



Thaw and Cadoxton Abstraction Licensing Strategy

A licensing strategy to manage water
resources sustainably

May 2015

About Natural Resources Wales

Natural Resources Wales brings together the work of the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales, as well as some functions of Welsh Government. Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future.

Wales' landscape, environment and wildlife are amongst its greatest resource, worth more than £8bn to the Welsh economy.

- We work for Wales' economy and enable the sustainable use of natural resources to support jobs and enterprise. We help businesses and developers to understand and consider environmental impacts when they make important decisions
- We work for the communities of Wales to protect people and their homes as much as possible from environmental incidents like flooding and pollution. We provide opportunities for them to learn, use and benefit from Wales' natural resources
- We work to maintain and improve the quality of the environment for everyone. We work towards making the environment and natural resources more resilient to climate change and other pressures.

We are the principal adviser to the Welsh Government on the environment, enabling the sustainable development of Wales' natural resources for the benefit of people, the economy and wildlife.

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Foreword

Water is the most essential of our natural resources and it is Natural Resources Wales job to ensure that we manage and use it effectively and sustainably in Wales.

The latest population growth and climate change predictions show that pressure on water resources is likely to increase in the future. In light of this, we have to ensure that we continue to maintain and improve sustainable abstraction, balancing the needs of society, the economy and the environment.

This licensing strategy sets out our licensing principles and provides you with information on water availability for further abstraction and how we will manage existing abstraction licences.

Martyn Evans

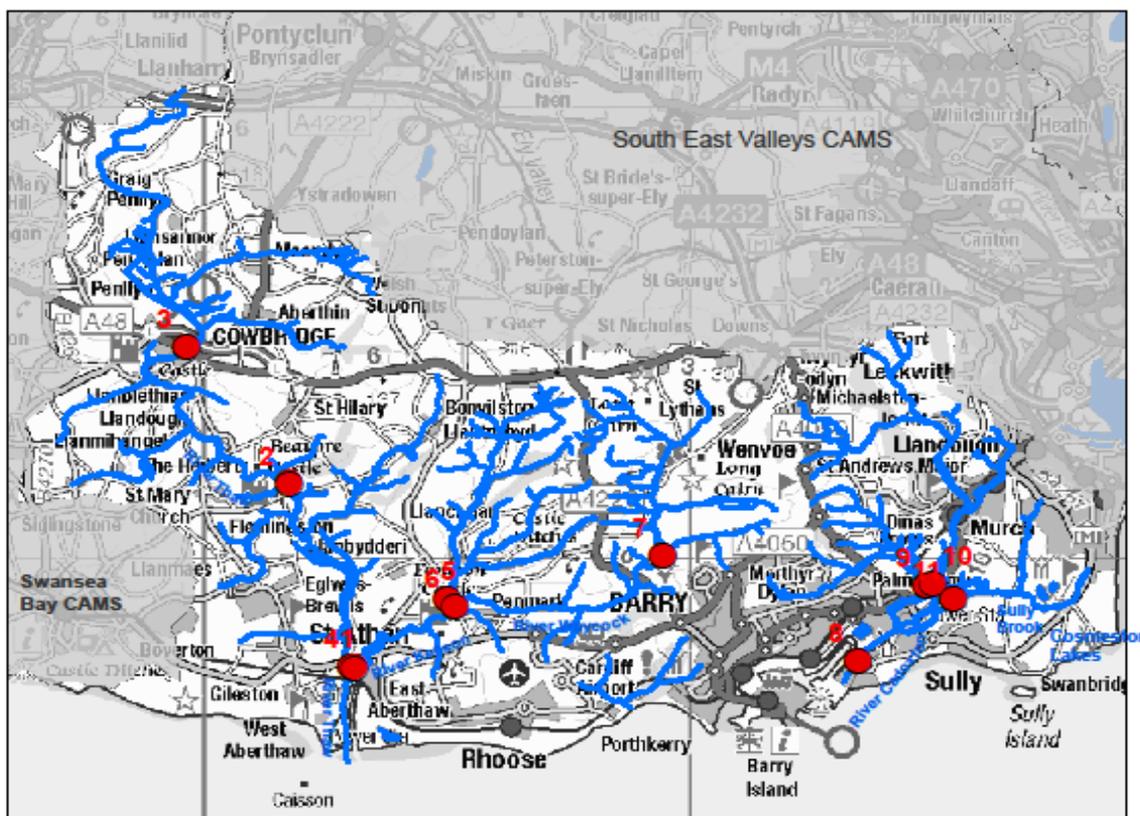
A handwritten signature in black ink that reads "Martyn Evans". The signature is written in a cursive style with a horizontal line above the first few letters.

Ecosystems Planning and Partnerships Manager – South
Natural Resources Wales

Map1: Thaw and Cadoxton Catchment Abstraction Management Strategy Area



Thaw and Cadoxton CAMS Area

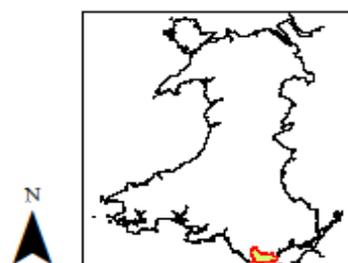


Legend

- Thaw and Cadoxton main rivers
- Main lakes
- Assessment Points (numbered)
- Thaw and Cadoxton CAMS Area
- Surrounding CAMS Areas

00.51 2 3 4 Kilometers

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1. About the Licensing Strategy

This **Licensing Strategy** sets out how water resources are managed in the Thaw and Cadoxton river catchments (Map 1). It provides information about where water is available for abstraction and an indication of how reliable a new abstraction licence may be. It also outlines our licensing principles for these catchments.

This strategy was produced in May 2015 and it supersedes the strategy issued in July 2006 and the update published in December 2010.

We now assess water resources at a sub-catchment level called [water bodies](#) in line with the Water Framework Directive. This means that we can provide more detailed information on the availability of water resources in the Thaw and Cadoxton Catchment Abstraction Management Strategy (CAMS) area compared to the scale used in the previous strategy.

1.1 When is an abstraction licence required?

You need a licence from us if you want to abstract more than 20 cubic metres (m³) (4,400 gallons) of water per day from a:

- river or stream
- reservoir, lake or pond
- canal
- spring or
- an underground source

Whether or not a licence is granted depends on the amount of water available after the needs of the environment and existing abstractors are met and whether the justification for the abstraction is reasonable.

If you want to apply for an abstraction licence or make changes to a licence that you already have then please contact:

Natural Resources Wales General Enquiries:

- by telephone on 0300 065 3000 (Monday to Friday, 8am to 6pm)
- by email enquiries@naturalresourceswales.gov.uk
- or visit the website at www.cyfoethnaturiolcymru.gov.uk

1.2 How CAMS contribute to achieving environmental objectives under the Water Framework Directive

The Water Framework Directive's (WFD) main objectives are to protect and enhance the water environment and ensure the sustainable use of water resources for economic and social development. Through the CAMS process we consider the impact of abstraction at all flows, from low flows to high flows. This helps us manage

future abstraction more sustainably and allows us to assess the sustainability of existing licences.

The CAMS process incorporates the WFD principles and contributes to the WFD objectives by:

- providing a water resource assessment of rivers, lakes, reservoirs, estuaries and groundwater referred to as water bodies under the WFD;
- identifying water bodies that fail flow conditions expected to support good ecological status;
- preventing deterioration of water body status due to new abstractions;
- providing results which inform [River Basin Management Plans \(RBMPs\)](#).

Information on the Western Wales River Basin District which encompasses the Thaw and Cadoxton river catchments can be found on our web pages at '[Improving Water Quality](#)'. The division of the Thaw and Cadoxton river catchments into their constituent water bodies is depicted on Map 3.

The background, aims and principles of CAMS, the overarching principles we use when managing abstraction licences and links with other initiatives are detailed in the Environment Agency's document: 'Managing Water Abstraction'. You should read 'Managing Water Abstraction' when reading this catchment specific licensing strategy. 'Managing Water Abstraction' is available on the website 'www.gov.uk/government/organisations/environment-agency' or can be accessed from our CAMS web pages under 'Other websites'.

2. Thaw and Cadoxton CAMS Area

2.1 The CAMS area

The Thaw and Cadoxton CAMS area encompasses approximately 159 km² of distinctive low-lying landscape in the Vale of Glamorgan; with a small range of hills to the north of the catchments reaching a height of 137m above sea level. The area includes the River Thaw and the River Cadoxton and all the tributaries of these two river catchments, such as the River Kenson, the River Waycock, the Nant Llancarfan, Sully Brook and Cold Brook (Map 1).

Although some parts of the CAMS area are urbanised and heavily industrialised the catchments as a whole are rural with much of the land area used for agriculture, mainly as arable and managed grassland.

The area is underlain by solid rocks which range from early Devonian to Jurassic in age (approximately 400 to 180 million years before present [Bp]). The solid geology is overlain by an irregular veneer of unconsolidated drift deposits of Quaternary age that were deposited during the last ice age and by modern, post-glacial river systems (approximately 122,000 to 0 years Bp).

The average annual rainfall across these catchments is between 950 – 1250 mm, which is below average compared with Wales (1340 mm) as a whole, reflecting the low-lying nature of the CAMS area. The rivers Thaw and Cadoxton have a [flashy flow regime](#) due to the underlying rocks not able to retain large quantities of water in storage. The rocks generally have rapid groundwater flow through fissures and fractures, provide poor long term storage and therefore little supporting [baseflow](#) to the rivers. As a result, the river systems can experience naturally occurring low river flows during prolonged dry periods. In very dry summers some of the smaller tributaries can dry up.

2.2 Main water resources pressures

There is a low demand for abstraction licences in these catchments. The main pressures on water resources are centred on a small number of large industrial and power generation abstractions, and potable water supply. The majority of licensed abstractions are for agricultural purposes, but these licences only account for 3% of the total quantity authorised for abstraction.

2.3 Ecological importance

Despite its relatively small area, the geology, coastal location and land management of the Vale of Glamorgan results in a great variety of habitats. Nineteen key [UK Biodiversity Action Plan](#) (BAP) habitats can be found.

The catchment watercourses provide an important migratory corridor for wildlife, including species such as otter, water voles and bats protected by the Wildlife and Countryside Act 1981 and the European Habitats Regulations. The river corridor habitat is also important for breeding birds (protected by the Wildlife and Countryside Act 1981).

There are two nationally designated water related sites near to the town of Barry. Cosmeston Lakes Site of Special Scientific Interest (SSSI) contains a range of wildlife habitats including lagoons, swamp, scrub, grassland, streams, trees and hedges. Cog Moors SSSI is an area of damp grassland, marsh, ditches, swamp and ponds. It contains a short section of the Sully Brook.

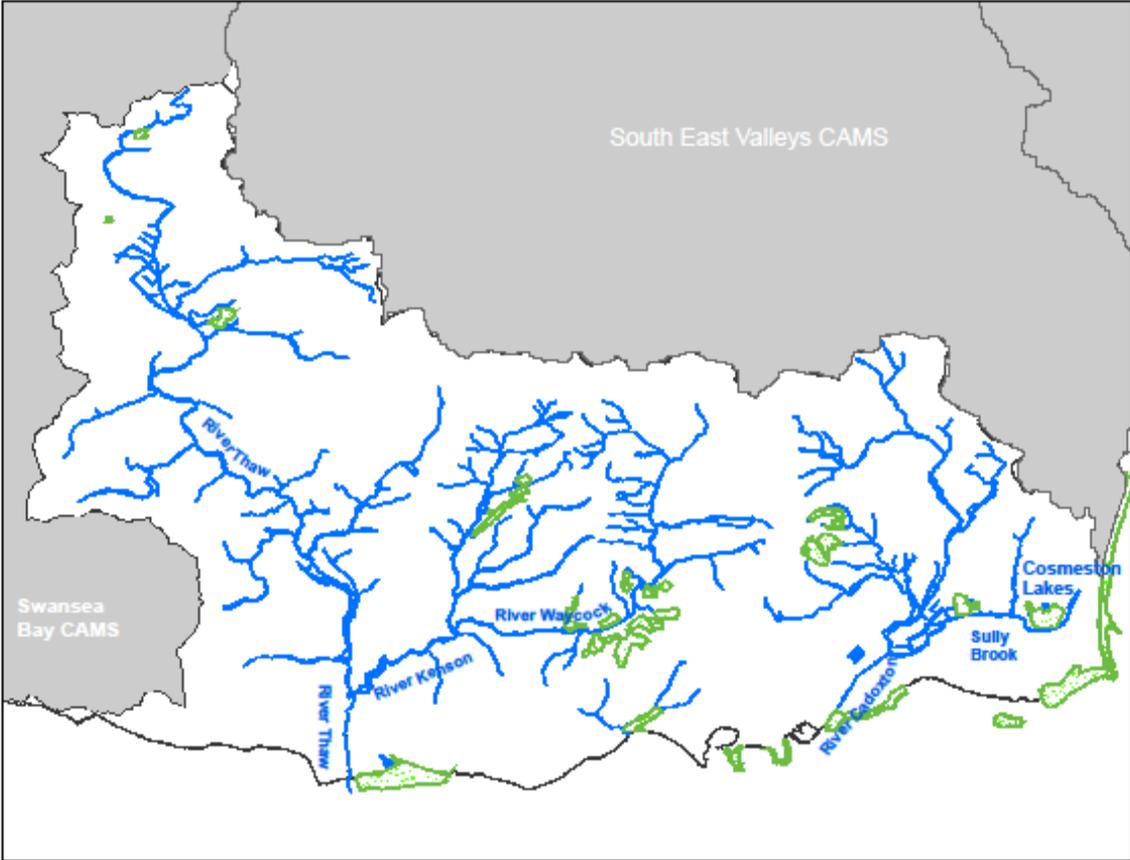
Due to the sub-optimal habitat, the River Cadoxton has no significant fishery present. Whilst, the River Thaw has a good population of brown trout and sea trout.

Designated sites are shown on Map 2.

Map 2: Designated sites in the Thaw and Cadoxton CAMS Area



**Thaw and Cadoxton CAMS Area
Designated Sites**



Legend

-  SSSI
-  Thaw and Cadoxton main rivers
-  Thaw and Cadoxton CAMS Area
-  Surrounding CAMS Areas



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3. Water Resource Availability of the Thaw and Cadoxton CAMS Area

3.1 Resource assessment

By taking into account the amount of water already licensed for abstraction and how much water the environment needs, we can determine how much water is potentially available for further abstraction.

Resource assessment is at the heart of abstraction management. We have a monitoring network to measure river flows and groundwater levels. We use this data along with our knowledge of human influences and environmental needs to establish a baseline of water availability for each water body that builds into a picture for the catchment. The main components of this assessment that help us to understand the availability of water resources are:

- river flows – measured at gauging stations;
- groundwater levels – measured at borehole monitoring stations;
- licensed abstraction quantities – the abstraction quantities stipulated on licences, termed the CAMS Fully Licensed (FL) scenario;
- actual quantities of water abstracted – the amount of water that has actually been abstracted on average over the previous six years, termed the CAMS Recent Actual (RA) scenario;
- consented discharges – water returned to rivers, streams and groundwater;
- a water resource allocation for the environment, defined as a proportion of the [natural flow](#) and known as the [Environmental Flow Indicator](#) (EFI).

3.2 Resource availability

The availability of water for abstraction is determined by the relationship between the CAMS FL scenario and the CAMS RA scenario in comparison to the needs of the environment defined by the EFI, and whether there is an environmental flow deficit or a risk of a deficit.

3.2.1 Surface water

To show catchment resource availability we use a colour coded classification system which indicates:

- the relative balance between the environmental requirements for water and how much is licensed for abstraction;
- whether water is available for further abstraction;
- areas where abstraction may need to be reduced.

River flows change naturally throughout the year, so we need to protect flow variability in our rivers from low to high flow conditions. We use flow statistics to help

to do this. Flow statistics are expressed as the percentage of time that flow is exceeded. Resource availability is calculated at four different flows, [Q95](#) (lowest), Q70, Q50 and Q30 (highest) at points along the river network. These points are called CAMS [Assessment Points](#) (APs) and are shown on Map 1. Q95 low flows reflect dry, low rainfall conditions and Q30 high flows reflect very wet, high rainfall conditions. There are 11 CAMS APs in the Thaw and Cadoxton CAMS area. Resource availability at the WFD water body sub-catchment level is derived based on a simple interpolation between CAMS APs.

The Thaw and Cadoxton CAMS area water resource availability colours and licensing implications are explained in Table 1. Resource availability at the water body scale is shown as Map 3.

After reviewing the CAMS process for this licence strategy, we still have concerns about the amount of water abstracted from the River Cadoxton catchment. For new licensed [consumptive](#) abstraction in this catchment, water may only be available at high flows.

Additional information on resource availability can be found in Managing Water Abstraction accessed from our CAMS web pages under ‘Other websites’.

Water resource availability colour	Implications for licensing in the Thaw and Cadoxton CAMS Area
Water available for licensing	<p>There is more water than required to meet the needs of the environment at the flows stated in Map 3. New licences will be considered depending on local and downstream impacts (refer to Section 4.2).</p> <ul style="list-style-type: none"> • Any consumptive licence issued will have abstraction restrictions to protect low flows, and • Non-consumptive licences can be issued but local flow restrictions may be applied.
Restricted water available for licensing	<p>At these flows shown on Map 3, the volume of water licensed compromises the needs of the environment. If all licensed water is abstracted, there will not be enough water left for the environment. This means at the flows stated in Map 3 :</p> <ul style="list-style-type: none"> • No further consumptive licences will be granted. • Non-consumptive licences can be issued but local flow restrictions may be applied. <p>In this situation, water may be available if you can ‘buy’ the entitlement to abstract water from an existing licence holder (known as licence trading, see Section 4.7).</p>

Water not available for licensing

At these flows shown on Map 3, the amount of water that is actually abstracted compromises the flow needs of the riverine ecology. Flows in these water bodies are below the indicative flow requirement to help support WFD ecological objectives. This means at the flows stated in Map 3 :

- No further consumptive licences will be granted.
- Non-consumptive licences can be issued but local flow restrictions will be applied.

Water may be available if you can 'buy' (known as licence trading) the amount equivalent to recently abstracted from an existing licence holder (see section 4.7).

This environmental flow deficit is under review in the Restoring Sustainable Abstraction Programme (see Section 4.9).

Table 1: Implications of surface water resource availability colours

3.2.2 Groundwater

There is limited data on groundwater levels and flows within the Thaw and Cadoxton CAMS area. Groundwater resource availability will be assessed on a case by case basis on application for a groundwater abstraction licence.

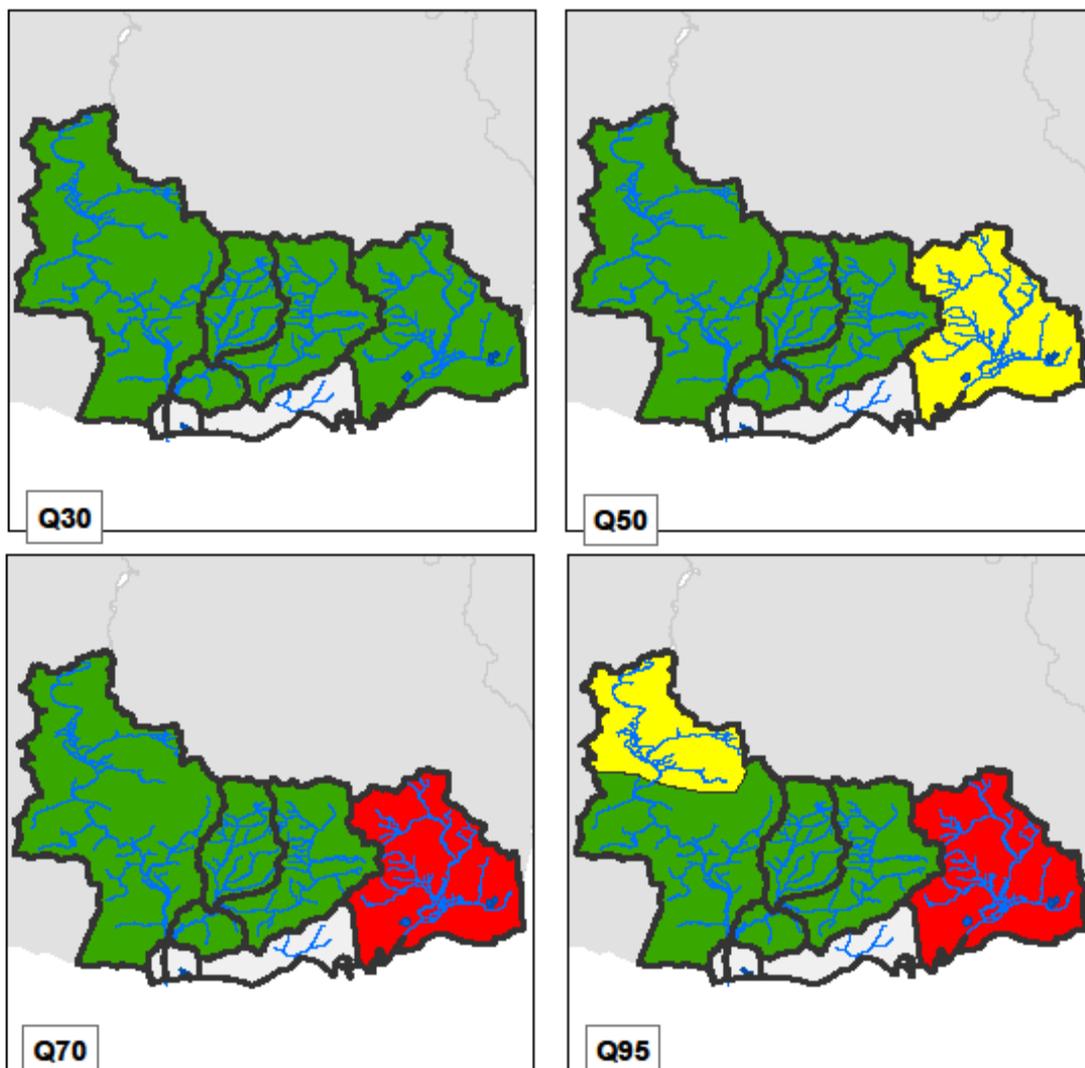
The main [aquifers](#) in the CAMS area comprise the Carboniferous Limestone, the Mercia Mudstone Group (Triassic) and the Lias Group (Jurassic). The majority of groundwater abstractions occur from the Carboniferous Limestone. Significant quantities of water can be abstracted from the limestone with groundwater flow likely to be along bedding planes, but dominated by the fissure and fracture system within the limestone. Overall, the differing nature of the aquifers across the area, from fractured limestones to mudstones, to drift deposits means that the volume of water that can actually/physically be abstracted from the strata will be highly variable.

There is limited information on the degree of connection between the watercourses and the regional groundwater, so it is assumed that across the Thaw and Cadoxton catchments groundwater discharges into the local streams and rivers (mirroring the topography). These groundwater and surface water interactions are likely to be complex and dependent on the groundwater level and river stage, permeability of the river sediment beds and the aquifer properties. Given the presence of drift deposits (mainly alluvium and glaciofluvial) along the main rivers, the surface water will potentially be perched above the regional groundwater. The degree of connection between the river (perched water) and the regional groundwater is unknown and difficult to assess with the data that we have.

Map 3: Water resource availability colours for the Thaw and Cadoxton CAMS Area



**Thaw and Cadoxton CAMS Area
Water Resource Availability**



Legend

- Water available for licensing
- Restricted water available for licensing
- Water not available for licensing
- Thaw Estuary & coastal areas
- Thaw and Cadoxton main rivers
- Water bodies
- Surrounding CAMS Areas

0 1.5 3 6 Kilometers



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3.3 Resource reliability

When issuing a licence we do not guarantee abstraction reliability i.e. the supply of water. Reliability is the amount of time a licence holder would be able to abstract water and is limited by the restrictions added to the licence and available resource. If you want to apply for a licence it is worth considering that a new licence may not be 100% reliable as abstraction conditions such as [Hands-off flow](#) and [Hands-off Level](#) may be applied. Abstraction reliability information is based on CAMS resource availability colours and is a way of presenting the reliability of new abstractions.

Map 4 gives an indication of the resource reliability in the Thaw and Cadoxton CAMS area expressed as a percentage of time. It shows where water availability may be more reliable and therefore available for a greater percentage of the year than other areas.

Based on the current licensed scenario (CAMS FL), a newly licensed consumptive abstraction from the River Thaw below Cowbridge, including its tributary catchments such as the Nant Tre-gof, River Kenson, Nant Llancarfan and the River Waycock, could be restricted for up to 18 days (5% of the time) in an average rainfall year. Above Cowbridge, a newly licensed consumptive abstraction from the River Thaw and its tributary catchments such as the Nant Aberthin, could be restricted for up to 40 days (11% of the time) in an average rainfall year. Abstractions are most likely to be restricted during the summer months as these are the periods when we tend to see lower river flows which trigger the abstraction restrictions.

There is less water available for abstraction in the River Cadoxton catchment due to current levels of committed licensed resources. A newly licensed consumptive abstraction from this catchment could be restricted for up to 200 days (55% of the time) in an average rainfall year. Water will not be available for consumptive abstraction for a significant proportion of the year throughout the Cadoxton catchment. Abstractions are most likely to be restricted during the spring to autumn months as these are the periods when we tend to see lower river flows which trigger the abstraction restrictions. Therefore to ensure you have a reliable source of water for your needs throughout the year, you may need to consider additional provisions such as storage.

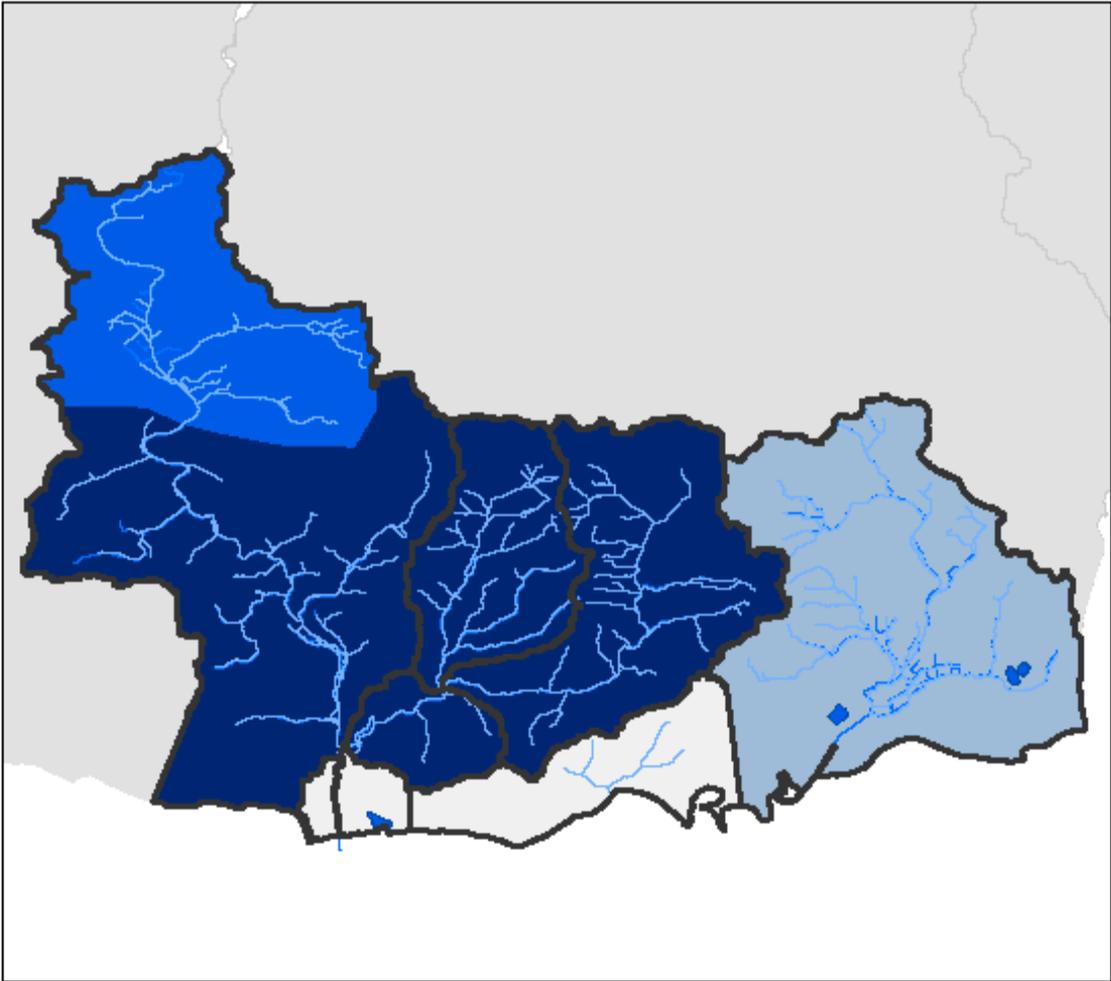
These reliability figures are indicative and do not take into account times of drought when the number of days abstraction may not be possible will be greater. There is only a moderate groundwater baseflow component to the surface watercourses in these catchments and therefore river flows are responsive to rainfall events including lack of rainfall.

The above indicative figures do not apply to non-consumptive abstraction (surface water and groundwater) or a consumptive groundwater abstraction; providing that during the application process they're assessed not to have a negative impact on local species and/or habitats or other existing water users. In these instances application of abstraction constraints will be assessed on a case by case basis and resource reliability discussed with you on submission of an application.

Map 4: Water resource reliability in the Thaw and Cadoxton CAMS Area



**Thaw and Cadoxton CAMS Area
Resource Reliability (% of time)**



Legend

- Water resources available at least 95%
- Water resources available at least 70%
- Water resources available at least 50%
- Water resources available at least 30%
- Water resources available less than 30%
- Thaw Estuary & coastal areas
- Thaw and Cadoxton main rivers
- Water bodies

0 1 2
Kilometers



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4. How We Manage Abstractions in the Thaw and Cadoxton CAMS Area

4.1 National licensing principles

If you want to abstract water in the Thaw and Cadoxton CAMS area this section outlines the licensing principles we follow in assessing your application for a licence.

Abstraction licence application process

Anyone wanting to take more than 20m³/day (4,400 gallons) from a 'source of supply' (river, stream, lake, well, groundwater, etc.) must have an abstraction licence. The application process is similar to the planning process in that we may require the application to be advertised and may require supporting environmental information. All abstraction licence applications are subject to an assessment to take account of any local and downstream issues. When considering the application we check that the quantities applied for and the abstraction purpose(s) are reasonable, that there is sufficient water available to support it and that the potential impacts on the environment and other water users are acceptable.

Each application is determined on its own merits

Whilst this document may indicate that some water is available for further abstraction, this does not guarantee that all applications will be successful. We'll determine each application upon its own merits and any local impacts. In certain cases we may have to refuse the application. Any applicant who is not happy with our determination (decision) has the right to appeal against it.

A licence does not guarantee that water is available

It's important to understand that when we issue a licence we do not guarantee the supply of water. We also have to protect the environment and rights of other abstractors. To do this we may add constraints to licences which require abstraction to stop when the river flow or groundwater levels fall below a certain amount. Licence holders need to understand the implications of this as it affects the reliability of supply. For example, in drier years it's more likely that HOF conditions will come into effect and abstraction is more likely to be stopped.

Abstractions are managed to protect the environment & WFD objectives

We assess the impact of new applications for water to make sure that the resultant river flows will:

- maintain a good ecology or if the ecology is not good, will not deteriorate the ecology of the water body further;
- maintain the near pristine condition of high ecological status water bodies.

To do this we may issue a licence with an abstraction restriction condition – see below Hands-off flow condition and Hands-off level condition.

We'll also take action if necessary to limit the increase in existing licensed abstractions, if we think this will lead to deterioration of the ecology or the near pristine condition of our high hydrological regime water bodies, as part of our Restoring Sustainable Abstraction Programme (see section 4.9).

These principles apply to the water body in which the abstraction is located and also to all downstream water bodies that may be affected by any reduction in abstraction related flow. Doing this means that we will maintain the water body status as reported in the 2009 RBMPs and ensure compliance with WFD.

Hands-off Flow conditions

To protect the environment we may issue a licence with a condition referred to as a 'Hands-off flow' (HOF). This specifies that if the flow in the river drops below that which is required to protect the environment abstraction must stop, hence 'Hands-off flow'.

Hands-off Level conditions

Where groundwater abstractions are likely to impact surface water features, or reduce baseflow to a river, a Hands-off level (HOL) condition may be applied to the abstraction. This is a groundwater level below which an abstractor is required to reduce or stop abstraction.

Time limited licences

Since 2001, in recognition of changing pressures on water resources, all new licences and variations (other than downward variations or minor variations having no environmental impact) have had a time limit imposed. This allows for the periodic review of these licences and allows changes to be made to licence conditions where circumstances have altered since the licence was granted.

All time limited licences within a CAMS area have a **common end date** (CED) so they can be reviewed at the same time. When a licence application is made within six years of the CED, we will generally apply the next CED to any renewal licence granted. This is to avoid issuing shorter and shorter duration licences as the CED approaches. This means that the initial CED on a licence may be between six and 18 years duration. On renewal the normal duration will then usually be 12 years.

Where we are uncertain about the long term environmental impacts of an abstraction we will grant a short term licence during which time potential impacts are monitored.

The current CED for the Thaw and Cadoxton CAMS is 31st March 2018 and the next one is 31st March 2030. As we are within 6 years of the current CED of 31st March 2018, any licences granted from now on will generally be subject to the CED of 31st March 2030.

There are currently no time limited licences in the Thaw and Cadoxton CAMS Area.

Water efficiency and demand management

We encourage all new abstractors to adopt water efficiency measures and water management measures as we need to make the best use of our existing water resources. Water efficiency is one of the tests that will need to be satisfied before we grant a new licence or replace a time limited licence. We will promote the wise and efficient use of water and actions to limit demand (and reduce leakage) to curb the growth in abstraction and limit the impact on flows and any consequent impact on the ecology.

4.2 Surface water licensing policy

The following subsections outline our current licensing policy in these catchments (Map 3):

- 4.2.1 River Thaw catchment upstream of Cowbridge
- 4.2.2 River Thaw catchment downstream of Cowbridge
- 4.2.3 River Cadoxton catchment

Surface water licensing policy common to all three catchments:

- All licence applications will be considered on a case by case basis.
- The protection of designated features (e.g. SAC, SSSI, UK BAP), important local features and the rights of other water users will be taken into consideration.
- We will not issue a licence that would cause deterioration in the ecological quality of a water body.
- All new consumptive licences will be issued with flow restrictions.
- An appropriate HOF reference location will be determined as part of the licence application. For consumptive abstractions it may be a local HOF based on the equivalent flow at the Gigman Bridge gauging station on the River Thaw at National Grid Reference (NGR) ST 0174 7166. Gigman Bridge is the only gauging station in the Thaw & Cadoxton CAMS area.
- As more of the 'available' water is allocated to consumptive abstractions, we will issue licences with increasingly restrictive HOF conditions to ensure sufficient water continues to be available for the environment and to protect existing abstractions.
- In most cases a time limit of 31 March 2030 will be applied. A shorter time period may be applied if we feel there is a need to review an abstraction earlier so we can monitor the effect of the abstraction on the environment and change the licence conditions if necessary. In exceptional circumstances we may grant longer term licences.
- The following conditions may also be applied:
 - Fish or eel screens on abstraction intakes to help minimise entrainment, entrapment and impingement from pumping;
 - Conditions to minimise [sub-daily pumping](#) to prevent the rapid exposure of riverine marginal habitat.

- There is the presumption of renewal for **time limited licences**, subject to the three renewal criteria (environmental sustainability, continued justification of need, and efficient use of water) and local considerations, however:
 - where RA flows have fallen below the EFI, we may seek to reduce licensed quantities as part of the renewal process,
 - where FL flows have fallen below the EFI, we may seek to reduce unused portions of licensed quantities as part of the renewal process,
 - conditions may be replaced with more restrictive terms and conditions to protect the environment e.g. as a result of a WFD assessment,
 - renewals may be subject to minor changes including the addition of water efficiency conditions, and
 - we will also take into account any objections received to the renewal of the licence.
- We will endeavour to give six years notice if a time limited licence will not be renewed or is to be renewed but on more restrictive terms that significantly impact on the use of the licence.
- As CAMS resource assessments and WFD assessments are reviewed and updated, we may identify water resources pressures that will need to be investigated through our Restoring Sustainable Abstraction programme (or future equivalent, if applicable).

For non-consumptive licences, where water is returned close to the point of abstraction, there is no need to protect flows at a wider catchment level. These licences may still be restricted to protect flows between the point of abstraction and the point of discharge. The level of the restriction will depend on the site-specific conditions. Each application will be dealt with on a case by case basis.

4.2.1 River Thaw catchment upstream of Cowbridge

For new **consumptive surface water licences** the following flow restriction will apply:

HOF Restriction	Amount of water currently available (MI/day) for licensing at AP3	Average number of days a year abstraction allowed
HOF at Q89	0.3	325
Once the available water has been licensed the HOF2 will be applied to licences.		
HOF 2 at Q85	1.6	310
Once the available water has been licensed the HOF 3 at Q75 will be applied to licences.		

Table 2: River Thaw upstream of Cowbridge - restrictions for new consumptive licences in an average rainfall year.

For new **non-consumptive licences**, the HOF restriction applied will be dependent on site specific conditions.

For **existing licences**, the following flow restriction will apply:

- Any existing consumptive licence which the holder applies to have formally varied to increase the volume abstracted will be subject to the restriction given in Table 2 on the increased part of the licence only.
- For a quantity increase on a non-consumptive licence, the HOF restriction applied will be dependent on site specific conditions.

4.2.2 River Thaw catchment downstream of Cowbridge

This includes the River Kenson, Nant Llancarfan and the River Waycock (Map 4).

For new **consumptive surface water licences** the following flow restriction will apply:

HOF Restriction	Amount of water currently available (MI/day) for licensing at:						Average number of days a year abstraction allowed
	AP1	AP2	AP4	AP5	AP6	AP7	
HOF at Q95	3.8	2.6	1.8	0.4	0.7	0.3	347
Once the available water has been licensed the HOF2 will be applied to licences.							
HOF 2 at Q85	4.3	3.0	2.0	0.5	0.9	0.4	310
Once the available water has been licensed the HOF 3 at Q75 will be applied to licences.							

Table 3: River Thaw downstream of Cowbridge - restrictions for new consumptive licences in an average rainfall year.

For new **non-consumptive licences**, the HOF restriction applied will be dependent on site specific conditions.

For **existing licences**, the following flow restriction will apply:

- Any existing consumptive licence which the holder applies to have formally varied to increase the volume abstracted will be subject to the restriction given in Table 3 on the increased part of the licence only.
- For a quantity increase on a non-consumptive licence, the HOF restriction applied will be dependent on site specific conditions.

4.2.3 River Cadoxton catchment

We have concerns about water availability in this catchment. Water is available for consumptive abstraction but only at high flows.

For new **consumptive surface water licences** the following flow restrictions will be applied:

HOF Restriction	Amount of water currently available (Ml/day) for licensing at:				Average number of days a year abstraction allowed
	AP8	AP9	AP10	AP11	
HOF at Q45	2.7		2.7	1.1	164
HOF at Q40		0.4			146
Once the available water has been licensed the HOF 6 will be applied to licences.					
HOF 6 at Q35	7.2	1.2	3.6	1.2	128

Table 4: River Cadoxton - restrictions for new consumptive licences in an average rainfall year.

For new **non-consumptive licences**, the HOF restriction applied will be dependent on site specific conditions.

For **existing licences**, the following flow restriction will apply:

- Any existing consumptive licence which the holder applies to have formally varied to increase the volume abstracted will be subject to the restriction given in Table 4 on the increased part of the licence only.
- For a quantity increase on a non-consumptive licence, the HOF restriction applied will be dependent on site specific conditions.

4.3 Hydropower licensing policy

Water abstraction for hydropower schemes is non-consumptive with all water used returned to the watercourse. Applications are assessed on a site specific basis based on the environmental risk for each scheme.

Hydropower licence applications are determined in line with Natural Resources Wales' hydropower policy. We have recently agreed a new approach for setting flow requirements for hydropower schemes. Details of the new standards and guidance on flow availability can be found at Natural Resources Wales hydropower website pages.

4.4 Groundwater licensing policy

Due to limited data on groundwater levels and flows within the Thaw and Cadovton catchments and the low demand for new groundwater abstractions, there isn't a separate groundwater licensing policy. Licences will be granted based on the following principles:

- Any application for a new groundwater abstraction licence or upwards variation to an existing licence will be treated on a case by case basis.
- Applications will be assessed as to their impact on designated sites and local features of importance such as wetland sites and surface watercourses, and other groundwater users.
- HOF or HOL restrictions may be applied to the licence.
- Abstraction restrictions will be dependent upon aspects such as aquifer type, the depth of the borehole/well, the proximity to a surface water course, the proximity to a designated site and local features of importance, the quantity of water applied for and purpose (how consumptive the abstraction will be).
- Surface water availability may override local groundwater availability if it is demonstrated that the groundwater abstraction impacts river flows. This means that the surface water HOF restrictions outlined in section 4.2 will apply. The appropriate HOF location will be based on the point of impact of the groundwater abstraction and determined during the licence application process.
- We will not issue a licence that would cause deterioration in the ecological quality of a water body.
- As more of the 'available' water is allocated to consumptive abstractions, we will issue licences with increasingly restrictive HOF/HOL conditions to ensure sufficient water continues to be available for the environment and to protect existing abstractions.
- In most cases a time limit of 31 March 2030 will be applied. A shorter time period may be applied if we feel there is a need to review an abstraction earlier so we can monitor the effect of the abstraction on the environment and change the licence conditions if necessary. In exceptional circumstances we may grant longer term licences.
- There is the presumption of renewal for **time limited licences**, subject to the three renewal criteria (environmental sustainability, continued justification of need, and efficient use of water) and local considerations such as connectivity to watercourses and wetland sites, however:
 - conditions may be replaced with more restrictive terms and conditions to protect the environment e.g. as a result of a WFD assessment,
 - renewals may be subject to minor changes including the addition of water efficiency conditions,
 - we will also take into account any objections received to the renewal of the licence,

- where connectivity to a watercourse is a factor and the RA flows have fallen below the EFI, we may seek to reduce licensed quantities as part of the renewal process, and
- where connectivity to a watercourse is a factor and the FL flows have fallen below the EFI, we may seek to reduce unused portions of licensed quantities as part of the renewal process.
- We will endeavour to give six years notice if a time limited licence will not be renewed or is to be renewed but on more restrictive terms that significantly impact on the use of the licence.
- As CAMS resource assessments and WFD assessments are reviewed and updated, we may identify water resources pressures that will need to be investigated through our Restoring Sustainable Abstraction programme (or future equivalent, if applicable).

A pre-application water features survey and groundwater investigation consent to drill and test pump an abstraction borehole/well are required. The groundwater investigation consent allows applicants to drill and test the borehole (or other source) to find out what water is available, whether it's suitable for its intended purpose, and to assess the impact on other water interests before applying for a licence. Anybody wishing to obtain such consent should contact us. On completion the water features survey and test pumping results will need to be submitted to us prior to a full licence application. Only when the water features survey and test data demonstrate that the above criteria are met will a full licence application be considered favourably.

4.5 Estuaries/coastal areas licensing policy

Estuaries

Estuaries are not included in the CAMS resource assessment as tidally influenced waters cannot be assessed in the same way as inland waters. The River Thaw has a short tidally influenced estuary; the tidal limit is at NGR ST 03114 67367. Surface water abstraction from the River Thaw estuary is not considered to require the same level of protection as that required for the area upstream of the tidal limit. This means that water may be available for abstraction at a wider range of flows.

Applications for abstractions from tidally influenced waters will be assessed on a case-by-case basis.

Coastal streams

Only the River Thaw and the River Cadoxton and their associated tributaries have been assessed using the CAMS resource assessment. Smaller coastal streams within this CAMS area have not been assessed (Map 3). Compared to the CAMS assessed rivers, these smaller streams provide a relatively small resource. The CAMS resource assessment is undertaken at a catchment scale with catchment significant resources. Coastal streams generally have a catchment area of less than 20km² and lack hydrological and ecological data to support any assessment of available resources.

Applications for abstractions, both surface water and groundwater, from resources in these coastal catchments will be assessed on a case-by-case basis.

4.6 Impoundment licensing policy

Applications for impoundment licences will be dealt with on a case-by-case basis and take into account the requirements of our statutory obligations for designated sites and WFD obligations such as ensuring no likelihood of water body ecological deterioration. An impoundment is a dam, weir or other construction in an inland waterway that obstructs or impedes flow and/or raises water levels. Our assessment of an impoundment application takes into consideration its potential impacts on the environment (such as fish migration), flood risk, downstream water users and flow modification. In line with current legislation, we do not time limit impoundment licences.

You must have an impoundment licence before you start to construct, alter, repair or remove an impoundment structure, even in an emergency. However, in certain circumstances licence exemptions apply and if we deem there is little or no impact on the environment and other water users, you may not need a licence. Please contact us if you intend to construct, alter, repair or remove an impoundment structure so that we may advise you whether a licence is required. The Environment Agency's document 'Low Risk Impoundment' offers guidance on when you need to apply for an impoundment licence and can be found by following the link given on our web page.

4.7 Opportunities for licence trading

We want to make it easier to trade water rights. A water rights trade is where a licence holder sells all or part of their water right, as defined by their abstraction licence(s), to another licence holder on a permanent or temporary basis. In the majority of cases a trade will involve a change in abstraction location and/or use which we will need to approve through the issue or variation of abstraction licences. Our approach to licensing water rights trades will depend on the water resource availability where the buyer and seller are located.

In licensing trades, as with new abstraction licences, we need to make sure that we do not impact Special Areas of Conservation (SAC) designated species and habitats nor cause any ecological deterioration in WFD water body status either within the water body / bodies where the trade will take place or to downstream water bodies. The table below (Table 5) provides a guide to the potential for trading in the water bodies of the Thaw and Cadoxton CAMS area based on the water resource availability colour (Map 3).

All applications for licence trading will be assessed on a case-by-case basis. To ensure sufficient environmental protection and to ensure abstraction does not derogate (interfere with the rights of) other licensed abstractors, any changes in use, consumptiveness and/or location of abstractions will be subject to the licensing

restrictions as outlined in the Section 4. The final decision on whether trading would be allowed lies with Natural Resources Wales.

CAMS water resource availability colour	Our approach to trading in the Thaw and Cadoxton CAMS catchment
Water available for licensing	Trading acceptable.
Restricted water available for licensing	<p>There may be opportunities for licence holders to trade up to their full licensed quantities, but the quantities of water available to trade may be restricted once levels of actual abstraction reach sustainable limits.</p> <p>Once this limit is reached, we will then only allow trades of recent actual abstraction (i.e. the quantity of water traded cannot exceed the quantity currently abstracted).</p>
Water not available for licensing	<p>We will only trade recent actual abstraction. No increase in recent actual abstraction is permitted in a water body.</p> <p>We may recover unused water for the environment as part of a trade.</p>

Table 5: Potential for licence trading in the Thaw & Cadoxton CAMS area

To find out more about licence trading please go to the Environment Agency’s pages of the ‘www.gov.uk’ website.

4.8 New authorisations

The Water Act 2003 brought all significant water abstraction under licensing control. This will result in previously exempt abstractions for trickle irrigation, dewatering of mines, quarries and engineering works, land drainage (including Internal Drainage Districts), navigation, ports and harbours coming into the licensing regime. Local exemptions that applied to various geographic areas will also be affected by this change.

These changes will allow us to meet the requirements of the Water Framework Directive and, as a result, we’ll be able to manage water resources more effectively by ensuring that all significant activities influencing the availability of water and its impact on the environment are undertaken in a sustainable manner.

The implementation of this legislation has yet to commence and Government are still developing their policies as to how to resolve some of the issues raised during the consultation process. Government will publish their proposals before new regulations are implemented and expect to do this at least 3 months before commencement so that we can issue guidance to those affected by the changes.

Where we have information on these exempt abstractions we have included them in our water resources assessments to consider how they impact flows and groundwater levels in the catchment, and in determining the availability of water resources for licensing.

4.9 Restoring sustainable abstraction

Where existing licensed abstractions result in environmental damage or present a risk of significant damage, we may need to change or even revoke those licences in order to achieve a sustainable abstraction regime. Abstraction licences that cause these issues are being investigated either individually and/or cumulatively as part of the Restoring Sustainable Abstraction (RSA) programme. Investigations into the impact caused by these licences may result in options being developed with licence holders on how to improve the sustainability of their abstraction. Information on how licences in the RSA programme are dealt with can be found in the Environment Agency's guide, 'Changing Water Abstraction & Impoundment Licences', available in the Environment Agency's pages of the 'www.gov.uk' website.

The RSA programme has provided us with a framework for undertaking WFD water resources investigations. We are currently investigating whether reduced river flow caused by licensed abstraction may be contributing to environmental concerns within water bodies under the WFD. Options on how to improve the sustainability of an abstraction include a cost/benefit analysis.

The River Cadoxton was identified in the first CAMS (2006) as having the potential for reduced river flow resulting from licensed abstraction in the catchment. This issue has been investigated through the RSA programme which concluded that changes to the abstraction regime in the catchment would result in little improvement to the riverine environment at this moment in time. This situation will be continually reviewed as part of the WFD programme.

Glossary of terms

Abstraction	Removal of water from a source of supply (surface or groundwater).
Abstraction licence	The authorisation granted by Natural Resources Wales and the Environment Agency to allow the removal of water.
Aquifer	An underground layer of permeable rock, sediment, or soil that can contain and yields water. Esp. one that supplies the water for wells, springs, etc.
Assessment Point	Point on a watercourse at which the flow from the upstream catchment is assessed.
Baseflow	The flow entering surface watercourses from groundwater i.e. the level of groundwater contribution to stream flow in catchments.
Biodiversity Action Plan	The UK BAP was published in 1994, in response to the Convention on Biological Diversity, which the UK signed up to in 1992. The UK BAP described the biological resources of the UK and provided detailed plans for conservation of these resources. UK BAP priority species and habitats were those that were identified as being the most threatened and requiring conservation action. The UK BAP has been succeeded. Many of the UK BAP species and habitats are now recognised as being 'species and habitats of principal importance' under Sections 41 and 42 of the NERC Act 2006. In the UK we are currently working to the 'UK Post-2010 Biodiversity Framework' (July 2012).
Catchment	The area specific to a river network from which precipitation (e.g. rainfall) and groundwater will collect and contribute to the flow of that network.
Consumptive abstraction	Abstraction where a significant proportion of the water abstracted is not returned either directly or indirectly to the source of supply after use. For example water abstracted for spray irrigation.
Discharge	The release of substances (e.g. sewage, industrial effluent) into surface waters.
Environmental flow indicator	A proportion of the natural flow in a river is set aside for the ecological health of the water course. This is called the environmental flow indicator and we use it to prevent ecological deterioration of rivers. It is set in line with new UK standards set by UKTAG.
Flashy flow regime	A water course that exhibits significantly increased flows immediately following the onset of a precipitation event and a rapid return to pre-rain conditions shortly after the end of the precipitation; and after dry spells, flows become very low.
Groundwater	Water that is contained in underground rocks or superficial deposits.

Hands-off flow	A condition attached to an abstraction licence which states that if flow (in the river) falls below the level specified on the licence, the abstractor will be required to reduce or stop the abstraction.
Hands-off level	A river flow or borehole (groundwater) level below which an abstractor is required to reduce or stop abstraction.
Impoundment	An impoundment is a structure that obstructs or impedes the flow of inland water, such as a dam, weir or other constructed works.
Natural flow	In hydrological assessments it refers to a flow in a water course that has no anthropogenic influences such as abstractions and discharges. Very few watercourses are truly natural as most catchments are affected by indirect anthropogenic influences including channel modification, land use change and urbanisation. Under WFD watercourses with (near to) pristine natural flows are defined to have a high hydrological regime.
Non-consumptive abstraction	Abstraction where all the water abstracted is returned to the source of supply a relatively short distance downstream of the abstraction point. For example, abstractions for fish farms and hydropower schemes are considered non-consumptive abstractions.
Q95, 70, 50, 30	The flow of a river which is equalled or exceeded on average for 95%, 70%, 50%, 30% of the time.
River Basin Management Plan	A River Basin Management Plan sets out measures to improve water in rivers, estuaries, coasts and aquifers. They are drawn up for different river basin districts under the Water Framework Directive and reviewed and updated every six years. The plans have been developed through consultations with organisations and individuals. They contain the main issues for the water environment and information on what we all need to do to tackle these issues.
Sub-daily pumping	The abstraction of the daily licensed quantity in less than a twenty four hour period.
Surface water	This is a general term used to describe all water features such as rivers, streams, springs, ponds and lakes.
Water body	A basic unit of surface water management at which assessments are completed for WFD. It is an entire (or part) stream, river or canal, lake or reservoir, and estuary or stretch of coastal water out to one nautical mile offshore. Water bodies altered by human activity may be classified as heavily modified water bodies (HMWB) or artificial water bodies (AWB). A body of groundwater is a distinct volume of underground water within one or more aquifers.

List of abbreviations

AP	Assessment Point
BAP	Biodiversity Action Plans
Bp	Before present
CAMS	Catchment Abstraction Management Strategies
CED	Common End Date
EFI	Environmental Flow Indicator
FL	Full Licensed (scenario)
HOF	Hands-off Flow
HOL	Hands-off Level
MI/d	Megalitres per day
NGR	National Grid Reference
Q	Symbol representation for volume of fluid which passes per unit time.
RA	Recent Actual (scenario)
RSA	Restoring Sustainable Abstraction
RBMP	River Basin Management Plans
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
UKTAG	United Kingdom's Technical Advisory Group
WFD	Water Framework Directive