensure that the site remains secure.

9. Operating Techniques

The applicant has described the proposed equipment and operating techniques and compared these against the relevant Best Available Techniques conclusions (BATc) which for an installation of this type is Waste Treatment[4].

A key issue of the determination was that the applicant was not able to demonstrate that they were fully complaint with all relevant BATc. We recognise that sludge treatment facilities such as these ones were constructed before the Waste Treatment BATc were published and that existing designs may not be compatible with the current permitting requirements. Where this is the case we can consider issuing a permit, with appropriate conditions, providing we are satisfied the applicant has provided the relevant risk assessments and has satisfactorily demonstrated a path to compliance within an acceptable timeframe.

In this section, we will discuss in detail which BATc the operator is not compliant with now, the evidence they have provided to demonstrate how they will meet the BATc and our assessment of that evidence. Relevant BATc include:

- Secondary Containment (BAT 19)
- Inventory of waste waters and waste gases (BAT 1xi and BAT 3)
- Point source emissions to water – indirect emissions (BAT conclusions 7 and 20)

[4] Best Available Techniques (BAT) Reference Document for Waste Treatment

- Waste gases and odour management (BAT 34, 53 and BAT 8)

Where a BATc is not discussed in detail, the operator has sufficiently demonstrated they are compliant with the remaining relevant BAT conclusions. We have specified that the applicant must operate the permit in accordance with descriptions in the application. See section 13 of this document for more information on how we have incorporated the variation into the permit and how emission limit values have been set.

9.1. Secondary Containment System

Appropriate containment is fundamental to preventing pollution at AD facilities which store and stream significant volumes of waste sludge which have the potential to cause pollution to land, air and water and negatively impact any nearby protected sites. The Waste Treatment BATc includes BAT 19 which identifies relevant techniques to prevent, or where that is not practicable, to reduce emissions to soil and water.

A full risk assessment has been completed by the applicant to assess the suitability of existing and proposed primary, secondary and tertiary (where applicable) containment measures at the installation using:

- the ADBA tool (B16399-123532-ZZ-XX-AS-ZA-CI1012 - Afan ADBA Assessment October 2024); and
- a containment risk assessment (which included spill modelling) against the recommendations in the recognised industry standard CIRIA C736 guidelines 'Containment systems for the prevention of pollution' (B16399-123532-ZZ-XX-RP-WA-HY1008 Afan WwTW Sludge Containment Assessment September 2024).

Additional supporting information to these assessments was also provided in response to Schedule 5 Notices:

- an updated control philosophy for the proposed flood gates (B16399-123532-XX-AB-MA-ZA-OA0038 - Flood Gates Control Philosophy September 2024);

- information on the approach to containment of firewater (B17497-123532-XX-XX-RP-KA-DH0035 Afan Sch 5 response – firefighting water Qu 1 020125); and
- implementation schedule (Afan Sch 5 response – IED program Qu2, Qu 7 01/08/2025).

Sources of potentially polluting substances

The total volume of identified sources of potentially polluting substances associated with the STC area is 10,766m^3, stored across 14 tanks with individual volumes varying between 13m^3 to 4,250m^3. Substances of concerns include raw sludge, digested sludge, thickened sludge and matured sludge. The majority of volume is stored between the 2 x primary digesters which have a working volume of 4,250m^3 each. The site also stores raw materials such as diesel and chemicals required for the AD process such as flocculants and sulphuric acid.

Firefighting water used in the event of a fire can become contaminated by the on-site sources of potentially polluting substances. In response to an information request the applicant, based on guidance for Fire Prevention and Management Plans and CIRIA C736, has estimated that in the event of a fire, 2,400 m^3 of water would be required.

Pathway

Rainwater can carry potentially polluting substances via overland flow. The applicant has considered this pathway in their assessment as due to the topography of the site, in the event of a spill, substances would flow under gravity (elevation of the site varies from 7mAOD to 9.5mAOD).

There are pervious areas near the STC (grass and bushes) which could lead to contamination of groundwater in the event of a spill. The underlying aquifer of the site is classified as a “Secondary A aquifer” (permeable layers) and a “Secondary Undifferentiated aquifer” (variable characteristics). The site is not within a Source Protection Zone (SPZ).

The potential of flooding and jetting were assessed to be not credible pathways. The site is outside flood zones, both digesters are built of non-combustible, reinforced concrete, and are more likely to spill via seeping rather than rupture.

Receptors

The applicants risk assessment identified that there are designated sites that need to be considered. There are no designated sites within 2km of the STC but the following sites can be found within 10km:

- Cefn Cribwr Grasslands SAC
- Cors Crymlyn SAC
- Crymlyn Bog RAMSAR / SSSI
- Eglwys Nunydd Reservoir SSSI
- Penycastell Cefn Cribwr SSSI
- Pant-y-Sais SSSI
- Crymlyn Burrows SSSI
- Earlswood Road Cutting and Ferryboat Inn Quarries SSSI
- Margam Moors SSSI
- Kenfig SAC / SSSI
- Waun Cimla SSSI
- Crymlyn Bog and Pant Y Sais Nature Reserve
- Kenfig Pool and Dunes Nature Reserve
- 6 x Local Nature Reserves
- Various Local Wildlife Sites
- Various Ancient Woodland Sites

Other receptors include the Bristol Channel which is located adjacent to the site, site infrastructure and sensitive human receptors located within the sites office buildings.

Hazard ratings and containment requirements

The applicant has assigned the following risk ratings:

- Source – 'medium'
- Pathway – 'medium' (assuming no secondary containment)
- Receptor – 'medium'

We have reviewed the operators risk assessment in line with the CIRIA C736 guidelines and are in agreement with the applicants overall site risk rating of 'medium' should no suitable secondary containment be in place.

Existing primary containment at the site is considered suitable. The applicant provided evidence that the primary digestor tanks, which are constructed on re-enforced concrete, were emptied and inspected in 2022 and were found to be in good condition. The application details how there are routine management checks in place to check for any structural issues which could cause failure of the primary containment tanks.

The site's does have some existing secondary containment in place which consists of kerbs and speed humps. Hydraulic modelling (spill modelling) has been undertaken to understand the impacts should there be a failure of one of the primary digesters. This has been identified as a credible scenario whereby this is the largest tank. none of the tanks are hydraulically linked (so rupture would only effect one tank).

The modelling included a scenario ("Pre-failure") to determine water levels following 24 hours of rainfall (1 in a 10 year event) and then a scenario ("Post-failure") to assess impacts should a 24 hour rainfall event be preceded by the failure of one of the primary digestors with the existing containment arrangement.

The results of this modelling, as detailed in the applicants report, showed that with the existing secondary containment arrangements, the spill would not be contained on the site and would, within 1 hour, spread to Tata Steel (an adjacent installation) to the north east and onto the beach of the Bristol Channel to the west at very shallow levels. These results confirm the requirement for new adequate secondary containment at the site and that as built, the site is not compliant with BAT 19 of the Waste Treatment BRef.

Proposed containment

CIRIA C736 recommends that secondary containment capacity should be the larger of 110% of the capacity of the largest tank or 25% of the total storage capacity within the bunded area.

The applicant has assessed the containment required in the event of a spill, considering a 1 in 10 year return period rainfall event occurring 24 hours beforehand , and it was determined that the required secondary containment volume was 6622 m^3.

This volume exceeds the 110% rule of the largest tank (which in this case would be 4,675 m^3).

Based on calculated containment requirements, the applicant has proposed a high level concept for improved secondary containment at the site. The design involves providing a containment system around all sources associated with the STC, providing 6,622 m^3 of containment capacity, which is the containment requirement calculated from the modelling discussed above. The system will comprise of walls and flood gates which will range from 1.2 – 2 metres in height. A 100 mm freeboard will be installed to provide additional containment in accordance with CIRIA C736 to allow for additional capacity for firewater in the event a spill coincides with a fire. The applicant has provided a reasoned justification demonstrating that the containment system does not need to accommodate a simultaneous occurrence of a spill, rainfall, and fire event.

The plan below (taken from the applicant's report) shows the location of the secondary containment walls (pink line):

The system will utilise existing buildings, kerbing and impermeable surfaces. New walls will need to be constructed on top of existing bund walls to achieve the required

capacity. Heights of the walls in the plan require design optimisation and so the plan above is not a detailed exact design. As the site needs to be accessible to in-coming and out-going traffic, 2 flood gates will be used (blue line in plan above). An automatic flood gate will be installed by the building with the boilers and a manual flood gate will be installed by the cake barn. A control philosophy for the gates has been provided (B16399-123532-XX-AB-MA-ZA-OA0038 - Flood Gate Control Philosophy Updated March 2025) which explains how the automatically controlled flood gates will operate. We have assessed the proposed operation of the gates and consider the proposal acceptable.

Hydraulic modelling results show that, with this enhanced secondary containment, in the worst case scenario of a 24 hour rainfall event and failure of a primary digestor tank, the spill is contained.

The applicant has confirmed that the containment bund wall shall be built to British Standards BS EN 15258:2008, CIRIA SP124 - Barriers, liners and covers for containment and control of land contamination, and using best practices as outlined in CIRIA C736 - Containment systems for the prevention of pollution (Chapters 6 and 7), CIRIA C608 - Use of sewage sludge in construction.

In the event of primary containment failure the containment system will allow all potentially polluting substances to the 'liquor returns chamber' and be pumped to the onsite WwTW for treatment. This drainage is isolated from other site drainage. The liquor returns pump will be able to pump 2000 m^3/day, so the applicant has stated clean up can be completed within 3-4 days and there is no risk of overwhelm should there be heavy rainfall. An option will also be available to remove contaminated liquid via tanker for offsite treatment. It will be the operator's responsibility to manage the event in order to protect their site assets and operation. A drainage plan has been provided detailing how all water (spills, run-off, firewater) will go to the return chamber within the STC bunded area. Emergency management procedures in the event of a primary containment failure have been detailed in the Accident Management Plan. In the BAT assessment submitted with the application, the operator has also committed to providing a wastewater and digestate buffer storage plan to review, describe and propose site contingency arrangements, and to provide, if necessary, appropriate

storage capacity for wastewater generated under other than normal operating conditions (in accordance with BAT 19(i))

Whilst we agree in principle that the outline design of the proposed enhanced secondary containment is in line with CIRIA C736 guidance, we recognise the designs are not yet finalised. We generally would not set improvement conditions that require BAT to be demonstrated after the permit variation has been granted and normally need to be satisfied the activity is compliant with all relevant BATc from when that activity starts. However, we recognise that as this industrial activity is already undergoing and there is a need to bring it into environmental regulation. Whilst there is a pollution risk, the operator is not introducing new risks to the environment. Although a detailed secondary containment design has not been confirmed as part of the application, the applicant was able to provide:

- A suitable risk assessment;
- confirmation a suitable secondary containment system will be implemented which will be designed in accordance with CIRIA C736 by a qualified structural engineer;
- a detailed implementation plan; and
- details of contractors engaged to carry out the required works.

We have specified an IC which has 3 parts. The operator will first have provide the finalised designs and plans for written approval. The second part (which should accompany the first part) will be an updated BAT Assessment specifying how these designs and plans comply with the relevant BAT standards. Finally, a report by a qualified engineer for our written approval will need to be submitted, confirming the proposed containment system has been constructed to the standards and descriptions in the final containment design documents (see Annex 1 – IC1a-c).

Failure to comply with the improvement conditions within the specified timescales (or alternative timescales agreed in writing with NRW) may be classed as a breach of condition 2.4 of the permit.

9.2. Wastewater streams and indirect water discharges

The activity produces liquid waste which is sometimes referred to as 'return liquors'. These, alongside any potentially contaminated run-off from within the secondary containment system, are discharged to the onsite WwTW. As discussed at the start of this report, the discharge from the WwTW is regulated under a separate water discharge permit. The discharge of water to the WwTW (EP S1) is classed as an indirect emission to water under the Waste Treatment BREF.

BAT 1(xi) and BAT 3(ii) require that the characteristics of wastewater streams are established as part of a comprehensive understanding of the installation's emissions and their management. This includes:

- Average flows and variability of flow, pH, temperature and conductivity;
- Average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorous, metals, priority substances / micropollutants); and
- Data on bio-eliminability (e.g. BOD/ BOD to COD ratio, Zahn-Wellens tests, biological inhibition potential such as inhibition of activated sludge).

In the BAT assessment submitted with the application, the operator confirmed that the characterisation of the indirect discharge is largely unknown (apart from flow and total suspended solids). As the waste water inventory is key to informing environmental risk assessments and monitoring requirements, the applicant is therefore also unable to demonstrate they are compliant with the mandatory emissions limits for indirect discharges to water (BAT-AELs) as set out in BATc 20 and associated monitoring in BAT 7.

A high level sampling plan (document reference 100123523_SamplingPlan_AFA September 2024) was provided with the application to evidence the operator's commitment to characterising of the liquid waste water streams. We requested a justification for why the sampling had not yet begun and a finalised sampling plan, with an implementation schedule for the program and further assessment. The operator confirmed that sampling was delayed due to a sector wide issue with technical challenges of characterising waste water emissions. Issues include (but are not limited

to) the solid content of the waters, availability of laboratories to analyse the full suite of required determinands and insufficient limits of detection.

As discussed above in section 9.1, we normally need to be satisfied the activity is compliant with all relevant BATc from when that activity starts. However, there is a need for a pragmatic way forward to bring this aspect of the activity into environmental regulation, noting that no new pollution will be introduced into the environment as a result of the permit variation. Furthermore, although a detailed inventory of the waste water stream has not been confirmed as part of the application, the applicant was able to provide:

- An outline sampling plan;
- Confirmation of some initial sampling for a small range of determinands and the laboratory this is being analysed at; and
- Justification for why the full sampling program has not been finalised or initiated

We have also engaged with another UK regulator who confirmed the sector wide issues with characterisation of waste water streams such as these. We therefore consider it appropriate to set improvement conditions for the operator to characterise the waste water and then implement future improvements.

We have specified an IC which will contains 5 parts (see Annex 1 IC2a-e). IC2a and ICb will require the operator to submit a finalised sampling plan and carry out the required sampling and analysis on the waste water stream. Due to the sector wide issue with sampling, we consider it appropriate for the timeframe for these ICs to be agreed to be 12 months from permit issue to allow time for these issues to be resolved. Next, the operator will be required to submit a risk assessment informed by the results of the sampling program (IC2c). The report should include confirmation of what BAT-AELs and monitoring requirements apply. Should the risk assessment identify any improvement work, the a further IC requires these to be implemented (IC2d). Finally, an updated BAT assessment should be submitted demonstrating how following completion of this IC, the operator is fully compliant with the applicable BAT standards.

All potentially relevant BAT-AELs for indirect emissions to water have been put in the permit (in Table S3.2) with a note that the limits and monitoring requirements may only apply following the substance being identified as relevant in the waste water inventory as determined by IC2.

Failure to comply with the improvement conditions within the specified timescales (or alternative timescales agreed in writing with NRW) may be classed as a breach of condition 2.4 of the permit.

9.3. Waste gas streams and odour management

The activity generates waste gas and odour emissions that are discharged to air. Existing permit limits and monitoring requirements apply to emissions from the permitted CHP units, boiler units, and biogas flares.

As outlined in Section 7.2, odour emissions are managed by extracting air from various areas of the site and treating it via two odour control units (OCU1 and OCU2). OCU1 serves the cake import hoppers, THP feed silo, and THP plant. OCU2 is designed to treat air from the belt press building, which also houses the cake bays, but is currently not operational.

BAT 1(xi) and BAT 3(iii) require that the characteristics of waste gas streams are established to support a comprehensive understanding of emissions and their management. The operator has confirmed that sampling and monitoring are undertaken for permitted air emissions from the CHP, boilers and flare. However, the operator has also confirmed that the odour control units have not yet been sampled or characterised in accordance with the relevant BAT conclusions.

BAT 8 requires monitoring of channelled emissions to air. As the waste gas streams from the OCUs have not been fully characterised, the operator cannot currently demonstrate full compliance with BAT 8, e.g. it remains unknown whether substances such as Total Volatile Organic Compounds (TVOC) and Hydrogen Chloride (HCl) are present from the OCU's and require monitoring.

BAT 34 and BAT 53 relate to the reduction of emissions to air, including odorous compounds, using appropriate techniques. As noted, OCU2 is not currently in use, and the applicant has acknowledged that further assessment is needed to determine whether the site's current measures meet these BAT requirements. The Waste Treatment BREF also sets BAT-AELs for biological treatment of waste with respect to odour (BAT 34), including limits of <1,000 OUE/Nm³ for odour concentration or ≤20 mg/Nm³ for ammonia. The operator has indicated that improvement works are necessary to achieve compliance with these BAT-AELs, as discussed further in Section 10.5. BAT 53 sets BAT-AELs to air for HCl and TVOC. The applicant has stated these are not applicable but applicability of these limits is related to the substances being identified as part of the waste gas stream, which as discussed is not fully understood at this site.

While we are satisfied, based on the information provided in the application, that the site is unlikely to pose a significant odour risk, further work is required to achieve full BAT compliance. As discussed in Section 9.1, we would normally expect full BAT compliance from the outset of the activity. However, in this case, a pragmatic approach is considered appropriate to bring the activity into regulation, noting that the permit variation does not introduce new pollution to the environment.

Although full compliance with BAT requirements for waste gas stream inventory and odour management has not yet been demonstrated, the applicant has provided:

- an Odour Assessment, including modelling which indicates that current odour levels do not exceed benchmark thresholds;
- an effective Odour Management Plan detailing recommendations for improvements at the site to achieve BAT compliance;
- a commitment to undertake detailed assessment and survey work, and to implement necessary improvements, including contractor details and timescales.

We therefore consider it appropriate to include an improvement condition requiring the operator to characterise the waste gas streams and implement measures to achieve full BAT compliance for odour management.

An improvement condition (IC3) will require the operator to verify the effectiveness of the odour management systems in place. The IC will contain 3 parts. Firstly, the operator will need to establish an inventory of waste gas emissions from both odour control units, implementing the proposed improvements, and assessing their effectiveness (IC3a). Following the completion of these works, the operator is required to submit a report detailing the improvements made, any updated waste gas treatment descriptions, results from the investigation and an updated Odour Impact Assessment (IC3b). Finally, an updated BAT assessment should be submitted demonstrating how following completion of this IC the operator is fully compliant with the applicable BAT standards (IC3c).

All potentially applicable BAT-AELs for emissions to air from the odour control units have been included in Table S3.1 of the permit. These limits and associated monitoring requirements will apply only where the relevant substances are identified in the waste gas inventory established under IC3.

Failure to comply with the improvement conditions (IC) within the specified timescales (or alternative timescales agreed in writing with NRW) may be classed as a breach of condition 2.4 of the permit.

We acknowledge that achieving the BAT-AEL for TVOC is a known industry-wide challenge, and that other regulators have granted a two-year extension for similar improvement conditions. While we consider the majority of the improvement condition achievable within the specified timeframes (9 months for all 3 parts), we are prepared to agree an alternative reasonable timescale in writing for demonstrating compliance with the TVOC BAT-AEL (if identified as applicable), outside of the permit determination process, in accordance with the caveat in the improvement condition that allows for alternative timescales to be agreed in writing with NRW.

9.4. Flare operation

BATc 15 of the Waste Treatment BREF is to use flaring only for safety reasons or for non-routine operating conditions. The operator's application detailed how as a result of equipment malfunctions and issues obtaining replacement parts, the flare was

operated for more than 10% of the time in 2024, which meant the existing waste permit limits were exceeded Monitoring showed that the limit for carbon monoxide was exceeded. The BAT assessment has confirmed the required improvement works have been implemented which include upgrading of the biogas clean-up system at the site and works to address legacy pressure issues with the biogas pipework. The improvements mean that the boilers and CHP can now run of simultaneously on biogas should production levels require and flare usage should reduce significantly. The operator has confirmed the flare operation is now compliant with the relevant BAT standards.

An improvement condition (IC4) has been included in the permit for the operator to carry out an assessment of the improvements to ensure they have reduced the need for flaring.

The permit will retain the permitted limits and exceedances will be treated as a non-compliance in accordance with the relevant guidance.

9.5. Process Monitoring

BAT 38 is to monitor and/or control the key waste and process parameters to reduce emissions to air and to improve the overall environmental performance.

The operator has confirmed they are compliant with this requirement, and the permit has been updated to include the requirement to monitor:

- pH, alkalinity and hydraulic and organic loading rates of the digester feed;
- operating temperature, liquid and foam levels, ammonia, Volatile Fatty Acids (VFA), alkalinity, FOS/TAC ratio and pH in the digester;
- VFAs and ammonia concentration in the digestate; and
- Flow, quantity, pressure, composition, methane, hydrogen sulphide and carbon dioxide.

We have also specified that odour is monitored daily from the digesting tanks, biogas holder, waste reception building and external storage areas. This is not a requirement

of BAT 38 but is considered appropriate to monitor, to ensure compliance with BAT 34 and condition 3.3.1 of the permit.

10. The site

10.1. Site Plan

The applicant has provided an updated plan which we consider is satisfactory, showing the extent of the site of the facility and the new emission points.

The updated plan will be included in the permit and the operator will be required to carry on the permitted activities within the site boundary.

10.2. Site Condition Report

The applicant has provided a description of the condition of the site in a Site Condition Report. We have reviewed this and consider this description is satisfactory. The decision was taken in accordance with our guidance on site condition reports – guidance and templates (H5)[5].

10.2.1. Site protection: potentially polluting substances and prevention measures

The operator has a duty to ensure that soil and groundwater are protected in order to meet the requirements of Articles 14 (1)(b), 14(1)(e) and 16(2) of the IED. Appropriate containment is also a requirement of Best Available Technique Conclusion (BATc) 19 of the Waste Treatment BREF. Please refer to section 9.1 for a detailed assessment of prevention measures proposed by the applicant.

11. Environmental Risk Assessment

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration; accidents, fugitive emissions to air and water; as well as point source releases to air, water, sewer and discharges to ground or groundwater, global warming potential and generation of waste. All these factors have

[5] Environmental Permitting Regulations , Guidance for applicants H5, Site Condition Report, Guidance and Template (naturalresources.wales)

been considered during our determination and the relevant risks from this proposal are discussed in this and other sections of this document.

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of emissions from the Installation on human health and the environment and what measures we are requiring ensuring a high level of protection.

In line with our guidance, the applicant has provided an environmental risk assessment with the application which identifies and the sources of key risks from the installation possible pathways and receptors. This risk assessment and further assessments provided by the applicant and/or completed by NRW will be discussed in further detail below.

11.1. Assessment of impact on air quality

The AD process produces biogas which is transferred to the onsite CHP engines and combusted in 2 x 3.745 MWth rated thermal input spark ignition engines. This process is already permitted as a waste activity, with associated emission points to air, under the existing permit. As emissions from this process have already been assessed, and there are no changes proposed to the CHP part of the process a new quantitative air risk assessment is not required.

The AD process being added to the permit is associated with the following emissions to air:

- EP6 Odour control unit 1 (serving the on-site sludge cake silo, enclosed hopers and the THP via an activated carbon filter outlet)
- EP7 Odour control unit 2 (serving the belt presses and cake bays via a sulphuric acid scrubber)
- EP8-10 3 x Pressure relief valves (one in each of the primary digestors and biogas holder)

As discussed in section 9, we have specified improvement conditions relating to the odour control units and the assessment of waste gases.

A key issue of AD Facilities is emissions of bioaerosols. The applicant has screened out the requirement for a Bioaerosol Risk Assessment as there are not anticipated to be any sensitive receptors within 250m for a period longer than 6 hours at a time. We agree with this approach in this instance.

11.2. Assessment of impact to surface and ground water

There are no direct discharge to surface waters.

Clean uncontaminated run-off from the roof of the main sludge treatment building and cake barn will be diverted to soakaway outside of the secondary containment bund (EP W1, W2, W3 and W4).

See section 9.1 which discusses for measures in place to protected surface water and groundwater in the event of primary containment failure.

11.3. Emissions to sewer

The proposal includes a discharge to sewer. All process liquors and all other clean uncontaminated water run-off from within the secondary containment bund will be directed via the sealed drainage system to the liquor returns well (EP S1). A pumping station will send this water to the Afan WwTW for treatment. The discharge will be operated in accordance with an existing sewer discharge consent.

As explained in section 9.2, we have specified improvement conditions relating to the characterisation and assessment of this discharge.

Based upon the information in the application and conditions being implemented in the permit, we are satisfied that the appropriate measures will be in place to prevent pollution of surface waters as a result of the sewer discharge.

11.4. Fugitive emissions

The applicant has identified the following potential fugitive emissions from the Sludge Treatment Facility in their environmental risk assessment:

- Releases of polluting gases, including biogas, and particulates to air

- Releases to polluting substances to surface water and groundwater as a result of primary containment failure, leaks or spills
- Noise from vehicles, waste treatment processing, engines and boilers
- Odour
- Litter, mud and debris
- Pests including vermin, birds and insects
- Explosion of biogas or pressurised tanks
- Fire

The application details measures which will be in place for preventing and minimising fugitive emissions.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise fugitive emissions and to prevent pollution from fugitive emissions.

Permit condition 3.2.1 requires that emissions of substances not controlled by emission limits (i.e., fugitive emissions) shall not cause pollution. Condition 3.2.2 requires that a management plan shall be developed if pollution is subsequently identified.

11.5. Assessment of odour impact

There are sensitive receptors within the vicinity of the installation. The nearest potential sensitive receptors are industrial premises which are located to the north and west of the site, and Associated British Port Talbot land to the northwest. However, due to the nature of the operations at these sites, sensitivity to odour emitted from the STC is anticipated to be low. The closest residential receptors are properties at Pentre Wern and Tal-y-Wern which lie approximately 1.8 km from the centre of the sludge digestion operations between 60 and 70 degrees from north. Additional residential receptors are situated at Lower West End, Duke Street and Prince Street at a distance of approximately 1.83 km with bearings of 30, 53 and 55 degrees from north respectively.

The applicant has identified the following sources of odour in their environmental risk assessment:

- Imported sludge cake deliveries (diffuse emissions)
- Digested sludge holding tank (diffuse emissions)
- Digested sludge cake storage bays (fugitive emissions)
- Digested sludge cake storage pad (diffuse emissions)
- Digested sludge cake export (diffuse emissions)
- Siloxane filter (channelled emission)
- Odour Control Unit 1 (channelled emission)
- Odour Control Unit 2(channelled emission)

The applicant has submitted an Odour Impact Assessment (OIA) summarising modelling results from modelling carried out using BREEZE AERMOD. The modelled assessed impact at 2 residential receptors (Lower West End and Tal-y-Wern) and 5 commercial/industrial receptors.

Two scenarios were modelled, the existing scenario and the proposed operation following implementation of improvements. The 98th percentile of predicted hourly impacts at each receptor was compared against a benchmark odour concentration assigned to each receptor based on the consultant's assessment of the associated receptor sensitivity, with residential receptors assigned the benchmark for most offensive odours of 1.5 ouE/m^3.The results indicated that for both scenarios assessed the maximum 98th percentile of hourly average odour impact for both scenarios are unlikely to exceed this benchmark.

Due to the amount of time that has passed since the OIA had been written, we asked the applicant to provide a statement from the authors of the original odour impact assessment that the conclusions of the assessment remain valid. This was provided by the applicant on 03/04/2025 in response to a Schedule 5 Notice.

We are in agreement with the modelling approach and Natural Resources Wales modelling specialists agree with the overall conclusions of the report.

Despite the modelling showing the existing scenario does not exceed the bench levels for anticipated odour impact, the modelling also assessed the impact of further enhancements which include:

- an Odour Management Plan;
- upgrading the carbon media of OCU 1 so that the unit is able to achieve the BAT-EAL of 1,000OU_E/M^3 (BAT 34);
- investigate the feasibility of enclosing the sludge delivery operation in a building to reduce diffuse emissions and maintaining that building under negative pressure with extraction to an appropriate odour treatment system (BAT 14a and BAT 14d) and;
- investigate the feasibility of installing an abatement system to treat odours from the siloxane filter during periodic regeneration.

The applicant has submitted an Odour Management Plan (OMP) which details various measures to minimise and mitigate odour issues. We have compared the measures proposed to minimise odour at for the site to the H4 Odour Management[6] guidance and are satisfied the techniques represent appropriate measures for the installation. The OMP will be incorporated into the operating techniques section of the permit.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where not practicable to minimise the effects of odour. However, as discussed in section 9.3 we have specified improvement conditions relating to the site's odour controls complying with BAT standards.

Condition 3.3.1 in the permit will also require that emissions from the activities are free from odour at levels likely to cause pollution outside the site. We are satisfied that this will be sufficiently protective in conjunction with the improvement conditions relating to odour and the measures described by the applicant for minimising odour at the installation.

11.6. Noise and vibration assessment

There are sensitive receptors within the vicinity of the installation.

[6] H4 Odour Management / How to comply (publishing.service.gov.uk)

The applicant has identified the following sources of noise in their environmental risk assessment:

- Digester unit 1 & 2
- Odour Control Unit carbon filter
- Odour Control Unit sulphuric acid scrubber

The CHP units, biogas flare stack and boiler units associated with the already permitted activity have also been identified as sources of noise.

The applicant has submitted a Noise Impact Assessment which focuses on impact of the two nearest noise sensitive receptors:

- R1: End of Mariners Point, Port Talbot, approximately 1.8km from north-west of the site
- R2: Clos Y Wern, Port Talbot, approximately 1.83km to the east of the site

The assessment has been conducted in line with BS 4142:2014+A1:2019. This outlines a method for assessing the impact of industrial and commercial sound on residential areas. The approach involves measuring or predicting the specific sound level from the source and comparing it with the background sound level. Adjustments are applied for certain sound characteristics, such as tonality, impulsivity, intermittency, or other features that make the noise more noticeable. The resulting "rating level" is then assessed against the background level: a difference of +10 dB indicates a significant impact, while +5 dB suggests an adverse impact. Contextual factors, including time of day and local sensitivity, are also considered.

A desk based study approach has been opted for, comparing calculated operational noise impacts based on referenced measurements of the same type of equipment at similar facilities and representative baseline noise levels in published strategic noise maps. We accept this approach in this instance.

The results show that the predicted rating levels are significantly below the estimated background sound levels. This is an indication that operational noise is expected to be barely audible or detectable having low or no impact.

The environmental risk assessment submitted with the application details measures which will be in place for preventing and minimising noise and/or vibration.

We are satisfied that noise is unlikely to be an issue at the installation. Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where not practicable to minimise the effects of noise (and vibration).

Conditions 3.4.1 of the permit requires noise from the activities to be below that which could cause pollution outside the site. We are satisfied that this will be sufficiently protective in conjunction with the measures described by the applicant for minimising noise at the installation.

12. Impact on National Site Network Sites, SSSIs and non-statutory sites

12.1. The National Site Network

The following National Site Network sites are located within 10 km of the installation:

- Kenfig Special Area of Conservation (SAC)
- Cefn Cribwr Grasslands SAC
- Crymlyn Bog SAC / Ramsar

A Habitats Regulations Assessment (HRA) is not required because there is no conceivable impact pathway to any of the National Site Network sites identified by virtue of the scale or location or nature of the project.

12.2. Sites of Special Scientific Interest (SSSI)

No SSSIs are located within 10km of the installation. Therefore, no further assessment was required as there is no impact pathway to any SSSI due to the location of the installation.

12.3. Non-statutory conservation sites

The following relevant non-statutory sites are located within 2 km of the installation:

- Little Warren Local Wildlife Site
- Afan Estuary Local Wildlife Site

Based upon the information in the application we are satisfied that there will be no adverse impact to the non-statutory conservation sites identified because there is no conceivable impact pathway.

13. The Permit Conditions

13.1. Incorporating the variation

We have specified that the applicant must operate the permit in accordance with descriptions in the application, including additional information received as part of the determination process.

These descriptions have been specified in the Operating Techniques table in the permit.

13.2. Emission Limits

Article 14(3) of IED states that BAT conclusions shall be the reference for permit conditions. Article 15(3) further requires that under normal operating conditions; emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions.

BAT conclusions set out specific limits that the operator must comply with. Emission limits have been set in accordance with the relevant BAT AELs (Associated Emission Limits) although applicability of some of the limits may be agreed through the completion of the improvement conditions as discussed in section 9.

13.3. Monitoring

We have decided that monitoring should be carried out for the parameters listed in Schedule 3 of the permit using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with the emissions limits in the permit. Some monitoring requirements may need to be agreed through completion of improvement conditions as discussed in section 9.

13.4. Reporting

We have specified the reporting requirements in Schedule 4 of the Permit to ensure data is reported to enable timely review by Natural Resources Wales to ensure compliance with permit conditions and to monitor the efficiency of material use and waste recovery at the installation.

13.5. Waste Types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility for recovery under the AD activity.

13.6. Improvement conditions

Based on the information on the application, we consider that we need to impose improvement conditions.

Improvement conditions relating to BAT standards (IC1 – IC4) have been discussed in detail in section 9 of this document.

We have also specified an improvement condition (IC5) requiring the operator to submit a climate change risk assessment (CCRA) that will inform climate change adaptation required for the site. Following review of the CCRA, a climate change adaptation plan should form part of the site's EMS. Operators of environmental permits need to carry out a CCRA because climate change is already increasing the frequency and severity of extreme weather events. We are expecting more intense rainfall and flooding, prolonged heatwaves, drought conditions, sea level rise and tidal surges, as well as stronger storms and a higher risk of wildfires.

These changes present significant risks to permitted operations. Without proper planning, extreme weather could lead to non-compliance with permit conditions and/or fugitive emissions. By identifying and assessing climate-related risks, operators can take steps to reduce the likelihood and severity of these impacts. This helps to maintain compliance and protect the environment in the event of a changing climate. We have also specified that the Operator should submit a monitoring and management plan for non-CO_2 greenhouse gas emissions, in accordance with our approach to

reduce such emissions from biowaste treatment activities (IC6). The plan should include the assessment of any methane slip from combustion activities and management controls for Leak Detection and Repair for any non-CO_2 greenhouse gas emissions from the facilities, including fluorinated gases (FGases).

See Annex 1 of this document for complete list of improvement conditions added to the permit as part of this variation.

14. OPRA

The agreed OPRA score at the installation is 42. This will form the basis for ongoing subsistence fees.

ANNEX 1: Improvement Conditions

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1a	The operator shall provide finalised designs for the secondary containment systems proposed in the documents: "B16399-123532-ZZ-XX-RP-WA-HY1008 - Afan WwTW Sludge Containment Assessment September 2024 (1).pdf" September 2024 "B16399-123532-XX-AB-MA-ZA-OA0038 - Flood Gate Control Philosophy" March 2025. "B17497-123532-XX-XXX-RP-KA-DH0035 Afan Sch 5 response – firefighting water Qu 021025" October 2025 The finalised designs and specifications shall be produced by appropriate competent individuals (qualified civil or structural engineer), in accordance with the risk assessment methodology detailed within CIRIA C736 (2014) guidance. The plans shall also be accompanied with: A wastewater and digestate buffer storage plan; An updated site and infrastructure plan; and A preventative maintenance and inspection regime The designs should be submitted to Natural Resources Wales for approval in writing by the date specified.	Within 1 month of permit issue or as otherwise agreed in writing with Natural Resources Wales

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1b	The operator shall submit, for written approval, an updated BAT assessment in order to evidence how the finalised designs and specifications ensure compliance with BAT 19 of the Waste Treatment BREF/BAT conclusions Document (EU 2018), specifically techniques to: d) reduce likelihood and impact of tank/vessel overflows and failures; f) segregation of waste water streams; g) adequate drainage infrastructure; and i) appropriate buffer storage capacity	Within 1 month of permit issue or as otherwise agreed in writing with Natural Resources Wales
IC1c	The operator shall submit a report by a qualified engineer (or equivalent) confirming that the proposed containment system has been constructed to the standards and descriptions in the final containment design documents agreed in writing with NRW under IC1a. The report should reference the CIRIA C736 (2014) guidance. The operator shall submit the report to Natural Resources Wales for approval in writing by the date specified.	Within 12 months of completion of IC1a and IC1b or as otherwise agreed in writing with Natural Resources Wales

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC2a	In relation to BAT 1xi and BAT 3(ii) of the Waste Treatment BREF/BAT conclusions Document (EU 2018), the operator shall submit a finalised sampling program in relation to waste water streams for approval with Natural Resources Wales. The finalised plan shall update document '100123523_ SamplingPlan_AFA (September 2024)' and be in accordance with the methodology described in document 'Afan Sch 5 response – wastewater streams Qu5 190825'.	Within 12 months of permit issue or as otherwise agreed in writing with Natural Resources Wales
IC2b	Following completion of IC2a, the monitoring program shall be carried out in accordance with the agreed waste water sampling plan. The operator shall confirm with Natural Resources Wales when the sampling program is completed.	Within 12 months of completion of IC2a or as otherwise agreed in writing with Natural Resources Wales

IC2c	Following completion of IC2b, the operator shall submit a report for written approval by Natural Resources Wales. The report shall include, but not be limited to; the waste water sampling results; a completed H1 risk assessment and a summary of the modelling outputs where appropriate; a summary of what mandatory emissions limits (BAT AELs) and monitoring requirements for indirect discharges to water are relevant to the site as set out in BAT 20 and BAT 7 of the Waste Treatment BREF/BAT conclusions Document (EU 2018); and conclusions on whether the waste water discharged to discharge point S1 will have any adverse impact on the receiving waters following discharge from the Afan Waste Water Treatment Works. The assessment shall be made against the parameters specified in the relevant environmental standards specified in the following guidance: Specific substances and priority hazardous substances – Surface water pollution risk for your environmental permit Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk); and Monitoring discharges to water: guidance on selecting a monitoring approach Monitoring discharges to water: guidance on selecting a monitoring approach - GOV.UK (www.gov.uk) The report shall also include any proposals and/or additional measures required to prevent or minimise any significant emissions from the installation and	Within 3 months of completion of IC2b or as otherwise agreed in writing with Natural Resources Wales

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	ensure compliance with the relevant BAT AELs specified in BAT 20 of the Waste Treatment BREF/BAT conclusions Document (EU 2018) along with timescales for implementation.	
IC2d	Following completion of the IC2c, the operator shall implement any improvements identified within the report approved under IC2c Written confirmation shall be submitted to Natural Resources Wales that the improvements have been completed.	Within 3 months of completion of IC2c or as otherwise agreed in writing with Natural Resources Wales
IC2e	The operator shall submit an updated BAT assessment in order to evidence compliance with BAT 1xi, BAT 3(ii), BAT 20 and BAT 7 of the Waste Treatment BREF/BAT conclusions Document (EU 2018).	Within 3 months of completion of IC2c or as otherwise agreed in writing with Natural Resources Wales

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC3a	The operator shall carry a full investigation and characterisation of waste gas streams of the abatement plants OCU1 (EP6) and OCU2 (EP7): to determine whether proposed measures have been effective and adequate to prevent, or where this is not possible, minimise, emissions released to air (including but not limited to odour, ammonia, hydrogen chloride (HCl) and TVOC); to satisfy requirements specified in to BAT 1xi and BAT 3(iii) of the Waste Treatment BREF/BAT conclusions Document (EU 2018); to determine applicability of BAT AELs set out in BAT 34 and 53 of the Waste Treatment BREF/BAT conclusions Document (EU 2018); to determine what monitoring requirements as set out in BAT 8 of the Waste Treatment BREF/BAT conclusions Document (EU 2018) apply The operator shall confirm with Natural Resources Wales when this is completed.	Within 6 months of permit issue or as otherwise agreed in writing with Natural Resources Wales

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC3b	Following completion of IC3a, the operator shall submit a report for written approval by Natural Resources Wales. The report shall include (but not be limited to): the details of the improvements made, including any improvement or replacement of any of the abatement plants; updated waste gas treatment descriptions including performance details; the results from the investigation specified in IC3a abatement process monitoring results; and an updated Odour Impact Assessment following guidance set out in Horizontal Guidance Note 4 Odour Management or any subsequent amendment or replacement of that guidance.	Within 3 months of completion of IC3a or as otherwise agreed in writing with Natural Resources Wales
IC3c	The operator shall submit an updated BAT assessment in order to evidence compliance with BAT 1xi, BAT 3(iii), BAT 34, BAT 53 and BAT 8 of the Waste Treatment BREF/BAT conclusions Document (EU 2018).	Within 3 months of completion of IC3a or as otherwise agreed in writing with Natural Resources Wales

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC4	In accordance with BAT 15 of the Waste Treatment BREF/BAT conclusions Document (EU 2018), the operator shall carry out a review on the operation of the gas management infrastructure to determine whether improvement measures have been effective and adequate to maximise biogas energy recovery rather than disposal by flaring. The operator shall submit a written report to Natural Resources Wales for written approval. The report shall include (but not be limited to): Determining whether the upgraded biogas clean-up system and works to address legacy pressure issues has been effective in maximising biogas energy recovery and reducing disposal by flaring; Identify any further improvements requires and timescales for implementing the identified improvements; and Further evidence that the works have satisfied BAT conclusions 15 and 16 of the Waste Treatment BREF/BAT conclusions Document (EU 2018) Should further improvements be proposed and agreed in writing with Natural Resources Wales, they are to be implemented in accordance with the approved timescale.	Withing 6 months of permit issue or as otherwise agreed in writing with Natural Resources Wales

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC5	The Operator shall submit to Natural Resources Wales a climate change risk assessment that includes current and future climate change projections. The assessment must be site specific and uses the most up to date climate projections to: plan and manage the risks associated with a 2°C rise by 2050; assess the risks associated with a 4°C rise by 2100; avoid lock-in to future proof your site; consider internal, external, and consequential climate change impacts; and develop a plan to regularly update the assessment based on new data or emerging climate trends	Within 6 months of permit issue or as otherwise agreed in writing with Natural Resources Wales

IC6	The Operator shall submit a monitoring and management plan for non-CO_2 greenhouse gas emissions, including emissions of methane (CH_4) and other non-CO2 GHGs such as FGases. This plan, as a minimum, shall contain monitoring and management controls for: Methane emissions as a result of slip from any combustion activities. This will include details of monitoring provisions (including reference to any appropriate standards including but not necessarily limited to EN ISO 25139 and EN ISO 25140) and frequency, and any continuous improvement measures and actions to improved performance, especially where the methane emissions deviate from the manufacturer's specification Leak detection and repair. This will include details of the provisions for leak detection, frequency, methods, and quantification and any continuous improvement measures and actions to improved performance and reduce non-CO_2 greenhouse gas releases from the facility. For FGas monitoring and management, any approach will need to comply with all the relevant FGas legislative requirements. The plan shall also include proposals for the review of the plan itself which shall not be greater than 3 years. The plan shall also be incorporated into the environmental management system	Within 6 months of permit issue or as otherwise agreed in writing with Natural Resources Wales

ANNEX 2: Consultation Reponses

1. Advertising and consultation on the Application

The application has been advertised and consulted upon in accordance with Natural Resources Wales Public Participation Statement. Responses to this consultation and how we have taken consultation responses into account in reaching our draft decision is summarised in this Annex.

Response Received from Public Health Wales	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
Recommendation that NRW should ensure best available techniques are used to reduce the risk of emissions, notably odour at sensitive receptor locations.	See section 9 for how we have considered BAT when determining this application.
NRW to ensure we are satisfied an updated air dispersion modelling is not required.	We are satisfied full air quality modelling is not required for this application which is for the AD plant. We have considered bioaerosols as discussed in section 11.1 and as discussed in section 9 we have specified improvement conditions relating to the assessment of waste gas emissions from the Odour Control Units from the AD plant.
NRW to ensure the noise management plan is not required	See section 11.6 for our assessment of Noise from the activity. We do not consider a Noise Management Plan to be required although standard conditions in the permit mean that should noise become an issue at the facility, NRW can request one from the Operator.
Recommendation the operator manages the site in accordance with guidance to prevent and respond to fires.	See section 8.2 for our assessment of fire mitigation.

Response Received from Neath Port Talbot Planning	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
No objections to the proposed development subject to standard planning conditions although noted it was unclear if the proposal required any new or changes to existing infrastructure. Recommendation a	As summarised in section 1, the application is to permit an existing activity.

pre-application planning enquiry may be submitted.	
Recommendation that the Air Quality modelling should be revised to assess PM2.5 which has new targets under the Environmental (Air Quality and Soundscapes) (Wales) Act 2024.	The application is for the AD plant. The CHP (i.e. the part of the activity which would require full air quality modelling) is already permitted and not being changed as part of this variation. Assessment of waste gases from the odour control units will be assessed through improvement conditions.
Recommendation for a permit condition to prepare and adopt a Air Quality Management Plan (AQMP). There is an encouragement for businesses in the area to have an AQMP to support compliance and continued improvements in PM10 in the Air Quality Management Area (AQMA)	The AQMA is located around 1.7km to the East of the facility. Whilst we acknowledge the air quality challenges in the area, we do not consider this permit variation to be the appropriate route to require the operator to prepare and adopt an AQMP.
Confirmed there have been no complaints regarding the activity.	-
Concerns the Noise Impact Assessment is based on background makes which include Tata Steelworks which has now ceased. The background may not be representative of the current noise in the area. Recommend suitability of background maps is considered.	We acknowledge this point but are satisfied there will be no noise impacts from the activity, particularly when also considering the activity is already operational (with the CHP element permitted) and there have been no noise complaints regarding the site.

Response Received from Neath Port Talbot Environmental Health	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
No comments to make in respect of the proposal.	-