



The case for change

– reforming water abstraction
management in England



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Foreword

Water is vital for life, sustaining businesses, agriculture and the natural environment. The pressures on water resources will increase in the future. The effects of changing rainfall patterns and population growth are likely to stretch already limited water resources. A concerted effort will be required to overcome these challenges to deliver sustainable use of water now and for future generations.

The way water abstraction is currently managed is not responsive or flexible enough to address these future pressures. Government has therefore committed to reforming the abstraction management regime. The Environment Agency and Ofwat support the proposals set out in Defra's Water White Paper and look forward to continuing to work with Government towards a more sustainable future.

The regulatory approach must facilitate the sustainable use of water resources, ensuring there is sufficient water for people, businesses, agriculture and the environment. It must ensure reliable supplies of water at least and fair cost to water bill payers and the consumers of other water dependent products and services. It also needs to be able to take account of and respond to future pressures.

In this report, the Environment Agency and Ofwat set out evidence for the need to reform water abstraction management. Acting together now will ensure enough good quality water for a healthier water environment and secure supplies of water for people, businesses and agriculture in the longer term.

Executive summary

In this report, the Environment Agency and Ofwat set out evidence for the need to reform water abstraction management. We set out our joint objectives for change to support and inform the Government's Water White Paper covering England.

The Environment Agency has a duty to manage, conserve and redistribute water resources in a way that minimises the burden on business and encourages innovation. It does this through an abstraction licensing system that has been in place since the 1960s. The main reason for introducing the system was to address and prevent interference between water users. It was not primarily designed or intended to be used as a way of allocating available water resources, nor protecting the environment. Although the system has been updated in the past 20 years, particularly to better protect the environment, many of the principles that underpin it remain unchanged since the 1960s.

Almost half of all fresh water abstracted in England is for public water supply. Ofwat is the economic regulator of the public water supply companies of England and Wales. Its duties include protecting the interests of consumers, wherever appropriate by promoting competition; ensuring the companies can carry out and finance their functions; promoting economy and efficiency whilst also contributing to the achievement of sustainable development.

When the licensing system was designed in the early 1960s and licences of right were issued to existing abstractors, there was a perceived surplus of water in most areas. This surplus has decreased over time, as our understanding of the impact that abstraction has on the environment has grown. The licensing system evolved with the introduction of the Water Resources Act 1991 and the Water Act 2003, but many licences remain unaltered. In the past, some licences were issued that we now understand are harming the environment. The Environment Agency is investigating 263 schemes in England and Wales where there is a risk of damage to important conservation sites under the Restoring Sustainable Abstraction (RSA) programme. Investigations may lead to changing abstraction licences, including reducing volumes licensed for abstraction.

In the future, pressures on water availability will increase because of climate change. By the 2050s, it is anticipated that under the medium emissions scenario¹ summer temperatures may increase and summer rainfall may decrease. Short duration drought conditions (12-18 months) are likely to become more frequent. Resilience in public water supply has increased since privatisation and there is more winter storage, but it is likely that droughts like the one in 1976 will be more common.

Changing lifestyles and an increase in population could have a substantial impact on demand for water. By the 2030s, the total population of England and Wales is expected to grow by an extra 9.6 million people, so despite forecasts of reductions in per capita consumption as a result of recent demand management initiatives by water companies, overall use is likely to grow.

The way water abstraction is currently managed is not responsive or flexible enough to create market or regulatory signals which would result in actions to address these future challenges.

- Many licences have a fixed water allocation. The volume of water permitted for abstraction is not dynamically linked to the actual volume of water available. Most licences have been issued without a time limit, making it difficult to review them. To change these licences, the Environment Agency has to follow a slow regulatory process. Where licences have a condition to reduce or stop abstraction, this condition is not flexible to a changing environment.
- Licences issued more recently have more restrictions compared with older historic licences, because of our improved understanding of the impact abstractions have on the environment. However there are still no mechanisms built in to licences to ensure that users respond to relative scarcity or abundance, and we still rely on regulatory intervention.
- There is no dynamic water abstraction market, with little trading or sharing of licences to abstract. This is because of real and perceived barriers, such as poor information about trading opportunities, a lengthy administrative process and uncertainty about trading outcomes. So abstractors who do not need to take their full water allocation do not hand back or sell-on licences as their needs change.
- Charges for licences are not linked to the volumes abstracted² so they do not reflect the availability of water or the competing demands and value that users place on it. Once water is allocated, there is no financial incentive to use it efficiently, or to consider its scarcity and other environmental impacts.

These limitations are already having an impact. The Restoring Sustainable Abstraction (RSA) process shows that the time and cost associated with each licence change has a significant impact on abstractors and regulators. There is in many parts of the country no or limited access to new or additional water, which risks limiting growth. There has been limited trading activity to date and little sharing between sectors.

The absence of a responsive system, a value for water and an effective market means that abstractors do not receive the right signals about sustainable decision-making, nor are they reflected in the way others use water throughout the value chain from source to tap. All of this means a very real risk of further environmental damage, the wrong choices and investments by abstractors, and water shortages at some times and in some places. Without reform it will not be possible to deliver sustainable use of water resources.

We welcome the Government's commitment to change the abstraction management system in the Natural Environment White Paper and the Water White Paper proposals for a fundamental reform of the abstraction management regime by the 2020s. By starting reform now, there will be time not only to assess and appraise options properly for the future but also to transition to a new system in a way which minimises risk to the environment, abstractors and water users, and so to society and the economy.

A future system should be flexible enough to react to changing patterns of water availability, provide incentives to share and trade water resources, allow users to respond to and plan for changing patterns of use and send signals about the sustainable use of water, including demand management. Doing this now will ensure current and future pressures can be addressed in a way that minimises their impact on society, the economy and the environment.

To deliver a more sustainable water resource management regime, the government intends reform in several areas. We recognise that reform of the abstraction licensing regime is only part of that package. There is much that we as regulators can do, and are doing now, using our existing powers to facilitate more sustainable use of water resources. But in this report, we³ (the Environment Agency and Ofwat) focus on long term reform and set out the evidence on the need for reform along with our shared views on the issues that need to be addressed. We look forward to continuing to work with Government to make the commitments in the Water White Paper a reality.

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1. Introduction

Water is precious. It is essential for life and is one of society's most basic needs. It is also vital to the economy, used to generate power, run industries, grow food, used in homes and supports the natural environment. Water is valuable in so many ways, both in the environment and in sustaining society.

The future for water is uncertain. Climate change, population growth and lifestyle changes mean that careful planning is needed to ensure sustainable water supplies for people, businesses and the environment. It is important to get this right now because planning and implementing changes can take many years. The current regime is already beginning to show limitations. In the Natural Environment White Paper, the Government committed to reforming the abstraction management regime and to take steps to tackle the legacy of unsustainable abstraction across England. And in the Water White Paper, the Government sets out the direction of travel, process and timetable for reforming the abstraction management regime and some immediate measures to restore sustainable abstraction more efficiently and promote abstraction licence trading to get more economic value from water resources.

The Environment Agency and Ofwat work together, with Government and others, to sustain the balance between abstractors and the environment across a range of sectors.

It is the Environment Agency's responsibility to decide how much water can be taken from the environment for people and business use, without damaging it or compromising existing lawful users. The Environment Agency looks at all aspects of water in an integrated way, dealing with managing abstraction, flood risk and water quality.

The Environment Agency manages water abstraction in England and Wales through an abstraction management regime (licensing system) that regulates abstractors taking more than 20 cubic metres per day (m³/d) of water (excluding purposes exempt from licensing). Farmers, industry, private and public water suppliers are all regulated abstractors. One of the Environment Agency's aims is that sustainable abstraction can provide "enough good quality water for people, agriculture, commerce and industry, and an improved water-related environment".

Ofwat is the economic regulator of the statutory water only, and water and sewerage companies in England and Wales. It ensures that the companies provide their customers with a good quality service and value for money. Its duties include ensuring efficient water companies can carry out and finance their functions; protecting the interests of consumers, wherever appropriate by promoting competition; promoting economy and efficiency and contributing to the achievement of sustainable development. Ofwat's vision is sustainable water that allows society to meet its needs for water and sewerage today, while enabling future generations to meet their own needs.

This document has been jointly produced by the Environment Agency and Ofwat in recognition of the commitment Government has made to reform abstraction management. It is one of two documents supporting the Water White Paper and complements '***The case for change – current and future water availability***', an Environment Agency document, which focuses on the impacts of climate change, population growth and changing lifestyles on water resources.

The rest of this report is structured as follows:

Section 2 provides background information on the **current water abstraction management system**.

In Section 3 evidence is presented of the **social, environmental and economic pressures** on water resources and how they are likely to get worse in the future because of climate change and population growth.

Section 4 explains why the Environment Agency and Ofwat support Government's view that the current water abstraction management regime **is not fit for the future**. We look at the limitations of the system, such as licence conditions that are not directly linked to a changing environment, the slow process for making changes to licences, the signals that abstraction charges send, unused licences and the lack of trading in abstraction licences.

Section 5 summarises why we **believe the management and allocation of water resources needs to change**. We look at the weaknesses of the current water abstraction management regime, alongside the social, environmental and economic pressures faced now and in the future. We have also set out objectives developed with the Government for a future water abstraction management system covering England.

2. Current water abstraction management

The Environment Agency regulates water abstraction through a licensing system first introduced in 1963. This system sits within the wider context of water resources management, which aims to make sure water resources are used properly.

Water abstraction management has changed substantially over the years. The Water Resources Act 1963 introduced a formal system for licensing abstractions from surface water and groundwater. Licences of right were allocated to existing abstractors with no assessment of environmental impact. Allocated volumes were based on amounts that had previously been abstracted and abstraction equipment capacity. Licences had no time limits – and few restrictions in times of low flow.

The Water Resources Act 1991 consolidated successive legislation such as the Water Resources Acts of 1963, 1968 and 1971 and the Water Act of 1989.

Increased environmental awareness, combined with concerns about the effect of the 1995-96 drought, led the Government to review water abstraction management. It found gaps in the regulation of abstraction and impoundments and recommended changes to the management of water abstraction. Many of these recommendations were accommodated within the Water Act 2003.

The main changes made to abstraction licensing in the 2003 Act included the following.

- Greater focus on efficient and sustainable water use.
- A requirement that all new abstraction licences have a start and end date (time-limited).
- Mechanisms to help licence trading, for example removing the need to specify on a licence where the water will be used.
- The introduction of different licence types: temporary, transfer and full licences.
- Deregulation of approximately 20,000 licensed abstractions of less than 20m³/d.
- Changes to who the licensing system should regulate. Some previously exempt abstractions, for example canal transfers, trickle irrigation and dewatering of excavations, will need to be licensed as soon as the regulations come into force.

Under the current abstraction licensing system there are more than 20,000 abstraction licences in England. They permit access to about 130,000 Ml/d of water from surface, groundwater and tidal sources⁴. For the main features of the current abstraction licensing system, see annex 1.

The Environment Agency's Catchment Abstraction Management Strategies (CAMS) set out the availability of water for abstraction on a catchment by catchment basis. By taking into account likely rainfall, the amount of water already licensed for abstraction, how much is discharged and how much water the environment needs, the Environment Agency can determine how much water is potentially available for further abstraction.

Almost half of all water abstracted is taken by water companies for public supply, which includes water for households and business customers. Since the Water Act 1989, statutory water and sewerage companies and water only companies have supplied water in England and Wales. In 1989 the Government established the Office of Water Services (Ofwat) to regulate the appointed companies and protect consumers' interests.

Ofwat can influence the way that water companies manage their abstractions by giving them incentives through the price control to abstract efficiently. Ofwat has recently outlined proposals for a new way to strengthen these incentives as part of its proposals for Future Price Limits, that would give companies incentives to take greater account of the impact of abstraction on the environment⁵. The 'Abstraction Incentive Mechanism' (AIM) would give each unit of abstraction a notional charge based on the environmental damage done by abstracting at that time and place. The AIM would work by setting a baseline of notional charges and then incentivising the companies to reduce the environmental impact of their abstractions. The financial impact of the incentive could be calibrated to send the right price signals to encourage sustainable abstraction. Ofwat will be publishing more information on the mechanism after further testing.

3. Resilience to pressures on water resources

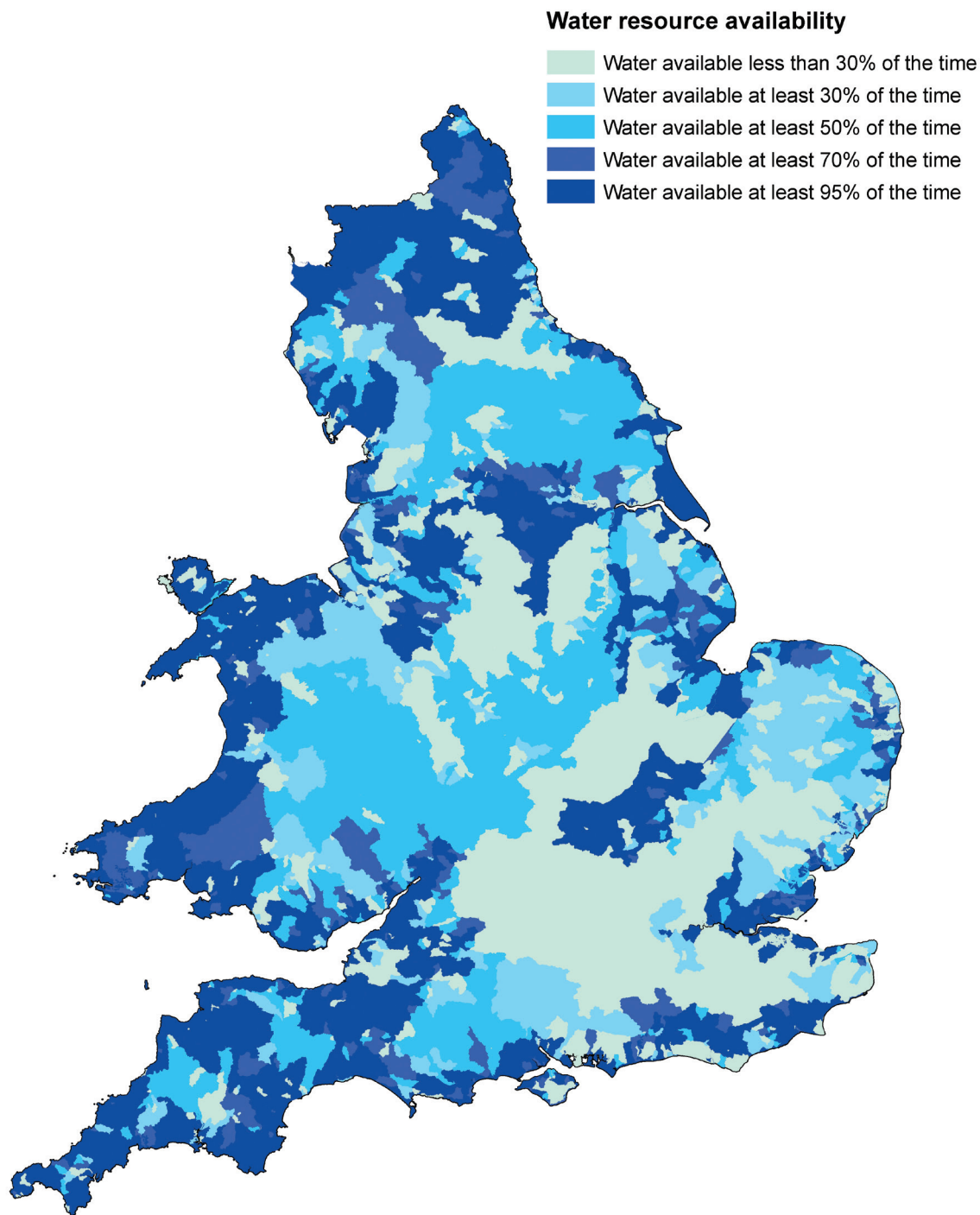
Reliable water supplies are already under pressure in parts of England and Wales. Climate change, population growth and lifestyle changes will make the situation worse. Some abstractions are unsustainable because historic licences were issued without considering the impact on the environment. In some places there is a very real risk of water not being available, or that responses to managing supply will be inefficient and expensive.

3.1 Limited access to additional reliable water supplies

Reliable supplies of additional water for abstraction are not available across much of England because much of the water that can be taken has already been allocated.

The availability of water varies in time and location. The Environment Agency's Catchment Abstraction Management Strategies (CAMS) indicate the amount of water that is available for abstraction. This takes into account how much water abstractors and the environment need. Figure 3.1 illustrates the variation in reliability for new consumptive surface water and groundwater licences. This takes into account where the Environment Agency would restrict a licence to protect the environment and how much of the time it would expect those conditions to restrict abstraction. It shows that for a quarter of water bodies in England, new licences would only allow abstraction for less than 30 per cent of the time in a typical year.

Resources are already stretched in many areas. In some situations, abstractors requiring more water or applying for a licence for the first time maybe granted a licence with strict conditions, or refused a licence because no water is available. These conditions or refusals protect the environment or existing abstractor's rights. This means that licences granted more recently are less likely to provide a reliable source of supply than older licences.



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Figure 3.1: Water resource reliability: percentage of time water would be available for abstraction under a new licence

3.2 Impacts of climate change on water resources

Climate change may reduce the amount of water available for abstraction. Average summer rainfall could decrease by the 2050s, only partially offset by wetter winters. Climate change may also alter the pattern of water availability during the year so abstractors may not be able to use existing resources in the same way.

Our current understanding of the likely impact of climate change on water resources in England is based on the latest UK Climate Projections 2009 (UKCP09). The effect of projected changes in rainfall and evaporation mean that natural river flows during the summer may decrease by the 2050s almost everywhere across England, with little change in average annual rainfall. Drier, warmer summers could increase seasonal soil moisture deficits. This may extend into the autumn, shortening the winter recharge season for groundwater, reducing groundwater storage and increasing vulnerability during subsequent drought.

Future changes in the climate could affect the reliability of existing licences. For licences with restrictions, the amount of time that an abstractor would be able to take water in an average year could decrease. This period of restriction would be likely to occur during the driest months of the year, which, particularly in the case of summer-only licences such as for spray irrigation, is when the abstraction is most required. Even abstractors with no licence restrictions may start to see some effects as flows and levels reduce – water may simply not be available for them to abstract. This could have a major impact on some abstractors and their businesses. For example, it could mean water companies and their customers need to make tough decisions about their use of water. The companies will need to maintain security of supply, but increasing abstraction might not be the most efficient or effective way to do this. Instead, reducing demand, cutting waste or changing the way they use their networks may be more cost-effective.

Climate change could make droughts more frequent. A Met Office study⁶ on climate change and extreme droughts in the UK found a range of possibilities – most showed that droughts, such as that of 1976 (one of the worst on record), will become more common. Increased resilience of public water supplies would only partially mitigate the effects of such droughts.

3.3 Future demand for water

Demand for water is likely to increase in the future because of climate change, population growth and changing lifestyles.

Climate change could increase total demand for water. Some activities, such as irrigation or electricity generation, may need more water, as lower average summer rainfall and higher temperatures mean power stations need more water for cooling. However, the change in demand will depend on how abstractors react to climate change. They could try to meet the increase in demand or adapt to the situation. For example, farmers could grow different crops, and power companies could invest in technology that does not rely on water for cooling. Water companies could encourage their customers to reduce demand, mitigate their own impact on available resources by reducing leakage, or they may be able to use their distribution networks to move water to serve areas of demand more efficiently. The scale of change necessary will vary across England and the timing will also be important.

The relationship between population growth and forecast demand is complex and depends on a number of factors, such as:

- changes in population;
- individual demand;
- non-public water supply demand (including the power generation, industrial and agricultural sectors);
- the impact of climate change on demand;
- water efficiency measures; and
- incentives for people and business to use less water.

On the whole, population growth is likely to increase the total demand for water supplies. The latest projections from the Office of National Statistics estimate there will be 9.2 million more people in England in the 2030s⁷. They will all need water. Water companies forecast, in their Water Resource Management Plans, that average consumption will drop from 154 litres per person per day in 2010-11 to 144 litres per person per day in 2030-31. In England the overall population increase would offset this efficiency improvement; total household demand is expected to increase by 400Ml/d (equivalent to 3 per cent of current public water supply) unless further measures are taken.

The areas expected to see the biggest increases (between 41 per cent and 50 per cent) are in already densely populated areas with water resources already under stress, such as South East England. '***The case for change – current and future water availability***' explores this evidence in more depth.

3.4 Environmental damage caused by unsustainable abstraction

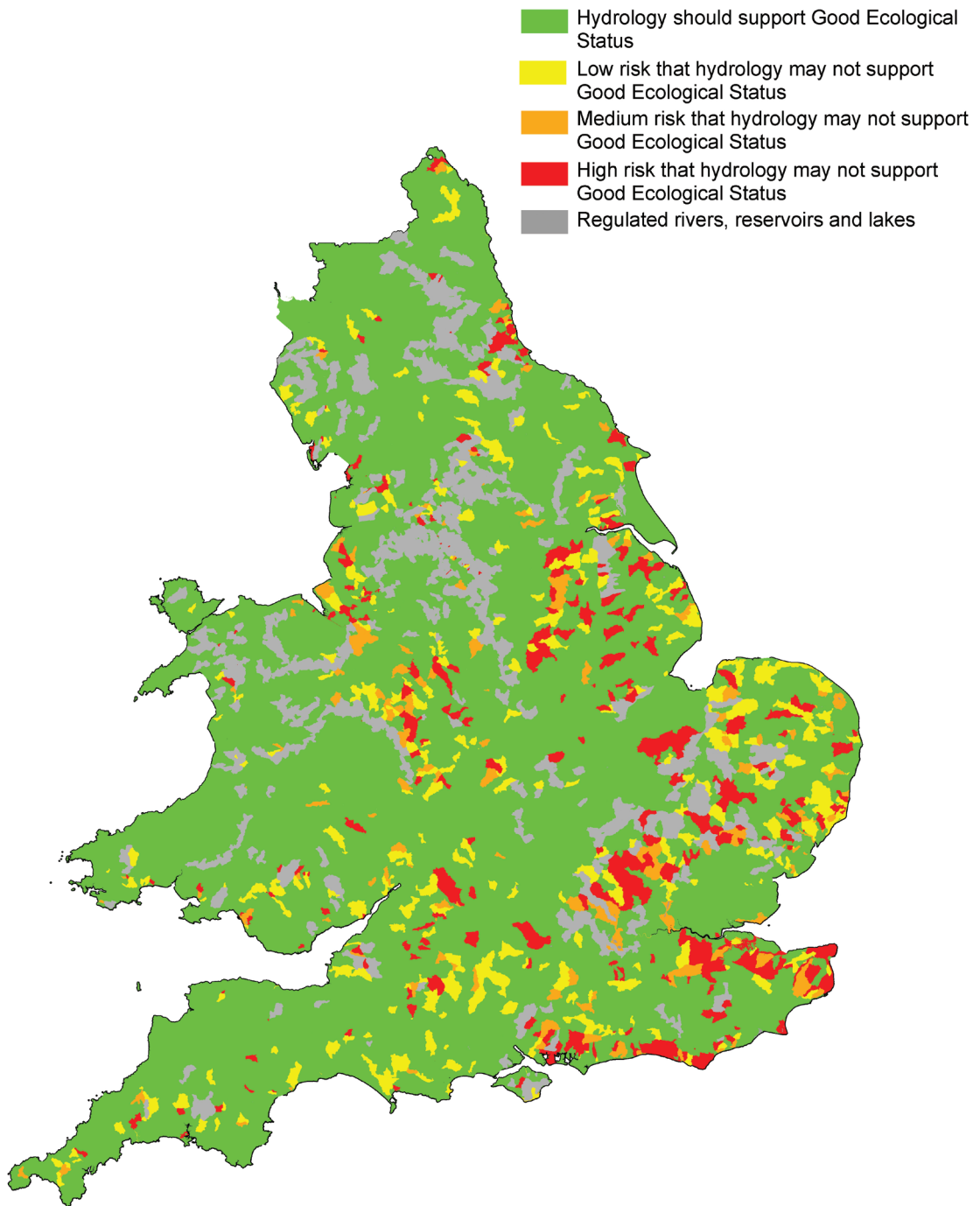
Some abstraction licences could be harming nature conservation sites or the ecological health of catchments. Action is needed to change the allocation of water at these sites. The Water Framework Directive is a major driver of these changes.

The Environment Agency has statutory powers and duties to protect, conserve and enhance the environment. These powers enable, and in some cases, such as the Habitats Regulations⁸, require the Environment Agency to act where abstractions are having, or potentially could have, a detrimental impact on the environment. The Environment Agency is also responsible for reviewing licensed abstractions that could damage Sites of Special Scientific Interest (SSSIs) or sites of local environmental importance.

The Water Framework Directive (WFD) requires Member States to aim to achieve good ecological status in surface water bodies and good groundwater quantitative status by 2015 and prevent water bodies deteriorating in status (subject to certain specific exemptions). The Environment Agency believes that river flows in up to 1,075 water bodies in England (11 per cent of total) are at risk of not supporting good ecological status and 35 per cent of groundwater bodies are at risk of not achieving good groundwater quantitative status (figure 3.2)⁹. More accurate figures will be known once investigations are complete in December 2012.

The Habitats and Birds Directive aims to protect wild plants, animals and habitats. It provides a high level of protection to the network of protected areas around the European Union of national and international importance. The Environment Agency checks if existing abstractions risk damaging these sites and takes action to mitigate any risk.

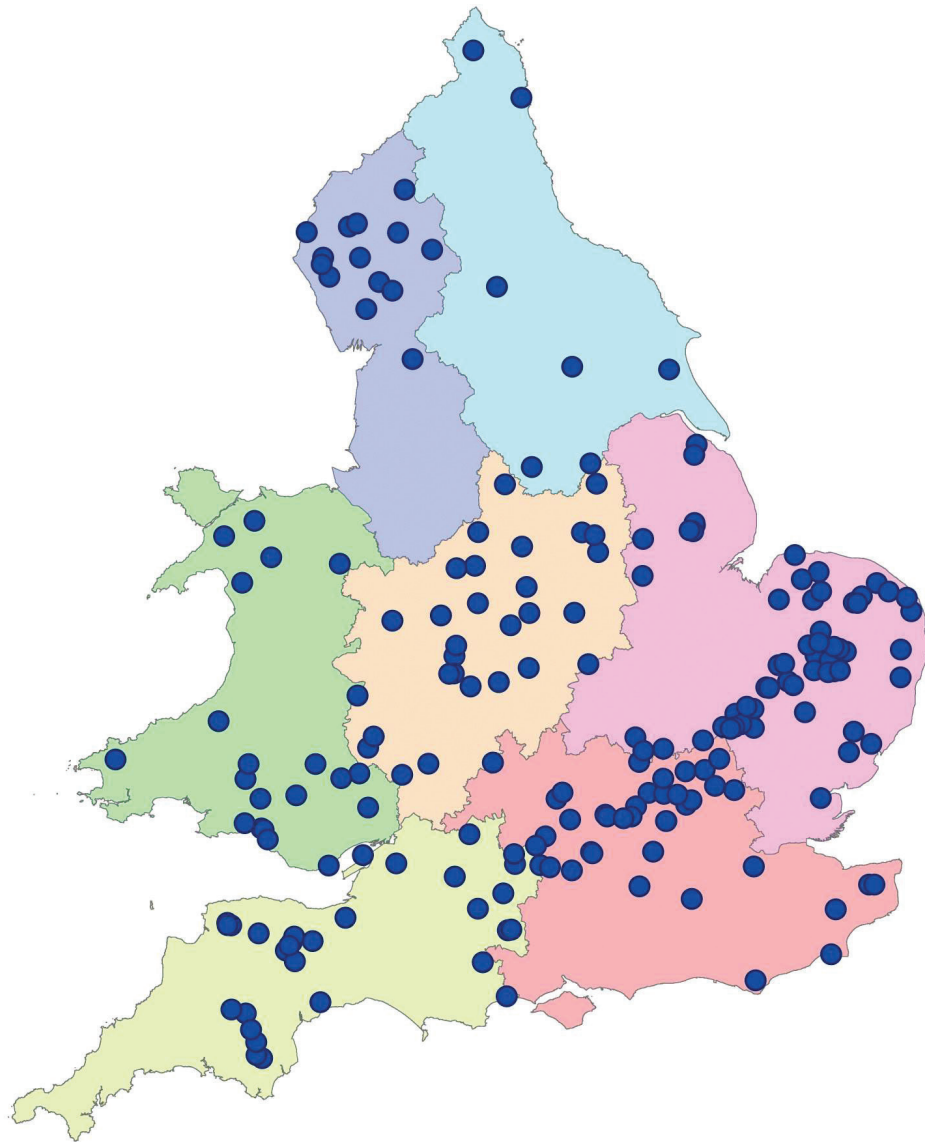
As the Environment Agency progresses investigations under the WFD and Habitats Directive it will look at the options to improve and protect a site. This may lead to changing abstraction licences, for example reducing volumes licensed for abstraction. Any changes to abstraction licences will be carried out as part of the Restoring Sustainable Abstraction (RSA) work. Other projects will be carried out to restore sites of local importance. This process will reduce the volume of water available for abstraction in some catchments as more water is allocated to the environment. The Environment Agency has identified 263 schemes where it may need to take action (figure 3.3)¹⁰. Of these, 170 are water company schemes. These schemes are likely to affect the water available for public water supply.



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Figure 3.2: Risk to ecology from current abstraction



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Figure 3.3: Distribution of Restoring Sustainable Abstraction schemes

The Environment Agency’s publication ‘*The case for change – current and future water availability*’, published alongside this document, sets out the challenges for future water resources and offers a range of projected futures. It takes into account climate change, population growth, demand change and environmental management pressures. By considering those futures, there is an opportunity to make decisions now on what is needed to deliver a future that society wants to see, rather than one that may otherwise develop.

4. Current limitations in water abstraction management

The current abstraction system is not flexible enough to meet the needs of a changing environment. Abstraction licences are difficult to change, charges do not reflect water availability over time and location and there is no price signal to encourage efficient water use. There are also constraints around trading. In this section we discuss these issues particularly in the face of future challenges and a changing environment.

4.1 Fixed allocations of water

The existing licensing system allocates water between abstractors and the environment in a way that gives little scope to address the effect of changing natural conditions quickly and effectively.

Licences allow abstractors to take a fixed amount of water, specified in the licence. Most licences (83 per cent in England) do not include any conditions to reduce or stop abstraction when water availability decreases. The only constraint on these abstractions is if the water is not physically available. For those licences where abstraction is constrained (usually those issued more recently) abstractors have to reduce – or in some cases stop – abstracting as the river flow drops. These constraints (often called a Hands Off Flow (HOF) condition) are specified in the licence, and refer to a fixed volume of flow in the river below which abstraction is prohibited.

There are two issues associated with the fact that volumes licensed are generally fixed.

First, the lack of a dynamic link to actual availability of water. Licensed volumes are agreed based on an assessment of the environment at the time the licence is granted. But from then on, those volumes are fixed and do not reflect the actual availability of the water. If flows drop with climate change or other factors but abstraction continues in accordance with the licensed volume, abstractions upstream could leave less for those downstream and risk damage to the environment and important species and habitats being lost.

Second, even where licences are constrained by HOF conditions, these are fixed to a specific flow volume (rather than a proportion of available flow), which does not reflect how flows can change over time. If climate change or other factors altered the flow, HOF conditions could be activated more frequently and the impact would fall entirely on the abstractor. The environment would retain the protection it had under the original flow regime.

4.2 A complex system of making changes

Once water has been allocated it is difficult and time consuming to change licences. Recovering funds to compensate abstractors can delay environmental improvements and create uncertainty for abstractors. For example, water companies say that uncertainty over which licences might be revoked is a barrier to effective long-term planning

Some abstraction licences issued historically could harm the environment. In some cases the Environment Agency will need to change licences and address unsustainable abstraction. Abstractors may have to decide the most sustainable course of action – not just when and where to abstract, but whether to abstract at all. In particular, water companies can choose to abstract more, to manage demand or to cut leakage.

There are two processes available to the Environment Agency to change abstraction licences; one voluntary and one compulsory. The Environment Agency uses a voluntary mechanism from the Water Resources Act 1991 (Section 51) to agree licence changes mutually with the licence holder. Under this process, no time limit is added to the revised licence and no compensation paid to the licence holder. This process is much quicker than where the Environment Agency proceeds to enforce a licence change under Section 52 of the Act.

Where the Environment Agency changes a licence using the Section 52 process, it must develop a case to support each proposed licence change. Abstractors can object to the proposed licence change and may be eligible to claim compensation for any loss it will cause to their business. The Environment Agency must refer technical objections to the Secretary of State. The decision whether to uphold the proposed change could mean a hearing or inquiry needs to be held. The licence holder makes a compensation claim to the Environment Agency, and if the compensation payments cannot be agreed, it can be referred to the Lands Upper Tribunal (Lands Chamber).

Making changes under Section 52 is complex and time consuming. The main problems for abstractors and regulators include the following.

Abstractors

- Raising funding for compensation through charges can delay licence changes for several years, creating uncertainty. Licence holders have six years from the date a licence is changed to make a claim for compensation.
- It can make future planning very difficult for abstractors. For example, if farmers do not know how or when their licence will change, they cannot commit to contracts with supermarkets. And water companies cannot plan effectively to balance supply and demand while they are unsure of their licensed entitlements.
- Individual abstractors have no incentive to mitigate the losses as a result of licence changes as they are compensated for these losses. But as a group all abstractors have an incentive to minimise compensation claims as they pay for these via the Environmental Improvement Unit Charge (EIUC).

Regulators

- The overall process, from investigation to issue of a licence change, can take at least two years and cost between £50,000 and £100,000 per scheme in staff time and legal costs.
- The Environment Agency is required to have sufficient funds to cover the likely costs of compensation before it can start revocation proceedings, although investigations can begin sooner. The time it takes to build up this fund through the EIUC in the annual charging scheme can cause delays between investigating the need for a licence change and implementing the change to reduce the impact on the environment.
- Where there is the option of mitigation without changing the licence (for example physical changes in river such as placing deflectors like log beams or other 'soft' materials in the channel bottom to focus and concentrate flows), there is no clear mechanism to finance such schemes and so little incentive for the abstractor to act.

For example, the Environment Agency investigated and examined remedial options to restore the Ouse Washes in Anglian region. The Environment Agency proposed revised conditions to be applied to four licences to restrict abstractions when flows are low and to apply a time limit to each licence. In September 2010 the Secretary of State agreed with this advice and changes were made to the licences. The Environment Agency estimates that it will take between eight and 15 years to collect sufficient revenue to fund compensation for all further potential licence changes in the Anglian region.

From 2012, the need to pay compensation will be removed where an existing permanent abstraction licence is revoked because the abstraction is causing serious environmental damage, as introduced under the Water Act 2003. This will not cover all licence changes – just those that the Environment Agency can demonstrate are causing serious environmental damage.

All new licences are typically issued with a time limit, and 21 per cent of licences already have one. Time-limited licences are subject to review upon expiry, and the Environment Agency can make changes at this point if it is damaging the environment. The licence is static between review times (the length of the time limit). This gives abstractors an important level of certainty.

4.3 Abstractors are not treated equitably

New abstractors bear a disproportionate share of the cost of protecting the environment compared with abstractors that hold historic licences.

The way available water is allocated is inequitable. The first area of inequity is around the period of rights: 79 per cent of current licences will remain in force until revoked, that is they have no time limit. The Environment Agency may have to compensate holders if it wants to make changes. However, since 2001 all new licences have been granted with a time limit. Since 2003 this has been a legal requirement.

Secondly, abstractors' absolute rights vary. As more water is allocated in a catchment for abstraction, the Environment Agency will issue licences with increasingly restrictive conditions. This means that a prospective abstractor in an over-licensed catchment is likely to have a less reliable supply of water than someone whose licence was issued earlier, with fewer or no restrictions.

4.4 Abstraction charges do not send the right signals

Abstraction charges do not provide a strong signal of the value of water nor reflect its availability over time and location.

The Environment Agency recovers the administrative costs of managing water resources through the abstraction licensing system. The charges for abstracting water are relatively low and are not linked to quantities abstracted¹¹. The charges do not reflect the availability of water resources in each catchment nor the value society places on the water and the level of protection needed for the environment.

This means there are no strong signals¹² to abstractors and water users about relative water availability across time and location. The absence of strong signals means abstraction decisions (i.e. when, where and how much to abstract) cannot currently take into account water availability. These price signals do not influence, for example, the level of investment a water company might make on demand management, the cropping patterns for agriculture or the choice of location for a water-intensive business. Nor do the signals pass down the value chain to water users.

Abstraction charges make up a small proportion of the price of final goods and services for which the water is used. This can influence decisions, for example when businesses compare the price of abstraction with the cost of not producing goods and services or water companies compare the price of abstraction with the costs and benefits of alternatives, such as storage or reducing demand.

Water companies need to take account of their customers' water use demands when deciding when, where and whether to abstract. The companies should also seek to influence their customers' behaviour, if for example reducing demand is more economically efficient than ongoing or increasing abstraction. Water companies may be able to use other alternatives to abstraction, such as moving water around their networks more efficiently.

The Environment Agency, Ofwat and Defra plan to consult on changes to the Water Resource Management Planning Guideline early in 2012. The revised Guideline will encourage the companies to make more sustainable abstraction decisions. Ofwat's proposed Abstraction Incentive Mechanism (AIM) has the same objective.

Clear information about the availability of water need to be provided to abstractors and end users for them to understand the level of stress on water resources. This will be essential to ensure more sustainable use of water in the long-term.

4.5 Some water is licensed but unused

Many abstractors do not take the full volume they have been allocated. However the volume not abstracted is not available to other abstractors.

Not all of the water that is licensed is taken. But because abstractors are licensed to use that water, the Environment Agency cannot make it available to someone else. Holding unused licences can prevent other abstractors from gaining access to water in a catchment.

Environment Agency research found that in 2008, only 40 per cent of licensed volume in England was actually abstracted¹³. Public water supply companies abstracted 62 per cent of their licensed volume. All other users abstracted an average volume of just 29 per cent. One reason is that abstractors who have licences with restrictive conditions will often be unable to take their full entitlement, particularly during drier years. In England, 17 per cent of the licensed volume from non-tidal surface sources is currently restricted by Hands Off Flows. When river flow is below a Hands Off Flow, a licence holder will be temporarily unable to take their allocated volume¹⁴. This will happen more frequently in drought conditions. For example in November 2011, following summer drought conditions, there were around 200 farmers, across central and eastern England, who could not abstract water because of conditions on their licences.

Other reasons for abstractors not taking their licensed volume include the following.

- Some of the volume not abstracted is a contingency to cope with periods of higher demand or a backup for other sources.
- Equally, some licences are used as a backup during drought conditions only.
- Demand may have reduced since a licence was granted, and the licence holder wishes to retain the ability to abstract more in case circumstances change.
- The licence may be for groundwater that has become contaminated and may be restored in the future, but is not available at present.
- Some licences are linked to a crop rotation and so are only used intermittently.
- Abstraction licences associated with land or a property can add value to that asset. An abstractor who has no need for the water may be reluctant to relinquish the licence.

In some cases, the licence allocation is not abstracted at all. Recent analysis by the Environment Agency found that from 2006 to 2010, more than a third of licences in England were not used, equivalent to 20 per cent of licensed volume. 74 per cent of those unused licences were for agricultural purposes, while the industrial sector had the greatest unused volumes at 39 per cent of unused licensed volume in England.

Retaining licences or parts of licences without abstracting the water restricts others from using it. The problem can occur anywhere, but is worse in over-abstracted and over-licensed catchments where no additional water is available. In some instances, the cost of retaining unused licences is low because the Environment Agency's charges are set to recover the cost of managing water resources rather than their value. On average abstraction licence fees represent about one per cent of water companies' turnover¹⁵.

Where a licence has been unused for more than four years, the Environment Agency has powers to change or revoke it without compensating the holder, where there is a justifiable reason.

4.6 Barriers to trading licences

There is little incentive for abstractors to hand back or trade a licence so that those who need the water can use it. The current system does not provide the right signals to abstractors to encourage trading or sharing of resources.

In any catchment, but particularly where it is difficult for a prospective abstractor to obtain a licence for abstraction in sufficient quantities or at the right time, an existing licence holder can trade water. Transferring licences on a permanent or a temporary basis is a way to meet water demand without the need for a 'new' allocation. The existing abstractor must relinquish the licence, and the potential abstractor must apply to the Environment Agency for a new one. The Environment Agency must assess the impact on the environment of taking water from the new location and can impose conditions to protect it (for example by reducing the licensed volume or including constraints such as HOFs). However, trading means an existing licence can be sold to a new licence holder, so water could be available where it might otherwise not have been.

Since 2003, the number of trades in England has been very small – only 53 were processed up to August 2011. Most trades involved agricultural water use, with more than 70 per cent of the total number of trades located in East Anglia.

The volume of water originally allocated in the 53 traded licences totalled 16 Ml/d. In some cases all of the water was traded, but in other cases only a portion of the licence allocation changed hands. This means that only 4.9Ml/d of water was actually traded, 30 per cent of the total original licensed volume. Of the remaining 70 per cent of water not traded, 42 per cent was kept by the original licence holder and 28 per cent was handed back. Of the 4 Ml/d handed back, almost all was returned voluntarily because neither the donor or the recipient had a use for it. In one case, the Environment Agency requested the water to be handed back, 0.03 Ml/d, in accordance with the local CAMS policy.

Joint research¹⁶ by the Environment Agency and Ofwat in December 2008 highlighted several possible reasons why the number of trades has been so low.

- There are restrictions on trades taking place outside of the same catchment meaning that trading within an already stressed catchment can be difficult. There are also limitations on moving abstraction points when trading.
- The concern that the Environment Agency will introduce licence restrictions as part of the process.

- Applicants may be put off by the administrative process, which can be lengthy.
- No access to clear information regarding the trading process and market (such as who is willing to trade and the volumes of water).

The current abstraction management regime influences abstractors' decision making, such as whether to share or trade resources. Encouraging abstractors to share resources will become increasingly important in the future. Joint sharing of information and resources has proved very beneficial for water abstractor groups in Norfolk, Lincolnshire and East Suffolk. So in some places abstractor groups are already proving successful, but they are not widespread geographically and some other sectors do not use such groups.

Water companies have been reluctant to share or trade water resources. There are barriers and disincentives to trading and resource sharing, some of which are due to the incentives within the price review mechanism. Ofwat is working to remove these barriers as far as possible.

An Environment Agency report¹⁷ published the results of modelling that the Water Resources South East (WRSE) group carried out. The modelling found that greater sharing and trading of resources in the south-east of England could lead to savings of £500 million by 2035, compared with the additional £760 million cost of the water resource schemes the companies identified in their draft water resource management plans.

As water may not be allocated in the most efficient way under the current system, water customers could be paying more than they need to. The system needs to change to encourage abstractors to explore all the options and to encourage innovative thinking, to make the most efficient and sustainable choices.

We are working to remove these barriers as far as possible. However, without a better abstraction management regime, it will be much harder and less effective to plan properly. In the absence of the signals such a regime would provide abstractors, it will also be difficult to manage demand, and to facilitate trading and sharing of resources.

4.7 Insufficient consideration of catchment-scale solutions

There has been little recognition of the fundamental link between water available for abstraction and that discharged. Therefore, there is insufficient consideration of strategic, catchment-wide water allocation.

Legislation divides water management into water resources, water quality or pollution control, and flood risk management. The Water Framework Directive is based on the concept of integrated river basin (water) management. Increasingly, the Environment Agency is looking to manage catchments in this way, recognising the fundamental link between water quantity and quality.

The Environment Agency uses CAMS to look at local water availability when making abstraction licensing decisions. Permits control point source discharges that take into account the environmental needs of the catchment at high and low river flows. Abstraction licences and permits to discharge have often been treated as separate entities under the current Environment Agency systems. There has been little recognition of the fundamental link between discharge and abstraction. Therefore, there is insufficient consideration of strategic, catchment-wide allocation of water resources.

In addition, the way that discharges are managed will need to change to ensure that the environment is protected in the light of future climate change and population growth. Return of water will become increasingly important in abstraction licensing. It is important to minimise chemical release at source. This will help return clean, uncontaminated water to rivers that can then be reallocated for abstraction across catchments.

With the exception of some public water supplies where effluent is returned to large works lower down the catchment, water is usually returned as close as possible to the point of abstraction. This limits local impacts on the environment by reducing the length of depleted reaches. But even where effluent is returned further downstream or even to a different river, effluent should be valued as a resource for use by abstractors or the environment.

There are also issues with the current mechanisms of charging separately for discharges and abstraction. This presents little incentive to abstract and discharge in the most efficient and effective way to benefit the economy or the environment. There is also little investment in catchment management solutions for drinking water, rather than traditional treatment which is costly, in financial and carbon terms. For water companies, Ofwat's proposals (set out in the Future price limits consultation⁴) to focus regulation on outcomes would complement this approach. It would hold companies to account for the outcomes they deliver rather than the means of delivering those outcomes.

The Environment Agency is looking at different catchment approaches in response to the need to reduce energy use and carbon emissions from enhanced treatment and changing patterns of flow resulting from changes in rainfall patterns. The current system is not structured in a way that allows integrated management of water.

5. Why change is needed

The system used to manage water today will not be able to provide access to secure supplies of water efficiently and effectively in the future whilst also protecting the environment. It encourages unsustainable responses. We believe it is time to reform the system following a full assessment of the options. The new system must provide clearer signals to abstractors to make decisions and investments to meet water users' needs and while protecting the environment.

The evidence in this document shows the need for and supports Government's views that a fundamental reform is needed to ensure reliable supplies of water at least and fair cost to water bill payers and the consumers of other water dependent products and services. The abstraction management regime is not responsive or flexible enough to address future challenges. The system does not provide clear signals as to the availability of water (in time and location) and the value of water to different users. There are also barriers to sharing and trading water. It therefore does not drive the most effective decisions for efficient resource allocation nor investment in supply and demand management.

Preventing environmental damage and rectifying unsustainable abstraction will be an ongoing challenge, while changing rainfall patterns and population growth will put pressure on the availability of water resources in the future. These issues will have to be considered and addressed in any reform.

The Environment Agency and Ofwat support the Government's commitment to reform the way water abstraction is managed in England so it is fit for the future. Doing this now will allow time not only to explore the options for change properly, but also to migrate to a new system in a way that minimises the level of risk and disruption to abstractors, users, society, the economy and the environment.

We believe that reform of the system will enable water resources to be better managed going forward.

5.1 Objectives of a future water management system

The Environment Agency and Ofwat fully support the following objectives that are set out in Government's Water White Paper.

A new system should:

- give clear signals and regulatory certainty on the availability of water, to drive efficient investment to adapt to climate change and meet water needs;
- better reflect the value of water to customers, its relative scarcity, and the value of ecosystems services to ensure rivers, lakes and aquifers are protected;
- reflect the benefit of discharges to river systems;
- drive efficiency in water use, using market forces and smart regulation to lower costs and reduce burdens;
- be fair to all abstractors, taking into account current licences;
- be flexible and responsive to changes in supply and demand, including providing greater access to water when more is available; and
- meet the water needs for people and the environment at least cost to water bill payers, and the consumers of other products and services which depend on water.

We do not underestimate the complexity of reform and the difficulties and uncertainties of transition from the current system to one which meets these objectives. However, we believe the alternative of doing nothing poses a far bigger risk to abstractors, water customers and the environment. In light of future pressures, the current system will not be able to cope. Acting now will ensure that when those pressures start to take effect, society will already be in the best position to deal with them.

Annex 1

The main features of the current system:

- The availability of water resources for abstraction is assessed through the Resource Assessment Management framework (RAM) and informs the Catchment Abstraction Management Strategy (CAMS) process. This determines how much water is available on a catchment by catchment basis and includes Water Framework Directive tests used for both surface water and groundwater to ensure new licences will not further damage the environment. CAMS information is available publicly.
- The rights of existing abstractors are protected from interference or loss that might arise because of subsequent proposals to abstract water under licence. This creates the principle commonly referred to as ‘first come, first served’.
- It protects the environment from damage that new applications could cause by looking at the possible impacts an abstraction may have before a licence is granted, and includes mechanisms to mitigate this in licence conditions. For example, most new surface water licences have a Hands Off Flow condition to protect the environment and other abstractors’ rights under low flows.
- It links to and identifies stressed areas that can be included in the Restoring Sustainable Abstraction process. The Environment Agency uses this to investigate abstractions that are shown to be damaging the environment. Licences can be revoked or modified, but compensation is generally required to be paid to the licence holder to cover any resulting loss.
- It includes a framework for setting annual charges for licences which the Environment Agency uses to fund water resources work. With the exception of two-part tariffs for spray irrigation, bills are based on the annual licensed volume rather than the amount abstracted.
- Since 2001, all new licences have been issued with an expiry date, so that about 21 per cent of licences in England now have time limits. Time-limited licences are subject to a presumption of renewal, as long as they meet tests of environmental sustainability, continued justification of need and efficient use of water.
- There are opportunities to encourage efficient use of abstracted water when licences are issued or renewed, by checking that the water required will be used efficiently.
- Licences can be traded, provided the new licence holder has access to the specified point of abstraction, and subject to the Environment Agency’s approval (following assessment of impacts on the environment and other abstractors).
- There are several measures to protect the environment and maintain essential public supplies during a drought, including granting drought permits and drought orders.
- The Environment Agency has a special duty to have regard to public water supply requirements and duties imposed on water companies in the Water Industry Act 1991.

- It also includes consideration of sustainable development with a particular regard to no adverse effects on the social and economic wellbeing of rural communities.
- The Environment Agency also has a duty in the Environment Act 1995 to take into account the likely costs and benefits of granting or refusing a licence application. This is to ensure a balance between water for the environment, with that for society and the economy.

Glossary

Average Incremental Costs (AICs) – This is used by water companies to calculate the unit cost of supplying additional water.

Average Incremental Social Costs (AISCs) – This is a standardised method of calculation the companies use, as set out in the ‘Economics of balancing supply and demand’. It incorporates the financial cost of supplying additional water, as well as any (net) environmental and social costs and benefits (including carbon, amenity value etc.) 60 years into the future.

Catchment Abstraction Management Strategies (CAMS) – These are local licensing strategies that use the results of the Resource Assessment Management framework (water availability) to set out how water resources will be managed within a catchment area.

Environmental Flow Indicator (EFIs) – These are precautionary limits set as a deviation from natural flow to ensure that abstraction does not cause or contribute to the failure of good ecological status under the Water Framework Directive.

First come, first served – When licensing abstraction, each application is taken in the order in which it is received to decide whether there is enough water available to licence.

Good Ecological Status (GES) – A water body with good ecological status under the Water Framework Directive has biological, structural and chemical characteristics similar to those expected under nearly undisturbed or natural conditions.

Habitats Directive (HD) – This is a European directive to protect important, rare and endangered plants, wildlife and natural habitats.

Hands Off Flow conditions (HOFs) – These are licence conditions that require abstraction to cease (or reduce) when river flows fall below the specified level at which we believe environmental damage and/or a detrimental impact of a previously existing licence will occur. Therefore, when flows are above this level, abstraction can take place but when flows are below this, no abstraction (or reduced abstraction) can occur.

Mega litres (ML) – the same as 1 million litres or 1,000 cubic metres (m³).

Regulated rivers – These are rivers where flow is supported by reservoirs and/or groundwater that are managed by the Environment Agency.

Resource Assessment Management framework (RAM) – This is a national process that allows water availability in a catchment to be determined consistently.

Restoring Sustainable Abstraction (RSA) programme – This is a programme of work that identifies, investigates and solves environmental risks or problems caused by unsustainable licensed water abstraction throughout England and Wales.

Waterbody – This is a discrete and significant element of surface water such as a river, lake or reservoir, or a distinct volume of groundwater within an aquifer. There are approximately 10,000 water bodies in England and Wales.

Water Framework Directive (WFD) – This is a European directive that came into force in December 2000 and became part of UK law in December 2003. It provides a framework for planning and delivering a better water environment, focusing on the ecological condition of a waterbody.

Endnotes

1. UKCP09 medium emission projections for the 2050s.
2. With the exception of spray irrigators.
3. Throughout this document we will use 'we' to mean the Environment Agency and Ofwat.
4. ABSTAT 2008 - <http://www.defra.gov.uk/statistics/environment/inland-water/>.
5. See 'Future price limits - a consultation on the framework' for more information (Ofwat website, October 2011).
6. <http://www.metoffice.gov.uk/news/releases/archive/2010/drought-to-increase>.
7. Based on 2033 projections taken from the ONS: 2008-based National Population Projections Statistical Bulletin - October 2009.
8. Water companies have a legal obligation to protect sites under the Habitats Directive. Ofwat therefore considered these schemes as part of the price review process in 2009.
9. Based on recent actual abstractions taken from 'Understanding and reporting water resource availability information'. August 2010.
10. Taken from the Environment Agency database - RSA Programme of delivery from Q1 2011/12.
11. With the exception of spray irrigators who have the option to enter into a two-part tariff agreement where they pay a basic charge of 50 per cent of the authorised volume and supplementary charge of 50 per cent for the volume actually abstracted.
12. The charges scheme places higher charges on abstraction during summer months than in winter months.
13. Based on Environment Agency ABSTAT 208 data.
14. This is made clear to them before the Environment Agency grant the licence so they can assess whether it is worth going ahead with the application.
15. Cave Review of Competition and Innovation in Water Markets.
16. Synovate UK (2008) Exploring views on the potential for more active water rights trading.
17. Progress towards a shared water resources strategy in the South East of England, Water resources in the South East Group (April 2010).



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