



Five Fords WwTW Advanced Anaerobic Digestion

Surface Water Drainage Strategy

March 2016

Dŵr Cymru Welsh Water

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Tŷ Awen, Celtic Springs Business Park,
Coedkernew, Newport, NP10 8FZ

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Executive Summary

Dŵr Cymru Welsh Water (DCWW) has commissioned Mott MacDonald Bentley to design and build an advanced anaerobic digestion (AAD) facility at their Five Fords Wastewater Treatment Works (WwTW) near Wrexham.

The development is located within Flood Risk Zone A and will have a secure drainage system which passes incident rainfall through the wastewater treatment works.

This protected drainage system will prevent contamination of controlled waters from any spillages of sewage sludge that may occur.

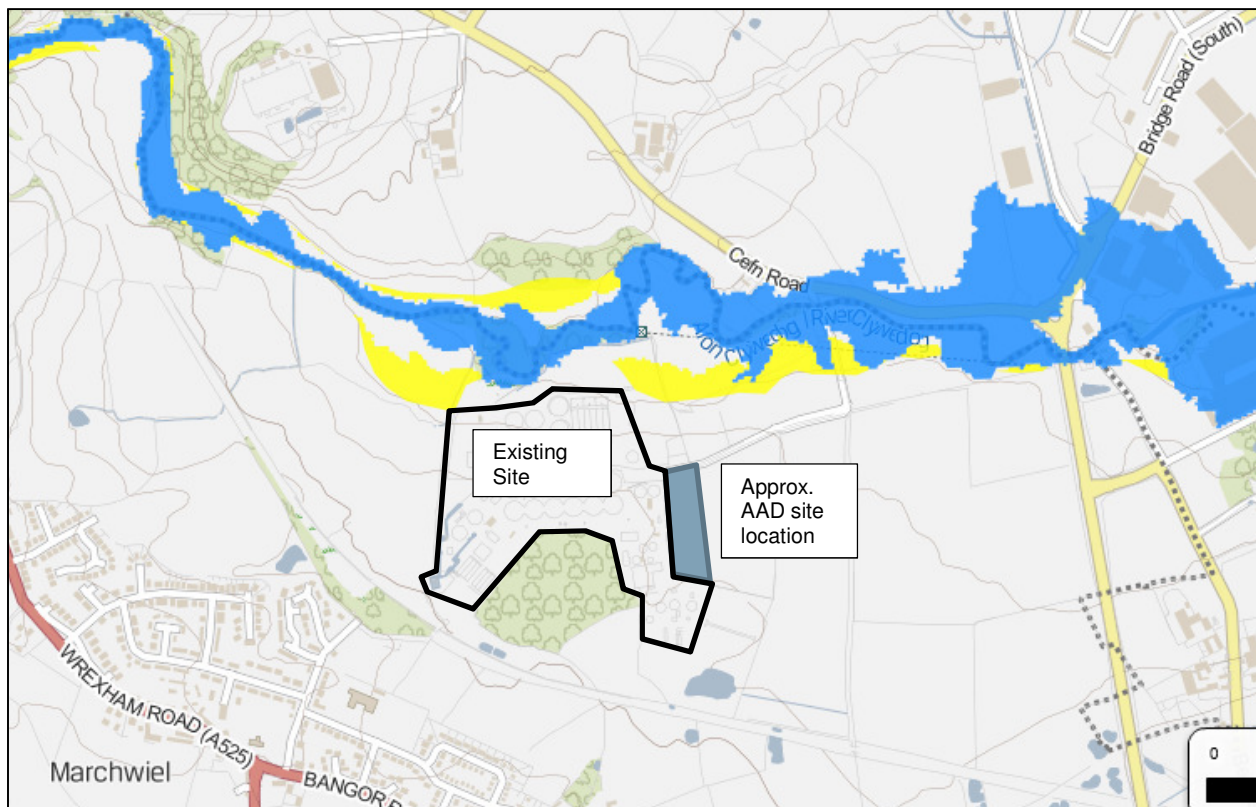
Surface water drainage from the site will not cause an increase in flood risk to the Afon Clywedog.

1 Introduction

Dŵr Cymru Welsh Water (DCWW) has commissioned Mott MacDonald Bentley to design and build an advanced anaerobic digestion (AAD) facility at their Five Fords Wastewater Treatment Works (WwTW) near Wrexham.

This report describes how the surface water drainage of the site will be managed to prevent potential pollution of controlled waters and ensure that there is no increase in flood risk. The site is located within the catchment of the Afon Clywedog and is within Flood Risk Zone A, considered to be at little or no risk of fluvial or tidal flooding from the Afon Clywedog (Figure 1.1), and consequently a flood consequences assessment is not required. However given the size of the proposed development at approximately 1ha consideration has been given to managing surface water run off so as not to pose a potential flood risk further downstream.

Figure 1.1 Flood Risk



The nearest ordinary watercourse is some 280m to the west of the WwTW and flows to the Afon Clywedog upstream of the site. This watercourse drains a small pond and is some 650m in length. It is considered that this watercourse does not present any risk to the site from flooding.

2 Drainage

Sewage sludge has the potential to contaminate controlled waters through spillages and run off and so the site will be covered in impermeable surfacing in order to contain any spillages and prevent mobilisation into the underlying groundwater. Site access roads will be built with kerbing to channel any surface spillages into the drainage network and prevent adjacent areas from being inundated. There are no surface watercourses close to the site. Any sewage spillages that occur will be limited in extent due to the site being secure with impermeable paving.

The proposed site layout is shown in Drawing 4791.S.201-MMB-00-XX-DR-XX-05003 and covers approximately 1ha. The entire area will be impermeable in order to protect the underlying aquifer from any spillages of sludge. The area receives an average annual rainfall of 852mm¹ and allowing for climate change effects (+30%) an additional 11050m³ (average 30m³ per day) of water will need to be managed. The area of the existing site which intercepts rainfall is some 4ha and so this new development will add a further 25% of the current site input to the inlet works. There is capacity within the WwTW to handle this volume of water.

The WwTW already provides temporary storage of storm flows which will have the effect of retaining rainfall during storm events and preventing direct discharges to the Afon Clywedog.

The inlet works is located on the western side of the site at an elevation of approximately 48mAOD. The AAD site varies in elevation from approximately 45mAOD in the south to 42mAOD in the north and so any surface drainage system from the AAD site to the inlet works will need to be pumped. It is proposed that the site drainage will fall towards the north following the contours of the site and will then be pumped via a rising main to the inlet works.

¹ National River Flow Archive Station 67025 Clywedog at Bowling Bank

Figure 2.1 Site Configuration

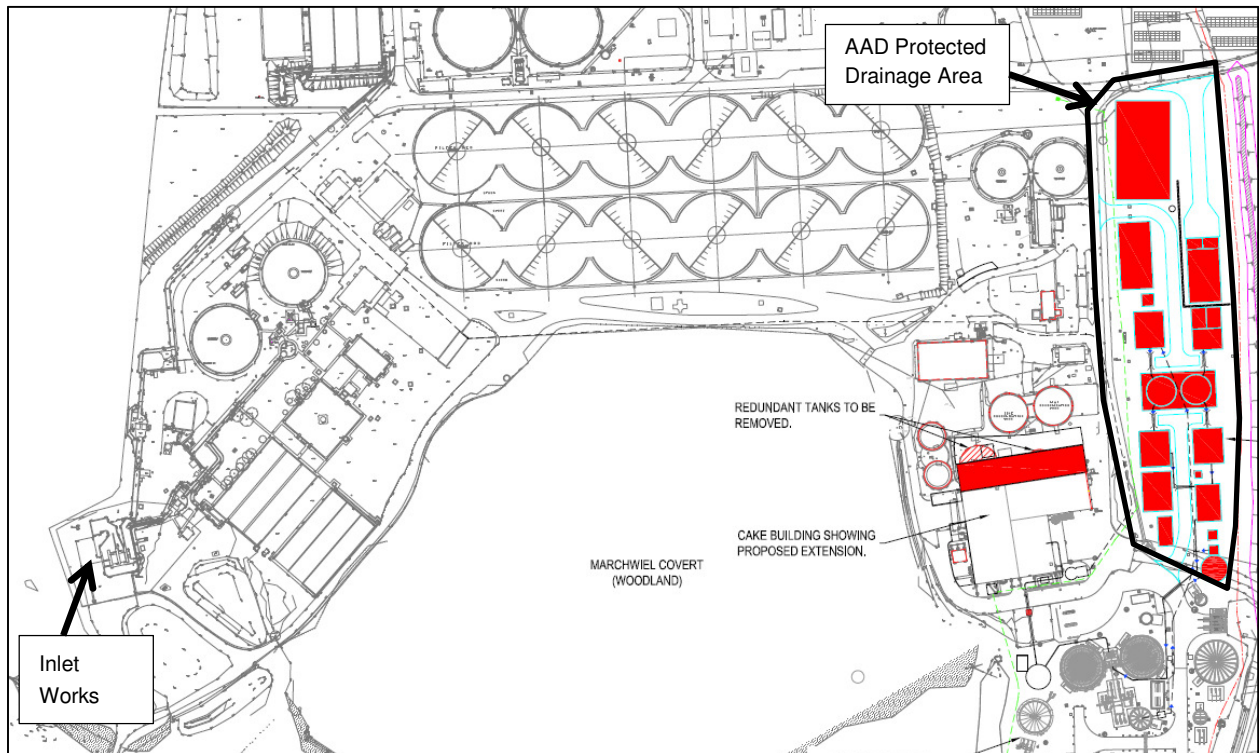


Figure 2.1 shows the relationship between the AAD site and the inlet works. A new drainage system will need to be constructed to connect the AAD area to the inlet works through the existing site. The modifications within the existing site will continue to use the existing drainage system.

3 Conclusions

The preferred option for managing drainage from the new site is to provide a closed drainage system which channels all water to the inlet works of the wastewater treatment works where it will be treated as per all other wastewater entering the site.

This protected drainage system will prevent contamination of controlled waters from any spillages of sewage sludge that may occur.

Surface water drainage from the site will not cause an increase in flood risk to the Afon Clywedog.