

# Caulmert Limited

Engineering, Environmental & Planning  
Consultancy Services

**COG MOORS WASTEWATER TREATMENT WORKS,  
CARDIFF ROAD, DINAS POWYS**

**PROPOSED DEVELOPMENT OF AN ADVANCED ANAEROBIC  
DIGESTION PLANT**

**WASTE PLANNING ASSESSMENT**

**Prepared by:**

**Caulmert Limited**

Unit 16  
St Asaph Business Park,  
St Asaph,  
Denbighshire,  
LL17 0LJ  
Tel: 01745-530890  
**Email:** [howardjones@caulmert.com](mailto:howardjones@caulmert.com)  
**Web:** [www.caulmert.com](http://www.caulmert.com)

**Doc ref: 2932-CAU-XX-XX-RP-T-9103.S0-P0.2**

**January 2018**



**APPROVAL RECORD**

**Site:** Cog Moors Wastewater Treatment Works, Cardiff Road, Dinas Powys.

**Client:** Dwr Cymru Welsh Water

**Project Title:** Proposed Development of an Advanced Anaerobic Digestion Plant.

**Document Title:** Waste Planning Assessment

**Document Ref:** 2932-CAU-XX-XX-RP-T-9103.S0-P0.2

**Report Status:** **FINAL**

**Project Director:** Howard Jones

**Project Manager:** Howard Jones

**Caulmert Limited:** Unit 16, St Asaph Business Park, St Asaph, Denbighshire, LL17 0LJ

**Telephone:** 01745-530890

<b>Author</b>	Howard Jones	<b>Date</b>	12 <sup>th</sup> January 2018
<b>Reviewer</b>	Clive Cunio	<b>Date</b>	18 <sup>th</sup> January 2018
<b>Approved</b>	Clive Cunio	<b>Date</b>	19 <sup>th</sup> January 2018

**DISCLAIMER**

This report has been prepared by Caulmert Limited with reasonable skill, care and diligence, in accordance with the instruction of the above named client and within the terms and conditions of the Contract with the Client.

The report is for the sole use of the above named Client and Caulmert Limited shall not be held responsible for any use of the report or its content for any purpose other than that for which it was prepared and provided to the Client.

Caulmert Limited accepts no responsibility of whatever nature to any third parties who may have been made aware of or have acted in the knowledge of the report or its contents.

No part of this document may be copied or reproduced without the prior written approval of Caulmert Limited.

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION</b>
<b>2</b>	<b>WASTE POLICY STATEMENT</b>
<b>3</b>	<b>DEVELOPMENT TIMESCALE</b>
<b>4</b>	<b>TYPES AND QUANTITIES OF WASTE TO BE MANAGED</b>
<b>5</b>	<b>DESIGN, LAYOUT, BUILDINGS AND PLANT</b>
<b>6</b>	<b>AMENITY AND NUISANCE</b>
<b>7</b>	<b>AIR POLLUTION</b>
<b>8</b>	<b>ENERGY EFFICIENCY</b>
<b>9</b>	<b>DECLARATION</b>

## 1. INTRODUCTION

- 1.1 Caulmert Ltd has been appointed by Skanska Ltd, acting on behalf of Dwr Cymru Welsh Water (DCWW,) to prepare this Waste Planning Assessment.
- 1.2 The Assessment relates to an application for full planning permission for the change of use of land as an extension to the existing wastewater treatment works site and the construction of an Advanced Anaerobic Digestion (AAD) Plant, together with associated landscaping and mitigation measures and the formation of a temporary construction compound at Cog Moors Wastewater Treatment Works (WwTW), Cardiff Road, Dinas Powys.
- 1.3 Technical Advice Note 21: Waste requires that a Waste Planning Assessment “*should be submitted with all applications for a waste facility classified as a disposal, recovery or recycling facility*”.
- 1.4 Whilst the submitted planning application for the proposed development is accompanied by a Landscape and Visual Impact Assessment (LVIA), a Transport Statement, a Noise Impact Assessment, an Air Quality Assessment, an Odour Assessment, a Flood Consequences Assessment, an Arboricultural Assessment, a Drainage Statement, a Construction Traffic Management Plan, Ecology Reports and a Pre-Application Consultation Report, the purpose of this Assessment is to ensure that the information necessary for making a decision has been provided by the applicant.

## 2. WASTE POLICY STATEMENT

### **Towards Zero Waste**

- 2.1 Towards Zero Waste was published in June 2010 and is the Wales Government's overarching Strategy Document for Waste.
- 2.2 The Strategy sets out a long term framework for Wales that describes the social, economic and environmental outcomes that resource efficiency and waste management will achieve and how they will contribute to a sustainable future.
- 2.3 The Towards Zero Waste Progress Report, published in July 2015, acknowledges the contribution that anaerobic digestion can make in reducing waste and greenhouse gas emissions

### **Technical Advice Note 21: Waste (TAN21)**

- 2.4 TAN21 was published in 2014 and provides guidance on the role of land use planning in the management and control of waste.
- 2.5 TAN21 emphasizes the importance of the waste hierarchy, with priority being given firstly to waste prevention, followed by re-use, recycling, energy recovery and, finally, to disposal.
- 2.6 Local planning authorities are encouraged to support the development of appropriate energy recovery options for the optimal recovery of energy from residual waste. In particular, local planning authorities are advised that combined heat and power, and heat only options, should be considered favourably where they meet high energy efficiencies.

### **Technical Advice Note 8: Planning for Renewable Energy (TAN8)**

- 2.7 TAN8 was published in 2005 and addresses the land use planning considerations of renewable energy.
- 2.8 With regard to anaerobic digestion, TAN8 acknowledges that the siting of biogas plant and the associated energy generation equipment is dependent upon the source of the digestate and that, in the case of sewage, the plant is almost certain to be within a wastewater treatment works.
- 2.9 Local planning authorities are advised to adopt policies for larger wastewater treatment works to include anaerobic digestion facilities with a positive utilisation of the methane fuel.

### **Policy Compliance**

- 2.10 The proposed development provides for the recycling of waste through the production of a high quality fertilizer and soil improver, and the recovery of renewable energy from waste. Thus, the proposed development accords with the waste hierarchy and is supportive of the Welsh Government's "Towards Zero Waste" Strategy and the provisions of TAN21.

### **Pre-Application Consultations**

- 2.11 The proposed development falls within Category 11(b) of Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2016 and exceeds the screening thresholds for that Category of development.
- 2.12 A formal Screening Opinion was requested from Vale of Glamorgan Council, as Local Planning Authority. The Local Planning Authority adopted a Screening Opinion on 23<sup>rd</sup> March 2017 (Ref: P/DC/2017/00162/SC1), concluding that, from the information submitted, *“the project is not a significant development of more than local importance, that is proposed for a particularly environmentally sensitive or vulnerable location, nor does it have unusually complex and potentially hazardous environmental effects. As such, whilst information regarding certain environmental issues will undoubtedly be required for any planning application, it is considered that there is no requirement for a formal Environmental Impact Assessment to be submitted.”*
- 2.13 Subsequently, discussions were held with various officers of the Local Authority and of Natural Resources Wales, regarding the details of the emerging proposals and the information required to support the planning application.
- 2.14 Formal pre-application consultations were also undertaken, in accordance with the provisions of the Town and Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016 which brought into force the requirements of the Planning (Wales) Act 2015.
- 2.15 A Pre-Application Consultation Report is submitted, as part of the planning application for the proposed AAD plant, and sets out the consultations undertaken with adjoining owners/occupiers, community consultees and specialist consultees and indicates the nature and location of site notices publicising the proposed development. In addition, the Report summarises the comments that were received, as a result of the pre-application consultation process, and explains DCWW’s response to those comments.

### **3 DEVELOPMENT TIMESCALE**

- 3.1 The proposed AAD plant will form a permanent and integral part of the sewage sludge treatment facilities at Cog Moors WwTW.
- 3.2 Normally, the proposed AAD plant will operate 24 hours per day/7 days per week.
- 3.3 Over recent years, AAD technologies, involving thermal hydrolysis, have become well established and enable the overall digestion process to operate more efficiently, producing both increased volumes of biogas and an improved fertiliser.
- 3.4 The proposed AAD plant will utilise up to date technology which has been tried and tested at other WwTW in Wales and elsewhere throughout the UK.
- 3.5 The engineering design life of the proposed AAD plant is approximately 20 years

#### 4 TYPES AND QUANTITIES OF WASTE TO BE MANAGED

- 4.1 Wastewater treatment processes typically produce a treated liquid effluent (which is normally discharged to either a river or to the sea, in accordance with an appropriate discharge consent) and a sewage sludge (which is normally disposed of to agricultural land, following treatment).
- 4.2 At Cog Moors WwTW, the sewage sludge that results from the treatment of wastewaters is currently treated by anaerobic digestion. The existing digestion process releases biogas, which is used to generate electricity on site, whilst the sewage sludge, following digestion, (referred to as “sludge cake”) is then disposed of to farmland as a soil improver and fertiliser. The residual liquors, following digestion, are returned to the WwTW inlet works for treatment.
- 4.3 The AAD plant now proposed will operate in conjunction with the existing sewage sludge treatment facilities at Cog Moors and will treat the indigenous sewage sludge produced at the WwTW site.
- 4.4 In addition, the AAD Plant will also receive and treat sewage sludge imports from “satellite” sites across South Wales. This accords with DCWW’s sustainability and sludge strategies, which seek to ensure that all sludge produced across the region receives treatment in an AAD facility, in order to improve energy efficiency and contribute to the wider carbon reduction effort within Wales.
- 4.5 De-watering would take place at the “satellite” sites, in order to reduce the volumes of sludge to be transported and, thereby, the number of traffic movements required.
- 4.6 It is anticipated that in the 2029 design year the proposed AAD plant will treat approximately 6290 tonnes dry solid (tDS) of indigenous sludge and approximately 9730 tDS of imported sludge from satellite sites
- 4.7 In the 2029 design year, it is anticipated that the proposed AAD plant will generate approximately 9410 tDS of sludge cake, which would be disposed of to available agricultural land in the general locality.
- 4.8 The proposed AAD plant has a design capacity of 20200 tDS of sludge per annum and the indigenous sludge generated at Cog Moors WwTW would be sufficient to allow the AAD plant to remain operational (albeit at reduced efficiency).
- 4.9 The residual liquors arising from the AAD process would be returned to the WwTW inlet works for treatment. Cog Moors WwTW has sufficient capacity to accept and treat the residual liquors that would be produced by the digestion of both indigenous and imported sludge by means of the AAD process.
- 4.10 The arisings from construction of the AAD plant will be utilized on site to provide a pile mat and in the localized re-profiling of the ground required as an integral part of the proposed development.



## 5 DESIGN, LAYOUT BUILDINGS AND PLANT

- 5.1 The proposed AAD plant will operate in conjunction with the existing sewage sludge treatment facilities and is located, therefore, on the eastern side of the existing Cog Moors WwTW, adjacent to the existing sewage sludge treatment infrastructure.
- 5.2 Part of the proposed AAD plant would be located within the existing operational area of the WwTW. The balance of the proposed development would be sited immediately to the east of the existing operational area, on an area of woodland, scrub and ruderal vegetation.
- 5.3 As the engineering design of the proposed AAD plant has progressed mitigation measures have been incorporated to reduce the potential impact of the proposed development on the surrounding area.
- 5.4 A compact layout has been adopted, in order to avoid the loss of individual trees located along the north eastern boundary of the site, which are the subject of a Tree Preservation Order (TPO), and to minimize the loss of an area of woodland immediately to the east and south east, which is also the subject of a TPO.
- 5.5 The height of the proposed tanks and other structures has been reduced commensurate with process requirements, in order to minimize their landscape and visual impacts.
- 5.6 In addition, DCWW has had regard to comments received from local councilors and other consultees and, following further pre-application consultations with Natural Resources Wales, the height of the proposed combined CHP/boiler stack has been reduced significantly, whilst still ensuring that predicted emissions are well below UK Government and EU Regulation objectives which are set to protect human health.
- 5.7 The proposed development will provide for:
- Additional digestion capacity;
  - Conditioning of the sludge generated on the site, (dewatering and removal of contaminating rags and plastic);
  - Reception facilities for sludge imported to the site from satellite WwTWs;
  - Blending of the indigenous sludge and imported sludge;
  - A thermal hydrolysis plant (THP), which uses steam to increase the temperature and pressure in a reaction vessel to pre-treat the sludge;
  - A siloxane plant to remove contaminants from the biogas generated;
  - A combined heat and power (CHP) plant to generate useable heat and electricity, which can be used on site, exported to the grid, or both.
  - A UV plant to treat some of the final effluent water from the WwTW, in order to provide process water for the THP sludge preparation;
  - Tanks to hold sludge and liquor, resulting from the thickening and dewatering processes;
  - A cake storage silo;
  - Odour control equipment;
  - New internal site access roads and drainage;
  - Site clearance and earthworks and new fencing;
  - New MCC equipment and control kiosks; and
  - Appropriate mitigation planting and ecological mitigation measures;

5.8 The dimensions of the proposed development are indicated in the tables below:

Proposed Building Structure	Dimensions (m)
Indigenous Dewatering Building	23.0(l) x 14.5(w) x 12.7(h)
Boiler House	19.5(l) x 13.7(w) x 8.0(h)
Final Dewatering Building	30.5(l) x 14.5(w) x 12.7(h)
Disinfected FE Building	15.0(l) x 10.0(w) x 5.0(h)
MCC1 Kiosk	15.0(l) x 5.0(w) x 4.5(h)
HV Switchgear Building	10.0(l) x 4.0(w) x 6.6(h)
LVDB and MCC3 Building	20.0(l) x 6.0(w) x 6.6(h)
Natural Gas Meter Kiosk	3.0(l) x 2.0(w) x 2.4(h)
Wash Water Booster Kiosk	3.2(l) x 3.2(w) x 2.8(h)
Wheel Wash Control Kiosk	4.0(l) x 4.0(w) x 2.9(h)

Proposed Plant and Machinery	Dimensions (m)
SAS Tanks A and B	2No – 12.5(d) x 11.3(h)
Primary Strainpress	8.5(l) x 6.0(w) x 12.6(h)
SAS Strainpress	9.0(l) x 6.5(w) x 12.1(h)
Centrifuge Feed Pumps	11.5(l) x 6.0(w) x 1.5(h)
Centrifuge Feed Tanks	2No – 10.0(d) x 13.2(h)
Cake Imports Facility	20.0(l) x 13(w) x 5.2(h)
THP Feed Silos A and B	2No – 7.0(d) x 15.4(h)
THP Plant	24.0(l) x 14.0(w) x 8.8(h)
Cooling Plant	19.0(l) x 9.0(w) x 3.1(h)
Secondary Digester Tanks C and D	2No – 15.0(d) x 12.5(h)
Gas Holder	18.0(d) x 14.0(h)
Flare Stack	6.5(l) x 4.0(w) x 8.6(h)
Siloxane Plant	10.0(l) x 8.0(w) x 3.2(h)
CHP Plant	17.0(l) x 12.5(w) x 2.8(h)
Post Digestion Tank	16.5(d) x 5.7(h)
Wash Water Tank	5.0(d) x 8.3(h)
Final Effluent Holding Tank	8.5(d) x 12.2(h)
Disinfected FE Storage Tank	8.5(d) x 12.5(h)
Liquor Balance Pumping Station	4.0(d) x 0.3(h)
Transformers	10.0(l) x 5.0(w) x 2.9(h)
Export Silos A and B	2No – 10(d) x 14.9(h)
Odour Control Unit A	15.0(l) x 10.0(w) x 5.0(h)
Odour Control Unit C	19.5(l) x 14.0(w) x 4.8(h)
Stack	3.5(d) x 18.0(h)
Polymer Silos	15.0(l) x 10.0(w) x 6.5(h)
Weighbridge	18.0(l) x 2.5(w) x 0.1(h)
FE Feed Pumping Station	5.0(l) x 3.0(w) x 0.3(h)

5.9 The proposed development will not involve the use of any hazardous substances in notifiable quantities.

- 
- 5.10 Prior to digestion, raw sludge from the storage tanks would be filtered through strainpresses, where screenings such as leaves, sticks and other inert material would be separated and discharged to a skip. A total of four strainpresses are proposed along with a maximum of four associated skips.
- 5.11 Following filtering, via the strainpresses, the sludge will be moved to Blending Tanks and dewatered by means of a centrifuge; the dewatered indigenous sludge will then be mixed with imported sludge in the THP Feed Silos.
- 5.12 The combined sludge will be transferred to the THP unit where it will be heated to approximately 165 degrees Celsius and pressurised to 6 bar for 20 to 30 minutes before undergoing anaerobic digestion.
- 5.13 The biogas produced by the proposed AAD plant will be used by a combined heat and power (CHP) plant and boiler, to generate heat and renewable electricity, for use on site or for export to the electricity grid.
- 5.14 The residual liquors, following digestion, would be returned to the WwTW inlet works for treatment.
- 5.15 The sludge cake would be recycled to farmland as a high-value and sustainable fertilizer.
- 5.16 The sludge cake at Cog Moors will be stored in a cake silo before off-site recycling. A silo is a contained tank under which a sludge tanker is driven. Sludge is dropped from the silo directly into the vehicle via a sliding door mechanism and taken to agricultural land.
- 5.17 The colours of the proposed buildings and structures have been carefully selected in response to the semi-rural landscape context of the proposed development and the appearance of the existing structures and colours, with the use, predominantly, of muted green and grey colours for building/structure exteriors.
- 5.18 Areas of landscape that are temporarily disturbed during construction would be restored on completion. In order to accommodate the proposed scheme within the local landscape, the following mitigation measures are proposed;
- New woodland planting in the south east of the proposed development,
  - Small pocket of individual tree planting near site entrance, and
  - Minimise lighting spill on new structures by;
    - i. There will be no change of lighting features on existing structures;
    - ii. There will not be any permanently lit flood lighting of the stack. An access platform on the stack will be used for routine maintenance and will have the appropriate task lighting installed, but this will usually be once a year activity;
    - iii. Use of latest lighting technology to reduce light spill;
    - iv. Emergency lighting will only be used at night when necessary, and
    - v. The intelligent exterior lighting would normally be switched off between 7pm and 7am, subject to routine maintenance/emergency works/operational need and the lighting activation would be linked to motion sensors to maximise efficiency.
- 5.19 Odour control measures will be included as part of the proposed development and will serve to mitigate any potential impact to the local community.

- 
- 5.20 Noise attenuation measures will be included as part of the design to ensure that noise disturbance does not arise at the nearest sensitive receptors.
- 5.21 Emissions from the proposed stack will be carefully controlled to ensure that air quality standards are satisfied.
- 5.22 Ecological mitigation measures, including habitat management, will be implemented in order to offset any potential harm to flora and fauna of nature conservation importance and, where appropriate, will be subject to licence controls exercised by Natural Resources Wales. A biodiversity strategy will be adopted and a habitat management plan will be implemented.
- 5.23 Temporary construction compounds would be sited on an area of mown grassland, immediately adjacent to the existing final settlement tanks, and on an area of grassland to the east of the proposed AAD plant. The temporary construction compound sites would be re-instated, in accordance with an agreed scheme, upon completion of the development.
- 5.24 Vehicular access to the proposed development would continue to be gained from the A4055 via Green Lane.
- 5.25 An AAD plant produces a significantly reduced volume of sludge cake from a similar volume of sewage sludge than a standard anaerobic digester. Consequently, once operational, the proposed development would result in a minor numerical increase only in HGV movements, notwithstanding the import of dewatered sludge from “satellite” sites.

## 6. AMENITY AND NUISANCE

- 6.1 The noise assessment that forms part of the planning application demonstrates that, with the application of appropriate mitigation measures, the noise generated by the proposed AAD facility would not be considered detrimental to the amenity of the nearest noise sensitive receptor locations.
- 6.2 The Odour Assessment that forms part of the planning application indicates that the receptors which are located closest to the site, are expected to experience an improvement in odour emissions from sludge works with the proposed Scheme in operation, whilst other receptors located within 1km of the site are expected to experience an imperceptible change in odour concentrations. Overall, the proposed development is predicted to slightly improve odour concentrations from the site.
- 6.3 The Air Quality assessment that forms part of the planning application indicates that that the proposed AAD plant will not lead to exceedances of air quality objectives at human receptors, and that pollutant concentrations are expected to be well below air quality objectives with the operation of the proposed development. There are therefore expected to be no significant air quality effects at human receptors as a consequence of the proposed development.
- 6.4 The Air Quality assessment also considered air quality effects at ecological receptors, including Cog Moors Site of Special Scientific Interest (SSSI), which is located adjacent to the WwTW. The impacts of the operation of the proposed AAD plant on air quality and nitrogen and acid deposition at ecological receptors are not expected to be significant.
- 6.5 The Flood Consequences Assessment that forms part of the planning application classifies the proposed development as “less vulnerable development”. The majority of the Cog Moors WwTW site is located in Flood Zone C2, however, a large portion of the proposed development has been located within the lower risk Flood Zone B. It is considered that the proposed development would satisfy the Justification Test, since it requires a location adjacent to the existing sludge treatment facilities and would result in significant sustainability and climate change benefits. In addition, the consequences of flooding at the site are considered to be negligible.
- 6.6 The lighting of the proposed development will be carefully controlled to ensure that lighting spill is minimised, commensurate with health and safety requirements and good working practices.
- 6.7 The Ecological Assessments that have been submitted as part of the planning application demonstrate that, subject to appropriate mitigation and management, the proposed development is unlikely to have a significant adverse long term impact on designated sites of nature conservation importance or on protected species.
- 6.8 The Landscape and Visual Impact Assessment that forms part of the planning application notes that existing vegetation cover and built form in the local landscape are such that the proposed development is anticipated to be primarily visible from properties, Public Rights of Way, and roads within 0.5km.

- 6.9 Due to the presence of existing woodland and hedgerows, the majority of the proposed infrastructure would be apparent from limited vantage points within the locality. This results in there being minor visual impacts from the majority of viewpoints, with moderate/major impact occurring from the viewpoints closest to the proposed development.
- 6.10 In addition, the Assessment concludes that existing vegetation and proposed planting would serve to strengthen existing landscape characteristics, and help to integrate the proposals within the surrounding landscape. Overall, the landscape and visual effects of the proposed development are considered to be moderate adverse during construction and operation.
- 6.11 Downs Farm is a Grade II listed building and is situated approximately 230m to the east of the proposed development. In addition, there are other Grade II listed building located at Cog Road and Swanbridge Road (Cog Farm and Nicells). Whilst parts of the proposed development may be visible from these listed buildings, its impact upon their settings is not considered to be significant

## **7. AIR POLLUTION**

- 7.1 An air quality assessment has been undertaken to assess air pollution associated with the proposed AAD plant.
- 7.2 A detailed air pollution dispersion model was used, together with information on pollution emissions and hourly weather observations, to predict pollution levels at nearby sensitive receptors, such as houses and sites of importance for ecology and habitats.
- 7.3 The model predictions have been compared against pollution thresholds set by UK Government and EU Regulations to protect human health and ecology.
- 7.4 The air quality assessment was undertaken assuming that the proposed development was operating at fully capacity, for every hour of the year; this is likely to overestimate emissions and air pollution, as the plant will not be used continuously at maximum output.
- 7.5 The results of the dispersion model indicate that the AAD plant will not lead to exceedances of air pollution thresholds, and that pollution levels are expected to be well below human health based thresholds with the plant in operation.
- 7.6 The emissions from the AAD plant are also predicted to have no significant effects on ecology and/or habitats.

## **8. ENERGY EFFICIENCY**

- 8.1 The operation of the proposed AAD plant will generate a biogas.
- 8.2 The biogas will be used in a combined heat and power (CHP) plant and boiler, in order to generate heat and renewable electricity, for use on site or for export to the electricity grid.



## 9. DECLARATION

9.1 This statement sets out how the waste hierarchy has been considered in developing the proposals currently forming this planning application.



Signed: Howard Jones, Director of Planning, Caulmert Ltd, on behalf of Dwr Cymru Welsh Water

Date: 19<sup>th</sup> January 2018

