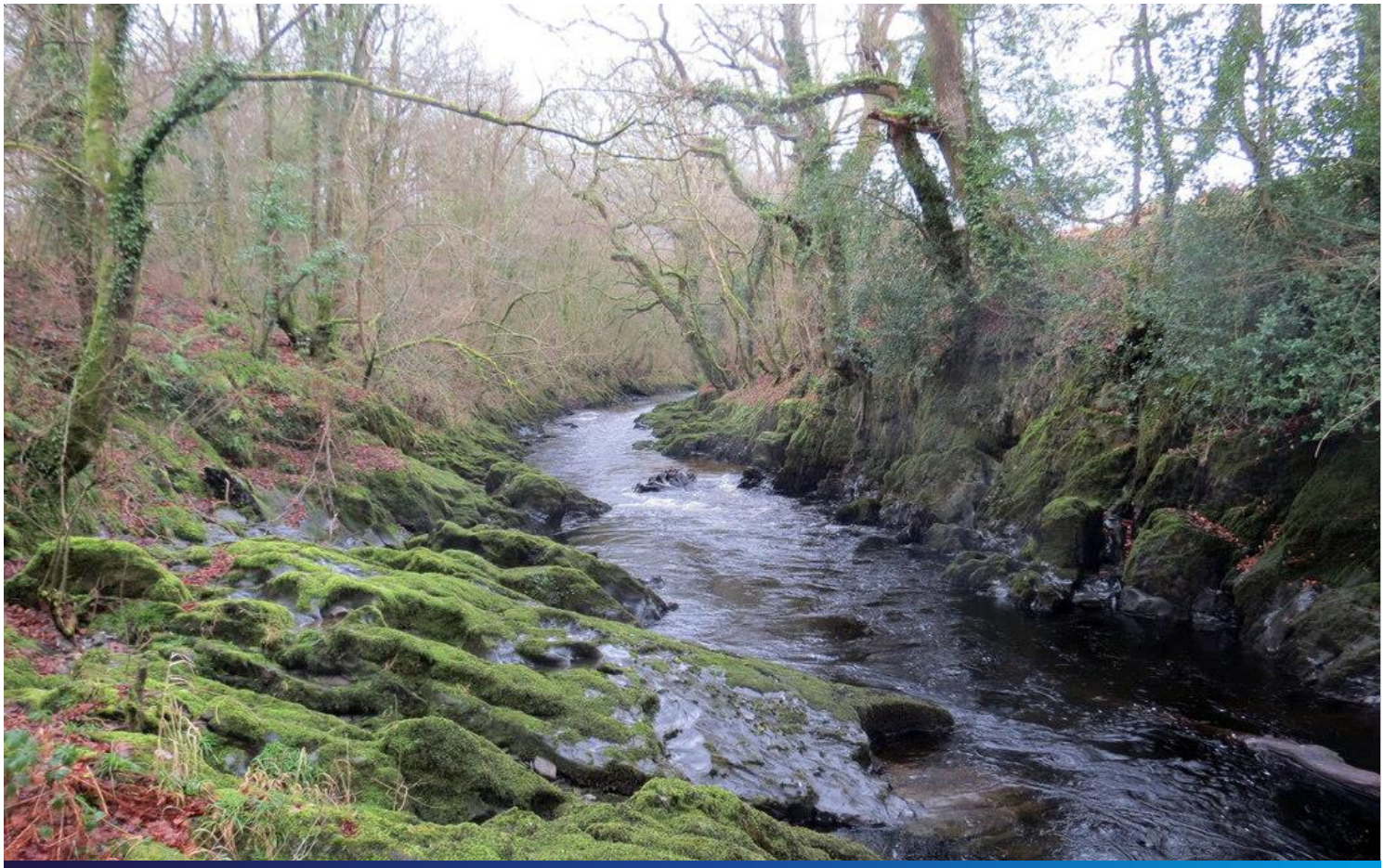

NUTRIENT BUDGET CALCULATOR GUIDANCE

A guide on how to calculate a nutrient budget for a development using the Nutrient Budget Calculator for Wales

Report for: Llywodraeth Cymru / Welsh Government

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GLOSSARY

Abbreviation	Definition
P	Phosphorus
TP	Total Phosphorus
N	Nitrogen
TN	Total Nitrogen
SAC	Special Areas of Conservation
CJEU	Court of Justice of the European Union
LPA	Local Planning Authority
NRW	Natural Resources Wales
WwTW	Wastewater Treatment Works
STW	Sewage Treatment Works
PTP	Package Treatment Plants
ST	Septic Tank
HRA	Habitats Regulations Assessment
AA	Appropriate Assessment
LSE	Likely Significant Effects
WFD	Water Framework Directive
SuDS	Sustainable Urban Drainage Systems

1 THE REQUIREMENT FOR NUTRIENT NEUTRALITY

1.1 THE DUTCH CASE

The 2018 ruling in the European Court of Justice referred to as 'The Dutch Case'[1] should be applied to plans or projects that may generate additional nutrient inputs in the catchments of European Designated sites (hereafter referred to as Protected sites) that are failing to meet their conservation objectives because of pre-existing levels of nutrients. A key point set out by the Court was that where the condition of a Protected habitat is unfavourable, the possibility of authorising further activities which will add additional nutrient loading is 'necessarily limited'.

The Court was also clear that an appropriate assessment may not take into account the existence of conservation measures if the expected benefits of those measures are not certain (i.e. beyond all reasonable scientific doubt) at the time of that assessment. Similarly, measures for conservation management, or to avoid deterioration, should not be relied on to grant the authorisation of a plan or project which has implications for the site concerned before they are actually implemented.

1.2 WHAT DOES THE DUTCH CASE MEAN FOR NUTRIENT NEUTRALITY?

Many Special Area of Conservation (SAC) rivers in Wales are failing to meet their Conservation Objectives for water quality due to high levels of nutrients. The Conservation Objectives for water quality are expressed as numerical targets for a range of attributes including phosphorus (P) and nitrogen (N). Increases in nutrients discharging to SAC rivers from new plans or projects can lead to exceedances of water quality targets or further deterioration of the river water quality where those targets have already been exceeded. New developments requiring planning permission that have the potential to affect a SAC must undergo a Habitats Regulations Assessment (HRA). The first stage of this process is a Test of Likely Significant Effect (TLSE). This screening process is used to determine whether there is the potential for a proposal to undermine the Conservation Objectives of a SAC and pose Likely Significant Effects. In the context of nutrient enrichment this means whether a proposal will lead to generation of additional P and if there is a pathway for the P to enter the SAC river environment.

Where a likely significant effect on a protected site is found due to additional nutrient inputs, an Appropriate Assessment (AA) must be undertaken to determine whether the proposal will lead to an adverse effect on site SAC integrity. It is only at this stage that mitigation measures intended to avoid or reduce effects can be considered as part of the assessment. In most cases it will be necessary for a plan or project to be nutrient neutral, where potential increases in nutrient input to a SAC must be balanced with nutrient reduction measures to ensure there is no net increase in the nutrients entering the SAC river environment.

Nutrient neutrality is required where a plan or project could increase the amount of P in a river SAC and water quality targets for P are already being exceeded or are failing to meet the targets downstream. In SAC river catchments meeting P targets, nutrient neutrality may not be required provided that new developments do not cause a SAC to exceed its water quality targets or prevent them from being achieved in the future.

In some cases, developments involving new connections to a public sewer may not need to demonstrate nutrient neutrality. In such cases, effluent discharges from the associated wastewater treatment works will have been assessed in terms of meeting local water quality targets and will be regulated by Natural Resources Wales (NRW) through the Wastewater Treatment Works Environmental Permit. However, it is most likely that NRW will sight that there is not enough evidence regarding headroom to allow a development without any risks of LSEs to the SAC.

[1] Joined Cases C-293/17 and C-294/17 *Coöperatie Mobilisation for the Environment UA and Others v College van gedeputeerde staten van Limburg and Other* (the Dutch Nitrogen cases)

The first step in an HRA AA is applying nutrient neutrality to understand whether a development will lead to additional nutrient inputs to a protected site and how much input there will be. This requires calculation of the amount of nutrients a new development will create, otherwise known as a nutrient budget.

If a nutrient budget shows that a new development will increase the nutrient input to any of the sites, it is not possible to conclude no adverse effect on site integrity alone or in combination. The annual P load calculated in the final nutrient budget must be mitigated to achieve nutrient neutrality. When nutrient neutrality can be demonstrated, a conclusion of no adverse effect on site integrity can be drawn.

1.3 THE ROLE OF THIS DOCUMENT

This guidance document accompanies the nutrient budget calculator created for Wales. This calculator is available in both English and Cymraeg. This calculator has been designed to enable developers in Wales to calculate nutrient budgets for developments. The following sections of this document provide step-by-step instructions on how to complete a nutrient budget using the calculator.

Note: This document is not a review of the evidence of the data that underpins the calculations in the nutrient budget calculators. An extensive evidence review and data collection phase was completed to identify the best available evidence to use within these calculators. The evidence review is unpublished at the time of writing.

1.4 PROTECTED SITES COVERED BY THE CALCULATOR

There are nine SACs with riverine features in Wales:

- Afon Eden - Cors Goch Trawsfynydd SAC
- Afon Teifi / River Teifi
- Afon Tywi / River Tywi
- Afonydd Cleddau / Cleddau Rivers
- Afon Dyfrdwy a Llyn Tegid / River Dee and Bala Lake
- Afon Wysg / River Usk
- Afon Gwy / River Wye
- Afon Gwyrfai a Llyn Cwellyn
- Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites (Afon Glaslyn)

A report published by NRW in 2021 showed that over 60% of water bodies assessed in SAC river catchments were failing to meet the revised water quality targets for P[1]. As such, if a development is within one of these catchments, a P budget will need to be completed in order to consider if the developer will cause adverse effects on site integrity due to increased nutrient loading to the SAC rivers. The local planning authority (LPA) must consider the effects on SAC rivers when evaluating a plan or proposal as the competent authority.

These rivers support a wide range of habitats and species between them, including:

- An abundance of water-crowfoots; white-flowered species can be found as floating mats typically in the first half of summer;
- Fish species such as Brook Lamprey, Sea Lamprey, River Lamprey, Bullhead, Atlantic Salmon, Twaite Shad, and Allis Shad;
- White-clawed crayfish;
- Freshwater pearl mussel;

[1] See: Compliance Assessment of Welsh River SACs Against Phosphorus Targets, available here: https://naturalresources.wales/evidence-and-data/research-and-reports/water-reports/compliance-assessment-of-welsh-river-sacs-against-phosphorus-targets/?lang=en

- Otters; and
- Floating water plantain.

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.

The habitats and species within these rivers that result in their respective designations as a SAC are referred to as 'qualifying features'. Not all of these qualifying features will be sensitive to changes in nutrients within these rivers. When completing an HRA involving nutrient neutrality, the LPA must ensure that the correct qualifying features have been identified and screen out any qualifying features that are not sensitive to nutrients. Developers will be asked to submit information to support this process.

More detailed information on the qualifying features of the SAC can be found in the following links:

- Afon Eden - Cors Goch Trawsfynydd SAC
- Afon Teifi/ River Teifi
- Afon Tywi/ River Tywi
- Afonydd Cleddau/ Cleddau Rivers
- Afon Dyfrdwy a Llyn Tegid / River Dee and Bala Lake
- Afon Wysg / River Usk
- Afon Gwy / River Wye
- Afon Gwyrfai a Llyn Cwellyn
- Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites

1.5 WHAT IS THIS GUIDANCE FOR?

This guidance document accompanies the nutrient budget calculator created for Wales. The calculator is used to calculate the change in N and P inputs, within any of the nine SAC catchments detailed in Section 1.4, due to any new residential, commercial, leisure, tourism or public service infrastructure development. The calculator can be used to inform an AA which is looking to apply nutrient neutrality to show whether a new development will require nutrient mitigation and if so, the amount of P loading that requires offsetting through mitigation measures to enable a conclusion of no adverse effect on site integrity, alone or in combination.

The guidance document contains the following:

- Step-by-step instructions on how to collect the specific data required as inputs to the calculator.
- Instructions on how to use the calculator.

1.6 WHO IS THE GUIDANCE FOR?

This guidance is for anyone who needs to complete a nutrient budget calculation to support an AA of a residential, commercial, leisure, tourism or public service infrastructure development within Wales. The calculator is primarily aimed at developers who need to complete a nutrient budget calculation to support a planning application and any LPA that needs to understand the mitigation requirements for future development or assess planning applications. It could also be used by communities or environmental groups wanting to understand the impacts of a local development on the nutrient inputs to the sites of concern.

The key factors to consider when assessing whether the nutrient neutrality approach is required for a new development are whether:

1. The development is within a catchment that drains to any of the nine SACs with riverine features (hereafter Protected sites).
2. The Wastewater Treatment Works (WwTW) servicing the development discharges to an affected Protected site.
3. The development will lead to an increase in 'overnight stays' (see note below).
4. The development will lead to an increase in the number of customers/users or employees coming into the catchment of the SAC river from outside of the catchment to work (in this context a user is defined as a person using service or facilities that result in an additional nutrient burden - such as wastewater production).

If the answer is yes to a combination of either; 1, 2 *and* 3 or, 2 *and* 4 above, a nutrient budget calculation will need to be completed in order to assess whether development will increase nutrient loading to a Protected site as identified in Section 1.4.

An approach to determining whether the development is within a catchment that drains to a Protected site is detailed in Appendix 1. In addition, a list of wastewater treatment works (WwTW) can be found in Appendix 2 of this document.

Note: An increase in overnight stays is defined as any development that will increase the number of people that will stay overnight compared to the previous land use on the development area. Whilst, small commercial developments are less likely to increase the number of employees travelling into the catchment estimating the number of employees coming from outside of the catchment may require the assistance of a professional consultancy.

2 OVERVIEW OF THE NUTRIENT BUDGET CALCULATOR

Note:

The calculator has been developed to be read in both **Welsh (Cymraeg) and English** languages.

The calculator includes budgets for **both P and N.**

Nutrient neutrality is only required for P.

The calculator generates results for N loading to future proof the tool should there be any required regulatory changes or challenges.

The nutrient budget calculator is built in Microsoft Excel and comprises six worksheets:

- **Instructions** – the cover page of the tool which details instructions on how to use the tool**.**
- **Stage 1** – a worksheet that calculates the annual nutrient loading from the additional wastewater based on development specific information inputted by you. This stage is required if a development connects to a WwTW that drains to a Protected site.
- **Stage 2** – a worksheet that calculates the annual nutrient loading from the existing, pre-development, land use based on development-specific information inputted by you. This stage is required if the surface water from a development drains to a Protected site.
- **Stage 3** – a worksheet that calculates the annual nutrient loading from the new, post-development, land use based on development-specific information inputted by you. This stage is required if the surface water from a development drains to a Protected site.
- **Stage 3S** – a worksheet that calculates the annual nutrient load removed from Sustainable Urban Drainage Systems (SuDS). This section must only be completed if SuDS are being implemented in accordance with the Flood and Water Management Act 2010 (Schedule 3) and are compliant with the national standards.
- **Stage 4** – a worksheet that automatically calculates the annual nutrient loading that needs to be mitigated in order prove nutrient neutrality based on the outputs from Stage 1 – Stage 3S.

The calculator uses a set of lookup tables to find values relevant to your inputs. The lookup tables are in a hidden worksheet. The data used in the lookup tables is based on the best available evidence. An evidence review and an extensive data collection phase was completed to determine this information.

To calculate the nutrient loading to a Protected site, you will need to navigate the tool and input key information into the appropriate cells at each stage. The **instructions worksheet** explains which cells require user inputs and how to find this information. The key stages of the calculation can be seen in the diagrams in Figure 1 and Figure 2. The key inputs to each stage of the nutrient budget calculations are shown in Figure 3.

Figure 1 Diagram demonstrating the key stages of the nutrient budget calculator

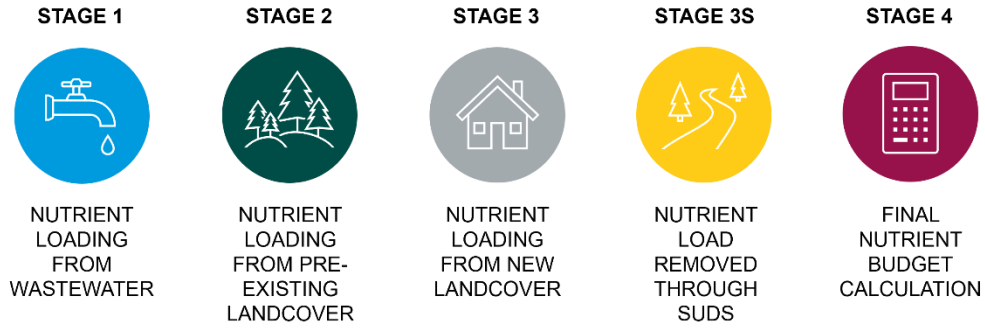
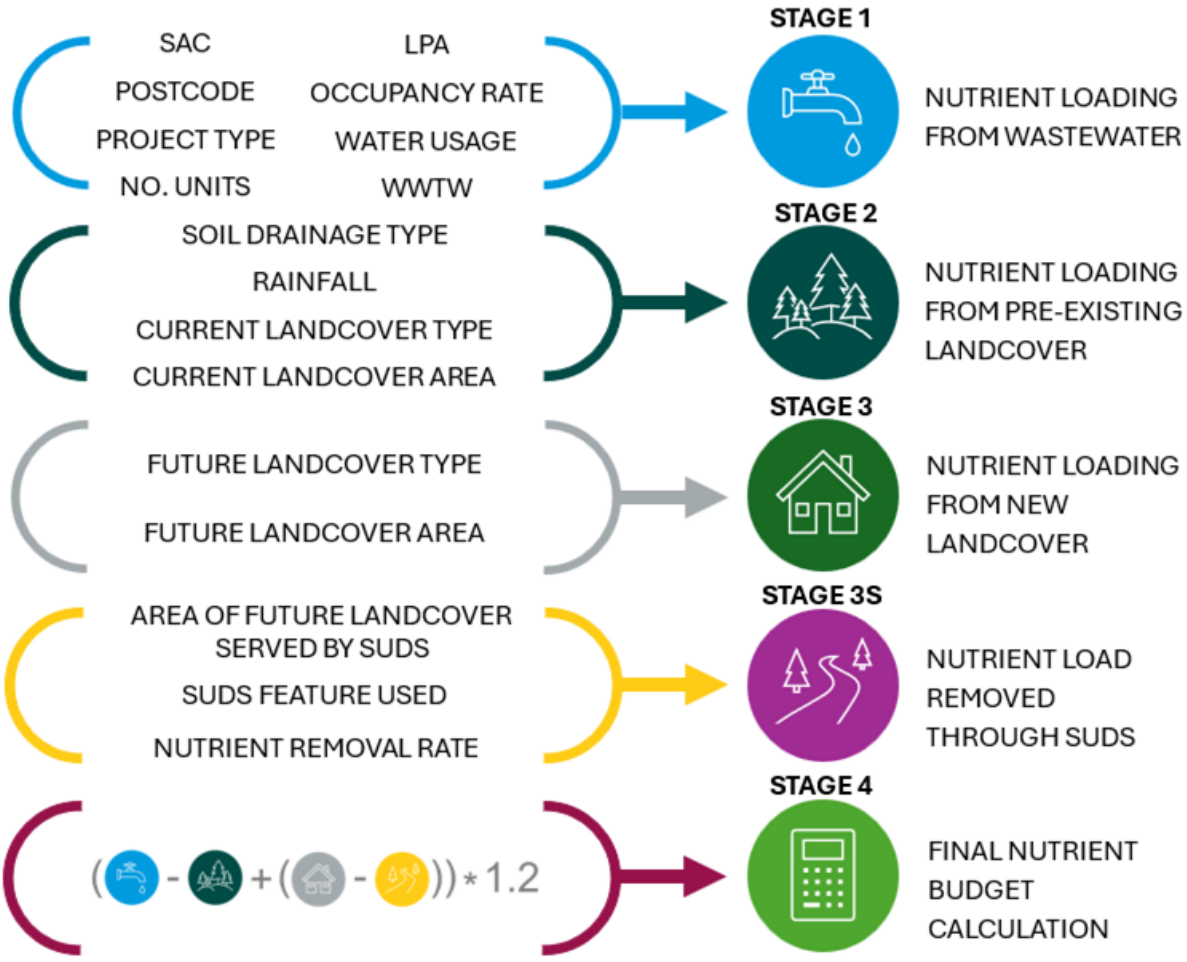


Figure 2 Diagram showing the overall equation used to calculate the nutrient loading to a Protected site

Figure 3 Diagram showing the inputs required to calculate the nutrient budget for a residential development



3 DATA COLLECTION AND PREPARATION

The nutrient budget calculator requires a set of inputs as shown in Figure 3.

This section does not provide instructions on how to gather development specific information, such as the number of properties being constructed, the area of the development, the pre-existing landcover etc as this should be known by the developer and should be detailed in the planning application. This information will need to be identified before completing the calculator.

The subsections below provide guidance on how to identify certain physical characteristics that are required as inputs to complete each stage of the nutrient budget calculations. The information required is available from free to access data sources[2]. Section 3.1 provides instructions on how to identify the soil drainage for a site. Section 3.2 provides instructions on how to identify the received rainfall volume for a site. Section 3.3 details the descriptions of the landcover types used in the calculator to assist in the classification of the correct landcover type. The majority of the required inputs are for factors that are specific to the location of a development site or the hydrological catchment.

3.1 STAGE 2: INSTRUCTIONS FOR FINDING THE SOIL DRAINAGE ASSOCIATED WITH THE PREDOMINANT SOIL TYPE WITHIN THE DEVELOPMENT SITE

- Go to this link: http://www.landis.org.uk/soilscapes/#
- Find your development site location on the map by using the search bar on the right side of the map in the 'Search' tab. Searching a location should generate a pop-up window in which you can view the soil information by clicking 'View soil information'. If this is not an option then click on the relevant soil type on the map and click on the 'Soil information' tab on the right-hand side of the map, below the 'Search' tab.
- The 'Soil drainage type' value can be found in the 'Soil information' under the title 'Drainage:'
- Make a note of this soil type and select the relevant soil drainage type from the drop-down list in the ‘Soil drainage type’ cell when you get to this part of the calculator tool. If your site overlays multiple soil types, please choose the majority.

3.2 STAGE 2 & 3: INSTRUCTIONS FOR FINDING THE ANNUAL AVERAGE RAINFALL THAT THE DEVELOPMENT SITE WILL RECEIVE

- Go to this link: https://nrfa.ceh.ac.uk/data/search
- This link will bring you to the National River Flow Archive data search page.
- Select the appropriate flow gauge (monitoring point) and navigate to the “Catchment Info” tab.
- Click on the dropdown list next to the title 'Select spatial data type to view:' on the left of the map and select 'Rainfall'.
- Select the Legend tab.
- Zoom in on the map to find the location of the development and find the corresponding rainfall range from the Legend. Note that you cannot search this map using location information and will need to ‘surf’ around the map to find your development site location. It may therefore be easier to select a flow gauge for the SAC catchment you are interested in.
- Make a note of the relevant rainfall band for your site and use it to select this rainfall band from the drop-down list in the ‘Average annual rainfall’ cell when you get to this part of the calculator tool.

Note: Some of the values you select in the stages detailed above will also be used in the Stage 3 calculations. However, you only need to enter the inputs to the first table in Stage 2 of the calculator and the required values for stage 3 will be carried through automatically.

[2] Correct at the time of writing. These data sources are available from web sources that currently have government funding but it should be noted that these datasets may become unavailable if funding is removed.

3.3 STAGE 2 & 3 LANDCOVER TYPES USED IN THE TOOL

This guidance document does not provide instructions on how to identify landcover types. To assist with converting the landcovers on your development to landcover types that can be entered into this tool, please see Table 1[3].

Table 1 Table detailing the landcover types available for use in the tool.

Land use types used in the calculator tool	Description
Cereals	Agricultural areas on which cereals, combinable crops and set aside are farmed.
General	Agricultural areas on which arable crops (including field scale vegetables) are farmed.
Horticulture	Agricultural areas on which fruit (including vineyards), hardy nursery stock, glasshouse flowers and vegetables, market garden scale vegetables, outdoor bulbs and flowers, and mushrooms are farmed.
Indoor Pig farming	Agricultural areas on which pigs are farmed indoors.
Outdoor Pig farming	Agricultural areas on which pigs are farmed outdoors.
Poultry	Agricultural areas on which poultry are farmed.
Dairy	Agricultural areas on which dairy cows are farmed.
Less Favoured Area (LFA) grazing	Agricultural areas on which cattle, sheep and other grazing livestock are farmed in locations where agricultural production is difficult. An area is classified as an LFA holding if 50 per cent or more of its total area is classed as LFA.
Lowland grazing	Agricultural areas on which cattle, sheep and other grazing livestock are farmed. A holding is classified as lowland if less than 50 per cent of its total area is in the LFA.
Mixed	Agricultural areas in which none of the above categories are farmed or where it is too difficult to select a single category to describe the farm type. This farm type does not include horticultural crops or outdoor pig farming.
Greenspace	Natural and semi-natural outdoor spaces provided for recreational use where fertilisers will not be applied and dog waste is managed, e.g. semi-natural parks. This does not include green infrastructure within the built urban environment, such as gardens, or grass verges, as these are included in the residential urban land category for residential developments, or the open land – built environment category for all other development types.
Woodland	Natural and semi-natural outdoor wooded areas.
Shrub	Natural and semi-natural outdoor shrubland area.
Water	Areas of surface water that remain inundated all year round, including rivers, ponds, and lakes.

[3] To view the specific definitions of the robust farm types, see: Farm Classification in the United Kingdom. Available here: http://farmbusinesssurvey.co.uk/DataBuilder/UK_Farm_Classification_2014_Final.pdf, accessed on: 12/12/2021

Land use types used in the calculator tool	Description
Residential land	Areas of houses and associated infrastructure. This is inclusive of residential roads, driveways, grass verges, gardens and SuDS infrastructure that drains a residential development[4].
Commercial/industrial land	Areas that are used for industry. These are businesses that typically manufacture, process or otherwise generate products. Included in the definition of industrial land are factories and storage facilities as well as mining and shipping operations.
Open land – built environment	Areas of land in urban areas used for various purposes, e.g. main roads, built facilities such as schools, sports centres, areas used for leisure and recreation - this may include open land, e.g. caravan sites, camping sites, sports fields, playgrounds, and public squares.
Community food growing	Areas that are used for local food production, such as allotments.

[4] Following the precautionary principle SuDS are incorporated into the Residential land type as they are likely to have similar nutrient inputs as the surrounding residential land.

4 POPULATING THE CALCULATOR

4.1 GENERAL TIPS

You must fill in any cells that require inputs to generate a nutrient budget. Some cells are automatically calculated. Cells that are automatically calculated will state 'Not applicable' or '0.00' until the relevant user inputs have been entered.

The instructions worksheet and the text in cell A2 and A3 of each worksheet provide further instructions on where you need to enter inputs. Some cells will have pre-populated values, such as the 'Water usage' input. The instructions for each cell will detail if an alternative value can be used. Where user inputs are required, the information needs to be based on best available evidence to demonstrate the inputs are accurate for the lifetime of the development (e.g. in perpetuity[5]) and are suitably precautionary.

The pre-populated values in this calculator have been identified through extensive research and modelling. The values are based on the best available evidence and are suitably precautionary to account for any uncertainty. This nutrient budget calculator can be used as supporting evidence for a Habitat Regulations Assessment (HRA). Specifically, this calculator can be used within an appropriate assessment to assess the likely significant effects of a proposal on the integrity of the site and its conservation objectives.

It is highly unadvisable to edit the values in this tool without a sufficient evidence base to justify any changes. If any pre-populated cells are changed the onus is on you to prove that these values are accurate and defendable.

Retain a default copy of the calculator which has not had any development details added. "Save as" a new copy each time you calculate a budget for a new development in case any of the default values in the calculator get overwritten and are needed again.

The calculator has been designed to account for both P and Nitrogen (N). Currently only an assessment of P is mandatory for Wales. The N column is for inclusiveness only and to future proof the tool should there be any required regulatory changes or challenges.

4.2 STAGE SPECIFIC INPUTS

4.2.1 Stage 1: calculate the additional nutrient loading from wastewater

SAC

You must choose the SAC for the calculator to function correctly. You must select one SAC from one of the nine SACs detailed in **Section 1.4.**

Postcode lookup

There is the option to enter the postcode for the development site. Entering a valid postcode that is within the catchment area of the SAC will automatically select the LPA and generate the rainfall for the site.

Note: The information generated from the postcode search feature is not definitive and is only recommended for use as an initial aid. Therefore, it is the responsibility of you to check that the inputs identified using the postcode search tool are correct.

Development type

You must choose the development type. You can select from the following development types: residential, commercial, leisure, public service infrastructure or tourism.

[5] The currently established definition of in perpetuity for the purposes of nutrient neutrality is 80-125 years.

The definitions of these development categories can be viewed in Table 2 with reference to the 'Planning permission: use classes'[6]. These development types specifically relate to the permanent change of land use compared to temporary uses of land, such as festivals. Caravan sites and camp sites should be included in the Tourism category.

Table 2 Table showing the definitions of development types in accordance with the Planning permission use classes[6]

Development type	Description
Residential	C2 Residential institutions; C2A Secure Residential Institution; C3 Dwellinghouses, used as sole or main residences; C4 Houses in multiple occupation; C5 Dwellinghouses, used otherwise than as sole or main residences; C6 Short term
Commercial	A1 Shops; A2 Financial and professional services; A3 Food and drink; B1 Business; B2 General industrial; B8 Storage or distribution
Leisure	D2 Assembly and leisure
Public service infrastructure	D1 Non-residential institutions
Tourism	C1 Hotels (in addition to holiday camping sites and caravan sites)

Changing the development changes the functionality in 'Stage 1' of the calculator:

- If 'Residential' is selected, you must confirm the default occupancy rate (people per dwelling) or enter a bespoke rate if the defaults are not being used.
- If 'Commercial', 'Leisure', 'Public service infrastructure' or 'Tourism' is selected you must enter the estimated total number of customers/users and populate a cell to enter the number of employees required for commercial uses.
- For both employees and customers you must enter the percentage of people who are commuting from outside of the catchment. The percentage of customers/users and employees commuting from outside of the catchment, is set to 100% as a default in lieu of any evidence to suggest otherwise. However, it is improbable that 100% of customers/users and employees will commute or travel from outside of the catchment. If a bespoke value is used, it will be up to you to identify a suitable and appropriately precautionary rate that will need to be agreed by the appropriate LPA. It may be possible to estimate the amount of people travelling from outside of the catchment based on the location and type of the development and analysing census data such as 'Distance travelled to work by occupation'[7] or conducting surveys of similar facilities/industries.

[6] See Planning permission: use classes (change of use), available here: https://www.gov.wales/planning-permission-use-classes-change-use

[7] See Distance travelled to work by occupation, available here: https://www.ons.gov.uk/datasets/RM016/editions/2021/versions/1

Number of additional dwellings/units

You will need to enter the number of additional dwellings that will be within the development at the time of completion of the development. This methodology is concerned with any residential, commercial or tourism development that increases the number of overnight stays, or leads to people coming from outside of the hydrological catchments into these SAC catchments with nutrient issues. 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.

LPA

You must select the LPA that is within the SAC catchment. Selecting the LPA automatically generates the default occupancy rate for that development. If you have entered a valid postcode that is within the SAC catchment the LPA will be automatically populated.

Average occupancy rate

The average occupancy rate must be entered for residential developments only. This value is the average amount of people per dwelling/unit. The default value is dependent on the LPA that the development is within. These values are based on the average occupancy rate for local authorities according to the 2021 census. The LPA is automatically populated if a valid postcode that is within the SAC catchment is entered. You must confirm the occupancy rate by selecting 'Yes' in the cell beneath the occupancy rate. Alternatively, you must select 'No' to enter a bespoke occupancy rate in the appropriate cell. This value should not be changed unless you can provide sufficient evidence that the development will have a different occupancy rate. If there is a mix of different sized dwellings/units and there is evidence that proves beyond reasonable scientific doubt that these will have different occupancy rates in perpetuity, you can input a different occupancy rate. The methodology for calculating this revised occupancy rate will also need to be submitted as supporting evidence to the nutrient budget output.

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 Regulations[8] 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.

All water usage values have been set to a default 120 litres/person/day in lieu of any evidence to suggest otherwise. However, it is unlikely that the water usage per person per day in a place of work will be as high as their place of residence. It is possible to set any of the values to zero if they are not relevant, although evidence that demonstrates this may be required by the LPA.

The default water usage figure comes with the caveat that the British Water Flows and Loads[9] water usage figure of 150 litres/person/day is used by NRW when assessing any Environmental Permits or Exemptions. This can potentially impact on the issuing of any permits or meeting the nutrient neutrality principles. Applicants will need to meet the conditions and figures set under an Environmental Permit.

[8] See: Building Regulations Approved Documents G, available here: https://www.gov.wales/sites/default/files/publications/2023-05/building-regulations-guidance-part-g-sanitation-hot-water-safety-and-water-efficiency.pdf

[9] See: British Flows and Loads – 4, available here: https://www.theseptictankstore.co.uk/wp-content/uploads/British_Water_flows_and_loads.pdf

Wastewater Treatment Works, Septic Tanks (ST) and Package Treatment Plants (PTP)
You will need to select the WwTW which will receive the wastewater from the development. If required, this information can be obtained from the sewerage undertaker for the development site. If it is not feasible to connect to mains sewerage and an ST or PTP is being used, please select this option. Please be aware that if the total phosphorus (TP) and final effluent concentrations (in mg/l) are specified by the manufacturer, please select 'Septic Tank user defined' or 'Package Treatment Plant user defined' and enter the specified value in the cell where prompted.

If the receiving WwTW is not on the dropdown list, please check that this information is correct by contacting the sewerage undertaker. Once confirmed that your development is connecting to a WwTW that discharges to one of the Protected sites listed in **Section 1.4** and that is not provided in the dropdown list, please notify your LPA.

Note: The WwTW permitted limits of final effluent TP and N concentrations are correct at the time of publication but may be subject to change in the future. If required, these values will be updated at a later date accordingly.

If a PTP or ST is being used and you are unsure whether it will drain to a Protected site, please check if the development is in the SAC catchment by following the instructions in Appendix 1. If you do not have a TP value provided by the manufacturer, select the 'Septic Tank default' or 'Package Treatment Plant default' option and a value will be provided automatically.

Note:
If an ST or PTP is being used then a comprehensive maintenance regime is required as part of the application process. If your ST or PTP has P stripping capabilities, chemical dosing may be the method used to achieve this. If chemical dosing is required, a robust management plan that details how chemicals are stored, the dilution rates, dosing frequencies, that any chemicals used will not have an environmental impact etc. must also accompany the planning application. The management plan should also consider a warning system for spills and failures (i.e. if the certified treatment limit is exceeded then action is required such as replacing dosing media). PTPs with chemical dosing may not be appropriate in all cases. In their advice to planning authorities, NRW sets out the risks associated with chemical dosing in small private drainage systems:

Natural Resources Wales / Advice to planning authorities for planning applications affecting P sensitive river Special Areas of Conservation

4.2.2 Stage 2: calculate the nutrient loading from pre-existing landcovers

In this section you must select some inputs on the physical characteristics of the site. In the first table you must select the soil drainage type and the rainfall value as described in **Section 3.1**. If you entered a valid postcode within the SAC catchment, the rainfall value will be automatically populated. You must confirm this is correct by selecting 'Yes' in the appropriate cell. Alternatively, you must select 'No' to select a different rainfall value.

In the 'Landcover' column of the second table in Stage 2 of the calculator, each cell has drop-down list of 18 landcover types. This list contains ten agricultural landcover types to choose from and eight different non-agricultural land cover types that may be present within the redline boundary of the development. You must determine the landcovers that comprise the site, as well as the extent (in hectares) of each landcover, before completing this calculator. If there is a landcover within the development area that is not in the list, please select the most similar land use type from those available. For example, if two hectares of agricultural land within a ten-hectare development site are being retained in agricultural use, the two-hectare area should not be included in the calculations.

Table 1 in **Section 3.3** provides a description of the different land use types available within the calculator tool.

4.2.3 Stage 3: calculate the nutrient loading from new landcovers

In this section you will need to select the type and area of the landcover present on the development site after the development has been completed.

The 'Landcover' column of the table in Stage 3 of the calculator, has the same drop-down list of land use types as Stage 2. Please find out which landcovers are present within the redline boundary of the development, as well as the extent (in hectares) before completing this part of the tool. If there is a landcover within the development area that is not in the list (see **Table 1** in **Section 3.3** for landcover descriptions), please select the most similar land use type.

4.2.4 Stage 3S: calculate the nutrient load removed through SuDS

This section is optional. It requires a lot of evidence to be provided alongside the output of this calculator.

You do not need to enter any inputs if SuDS are not applicable to the development. In this section you can enter information about the SuDS features used to calculate the amount of nutrients removed through SuDS treatment of surface runoff. This section must only be completed if SuDS are being implemented in accordance with the Flood and Water Management Act 2010 (Schedule 3) and are compliant with the national standards.

Any SuDS that are being implemented in addition to the site plans for the purposes of mitigation must not be considered in the nutrient budget calculation for the site. In this instance, it is instead recommended that a second calculation is populated - the People over Wind judgment means that it is no longer possible to apply mitigation measures at the screening stage.

SuDS cannot be considered in Flood Zone 3 (areas at risk of frequent flooding) as shown on the NRW Flood Map for Planning (Natural Resources Wales / Flood map for planning).

If the SuDS section of the calculator is used, when the calculator output is submitted to the LPA you will also need to submit the calculations and justification of the assumptions used to populate this section of the calculator. In addition you will need to provide:

- Design details of each element of the SuDS treatment train
- Evidence to justify the nutrient removal rate used
- A maintenance plan (for example, the removal of sediment, vegetation management, and details of how the waste arisings would be disposed of to maintain nutrient neutrality principles and comply with the correct environmental permissions)

Removal rates

A SuDS device or treatment train will only treat the proportion of the water which enters the SuDS and they will not treat **all** flows, including severe storm events. The treated flow for the first SuDS device should be determined based on the catchment area and flows/loads draining to the device. The proportion of the flow/load that bypass and do not enter the SuDS device must be removed. Reductions from the SuDS device via infiltration and conveyed flows should only be applied to this treated flow/load.

The treated flow for the second or third devices should be determined based on the flow/load modelled as leaving the previous SuDS device. The SuDS management train should be designed to manage both particulate P and dissolved P.

It is essential to check that the influent will contain enough TP to allow treatment to be effective. If the TP level in the influent is too low, then the anticipated level of treatment may not be met.

Find out how to calculate the removal rates in the following guidance documents published by the Construction Industry Research and Information Association (CIRIA): https://www.ciria.org/CIRIA/Books/Bookshop.aspx?hkey=5d0b1bf4-bcee-4410-ade0-2dfb2a319cc2

- using SuDS to reduce phosphorus in surface water runoff (C808)
- using SuDS to reduce nitrogen in surface water runoff (C815)

The CIRIA guidance includes factors that should be taken into consideration when designing a SuDS management train for P removal, regardless of the SuDS components used. All measures will need to meet the criteria detailed in Table 2.1 in the CIRIA guidance.

Populating Section 3S of the calculator

The type(s) and area(s) of the landcover present on the new site will be automatically populated from Stage 3.

You will need to:

- enter the catchment area that drains to the SuDS as a proportion of the new landcovers
- choose the SuDS features used
- enter the nutrient removal rates as a percentage

It is recommended that the surface area of the SuDS features are included within the area of the landcover that they drain. If required, you can split the landcover up in Stage 3 to demonstrate multiple drainage configurations.

You can select a SuDS feature from a list of 23 options. If a SuDS management train that comprises multiple SuDS features is being implemented you should select the appropriate option from the start of the list. Otherwise, you should select the individual SuDS feature being used. If the appropriate SuDS feature cannot be found in the list, select the most relevant alternative.

The nutrient removal rates should be entered as a whole number percentage. You must be able to provide evidence for the removal rates you have entered. The performance of SuDS is extremely variable and dependent on the design and the physical characteristics of the site. As such, it is your responsibility to demonstrate that the nutrient removal rates are based on the best available evidence and are specific to the SuDS configuration on their site. This is likely to require the submission of a drainage assessment and a detailed design.

The amount of nutrients removed through SuDS is automatically calculated using the landcovers and associated loads from Stage 3, the drainage area, and the nutrient removal rates. The total load removed through SuDS is incorporated into the final nutrient budget calculation. Selecting the type of SuDS feature used is to ensure that the nutrient budget calculator matches the SuDS design detailed in the planning application.

Soakaways required under the building regulations can be entered, although the required evidence level would be the same as SuDS. As such, using soakaways as a nutrient reduction measure would need to evidence the design, the construction, the maintenance plan, as well as ability to function under storm events and infiltrate the surface runoff.

More information about SuDS can be found in the links below:

- National standards for sustainable drainage systems (SuDS) can be found here: https://www.gov.wales/national-standards-sustainable-drainage-systems-suds
- Ciria's Using SuDS to reduce P in surface water runoff (C808F) can be found here: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C808F&Category=FREEPUBS

4.2.5 Stage 4: the nutrient budget

The final stage automatically uses the results from Stage 1 to Stage 3S and calculates the nutrient budget using the equation shown in Figure 3. No user inputs are required in this stage beyond those entered in Stage 1 to Stage 3S. The output in Stage 4, adjacent to the cell that reads “P budget + 20% buffer”, shows you how much nutrient mitigation is required in kilograms per year to achieve nutrient neutrality.

As shown in Figure 2, 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%, which is termed the ‘precautionary buffer’.

The 20% precautionary buffer is applied to account for the uncertainties that underlie the inputs to Stage 1 to Stage 3 of the nutrient budget calculations, as well as accounting for some potential nutrient sources associated with new development that cannot be readily quantified. To cover all possible inputs to a nutrient budget with a high enough certainty to remove the need for the precautionary buffer would require extensive site-specific investigations. The 20% precautionary buffer is a way of accounting for the uncertainties within the nutrient budget calculations and providing confidence that mitigation of the nutrient budget will remove the risk of adverse effects on site integrity in SACs.

4.3 EXAMPLE SCENARIOS

This section contains two hypothetical examples of planning applications and the way in which key details related to these example developments would be entered as inputs to the nutrient budget calculator. These examples are based on initial feedback on the calculator and aim to provide further clarification on how to apply the calculator in practice.

Box 1: Planning scenario A

A **hypothetical** 2.5-hectare school site is being converted to 20 residential dwellings with gardens in 1.8 hectares, 0.5 hectares of a community park and 0.2 hectares of pond.

- The previous 1.25-hectare school site (including playground and car park) is entered as the landcover type 'Open land built environment. The 1.25 hectare playing field is entered as 'Greenspace'.
- The 20 residential dwellings, including the road, roadside verges and gardens are entered as 1.8 hectares of residential land.
- The 0.5-hectare park is entered as 0.5 hectares of greenspace.
- The 0.2-hectare pond is entered as 0.2 hectares of water.

Note: The wastewater generated by the new development is classified as additional wastewater to the Protected site because it would increase the number of overnight stays in the catchment

The following inputs were entered into Stage 2:

Physical characteristics	
Description of required information	**Data entry column - user inputs required**
Soil drainage:	Freely draining
Rainfall identified using postcode (mm/year):	**1441**
Is this rainfall value correct?	No
Rainfall (mm/year):	2,000.1 - 2,400

Pre-existing landcovers			
Landcover	**Area (hectares)**	**Phosphorus load (kg TP/year)**	**Nitrogen load (kg TN/year)**
Greenspace	1.25	**0.03**	**3.75**
Open land – built environment	1.25	**2.95**	**30.21**

The following inputs were entered into Stage 3:

New landcovers			
Landcover	**Area (hectares)**	**Phosphorus load (kg TP/year)**	**Nitrogen load (kg TN/year)**
Residential land	1.8	**7.93**	**73.81**
Greenspace	0.5	**0.01**	**1.50**
Water	0.2	**0.00**	**0.00**

This gives a final Stage 4 output of:

Total phosphorus budget	
Description of phosphorus values generated	**Values generated**
Stage 1 phosphorus load (kg TP/year):	**10.08**
Stage 2 phosphorus reduction (kg TP/year):	**2.98**
Stage 3 phosphorus load (kg TP/year):	**7.94**
Stage 3S phosphorus load removed through SuDS (kg TP/year):	**0.00**
Phosphorus budget ((Stage 1 - Stage 2) + (Stage 3 - Stage 3S)):	**15.04**
Phosphorus budget + 20% buffer	**18.05 kg TP/year requires mitigation**

Box 2: Planning scenario B

A **hypothetical** 1.1-hectare land parcel used for grazing cattle is being converted to a licenced caravan site for tourism with one office on site for two employees. The developer has supplied robust evidence that shows the average occupancy rate will be 1 person per unit with a total of 30 units occupied at this rate for 6 months and a daily water usage of 150 litres/person/day, all inputs continuing for the lifetime of the development (e.g. in perpetuity). A PTP is being used which has a certified final effluent TP concentration of 2.5 mg TP/l.

This gives a Stage 1 entry for wastewater load input data as below:

Description of required information	Data entry column - user inputs required
Special Area of Conservation (SAC):	River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid
Postcode:	
Not applicable	**Not applicable**
Not applicable	**Not applicable**
Project type:	Tourism
Development proposal (number of additional units):	1
Local Planning Authority (LPA):	Eryri National Park
Not applicable	**Not applicable**
Not applicable	Not applicable
Number of customers / users per unit:	30
Water usage per customer / user (litres/person/day):	150
Percentage of customers / users from outside catchment:	50
Number of employees (per unit):	2
Water usage per employee (litres/person/day):	120
Percentage of employees from outside catchment:	0
Wastewater treatment works:	Package treatment plant (PTP) user definec
Enter the bespoke P permit (mg TP/l):	2.5
Enter the bespoke N permit (mg TN/l):	15
Phosphorus permitted limit (mg TP/l):	**2.50**
Nitrogen permitted limit (mg TN/l):	**15.00**

The SAC was selected and the project type was set to tourism.

The development proposal was set to 1, though this could also be set to 30 and the number of customers per unit set as 1.

The LPA has been selected in lieu of the postcode entry automatically generating the LPA.

The water usage per employee was set to 120, though the water usage per customer is set to 150 according to the British Flows and Loads estimates.

The percentage of customers from outside the catchment has been set to 50% to account for the 6-month occupancy timeframe (i.e. the annual impact is halved). However, there is strong evidence that the employees will be local and as such this percentage of employees coming from outside of the catchment has been set to 0.

A PTP has been selected and the certified concentration of TP has been entered.

The pre-existing landcover was entered as Lowland grazing and the new landcover was entered as Open urban land.

5 REFERENCES

Front page image credits:

Afon Tywi / River Tywi

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Satellite Image screenshots:

World Imagery. Esri, Maxar, Earthstar Geographics, USDA FSA, USGS, Aerogrid, IGN, IGP, and the GIS User Community. “World Imagery Map”. February 18, 2022. https://www.arcgis.com/home/item.html?id=10df2279f9684e4a9f6a7f08febac2a9

APPENDICES

Appendix 1 Instructions on how to identify whether the wastewater produced by the development will affect a Protected site due to this wastewater being discharged within an affected hydrological catchment

- Go to this link: https://waterwatchwales-nrw.hub.arcgis.com/
- Click on the Web Mapping Application titled “WFD Cycle 3 Rivers and waterbodies”
- Once the map and legend loads, navigate to the layer list and turn on the layer titled “River Waterbody Catchments Cycle 3 2021”
- In the top left type in the name or the postcode of the area where the development is, find the correct location and click on the map to display information on the layer
- Make note of the Waterbody Catchment next to the “WB_NAME” category, or the Waterbody Catchment ID next to the “WATERBODY_ID”.
- If the Waterbody Catchment identified using the link can be found in the table below the site Is likely to have an affect on a Protected site.

Note: There are areas within the LPAs that drain to the SACs but do not have a Waterbody Catchment in the link provided above.

Table 3 WFD waterbodies within the Afon Eden - Cors Goch Trawsfynydd SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110064048710	Mawddach - lower	Eryri LPA (19.05)
GB110064048720	Gamlan	Eryri LPA (15.12)
GB110064048730	Mawddach - middle	Eryri LPA (4.46)
GB110064048740	Wen (Mawddach)	Eryri LPA (11.99)
GB110064048750	Eden - lower	Eryri LPA (9.19)
GB110064054610	Crawcwellt South	Eryri LPA (17.45)
GB110064054620	Mawddach - upper	Eryri LPA (36.28)
GB110064054630	Eden - upper	Eryri LPA (25.64)
GB110064054640	Gain	Eryri LPA (26.1)

Table 4 WFD waterbodies within the Afon Gwyrfai a Llyn Cwellyn SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110065054190	Gwyrfai - downstream of Cwellyn	Eryri LPA (8.82), Gwynedd LPA (25.5)
GB110065054191	Gwyrfai - upstream of Cwellyn	Eryri LPA (19.95)

Table 5 WFD waterbodies within the Afon Teifi/ River Teifi SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110062038950	Tyweli - headwaters to confluence with Talog	Carmarthenshire LPA (12.3)
GB110062038960	Cneifa - headwaters to confluence with Cych	Pembrokeshire LPA (13.75)
GB110062038980	Talog - headwaters to confluence with Tyweli	Carmarthenshire LPA (21.3)
GB110062039000	Siedi - headwaters to confluence with Teifi	Carmarthenshire LPA (11.92)
GB110062039010	Dulas - headwaters to confluence with Cych	Pembrokeshire LPA (22.41)
GB110062039020	Tyweli - confluence with Talog to confluence with Teifi	Carmarthenshire LPA (19.33)
GB110062039030	Bargod - headwaters to confluence with Teifi	Carmarthenshire LPA (26.88)
GB110062039041	Cych - headwaters to confluence with Teifi	Carmarthenshire LPA (33.98), Pembrokeshire LPA (19.84)
GB110062039050	Morgenau - headwaters to confluence with Teifi	Pembrokeshire LPA (11.28)
GB110062039060	Duar - headwaters to confluence with Teifi	Carmarthenshire LPA (14.65)
GB110062039070	Piliau - headwaters to confluence with Teifi	Ceredigion LPA (2.17), Pembrokeshire LPA (11.74)
GB110062039090	Cynllo - headwaters to confluence with Teifi	Ceredigion LPA (17.49)
GB110062039110	Ceri - Dulas to conf Teifi	Ceredigion LPA (17.93)
GB110062039130	Hirwaun - headwaters to confluence with Teifi	Ceredigion LPA (19.47)
GB110062039140	Cerdin - headwaters to confluence with Teifi	Ceredigion LPA (28.04)
GB110062039150	Cledlyn - headwaters to confluence with Teifi	Ceredigion LPA (27.3)
GB110062039160	Mwldan	Ceredigion LPA (12.55)
GB110062039170	Arberth - headwaters to confluence with Teifi	Ceredigion LPA (16.27)
GB110062039180	Dulas - headwaters to conf Ceri	Ceredigion LPA (12.7)
GB110062039190	Ceri - headwaters to conf Dulas	Ceredigion LPA (29.75)
GB110062039200	Clywedog - headwaters to confluence with Teifi	Carmarthenshire LPA (1.02), Ceredigion LPA (16.09)
GB110062039210	Creuddyn - headwaters to confluence with Teifi	Ceredigion LPA (11.73)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110062039220	Clettwr - headwaters to confluence with Teifi	Ceredigion LPA (59.35)
GB110062039230	Grannell - headwaters to confluence with Teifi	Ceredigion LPA (37.83)
GB110062039240	Dulas - headwaters to conf Teifi	Ceredigion LPA (29.74)
GB110062039250	Brefi - headwaters to confluence with Teifi	Ceredigion LPA (18.89)
GB110062043470	Berwyn/Brennig - headwaters to confluence with Teifi	Ceredigion LPA (17.28)
GB110062043490	Groes - headwaters to confluence with Teifi	Ceredigion LPA (13.5)
GB110062043501	Teifi - conf with Meurig to conf with Brennig	Ceredigion LPA (35.27)
GB110062043510	Fflur - headwaters to confluence with Teifi	Ceredigion LPA (15.19)
GB110062043530	Camddwr - headwaters to confluence with Teifi	Ceredigion LPA (26.55)
GB110062043540	Teifi - headwaters to confluence with Meurig	Ceredigion LPA (40.23)
GB110062043550	Meurig - headwaters to confluence with Teifi	Ceredigion LPA (14.69)
GB110062043563	Teifi - Afon Ceri to estuary	Carmarthenshire LPA (5.44), Ceredigion LPA (24.42), Pembrokeshire LPA (13.69)
GB110062043564	Teifi - Afon Clettwr to Afon Ceri	Carmarthenshire LPA (28.34), Ceredigion LPA (30.03)
GB110062043565	Teifi - Afon Dulas to Afon Clettwr	Carmarthenshire LPA (48.21), Ceredigion LPA (24.83)
GB110062043566	Teifi - Afon Brennig to Afon Dulas	Carmarthenshire LPA (7.55), Ceredigion LPA (54.4)

Table 6 WFD waterbodies within the Afon Tywi/ River Tywi SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110060029040	Cloidach - headwaters to confluence with Cothi	Carmarthenshire LPA (9.71)
GB110060029070	Crychiau - headwaters to confluence with Gwili	Carmarthenshire LPA (14.98)
GB110060029080	Gwili - Duad conf to conf with Tywi at spring TL	Carmarthenshire LPA (25.77)
GB110060029280	Cennen - headwaters to confluence with Tywi	Bannau Brycheiniog LPA (18.46), Carmarthenshire LPA (10.23)
GB110060029290	Tywi - confluence with Cothi to spring tidal limit	Carmarthenshire LPA (13.26)
GB110060029300	Clydach - headwaters to confluence with Sawdde	Bannau Brycheiniog LPA (27.37)
GB110060029310	Dulas - conf with Sannan to confluence with Tywi	Carmarthenshire LPA (6.7)
GB110060029320	Tawelon - headwaters to tidal limit	Carmarthenshire LPA (18.67)
GB110060029340	Sawdde - headwaters to confluence with Clydach	Bannau Brycheiniog LPA (27.09)
GB110060029350	Annell - headwaters to confluence with Tywi	Carmarthenshire LPA (12.64)
GB110060029370	Sawdde - conf with Clydach to confluence with Tywi	Bannau Brycheiniog LPA (23.44), Carmarthenshire LPA (5.67)
GB110060029380	Myddfi - headwaters to confluence with Tywi	Carmarthenshire LPA (19.01)
GB110060035940	Gwydderig - headwaters to confluence with Bran	Bannau Brycheiniog LPA (17.49), Carmarthenshire LPA (23.13), Powys LPA (20.69)
GB110060035950	Bran - conf with Crychan to conf with Tywi	Carmarthenshire LPA (10.67)
GB110060035960	Crychan - headwaters to confluence with Bran	Carmarthenshire LPA (15.04), Powys LPA (0.3)
GB110060035970	Bran - headwaters to confluence with Crychan	Carmarthenshire LPA (37.47), Powys LPA (4.69)
GB110060035990	Pib - headwaters to confluence with Marlais	Carmarthenshire LPA (13.71)
GB110060036000	Marlais (Brechfa) - headwaters to conf Cothi	Carmarthenshire LPA (13.31)
GB110060036020	Clydach - headwaters to confluence with Cothi	Carmarthenshire LPA (26.34)
GB110060036030	Gorlech - headwaters to confluence with Cothi	Carmarthenshire LPA (14.25)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110060036040	Cothi - conf with Twrch to confluence with Marlais	Carmarthenshire LPA (11.04)
GB110060036050	Cothi - headwaters to confluence with Twrch	Carmarthenshire LPA (33), Ceredigion LPA (3.82)
GB110060036060	Melinddwr - headwaters to confluence with Marlais	Carmarthenshire LPA (16.92)
GB110060036070	Annell - headwaters to confluence with Cothi	Carmarthenshire LPA (17.72)
GB110060036080	Marlais - headwaters to conf Cothi	Carmarthenshire LPA (29.1)
GB110060036090	Twrch - headwaters to confluence with Cothi	Carmarthenshire LPA (44.67), Ceredigion LPA (3.49)
GB110060036100	Gwili - headwaters to confluence with Alltwalis	Carmarthenshire LPA (29.35)
GB110060036110	Gwili - conf with Alltwalis to conf with Duad	Carmarthenshire LPA (16.36)
GB110060036120	Gochen - headwaters to confluence with Duad	Carmarthenshire LPA (17.83)
GB110060036130	Alltwalis - headwaters to confluence with Gwili	Carmarthenshire LPA (18.79)
GB110060036140	Duad - headwaters to confluence with Gwili	Carmarthenshire LPA (27.74)
GB110060036180	Bran - confluence with Ydw to confluence with Tywi	Bannau Brycheiniog LPA (1.36), Carmarthenshire LPA (6.74)
GB110060036190	Dulas - headwaters to confluence with Sannan	Carmarthenshire LPA (13.76)
GB110060036200	Sannan - headwaters to confluence with Dulas	Carmarthenshire LPA (16.59)
GB110060036210	Dulais - conf with Ddu to confluence with Tywi	Carmarthenshire LPA (17.71)
GB110060036220	Bran - headwaters to confluence with Ydw	Bannau Brycheiniog LPA (27.09), Carmarthenshire LPA (3.9)
GB110060036230	Dulais - headwaters to confluence with Ddu	Carmarthenshire LPA (14.78)
GB110060036240	Ydw - headwaters to confluence with Bran	Bannau Brycheiniog LPA (4.49), Carmarthenshire LPA (6.74)
GB110060036250	Tywi - conf with Llandovery Bran to conf with Cothi.	Bannau Brycheiniog LPA (18.71), Carmarthenshire LPA (90.84)
GB110060036260	Ddu - headwaters to confluence with Dulais	Carmarthenshire LPA (11.83)
GB110060036290	Marlais - headwaters to confluence with Tywi	Carmarthenshire LPA (12.81)
GB110060036300	Cothi - headwaters to confluence with Tywi	Carmarthenshire LPA (65.31)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110060036310	Mynys - headwaters to confluence with Tywi	Carmarthenshire LPA (15.6)
GB110060036320	Dunant - headwaters to confluence with Tywi	Carmarthenshire LPA (11.62)
GB110060036330	Dulais - headwaters to confluence with Tywi	Carmarthenshire LPA (26.61)
GB110060036340	Gwenlais - headwaters to confluence with Tywi	Carmarthenshire LPA (16.08)
GB110060036350	Tywi - conf with Doethie to conf with Llandovery Bran	Carmarthenshire LPA (41.51)
GB110060036360	Doethie - Pysgotwr Fawr conf to conf with Tywi	Carmarthenshire LPA (2.28), Ceredigion LPA (1.61)
GB110060036370	Gwenffrwd - headwaters to confluence with Tywi	Carmarthenshire LPA (15.53)
GB110060036380	Tywi - Llyn Brianne to confluence with Doethie	Carmarthenshire LPA (6.16), Ceredigion LPA (6.11), Powys LPA (5.06)
GB110060036390	Pysgotwr Fawr - headwaters to conf with Doethie	Carmarthenshire LPA (4.48), Ceredigion LPA (18.3)
GB110060036400	Doethie - headwaters to conf with Pysgotwr Fawr	Carmarthenshire LPA (0.02), Ceredigion LPA (23.28)
GB110060041350	Camddwr - headwaters to Llyn Brianne reservoir	Ceredigion LPA (26.3)
GB110060041360	Tywi - headwaters to Llyn Brianne reservoir	Ceredigion LPA (29.91), Powys LPA (20.24)

Table 7 WFD waterbodies within the Afonydd Cleddau/ Cleddau Rivers SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110061030660	Narbeth Brook - headwaters to conf with E. Cleddau	Pembrokeshire Coast LPA (0.29), Pembrokeshire LPA (17.6)
GB110061030670	Eastern Cleddau - conf with Syfynwy to tidal limit	Pembrokeshire Coast LPA (0.42), Pembrokeshire LPA (15.91)
GB110061030680	Longford Brook - HW to conf with E. Cleddau	Pembrokeshire LPA (14.54)
GB110061030690	Deepford Brook - headwaters to conf with Syfynwy	Pembrokeshire LPA (18.77)
GB110061030700	Syfynwy - Llys-y-fran to conf with E Cleddau	Pembrokeshire LPA (27.9)
GB110061031170	Pelcomb Brook - headwaters to conf with W. Cleddau	Pembrokeshire Coast LPA (0.26), Pembrokeshire LPA (15.83)
GB110061031180	Camrose Brook - headwaters to conf with W. Cleddau	Pembrokeshire Coast LPA (0.3), Pembrokeshire LPA (22.75)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110061031190	Rudbaxton Water - HW to conf with W. Cleddau	Pembrokeshire LPA (12.47)
GB110061031330	Cartlett Brook - HW to conf with W. Cleddau	Pembrokeshire LPA (35.48)
GB110061031340	W Cleddau - Anghof conf to Cartlett Brook conf	Pembrokeshire LPA (33.5)
GB110061031350	Spittal Brook - headwaters to conf with W. Cleddau	Pembrokeshire LPA (17.12)
GB110061038290	E. Cleddau - conf with Wern to conf with Syfynwy	Carmarthenshire LPA (1.29), Pembrokeshire Coast LPA (3.01), Pembrokeshire LPA (49.54)
GB110061038300	Syfynwy - headwaters to Llys-y-fran	Pembrokeshire Coast LPA (13.27), Pembrokeshire LPA (11.23)
GB110061038310	Wern - headwaters to conf with Eastern Cleddau	Pembrokeshire Coast LPA (9.07), Pembrokeshire LPA (3.29)
GB110061038320	Eastern Cleddau - headwaters to conf with Wern	Carmarthenshire LPA (3.07), Pembrokeshire Coast LPA (17.84), Pembrokeshire LPA (0.19)
GB110061038651	Western Cleddau - Cleddau North to Anghof conf	Pembrokeshire LPA (26.32)
GB110061038660	Nant y Bugail - headwaters to conf with Cleddau N.	Pembrokeshire LPA (13.47)
GB110061038670	W Cleddau - headwaters to conf with Cleddau North	Pembrokeshire LPA (19.35)
GB110061038680	Cleddau North - H'waters to conf with W. Cled	Pembrokeshire LPA (17.1)
GB110061038690	Anghof - headwaters to conf with Western Cleddau	Pembrokeshire Coast LPA (9.16), Pembrokeshire LPA (29.71)

Table 8 WFD waterbodies within the parts of the Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites SAC catchment that drain to riverine features i.e. the Afon Glaslyn SSSI

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB110065053810	Portreuddyn (Glaslyn)	Eryri LPA (2.38), Gwynedd LPA (0.79)
GB110065053840	Gaseg - upper	Eryri LPA (7.27), Gwynedd LPA (4.16)
GB110065053860	Glaslyn - tidal to Afon Croesor	Eryri LPA (5.2), Gwynedd LPA (9.71)
GB110065053890	Croesor	Eryri LPA (16.88), Gwynedd LPA (2.23)
GB110065053910	Glaslyn - Nanmor to Colwyn	Eryri LPA (11.23)
GB110065053930	Nanmor	Eryri LPA (12.45)
GB110065053950	Colwyn	Eryri LPA (21.87)
GB110065053960	Glaslyn - upstream Colwyn	Eryri LPA (45.65)

Table 9 WFD waterbodies within the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB111067046410	Dee - upstream Llyn Tegid	Eryri LPA (21.83)
GB111067046420	Twrch	Eryri LPA (31.24)
GB111067051600	Morlas Brook	Wrexham LPA (3.22)
GB111067051610	Ceiriog - upstream of Teirw	Denbighshire LPA (0.28), Powys LPA (0.95), Wrexham LPA (54.93)
GB111067051620	Teirw	Denbighshire LPA (0.01), Wrexham LPA (16.28)
GB111067051630	Ffrauer	Denbighshire LPA (4.63), Gwynedd LPA (7.8)
GB111067051640	Merddwr (Dee)	Conwy LPA (2.94), Gwynedd LPA (8.19)
GB111067051650	Medrad	Conwy LPA (12.56), Gwynedd LPA (2.4)
GB111067051660	Ceirw - Alwen to Medrad	Conwy LPA (13.37), Gwynedd LPA (0.07)
GB111067051670	Ceirw - Medrad to Nug	Conwy LPA (9.28)
GB111067051680	Ceirw - above Nug	Conwy LPA (14.34), Eryri LPA (2.69), Gwynedd LPA (3.55)
GB111067051690	Clywedog - Gwenfro to Black Brook	Wrexham LPA (9.17)
GB111067051700	Black Brook (Clywedog)	Wrexham LPA (26)
GB111067051710	Nug	Conwy LPA (14.3)
GB111067051720	Clywedog - above Black Brook	Denbighshire LPA (2.4), Wrexham LPA (18.82)
GB111067051730	Gwenfro	Wrexham LPA (20.96)
GB111067051750	Alwen - Ceirw to Brenig	Conwy LPA (27.24), Denbighshire LPA (16.42)
GB111067051760	Alwen - above Afon Brenig	Conwy LPA (28.01), Denbighshire LPA (3.06)
GB111067051770	Cegidog	Denbighshire LPA (3.02), Flintshire LPA (21.21), Wrexham LPA (8.24)
GB111067051780	Brenig - trib from Llyn Bran	Conwy LPA (1.85), Denbighshire LPA (5.5)
GB111067051790	Brenig - reservoir and east catchment	Conwy LPA (7.79), Denbighshire LPA (9.33)
GB111067051800	Terrig	Denbighshire LPA (7.88), Flintshire LPA (16.43)
GB111067051810	Alyn - upstream Dolfechlas Brook	Denbighshire LPA (62.86), Flintshire LPA (20.47)
GB111067051820	Glyn	Eryri LPA (13.19)
GB111067051840	Caletwr	Denbighshire LPA (0.46), Eryri LPA (7.43), Gwynedd LPA (1.25)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB111067051850	Lliw	Eryri LPA (35.55)
GB111067051860	Hirnant	Eryri LPA (33.24), Gwynedd LPA (0.34)
GB111067051870	Llafar	Eryri LPA (28.44)
GB111067051880	Ceidiog	Denbighshire LPA (35.57), Eryri LPA (0.58), Gwynedd LPA (0.3), Powys LPA (0.97)
GB111067051890	Llynor	Denbighshire LPA (11.69)
GB111067051900	Tryweryn - Dee to Mynach	Eryri LPA (15.39), Gwynedd LPA (4.47)
GB111067051910	Ceiriog - confluence Dee to Teirw	Denbighshire LPA (0.17), Wrexham LPA (39.47)
GB111067051930	Shell Brook	Wrexham LPA (1.32)
GB111067051940	Trystion	Denbighshire LPA (13.86), Wrexham LPA (0.05)
GB111067051950	Tryweryn - Llyn Celyn to Llyn Treweryn Inlet	Eryri LPA (34.37)
GB111067051960	Meloch	Conwy LPA (0.08), Gwynedd LPA (16.16)
GB111067051980	Tryweryn - Mynach to Llyn Celyn	Eryri LPA (12.02)
GB111067051990	Mynach	Eryri LPA (8.95), Gwynedd LPA (8.2)
GB111067052000	Hesgin	Conwy LPA (0.07), Eryri LPA (10.12)
GB111067052010	Trefnant Brook	Denbighshire LPA (1.63), Wrexham LPA (9.05)
GB111067052020	Alwen - Dee to Ceirw	Conwy LPA (0.61), Denbighshire LPA (3.43), Gwynedd LPA (1.73)
GB111067052030	Gelyn	Eryri LPA (18.22)
GB111067052040	Dungrey Brook	Wrexham LPA (13.95)
GB111067052050	Eitha	Denbighshire LPA (0.01), Wrexham LPA (16.2)
GB111067052060	Dee - Ceiriog to Alwen	Denbighshire LPA (102.32), Wrexham LPA (26.38)
GB111067052070	Camddwr	Denbighshire LPA (13.88)
GB111067052080	Eglwyseg	Denbighshire LPA (21.09), Wrexham LPA (0.21)
GB111067052090	Worthenbury Brook - lower	Wrexham LPA (6.15)
GB111067052100	Morwynion	Denbighshire LPA (29.01)
GB111067052110	Clywedog - Dee to Gwenfro	Wrexham LPA (25.92)
GB111067052130	Pulford Brook	Flintshire LPA (20.55), Wrexham LPA (17.61)
GB111067052150	Balderton drain	Flintshire LPA (3.6)
GB111067052160	Sandycroft Drain	Flintshire LPA (17.58)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB111067052171	Alyn - Dolfechlas to Leadmill	Flintshire LPA (4.6)
GB111067052172	Alyn - Leadmill to Hope	Denbighshire LPA (0.37), Flintshire LPA (50.7)
GB111067052173	Alyn - Hope to Dee	Flintshire LPA (5.89), Wrexham LPA (30.11)
GB111067052200	Worthenbury Brook - upper	Wrexham LPA (18.97)
GB111067052211	Emral Brook	Wrexham LPA (44.38)
GB111067052220	Worthenbury Brook - middle	Wrexham LPA (9.13)
GB111067052240	Dee - Alwen to Llyn Tegid	Denbighshire LPA (22.93), Eryri LPA (24.39), Gwynedd LPA (27.38)
GB111067056870	Dolfechlas Brook	Denbighshire LPA (0.01), Flintshire LPA (14.21)
GB111067056880	Wepre Brook	Flintshire LPA (20.68)
GB111067056930	Finchetts Gutter	Flintshire LPA (5.6)
GB111067056960	Shotwick Brook	Flintshire LPA (7.18)
GB111067057080	Dee - Chester Weir to Ceiriog	Wrexham LPA (68.17)

Table 10 WFD waterbodies within the River Usk/ Afon Wysg SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB109056026790	Dowlais Bk - source to conf Afon Lwyd	Newport LPA (0.15), Torfaen LPA (9.85)
GB109056026840	Pantyreos Bk - source to Barrack Hill	Caerphilly LPA (0.41), Newport LPA (13.84), Torfaen LPA (11.06)
GB109056026890	Usk - conf Olway Bk to New Br	Monmouthshire LPA (23.67)
GB109056026900	Sor Bk - source to Sor Bk Br	Monmouthshire LPA (22.45), Newport LPA (0.38), Torfaen LPA (3.98)
GB109056026920	Pill Bk - source to conf Olway Bk	Monmouthshire LPA (32.18)
GB109056026940	Olway Bk - conf Nant y Wilcae to R Usk	Monmouthshire LPA (19.21)
GB109056026950	Berthin Bk - source to conf R Usk	Bannau Brycheiniog LPA (4.6), Monmouthshire LPA (13.43), Torfaen LPA (4.89)
GB109056032911	Afon Lwyd - below Mon and Brecon Canal	Caerphilly LPA (0.02), Monmouthshire LPA (3.61), Newport LPA (3.12), Torfaen LPA (23.27)
GB109056032912	Afon Lwyd - source to Mon and Brecon Canal	Bannau Brycheiniog LPA (0.89), Blaenau Gwent LPA (1.31), Caerphilly LPA (0.05), Torfaen LPA (63.71)
GB109056032920	Olway Bk - source to conf Nant y Wilcae	Monmouthshire LPA (33.74)
GB109056032930	Nant y Wilcae - source to conf Olway Bk	Monmouthshire LPA (27)
GB109056032940	Clawdd Bk - source to conf R Usk	Monmouthshire LPA (16.33)
GB109056032950	Nant Onnau - source to conf R Usk	Bannau Brycheiniog LPA (10.47)
GB109056032960	Nant Cleisfer - source to conf R Usk	Bannau Brycheiniog LPA (10.35)
GB109056032970	Afon Crawnon - source to conf R Usk	Bannau Brycheiniog LPA (18.31)
GB109056032980	Grwyne Fawr - conf Grwyne-Fechan to conf R Usk	Bannau Brycheiniog LPA (7.19)
GB109056032990	Gavenny - source to conflence R Usk	Bannau Brycheiniog LPA (15.38), Monmouthshire LPA (5.84)
GB109056033000	Caerfanell - source to conf R Usk	Bannau Brycheiniog LPA (38.38)
GB109056033010	Nant Menasgin - source to conf R Usk	Bannau Brycheiniog LPA (17.7)
GB109056033020	Afon Cynrig - source to conf R Usk	Bannau Brycheiniog LPA (16.59)
GB109056033030	Afon Hydfer - source to conf R Usk	Bannau Brycheiniog LPA (15.34)
GB109056033040	Cwm Treweryn - source to River Senni	Bannau Brycheiniog LPA (10.6)
GB109056033050	Senni - source to conf River Usk	Bannau Brycheiniog LPA (31.21)
GB109056033070	Afon Tarell - source to conf R Usk	Bannau Brycheiniog LPA (40.62)
GB109056033080	Afon Crai - source to conf R Usk	Bannau Brycheiniog LPA (31.65)
GB109056033090	Clydach - source to conf R Usk	Bannau Brycheiniog LPA (26.12), Blaenau Gwent LPA (7.35), Torfaen LPA (0.67)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB109056039960	Grwyne-Fechan - source to conf Grwyne Fawr	Bannau Brycheiniog LPA (33.2)
GB109056039970	Usk - source to conf Afon Hydfer	Bannau Brycheiniog LPA (25.08)
GB109056039980	Usk - conf Afon Hydfer to conf Afon Senni	Bannau Brycheiniog LPA (12.38), Powys LPA (9.17)
GB109056039990	Rhiangoll - source to conf R Usk	Bannau Brycheiniog LPA (48.57)
GB109056040000	Grwyne Fawr - source to conf Grwyne-Fechan	Bannau Brycheiniog LPA (43.66)
GB109056040020	Afon Yscir - conf Yscir Fechan to conf R Usk	Bannau Brycheiniog LPA (0.72), Powys LPA (11.84)
GB109056040030	Cilieni - source to conf R Usk	Bannau Brycheiniog LPA (2), Powys LPA (39.86)
GB109056040040	Nant Bran - source to conf R Usk	Bannau Brycheiniog LPA (0.35), Powys LPA (43.23)
GB109056040050	Yscir Fechan - source to conf Afon Yscir	Powys LPA (24.58)
GB109056040060	Honddu - source to conf R Usk	Bannau Brycheiniog LPA (3.24), Powys LPA (61.36)
GB109056040070	Afon Yscir - source to conf Yscir Fechan	Powys LPA (28.1)
GB109056040081	Usk - conf Afon Senni to conf Afon Crawnon	Bannau Brycheiniog LPA (69.07), Powys LPA (13.97)
GB109056040082	Usk conf Afon Crawnon to conf Gavenny R	Bannau Brycheiniog LPA (68.42), Monmouthshire LPA (4.22)
GB109056040083	Usk - conf R Gavenny to conf Olway Bk	Bannau Brycheiniog LPA (21.25), Monmouthshire LPA (75.79), Torfaen LPA (0.79)
GB109056026790	Dowlais Bk - source to conf Afon Lwyd	Newport LPA (0.15), Torfaen LPA (9.85)
GB109056026840	Pantyreos Bk - source to Barrack Hill	Caerphilly LPA (0.41), Newport LPA (13.84), Torfaen LPA (11.06)
GB109056026890	Usk - conf Olway Bk to New Br	Monmouthshire LPA (23.67)

Table 11 WFD waterbodies within the River Wye/ Afon Gwy SAC catchment

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB109055022830	Tintern Bk - source to conf R Wye	Monmouthshire LPA (21.54)
GB109055029610	Norton Bk - source to conf R Monnow	Monmouthshire LPA (13.19)
GB109055029620	Monnow - conf Escley Bk to conf Afon Honddu	Bannau Brycheiniog LPA (4.62)
GB109055029630	Llanymynech Bk - source to conf R Trothy	Bannau Brycheiniog LPA (2.33), Monmouthshire LPA (16.5)
GB109055029640	Trothy - conf Llanymynach Bk to conf Llymon Bk	Monmouthshire LPA (23.26)
GB109055029650	Llymon Bk - source to conf R Trothy	Monmouthshire LPA (12.33)
GB109055029660	Trothy - source to conf Llanymynech Bk	Bannau Brycheiniog LPA (0.58), Monmouthshire LPA (36.25)
GB109055029680	Trothy - conf Llymon Bk to conf R Wye	Monmouthshire LPA (53.65)
GB109055029720	Monnow - conf Afon Honddu to conf R Wye	Monmouthshire LPA (57.7)
GB109055036590	Arrow - source to conf Gladestry Bk	Powys LPA (40.6)
GB109055036600	Gladestry Bk - source to conf R Arrow	Powys LPA (16.34)
GB109055036680	Cledan - source to conf R Irfon	Carmarthenshire LPA (0.31), Powys LPA (16.36)
GB109055036690	Tirabad Dulas - source to conf R Irfon	Carmarthenshire LPA (1.59), Powys LPA (30.31)
GB109055036760	Irfon - conf Afon Gwesyn to conf Cledan	Powys LPA (38.04)
GB109055036820	Olchon Bk - source to conf R Monnow	Bannau Brycheiniog LPA (0.08)
GB109055036830	Afon Honddu - source to conf R Monnow	Bannau Brycheiniog LPA (60.33), Monmouthshire LPA (2.64)
GB109055036900	Afon Llynfi - source to conf Dulas Bk	Bannau Brycheiniog LPA (35.52), Powys LPA (21.6)
GB109055036910	Ennig - source to conf Afon Llynfi	Bannau Brycheiniog LPA (19.74), Powys LPA (0.04)
GB109055036920	Dulas Bk - source to conf Afon Llynfi	Powys LPA (28.08)
GB109055036950	Afon Llynfi - conf Dulas Bk to conf R Wye	Bannau Brycheiniog LPA (15.77), Powys LPA (12.19)
GB109055036970	Triffrwd - source to Dulas	Powys LPA (17.87)
GB109055036980	Digedi Bk - source to conf R Wye	Bannau Brycheiniog LPA (11.15), Powys LPA (1.1)
GB109055036990	Scithwen Bk - source to conf R Wye	Powys LPA (17.85)
GB109055037010	Hay Dulas Bk - source to conf R Wye	Bannau Brycheiniog LPA (7.6)
GB109055037020	Clyro Bk - source to conf R Wye	Powys LPA (11.33)
GB109055037030	Clettwr Bk - source to conf R Wye	Powys LPA (27.46)
GB109055037050	Duhonw - source to conf R Wye	Powys LPA (31.34)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB109055037060	Bach Howey Bk - source to conf R Wye	Powys LPA (47.55)
GB109055037070	Willersley Bk - source to conf R Wye	Powys LPA (0.09)
GB109055037080	Edw - conf Clas Bk to conf R Wye	Powys LPA (30.82)
GB109055037090	Irfon - conf Cledan to conf R Wye	Powys LPA (61.34)
GB109055037111	Wye - conf Walford Bk to Bigsweir Br	Monmouthshire LPA (33.01)
GB109055037115	Wye - conf R Irfon to Scithwen Bk	Powys LPA (42.61)
GB109055037116	Wye - Scithwen Bk to Brewardine Br	Bannau Brycheiniog LPA (5.95), Powys LPA (71.37)
GB109055037130	Edw - conf Camnant Bk to conf Clas Bk	Powys LPA (6.56)
GB109055037140	Clas Bk - source to conf R Edw	Powys LPA (11.25)
GB109055037150	Wye (Avon Gwy) - conf R Ithon to conf R Irfon	Powys LPA (15.15)
GB109055037160	Builth Dulas Bk - source to conf R Wye	Powys LPA (16.67)
GB109055041830	Gilwern Bk - source to conf R Arrow	Powys LPA (24.55)
GB109055041870	Afon Gwesyn - source to conf R Irfon	Powys LPA (10.39)
GB109055041880	Afon Cammarch - source to conf R Irfon	Powys LPA (42.22)
GB109055041890	Afon Garth Dulas - source to conf R Irfon	Powys LPA (31.26)
GB109055041900	Howey Bk - source to conf R Ithon	Powys LPA (12.57)
GB109055041910	Irfon - source to conf Afon Gwesyn	Powys LPA (25.02)
GB109055041930	Hindwell Bk - conf Knobley Bk to conf R Lugg	Powys LPA (9.2)
GB109055041960	Mithil Bk - source to conf R Ithon	Powys LPA (18.17)
GB109055041970	Hindwell Bk - source to conf Knobley Bk	Powys LPA (37.26)
GB109055041980	Knobley Bk - source to conf Hindwell Bk	Powys LPA (19.27)
GB109055041990	Cascob Bk - source to conf R Lugg	Powys LPA (14.96)
GB109055042010	Lugg - conf Cascob Bk to conf Norton Bk	Powys LPA (8.65)
GB109055042020	Lugg - conf Bleddfa Bk to conf Cascob Bk	Powys LPA (15.83)
GB109055042030	Lugg - conf Norton Bk to conf R Arrow	Powys LPA (8.09)
GB109055042040	Norton Bk - source to conf R Lugg	Powys LPA (9.86)
GB109055042050	Bleddfa Bk - source to conf R Lugg	Powys LPA (19.93)
GB109055042060	Lime Bk - source to conf R Lugg	Powys LPA (0.94)
GB109055042070	Clywedog Bk - conf Bachell Bk to conf R Ithon	Powys LPA (19.96)
GB109055042080	Nantmel Dulas - source to conf R Ithon	Powys LPA (29.4)
GB109055042090	Clywedog Bk - source to conf Bachell Bk	Powys LPA (17.88)
GB109055042100	Lugg Bk - source to conf Bleddfa Bk	Powys LPA (30.6)
GB109055042110	Aran - source to conf R Ithon	Powys LPA (58.15)

WFD Waterbody ID	WFD Waterbody name	LPAs within WFD waterbody catchment (area in km2)
GB109055042120	Bachell Bk - source to conf Clywedog Bk	Powys LPA (19.18)
GB109055042130	Camddwr Bk - source to conf R Ithon	Powys LPA (18.91)
GB109055042140	Ithon - conf Gwenlas Bk to conf Camddwr Bk	Powys LPA (31.78)
GB109055042150	Ithon - conf Llaethdy Bk to conf Gwenlas Bk	Powys LPA (5.37)
GB109055042160	Llaethdy Bk - source to conf R Ithon	Powys LPA (14.9)
GB109055042170	Gwenlas Bk - source to conf R Ithon	Powys LPA (12.08)
GB109055042180	Ithon - source to conf Llaethdy Bk	Powys LPA (25.25)
GB109055042190	Afon Chwefru - source to conf R Irfon	Powys LPA (33.69)
GB109055042200	Edw - source to conf Colwyn Bk	Powys LPA (35.22)
GB109055042210	Rhiwnant - source to conf Afon Claerwen	Powys LPA (15.03)
GB109055042230	Afon Claerwen - conf Afon Arban to Caban-coch	Powys LPA (18.38)
GB109055042240	Afon Arban - source to conf Afon Claerwen	Powys LPA (12.02)
GB109055042250	Wye - conf Afon Elan to conf R Ithon	Powys LPA (65.49)
GB109055042260	Afon Elan - Caban-coch Rsvr to conf R Wye	Powys LPA (18.96)
GB109055042270	Ithon - conf Camddwr Bk to conf R Wye	Powys LPA (77.11)
GB109055042280	Wye - conf to conf Afon Marteg to conf Afon Elan	Powys LPA (32.64)
GB109055042290	Afon Claerwen - source to conf Afon Arban	Ceredigion LPA (23.51), Powys LPA (29.96)
GB109055042300	Afon Elan - source to Pont ar Elan	Ceredigion LPA (10.34), Powys LPA (70.48)
GB109055042310	Afon Marteg - source to conf R Wye	Powys LPA (51.89)
GB109055042320	Wye - conf Afon Bidno to conf Afon Marteg	Powys LPA (36.73)
GB109055042330	Wye - conf Afon Tarenig to conf Afon Bidno	Powys LPA (15.61)
GB109055042340	Afon Bidno - source to conf R Wye	Powys LPA (11.61)
GB109055042350	Afon Tarenig - source to conf R Wye	Ceredigion LPA (8.85), Powys LPA (4.67)

Appendix 2 Table of Wastewater Treatment Works By Catchment

Table 12 WwTW within Afon Eden - Cors Goch Trawsfynydd SAC Catchment

WwTW name	WwTW name	WwTW name
Ganllwyd STW	Bronaber STW	Llanfachreth WwTW

Table 13 WwTW within Afon Teifi / River Teifi SAC Catchment

WwTW name	WwTW name	WwTW name
Abercych WwTW	Danrhelyg STW	Newchapel STW
Adpar WwTW	Drefach/Velindre WwTW	Pencader STW
Beulah WwTW	Ffostrasol STW	Pentrecwrt STW
Blaenannerch STW	Gorsgoch STW	Pontrhydfendigaid WwTW
Boncath STW	Henllan STW	Pontrhydyceirt STW
Bryndulais STW	Lampeter STW	Rhoshill STW
Capel Iwan STW	Llandewi Brefi WwTW	Rhosygadair Newydd Blaenannerch
Cardigan WwTW	Llandysul WwTW	Rhydlewis STW
Cellan WwTW	Llanfair Clydogau WwTW	Talgarreg WwTW
Cenarth WwTW	Llanfihangel-Ar-Arth STW	Tregaron WwTW
Cilgerran STW	Llangybi STW	Verwig STW
Cribyn WwTW	Llanybydder WwTW	
Cwrtnewydd STW	Llechryd STW	

Table 14 WwTW within Afon Tywi / River Tywi Catchment

WwTW name	WwTW name	WwTW name
Abergorlech WwTW	Cwm Ifor WwTW	Llandovery WwTW
Alltwalis STW	Cwmduad STW	Llangadog STW
Bethlehem STW	Cwrt Henri STW	Llanpumpsaint WwTW
Brechfa WwTW	Cynghordy WwTW	Llansawel WwTW
Bro Dolau STW	Cynwyl Elfed WwTW	Myddfai WwTW
Bro Nant STW	Farmers STW	Pont-Ar-Gothi & Nantgaredig WwTW
Broad Oak WwTW	Felingwm WwTW	Pumpsaint STW
Bronwydd STW	Ffairfach STW	Rhandirmwyn STW
Bryngwyn WwTW	Glanyrafon STW	Salem STW
Caio STW	Golden Grove WwTW	Talley WwTW
Cilycwm WwTW	Gwynfe STW	Trapp STW
Crugybar STW	Heol Timothy STW	Twynllanan STW

Table 15 WwTW within Afonydd Cleddau / Cleddau Rivers Catchment

WwTW name	WwTW name	WwTW name
Ambleston STW	Llangolman STW	Robeston Wathen Housing Act Works
Camrose WwTW	Llawhaden STW	Rosebush WwTW
Castlemorris Wastewater Treatment	Llys Y Fran WwTW	Spittal WwTW
Clarbeston WwTW	Llysyfran Reservoir STW	Treffgarne STW
Clynderwen STW	Maenclochog STW	Walton East STW
Keeston WwTW	Mathry STW	Wiston STW
Letterston West STW	Panteg STW	Wolfscastle STW
Llanddewi Velfrey STW	Puncheston WwTW	

Table 16 WwTW within Afon Dyfrdwy a Llyn Tegid / River Dee and Bala Lake Catchment

WwTW name	WwTW name	WwTW name
Abenbury WwTW	Glan Yr Afon STW	Mold WwTW
Alwen Septic Tank	Glynceiriog STW	Overton WwTW
Bala WwTW	Glyndyfrdwy WwTW	Pandy STW
Bangor On Dee STW	Grainnrhyd STW	Parc STW
Betws Gwerfil Goch STW	Gresford STW	Penley STW
Bowling Bank STW	Halton WwTW	Penrallt STW
Bronington STW	Hanmer Arrowy STW	Pentre Llyn Cymer STW
Bryneglwys STW	Holt STW	Pen-Y-Stryt WwTW
Carrog WwTW	Hope WwTW	Pontfadog STW
Cefn Brith STW	Isycoed Marshlea STW	Queensferry WwTW
Cefn Mawr WwTW	Lavister WwTW	Rhosesmor STW
Cerrigydrudion STW	Llanarmon Dc STW	Rhyduchaf STW
Cilcain Pantymwyn STW	Llanarmon-Yn-Ial STW	Rhydymwyn STW
Connahs Quay STW	Llandderfel WwTW	Sarnau STW
Corwen WwTW	Llandrillo STW	Tregeiriog STW
Cynwyd STW	Llanfihangel Glyn Myfyr STW	Treuddyn (Bridge Terrace) STW
Dinmael STW	Llanfor STW	Treuddyn Lodge Villas STW
Dolywern STW	Llanfynydd STW	Treuddyn WwTW
Erbistock STW	Llangollen WwTW	Tryweryn Dam STW
Fenns Bank STW	Llangower STW	Ty Gwyn WwTW
Five Fords STW	Llanuwchllyn STW	Whitehurst STW
Four Crosses STW	Llidiart Annie STW	Worthenbury STW
Froncysyllte STW	Maes Y Groes STW	

WwTW name	WwTW name	WwTW name
Frongoch STW	Min-Y-Rhos STW	

Table 17 WwTW within • Afon Wysg / River Usk Catchment

WwTW name	WwTW name	WwTW name
Aber STW	Gwernesney STW	Nash STW
Aberbaiden STW	Libanus WwTW	Pantygasseg WwTW
Brecon STW	Little Mill STW	Pencelli STW
Bryn WwTW	Llanarth STW	Pennorth And Scethrog STW
Brynmawr STW	Llanbedr WwTW	Pontfaen STW
Bwlch (S) STW	Llanddew STW	Ponthir STW
Caerleon Road STW	Llandegfedd (Waunypwll) STW	Raglan Enterprise Park
Christchurch WwTW	Llanellen STW	Raglan STW
Coedwaungaer STW	Llanfihangle Nant Bran STW	Sennybridge Army Camp STW
Cradoc STW	Llanfoist WwTW	STP at Cross Oak
Cray STW	Llanfyrnach STW	STW at Lower Chapel Brecon ,
Crickhowell STW	Llangenny STW	STW Serving Court Farm Wtw
Cwmdu STW	Llangybi STW	Talybont STW
Dan Y Parc Highways Depot STW	Llanishen STW	Trecastle WwTW
Devauden STW	Llanover STW	Tredunnock STW
Glangrwyney STW	Llansoy STW	Trellech STW
Goytre STW	Llanspyddid STW	Tretower STW
Great Oak STW	Llanvair STW	Usk STW
Groesffordd STW	Llanwenarth STW	

WwTW name	WwTW name	WwTW name
Abbeycwmhir WwTW	Gwenddwr STW	Llowes STW
Aberedw STW	Hundred House STW	Llyswen STW
Aberllynfi Three Cocks	Llanbadarn Ffynydd STW	Monmouth STW
Beulah STW	Llanbister STW	Narth WwTW
Builth Road STW	Llandefalle STW	New Radnor STW
Builth Wells STW	Llandegley STW	Newbridge-On-Wye STW
Cefn Gorwydd WwTW	Llandewi Rhydderch STW	Old Radnor STW
Cilmery STW	Llandewi Ystradenny STW	Painscastle STW
Clyro WwTW	Llandogo STW	Pandy STW
Crossgates STW	Llandrindod Wells STW	Pantydwr STW
Cwmyoy STW	Llanfaredd STW	Penrhos STW

WwTW name	WwTW name	WwTW name
Dingestow STW	Llanfilo STW	Penybont STW
Elan Glan-Yr-Afon STW	Llangammarch Wells WwTW	Presteigne STW
Elan Village STW	Llangunllo STW	Rhayader STW
Erwood STW	Llangurig STW	Rockfield STW
Evenjobb STW	Llanigon WwTW	Talgarth STW
Fforddlas STW	Llantilio Crosenny STW	Tintern STW
Garth STW	Llanvapley STW	Tirabad STW
Glasbury STW	Llanwrthwl STW	Velindre STW
Great Craig Cross Ash STW	Llanwrtyd Wells STW	WwTW at Broadstone (Catbrook)
Grosmont WwTW	Llanyre WwTW	

Table 18 WwTW within Afon Gwyrfai a Llyn Cwellyn SAC Catchment

WwTW name	WwTW name	WwTW name
Betws Garmon WwTW	Rhyd Ddu STW	Waunfawr STW
Llanfaglan WwTW		

Table 19 WwTW within Glaslyn SSSI Catchment

WwTW name	WwTW name	WwTW name
Aber (Nant Gwynant) STW	Llanfrothen STW	Toilet Block Pont Bethania Nantgwy
Beddgelert WwTW	Nantmor STW	
Croesor STW	Prenteg STW	

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