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Warwickshire Avon abstraction licensing strategy

February 2013

A licensing strategy to manage water resources sustainably

LIT 2604

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Published by:

Environment Agency
Horizon House
Deanery Road
Bristol BS1 5AH
Tel: 0370 8506506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

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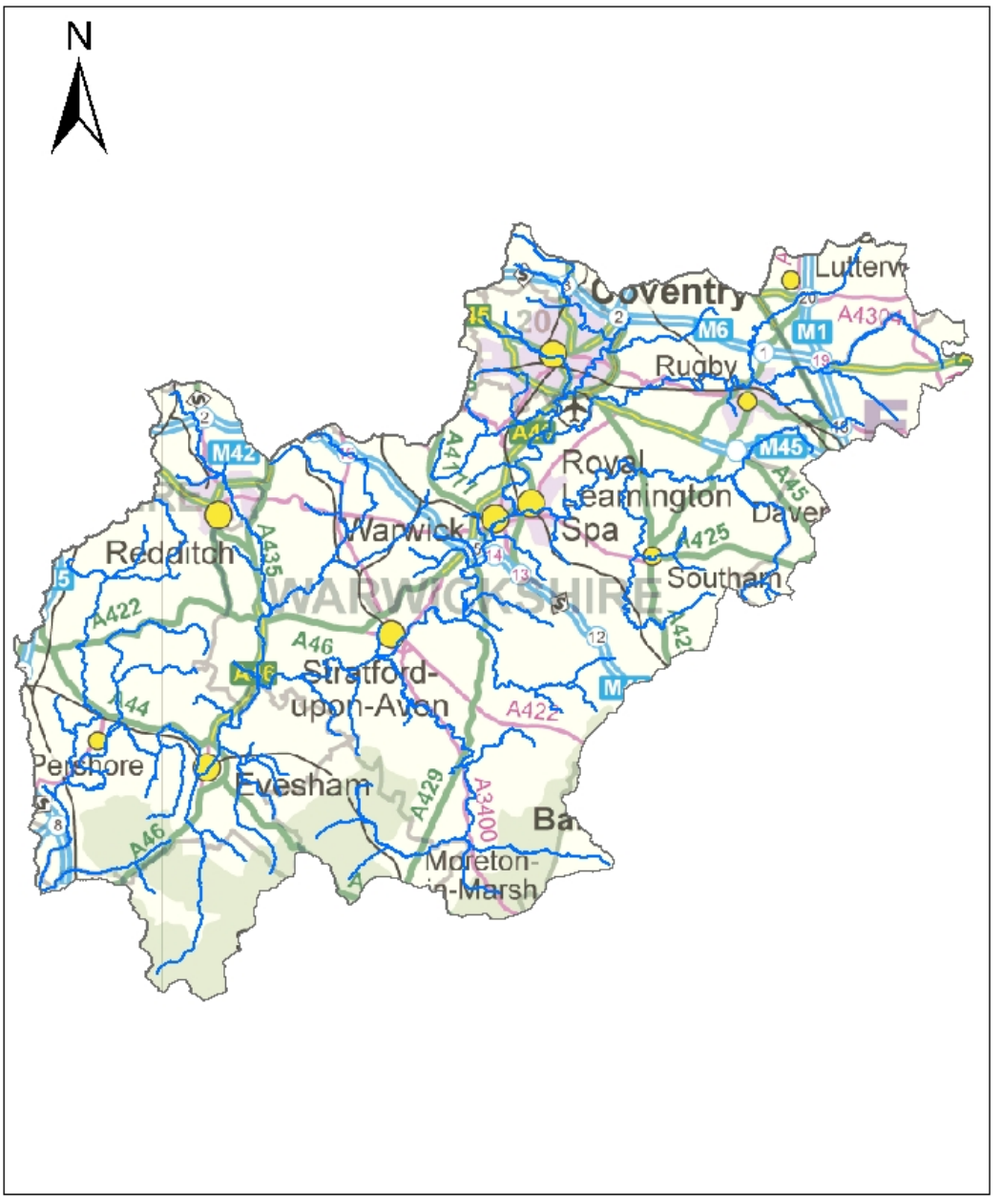
Warwickshire Avon CAMS Area



Warwickshire Avon CAMS

Main rivers

Kilometres

0 7.5 15 22.5 30 37.5

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Overview map of the Warwickshire Avon CAMS area

Foreword

Water is the most essential of our natural resources. Our rivers and groundwater resources support the needs of society, the economy and the environment. Yet population growth and the latest climate change predictions mean our water resources are under increasing pressure. It is our job to ensure that we manage and use them effectively and sustainably.

This licensing strategy sets out how we will manage water resources in the Warwickshire Avon catchment. It provides information on how existing abstraction is regulated and whether water is available for further abstraction. The strategy also details how it protects our requirements under the Water Framework Directive, ensuring no ecological deterioration to our rivers.

It is important that our activities today do not damage the environment or water supplies of the future. We have a shared responsibility to use water wisely, in the home, at work and for recreational activities, a challenge this licensing strategy will help us to meet.

Sarah Cook,

Environment, Planning and Engagement Manager,
Midlands Central Area

Contents

OVERVIEW MAP OF THE WARWICKSHIRE AVON CAMS AREA 2

1. ABOUT THE LICENSING STRATEGY 5

2. WARWICKSHIRE AVON CAMS AREA 7

3. WATER RESOURCE AVAILABILITY OF THE WARWICKSHIRE AVON AREA 9

4. HOW WE MANAGE ABSTRACTIONS IN THE WARWICKSHIRE AVON AREA 17

GLOSSARY OF TERMS 31

LIST OF ABBREVIATIONS 32

1. About the Licensing Strategy

This **Licensing Strategy** sets out how water resources are managed in the Warwickshire Avon catchment area. It provides information about where water is available for further abstraction and an indication of how reliable a new abstraction licence may be.

This strategy was produced in February 2013 and it supersedes the strategy issued in June 2006.

How CAMS contributes to achieving environmental objectives under the (WFD) Water Framework Directive

The Water Framework Directive's main objectives are to protect and enhance the water environment and ensure the sustainable use of water resources for economic and social development.

Catchment Abstraction Management Strategies (CAMS) set out how we will manage the water resources of a catchment and contribute to implementing the WFD.

CAMS contribute to the WFD 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).

When is an abstraction licence required?
You need a licence from us if you want to abstract more than $20m^3$ (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 us:

- by telephone on 03708 506 506
- by email at enquiries@environment-agency.gov.uk
- or visit our website at www.environment-agency.gov.uk.

Sustainable abstraction

This licensing strategy has been produced using evidence and information gathered during the Catchment Abstraction Management Strategy (CAMS) process. Through this process we consider the impact of abstraction at all flows. This helps to manage future abstraction more sustainably.

We now assess water resources at a sub-catchment level called water bodies. This means that we can provide more detailed information on the availability of water resources in the Warwickshire Avon CAMS area compared to the scale used in the previous strategy.

Within this strategy we also outline where we may need to reduce current rates of abstraction and our approach on time limiting licences.

The background, aims and principles of CAMS, the over arching principles we use when managing abstraction licences and links with other initiatives are detailed in our document: Managing Water Abstraction. You should read Managing Water Abstraction when reading this catchment specific licensing strategy.

2. Warwickshire Avon CAMS area

The Warwickshire Avon catchment covers some 2,900 square kilometres of central England. It includes most of Warwickshire and significant areas of Worcestershire, Gloucestershire and small parts of Oxfordshire, Leicestershire and Northamptonshire. The City of Coventry is the largest urban area in the catchment with a population of approximately 900,000 people. Other major cities and towns are Rugby, Leamington Spa, Warwick, Stratford-upon-Avon, Evesham, Redditch and Tewkesbury.

The River Avon is a major tributary of the River Severn. The Avon rises near Naseby and flows southwest for approximately 179 kilometres until its confluence with the Severn at Tewkesbury. There are a number of important tributaries of the River Avon including the Rivers Swift, Leam, Arrow, Sowe, Stour, Isbourne, Dene and the Badsey and Bow Brooks, all of which support a significant number of abstractions. Apart from some more significant topographical features around the catchment boundary the majority of the catchment is low-lying.

The catchment has significant groundwater resources stored in the principal and secondary aquifers around the Coventry, Warwick, Kenilworth and Bromsgrove areas. The Great and Inferior Oolitic Limestone aquifers along the south west edge of the area are also a major resource, as well as the Avon Confined aquifer near Stratford-upon-Avon.

The Triassic Sherwood Sandstone and the Mercia Mudstone groups represent important geological strata in the Avon catchment with the former an important aquifer for water supply. The Sherwood Sandstone is represented in the Coventry and Warwick area; the Mercia Mudstone forms an extensive band that runs in a northeast trend from near Bromsgrove to the east of Coventry.

Drift deposits represent the youngest deposits in the Avon catchment. Quaternary drifts formed of glacial deposits (sands/gravels and boulder clays) cap a high portion of the rocks in the northeastern part of the catchment in particular. Alluvial terraces of the River Avon constitute the most recent deposits of the geological sequence and generally follow river and stream channels.

The rivers of the catchment play a vital role in the disposal of sewage from the catchment's population and waste water from industry. There are 26 main sewage treatment works operated by Severn Trent Water which release over 300 million litres of treated water into the rivers each day.

The use of the River Avon for navigation is important in shaping its character. There are numerous weirs, which control water levels in much of the river enabling it to be used for recreational boating. The River Avon is navigable from Tewkesbury to Alveston, immediately upstream of Stratford.

Despite the large population and significant industrial activity, agriculture is an important part of the economy and accounts for 90% of land-use. Traditionally the main farming activities have been crop growing, grazing dairy and beef cattle with horticulture and market gardening, especially around Evesham. Fruit and vegetables produced in this area supply a significant proportion of supermarket demand across the country.
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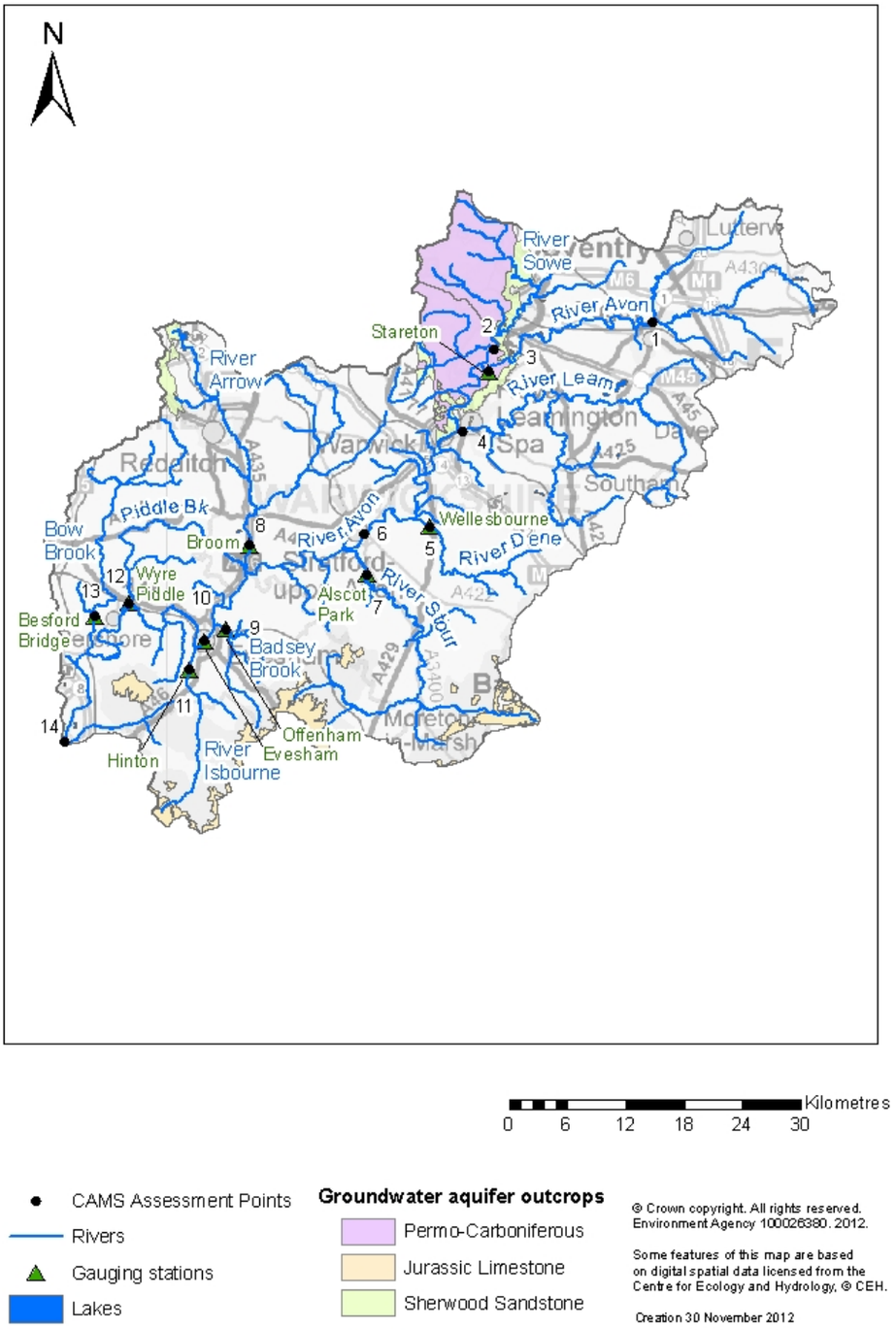
Warwickshire Avon CAMS Area



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CAMS Assessment Points
Rivers
Gauging stations
Lakes

Groundwater aquifer outcrops
Permo-Carboniferous
Jurassic Limestone
Sherwood Sandstone

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Map 1 **Warwickshire Avon catchment showing groundwater aquifer outcrops, SACs and gauging stations.**

3. Water resource availability of the Warwickshire Avon area

3.1 Resource assessment

Resource assessment is at the heart of abstraction management. To manage water effectively we need to understand how much is available and where it is available, after considering the needs of the environment. 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:

- a resource allocation for the environment defined as a proportion of natural flow, known as the Environmental Flow Indicator (EFI);
- the Fully Licensed (FL) scenario - the situation if all abstraction licences were being used to full capacity;
- the Recent Actual (RA) scenario – the amount of water which has actually been abstracted on average over the previous six years.

River flows change naturally throughout the year, so we want 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).

This information gives a realistic picture of what the current resource availability is within a given water body. Water bodies are sub-catchment surface water units or groundwater units on which we carry out assessments and map results.

NB: *Natural flows for CAMS AP (Assessment Point) water bodies have been taken from information provided in the CAMS ledgers. Natural flows for other water bodies have been derived based on simple interpolation between, or downstream of, CAMS APs, based on catchment area.*

3.2 Resource availability

3.2.1 Surface water

If you want to abstract water, you need to know what water resources are available within a catchment and where abstraction for consumptive purposes is allowed. To show this we have developed a 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.

The availability of water for abstraction is determined by the relationship between the fully licensed and recent actual flows in relation to the EFI. The results mapped onto these water bodies are represented by different water resource availability colours showing the availability of water resource for further abstraction. The water resource availability colours are explained in Table 1.

In addition to these water resource availability colours we've classified some surface water bodies as 'high hydrological status' which are coloured blue on the maps. In these water bodies very little actual abstraction occurs and they show virtually undisturbed, or close to natural, flow conditions. There are no 'high hydrological status' water bodies in the Warwickshire Avon area.

Another category of water body are Heavily Modified Water Bodies (HMWB). These can be classified for many reasons but for water resources they are classified if they contain a lake and/or reservoir that influences the downstream flow regime of the river. The downstream 'flow modified' water bodies are also classified as heavily modified.

We'll add any conditions necessary to protect flows to a new licence during the licence determination procedure. We will base licence conditions on the water resource availability at different flows from high flows (Q30) to low flows (Q95). Table 1 lists the implications for licensing for each water resource availability colour.

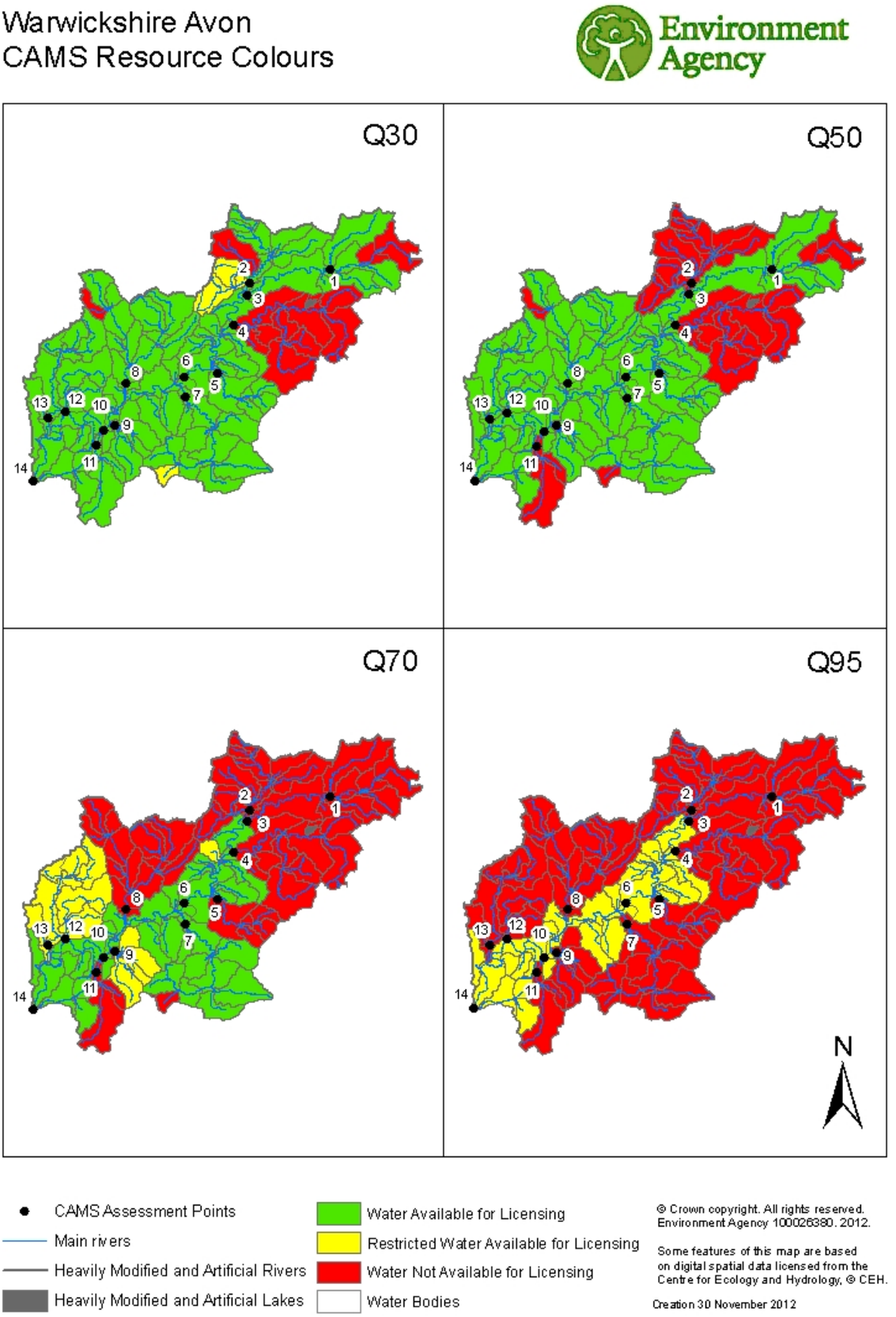
In cases where there is a flow deficit (recent actual flows are below the EFI) or a risk of a flow deficit (full licensed flows are below the EFI), there may be water available for abstraction at higher flows. This means that water may be scarce at low flows, but may be available to abstract at medium or high flows. A licence may still be granted but with conditions which protect the low flows. This usually takes the form of a Hands off Flow (HOF) condition on a licence which requires abstraction to stop when the river flow falls below a certain amount. A river may also be heavily supported by flows from a reservoir and may have unnaturally high 'low' flows which means that the river environment is most vulnerable at medium flows.

Map 2 shows the water resource availability colours in the Warwickshire Avon CAMS area.

Water resource availability colour	Implication for licensing
High hydrological regime	There is more water than required to meet the needs of the environment. However, due to the need to maintain the near pristine nature of the water body, further abstraction is severely restricted.
Water available for licensing	There is more water than required to meet the needs of the environment. New licences can be considered depending on local and downstream impacts.
Restricted water available for licensing	Full Licensed flows fall below the EFIs. If all licensed water is abstracted there will not be enough water left for the needs of the environment. No new consumptive licences would be granted. It may also be appropriate to investigate the possibilities for reducing fully licensed risks. Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder.
Water not	Recent actual flows are below the EFI.

available for licensing	This scenario highlights water bodies where flows are below the indicative flow requirement to help support Good Ecological Status (as required by the Water Framework Directive Note : we are currently investigating water bodies that are not supporting GES / GEP). No further consumptive licences will be granted. Water may be available if you can buy (known as licence trading) the amount equivalent to recently abstracted from an existing licence holder.
HMWBs (and /or discharge rich water bodies)	These water bodies have a modified flow that is influenced by reservoir compensation releases or they have flows that are augmented. These are often known as 'regulated rivers'. They may be managed through an operating agreement, often held by a water company. The availability of water is dependent on these operating agreements. More detail if applicable can be found in section 4.2.1 Surface Water There may be water available for abstraction in discharge rich catchments, you need to contact the Environment Agency to find out more.

Table 1 **Implications of water resource availability colours.**



Map 2 **Water resource availability colours for the Warwickshire Avon CAMS**

3.2.2 Groundwater

Groundwater availability is guided by the surface water resource availability colours unless we have better information on principal aquifers or are aware of local issues we need to protect.

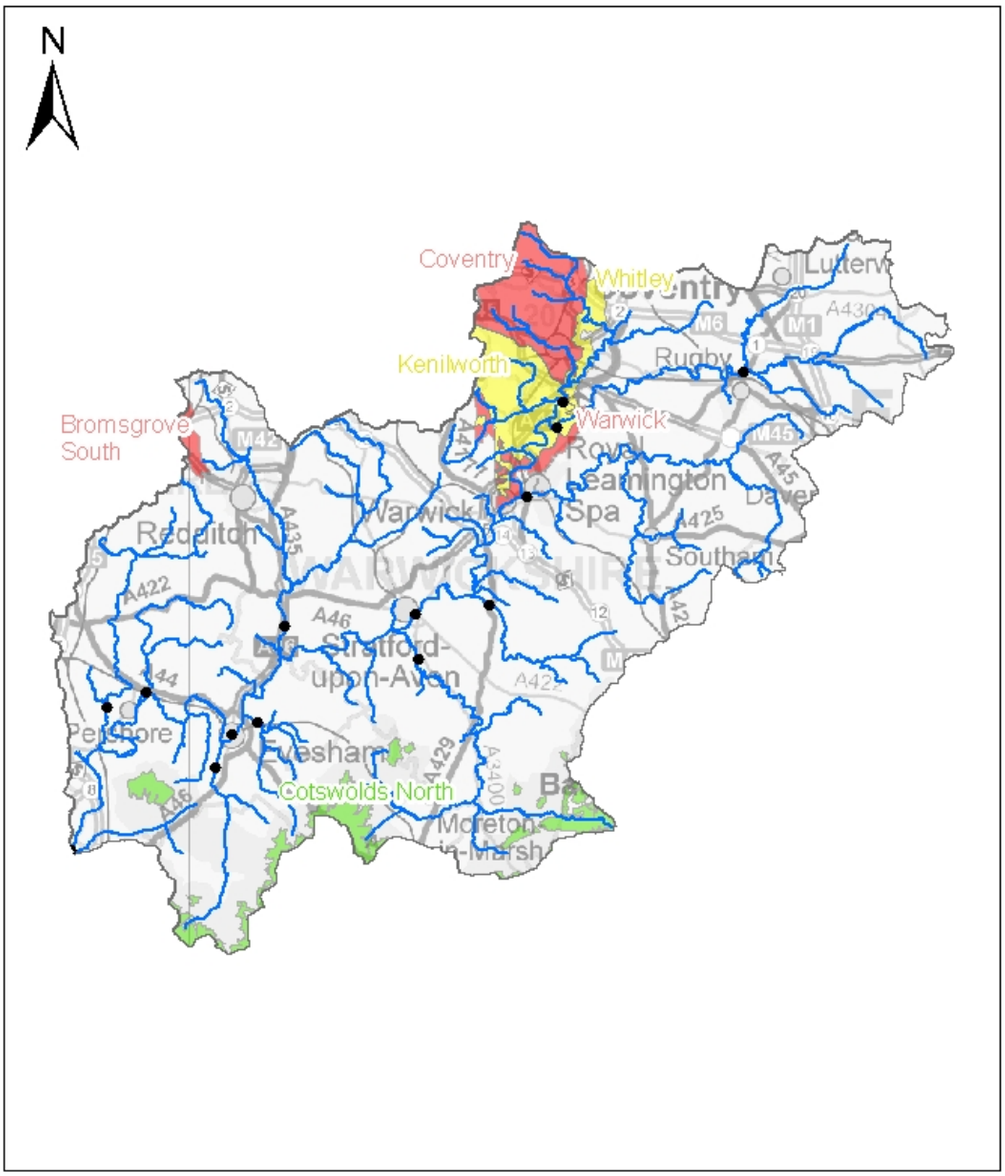
Please refer to Section 4.2.2 Groundwater on page 26 for further information.

Map 2 shows the water resource availability colours in the Warwickshire Avon area. The same availability is applied to groundwater and surface water. Map 3 shows water resource availability colours in the Warwickshire Avon area, specifically for groundwater.

GWMU resource availability colour	Implication for licensing
Water available for licensing	Groundwater unit balance shows groundwater available for licensing. New licences can be considered depending on impacts on other abstractors and on surface water.
Restricted water available for licensing	Groundwater unit balance shows more water is licensed than the amount available, but that recent actual abstractions are lower than the amount available **OR** that there are known local impacts likely to occur on dependent wetlands, groundwater levels or cause intrusions but with management options in place. In restricted groundwater units no new consumptive licences will be granted. It may also be appropriate to investigate the possibilities for reducing fully licensed risks. Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder. In other units there may be restrictions in some areas e.g. in relation to saline intrusion
Water not available for licensing	Groundwater unit balance shows more water has been abstracted based on recent amounts than the amount available. No further consumptive licences will be granted.

Table 2 **Implications of groundwater resource availability colours.**

Warwickshire Avon CAMS
Groundwater Management Unit Resource Availability



- CAMS Assessment Points
- Rivers
- Water available for licensing
- Restricted water available for licensing
- Water not available for licensing

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Map 3 **Water resource availability colours for the Warwickshire Avon CAMS, specifically for groundwater management units (primary aquifers).**

3.3 Resource reliability

If you want to apply for a licence, it is worth considering that in some areas a new, consumptive abstraction may not be 100% reliable. Reliability information is based on CAMS resource availability colours and is a way of presenting the reliability of new abstractions at all flows.

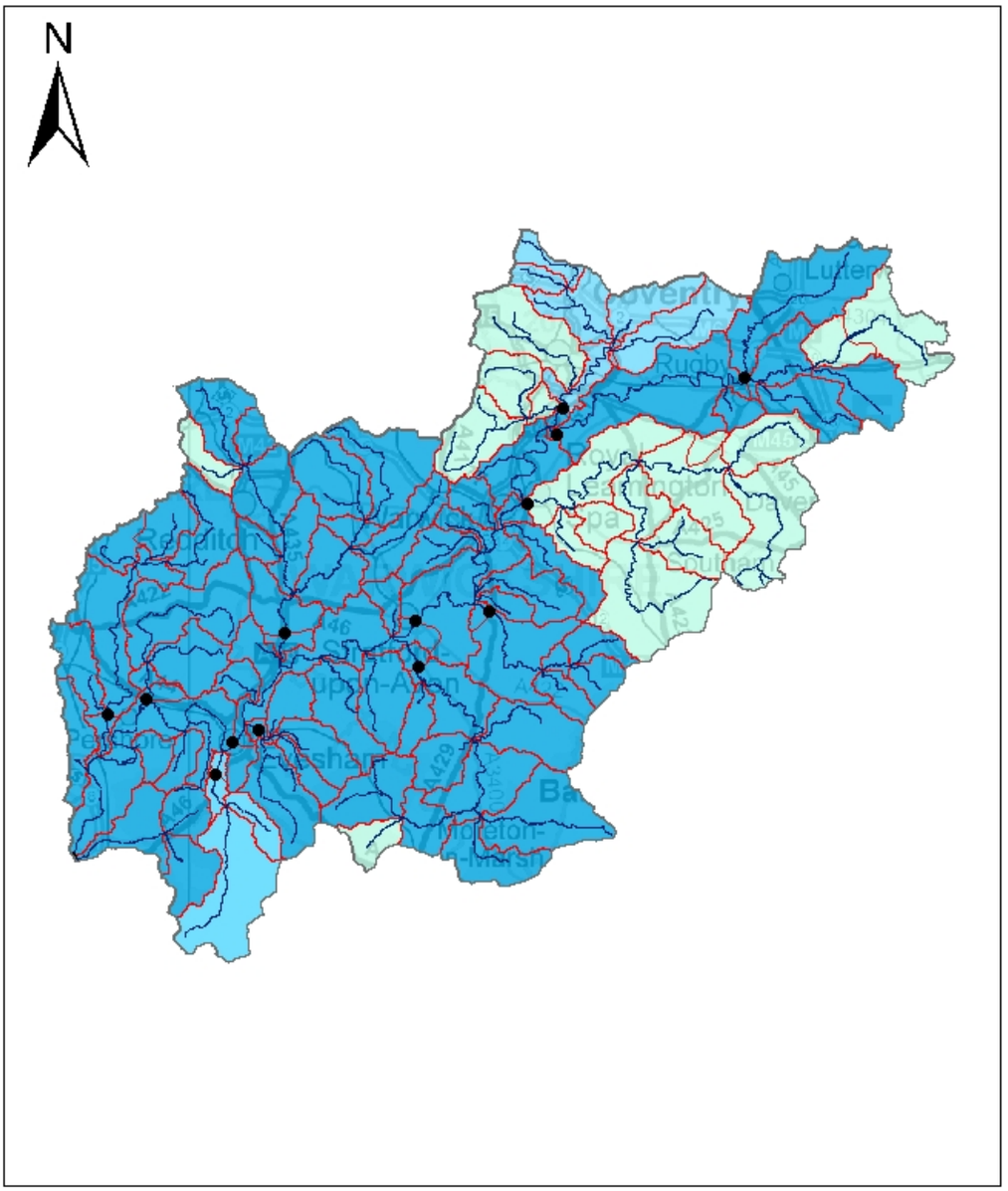
The availability of water for abstraction within a river varies greatly from high to low flows. By assessing the quantity of water available at different flows it is possible to see when there is a surplus or deficit of water and the associated reliability of an abstraction. This is an indication only; actual reliability of a licence will be discussed on application.

Table 3 shows the resource availability colour associated with the percentage reliability of consumptive abstraction. Map 4 gives an indication of the resource reliability in the Warwickshire Avon area expressed as percentage of time.

Resource	Percentage of the time additional consumptive resource may be available
	Consumptive abstraction available **less than** 30% of the time.
	Consumptive abstraction available **at least** 30% of the time.
	Consumptive abstraction available **at least** 50% of the time.
	Consumptive abstraction available **at least** 70% of the time.
	Consumptive abstraction available **at least** 95% of the time.
	Not assessed

Table 3 **Percentage reliability of consumptive abstraction.**

Warwickshire Avon CAMS
Resource Reliability (% of the time)



CAMS Assessment Points
Rivers
Water Bodies
Water Resources available less than 30%
Water Resources available at least 30%
Water Resources available at least 50%
Water Resources available at least 70%
Water Resources available at least 95%

Kilometres
0 6 12 18 24 30

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Map 4 **Water resource reliability expressed as percentage of time available.**

4. How we manage abstractions in the Warwickshire Avon area

4.1 Principles

The document Managing Water Abstraction outlines the over-arching principles that we follow in managing our water resources. How we apply these principles in the Warwickshire Avon area is outlined in this section. If you want to abstract water it outlines where water is available for further abstraction and the principles we follow in assessing your application for a licence.

Abstraction licence application process

Anyone wanting to take more than 20m^3/day (4,400 gallons) from a 'source of supply' (river, stream, lake, well, groundwater, etc) must have an abstraction licence. The application process for abstraction is similar to the planning process in that we may require the application to be advertised and may require supporting environmental information. When considering the application we check that the quantities applied for and the purpose of the abstraction 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. Depending on the outcome of our investigations we will issue a licence either as applied for, or with conditions that restrict the abstraction to protect the environment or other users. 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.

Each application is determined on its own merits

Whilst this document may say that 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.

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 have to protect the environment and rights of other abstractors. To do this we may add constraints to licences. 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 conditions will come into effect and abstraction is more likely to be stopped.

Abstractions are managed to protect the environment.

No ecological deterioration

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 our rivers further;
- will maintain the near pristine condition of high hydrological regime water bodies.

We'll also take action if necessary to limit the increase in current abstraction, if we think this will lead to deterioration of the ecology or the near pristine condition of our high hydrological regime water bodies.

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 River Basin Management Plans (2009) and ensure compliance with the European Union Water Framework Directive.

Water efficiency and demand management

We need to make the best use of our existing water resources. Adopting water efficiency and demand management measures can help us achieve this goal. Water efficiency is one of the tests that will need to be satisfied before we grant a new licence or renew 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. For further details on our general approach to licensing please see the document Managing Water Abstraction.

Impoundments
Applications for impoundments will be dealt with on a case-by-case basis. An impoundment is a dam, weir or other construction in an inland waterway that obstructs or impedes flow and/or raises water levels.

Hydropower
Water abstraction for hydropower schemes is non-consumptive, with all water used returned to the watercourse. Hands off Flows and maximum abstraction volumes are determined in line with the Environment Agency's Hydropower Good Practice Guidelines and based on the assessment of environmental risk for each scheme. For further information please refer to our website.

4.2 Abstraction restrictions

When issuing a licence we have to protect the environment and rights of other abstractors. To do this we may add conditions to licences.

Time limited licences
In recognition of changing pressures on water resources all new licences and variations (other than downward variations or minor variations having no environmental impact) will have a time limit imposed. This allows for the periodic review and changes to abstraction licences where circumstances have changed since the licence was granted.

All new licences within a CAMS area have a **common end date** (CED) so they can be reviewed at the same time. When an application is made within six years of the CED, we will generally apply the subsequent CED to any 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 replacement the normal duration will then usually be 12 years.

10.5% of the licences in Warwickshire Avon CAMS are time-limited. CEDs occur every twelve years. The next CED for the Warwickshire Avon CAMS is 31 March 2013 and the subsequent one is 31 March 2025. A time limit of 31 March 2025 will generally be applied to new abstraction licences. Where we are uncertain about the long term impacts of an abstraction we will grant a shorter term licence during which time potential impacts are monitored.

Time limited licences will be renewed providing the abstraction:

- is environmentally sustainable
- has a continued justification of need
- is an efficient use of water.

Additional information about the replacement of time limited licences is available in Managing Water Abstraction.

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'.

4.2.1 Surface water

We assess surface water flows at Assessment Points (APs) which are significant points on the river, often where two major rivers join or at a gauging station. Where flows fall below the EFI, new abstractions may be subject to HoFs.

Table 4 gives an indication of how much water is available for further abstraction and the associated restrictions that we may apply to new and varied abstraction licences from the main river. The volume of water available applies to the whole of the catchment so less will be available further upstream due to lower flows. Likewise, tributaries to the main river may be subject to different restrictions and quantities.

Each HOF is linked to an AP and is dependent on the resource availability at that AP. In some cases additional restrictions may apply to licences where there is a more critical resource availability downstream to protect the ecological requirements of the river.

All abstraction licence applications are subject to an assessment to take account of any local and downstream issues and may be subject to further restrictions.

Reading from top to bottom in Table 4 are the APs in the Warwickshire Avon CAMS area. Reading across the columns you can see the potential HOF that may be applied to a licence, the number of days water may be available under this restriction and the approximate volume of water in Ml/d that may be available. In cases where there is water available at all flows we may apply a Minimum Residual Flow (MRF) to protect very low flows. We'll decide this on a case by case basis.

Further information on water availability and restrictions can be found in the table and text below.

AP	Name	Water Resource Availability Colour	HOF Restriction (Ml/d)	Number of days per annum abstraction may be available	Approximate volume available at restriction
1	Rugby (Upper River Avon and River Swift)	Water Available for Licensing	**87.3 at Stareton gauging station**	**230**	**2.68Ml/d** (from the whole of the River Avon catchment upstream of Rugby. Less will be available further upstream and from tributaries due to reduced flows)
2	Stoneleigh (River Sowe and Sherbourne)	Water Available for Licensing	**143 at Stareton gauging station**	**153**	**5.6Ml/d** (from the whole of the River Sowe catchment. Less will be available further upstream and from tributaries due to reduced flows)
3	Stareton (River Avon)	Water Available for Licensing	**80 at Stareton gauging station**	**245**	**2.9Ml/d** (from the whole of the River Sowe catchment. Less will be available further upstream and from tributaries due to reduced flows)
4	Leamington (River Leam)	Water Not Available for Licensing	**N/A**	**N/A**	**Closed**
5	Wellesbourne (River Dene)	Water Available for Licensing	**11.4 at Wellesbourne gauging station**	**256**	**2.0Ml/d** (from the whole of the River Dene catchment. Less will be available further upstream and from tributaries due to reduced flows)
6	Stratford (River Avon)	Water Available for Licensing	**409 at Evesham gauging station**	**318**	**32.6Ml/d** (from the whole of the River Avon catchment upstream of Stratford. Less will be available further upstream and from tributaries due to reduced flows)
7	Alscot Park (River Stour)	Water Available for Licensing	**34 at Alscot Park gauging station**	**263**	**4.5Ml/d** (from the whole of the River Stour catchment. Less will be available further

					upstream and from tributaries due to reduced flows)
8	Broom (River Arrow)	Water Available for Licensing	**90 at Broom gauging station**	**292**	**19.4Ml/d** (from the whole of the River Arrow catchment. Less will be available further upstream and from tributaries due to reduced flows)
9	Offenham (Badsey Brook)	Water Available for Licensing	**15.5 at Offenham gauging station**	**248**	**2.8Ml/d** (from the whole of the Badsey Brook catchment. Less will be available further upstream and from tributaries due to reduced flows)
10	Evesham (River Avon)	Water Available for Licensing	**409 at Evesham gauging station**	**318**	**32.6Ml/d** (from the whole of the River Avon catchment upstream of Evesham. Less will be available further upstream and from tributaries due to reduced flows)
11	Hinton (River Isbourne)	Water Available for Licensing	**38 at Hinton gauging station**	**164**	**4.8Ml/d** (from the whole of the River Isbourne catchment. Less will be available further upstream and from tributaries due to reduced flows)
12	Wyre Piddle (Piddle Brook)	Water Available for Licensing	**11 at Wyre Piddle gauging station**	**277**	**1.6Ml/d** (from the whole of the Piddle Brook catchment. Less will be available further upstream and from tributaries due to reduced flows)
13	Besford Bridge (Bow Brook)	Water Available for Licensing	**16 at Besford Bridge gauging station**	**281**	**0.7Ml/d** (from the whole of the Bow Brook catchment. Less will be available further upstream and from tributaries due to reduced flows)
14	Upper Pound (River Avon)	Water Available for Licensing	**1800 at Deerhurst gauging station on the River Severn**	**328**	**32.6Ml/d** (from the whole of the River Avon catchment. Less will be available further upstream and from tributaries due to reduced flows)

Table 4 **HOFs for the assessment points of the Warwickshire Avon CAMS.**

Across the Severn catchment the water resource strategies are driven by the need to protect flows at the bottom of the River Severn at Deerhurst gauging station. A Habitats Directive Review of Consents has concluded that in order to protect the Severn Estuary, a HOF of 1800 Ml/d at Deerhurst is appropriate.

Therefore throughout the catchment all HOFs have been set at local gauging stations but at flows which are equivalent to or higher than 1800Ml/d at Deerhurst gauging station. Where watercourses need further protection of flows due to unfavourable local water resource situations or other local

considerations, we have set their HOFs at a suitable higher flow. In the Avon the need for sufficient water flowing over weirs for fish has meant we have retained most of the existing HoFs but we will be continuing to investigate the water requirements and the HoFs needed.

Groundwater licences which aren't from the major aquifers described in Section 4.2.2 will be individually assessed. Where they are linked to surface water, the surface water restrictions below may be applied.

Parts of the River Avon catchment are discharge rich so the strategy outlined below depends on the resource situation remaining as it is currently. Any changes to major abstractions from or discharges to the catchment may result in a change in this licensing strategy or to the volumes of water available.

The following conditions may not apply if the abstraction is non-consumptive (i.e. it doesn't result in a loss of water to any part of the catchment) or if the licence results in an overall environmental benefit.

AP1 Rugby (Rivers Avon and Swift)
For assessment point 1, the Upper River Avon catchment to Rugby, there is water available for licensing subject to a HOF of 87.3Ml/d at Stareton gauging station on the River Avon and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP2 Stoneleigh (River Sowe)
For assessment point 2, the River Sowe catchment, there is water available for licensing with a HOF of 143Ml/d at Stareton gauging station and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

The catchments of the River Sherbourne and the Finham Brook are both closed to further abstraction. The River Sherbourne has been over licensed and abstracted and the Finham Brook over licensed and the impacts on both are being investigated under the Restoring Sustainable Abstraction programme, see Section 4.5 Restoring Sustainable Abstraction.

AP3 Stareton (River Avon)
For assessment point 3, the River Avon catchment from Rugby to Stareton, there is water available for licensing subject to a HoF of 80Ml/d at Stareton gauging station and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;

• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP4 Leamington (Rivers Leam and Itchin)
For assessment point 4, the River Leam catchment, there is no water available for licensing due to over abstraction.

This means that no new consumptive licences will be granted and there is no impact on existing licence holders.

• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability). However we will seek to reduce licensed quantities and encourage improved water efficiency wherever possible.

We have been working with Severn Trent Water to review the licence operating agreement for Draycote reservoir.

AP5 Wellesbourne (River Dene)
For assessment point 5, the River Dene catchment, there is water available for licensing subject to a HOF of 11.4Ml/d at Wellesbourne gauging station on the River Dene and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP6 Stratford and 10 Evesham (River Avon)
For assessment points 6 and 10, the Avon catchment from Stareton to Evesham, there is water available for licensing with a HOF of 409Ml/d at Evesham gauging station on the River Avon and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP7 Alscot Park (River Stour)
For assessment point 7, the River Stour catchment, there is water available for licensing subject to a HOF of 34Ml/d at Alscot Park gauging station on the River Stour and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;

• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP8 Broom (River Arrow)
For assessment point 8, the River Arrow catchment, there is water available for licensing with a HOF of 90Ml/d at Broom gauging station on the River Arrow and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

There have been low flow issues in the upper catchment around Batchley Brook. A compensation scheme is in operation to support levels in Hewell Park Lake SSSI. As such the Batchley Brook catchment will be closed to further abstraction.

AP9 Offenham (Badsey Brook)
For assessment point 9, the Badsey Brook catchment, there is water available for licensing with a HOF of 15.5Ml/d at Offenham gauging station on the Badsey Brook and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP11 Hinton (River Isbourne)
For assessment point 11, the River Isbourne catchment, there is water available for licensing subject to a HOF of 38Ml/d at Hinton gauging station on the River Isbourne and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP12 Wyre Piddle (Piddle Brook)
For assessment point 12, the Piddle Brook catchment, there is water available for licensing subject to a HOF of 11Ml/d at Wyre Piddle gauging station on the Piddle Brook and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP13 Besford Bridge (Bow Brook)
For assessment point 13, the Bow Bridge catchment, there is water available for licensing subject to a HoF of 16Ml/d at Besford Bridge gauging station on the Bow Brook and a HOF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

AP14 Upper Pound (River Avon)
For assessment point 14, the Avon catchment from Evesham to the Severn confluence, there is water available for licensing subject to a HoF of 1800Ml/d at Deerhurst gauging station on the River Severn.

This means that for new licences:
• All new consumptive or partially consumptive licences will be issued with this HOF;
• Water is only available during periods of medium to high flows due to the HOF condition;
• There is a time limit of 31 March 2025

and for existing licences:
• There is no impact on existing licence holders.
• Time limited licences will be renewed subject to the fulfilment of the renewal criteria (justification of need, water efficiency and environmental sustainability).

Heavily Modified Water Bodies

These water bodies can be classified for many reasons, but for water resources they are classified if they may contain a lake and/or reservoir that influence the downstream flow regime of the river. The downstream 'flow modified' water bodies are also classified as heavily modified. They are designated for water resource purposes if the flow regime has been altered by flow regulation/augmentation.

Within the Avon CAMS catchment, there are a number of watercourses that are designated Heavily Modified Water Bodies (HMWB) for water resources reasons. These include the River Leam catchment which includes Draycote Reservoir, and the upper River Avon catchment which encompasses Naseby, Sulby and Stanford reservoirs. Draycote and Stanford provide storage for potable (drinking) water while Naseby and Sulby provide water to the canal network. As they are impoundments, they obstruct the watercourses and thus alter the flow regime downstream of these impoundments. This affects the water availability within these catchments. Abstractions in the upper River Avon are subject to a higher HOF than further downstream while the River Leam has been closed – see Section 4.5 Restoring Sustainable Abstraction.

There are other waterbodies in the Avon catchment which have been designated as HMWB for reasons other than water resources. These include flood protection, urbanisation, navigation and the wider environment.

Important local features that may affect water availability

European law provides a very high level of protection to two types of designated sites due to their special environment. These are:

- Special Areas of Conservation (SAC), which contribute to biodiversity by maintaining and restoring habitats and species;
- Special Protection Area (SPA), which provides protection to birds and their nests, eggs and habitats

Ramsar sites and Sites of Special Scientific Interest (SSSI) also carry a high level of environmental importance. Further information can be found in Section 4.5 – Restoring Sustainable Abstraction.

There are two SACs within the Warwickshire Avon catchment but as neither is water-dependent they have no impact on the licensing strategy.

There are 47 water dependent designated Sites of Special Scientific Interest (SSSI) and many more important nature reserves within the catchment. Many of these sites are dependent on water supplied during periods of flooding, but some are in direct continuity with rivers or groundwater and depend on them all year round. The impact of any new abstraction will be considered on these sites.

The fisheries monitoring results suggest that the river supports a huge diversity of coarse fish species and that population densities are excellent or good throughout the catchment. Wild brown trout can also be found in some of the smaller tributaries such as the Isbourne, Arrow, Alne and Stour. The Warwickshire Avon is unusual in the fact that it has few sizable tributaries, this means that the numerous small brooks that join the main river are disproportionately important for fish survival, particularly in winter flows.

In this area fisheries can be particularly affected by the intensive agriculture in terms of fertilizer application, sediment erosion from regular ploughing and water abstraction. All these inputs can have a negative impact on fish stocks from choking the river with weed growth, degradation of spawning gravels and low flows in the summer. These issues can increase water quality problems. In addition urbanisation has required the installation of numerous flood protection schemes, which reduce the quality of habitat. For these reasons we have erred on the side of caution when considering HOFs and will investigate the impacts further before any changes are made.

Designation	Site Name
Site of Special Scientific Interest	Avon Valley Wetland
	Aston Grove & Withycombe Wood Avon Valley
	Baynall Meadow
	Bittell Reservoirs
	Bosworth Mill Meadow
	Brandon Marsh
	Calcutt Locks Meadow
	Cave's Inn Pits
	Cleeve Common
	Combe Pool
	Cooksholme Meadows
	Dagnell End Meadow
	Dean Brook Valley Pastures
	Fosters Green Meadows
	Herald Way Marsh
	Hewell Park Lake
	Hopwood Dingle
	Ipsley Alders Marsh
	Knavenhill Wood
	Lobbington Hall Farm Meadow
	Long Meadow
	Lower Saleway Farm Meadows
	Loxley Church Meadow
	Merriman's Hill Farm Meadow
	Midsummer Meadow
	Misterton Marshes
	Oak Tree Farm Meadows
	Oxhouse Farm
	Portway Farm Meadows
	Racecourse Meadow
	River Itchen
	Rough Hill & Wirehill Woods
	Rookery Cottage Meadows
	Sherbourne Meadows
	Tiddesley Wood
	Tilehill Wood
	Trickses Hole
	Tunnel Hill Meadow
	Ufton Fields
	Ullenhall Meadows
	Upham Meadow & Summer Leasow
	Welford Field
	Whichford Wood
	Wolford Wood & Old Covert
	Wylde Moor, Feckenham
	Yellow House Meadow

Table 5 **SSSIs in the Warwickshire Avon CAMS area**

4.2.2 Groundwater

This area contains two principal aquifers – the Sherwood Sandstone and Jurassic Limestone. The outcrops are shown on maps 1 and 3. The Sherwood Sandstone is a principal aquifer of strategic importance. It provides large volumes of potable water, particularly from the Sowe, Leam, mid-Avon and Upper Arrow catchments, and sustains industrial and agricultural abstractions. The main outcrop is in the centre of the northern catchment, to the north of Warwick around Coventry, with a smaller outcrop north of Redditch. The Jurassic Limestone is situated in the south of the

catchment. There are very few licences abstracting from this aquifer; those that do are for purposes associated with agriculture.

On principal aquifers we have divided the area into groundwater management units (GWMUs). The Sherwood Sandstone has been divided into six GWMUs and the Jurassic Limestone is represented by a single GWMU (Cotswold North). We use the information and assessments on these units to determine water availability and licence restrictions – see Table 6. The remainder of the catchment is open to new groundwater abstraction applications if applicants can confirm that there is no impact on other abstractors, the aquatic environment and river flows.

Where groundwater abstractions from solid or drift geology are likely to impact surface water features, or reduce baseflow to a river, the impact is measured at the surface water AP and a Hands off Flow (HOF) condition may be applied to the abstraction. This is a river flow below which an abstractor is required to reduce or stop abstraction. The surface water HOF restrictions in Table 4 may be applied to these licences, and will be applied to abstractions from the Cotswolds North Jurassic Limestone aquifer.

WFD groundwater body	Groundwater management unit	Water resource availability	Licence restriction
Warwickshire Avon - PT Sandstone Bromsgrove South	Bromsgrove South	Water not available for licensing	Closed due to over abstraction.
Warwickshire Avon - Coal Measures Coventry	Coventry	Restricted water available for licensing	Closed to new abstractions as all resources have been licensed. Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder.
	Kenilworth	Water available for licensing	Open to further abstraction if applicants can confirm that there is no impact on other abstractors, the aquatic environment and river flows. A HOF may be applicable. Borehole yields tend to be low.
Warwickshire Avon - PT Sandstone Warwick/Avon Confined	Warwick	Water not available for licensing	Closed due to over abstraction.
	Avon (confined)	Water not available for licensing	Closed as licensed and actual abstraction exceed natural groundwater inflows to the unit.
	Whitley	Restricted water available for licensing	Closed to new abstractions as all resources have been licensed. Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder.

Warwickshire Avon - Jurassic Limestones Cotswold Edge North	Cotswolds North	Water available for licensing	The unit covers many catchments and has a significant impact on surface water. Therefore a HOF will be applied to new abstractions according to the surface water catchment affected by the abstraction.

Table 6 **Licence restrictions on groundwater abstractions in the Warwickshire Avon CAMS area**

We want to reduce the unacceptable impact of groundwater abstraction on surface water low flows. Many Sherwood Sandstone catchments in Midlands Region have suffered in this way, but the high storage capacity of the aquifer also provides the means to restore sustainability. We will encourage modification of existing water supply schemes to make better use of aquifer storage in conjunction with surface water. In principle, two types of scheme are acceptable:

1. Conjunctive use schemes. The Sherwood Sandstone is capable of supporting increased daily abstraction. We will encourage schemes with increased daily groundwater abstraction during times of low surface flow, and increased surface water abstraction at times of high surface flow. These will be accompanied by licence changes to reduce actual annual groundwater abstraction, which will increase surface flows in the long term. These arrangements will only be considered for existing groundwater licences with relatively constant, high rates of actual abstraction, such as public water supplies.

2. Surface to groundwater exchange licence schemes. We will consider exchanging surface water licences for groundwater licences where water resources are available and where there are benefits to the surface water environment.

In both cases, we will only consider schemes that achieve real improvements in surface water low-flow conditions. All schemes will be subject to environmental assessment.

4.3 Opportunities for licence trading

We want to make it easier to trade water rights. A water rights trade is where a person sells all or part of their water right, as defined by their abstraction licence(s), to another person 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.

In licensing trades, as with new abstraction licences, we need to make sure that we do not cause any deterioration in WFD water body status both within the water body / bodies where the trade will take place or to downstream water bodies. The table below provides a guide to the potential for trading in water bodies of a particular CAMS water resource availability colour, as shown on map 3.

CAMS water resource availability colour	Our approach to trading
High hydrological regime	Opportunities for trading water rights will be limited
Water available for licensing	Allow trades of recent actual abstraction and licensed abstraction, but little demand for trading expected within water body as water available for new abstractions.

CAMS water resource availability colour	Our approach to trading
Restricted water available for licensing	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
Water not available for licensing	We will only trade recent actual abstraction but no increase in recent actual abstraction is permitted in water body. Licensed abstraction will be recovered for the environment.
HMWBs	Opportunities for trading will depend on local operating agreements and local management.

Table 7 **Licence trading opportunities**

To find out more about licence trading please go to our website.

4.4 New Authorisations

The Water Act 2003 brought all significant water abstraction under licensing control. This will result in trickle irrigation, dewatering of mines, quarries, engineering works and construction sites, abstractions related to Internal Drainage Districts, navigation abstraction and abstraction for ports and harbour authorities and other local exemptions coming into the licensing regime.

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.

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 details of these abstractions we have included them in our assessments to consider how they impact on the catchment.

4.5 Restoring Sustainable Abstraction

Where water abstractions cause or potentially cause actual flows to fall short of the EFIs and result in environmental damage, we may need to change or even revoke existing abstractions in order to achieve a sustainable abstraction regime. Within the Warwickshire Avon CAMS there are nine water bodies in which recent actual flows have fallen below the EFI. The reasons for this have been investigated and we are carrying out further investigations on four of them. The abstraction that cause these issues within these water bodies are being investigated as part of the RSA programme. Investigations into the impact caused by these licences, individually or cumulatively, will result in options being developed with licence holders on how to improve sustainability. Investigations will include a cost/benefit analysis. Information on how licences in the RSA programme are dealt with can be found in our Step by Step guide on our website.

Investigation of Water Framework Directive Water bodies.

In addition to the RSA programme, we are investigating whether reduced water flow may be causing problems under the Water Framework Directive (WFD). About four per cent of rivers are failing to support WFD good ecological status due to pressures from over-abstraction.

Habitats Directive
Under the Habitats Regulations we have assessed the effects of existing abstraction licences and will assess new applications to make sure they are not impacting on internationally important nature conservation sites. These sites are known as Special Areas of Conservation (SAC's) and Special Protection Areas (SPA's). If your current licence has been reviewed under this legislation to assess its impact you will already know about the review. If we haven't contacted you yet then your licence is either not near a SAC/SPA or isn't having an impact on these sites. If our assessment shows that a new application could have an impact on a SAC/SPA we have to follow strict rules in setting a time limit for that licence. These are:

• we may be able to grant the licence but only with a short time limit. This allows us to monitor the impact of the abstraction on a SAC/SPA and change the licence if necessary;
• if we can't determine that your application will not affect the site we have to either put conditions on the licence so that it cannot affect the site or refuse the application. If we grant the licence we may ask you to monitor its impact;
• if our assessment shows that there isn't an impact on the site we will manage the application according to the principles in this document.

The main pressure driving the RSA programme in this CAMS area is that of the impact of abstraction from groundwater on surface water features causing low flow conditions. Other pressures on river flows include the network of transfers of water for public water supply and to the canal network for navigation.

The table below contains details of the current RSA sites in the Warwickshire Avon CAMS catchment.

Site name	Type of site	AP	Details of current investigations or planned implementations
Coventry groundwater	AMP4/5	2	Previous investigations have concluded that the surface watercourses in this area are impacted by groundwater abstraction from multiple sources. We are currently assessing the impact of these public water supply abstractions from the Coventry coal measures groundwater unit on the watercourses – the Rivers Sowe and Sherbourne, and the Canley and Finham Brooks. The River Sherbourne is known to have low flow issues in its upper reaches. Investigations into the impacts of public water supply groundwater abstractions have led to plans for one of the abstractions to be converted to a flow compensation scheme. The whole river will be closed to further licences as it has been over abstracted, as will the Finham Brook which has been over licensed.
Upper River Arrow	AMP4/WFD	8	Batchley Brook at the top of the River Arrow, is non-compliant with WFD hydrology. Under the AMP4 programme a borehole compensation release scheme was implemented to ensure that Hewell Park lake (a SSSI) levels are maintained to agreed limits. The site is now in favourable condition, but we will keep the Batchley Brook catchment closed to further abstraction.

Table 8 **Current RSA sites in the Warwickshire Avon catchment**

Glossary of terms

Abstraction	Removal of water from a source of supply (surface or groundwater).
Abstraction licence	The authorisation granted by the Environment Agency to allow the removal of water.
Assessment Point Unit	Point at which the flow from upstream catchment is assessed.
Catchment	The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.
Consumptive abstraction	Abstraction where a significant proportion of the water is not returned either directly or indirectly to the source of supply after use. For example for the use of spray irrigation.
Discharge	The release of substances (i.e. water, sewage, etc.) into surface waters.
Environmental flow indicator	Flow indicator to prevent environmental deterioration of rivers, set in line with new UK standards set by UKTAG.
Full licence	A licence to abstract water from a source of supply over a period of 28 days or more
Groundwater	Water that is contained in underground rocks.
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.
Protected right	Means a right to abstract, which someone has by virtue of the small abstractions exemptions defined in the Water Act 2003 or by virtue of having an abstraction licence. The right protected is the quantity that can be abstracted up to that allowed by the exemption or the terms of the licence. The small abstraction exemptions defined by the Water Act 2003 are for domestic and agricultural purposes (excluding spray irrigation) not exceeding 20 m^3/d.
Surface water	This is a general term used to describe all water features such as rivers, streams, springs, ponds and lakes.
Transfer licence	A licence to abstract water from one source of supply over a period of 28 days or more for the purpose of; 1. transferring water to another source of supply; or, 2. transferring water to the same source of supply, but at another point, in the course of dewatering activities in connection with mining, quarrying, engineering, building or other operations (whether underground or on the surface); without intervening use.
Water body	Units of either surface water or groundwater at which assessments are completed for WFD.

List of abbreviations

AMP	Asset Management Plans
AP	Assessment Point
ASB	Abstraction Sensitivity Bands
AWB	Artificial Water body
CAMS	Catchment Abstraction Management Strategies
CED	Common End Date
Defra	Department of Environment Fisheries and Rural Affairs
EA	Environment Agency
EFI	Environmental Flow Indicator
FL	Full Licensed (scenario)
GEP	Good Ecological Potential
GES	Good Ecological Status
GW	Groundwater
GWMU	Groundwater Management Unit
HES	High Ecological Status
HMWB	Heavily Modified Water Body
HoF	Hands off Flow
HoL	Hands off Level
LDE	Level Dependent Environment
Ml/d	Megalitres per day
maOD	Metres above ordnance datum
Q95	The flow of a river which is exceeded on average for 95% of the 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
SW	Surface water
UKTAG	United Kingdom's Technical Advisory Group
WB	Water body
WFD	Water Framework Directive
WRGIS	Water Resources Geographical Information System

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