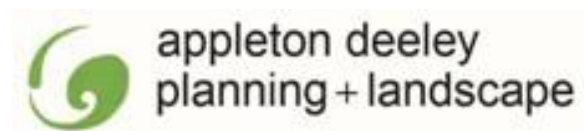


PHOSPHOROUS STATEMENT

SITE AT GAMFORD HOUSE, GAMFORD LANE, ROSSETT LL12 0EW
REDEVELOPMENT OF SITE WITH MIXED USE OF 9no. DETACHED
CARBON ZERO DWELLINGS, AN OFFICE BUILDING AND ASSOCIATED
LANDSCAPING WORKS



December 2022

Introduction

In the absence of a Calculator being made available by Wrexham CBC we have used the Calculator developed recently by Carmarthenshire County Council. This will illustrate our approach to mitigation of effects of our proposals on the River Dee Special Conservation Area.

Methodology

Stage 1: calculate the new nutrient load associated with the additional wastewater

Stage 2: calculate the annual phosphorus load from the existing (pre-development) land use on the development site

Stage 3: calculate the annual phosphorus load from new (post-development) land use on the development site

Stage 4: the nutrient budget

The additional nutrient load from the increase in wastewater and/or the change in land use created by this project can create an 'impact pathway' that will exacerbate the problems related to nutrient loading that are currently seen in the River Dee SAC.

The impact pathway for nutrients from a new development will result in a Habitats Regulations Assessment (HRA) finding 'Likely Significant Effects' on the ecology of the river Dee SAC due to increased nutrient inputs. The two key nutrients that are output by new developments are nitrogen (N) and phosphorus (P).

The first step in an appropriate assessment that is applying nutrient neutrality is to understand whether a development will cause additional nutrient inputs to a European site. This requires calculation of the amount of nutrients a new residential development will create, known as a nutrient budget. We have undertaken this calculation using the Carmarthen County Council methodology.

Increased levels of P entering aquatic environments via surface water and groundwater can severely threaten the sensitive habitats and species that are within each SAC. The elevated levels of nutrients can cause eutrophication, leading to algal blooms which disrupt normal ecosystem function and cause major changes in the aquatic community. These algal blooms can result in reduced levels of oxygen within the water, which in turn can lead to the death of many aquatic organisms including invertebrates and fish.

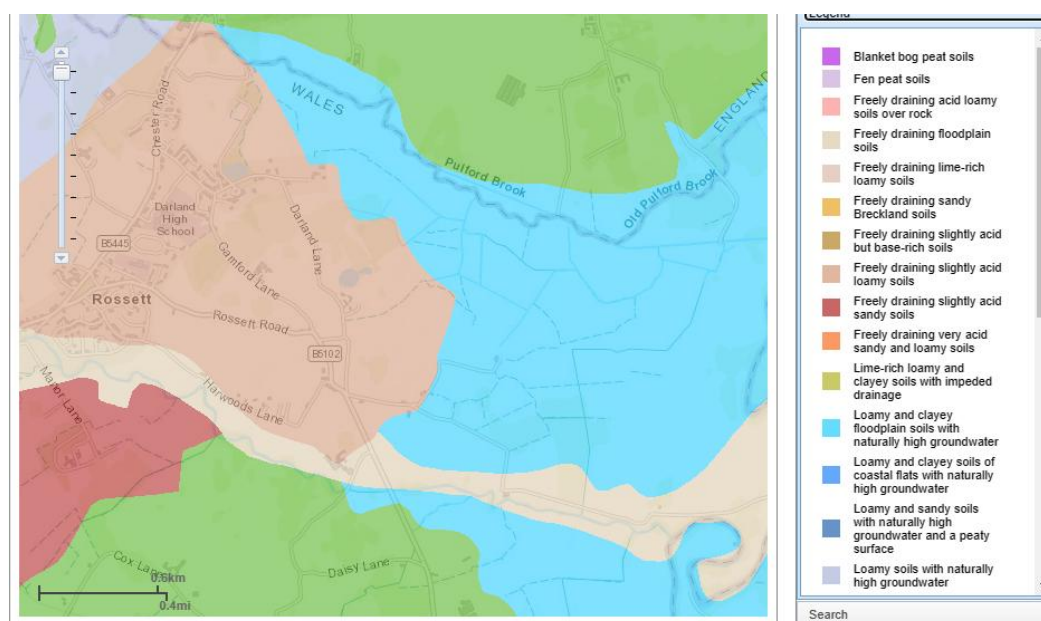
Under Step 4 we have identified an area of land that has a pond and reed beds to be used to offset phosphorous generated by the proposed uses. We are confident that this area will afford mitigation that renders the scheme phosphate neutral. Our calculations are accurate but must be ratified by Wrexham CBC's own methodology.

Calculations for the Gamford House Site

The site has previously been partly used as commercial/industrial land. Included in the definition of industrial land are factories and storage facilities as well as mining and shipping operations.

The site is made up of freely draining, slightly acid loamy soils. The source of this information is detailed here:

<http://www.landis.org.uk/soilscapes/#>



Stages 2 and 3 of the calculation requires an accurate assessment of the annual average rainfall on the site. It is recorded as; 675.1 - 700mm per annum.

The source of this information is from this link:

<https://nrfa.ceh.ac.uk/data/station/spatial/60010> Station number 67027.

Average occupancy rate

This value is the average amount of people per dwelling/unit. The default setting is 2.3 people per dwelling/unit, but, due to the fact that large dwellings are proposed we have used 4 people.

Number of dwellings/units

The user will need to enter the number of dwellings that will be within the development at the time of completion. This methodology is concerned with any residential development that increases the number of overnight stays. Therefore, if a development involves constructing additional dwellings/units in place of those that were pre-existing, only the additional dwellings/units are input to the calculator. The additional dwellings total eight in net terms.

Water usage per person

This value is the estimated average water usage per person. This is set to a default of 120 litres/person/day which is 10 litres higher than the Building Regulations¹ standard set by the Welsh Ministers of 110 litres/person/day of wholesome water where a dwelling/unit is erected. The standard is based on a 'fittings approach' where water efficiency compliance is achieved through water efficient fittings. The extra 10 litres/person/day is a precautionary approach to account for water usage variations and account for any potential future changes to the water fittings in perpetuity. If a dwelling/unit is formed by a material change of use of a building, then this value should be changed to 135 litres/person/day. Again, this value is 10 litres/person/day above the Building Regulations standard of 125 litres/person/day in order to be precautionary for the same reasons identified above.

Wastewater Treatment Works (WwTW)

It is not feasible to connect to mains sewerage and a septic tank (ST) or package treatment plant (PTP) will be used. The total phosphorus (TP) final effluent concentrations (in mg/l) are specified by the manufacturer but we have selected 'Septic Tank user defined' or and entered the specified value in the cell where prompted. We do not have a TP value provided by the manufacturer, the 'Septic Tank default' option provides a value automatically.

Stage 2: calculate the annual phosphorus load from the existing (pre-development) land use on the development site

In this section some environmental information about the development will need to be entered as well as the type and area of landcover that is being developed. The environmental information required is described above in Section 3.2.

Only the types and areas of land that are being altered by the development should be entered. These are the areas currently containing buildings.

Stage 3: calculate the annual phosphorus load from new (post-development) land use on the development site

In this section we have selected the type and area of the landcover present on the development site after the development has been completed.

Stage 4: the nutrient budget

The final stage automatically uses the results from Stages 1-3 and calculates the nutrient budget using the equation. No user inputs are required in this stage beyond those entered in Stage 1 - Stage 3. The output in Stage 4, shows how much nutrient mitigation is required in kilograms per year to achieve nutrient neutrality. We have calculated this as 780Kg TP per annum. This is significantly less than TP arising from previous intensive production uses on the site and can be offset using the existing pond and reed-beds.

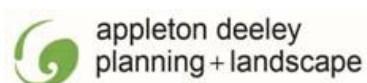
The output from Stage 4 of nutrient budget calculations is the balance of new sources of P from a development minus the existing sources of P from the pre-development site. This balance is multiplied by 1.2, i.e. increased by 20%, This 'precautionary buffer' has been applied in the case at Gamford House.

We feel strongly that the Phosphate impacts of the development can be 'screened out' as not likely to have a significant effect on a river SAC in relation to phosphorus inputs. This stage is called 'the Test of Likely Significant Effects (TLSE)'.

PHOSPHEROUS STATEMENT

SITE AT GAMFORD HOUSE, GAMFORD LANE, ROSSETT LL12 0EW

REDEVELOPMENT OF SITE WITH MIXED USE OF 9no. DETACHED CARBON ZERO DWELLINGS,
AN OFFICE BUILDING AND ASSOCIATED LANDSCAPING WORKS



December 2022