Water industry strategic environmental requirements (WISER)

Strategic steer to water companies on the environment, resilience and flood risk for business planning purposes

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Foreword from Sir James Bevan, Chief Executive, Environment Agency

"The thing about water is that it gets everywhere" – a deceptively simple but powerful insight that I once heard from a leading environmental campaigner. And it's true: water affects everything and everyone. It keeps us alive; drives the economy (industry, energy and farming depend on it); sustains plants, wildlife and the natural world; keeps our lakes and rivers healthy; and enhances the beauty of the world around us. Water pollution and drought threaten all these things. So having good quality water in the quantities we need is essential for all of us.

Over the last twenty years there's been huge progress in enhancing the water environment:

- Water courses that were once so badly polluted they were biologically dead are now coming back to life, with salmon and trout returning to many rivers.
- Our coasts have the cleanest bathing waters since records began.
- Businesses and the public are using water much more efficiently.
- Serious pollution incidents, such as the discharge of untreated sewage into watercourses, are steadily declining.
- Treated wastewater going back into rivers and streams is much cleaner now (40% less phosphates, 70% less ammonia).
- Despite growing demand and several periods of drought, consumers across the country have with very few exceptions enjoyed uninterrupted supplies of water.

These things didn't happen by accident. They happened because of the work of the water companies themselves, whose huge contribution we should acknowledge; because of the Environment Agency's regulation of the water industry and our work with it to improve the environment; and because of many others, including Natural England, the Wildlife and River Trusts, other NGOs and communities.

But there is much still to do:

- Less than a fifth (14%) of rivers and lakes in England are at "good" status or above in terms of water quality and ecology.
- There are still over 50 serious pollution incidents a year for which water companies are responsible.

As demand rises and the climate changes, bringing periods of hotter and drier weather, the long term risk of severe water shortages is rising.

This document sets out the action we would like to see from the water companies over the next several years to tackle these challenges, through the investments they

make, the decisions they take, and the daily operations they run. We want them in particular to do three things: ensure their own environmental performance is excellent; help protect and enhance the wider environment; and further improve our resilience to drought and flooding.

We owe the water companies some commitments in return. Mine are that the Environment Agency will seek to work in partnership with them to achieve these goals; that we will consult them on decisions that affect them; and that in all we do we will seek not only to protect and enhance the environment but also to support the sustainable businesses, growth and development we all need to build a cleaner, greener and more prosperous country.

Foreword from James Cross, Chief Executive, Natural England

Last October we published '**Conservation 21**: Natural England's conservation strategy for the 21st century', setting out how we will support the government's ambition for England to be a great place to live – from flourishing fens, to more naturally functioning streams, rivers and lakes to wildlife-rich estuaries – a healthy natural environment on land and at sea that benefits people and the economy. Underpinned by our focus on delivering better long term outcomes for the environment by working towards shared visions with partners, Conservation 21's three guiding principles are: 1) creating resilient landscapes and seas; 2) putting people at the heart of the environment; and 3) growing natural capital.

Water companies play a key role in the long term sustainability of the natural environment, from providing clean water for customers to providing wastewater services as well as protecting sensitive ecosystems. In previous price reviews water company investment has helped restore the protected sites for nature conservation that you own and manage and increase the resilience of other special freshwater, wetland and coastal habitats. We want to develop strong partnerships with you to make further environmental gains that build upon that progress, now and for future generations. We want to work with you to grow natural capital and build resilient landscapes, recognising your own objectives for customers, wider society and investors.

We would like to see investment in PR19 contribute towards long term environmental resilience in our most important wildlife sites, in our precious biodiversity in the wider landscape, and in the catchments that support them.

To support this ambition we want to work with you to:

- Identify actions that build the resilience of catchments and reap longer term rewards by enhancing our natural capital.
- Help you encourage and build on customer support for investment to protect and enhance the environment.
- Identify where your catchment scale priorities and our landscape scale 'Focus Areas' overlap and present particular opportunities for achieving multiple outcomes and combining resources.
- Identify innovative approaches and pilot projects to help shape longer term initiatives, for example through further developing Payment for Ecosystem Services (PES), nutrient trading or developer contribution schemes. We recognise that traditional approaches will still be key to achieving important outcomes and we encourage the use of innovative technology here too.

We’ve got a wonderful track record of working collaboratively with each other and with the rest of the Defra group. I hope we can continue to work together to realise this ambition in your Business plans.

1.0 Introduction and summary: Water Industry Strategic Environmental Requirements (WISER)

The government has set out in its Strategic Policy Statement to Ofwat (SPS) its priorities in pursuit of a water industry that works for everyone. It states that the Environment Agency and Natural England will write to water companies outlining the obligations and expectations for the water industry during the price review period 2020-2025 (PR19).

This strategic steer, WISER, is intended for you as water only and water and sewerage undertakers ('water companies'), but will be of interest to regulators, customer groups and other interested parties. It applies to English water companies (those operating wholly or mainly in England). It describes the environmental, resilience and flood risk obligations that you must take into account when developing your business plans. WISER is designed to help you understand the statutory obligations and regulator's expectations that apply. This is so you can embed them in the outcomes, performance commitments and investment decisions that underpin your business plans.

WISER is issued jointly by the Environment Agency and Natural England. It replaces the Defra Statement of Obligations and the Environment Agency letter of expectations issued to you at PR14. It highlights the main obligations as they apply but you should rely on your own advice when identifying legal obligations and how to meet them. We request that you consider enhancements that go beyond the statutory minimum where there is customer support and wherever possible identify opportunities for working in partnership in order to achieve wider benefits.

There are 2 main sections to WISER. Section 1 outlines our regulatory aims and objectives for the water industry and areas of innovation and good practice that we would like you to consider including in your PR19 business plans. We have outlined some of the innovative regulatory approaches that we are developing to support the water industry. The section ends with a table that summarises our statutory and non-statutory expectations of water companies for PR19.

Sections 2 - 4 provides more detail on the relevant legislation, duties and expectations. Each chapter highlights associated areas of good practice. WISER ends with 3 appendices including an inventory of legislation, a summary of our responsibilities and duties as environmental regulators and further information on applying phosphorus stewardship as an approach to tackling diffuse pollution.

We recognise that many of expectations set out in this document extend beyond the water industry and WISER highlights the need for other sectors to play their part and work with yourselves to make the water environment better for people and wildlife.

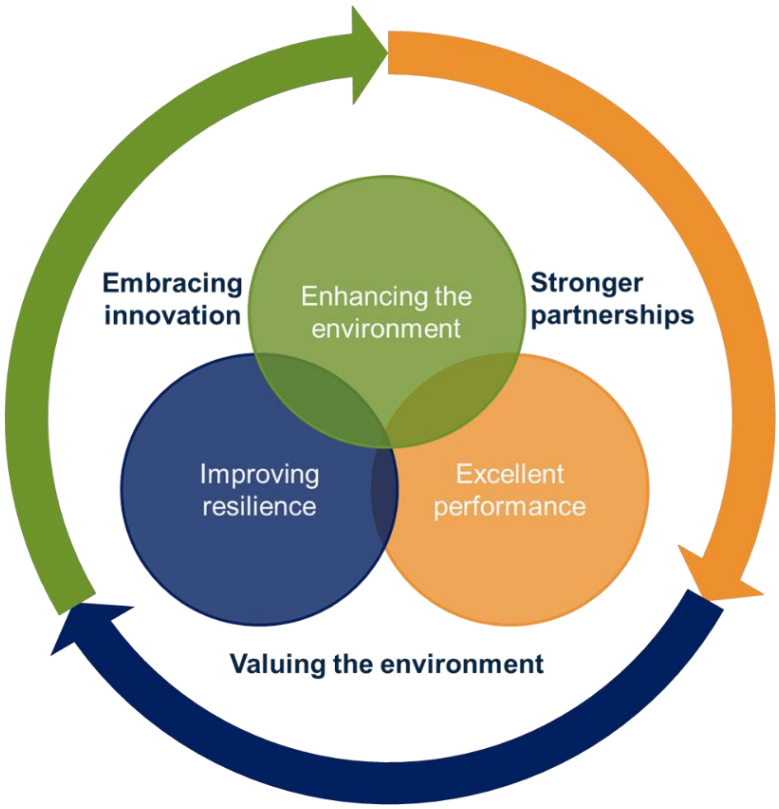
1.1 Aims and objectives

Our ambition is to achieve a water environment that is cleaner, healthier and managed in a way that is more resilient to floods and drought and better supports people, wildlife and the economy. Your actions have the potential to greatly enhance the natural environment and support sustainable growth. Equally, your operations can have a detrimental effect on the quality of the natural assets (such as rivers) that your customers and wider society rely on.

Water companies, regulators, local government and communities together face significant challenges relating to the water environment. These include: managing extreme weather and flood risk, reducing pollution, increasing urbanisation, managing ageing assets and adapting to climate change. There are also opportunities to enhance the environment and its biodiversity, create resilient communities and infrastructure and support economic growth.

We want you to demonstrate how you value nature in the decisions you take and to build on your role as stewards of the environment both now and for future generations. Integrating the needs of customers and the environment (as illustrated below) provides an opportunity for you to protect services and improve our natural assets.

Figure 1. Environmental regulators' objectives and good practice approaches for PR19



You can contribute to meeting the challenges and to achieving the outcomes that customers and the environment need by:

- Enhancing the environment
- Improving resilience in water infrastructure and the natural environment
- Achieving excellent performance

These objectives are best achieved by continuing to focus on the long-term outcomes and service improvements that benefit customers and the environment.

Enhancing the environment	Improving resilience	Excellent performance
• Improving, managing and conserving water as a valuable resource for business, people and wildlife • Protecting and enhancing the water environment by contributing to the achievement of water and biodiversity objectives	• Improving the resilience of water supply, wastewater, drainage, ecosystems and catchments to risks posed by extreme weather, climate change and population growth • Protecting communities from flooding by implementing cost-effective, co-funded solutions	• Sustaining a high level of performance and operating in a way that best protects people and the environment • Achieving 4* status on the Environment Performance Assessment

The government is committed to the goal of being the first generation to leave the natural environment of England in a better state than before. Alongside its plans for the environment the government is developing an industry strategy that aims to improve living standards and economic growth. In both areas the government recognises the vital role you play in providing affordable water and sewerage services to us all and the increasing challenges you face in minimising the impacts of droughts, pollution and floods on people, business and the environment. The Environment Agency's ambition for the water environment – Creating a better place[1], and Conservation 21 - Natural England's Conservation Strategy for the 21st Century[2] support the government's vision for water and biodiversity and the need for more resilient infrastructure alongside economic growth.

[1] Creating a better place Our ambition to 2020
[2] Conservation 21: Natural England's conservation strategy for the 21st century

Freshwater and marine environments provide habitats for our wildlife to thrive. Our aim is to have more, bigger, healthier and better-connected habitats that support a greater diversity and abundance of wildlife. This means maintaining and improving our most important sites and protecting our most threatened species while managing invasive non-native species. This will require a continued emphasis on resilience and catchment management. Building long term environmental resilience by managing the effects of growth, influencing local development plans, and preparing for the impacts of climate change and extreme weather, will help reduce uncertainties over future services, protect habitats and enhance the water environment. Investing at a catchment scale can reap longer term rewards and help grow natural capital.

1.2 Good practice approaches

We expect you to demonstrate leadership to the water sector by sharing and adopting best practice and seeking out new ways of meeting the performance commitments and achieving the outcomes that you agree with customers. When embedding good practice in business plans you should consider:

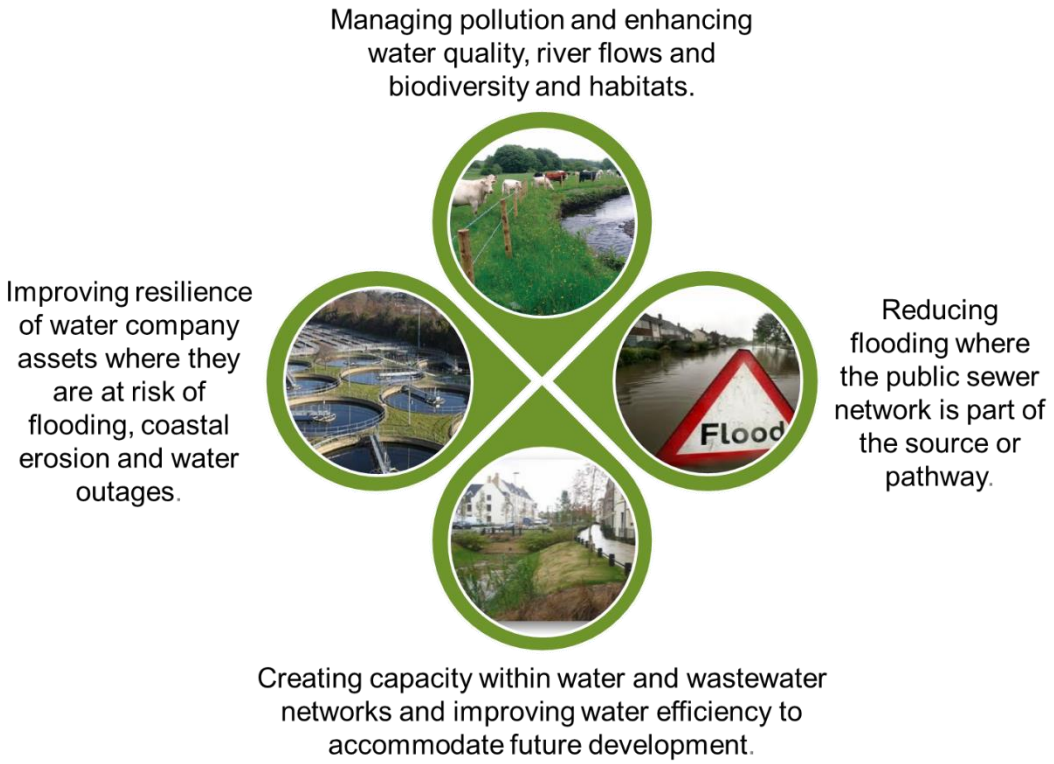
- Valuing the environment
- Embracing innovation
- Building stronger catchment and flood partnerships to maximise and integrate benefits

Valuing the environment	Embracing innovation	Seeking partnership
• Consider the social and economic value of the water environment, using it to inform decision making and to secure wider benefits for communities and society.	• Seek opportunities to improve the environment through better industry practices, better urban design and better land management	• Work with others to allow catchments to function more naturally and wildlife to thrive

Partnerships

Better outcomes can be achieved by working with others to align programmes, funding and action on the ground. Partnerships with others who use and depend on water and the services you provide, can greatly improve efficiency and drive more sustainable, resilient options. This includes working with other local plan makers and authorities to ensure adequate water for growth, development and the environment. Working with catchment partners will allow you to optimise your investments and help gain support from local communities by developing a shared vision and understanding. Figure 2 identifies some of the collaboration opportunities that exist.

Figure 2. Opportunities for collaboration and partnership



Environmental valuation

The government's SPS will support a more integrated approach, incorporating the value of the environment into decision making to enhance and protect natural assets.

It is important to consider the value of the natural assets that you rely on and have regard to the social and economic value of the water environment, your landholdings and the wider benefits for people and communities. You should consider the different dimensions of the value of the natural environment to society. Quantitative evidence of customer valuations, supported by qualitative evidence on customer priorities,

needs, requirements and behaviours should be used to assess the impacts of your business plans on social values.

The environmental valuation techniques you use should be clear, proportionate, and based on multiple evidence sources. They should include qualitative and quantitative information and monetary assessment if necessary. We recognise that economic values of environmental impacts are usually partial estimates as only some economic aspects can be valued with, for example, valuing biodiversity recognised as a particularly difficult area. Using wider valuation techniques to measure the costs and benefits to society of the environment will inform better decision making and support sustainable and resilient actions.

People's preferences for changes in the environment can be elicited from surveys you conduct, and these can be used in benefit valuation work if appropriate. Questions directly linked to well-described environmental changes will help to elicit quantitative estimates of people's preferences and the economic value they place on changes to the environment.

We would like you to consider how natural capital accounting can inform water industry planning and long term investment decisions. Our aim is to see natural capital tools used to inform planning and underpin environmental improvements. For PR19 you should trial natural capital asset accounts (including quantity and condition) and ecosystem service assessments (including qualitative and quantitative assessments) to help you better understand the flow of benefits you receive from natural assets, their value and how they may change in the future. We do not expect the outcomes of trials to inform decisions for PR19 business plans, unless it is feasible and well-founded to do so. Trials should contribute to current research and development in this field to ensure the use of viable accounting methods in future price reviews.

Innovation

We want you to achieve environmental outcomes using new and innovative approaches so that you can help overcome the challenges ahead and continue to provide customers with best value services. We recognise that as regulators we also have a role to play in this area. As well as providing strategic direction and advice we are looking to implement a range of innovative regulatory approaches that will help you meet your environmental and flood risk obligations. These include:

- Further embedding the catchment based approach to bring together interested parties and ensure all sectors contribute to protecting and improving the environment.

- Building upon our experience of partnership work in areas such as Catchment Sensitive Farming and Countryside Stewardship to enable innovative and cost effective catchment management approaches in future.

- Progressing our catchment permitting approach to identify opportunities for more flexible permitting.

- Abstraction reform to help abstractors make the most of scarce water resources.

- Pursuing organisational licences for protected species with a number of water companies to reduce the regulatory burden.

Other approaches that we are exploring include:

Phosphorus stewardship - embracing best practice and innovation

Phosphorus (P) is the most common reason for English water bodies not achieving their objectives. The concept of P stewardship focusses on making better use of this non-renewable resource whilst also protecting the environment. You are well placed to support more sustainable future management of P and we encourage you to view and manage P as a resource for potential recycling and/or recovery (for agricultural or other uses) as well as a pollutant to remove from sewage. More details in annex 3.

Nutrient trading

Nutrient trading encourages the use of more cost effective land management improvements as an alternative to upgrading smaller wastewater treatment works (WwTWs). Trials have shown that bigger pollution reductions are possible under nutrient trading at potentially less cost than hard engineering solutions. We encourage you to incorporate forward thinking about nutrient trading into your business plans. You can consider trading as part of options appraisal for improvement measures, or you can undertake trials linked to nutrient trading to enable you to:

- better understand the practicalities of adopting such approaches
- align nutrient trading with other mechanisms (for example, flood risk planning) that could potentially pay for wider benefits

It is important to consider long term sustainability of the solution, its ecological effectiveness and the relationship with other required improvements (including land management improvements to tackle the existing contribution). It should not increase the cost or economic impact to the water sector.

1.3 Summary of the expectations of water companies

Our PR19 expectations of water companies include statutory obligations and non-statutory requirements. Table 1 lists the expectations and categorises them as either statutory (S), statutory plus (S+) or non-statutory (NS) according to the definitions below.

Statutory obligations (S): Statutory obligations principally arise from legislative requirements and the need to comply with obligations imposed directly by statute or by permits, licences and authorisations granted by the Secretary of State, the Environment Agency or other body of competent jurisdiction. Other statutory obligations include ministerial directions and meeting specific planning requirements. While it is important to understand the costs and benefits of measures needed, these statutory obligations must still be achieved.

Statutory plus obligations (S+): Statutory plus obligations are categorised as legal requirements where economic evidence forms part of the decision making process, that is the balance of costs and benefits, and affordability considerations. In cases where action is considered disproportionately expensive to meet statutory plus obligations, alternative objectives or timescales to meet them may be set.

Non-statutory actions (NS): Some expectations are not driven by statutory obligations. There may be a public need but this may not be underpinned by a specific Act or piece of legislation. You should demonstrate that there is an environmental requirement and/or customer support and that such investments provide best value for customers over the long term. Effective customer engagement should reveal whether customers (and which types of customers) want to see further environmental improvements, and over what timescale.

You will need to consider carefully how you prioritise investment in non-statutory requirements. We encourage you to engage widely with other stakeholders and partners and base your decisions on local priorities and needs. This should include engaging other water companies, risk management authorities and environmental groups as well as the public. In considering how you meet these expectations you should consider applying the good practice approaches included each of the chapters.

Table 1: Expectations of water companies

The tables below list the expectations under our three objectives; enhancing the environment, improving resilience and excellent performance. They are grouped according to the main legislative drivers and current regulatory priorities in a manner consistent with previous Statement of Obligations.

Enhancing the environment

	Water body status (Water Framework Directive)	
1.	Measures to prevent deterioration in current water body status.	S
2.	Measures to improve water body status.	S+
3.	Work with stakeholders and Catchment Based Approach (CaBA) partnerships to explore integrated solutions at a catchment scale.	NS

	Bathing waters	
1.	Measures to achieve at least sufficient class.	S
2.	Measures to prevent deterioration in class.	S
3.	Event monitoring of storm overflows impacting on bathing waters.	S
4.	Measures to achieve good / excellent class.	NS

	Shellfish waters	
1.	Measures to prevent deterioration in current water body status.	S
2.	Measures to achieve shellfish water protected areas objectives.	S+
3.	Event monitoring of storm overflows impacting on shellfish waters.	S

	Biodiversity and ecosystems	
1.	Measures that contribute to meeting and or maintaining conservation objectives of Natura 2000 sites (Special Areas of Conservation (SAC) & Special Protection Areas (SPA)) and Ramsar sites.	S
2.	Measures that contribute to meeting and/or maintaining Favourable Condition targets for Sites of Special Scientific Interest (SSSI).	S, S+
3.	Measures that contribute to priority habitat and species outcomes as well as other biodiversity actions and measures to enhance ecosystem resilience on your own land or in the catchments within which you operate	S+
4.	Measures that contribute to the conservation objectives of Marine Conservation Zones (MCZ).	S+

	Sustainable fisheries	
1.	Screen abstractions and outfalls to prevent the entrainment of eels and salmon.	S+
2.	Address barriers to the passage of fish.	S+

	Invasive non-native species (INNS)	
1.	Prevent deterioration by reducing the risks of spread of INNS and reducing the impacts of INNS.	S
2.	Reduce the impacts of INNS, where INNS is a reason for not achieving conservation objectives or good status.	S, S+
3.	Understand pathways of introduction and spread of INNS.	NS

	Urban waste water	
1.	Measures to protect newly identified sensitive areas.	S
2.	Measures to improve wastewater treatment where population thresholds are exceeded.	S
3.	Maintain sewers to demonstrate sewer leakage to ground is minimal, especially in Source Protection Zones.	S

	Drinking Water Protected Areas (DrWPA)	
1.	Catchment measures to prevent deterioration in water quality and to reduce the need for additional treatment.	S
2.	Catchment measures to improve water quality to reduce the level of existing treatment.	S+

	Chemicals	
1.	Measures to prevent deterioration (includes load standstill measures).	S
2.	Measures to achieve compliance with environmental quality standards (EQS).	S+
3.	Work with business customers and catchment partners to explore alternatives to end of pipe treatment solutions.	NS

Improving resilience

	Flood risk management	
1.	Co-operate with other risk management authorities in exercising your flood risk management functions.	S

2.	Co-ordinate and share information with Cat.1 and 2 responders.	S
3.	Comply with statutory reservoir safety requirements.	S
4.	Develop a clear and systematic understanding of service and system risks and include options for reducing the likelihood of future service failures and service failures that lead to flooding.	NS
5.	Reduce sewer flooding of homes and businesses trending towards zero.	NS
6.	Reduce the number of properties at risk of flooding.	NS
7.	Take every opportunity to increase the number of partnership flood schemes achieving multiple benefits.	NS
8.	Work with others to actively identify and build in sustainable drainage options.	NS
9.	Work with government and other utilities to take forward the recommendations of the National Flood Resilience Review.	NS

	Future drainage	
1.	Use the 21st Century Drainage Programme workstreams on storm overflows and drainage capacity metrics to inform business plans.	NS
2.	Maintain networks and WwTWs to reduce the risk of future failures.	NS
3.	Event duration monitoring on high significance storm overflows.	S
4.	Ensure compliance with permitted flow to full treatment settings.	S

	Water resources security of supply	
1.	Solutions to meet water resources management plan outcomes or measures to protect the environment form the supply-demand component of business plans.	NS
2.	Assess resilience of your water supply system to predicted droughts and other non-drought water supply hazards.	NS
3.	Measures to reduce demand and per capita consumption.	NS
4.	Achieve a downward trend for leakage with rates at or below the sustainable economic level of leakage.	NS
5.	Assess universal metering in water stressed areas.	S
6.	Ensure agreed and up to date plans are place to manage a drought.	S
7.	Demonstrate that Defra's Guiding principles for water resources planning have been met.	NS
8.	Incorporate sustainability changes into supply forecasts.	NS

9.	Current abstractions and operations, and future plans support the achievement of environmental objectives.	S, S+

	Climate change	
1.	Report on understanding of risks from climate change and how they are being addressed via Adaptation Reporting Power (ARP) reports.	S
2.	Reduce total carbon emissions.	S+
3.	Ensure Adaptation Reporting Power (ARP) report commitments are consistent with, and embedded within, business plans.	NS

Excellent performance

	Regulatory compliance and sludge	
1.	A plan in place to achieve 100 per cent compliance for all licences and permits.	S
2.	100% compliance with environmental permit conditions at WwTWs with descriptive not numeric limits.	S
3.	Serious pollution incidents must continue to trend towards zero.	S
4.	Trend to minimise all pollution incidents (category one to three) by 2025. There should be at least a 40% reduction compared to numbers of incidents recorded in 2016.	S
5.	Effective management of transferred private sewers and pumping stations with low levels of pollution incidents.	S
6.	No D, E, or F rated sites under Operational Risk Appraisal OPRA for waste related sewerage service Environmental Permitting Regulations permits.	S
7.	Compliance with flow requirements, including MCERTS certification, at WwTWs	S
8.	High levels of self-reporting of pollution incidents with at least 80 per cent of incidents self-reported by 2025. More than 90% of incidents self- reported for WwTWs and pumping stations.	NS
9.	Business plans include all measures identified within the Water Industry National Environment Programme and these are planned well and completed to agreed timescales and specification.	S
10.	Sample and provide data in relation to self-monitoring under Operator Self-Monitoring (OSM), Urban Waste Water Treatment Directive (UWWTD), Flow monitoring and UV disinfection.	S
11.	Manage sewage sludge treatment and re-use so as not to cause pollution to land, surface water or groundwater.	S

2.0 Enhancing the Environment

Our enhancing the environment outcomes are:

- Protect and enhance the water environment by contributing to the achievement of water and biodiversity objectives.

- Improve, manage and conserve water as a reliable resource for business, people and wildlife.

The following chapters expand on the expectations associated with these outcomes. The chapters mirror the 'environmental themes' in Table 1. For each theme we set out the relevant legislation and duties, provide more detail on the expectations and include a section on good practice approaches.

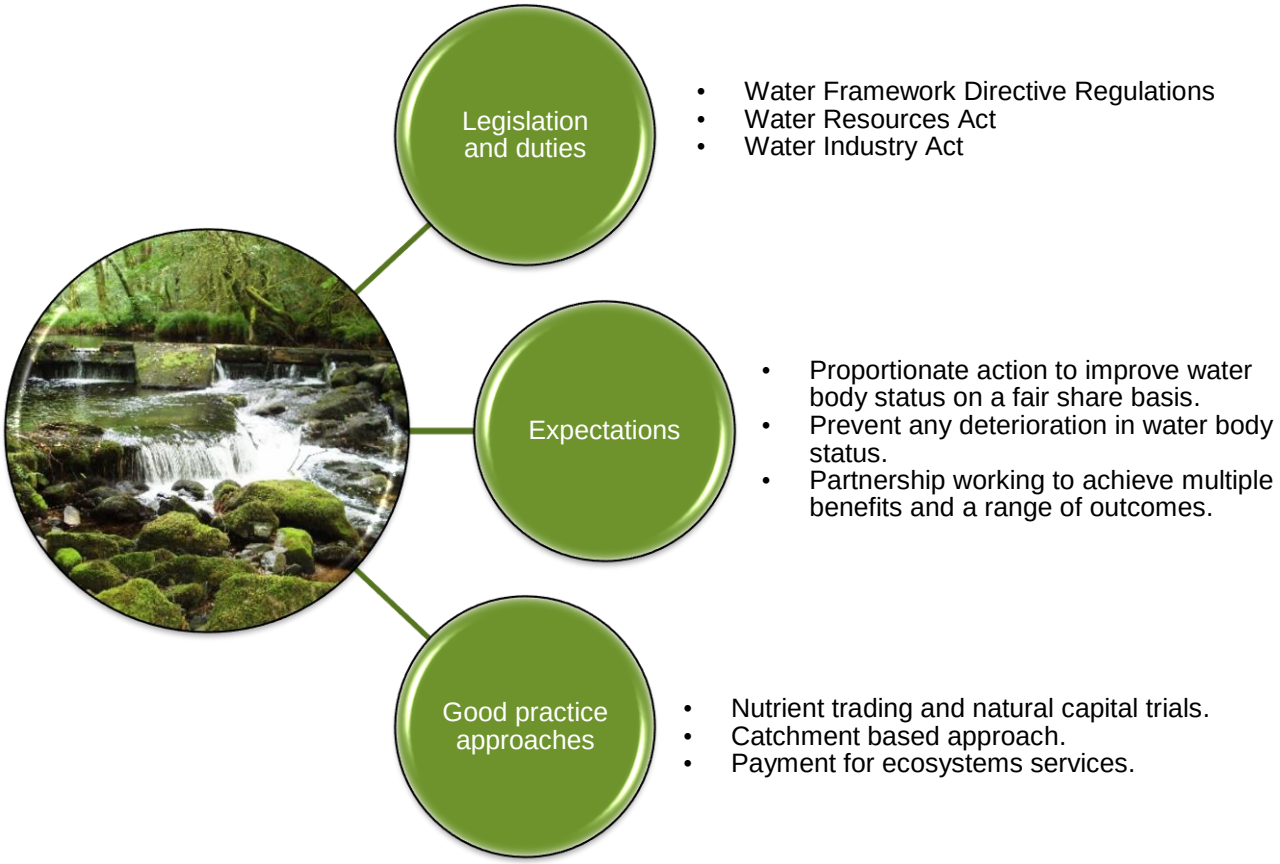
The Water Industry National Environment Programme (WINEP) will identify the environmental measures that you should include in your business plans. WINEP consists of statutory, statutory plus and non-statutory measures. These measures may be investigations, monitoring, options appraisals or schemes to improve and protect the water environment. More detail on what measures are eligible for inclusion in WINEP is set out in our identifying measures for PR19 WINEP driver guidance.[3] We expect WINEP to form part of your Asset Management Plan 2020-2025 (AMP6).

In PR14 we introduced the 'managing uncertainty' approach to assist with planning for the time difference between business plan final determination and ministerial signoff of the River basin management plans (RBMPs). For PR19 we have added a traffic light system to reflect the different levels of evidence and degrees of uncertainty associated with measures within the programme. This is intended to help you develop business plans for PR19 and longer term planning. More detail is available in our traffic light system for WINEP measures guidance[4].

There is significant interest in the WINEP among NGOs and other stakeholders. It is important that your approach to your WINEP shows leadership and encourages greater collaboration and partnership working to achieve better outcomes for people and the environment. In planning your AMP work we encourage you to consider the benefits of an early start programme to stagger investment and reduce any potential impact on bills.

[3] Identifying measures for PR19 WINEP driver guidance - available from the Environment Agency
[4] Traffic light system for identifying measures for the WINEP and managing uncertainty - available from the Environment Agency

2.1 Water body status (Water Framework Directive)



Legislation and duties

RBMPs establish an integrated approach for the protection and sustainable use of the water environment. This takes account of the wider ecosystem and the movement of water through the hydrological cycle. The '2015 plans'[5] set environmental objectives for groundwater and surface waters (including estuaries and coastal waters) and summarise the programmes of measures to meet those objectives.

In England, the Environment Agency is the competent authority for producing and updating RBMPs. Under Regulation 33 of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations), public bodies must, in exercising their functions so far as affecting a river basin district, have regard to the RBMP for that district. 'Have regard to' includes taking account of and considering the environmental objectives and summary of measures contained within the 2015 plans when exercising any of your functions. Abstraction licencing

[5] River basin management plans 2015

and environmental permitting are examples of mechanisms that support water body objectives.

Expectations (S, S+)

You must ensure that your current and future abstraction or return of treated wastewater supports the achievement of environmental objectives in RBMPs and prevents deterioration in water bodies. You must take proportionate action to improve water bodies on a fair share basis following the Environment Agency's agreed approach. This includes taking account of the likely impacts of extreme weather and climate change on WFD objectives.

Fair share approach

When determining actions to improve or to prevent deterioration of the water environment, consideration should be given to the proportion each sector, business or individual contributes to the problem. Action to reduce pollutants should be targeted on a 'fair share' basis, whereby each sector, business or individual deals with its proportional contribution. This approach is rooted in the 'polluter pays' principle.

Individual sectors, businesses or individuals can do more than their fair share if they are willing to do so and this additional burden is supported, where relevant, by their customers. When a sector cannot achieve its fair share reduction, on the grounds of technical infeasibility, it should work with regulators and other sectors to identify alternative measures to deal with the problem that are both technically feasible and cost-effective.

This 'fair share' approach should be applied when developing programmes of measures for protected areas and catchments. The method is appropriate for nutrients but we do not anticipate it being used for other substances.

You must include in your business plans provision for measures to prevent deterioration and achieve the target water body status in the 2015 plans. In doing so you should ensure that proposed measures are resilient in the face of climate change and population growth. It is recognised that where evidence supports a change in the target status of a water body, that detailed measure requirements can only be confirmed once the Secretary of State has approved the revised RBMPs in December 2021. All parties will work together to make reasonable assumptions for business plans and be prepared to make adjustments following the final determination in 2019. Where compelling evidence shows that measures to get to

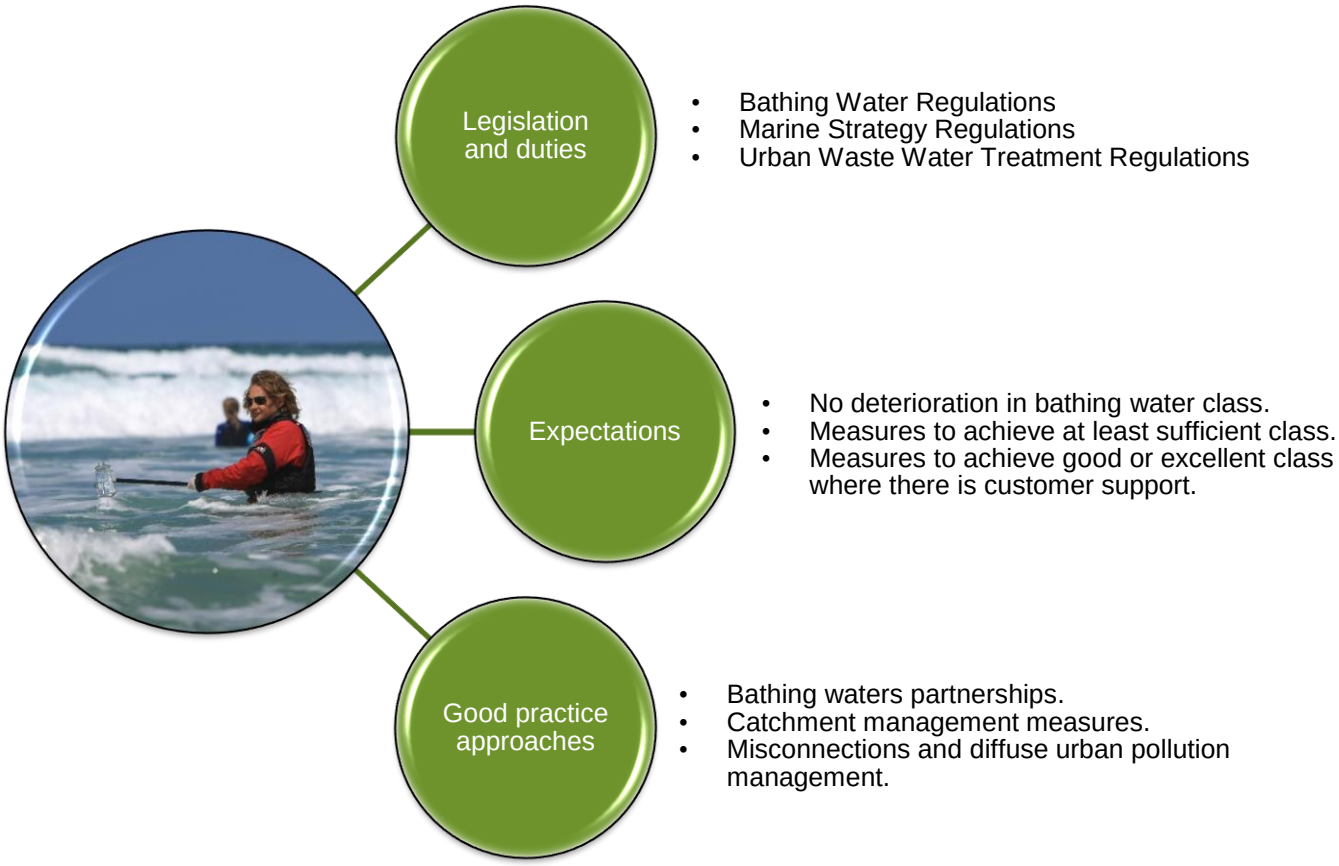
good status are now technically feasible and cost beneficial they can and should be implemented as early as possible after Ofwat's final determination.

We expect you to assess and develop a programme to meet WFD requirements by 2027, which is based on a consistent methodology for assessing costs and benefits across the sector. In doing this we expect you to work in partnership with key stakeholders. In particular we would like you to extend support for catchment partnerships and the Catchment Based Approach (CaBA). This well-established initiative can provide cost-effective improvements that benefit both you and your customers. You should consider how you can support CaBA and other catchment initiatives through the use of performance commitments and outcome delivery incentives (ODIs).

Good practice

You are not limited to measures that relate to the operation of your own assets. You can invest in natural as well as built infrastructure to achieve water body objectives. For example, where this provides value to your customers, you can support land management approaches designed to minimise pollution at source instead of paying for measures to remove the same pollutants downstream. Targeted investment of this sort can provide a wide range of positive social, environmental and economic outcomes. An increasingly common approach to making such investments is through 'payments for ecosystems services' measures. You should consider where payments for ecosystems services measures, or other such investments in natural infrastructure, can result in cost beneficial outcomes for customers. This approach will help encourage healthy functioning ecosystems as well as benefits to people.

2.2 Bathing waters



Legislation and duties

Bathing waters and the seaside economy are valuable economically, socially and environmentally. The Bathing Waters Regulations 2013 protect the health of bathers and maintain the aesthetic quality at designated bathing waters by setting microbiological standards for water quality. Bathing waters are classified annually using up to the last four years monitoring results. For example, the 2016 classifications are based on 2013-2016 results. The classifications for the standards are:

- Excellent – the highest, cleanest class
- Good – generally good water quality
- Sufficient – the water quality meets the minimum standard
- Poor – the water quality has not met the minimum standard

Expectations (S, NS)

The government's aim is for all designated bathing waters in England to achieve at least 'Sufficient' class. You must progress measures that improve:

- bathing waters which have a current planning class of 'Poor'
- bathing waters which have a risk of receiving a planning class of Poor
- bathing waters failing their baseline class
- bathing waters to Good or Excellent class where there is customer support

All significant storm overflows that impact on or discharge into bathing waters should be fitted with event duration monitors with data recorded by telemetry. Particular consideration should be given to new bathing waters.

Good practice

Where failing bathing waters are being impacted by pollution from a range of sources you should consider the use of urban pollution management or catchment based partnership approaches. Good asset maintenance is essential for protecting bathing waters and you need to be actively managing your collecting systems and monitoring the frequency and severity of storm overflows.

Catchment initiatives and partnership working can be effective in reducing the impact of microbial pollution on bathing water protected areas. You should consider land use management as an alternative to UV disinfection and additional treatment.

2.3 Shellfish waters

Legislation and duties

Safe and sustainable shellfish harvesting areas bring commercial and economic benefits to local communities and improve public health. The environmental requirements for shellfish water protected areas in England are set out in the WFD Regulations 2017 and the Shellfish Water Protected Areas Directions 2016. The measures to protect and improve these waters are included in the updated RBMPs (the 2015 plans).

The microbial standard for bacteria (measured as E. coli) in shellfish flesh has been retained for shellfish protected areas in legislation (WFD Regulations and Shellfish Water Protected Areas Directions 2016).

Expectations (S, S+)

Where standards are not currently consistently met improvement measures to reduce microbial pollution from wastewater discharging to or near shellfish water protected areas will be required. Such improvements will be subject to tests of cost-benefit. Measures that are not cost-beneficial may be considered but only where you

can provide evidence that the proposed measure is fully supported by your customers. These measures will either result in compliance or move waters towards compliance. The impacts of storm overflows and emergency overflows should be reduced by limiting spill frequency and volume. All significant storm overflows impacting on or discharging into shellfish water protected areas must be fitted with event duration monitoring devices to record the frequency and duration of events.

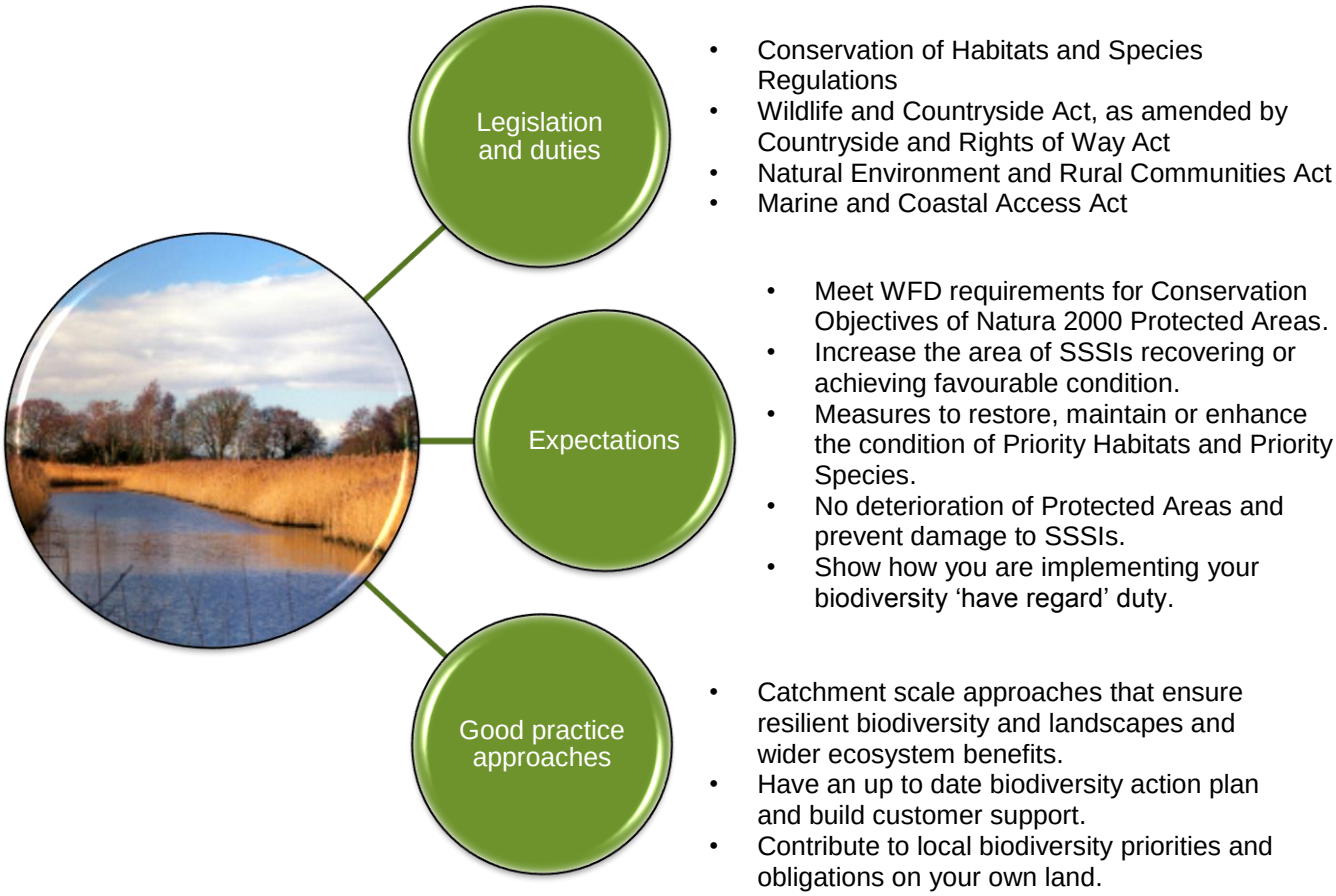
Any of your assets that contribute to a deterioration in shellfish water quality should be identified for improvement. Deterioration will be formally assessed and reported once every 6 years in the update to RBMPs with the first formal assessment in 2021.

Good practice

Catchment initiatives and partnership working can be effective in reducing the impact of microbial pollution on shellfish water protected areas. You should consider land use management as an alternative to UV disinfection and additional treatment.

Urban diffuse pollution is a major reason for water quality failures in shellfish water protected areas. Measures to rectify misconnections of foul drainage and tackle surface water pollution can significantly reduce faecal contamination in waters. You should work with local authorities, the Environment Agency and catchment partners to identify and advise customers on misconnection repair. You should also engage with customers to raise awareness of misconnections and their impact.

2.4 Biodiversity and ecosystems

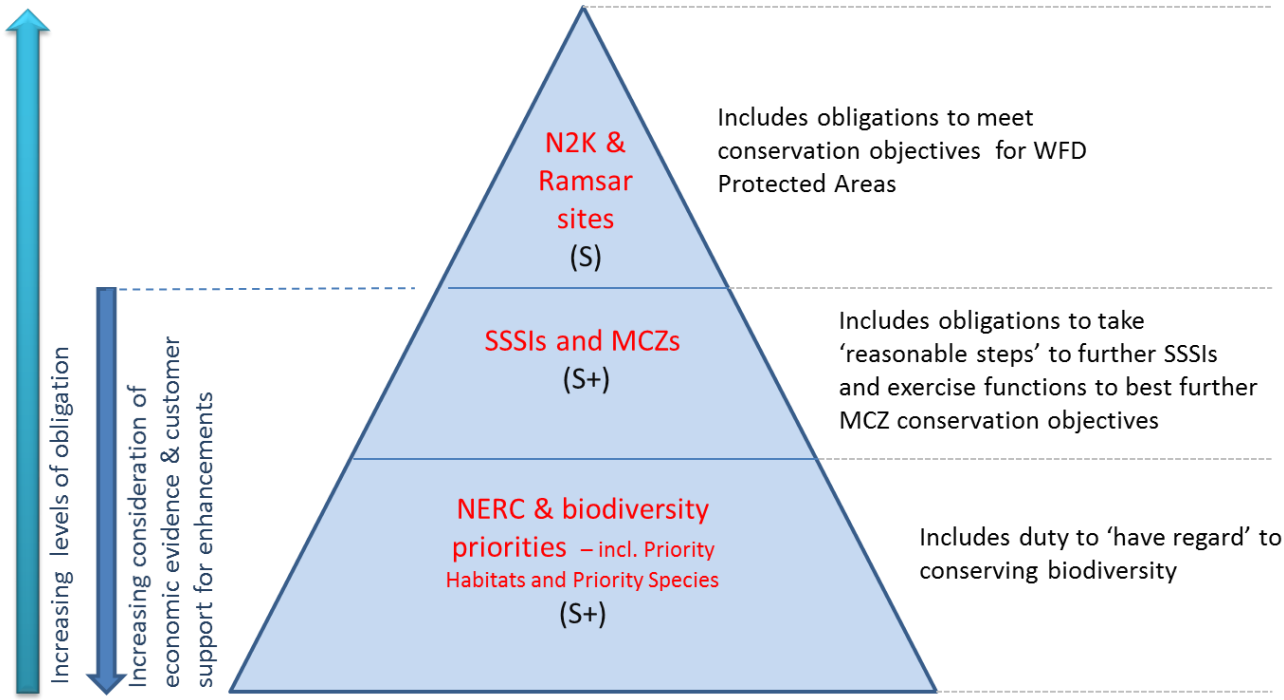


Introduction

Much has been achieved for biodiversity through your actions in previous price reviews, both in relation to actions on the land you own, and to address pressures on freshwater, coastal and marine habitats. However, over the SSSI series pressures on aquatic habitats such as water quality and hydrology continue to prevent achievement of favourable condition. Only around 84% of lowland freshwater and wetland SSSI (67% of river SSSIs) are in favourable or recovering condition, compared to over 94% for the SSSI series as a whole. You have an important role to play in preventing further damage and in enabling recovery. The status of wetland biodiversity is linked to the health of the wider catchment. You are important players in the action needed to tackle diffuse pollution and to improve the wildlife connectivity between designated sites.

Figure 3 summarises the degree to which biodiversity and ecosystem enhancement expectations are driven by statutory obligations and the need for economic considerations. This process is not definitive in every case but cost benefit assessment is part of the consideration where measures contribute to RBMP objectives.

Figure 3. Illustration of the biodiversity and ecosystem enhancement expectations



Natura 2000 and Ramsar sites

You have obligations relating to Natura 2000 sites and species protection under the Conservation of Habitats and Species Regulations 2010. The Repeal Bill intends to convert existing EU environmental law, including the Birds and Habitats directives into domestic law. Ramsar sites (designated under the Ramsar convention) should be treated in the same way as SPAs and SACs under government policy.

New considerations for PR19 include: requirements arising from new site designations (mainly marine); revised boundaries or new features added to existing designated sites; new evidence or technology (including that arising from PR14 investigations and outcomes from joint Environment Agency / Natural England work to update diffuse water pollution plans for all Natura 2000 sites affected by diffuse pollution); and changes to targets under revised Common Standards Monitoring Guidance.

Expectations (S)

You should complete measures to improve sites or prevent deterioration from fully licensed abstraction and/or discharge flow scenarios. You should also include measures (investigations or in certain circumstances actions) where necessary to

contribute to or meet conservation objectives based on Common Standards Monitoring Guidance (CSMG). This should include measures to prevent deterioration (investigations or in certain circumstances actions) by addressing the potential impact of development growth. More detail on what measures are eligible for inclusion in WINEP is set out in our 'WINEP driver guidance on Habitats and Birds Directives (including Ramsar)'.

The Environment Agency's Restoring Sustainable Abstraction programme includes licences that may impact the most sensitive environmental needs, for example, Natura 2000 sites. All action needed to improve these sites to meet 2021 objectives should be completed by 2020. You should put in place solutions by the agreed dates to achieve the required environmental outcomes.

Sites of Special Scientific Interest (SSSI)

The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 requires public bodies to take reasonable steps, consistent with the proper exercise of their functions, to further the conservation and enhancement of the flora, fauna or geological or physiological features of SSSIs. The legislation places a statutory obligation (S) to give prior notification to the statutory nature conservation advisors in relation to operations you undertake or for which you give consents or authorisations, which are likely to damage the special features of an SSSI. This applies whether the functions/activity is being carried on, within or outside the SSSI. SSSIs benefit from strong legal protection due to their high value for biodiversity.

Expectations (S+)

We expect you to contribute to maintaining or achieving SSSI favourable condition both on your own land and in the catchments you manage or impact on. The rate at which SSSIs are improved links to government policy. Biodiversity 2020: A strategy for England's wildlife and ecosystem services[6] sets out the government's strategic direction for biodiversity policy to 2020 on land (including rivers and lakes) and at sea. Government is developing a 25 year environment plan, which will provide the long-term direction for the important work already begun under Biodiversity 2020 and the Convention on Biological Diversity 'Aichi targets'[7]. In the interim, you should continue working towards the priorities set out in Biodiversity 2020 but factor in the need to have regard to any change in policy or strategy.

[6] *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*
[7] 'Aichi' targets

Natural Environment and Rural Communities Act 2006 (NERC) and Biodiversity priorities

The Natural Environment and Rural Communities Act 2006 (NERC) places a duty on you to have regard, so far as is consistent with the proper exercise of your functions, to conserving biodiversity. This reflects the aim of restoring or enhancing a species population or habitat and government's ambition for the 'prevention of further human-induced extinctions of known threatened species'. Biodiversity 2020 expands on this, setting more specific targets for Priority Habitat condition and creation, and for the application of the ecosystem approach and restoration of degraded ecosystems.

Expectations (S+)

Under the NERC you should contribute to the biodiversity priorities under Biodiversity 2020, including work to halt overall biodiversity loss and to support healthy well-functioning ecosystems by following the Lawton principles[8] of making our network of wildlife sites 'bigger, better and more joined up'.

We expect you to develop measures during the price review to contribute to biodiversity priorities and obligations on your own land or in the catchments you influence and operate in. You should have particular regard to the needs of Priority Habitats and Priority Species as set out in legislation[9]. New information since PR14 that you should take into account includes Priority river habitat[10] and lake habitat[11] mapping and targeting, and details on the management needs of 'Section 41 species' and others at high risk of extinction. Although the ambitions set out in Biodiversity 2020 are not statutory, you should refer closely to it in delivering your duties under NERC, particularly when setting priorities and decisions around the targeting of resources.

You should consider how to apply the Defra published guidance[12] for public authorities on implementing the Biodiversity Duty. This includes using up to date biodiversity audits and action plans and building customer awareness and support for biodiversity action. We would encourage you to consider developing biodiversity related performance commitments and ODIs. You should identify how you can contribute to implementing the National Pollinator Strategy[13] and seek opportunities to manage your assets in a way that provides food and shelter for pollinators.

[8] Making Space for Nature Review
[9] Habitats and species of principal importance in England
[10] Priority river habitat in England – mapping and targeting measures (JP006)
[11] Priority lake habitat in England – mapping and targeting measures (JP008)
[12] Defra published guidance
[13] National Pollinator Strategy

Marine Conservation Zones (MCZ)

The Marine and Coastal Access Act 2009 (MACA) provides the legal mechanism to help ensure clean, healthy, safe, productive and biologically diverse oceans and seas by putting in place a new system for improved management and protection of the marine and coastal environment. Marine Conservation Zones (MCZs) are a national designation created by the MACA to protect nationally important marine wildlife, habitats, geology and geomorphology in offshore and inshore waters. The legislation requires public authorities (so far as consistent with the proper exercise of their functions) to exercise those functions in a manner they consider best furthers the MCZ's conservation objectives and where that is not possible, to exercise them in a manner that least hinders those objectives. This would embrace considering whether to review or change permits that pose a risk to an MCZ.

Expectations (S+)

Your activities, primarily those influencing water quality, have the potential to negatively impact on the MCZ features. For these new designations the Environment Agency, in consultation with Natural England, is undertaking a national scoping assessment of sites and permits. Where risks to MCZs are identified this will be explored further with you.

Biodiversity and ecosystems good practice

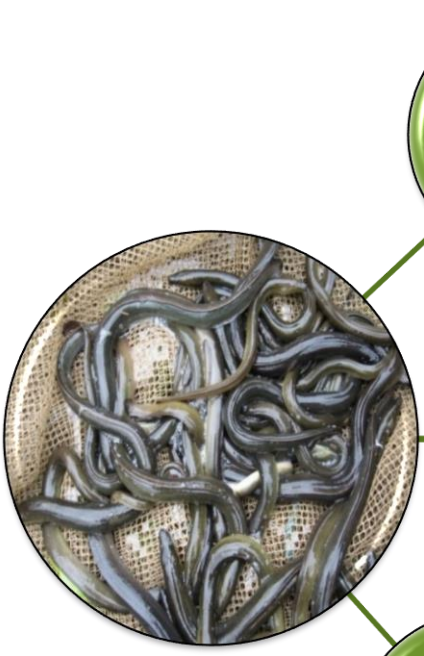
You should consider both point source improvements and catchment based approaches to meet your biodiversity obligations. When planning improvements you should consider taking an ecosystem approach as described under the Convention of Biological Diversity[14]. Where possible you should seek to achieve multiple benefits by combining biodiversity improvements with other initiatives such as catchment sensitive farming or Drinking Water Protected Area measures. Such action might include approaches such as Payment for Ecosystem Services. Catchment based approaches and other biodiversity work should be planned at the landscape-scale to improve the coherence and resilience of ecological networks. The aim should be to make them better in quality, bigger in size and more joined up. As part of your biodiversity obligations and requirements you should consider using remediation options and habitat restoration to address the legacy of historic pollution, for example, as part of river, ditch or lake restoration programmes. Natural England is especially interested to explore collaboration opportunities where your ambitions overlap with its spatial priorities (Focus Areas) and Conservation Strategy (Conservation 21) ambition.

[14] Convention of Biological Diversity

Landscape, Access and Recreation expectations and good practice

We expect you to consider your impacts on and contributions to improving landscape and access/recreation outcomes linked to your duties under the Water Industry Act 1991. In exercising your functions in relation to land within designated landscapes (areas of outstanding natural beauty (AONBs), National Parks and The Broads) you should have regard to their statutory purposes. You are encouraged to talk with your local AONB Unit or National Park Authority on interpretation of the have regard duty, which may help identify opportunities for partnership working. Good practice is also considered to include keeping records of decisions that show how you have taken the duty into account.

2.5 Sustainable fisheries



Legislation and duties

- Eels (England and Wales) Regulations
- Salmon and Freshwater Fisheries Act
- Water Framework Directive Regulations

Expectations

- Measures to improve abstractions and outfalls to prevent the entrainment of fish and to address barriers to passage of fish.
- Factor in the wider benefits of fish pass solutions such as improved geomorphology.

Good practice approaches

- Work in partnership to identify and implement the best options for salmon recovery in line with the 5 point salmon approach.
- When considering a fish pass solution include a feasibility study into removing the barrier to fish migration.
- Identify opportunities to schedule action alongside other programmes of work to make eel protection more cost effective.

Eel fisheries

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has classified the European eel as being critically endangered. Currently only 1 out 9 river basin districts in England are compliant with the EC Eel Regulation target of ≥40% escapement of adult silver eels returning to the sea to breed. The objective for the fishery is for eels to fulfil their role in the aquatic

ecosystem and provide social and economic benefits from recreational and commercial fishing at sustainable levels.

The Eels (England and Wales) Regulations 2009 (the Eels Regulations) came into force on 15 January 2010 to support the UK in implementing EC Council Regulation (1100/2007) (the EC Eel Regulation). The Eels Regulations require the UK to consider eel passage as part of the solution to halt and reverse the decline in eel stocks.

Expectations (S+)

You need to continue to support the recovery of the European eel stock by managing your assets in line with the regulations best practise guidance for screening and eel passage. To be legally compliant with the Eels Regulations, all intakes (abstracting more than 20 cubic metres per day) and all outfalls must be screened for eel unless the Environment Agency exempts the requirement. The Environment Agency can serve notice to require the owner of a barrier to install eel passage. In keeping with other sectors there is flexibility in scheduling action alongside other programmes of work to make eel protection more cost effective.

Good practice

Newly built assets will have to comply with eel screening and passage best practice guidance. For existing (legacy) assets the Environment Agency will take account of the potential extra costs associated with retrofitting screens and passes. You should work in partnership with the Environment Agency to identify the most cost effective way of addressing medium and lower priority eel sites. In prioritising assets to be addressed, those impacting designated sites should be given highest priority, as a healthy eel population is vital to the natural function of many protected freshwater habitats and species.

Salmon fisheries

Salmon are a protected species and an iconic indicator of the health of the water environment. The management objective for salmon stocks in England is that they should meet or exceed their conservation limits in at least four years out of five, on average. In 2015, 31 of England's 42 principal salmon rivers were judged as being 'at risk' or 'probably at risk'. None were categorised as 'not at risk'.

Salmon passage needs are included in species specific legislation (SAFFA 1975), and site specific legislation for protected areas such as Special Areas of Conservation or SSSI, which are designated under the Habitats Directive/Regulations and Wildlife and Countryside Act 1981, respectively. Salmon

passage requirements can also be a legal requirement when included as conditions in permits and licences.

The government backed Salmon 5 point approach (Salmon 5PA) aims to restore the abundance, diversity and resilience of salmon stocks across England through: improving marine survival; reducing exploitation by nets and rods; removing barriers to migration and enhancing habitats; safeguarding sufficient river flows; and maximising spawning success by improving water quality.

Expectations (S+)

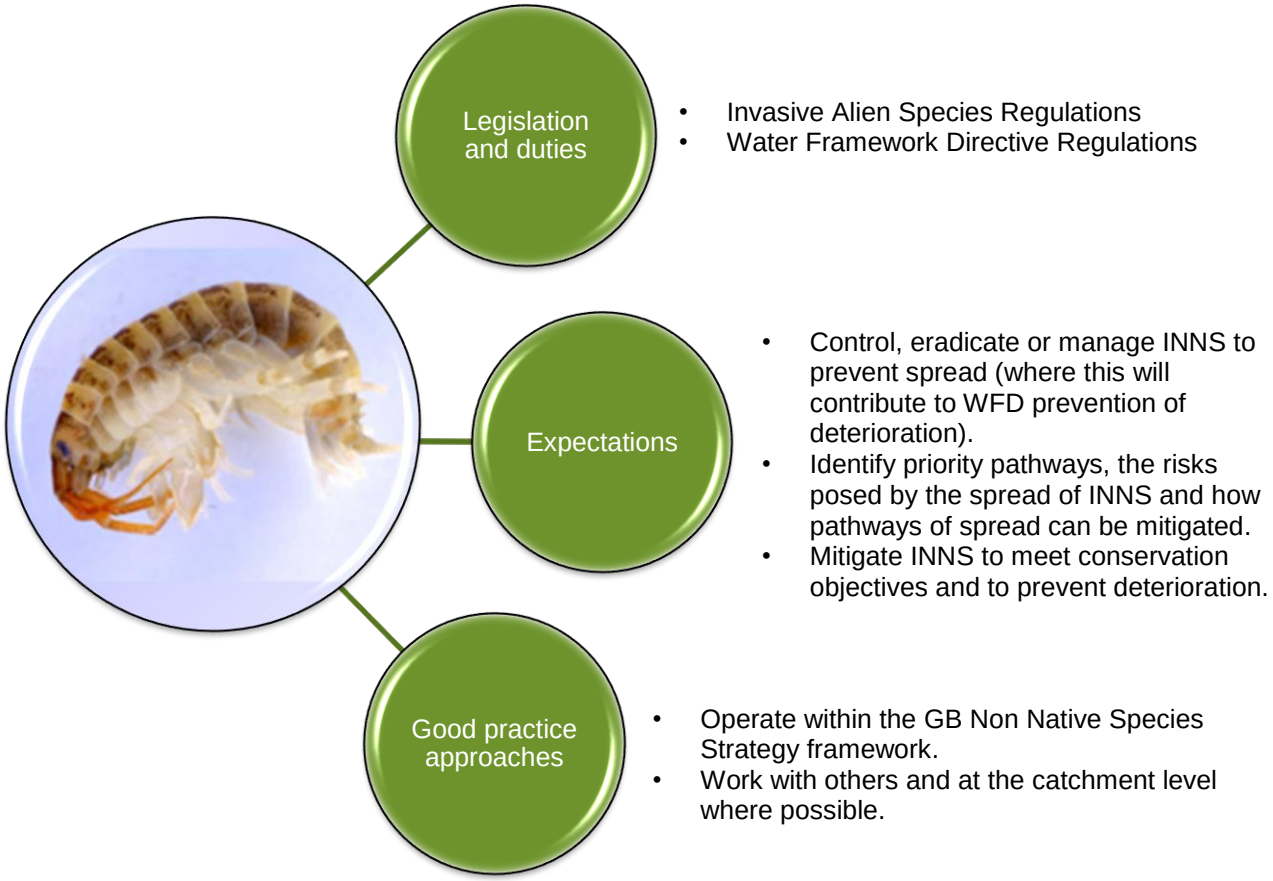
You should contribute to the Salmon 5PA by addressing environmental pressures faced by salmon indirectly via other existing statutory drivers. This may include using Sections 40 and 41 NERC (protective species) to address flow pressures in principal salmon waters failing to achieve their conservation targets. You should complete RBMP measures that address the barriers to fish migration, low flows and water quality. Where customer support places added value on the presence of healthy salmon stocks in rivers we expect you to go beyond statutory obligations. In such cases, we encourage you to work with local fisheries partners and the Environment Agency to help identify the best options for salmon recovery and the attainment of favourable conservation status for the species.

Good practice

When considering fish pass solutions you should conduct a feasibility study into removing the barrier to fish migration. Although not always technically or economically feasible we consider barrier removal as best practice. As well as addressing fish migration issues it typically provides wider benefits for the river, such as restoring the natural geomorphology and flow regimes.

Where the river is a designated site and has a river restoration strategy in place, the aim should be for any work on fish passage to sit alongside physical habitat restoration plans.

2.6 Invasive Non Native Species (INNS)



Legislation and duties

An invasive non-native, or “alien”, species (INNS) is defined as a species introduced outside its normal past or present distribution. INNS are those which threaten ecosystems, habitats or species with environmental or socio-economic harm. Water body risk assessments found over 70% of water bodies across all surface categories in England are at risk of deterioration as a consequence of INNS. The annual cost of invasive non-native species to the Great Britain economy was estimated in 2010 to be £1.7 billion per year, of which around £5 million was attributed to water industry management of INNS.

The UK has international and national obligations and laws to control the spread of INNS. The European Union Regulation on Invasive Alien Species (IAS), the WFD Regulations and the Great Britain (GB) Invasive Non Native Species Strategy all aim to limit spread, implement controls and prevent risks from INNS. The Wildlife and Countryside Act 1981 (as amended) provides controls on the release of non-native species into the wild in Great Britain. Both the IAS and the GB strategy have a focus on understanding, management and mitigation of pathways of spread. The GB

strategy states that the most cost beneficial and least damaging way to manage invasive species is to prevent their arrival and spread.

Expectations (S, S+, NS)

INNS can impact on your operations through fouling, eroding or blocking assets, altering water quality and the ability to measure it. We expect you to understand the pathways of spread of INNS on your assets and catchments, and how those pathways of spread through the water environment can be mitigated. Key pathways are raw water transfers and recreational activity. You should consider measures to control and manage INNS where the species or locations pose a risk of deterioration in WFD status or to achieving conservation objectives at SSSI and Habitats Directive sites. You should identify measures to eradicate existing impacts of INNS through local discussions with Natural England and the Environment Agency.

When considering new raw water transfers you should take account of the Environment Agency position statement on managing risk of spreading INNS through raw water transfers[15]. If a scheme would create a new hydrological connection between locations not already connected you will be required to put mitigation measures in place to ensure INNS cannot be spread by the new transfer. If a new scheme creates a hydrological connection between locations that have an existing hydrological link, you will need to undertake an assessment of the increased risk that the scheme poses (that is considering existing pathways and potential for spread via these). The Environment Agency will decide whether mitigation will be necessary for these schemes on a case-by-case basis to ensure that they do not significantly increase the risk of INNS transfers.

Good practice

Many measures to tackle INNS are most effective when resources and expertise are shared. We encourage you to work with other water companies on research into mitigation measures for water transfers and to work with local stakeholders to prevent and control INNS, for example, by promoting the “Check, Clean, Dry’ campaign. You should develop plans for managing and controlling the effects of INNS on your assets and for preventing the spread of INNS. These should take account of any additional threats or challenge posed by invasive species as a result of climate change.

[15] Managing risk of spread of Invasive Non-Native Species through raw water transfers, Environment Agency position statement 1321_16

2.7 Urban Waste Water

Legislation and duties

The environment is protected from the adverse effects of discharges of urban waste water through the Urban Waste Water Treatment Directive (UWWTD) (91/271/EEC), implemented by the Urban Waste Water Treatment Regulations 1994. These should be seen in the context of the general duties to provide, improve and extend the sewerage system imposed by section 94 Water Industry Act 1991. Section 101A of the Water Industry Act 1991 (as amended by the Environment Act 1995) places a duty on sewerage undertakers to provide first time sewerage (by connection to a foul sewer) in an area where non mains sewerage arrangements are causing an environmental or amenity problem or is likely to do so if no preventative action is taken.

Expectations (S)

Water bodies are reviewed every four years to determine whether they are sensitive to the effects of wastewater discharges. Once waters have been identified as sensitive then qualifying WwTWs must be upgraded within seven years to meet tertiary treatment requirements at plants. In late 2016, a number of sites were submitted to Defra as candidates for designation as a sensitive area. The outcome of

the review will be announced in 2017. In providing satisfactory collecting systems and treatment requirements you should only include measures in your business plan, where requirements have already been identified or become newly identified for example additional sewerage capacity for population growth areas or the resolution of issues concerning permit applications.

Schemes relating to successfully determined applications made under Section 101A of the Water Industry Act 1991 and not already funded will be eligible for PR19 funding if engineering work is scheduled for the period (2020 - 2025). Schemes relating to potentially successful applications in relation to Section 101A, i.e. applications received but not yet determined, should be identified in order to indicate the likely scale of obligations for PR19.

UWWTR Regulation 4 requires that urban waste water entering collecting systems is subject to treatment provided in accordance with regulation 5, and that WwTWs are designed, constructed, operated and maintained to ensure sufficient performance under all normal local climatic conditions. They also require the Environment Agency to ensure the limitation of pollution from storm overflows is achieved using “best technical knowledge not entailing excessive cost” BTKNEEC. These requirements were reinforced in judgement from the Thames Tideway and Whitburn UWWTD Infraction proceedings (Case C 301/10).

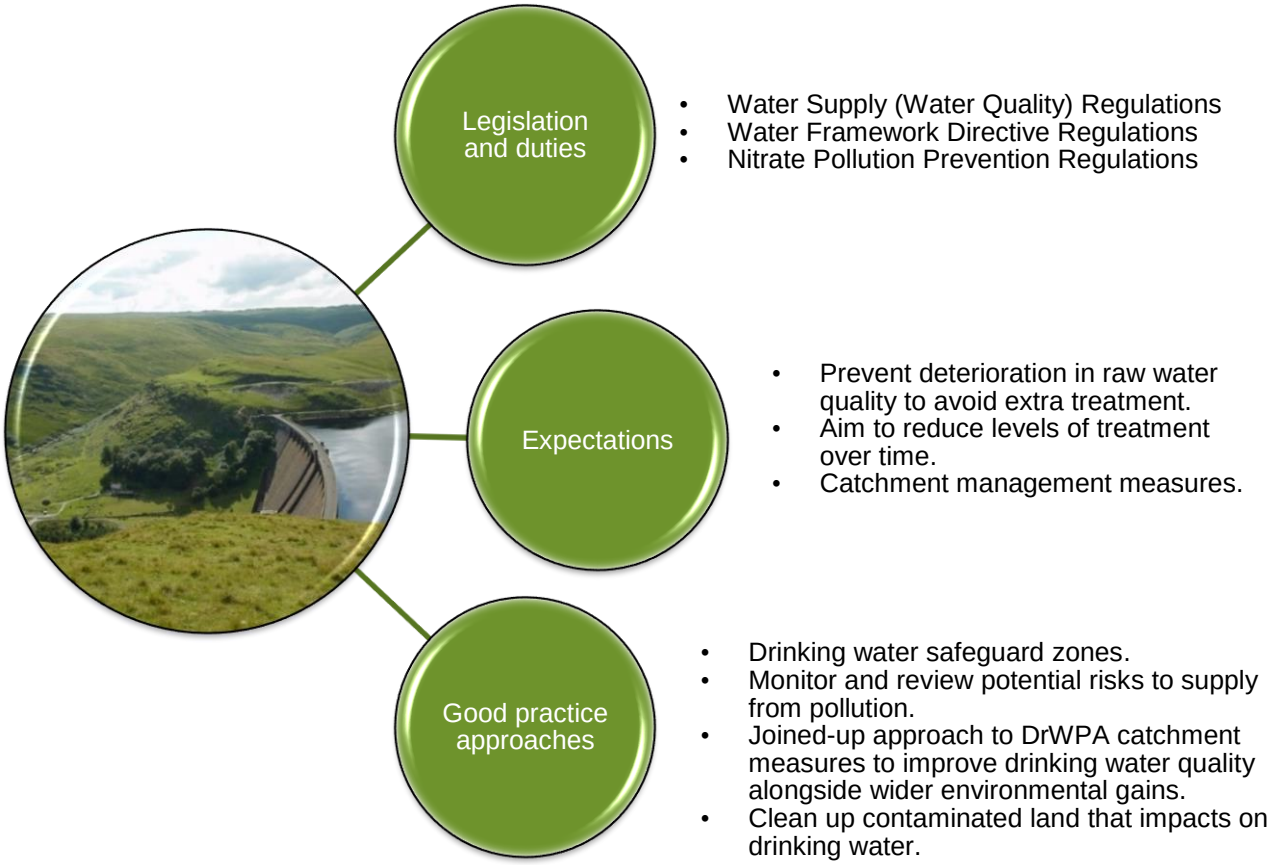
Action to increase Flow to Full Treatment (FFT) and storm tank capacity at WwTWs will be needed where UWWTR requirements are not being met. Prioritisation of improvements should consider factors such as spill frequency and duration, available dilution, observed or modelled water quality problems, amenity use or other planned improvements. Where permit requirements for FFT or storm tanks are not being met, improvements should be included in business plans.

Good practice

Demonstrating ongoing active management of collecting systems is strongly encouraged. This includes the approach to sewerage planning but may also include the monitoring of events from intermittent discharges where appropriate. Spill frequency trigger levels in permits for discharges impacting on particularly sensitive waters (for example, bathing and shellfish waters) would further underline a commitment to protecting such waters and those who use them.

In the case of the provision of satisfactory collecting systems and treatment requirements, action and investment should only be needed where requirements have already been identified or become newly identified, for example, additional sewerage capacity for population growth areas or the resolution of issues concerning permit applications.

2.8 Drinking Water Protected Areas



Legislation and duties

You need to protect and ensure the future resilience of water resources. Climate change impacts, future demand and deterioration caused by emerging and current substances also need to be mitigated. To safeguard drinking water quality Drinking Water Protected Areas (DrWPAs) are established, under the WFD Regulations, for water bodies (reservoirs, rivers, lakes and groundwater) from which water for human consumption is abstracted. Under existing water treatment provisions, treated water from DrWPAs must meet the Drinking Water Directive (DWD) standards.

Expectations (S, S+)

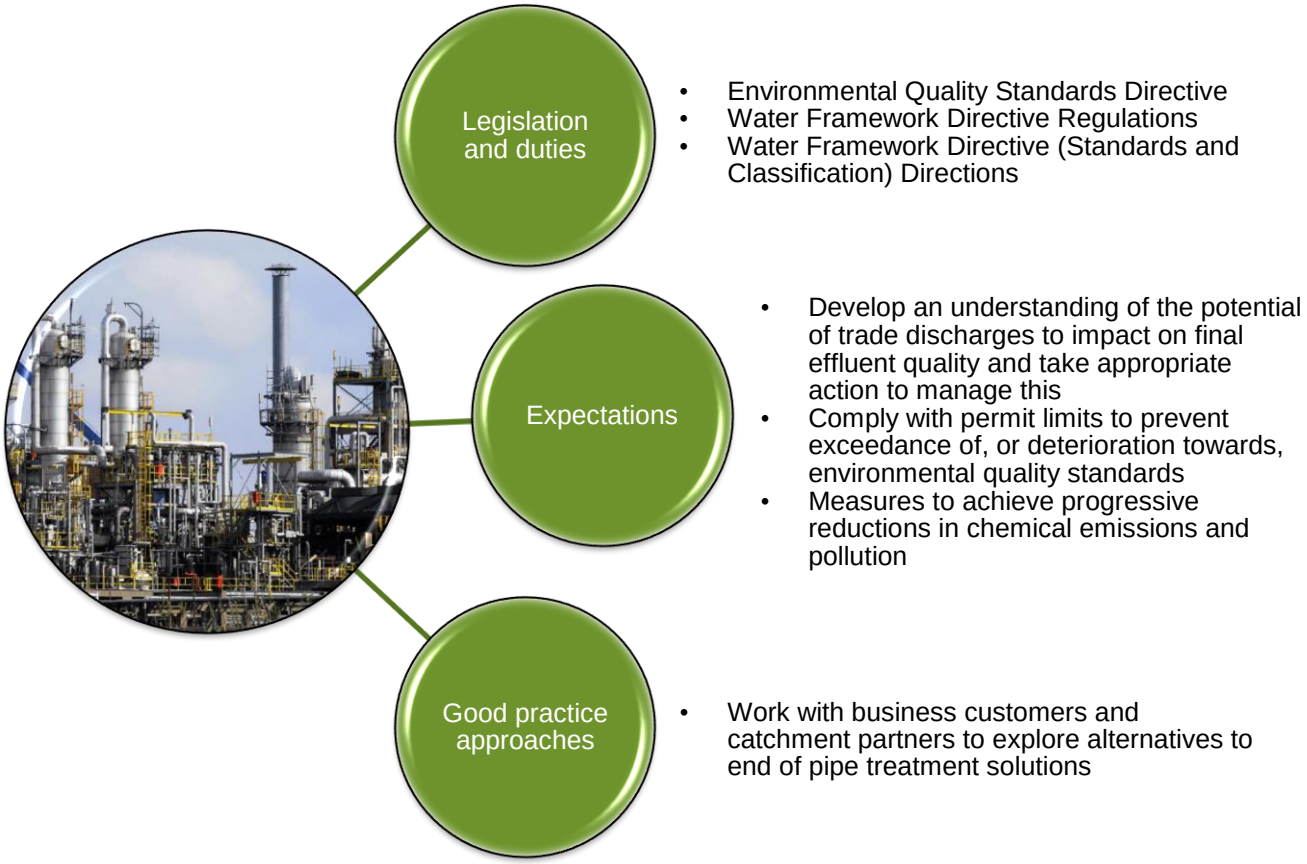
We encourage you to develop catchment measures to reduce pollution that is reaching your abstractions. DrWPAs must be protected and measures put in place to avoid deterioration in water quality, which could lead to the need for additional treatment. The long term aim is to reduce the levels of treatment over time. Groundwater bodies must meet WFD good status and upward pollutant trends should be reversed.

Defra expects to consult on options to manage metaldehyde in the environment to protect drinking water sources. Catchment based solutions are preferred, however, no options are currently ruled out. You should plan on the basis of implementing catchment management solutions to tackle pesticide pollution, including metaldehyde, wherever possible. You should also contribute to a collaborative approach to help develop an evidence base to inform catchment management as well as other potential solutions. Where a catchment investigation for metaldehyde or other pesticide has taken place in PR14 this should identify the scale and geographical extent of the problem and what measures, if any, would be required in PR19.

Good practice

The Environment Agency identifies non-statutory Safeguard Zones (SgZs) for DrWPAs ‘at risk’ of not meeting the WFD drinking water objectives. You can enter into agreements with land owners, occupiers or local authorities, to more effectually collect, convey or preserve the purity of drinking water sources under section 164 Water Industry Act 1991. Catchment solutions to control and reduce pollution are encouraged as cost effective alternatives to additional treatment. These measures, which can be implemented by you or through local catchment partnerships, secure wider catchment benefits and increase natural capital value. You are encouraged to work with farmers and landowners to change land use, reduce concentrations of substances such as nitrate or pesticides, or to implement other innovative solutions to achieve DrWPA objectives. Under section 164 Water Industry Act you can enter into agreements to fund the remediation of contaminated land at orphaned sites.

2.9 Chemicals



Legislation and duties

Discharges of hazardous pollutants to surface water are controlled under Environmental Quality Standards Directive (EQSD) (2008/105/EC), as amended by Directive 2013/39/EU. The controls are implemented by the WFD Regulations and the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Expectations (S, S+, NS)

You are required to meet permit limits set to prevent exceedance of, or deterioration towards, environmental quality standards (EQS) downstream of your wastewater discharges, subject to assessments of the costs and benefits of any additional treatment where appropriate. No deterioration measures and load standstill measures are not subject to tests of cost benefit. The Environment Agency and Defra are developing a strategy to tackle risks from harmful chemicals in UK waters. If approved by the minister, the chemicals strategy will rely on a combination of national source control measures and wastewater discharge control measures. Following agreement of the strategy you will still be required to achieve chemical

permit limits to address local issues, but where widespread exceedance of EQSs can be better mitigated through application of existing source controls, permit limits will not be applied in PR19 to avoid any potential abortive investment. Progress on reductions in emissions will be assessed to inform planning for PR24. You should undertake effluent monitoring of key chemicals to assess changes in concentrations present in discharges over time so that trends can be assessed. You should continue to gather evidence to understand how your facilities are contributing to environmental levels of existing/emerging chemicals and associated issues, such as microplastics and antimicrobial resistance, evaluate new treatments and assess options to manage risks. These will be incorporated within a further round of chemicals investigations in PR19.

Good practice

You should seek to achieve the best overall improvement in environmental quality through any planned improvements. This means working with business customers and catchment partners to explore alternatives to end of pipe treatment solutions. Innovation in this area will be key to finding more effective and less costly solutions.

3.0 Improving resilience

Our resilience outcomes are:

- Strengthen resilience of water supply, wastewater, drainage, ecosystems and catchments to risks posed by extreme weather, climate change and population growth.

- Protecting communities from flooding by implementing cost-effective, co-funded solutions.

The definition of resilience as described by Ofwat's Resilience Task and Finish Group is: the ability to cope with, and recover from disruption, and anticipate trends and variability in order to maintain services for people and protect the natural environment now and in the future[16]. Making sure your assets and infrastructure are fit for the country's long-term needs is a vital part of ensuring resilience. We need to protect people and the environment and mitigate the potential economic losses that result from a changing climate, flooding and drought. We also need to build resilient natural systems so that we, and the habitats they support, can continue to benefit from the services they provide.

The 2015 progress report from the government's Climate Change Committee[17] concluded that you have made significant progress on resilience planning in recent years. The committee also made clear that this effort needs to be maintained as climate change continues to threaten the resilience of the water sector, for example, by bringing increasing frequent severe weather events. The government is committed to increasing the resilience of critical infrastructure to prevent disruption to services and to protect people and the environment. This means better protection for vulnerable assets from a range of hazards, including flood risk and drought risk, but also the availability of spare capacity where appropriate and more effective response and recovery. It is important to consider improving the resilience of ecosystems, alongside public water and wastewater systems. This aim should be to protect the long-term functioning of the ecosystems themselves as well the natural assets that the water industry and people rely on. In developing your business plans you should consider both service resilience and the resilience of the natural systems and take into account how risks are likely to change over time.

We expect your business plans to detail the steps you plan to take to increase resilience in water infrastructure and the natural environment whilst maintaining services and conserving the natural environment. Your plans need to be based on a

[16] Ofwat. Final report of the Resilience Task and Finish Group, December 2015
[17] Climate Change Committee. Reducing emissions and preparing for climate change: 2015 Progress Report

clear and systematic understanding of your service and system risks and include a range of options for reducing the likelihood of future service failures. There should be a clear line of sight between your resilience risk assessments and the options within your business plans.

3.1 Flood risk management

Legislation and duties

- Water Industry Act
- Flood and Water Management Act
- Reservoirs Act
- Flood Risk Regulations

Expectations

- Co-operate with other risk management authorities in exercising flood risk functions.
- Reduce sewer flooding of homes and businesses trending to zero.
- Reduce the number of properties at risk of flooding.
- Improve the resilience of significant assets and systems.
- Comply with statutory reservoir safety requirements.
- Work with others to actively identify and build in sustainable drainage options
- Take every opportunity to increase the no. of partnership schemes delivering multiple benefits.
- Take account of the National Flood Resilience Review.

Good practice approaches

- Incorporate climate change allowances in any flood risk assessments.
- Remove surface water from sewerage networks.
- Consider natural flood management and operating water supply reservoirs to reduce fluvial flood risk downstream.

Legislation and duties

Achieving effective flood risk management and improving the resilience of critical infrastructure requires good partnership working and a focus on what is best for communities and the public. You have a duty under section 94 Water Industry Act 1991 to ensure that the area you serve is effectually drained. The duty is not absolute and does not set standards. The Water Industry Act highlights the need for long-term resilience of water and wastewater systems and long-term planning and investment.

As a risk management authority (RMA) you must act in a manner that is consistent with the national flood and coastal erosion risk management strategy for England and have regard to local flood risk management strategies as developed by lead local flood authorities. All RMAs under the Flood and Water Management Act 2010

must cooperate with each other in exercising their flood risk functions. This includes the timely provision of flood risk information, data sharing, and working jointly on local strategies, plans and local flooding investigations. The Flood Risk Regulations 2009 implement the requirements of the Floods Directive, a sister Directive to WFD. It sets out a six year time cycle for flood risk management planning that aligns with the WFD planning cycle. Cooperation is a legislative principle that applies to all RMAs, placing a real emphasis on partnership working to achieve shared outcomes and address common issues.

Expectations (S, NS)

We expect you to show leadership in your RMA role and take a proactive role in enabling partnership working. We expect you to co-operate with other RMAs in long term surface water and sewerage planning for future resilience. The regulatory framework is sufficiently flexible to enable a broad range of measures including catchment solutions and investment in third party assets.

You are able to contribute and benefit from partnership schemes to reduce flood risk to communities. As beneficiaries of flood protection we expect you to have a clear and systematic approach to assessing partnership opportunities. You should demonstrate how you are taking a strategic approach to contributing to flood alleviation schemes in order to maximise the benefits to customers, the economy and the environment. We recommend using the approach set out in the UK Water Industry Research 2016 report on "Unlocking collaborative opportunities between water companies and partners"[18] to identify and allocate funding for joint schemes where these prove beneficial to customers. Solutions to reduce sewer flooding and local flood risk are frequently the same, meaning costs and resources can be shared. RMAs working in partnership can achieve business efficiencies and savings and secure additional outcomes that benefit customers, communities and the environment. We expect the number of joint funded flood alleviation schemes to increase compared to PR14.

Sewer flooding is one of the most serious service failures that customers can experience. Climate change and new housing development is likely to place greater pressure on drainage networks. You should work closely with local planning authorities and developers to encourage the better management of both foul and surface water in new and redevelopments. New sewerage systems should be designed to cope with a least a 1 in 30 year storm event and should take account of climate change. You should demonstrate a systematic understanding of the service risks that you face and how to manage them. There should be a clear link between

[18] How best to align the funding processes with the various bodies involved in resolving flooding: http://evidence.environment-agency.gov.uk/FCERM/Libraries/FCERM_Project_Documents/SC150010_report.sflb.ashx

your flood risk assessments and options within your business plans. In planning resilience improvements we expect you to prioritise your local high risk systems and major water and WwTWs serving 10,000 or more people. These works will need to be resilient to extreme flood events (as described in the National Flood Resilience Review and supporting information). Your business plans should set out priority actions for ensuring existing and new assets and systems are resilient.

You have choice and flexibility in how you reduce flood risk but should consider the use of sustainable drainage systems (SuDS) wherever possible. The Water Act 2014 confirmed that you can use sustainable drainage approaches to reduce the amount of surface water in your sewers and consequently manage sewer flooding. We encourage you to continue to work with Water UK, the Environment Agency, local authorities, and others to develop a UK-wide SuDS adoption standard.

Good practice

We expect you to show leadership by engaging partners on understanding risks, sharing and publishing a plan on how you will reduce service failures due to flooding, and service failures that lead to flooding. We want you to innovate and make good practice common practice.

Removing surface water from sewerage networks can improve network capacity and long-term resilience. Where technically feasible you may wish to consider operating water supply reservoirs to reduce fluvial flood risk downstream, provided there is no detriment to customers and this is balanced with managing drought risks. Using natural flood management to slow, store and filter flood water can provide a cost-effective way of keeping surface water out of sewers and increasing the resilience of networks. Catchment approaches of this type can provide additional biodiversity, water quality and water resource benefits.

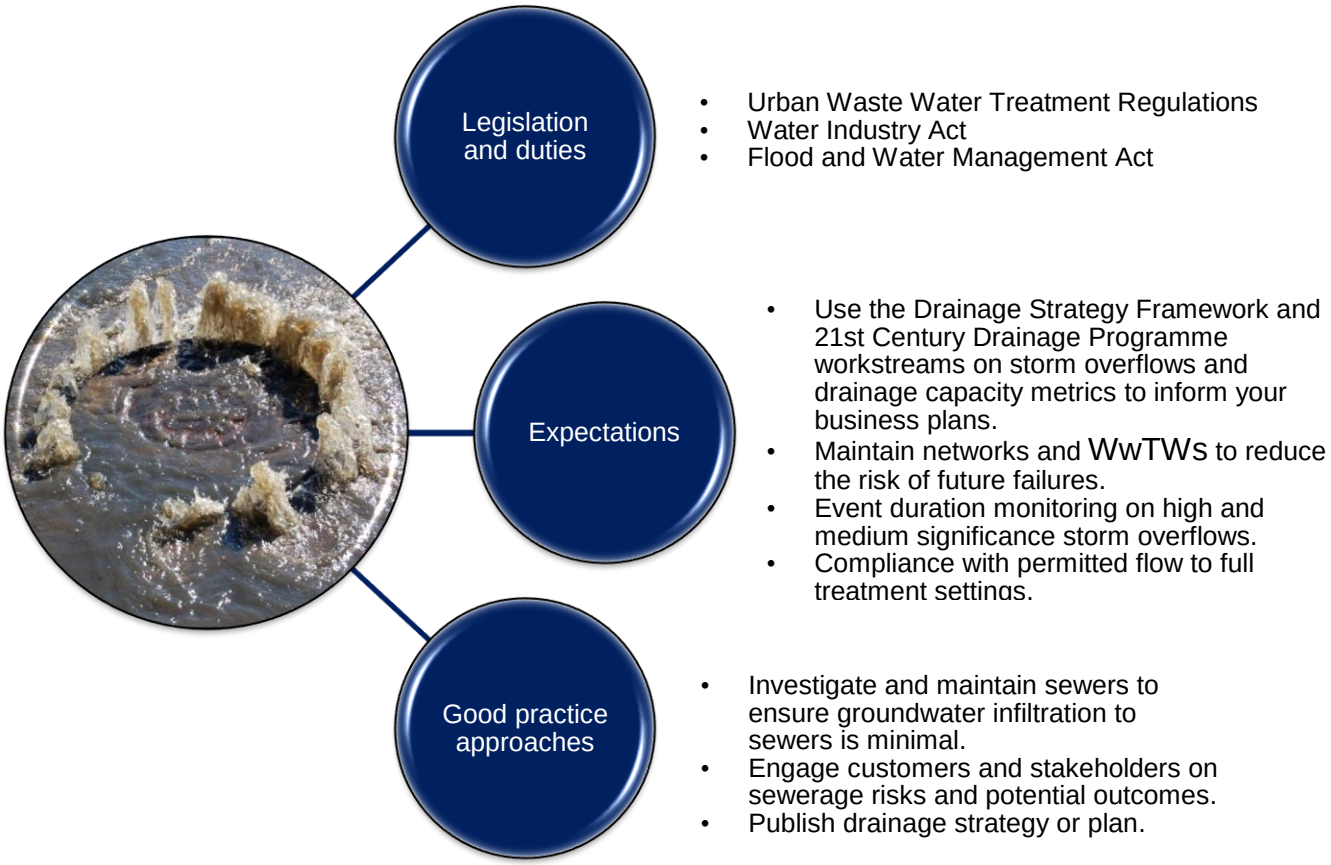
3.2 Service resilience

Water and sewerage undertakers are required to comply with the Security and Emergency Measures Direction 1998. This requires undertakers to have plans in place to provide essential water supplies and sewerage services in the event of a civil emergency, for instance natural disaster or other emergency, such as flooding, or an event affecting national security. Similar requirements are imposed on licensed water suppliers in subsequent Directions.

Under the Civil Contingencies Act 2004 you have responsibilities as Category 2 responders to share relevant information with Category 1 and other Category 2

responders. There may be further resilience obligations as Ofwat discharges its Resilience Duty[19] from the Water Act 2014.

3.3 Future drainage



Legislation and duties

You should move towards the establishing a resilient drainage system that can accommodate future risks. The UWWTD is designed to protect the environment from the adverse effects of urban waste water discharges and section 94 Water Industry Act 1991 to ensure that the area served is effectually drained. In the absence of any statutory planning requirement for wastewater, the Water UK 21st Century Drainage Programme (21stCDP) builds on the Environment Agency / Ofwat joint Drainage Strategy Framework (DSF) and Ofwat recommendations[20], to set the long term (25 year) direction, priorities and pace for wastewater drainage activities. 21stCDP encourages greater consideration of future pressures such as growth, climate change and asset deterioration.

[19] Water Act 2014
[20] Ofwat. Final report of the Resilience Task and Finish Group, December 2015

Expectations (S, NS)

We expect you to use the 21st CDP recommendations to gather information about asset condition, capacity and performance and to inform your decision making. Maintaining sewer networks and WwTWs should be a measure of success and we expect you to target investment to reduce the risk of future failures. Your drainage and sewerage plans should extend to 2050 and address how you intend to meet the challenges of protecting the environment, supporting economic growth, and dealing with the pressures of new development, climate change and ageing infrastructure. Any interventions should be informed by liaison with customers and stakeholders before being included in business plans. You should apply the principles in the DSF[21] and 21st CDP workstreams on storm overflows and drainage capacity metrics to directly inform your business plans. You should use new information on sewerage system performance, derived from the installation of event duration monitoring equipment on storm overflows during AMP6, to prioritise storm overflow spill reduction and drainage planning. We expect you to be able to demonstrate you are reducing spills and have plans in place to trigger action where risks from future pressures on sewerage are predicted to be unacceptable.

Good practice

Drainage plans prepared with full stakeholder engagement and made publically available will demonstrate the DSF guiding principles have been followed. In applying 21st CDP you should consider good practice to design for exceedance and work with partners on managing exceedance flows. Proactive communication of sewerage risks with partners should help you develop better overall solutions.

We have already seen the development of a "flushability" standard by the 21st CDP, to influence customer, manufacturer and retailers behaviours. This has the potential to reduce sewer flooding and pollution. Your communication plans should extend to a more open discussion with the public and stakeholders on sewerage and storm overflows. You should consider engaging customers on sewerage choices and potential outcomes. You should use your knowledge of drainage systems to develop integrated catchment approaches and start to tackle the issue of replacing intergenerational assets.

[21] Ofwat / Environment Agency, 2013, http://www.ofwat.gov.uk/wp-content/uploads/2015/12/rpt_com201305drainagestrategy1.pdf

3.4 Water resources planning and security of supply

- Water Industry Act
- Water Resources Act
- Water Resources Management Plan Regulations
- Water Act

- WRMP options to achieve security of supply outcomes or protect the environment to form the supply-demand component of business plans.
- Assess resilience of your water supply system to predicted droughts and other hazards.
- Commitment to reduce demand and/or PCC.
- Ensure agreed and up to date plans are in place to manage a drought.
- Set challenging targets for leakage informed by your customers' views and the potential for innovation.
- Incorporate sustainability changes in supply forecasts.
- Measures to ensure current abstractions and operations, and future plans support the achievement of environmental objectives.
- Implement universal metering in areas of serious water stress if supported by economic appraisal.

- Consider the costs and benefits of increasing your resilience to drought and other water supply hazards.
- Collaborate with customers, partners and regulators to build consensus on proposed solutions.
- Consider shared multiple use developments that bring resilience to other sectors.
- Consider innovative techniques to assess supply and demand and inform decision making.
- Demonstrate that decisions reflect the value of the environment and incorporate climate change in water resources management plans.

Legislation and duties

You are responsible for ensuring that your water resources are adequate to meet the present and future demands of your customers. The duty to prepare and maintain a Water Resources Management Plan (WRMP) is set out in Section 37A-37D of the Water Industry Act 1991. In preparing and publishing a WRMP for your company, you must take account of the Water Resources Management Plan Regulations 2007 and directions given by government.

Your WRMPs are complemented by your drought plans, which set out the short-term operational steps needed as drought progresses to manage customer demands, enhance available supplies, and minimise environmental impacts. The duty to prepare, consult upon and adopt a drought plan is set out in Section 39B of the Water Industry Act 1991. In preparing and publishing a drought plan, you must take account of directions given by government.

Water abstraction can cause damage to the ecology and habitats supported by rivers, wetlands, estuaries and groundwater. You have a significant role to play in achieving sustainable abstraction and have a duty to have regard to RBMP objectives, Protected Area requirements and general biodiversity duties when carrying out your water resources activities.

Expectations (S, S+, NS)

You should produce your WRMP using the Water Resources Planning Guideline 2016 and Defra's Guiding Principles for Water Resources Planning 2016. You need to plan to make sure that there is a reliable water supply for people and businesses, and to protect the environment. Your water resources management plan must set out how you will manage and develop water resources to meet your water supply obligations. When preparing your WRMP, you must assess the vulnerability of your water resources to future pressures such as climate change and population and consider all options to balance supply and demand. There needs to be sufficient flexibility to accommodate reasonably predictable changes to regulation, such as abstraction reform and competition.

Your WRMP must show how you will ensure efficient use of water. You should take on a 'twin track' approach to improving the resilience of your water supplies, with investment in new supplies complementing measures to reduce the demand for water. Government has stated that it is difficult to see why you should not be able to achieve a reduction in per capita consumption and it expects you to cut leakage. Your business plan should include a long-term commitment to reduce demand and consider the merits of increasing the number of metered households as a means to reduce demand. We expect the downward trend of leakage should continue and you should set challenging targets for leakage informed by your customers' views and the potential for innovation. If your water company is in an area designated as an area of serious water stress, you must consider universal metering as part of the feasible options in your WRMP options appraisal.

You should take a strategic approach to water resources planning that represents best value to customers over the long term – planning for at least the next 25 years in your WRMP. This should draw on the latest information from collaborative projects, such as the Water Resources East, Water Resources in the South East and Water UK's long-term planning framework project. You should consider all options to meet your supply and demand balance – including options outside your boundaries. This includes reviewing current operations to confirm whether they are the most appropriate option. You should consider environmental and social impacts of your feasible options.

The solutions needed to achieve your WRMP outcomes and protect the environment over the long-term must form the supply-demand component of your business plan. Any material difference between your WRMP and business plan should be justified. In developing business plans, you need to balance managing demand, improving how water resources are allocated and developing new resources. You should also carry out effective engagement with your customers on any new options that you are bring forward.

Resilience is at the heart of the government's long term thinking. Given the scale of future challenges, we want to see a real change in your approach to your WRMP. Your plans should properly examine the value of resilience to your customers, taking account of your customers' views and identify what actions you will take to reduce risk now and in the future. We expect you to thoroughly assess the vulnerability of your water supply system to likely climate change, predicted droughts and to other non-drought water supply hazards, such as flooding and freeze-thaw impacts. In doing so, you should bear in mind the long term needs of your customers and take account of any direction given by government on levels of service. A resilient WRMP relies on a resilient environment and consideration of sustainable abstraction should be an integral part of your WRMP process. Sustainability changes identified in the WINEP should be included in your WRMP supply-demand baselines and factored into business plan options.

You must comply with your abstraction licences and prevent damage to the environment. Your abstractions should support the achievement of environmental objectives and measures set out in the RBMP. Where required you should put solutions in place to resolve existing environmental problems caused by abstraction and also to prevent deterioration in the condition of the environment. It is important that you show leadership on the issue of environmental flows by working with stakeholders and other abstractors to improve understanding. We also ask you to strongly consider including appropriate abstraction sites in Ofwat's Abstraction Incentive Mechanism (AIM) where reductions in abstraction at low flows would benefit the environment.

You should complete all drought plan outstanding actions. You should link your WRMP to your drought plan by identifying when you will need to use drought management interventions to manage plausible droughts more severe than your WRMP has been designed to meet. You should engage with your customers to determine the frequency that you plan to use supply restrictions to reduce demand during droughts (the 'level of service' that you will provide).

Good practice

The environment is dependent on sufficient water in rivers, lakes and aquifers. You are a steward and leader of our natural water resources assets and the ecology that depends on them. You should show leadership by collaborating with customers, partners and regulators to develop a strong understanding of future needs and build consensus on your proposed solutions. You should consider whether your abstractions are truly sustainable, looking across a catchment as a whole and consider investment in integrated catchment schemes to improve drought resilience and water quality. You should include abstractions in Ofwat's Abstraction Incentive Mechanism, where reductions in abstraction at low flows would benefit the environment.

You should consider water trading and shared, multiple use developments that bring resilience to other sectors such as agriculture and demonstrate that your decisions reflect the value of the environment, using natural capital approaches.

You should consider using new innovative techniques to assess supply and demand, and to inform your decision-making. If you are not in an area of serious water stress, you should still evaluate the wider benefits of metering for managing demand and reducing leakage and implement this where it represents value for money over the long-term. You should use the latest research information on the effectiveness of metering programmes, the use of tariffs, the effectiveness of retailers in the non-household water market in England (and Scotland) in reducing demand, and synergies with other regulated markets to assess the costs and benefits of metering.

3.5 Climate Change

- Climate Change Act (2008)
- Adaptation Reporting Power reporting obligation
- Energy Savings Opportunity Scheme Regulation 2014
- Potential duty under the National Adaptation Programme 2 2018

- Ensure Adaptation Reporting Power (ARP) report commitments and planned actions are consistent with, and embedded within, business plans.
- Contribute to the government's carbon reduction emissions targets.

- Improve understanding of the risks of climate change to the natural assets that you rely on.
- Take into account the impacts of climate change on assets, services and activities, incorporate climate change in water resources management plans and flood risk assessments for new developments.
- Ensure services are resilient to the increasing frequency of severe weather events.
- Implement ISO50001 to ensure ESOS compliance and effective energy management.

Legislation and duties

The Climate Change Act 2008 legally binds the UK to reduce emissions of carbon by at least 80% by 2050, compared to 1990 levels. The Energy Savings Opportunity Scheme is a mandatory energy assessment and saving identification scheme, introduced to meet the requirement of Article 8 of the Energy Efficiency Directive. The scheme helps organisations recognise energy saving opportunities and operates in 4 yearly compliance phases.

The Climate Change Act 2008 sets the legal framework for adaptation policy in the UK, preparing for the likely impacts of climate change. Every 5 years it requires a UK Climate Change Risk Assessment (CCRA) to be conducted and a National Adaptation Programme (NAP) to be developed to tackle the most pressing climate change risks to England. The 2nd Climate Change Risk Assessment, 2017[22]

[22] The UK Climate Change Risk Assessment 2017, Defra

identifies risks to water supply, and natural capital, including coastal communities, marine and freshwater ecosystems and biodiversity, as among the highest future risks for the UK relevant to the water industry. The Climate Change Act 2008 contains an adaptation reporting power that gives the Secretary of State the power to require you to report on your understanding of climate change risks, how you are addressing them and how these actions are being embedded within business plans.

Expectations (S, S+, NS)

We expect you to engage with the follow-up NAP, to be published in 2018 and ensure that Adaptation Reporting Power (ARP) report commitments and planned actions are consistent with, and embedded within, business plans.

Many of you made commitments to reduce operational greenhouse gas emissions at the last price review and we expect you to continue to contribute to the government's emission reduction targets during PR19. We expect you to sign up to recognised carbon management schemes that commit you to greenhouse gas emissions reductions. Implementation of ISO50001 is the international standard for energy management and is recognised as providing compliance by the Energy Savings Opportunity Scheme (ESOS). The compliance date for phase 2 of ESOS is 5 December 2019, the next compliance period starts 6 December 2019 for 4 years.

Good practice

As the climate changes there may be fundamental alterations to the character of natural assets and to the scale of pressures from natural hazards. For example, streams might become ephemeral (only flowing in winter), coastal freshwater water bodies might become saline due to sea-level rise and more frequent heavy rain will result in sewer overflows operating more frequently. You should look to improve your understanding of how risks from climate change effect the provision of water and wastewater services and your ability to protect the water environment. This could include the use of scenario planning and projections to ensure climate change is factored into your decision making. The Environment Agency proposes to use a consistent future climate screening scenario to future-proof our strategies and join up with you on this work would be welcomed. A priority for all should be to work together to build an evidence-based understanding of the likely effects of climate change and identifying and implementing low carbon solutions that address any negative environmental impacts that may arise.

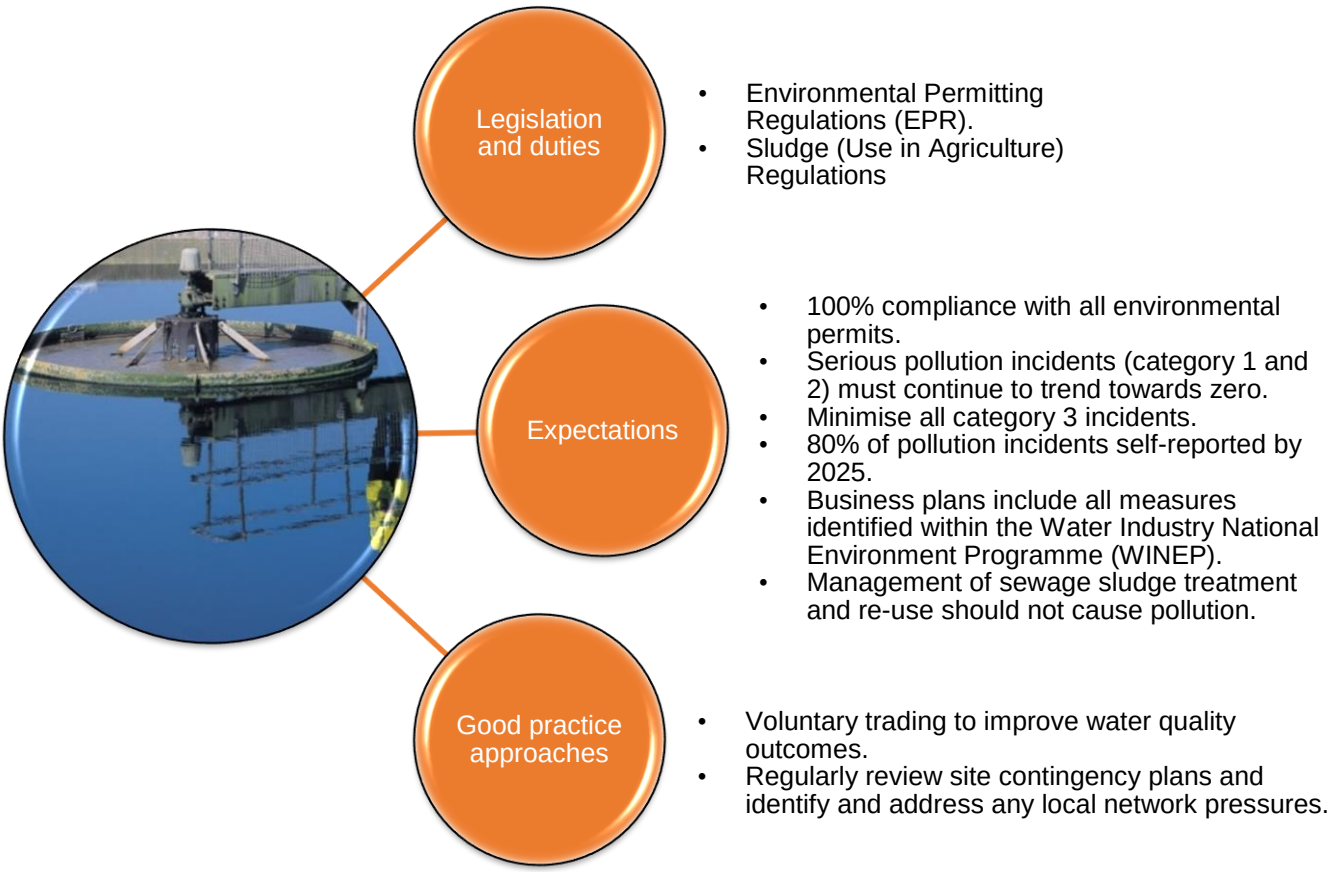
4.0 Excellent performance

Our excellent performance outcomes are:

- Sustaining a high level of performance and operating in a way that best protects people and the environment.

- Achieving 4 star status on the Environment Performance Assessment.

4.1 Regulatory compliance as part of achieving excellent performance



Legislation and duties

The Environmental Permitting (England and Wales) Regulations 2016 (EPR), ensure that water discharges and groundwater activities do not pollute the environment. The principal offences under EPR are operating a regulated facility without a permit, causing or knowingly permitting a water discharge activity or groundwater activity without a permit, and failing to comply with a permit or an enforcement related notice. Our role is to apply the EPR in proportion to the environmental risk posed by an operation, the impact of that operation and the operator's performance in mitigating the risks and impacts.

Expectations (S, NS)

As a competent operator you must comply with existing EPR permit requirements and respond appropriately to any accidents at sites you operate. You must achieve 100% compliance with all look up table permits for water quality discharges and point source groundwater activities. You must also comply with operation and environmental impact permit conditions at WwTWs with descriptive rather than numeric limits.

At the last price review we outlined our expectation for serious (category one and two) pollution incidents to trend towards zero by 2020 with at least a 50 per cent reduction compared to numbers of serious incidents recorded in 2012. You made performance commitments to reduce serious pollution incidents trending to zero by 2020. We expect you to extend these commitments into PR19. Permit compliance is a statutory obligation. Where you are not achieving zero serious pollution incidents or 100% compliance with permits we expect you to have established the reasons for this and have plans in place to improve performance. These plans should be shared with customers, Customer Challenge Groups and Ofwat.

Flow monitoring of significant discharges has a vital role in protecting water quality by helping us ensure that permitted flow limits are complied with and by providing data that helps us understand the impact of discharges on the water environment. We expect you to comply with all permit flow requirements. You should provide MCERTS flow monitoring for the first time at WwTWs where permitted dry weather flow or maximum daily flow is greater than 50m3/d and qualifying water treatment works (WTW). We expect you to effectively monitor and operate wastewater storm tanks to minimise the risk of pollution incidents. Where necessary you should install event duration monitoring on overflows to storm tanks to be confident that permitted flow to full treatment FFT settings are being complied with.

Good practice

The Environmental Performance Assessment (EPA) uses indicators to compare performance between water companies and across years. These indicators measure performance associated with:

- reducing pollution incidents and increasing company reporting of incidents
- complying with water discharge and groundwater activity permits
- managing the use and disposal of sewage sludge
- completing environmental improvement schemes

We intend to expand the EPA to include indicators on resilience to flooding, flow at WwTWs and further measures of performance relating to water resources activities.

We expect you to achieve at least good performance against these indicators by 2025.

How you operate your facilities can improve compliance performance and minimise the risk of pollution from your activities. You need to understand the vulnerability of your sites and any local network pressures. Management systems should be regularly reviewed and contingency plans and accident prevention and management plans tested so staff can effectively respond to any incident.

We expect you to take responsibility for regularly reviewing and updating permits. By 2025 the majority of permits should be updated to EPR in line with agreed permitting programmes. Permitting information should be provided in an accurate and timely manner to improve the quality and minimise rejected applications.

4.2 Sludge

Legislation and duties

The Sewage Sludge Directive is transposed by the Sludge (Use in Agriculture) Regulations 1989. The Regulations introduce prohibitions on the supply and use of sludge in agriculture otherwise than in accordance with requirements for treatment and use which reflect the Directive requirements. The UWWTD requires reuse of sludge where practicable. Recycling to land of sewage sludge should not prevent water bodies achieving WFD objectives.

Expectations (S)

We expect you to manage your sewage sludge treatment and re-use, so as not to cause pollution to land, surface water or groundwater and follow the Sludge (Use in Agriculture) Regulations and Environmental Permitting Regulations and the Code of Practice for Agriculture Use of Sewage Sludge. In periods of extreme cold this includes considering and using alternative management options when existing routes are not available.

Good practice

We expect to see the development of new markets and the wider use of sludge, including renewable energy production via advanced anaerobic digestion (AAD).

Appendix 1. List of the main environmental statutory environmental and flood risk obligations that apply to water companies

Enhancing the Environment

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 establish a legal framework for managing the water environment and implementing the requirements of the Water Framework Directive in relation to characterising river basin districts, monitoring water bodies, setting environmental objectives, establishing programmes of measures and producing and publishing river basin management plans: Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

Under the **Water Resources Act 1991** most abstractions or impoundment of water require a licence although certain exemptions apply. You can find further information at https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process

Under the **Water Industry Act 1991**, water companies are required to prepare Water Resources Management Plans and drought plans to show how they will manage and develop water resources to supply customers. You can find further information on drought planning here: https://www.gov.uk/government/publications/drought-management-for-england

Bathing Water quality is assessed using the revised **Bathing Water Directive (2006/7/EC)** which includes the classification of waters into four categories - excellent, good, sufficient and poor. The directive is implemented through the **Bathing Water Regulations 2013**. You can find further information here: https://www.gov.uk/government/publications/water-quality-information-at-swimming-beaches-and-lakes-eu-regulations

The Marine Strategy Framework Directive 2008 established an integrated policy for the protection of the marine environment, in a similar manner to the WFD and requires the achievement of good environmental status in marine waters. Further information can be found here: https://www.gov.uk/government/publications/2010-to-2015-government-policy-marine-environment/2010-to-2015-government-policy-marine-environment#appendix-2-implementing-the-marine-strategy-framework-directive

The **Urban Waste Water Treatment Directive (91/271/EEC**) regulates the collection and treatment of waste water from homes and industry. The directive is implemented through the **Urban Waste Water Treatment Regulations 1994**. Powers to permit discharges, with conditions to protect the receiving waters, are available under the **Environmental Permitting (England and Wales) Regulations 2016**.You can find further information here:

https://www.gov.uk/government/policies/improving-water-quality/supporting-pages/reducing-and-controlling-pollution-in-wastewater-discharges-sludge-and-septic-tanks

Shellfish protection is now ensured by the WFD and WFD Regulations. The **Shellfish Water Action Plans** are available at https://ea.sharefile.com/d-s84c5554e50947dbb

The Habitats Directive **Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora** aims to protect biodiversity through conservation of natural habitats and wild plants and animals. The Birds Directive **Directive 2009/147/EC on the conservation of wild birds (codified version)** that provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. Both directives are implemented through the **Conservation of Habitats and Species Regulations, 2010.** You can find further information here: http://jncc.defra.gov.uk/page-1373

The Wildlife and Countryside Act 1981 (WCA 1981) (as amended by the **Countryside and Rights of Way Act 2000** (CROW), requires public bodies, including water companies, to take reasonable steps, consistent with the proper exercise of their functions to further the conservation and enhancement of Sites of Special Scientific Interest. You can find further information here: https://www.gov.uk/guidance/sites-of-special-scientific-interest-public-body-responsibilities

The **Natural Environmental and Rural Communities Act 2006 (NERC)** places a duty on public bodies, including water companies, to have regard, so far as is consistent with the proper exercise of their functions, to conserving biodiversity. You can find further information here: https://www.gov.uk/guidance/biodiversity-duty-public-authority-duty-to-have-regard-to-conserving-biodiversity

The Marine and Coastal Access Act 2009 enables the designation of nationally important Marine Conservation Zones and includes a duty on public bodies to further the conservation objectives of MCZs (and where not possible, to exercise them in a manner least hindering those objectives). See further information here: https://www.gov.uk/government/collections/marine-conservation-zone-designations-in-england. The act also established Inshore Fisheries and Conservation Authorities in England, who can introduce byelaws for the regulation of sea fisheries that have an impact on migratory fish.

Duties on public bodies to have regard to the purposes of Protected Landscapes come through the **National Parks and Access to the Countryside Act 1949, the Countryside and Rights of Way Act 2000 (CROW) and the Norfolk and Suffolk Broads Act 1998**.

The Drinking Water Directive (98/83/EC) makes sure that the water is safe to drink. It is implemented through the **Water Supply (Water Quality) Regulations 2016**and the **Private Water Supplies (England) Regulations 2016**. You can find further information here: http://dwi.defra.gov.uk/stakeholders/legislation/index.htm

Drinking water safeguard zones: are areas where raw drinking water are at risk of deterioration due to the use of substances like pesticides or nitrates. Further information: http://apps.environment-agency.gov.uk/wiyby/141891.aspx

The Nitrates Directive (91/676/EEC) is designed to reduce water pollution caused by nitrates from agriculture sources and prevent further such pollution occurring. It is implemented in England by the **Nitrate Pollution Prevention Regulations 2015**. You can find further information here: https://www.gov.uk/guidance/nutrient-management-nitrate-vulnerable-zones

EU Invasive Alien Species Regulation 1143/2014 (October 2014) covers prevention, early detection and rapid eradication, and management of invasive species.

EC Eel Regulation1100/2007 (September 2007) aims to establish measures for the recovery of the stock of European eel. **The Eels (England and Wales) Regulations 2009** implement the eel passage measures of the Eel Regulation. You can find further information here: https://www.gov.uk/government/policies/managing-freshwater-fisheries/supporting-pages/increasing-eel-stocks

Salmon and Freshwater Fisheries Act 1975 provides various powers for the protection and management of fisheries, including the introductions of orders that limit the number of nets fishing in a public fishery.

Improving Resilience

The Water Resources Act 1991 makes it a requirement to have an abstraction licence to take water from surface waters and groundwater. The **Water Industry Act 1991** which requires water companies to prepare **Water Resources Management Plans** and **Drought Plans** was amended by the Water Act 2014 to add provisions relating to improving resilience. You can find further information here: https://www.gov.uk/government/publications/drought-management-for-england

Under the **Flood and Water Management Act 2010** there is a duty to co-operate, in the exercise of companies' effectual drainage functions (section 94 Water Industry Act 1991).

The European Directive on the Assessment and Management of Flood Risks (2007/60/EC of 23 October 2007, the Floods Directive) is a common framework for member states to assess the risk of flooding, map its potential impact and plan objectives and measures to reduce potential and significant flood risk. The directive is implemented in England and Wales through the **Flood Risk Regulations 2009**. This requires the preparation of preliminary flood risk assessments, flood hazard and flood risk maps and the production of Flood Risk Management Plans.

The Flood and Water Management Act 2010 gave authorities new and amended powers and duties in managing flood and coastal erosion risk. You can find further information here: https://www.gov.uk/government/policies/reducing-the-threats-of-flooding-and-coastal-change

National Planning Policy Framework (NPFF) states that planning authorities should consider the impact of climate change on water supply in their local plans.

The Environmental Permitting (England and Wales) Regulations 2016 (EPR) provide the Environment Agency with regulatory control (through flood risk activity permitting) of the construction, alteration or repair of structures in, over or under any main river.

Land Drainage Act 1991: Any work carried out by third parties that may impact on flow conveyance is subject to a land drainage consent from the relevant authority.

Environmental Impact Assessment (Land Drainage Improvement Works) Regulations 1999: Requires an Environmental Impact Assessment for certain activities (listed in the Schedules to the Regulations) to determine the likelihood that a proposed project (development or other activity) will have significant environmental effects.

Trade effluent controls under Water Industry Act 1991: Regulates discharges and drainage arrangements from certain industrial and trade sites.

The **Water Resources Act 1991** provides power to the Environment Agency to make byelaws necessary for the efficient working of any drainage system and for regulating the effects of any drainage system on the environment.

Excellent Performance

Environmental Permitting Regulations (EPR): Requires action by a responsible person to prevent/remediate pollution. You can find further information here: www.gov.uk/government/publications/groundwater-protection-principles-and-practice-gp3

The Sewage Sludge Directive (86/278/EEC) protects people, animals, plants and the environment against the possible harmful effects from the uncontrolled spreading of sewage sludge on agricultural land. It is implemented through the **Sludge (Use in Agriculture) Regulations 1989** as amended, with the Environment Agency as competent authority. You can find further information here: https://www.gov.uk/managing-sewage-sludge-slurry-and-silage

The Reservoirs Act 1975 ensures adequate structural safety in the design, construction, operation and maintenance of large raised reservoir. The Environment Agency is the enforcement authority for the Act in England

Appendix 2. Role and duties of the environmental regulators

The Environment Agency

The Environment Agency is the environmental regulator of the water industry in England. We work with water companies to manage the environmental impacts of water and waste operations and ensure that there is enough water to meet the needs of people, the economy and the environment. In freshwater, wetland and coastal areas, we help to protect wildlife habitats by controlling pollution and regulating the amount of water taken from rivers, lakes and groundwater. We have a specific duty to maintain, improve and develop fisheries for salmon, trout, eels, lampreys, smelt and freshwater fish. We are also responsible for managing the risk of flooding from rivers, reservoirs, estuaries and the sea. Our responsibilities in these areas extend to managing and adapting to the effects of climate change.

Natural England

Natural England is the government's statutory advisor for the natural environment in England. We aim to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations. We have responsibility for enhancing biodiversity and landscapes in urban, rural, and marine areas, promoting access, recreation and public well-being. Natural England sets objectives for the management of sites designated under national and international legislation, and works in partnership with others to achieve these and wider biodiversity outcomes. Our Conservation Strategy sets out an ambition to create more resilient landscapes and seas, working especially through Focus Areas where we will concentrate our work with partners

Appendix 3. Phosphorus Stewardship - embracing best practice and innovation

The concept of phosphorus (P) stewardship – making better use of the non-renewable resource whilst also protecting the environment – is gaining currency in Europe. Some EU countries are moving to set obligations for recovery and/or recycling of P from wastewater. In England, P is one of our most challenging water quality pressures. P (rock) is also one of only 20 EU Critical Raw Materials based on economic importance and supply risk, used inefficiently in agriculture and not generally managed as a resource by the water industry. The UK is a big net importer of P. The amounts lost to the water environment and accumulating in soils each year exceed those in imported P fertiliser.

P is the most common reason for English water bodies not achieving Good Ecological Status under the WFD Regulations. As a result you must put in place P reduction, to increasingly ambitious levels, at more and more WwTWs, to improve compliance with river P standards. The type of treatment applied affects the degree to which P removed from wastewater can be recovered and/or usefully recycled as biosolids to agricultural land. The current widely-used method of iron dosing locks up P so that it may have reduced agronomic value and recovery may not be feasible. There are just two WwTWs in England where P recovery is practised.

We believe that there are opportunities to support more sustainable future management of P in the water sector. We encourage you to view and manage P as a resource for potential recycling and/or recovery (for agricultural or other uses) as well as a pollutant to remove from sewage. Examples of the sorts of actions that are encouraged are as follows, but you should also consider other innovative solutions.

- Research, innovation and trials associated with the development and adoption of wastewater treatment processes to reduce effluent P to low levels whilst also facilitating effective P recycling and/or recovery.

- The use of P flow analyses at a company level to inform the development of improved management practices and assessment of the degree to which total P loadings received at WwTWs are recycled or recovered. Adoption of voluntary targets could be considered.

- Development and testing of novel catchment-based approaches to the economics around P reduction, recycling and recovery, aimed at giving greater recognition and value to these activities and to recovered or recycled nutrients in the market.

- Explore with the Environment Agency the potential use of flexible catchment permitting as a means of facilitating trials of biological P reduction and recovery at relevant WwTWs.

- Research to assess whether P in biosolids from chemically dosed sewage is less bio-available to crops (than from non-dosed STWs) and the implications for current recycling practices.

- Assess the potential to minimise P contributions to WwTWs and to the water environment, including through mains leakage, from P dosing of water supplies. As an alternative, consider the potential for compensatory action to offset this contribution.

- Explore the potential for future P recovery from incinerated biosolids ash and whether stockpiling of ash for future P recovery is feasible.

- Identification of regulatory and other barriers to P recycling and recovery and of potential solutions.