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# Cotswold District Council- Water Cycle Study Stage 2

**Final**

A1-C05

Prepared for  
Cotswold District Council

Date  
July 2026



**COTSWOLD**  
District Council

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# Contract

|                     |                                                |
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This report describes work commissioned by Cotswold District Council, on behalf of by an instruction dated (21 January 2026). The Client's representative for the contract was Joanne Corbett of Cotswold District Council. Jessica Creber and Richard Pardoe of JBA Consulting carried out this work.

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The methodology adopted and the sources of information used by JBA in providing its services are outlined in this Report. The work described in this Report was undertaken between (21 January and 22 July 2026) and is based on the conditions encountered and the information available during the said period. The scope of this Report and the services are accordingly factually limited by these circumstances.

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## Abbreviations

|       |                                                                                                    |
|-------|----------------------------------------------------------------------------------------------------|
| AMP   | Asset Management Plan                                                                              |
| BNG   | Biodiversity Net Gain                                                                              |
| BOD   | Biological Oxygen Demand                                                                           |
| CAMS  | Catchment Abstraction Management Strategy                                                          |
| CDC   | Cotswold District Council                                                                          |
| CIRIA | Company providing research and training in the construction industry                               |
| DWMP  | Drainage and Wastewater Management Plan                                                            |
| EA    | Environment Agency                                                                                 |
| EC    | European Community                                                                                 |
| EN    | English Nature                                                                                     |
| GIS   | Geographical Information System                                                                    |
| GWMU  | Groundwater management unit                                                                        |
| HM    | High Mileage                                                                                       |
| HOF   | Hands-off flow: river flow below which an abstractor may be required to stop or reduce abstraction |
| ID    | Identifier                                                                                         |
| JNCC  | Joint Nature Conservation Committee                                                                |
| LFRMS | Local Flood Risk Management Strategy                                                               |
| LLFA  | Lead Local Flood Authority                                                                         |
| LPA   | Local Planning Authority                                                                           |
| NFM   | Natural Flood Management                                                                           |
| NPPF  | National Planning Policy Framework                                                                 |
| PMP   | Probable Maximum Precipitation                                                                     |
| PPG   | Planning Policy Guidance                                                                           |
| RBMP  | River Basin Management Plan                                                                        |
| SAC   | Special Area of Conservation, protected under the EU Habitats Directive                            |
| SFRA  | Strategic Flood Risk Assessment                                                                    |
| SPA   | Special Protection Area for birds, protected under the EU Habitats Directive                       |
| SSSI  | Site of Special Scientific Interest                                                                |
| STW   | Sewage Treatment Works                                                                             |
| UKWIR | UK Water Industry Research Ltd                                                                     |
| WFD   | Water Framework Directive                                                                          |
| WRMP  | Water Resources Management Plan                                                                    |

## Definitions

| Term                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Abstraction Point                              | The location where water is either taken or extracted from either a surface or groundwater waterbody.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Agricultural Management                        | The farming techniques and practices used to produce food and manage livestock.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Abstraction Licencing Strategy                 | The Abstraction Licencing Strategy sets out the Environment Agency's approach to managing new and existing abstraction and impoundments within their river management catchments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Asset Management Plan (AMP) Period             | <p>Price limit periods in the water sector are sometimes known as Asset Management Plan (AMP) periods. The current period (2025-30) is commonly known as AMP 8 because it is the eighth price review period since privatisation of the water industry in 1989. AMP periods are five years in duration and begin on 1 April in the years ending in 0 or 5.</p> <p>Every five years the industry submits a Business Plan to OfWAT for a Price Review (PR). These plans set out the companies' operational expenditure (OPEX) and capital expenditure (CAPEX) required to maintain service standards, enhance service (for example where sewer flooding occurs), to accommodate growth and to meet environmental objectives defined by the Environment Agency. OfWAT assesses and compares the plans with the objective of ensuring what are effectively supply monopolies and operating efficiently.</p> |
| Aquifer                                        | An aquifer is a rock and/or sediment body that holds groundwater.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Determinand                                    | <p>In a water quality assessment, a water sample may be tested to determine one or more properties of the sample or the environment it is taken from. The properties measured are called determinands.</p> <p>A determinand defines both the result that is measured (for example a concentration of ammonia), and the method for carrying out the measurement, including its unit.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Domestic purposes                              | As defined by <a href="#">Section 218 of the Water Industry Act 1991</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dry Weather Flow                               | Dry weather flow is the average daily flow of wastewater to a wastewater treatment works during a period without rain.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Drainage and Wastewater Management Plan (DWMP) | Drainage and Wastewater Management Plans are statutory documents that all sewerage undertakers must produce at least every five years. They must address the current capacity, future demands and resilience of the drainage and sewerage system; the measures which will allow statutory obligations to be met and their likely sequence and timing;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Term                                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                               | and the relevant environmental risks and how these will be mitigated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Effluent                                                      | Effluent discharge is the liquid waste produced from residential, commercial and industrial processes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Environmental Flow Indicator                                  | The Environmental Flow Indicator (EFI) is the proportion of natural flows that are required to support the environment of a waterbody.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Environmental Permit                                          | A legal authorisation issued by the EA allowing water companies to treat and / or discharge wastewater under controlled and monitored conditions. Environmental Permits are defined by the <a href="#">Environmental Permitting (England and Wales) Regulations 2016</a> .                                                                                                                                                                                                                                                                                                                                                                                                  |
| Groundwater Body                                              | A Groundwater Body is the management unit under the Water Framework Directive which represents a distinct body of groundwater with its own hydrogeological characteristics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Lead Local Flood Authority                                    | A county council or unitary authority which leads in managing local flood risks (i.e., risks of flooding from surface water, ground water and ordinary (smaller) watercourses). Their duties are outlined in the Flood and Water Management Act.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Natural Flood Management                                      | Natural flood management is the use of natural processes to reduce the risk of flooding and coastal erosion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Per Capita Consumption                                        | The per capita consumption is the average volume of water used by one person in a day. It is defined as the sum of the measured household consumption of clean water and unmeasured household consumption of clean water divided by the total household population. This is often expressed in litres per person per day (l/p/d).                                                                                                                                                                                                                                                                                                                                           |
| Permitted Headroom                                            | The difference between the volume of treated wastewater a treatment works is allowed to discharge under its environmental permit, and volume it currently discharges. It can be used to estimate the number of properties that could be connected to a WwTW catchment before a flow permit is exceeded.                                                                                                                                                                                                                                                                                                                                                                     |
| Pollution load                                                | The total amount of pollutants found in wastewater.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Storm Overflow 'rainfall target' ( <a href="#">EA, 2023</a> ) | Storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050.<br>"The EA will apply an industry standard measure to translate rainfall events to discharges from Storm Overflows. This means that any discharge from a Storm Overflow within a maximum of 12 hours will be counted as related to one rainfall event for the purposes of the target. For long duration discharges that occur beyond the initial 12-hour period, it will be counted as an additional rainfall event for the subsequent 24 hours and each 24 hours after that for the purposes of the target. When an overflow has ceased to discharge for a 24- |

| Term                                                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                   | hour period, the counting mechanism will reset."                                                                                                                                                                                                                                                                                                                                                                                                              |
| Sustainable Drainage Systems (SuDS)                               | Sustainable drainage systems are drainage solutions that provide a natural alternative to the direct channelling of surface water through an artificial network of pipes and sewers to nearby watercourses.                                                                                                                                                                                                                                                   |
| Technically Achievable Limit (TAL)                                | The concentrations that effluent can be realistically treated to using the best available technology. For phosphates this is 0.25mg/l and nitrates 10mg/l ( <a href="#">Nutrient Neutrality &amp; Habitats Regulations Assessment Update letter, 2022</a> ).                                                                                                                                                                                                  |
| Waterbodies                                                       | Water bodies constitute areas of water – both salt and fresh, large and small – which are distinct from one another in various ways.<br>All surface waters (including rivers, lakes, estuaries and stretches of coastal water) and groundwaters have been divided up into discrete units called water bodies. Water bodies are the basic unit that are used to assess the quality of the water environment and to set targets for environmental improvements. |
| Water Framework Directive (WFD)                                   | The Water Framework Directive is a river basin management planning system which was implemented to help protect and improve the ecological health of the UK's rivers, lakes, estuaries and coastal and groundwaters.                                                                                                                                                                                                                                          |
| Water Framework Directive Classification Status                   | Rivers, lakes, estuaries and coastal waters can be awarded one of five WFD statuses: High, Good, Moderate, Poor or Bad<br>Groundwater can be awarded one of two statuses: Good or Poor.                                                                                                                                                                                                                                                                       |
| Water Framework Directive – Reasons for not achieving good (RNAG) | Where a WFD element is classified as being at less than good status, a reason for the failure to meet the good status is attributed, including the sector deemed responsible or a pressure affecting a biological element.                                                                                                                                                                                                                                    |
| Water Framework Directive objectives                              | The Water Framework Directive objectives are set out in Regulation 12 and Regulation 8 of the Water Environment Regulations 2017.                                                                                                                                                                                                                                                                                                                             |
| Water Industry National Environment Programme                     | The Water Industry National Environment Programme is the programme of work in which water companies in England must meet their obligations from environmental legislation and UK government policy.                                                                                                                                                                                                                                                           |
| Water Resource Management Plan (WRMP)                             | Water Resource Management Plans are statutory documents that all water companies must produce at least every five years. They set out how the water company intends to achieve a secure water supply for their customers while protecting and enhancing the environment.                                                                                                                                                                                      |
| Water Resource Zone (WRZ)                                         | A Water Resource Zone is an area in which the abstraction and distribution of water is self-contained and is used to meet                                                                                                                                                                                                                                                                                                                                     |

| Term                              | Description                                                                                                                                                                                                            |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   | demand within that area.                                                                                                                                                                                               |
| Water Treatment Works (WTW)       | A Water Treatment Works is the place where raw water is treated to bring it up to a potable standard so it can be delivered in to the drinking water supply.                                                           |
| Wastewater Treatment Works (WwTW) | A Wastewater Treatment Works receives flows from the sewerage system and treats it so it can be discharged back into a river. They may also be called Sewage Treatment Works (STWs) or Water Recycling Centres (WRCs). |

# Executive Summary

JBA Consulting was commissioned by Cotswold District Council (CDC) to undertake a Stage 2 Water Cycle Study (WCS) for Buckinghamshire. The purpose of the WCS is to form part of a comprehensive and robust evidence base to inform the preparation of the emerging Local Plan for Cotswold District.

New homes require the provision of clean water, safe disposal of wastewater and protection from flooding. The allocation of large numbers of new homes in certain locations may result in the capacity of existing available infrastructure being exceeded, a situation that could potentially cause service failures to water and wastewater customers, adverse impacts to the environment, or high costs for the upgrade of water and wastewater assets being passed on to the bill payers.

In addition to increased housing demand, future climate change presents further challenges to the existing water infrastructure network, including increased intensive rainfall events and a higher frequency of drought events. Sustainable planning for water must now take this into account.

## Water resources

Water resources in England are under considerable pressure. The Environment Agency has stated that "the scale of the challenge we face increases with time, and by 2050, we are looking at a shortfall of nearly 5 billion litres of water per day between the sustainable water supplied available and the expected demand."

Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand deficit in the future, and making environmental damage from over abstraction of water resources more likely. Furthermore, the delivery of water and wastewater services and the heating of water in the home require high energy inputs and therefore contribute directly to emissions of greenhouse gases.

It is important that new development does not result in an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new houses through to achieving water neutrality in a region by offsetting a new developments water demand by improving efficiency in existing buildings.

The National Water Resources Framework sets the objective to reduce the average per capita water consumption in the UK to 110 l/p/d by 2050. This is now part of the Environmental Improvement Plan and water companies WRMPs. Within Defra's Plan for Water is the commitment to review Building Regulations and a target of 100 l/p/d in severely water stressed areas is suggested.

The Future Homes Hub, who are supporting Defra to produce a roadmap to greater water efficiency proposed a staged reduction in PCC, with a target of 100 l/p/d in water stressed areas in place from 2025, and a reduced target of 90 l/p/d in place by 2030 (depending on market conditions and customer acceptance).

This study recommends that as a minimum the proposed new Building Regulations target of 100 l/p/d outlined in Defra's Plan for Water be adopted across the study area. This should be achieved using a fittings-based approach.

This should be supported by the requirement for non-household development to achieve three credits in the assessment category WAT01 of the Building Research Establishment Environmental Assessment Methodology (BREEAM) UK New Construction Standard.

The Water Industry National Environment Programme (WINEP) is a set of actions that the EA have requested all 20 water companies operating in England to complete in a particular AMP as part of their environmental commitments. A number of investigations are planned or underway to ensure that abstraction of water from both groundwater and rivers, is not leading to unsustainable reductions in flow. Development and population growth can increase abstraction, and so CDC have an opportunity to contribute to these actions indirectly by pursuing policies that promote water efficiency in new development.

Water supply and wastewater services within the study area are provided by Bristol Water, Severn Trent, Thames Water and Wessex Water. Cotswold district is located across several water resource zones, but predominantly in Thames Water's SWOX Water resource Zone (WRZ).

### **Water supply**

Water supply within the study area is provided predominantly by Thames Water, with small areas served Bristol Water and Severn Trent Water.

TW provided a site-by-site assessment of potential allocations in their supply area. This identified 15 sites where further modelling by TW would definitely be required, and a further 20 where modelling may be required, in both cases, upgrades to the water supply network may be needed to accommodate development.

Upgrades to the local supply network would be funded as part of the developer Infrastructure Charge. Early engagement between developers, CDC and the water companies is recommended to ensure upgrades are in place prior to occupation

### **Wastewater network and storm overflows**

Thames Water is the primary wastewater provider and the designated sewerage undertaker for the study area. Wessex Water, and Severn Trent Water also operate within small parts of the area.

Development in areas where there is limited wastewater network capacity will increase pressure on the network, increasing the risk of a detrimental impact on customers, and increasing the likelihood of storm overflow operation. Early engagement with developers, Thames Water, Wessex Water and Severn Trent Water is required, and modelling of the network may be required at the planning application stage.

Where network capacity constraints are identified, network reinforcement may be required which would be funded as part of the developer infrastructure charge. It may be necessary for development sites to be phased in line with the provision of any network upgrades.



The drainage network includes 14 storm overflows that are likely to serve the study area. Storm overflow performance is generally poor with nine of these overflows currently exceeding the threshold for investigation. The poorest performing of these is at Avening Wastewater Treatment Works (WwTW), with a 3-year operation average of 128 spills per year.

2024 was a particularly bad year, in part because it was a wetter than average year. This was not the case in 2023 and 2025 when many of the storm overflows also operated well above the threshold.

Further development in catchments where there are poorly performing overflows increase the risk of storm overflow operation due to increased sewage flows and surface runoff.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

### **Wastewater treatment**

There are 25 WwTWs that are within the Cotswold district or outside but serving a population within Cotswold district. Of these, twelve are expected to serve growth during the Local Plan period.

Five WwTW are expected to have capacity for growth during the plan period and will not require further upgrades for capacity. Seven WwTWs are expected to exceed their permit limit during the Local Plan period or be close to their permit limit by the end of the plan period.

Where an increase in capacity may be required, sufficient time is needed for the water company to plan and deliver the upgrade scheme. This would typically be planned for delivery in the next AMP period. i.e., a need to upgrade a WwTW would be identified in DWMP28 for inclusion in the PR29 business plan and delivered between 2030 and 2035.

There may therefore be a constraint to growth at WwTWs that are already at their permit limit and do not have upgrades planned within this AMP period. Beyond 2030, there should be sufficient time once the Local Plan is adopted for water companies to provide additional capacity where required. It is strongly advised that CDC discuss the phasing of potential allocations with TW, STW and WW early in the Local Plan period to allow infrastructure upgrades to be planned to provide capacity when it is required.

The odour screening assessment identified eight potential allocations that are close enough to a WwTW that an odour impact assessment would be recommended. This would be funded by the developer.

### **Water quality and environmental impact**

An increase in the discharge of effluent from WwTW as a result of development and growth in the area in which they serve can lead to a negative impact on the quality of the receiving



watercourse. Under the Water Framework Directive (WFD), a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for individual elements assessed).

It is Environment Agency (EA) policy to model the impact of increasing effluent volumes on the receiving watercourses. Where the scale of development is such that a deterioration is predicted, a variation to the environmental permit may be required for the WwTW to improve the quality of the final effluent, so that the increased pollution load will not result in a deterioration in the water quality of the watercourse. This is known as 'no deterioration' or 'load standstill'. The need to meet river quality targets is also taken into consideration when setting or varying a permit.

The EA's Reasons for Not Achieving Good (RNAG) dataset indicates that sewage treatment, the urban and transport sectors (urban development), as well as agriculture and rural land management, are the main reasons for watercourses not achieving good status in this area.

Growth during the Local Plan period is predicted to cause a significant deterioration in water quality downstream of seven WwTWs (six have a greater than 10% deterioration in one or more determinands, and one has a deterioration in WFD class).

With the exception of Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, all of these deteriorations can be prevented by upgrades to treatment processes.

At Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, a greater than 10% deterioration is predicted for Ammonia and BOD which is not prevented in the modelling scenario where upgrades to WwTWs are applied.

This is because these WwTWs are situated in an area where the current WFD classification for ammonia is "High" (i.e., the best water quality) and is operating either beyond or close to the technically achievable limit.

Under these circumstances, a high percentage deterioration in water quality is expected, and as there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains high. No change in WFD classification is predicted, and High status is maintained for Ammonia and BOD. The WCS therefore does not consider this a constraint to growth.

The water quality modelling indicates that growth alone will not prevent good ecological status being prevented in the future should improvements in upstream water quality be made.

Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with Thames Water, Severn Trent Water and Wessex Water provide is essential to ensure that infrastructure is in place prior to development to prevent a breach of the environmental permit.

Within the WRZs serving growth over the Local Plan period and downstream of the district, there are 45 Sites of Special Scientific Interest (SSSIs) associated with waterbodies that

are affected by surface water abstraction, identified as a significant water management issue, alongside 4 Ramsar sites, 11 Special Areas of Conservation (SACs) and 6 Special Protection Areas (SPAs). In addition, 290 groundwater-dependent terrestrial ecosystems (GWDTEs) are located within groundwater bodies where abstraction-related impacts on flows have also been identified as significant water management issues.

The water quality modelling results were used to identify the predicted deterioration in water quality in waterbodies adjacent to designated sites downstream of WwTWs serving growth during the Local Plan period. The results show there are no significant deteriorations adjacent to environmental sites that cannot be prevented by improvements in treatment to TAL with the exception of the Cotswold Water Park SSSI downstream of Ampney St Peter WwTW.

As noted above, Ampney St Peter is in the upper catchment discharging to a waterbody with High WFD status for Ammonia. Current performance of the WwTW is at or exceeding the technically achievable limit so there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains 14%. It remains at High WFD status.

SuDS are required on all development sites. Their design should consider both water quantity and water quality and site level investigations should be undertaken to define the most appropriate SuDS types for each specific development. Opportunities exist for these SuDS schemes to offer multiple benefits of flood risk reduction, amenity value and biodiversity.

CDC should be consulted at an early stage of development to ensure that SuDS are implemented and designed in response to site characteristics and policy factors. In the wider area, opportunities exist to implement Natural Flood Management (NFM) techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

# 1 Introduction

## 1.1 Terms of reference

JBA Consulting was commissioned by Cotswold District Council (CDC) to update the Water Cycle Study (WCS) to support their Local Plan review. This will provide an assessment of the impact of the growth options on water infrastructure and the water environment.

The purpose of the WCS is to form part of a comprehensive and robust evidence base to inform the delivery of the new Local Plan, which will set out where and how development will take place during the plan period (2025 to 2043) and will be used to inform decisions on the location of future development.

Unmitigated future development and climate change can adversely affect the environment and water infrastructure capability. A WCS will provide the required evidence, together with a strategy to ensure that planned growth occurs within environmental constraints, with the appropriate infrastructure in place in a timely manner so that planned allocations are deliverable.

## 1.2 Impacts of development on the water cycle

Figure 1.1 shows the main elements that comprise the Water Cycle. The natural water cycle describes the continuous transfers of water around the planet, from atmosphere to surface and back via evaporation, transpiration and precipitation, and the various flows and storage processes that occur. The artificial water cycle looks at the availability of water resources for human consumption, its treatment and supply to homes and business, its use and consequently the generation of wastewater. It then looks at how wastewater is taken away, treated, and finally what happens when it is returned to the environment.

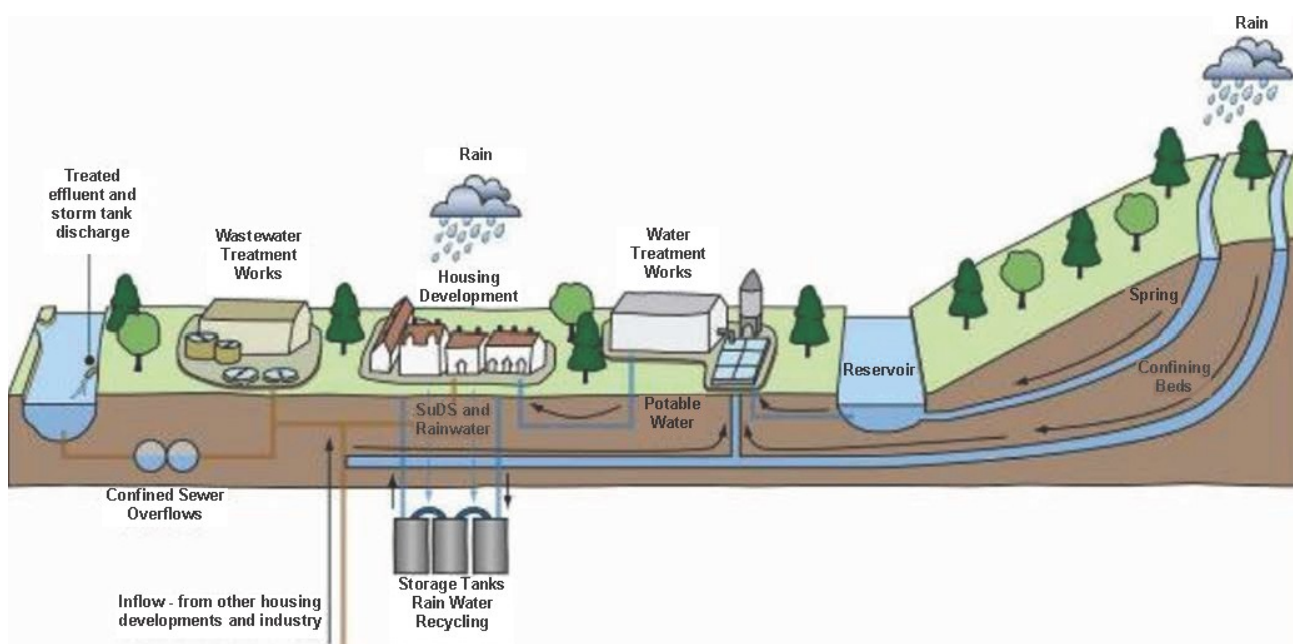


Figure 1.1 The Water Cycle

New homes require the provision of clean water, safe disposal of wastewater and protection from flooding. It is possible that allocating large numbers of new homes at some locations may result in the capacity of the existing available infrastructure being exceeded, in the absence of further investment from water companies. This situation could potentially lead to service failures to water and wastewater customers, have adverse impacts on the environment or cause the high cost of upgrading water and wastewater assets being passed on to bill payers. Climate change presents further challenges such as increased intensity and frequency of rainfall and a higher frequency of drought events that can be expected to put greater pressure on the existing infrastructure.

As statutory undertakers water companies, including Bristol Water, Severn Trent, Thames Water and Wessex Water are legally obliged to plan for and accommodate new residential development. The water companies do this by, for example, taking forward projection of growth and incorporating them into their asset management plan cycles and their long-term plans including their Water Resource Management Plan and Drainage and Wastewater Management Plan.

### **1.3 Structure of the WCS**

The report contains the following chapters:

#### **Chapter 2 - Legislative and policy framework**

This section provides a comprehensive summary of relevant national, regional and local policies relating to environmental and water management that should be considered by CDC.

#### **Chapter 3 - Future growth in Cotswold District**

This section outlines how the district is expected to grow during the plan period. It updates the information provided in the previous WCS with the latest forecast from CDC and neighbouring authorities. It also contains information on how water demand has been calculated within the WCS.

#### **Chapter 4 - Water resources**

This chapter assesses water resources in the Cotswolds, examining how Local Plan growth will affect water supply and demand while avoiding shortages and environmental impacts.

#### **Chapter 5 - Water supply infrastructure**

This section examines how growth and new development can place additional demand on existing water supply infrastructure. The assessment draws on input from Severn Trent Water, Thames Water, Wessex Water and Bristol Water regarding infrastructure capacity and impacts during the CDC Local Plan period.

## **Chapter 6 - Wastewater collection**

This section examines how new development could affect existing wastewater infrastructure. It highlights that new developments increase demand for sewerage services, potentially requiring upgrades to existing treatment works or new wastewater treatment facilities, and may also influence storm overflows. The assessment draws on input from Severn Trent, Thames Water and Wessex Water.

## **Chapter 7 - Wastewater treatment**

This chapter presents the results of the wastewater treatment works flow capacity assessment, based on the predicted growth throughout the CDC local plan period. Where results suggest an upgrade to treatment processes may be required in order to accommodate growth, this will also be stated. This chapter also assesses the performance of storm tank overflows within the district and highlights where potential local plan allocations lie within a wastewater treatment works odour buffer zone.

## **Chapter 8 - Water quality**

This chapter presents the environmental baseline and contains the modelling assessing the impact of growth during the Local Plan period on water quality.

## **Chapter 9 - Environmental opportunities and constraints**

This section examines the impacts of development on environmentally designated sites, with a particular focus on the effects of water abstraction on sensitive aquatic and groundwater-dependent ecosystems.

## **Chapter 10 - Conclusions and recommendations**

Conclusions and recommendations from each section of the report are collated into two tables.

### **1.4 Study area**

The study area is the administrative area of Cotswold District Council (CDC) that covers Moreton-in-Marsh, Bourton-on-the-Water, Cirencester and Tetbury, see Figure 1.2. Cotswold District has a population of 90,800 (Office for National Statistics, 2022). and encompasses the Cotswold Area of Outstanding Natural Beauty (AONB).

Significant watercourses within the study area are the River Thames, Coln, Churn, Dikler, Evenlode, Windrush, Leach and Ampney Brook.

Some of the keys transport routes passing through the study area are the A429, A40, A417, A419 and A433.



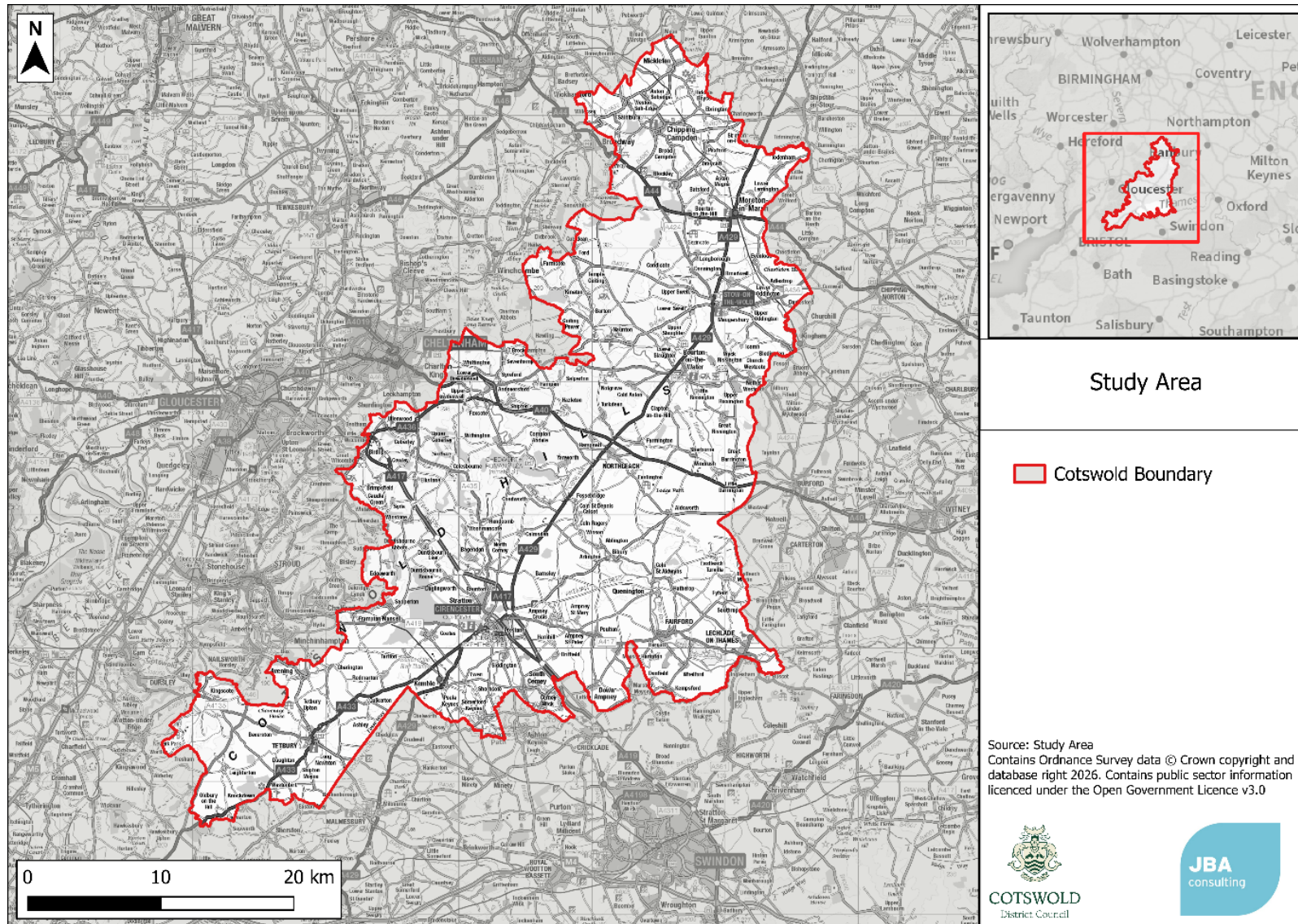


Figure 1.2 Study area

## 1.5 Authorities responsible for Water Resources and Wastewater Management in Cotswold District

### 1.5.1 Introduction

Preparation of a WCS requires significant engagement with stakeholders within the Local Planning Authority area, with water and wastewater utilities, with the Environment Agency and Natural England, and where there may be cross-boundary issues, with neighbouring local authorities. This section forms a record of engagement for the WCS.

Table 1.1 Responsibilities of authorities within Cotswold District

| Authority Name                                                    | Key Responsibilities of different authorities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environment Agency (EA)                                           | The EA are the environmental regulators in the UK. Their responsibilities are within water quality, flood risk and administering water abstraction licences.<br>They are a statutory consultee for many development plan documents and for some planning applications. They advise on environmental and infrastructure capacity issues across the water cycle.                                                                                                                                                                                                              |
| Natural England (NE)                                              | Natural England are the Government's advisors on the natural environment, which they have a responsibility to protect and enhance. In a WCS they may provide information on the conservation objectives, and guidance on, the protection of designated sites.                                                                                                                                                                                                                                                                                                               |
| Bristol Water, Severn Trent Water, Wessex Water and Thames Water. | Bristol Water, Severn Trent Water and Thames Water are the water suppliers for the Cotswold district; therefore, they have a statutory duty under the Water Industry Act to maintain an efficient and economical system of water supply within their areas and supply households with a reliable and sufficient water supply.                                                                                                                                                                                                                                               |
| Severn Trent Water, Thames Water and Wessex Water                 | Severn Trent Water, Thames Water and Wessex Water are the sewerage undertakers for the district. This means they have a duty under the Water Industry Act to provide, improve and extend a system of public sewers (for both domestic and trade flows) so as to cleanse and maintain those sewers (and any lateral drain), to ensure that the area that they serve is effectually drained. There is also a duty to make provision for the emptying of those sewers, normally through sewage treatment works or where appropriate through discharges direct to watercourses. |

## 1.6 Record of engagement

### 1.6.1 Detailed study engagement

An inception meeting was held with Cotswold District Council. Further discussions were held with Severn Trent Water (STW), Thames Water (TW) and Wessex Water (WW) and the Environment Agency (EA) as the project progressed, and results emerged. The EA provided their water quality model for the area.

Neighbouring authorities that shared wastewater infrastructure were contacted by CDC to obtain an estimate of growth in areas that would be served by those Wastewater Treatment Works (WwTW). This allowed a quantum of growth to be understood.



## 2 Policy and legislation

### 2.1 Introduction

The following sections introduce several national, regional, and local policies that must be considered by the Local Planning Authority (LPA), water companies and developers during the planning stage. Key extracts from these policies are presented as well as links to the full text. Whilst care has been taken to ensure that the information presented in this report was up to date at the time of writing, policy and guidance can change rapidly and the reader should ensure that the most up to date information is sought.

### 2.2 Plan-making

The [National Planning Policy Framework](#) (2025) was originally published in 2012, as part of reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

Local Plans are the primary mechanism by which plan-led spatial planning is implemented in England. Local Plans must be prepared by Local Planning Authorities (LPAs) and include:

- Strategic policies which set out the "overall strategy for the pattern, scale and design duality of places", including for the provision of infrastructure, transportation and community facilities.
- Non-strategic policies, which "set out more detailed policies for specific areas, neighbourhoods or types of development. This can include allocating sites, the provision of infrastructure and community facilities at a local level."

Under the [Localism Act](#) (HM Government, 2011) new rights were provided to allow local communities to come together and shape the development and growth of their area by preparing Neighbourhood Development Plans, or Neighbourhood Development Orders, where the ambition of the neighbourhood is aligned with strategic needs and priorities for the area. Neighbourhood Plans can make non-strategic policies, aligned to the strategic policies of the Local Plan. As neighbourhoods draw up their proposals, Local Planning Authorities are required to provide technical advice and support to communities.

### 2.3 Water and the Planning System

#### 2.3.1 National Planning Policy Framework and water

The NPPF provides guidance to planning authorities to take account of flood risk and water and wastewater infrastructure delivery in their Local Plans. Key paragraphs include:

- Paragraph 34: "Plans should set out the contributions expected from development. This should include setting out the levels and types of affordable housing provision required, along with other infrastructure (such as that needed

for education, health, transport, flood and water management, green and digital infrastructure). Such policies should not undermine the deliverability of the plan.”

- Paragraph 158: “Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply...”
- Paragraph 180e: “...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans”.

### 2.3.2 Planning Practice Guidance overview

Planning Practice Guidance (PPG) was originally issued in 2014 by the Department for Communities and Local Government, with the intention of providing guidance on the application of the NPPF. The individual guidance documents are updated periodically. The following guidance documents are particularly relevant to a WCS:

- [Water Supply, Wastewater and Water Quality](#) (HM Government, 2019)
- [Housing - Optional Technical Standards](#) (HM Government, 2015)
- [Flood Risk and Coastal Change](#) (HM Government, 2025)

### 2.3.3 PPG - Water Supply, Wastewater and Water Quality

Two key passages from the PPG (Para 002) provide an overview of what needs to be considered plan-making authorities, and provide a basis for the work contained in a WCS or IWMS:

"Early discussions between strategic policy-making authorities and water and sewerage companies can help to ensure that proposed growth and environmental objectives are reflected in company business plans. Growth that requires new water supply should also be reflected in companies' long-term water resources management plans. This will ensure that the necessary infrastructure is funded through the water industry's price review."

"Strategic policy-making authorities will also need to consider the objectives in the government's 25 Year Environment Plan to reduce the damaging abstraction of water from rivers and groundwater, and to reach or exceed objectives for rivers, lakes, coastal and ground waters that are specially protected."

A summary of the advice for plan-makers and for planning applications is contained below but it is recommended that the full text is reviewed.

#### **Plan-making considerations - Infrastructure (Para 005)**

- Identification of suitable sites for new or enhanced infrastructure, including the location of existing and proposed development.

- Consider whether new development is appropriate near to water and wastewater infrastructure (for example due to odour concerns).
- Phasing new development so that water and wastewater infrastructure will be in place when needed. Infrastructure should also be in place before any environmental effects occur on designated sites of importance for biodiversity.

#### **Plan-making considerations - Water quality (Para 006)**

- How to help protect and enhance local surface water and groundwater in ways that allow new development to proceed and avoids costly assessment at the planning application stage.
- The type or location of new development where an assessment of the potential impacts on water bodies may be required.
- Whether measures to improve water quality, (e.g., SuDS schemes) can be used to address water quality in addition to flood risk.

#### **Plan-making considerations - Wastewater (Para 007)**

- The sufficiency and capacity of wastewater infrastructure.
- The circumstances where wastewater from new development would not be expected to drain to a public sewer (such as via a package treatment sewage treatment works or septic tank).
- The capacity of the environment to receive effluent from development without preventing statutory objectives being met.
- Early engagement with the LPA, the EA, and relevant water and sewerage companies can help establish whether any particular water and wastewater issues need to be considered.

#### **Considerations for planning applications - Water supply (Para 016)**

Water supply planning would normally be addressed through the LPA's strategic policies and reflected in the water companies WRMPs. Water supply is therefore unlikely to be a consideration for most planning applications. However, some exceptions might include:

- Large developments not identified in plans that are likely to require a large volume of water; and/or
- significant works required to connect the water supply; and/or
- where a plan requires enhanced water efficiency in new development as part of a strategy to manage water demand locally.

#### **Considerations for planning applications - Water quality (Para 016)**

Water quality is only likely to be a significant planning concern where a proposal would:

- Involve physical modifications to a water body such as flood storage areas, channel diversions and dredging, removing natural barriers, construction of new locks, new culverts, major bridges, new barrages or dams, new weirs, and removal of existing weirs; and/or
- indirectly affect water bodies, for example:

- As a result of new development such as the redevelopment of land that may be affected by contamination, mineral workings, water and wastewater treatment, waste management facilities and transport scheme including culverts and bridges.
- Result in runoff into surface water sewers that drain directly, or via a combined sewer, into sensitive waterbodies e.g., waterbodies with a local, national or international habitat designation.
- Through a lack of adequate infrastructure to deal with wastewater.
- Through a lack of adequate infrastructure to deal with wastewater where development occurs in an area where there is strategic water quality plan e.g., a nutrient management plan, River Basin Management Plan, Water Cycle Study, Diffuse Water Pollution plan or sewerage undertakers' drainage strategy which set out strategies to manage water quality locally and help deliver new development.

#### 2.3.4 PPG - Housing - Optional Technical Standards

This guidance advises planning authorities on how to gather evidence to set optional requirements, including for water efficiency. It states that “all new homes already must meet the mandatory national standard set out in the Building Regulations (of 125 litres /person /day). Where there is a clear local need, local planning authorities can set out Local Plan policies requiring new dwellings to meet the tighter Building Regulations optional requirement of 110 litres/person/day. Planning authorities are advised to consult with the EA and water companies to determine where there is a clear local need, and also to consider the impact of setting this optional standard on housing viability. Viability is reviewed in section 0.

## 2.4 Water and design

### 2.4.1 Building regulations

The Building Regulations (2010) Part G was amended in early 2015 to require that all new dwellings must ensure that the potential water consumption must not exceed 125 litres/person/day, or 110 litres/person/day where required under planning conditions (see Section 2.3.4).

The Environmental Improvement Plan 2025 (discussed in 0) contains a commitment to consider a new standard for new homes in England of 105 litres per person per day (l/p/d) and 100 l/p/d where there is a clear local need, such as in areas of serious water stress. Whilst this new standard is only under consideration, it demonstrates the direction of travel for water efficiency standards, and it is highly likely that this or a similar standard will be adopted.

### 2.4.2 Building Research Establishment

The Building Research Establishment (BRE) publish an internationally recognised environmental assessment methodology for assessing, rating, and certifying the sustainability of a range of buildings.

New homes are most appropriately covered by the Building Research Establishment Environmental Assessment Methodology (BREEAM) [UK New Construction: Residential](#) (2015) and commercial, leisure, educational facilities and mixed-use buildings by the [BREEAM UK New Construction](#) (2026).

Using independent, licensed assessors, BREEAM assesses criteria covering a range of issues in categories that evaluate energy and water use, health and wellbeing, pollution, transport, materials, waste, ecology, and management processes.

In the BREEAM New Construction Residential, 400 credits are available across 11 categories and lead to a star rating. 18 credits are available for water efficiency and water recycling. A greater number of credits are awarded for homes using water efficient fittings (with the highest score achieving 100l/p/d or less), and further credits are awarded for the percentage of water used in toilet flushing that is either sourced from rainwater or from grey water.

The BREEAM New Construction Standard awards credits across nine categories, four of which are related to water: water consumption, water monitoring, leak detection and water efficient equipment. This leads to a percentage score and a rating from “Pass” to “Outstanding”.

Through the Local Plan, the Council has the opportunity to seek BREEAM status for all new, residential, and non-residential buildings.

### 2.4.3 Energy and Water

18% of the UK’s domestic energy usage is for water heating ([Department for Energy Security and Net Zero, 2025](#)) If less water was being used within the home, for instance through more water efficient showers, less water would need to be heated, and overall domestic energy usage would be reduced.

The government recently published the results of a [2023 consultation](#) on [The Future Homes and Buildings Standards](#) which involved changes to Part 6, Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for dwellings and non-domestic buildings and seeking evidence on previous changes to Part O (overheating). Water efficiency and water scarcity were out of scope for this consultation. However, there is an important link between water use and energy use, and therefore between water use and the whole-life carbon cost of developments.

### 2.4.4 Viability

The evidence for the costs of meeting the optional 110l/p/d water efficiency target in new homes indicate that the costs are minimal:

- A [2014 study](#) into the cost of implementing sustainability measures in housing found that meeting a standard of 110 litres per person per day would cost only £12 (at 2023 prices) for a four-bedroom house (EC Harris, 2014).
- The Committee on Climate Change report - [UK Housing: Fit for the Future](#) - stated that the cost of "requiring all homes in England to be built to 110 l/p/d is possible under Part G of regulations and would be no additional cost." (Committee on Climate Change, 2019)
- Heating water accounts for 17% of energy used in the home (Department for Energy Security & Net Zero, 2025) This would cost a 2-3 person, 3-bed household an average of £352 per year in energy at [2023 costs](#) (British Gas, 2023). Water efficiency is therefore not only viable but of positive economic benefit to both private homeowners and tenants.

There is less evidence available on the costs of going below 110l/p/d. The [Sussex North Water Neutrality Strategy](#) (JBA Consulting, 2022) found that the additional cost to meet 85l/p/d using water efficient fittings would be between £349 and £431 per dwelling, or £1,049 to £1,531 where white-goods appliances would not otherwise have been installed in the dwelling (2022 prices).

## 2.5 The Water Industry

### 2.5.1 The Water Industry in England

Water and sewerage services in England and Wales are provided by eleven Water and Sewerage Companies (WaSCs) and five 'water-only' companies. The central legislation relating to the industry is the [Water Industry Act 1991](#). The companies operate as regulated monopolies within their supply regions, although very large water users and developments are able to obtain water and/or wastewater services from alternative suppliers - known as inset agreements.

The [Water Act 2014](#) aims to reform the water industry to make it more innovative and to increase resilience to droughts and floods. Key measures that could influence the future provision of water and wastewater services include:

- Non-domestic customers being able to switch their water supplier and/or sewerage undertaker;
- New businesses being able to enter the market to supply these services;
- Measures to promote a national water supply network; and
- Enabling developers to make connections to water and sewerage systems.

The water industry is primarily regulated by three regulatory bodies:

- **Economic regulation:** Water Service Regulation Authority (Ofwat) are the economic regulator. They have a statutory duty to protect the interests of consumers, ensuring water companies carry out their functions (customer service standards, environmental rules, drinking water standards etc) and can finance



them. Part of this role is setting the limits on pricing of water and sewerage services.

- **Environmental regulation:** The EA are the environmental regulator. They are responsible for monitoring the impact of the water industry (as well as others) on the environment and issuing permits for abstraction of water and discharge of wastewater.
- **Drinking water regulation:** Finally, the Drinking Water Inspectorate implement standards for drinking water and can take enforcement measures against water companies if those standards are not met.

As a result of the [Independent Water Commission](#), the Government have announced that Ofwat would be abolished and replaced by a new regulator taking responsibility for water functions across Ofwat, Environment Agency, Natural England and Drinking Water Inspectorate (UK Government, 2025). This is described in more detail in Section 2.5.7.

### 2.5.2 Planning and funding of the water industry

The water industry works on a five-year cycle called the Asset Management Plan period or AMP periods. Every five years a water company submits a Business Plan to Ofwat for a Price Review. These plans set out the companies' operational expenditure (OPEX) and capital expenditure (CAPEX) required to maintain service standards, enhance service (for example where sewer flooding occurs), to accommodate growth and to meet environmental objectives defined by the Environment Agency. Ofwat assesses and compares the plans with the objective of ensuring what are effectively supply monopolies are operating efficiently, and that the company is meeting its obligations. It then sets the allowable price increase for consumers based on the retail prices index, the business plan, and taking into consideration affordability for consumers.

The current AMP period is AMP 8 (2025-2030), and the price of water for this period was set by Ofwat in 2024 in a process referred to as Price Review 24 (PR24). The new price came into effect in April 2025. The next price review will be 2029 (PR29) and will set prices from 2030 to 2035, coming into effect in April 2030. This system gives stability in pricing. Within this price review process there may also be incentives and penalties on the water company for exceeding or failing to meet targets.

When considering investment requirements to accommodate growing demand, water companies are required to ensure a high degree of certainty that additional assets will be required before funding them. Longer term growth is, however, considered by the companies in their internal asset planning processes and in their 25-year Strategic Direction Statements and WRMPs.

The Water Industry National Environment Programme (WINEP) is a set of actions that are defined by the EA and given to all water companies operating in England for completion during a particular AMP period. The aim of the programme is to support the objectives in the Environment Act, Water Framework regulations, Habitats regulations and other environmental objectives. Examples of typical actions could include investigations into the



sustainability of an abstraction, a reduction in an abstraction to support river flows, or new permit limits at a WwTW.

Water and wastewater infrastructure requires significant lead-times to plan, obtain planning and other permissions, finance and construct. The time required to provide new or upgraded infrastructure to serve a development or a larger spatial plan is highly locally specific.

Table 2.1 is provided as an indicative guide to lead-times.

Table 2.1: Indicative lead-times (years) for new infrastructure to serve development

| Scale of development | Water supply | Water resources | Wastewater network | Wastewater treatment |
|----------------------|--------------|-----------------|--------------------|----------------------|
| Minor                | 1            | N/A             | 1                  | N/A                  |
| Major                | 1-3          | 5-10            | 1-5                | 3-5                  |
| Strategic / Plan     | 3-5          | 10-20           | 5-10               | 5-10                 |

### 2.5.3 Planning for Water

#### Water resource management plans

Water Resource Management Plans (WRMPs) are 25-year strategies that water companies are required to prepare, with updates every five years. In reality, water companies prepare internal updates more regularly. WRMPs are required to assess:

- Future demand (due to population and economic growth);
- Future water availability (including the impact of sustainability reductions);
- Demand management and supply-side measures (e.g., water efficiency and leakage reduction, water transfers and new resource development);
- How the company will address changes to abstraction licences;
- How the impacts of climate change will be mitigated;
- where necessary, the requirements for developing additional water resources to meet growing demand and describe how the balance between water supply and demand will be balanced over the period 2015 to 2040;
- Using cost-effective demand management, transfer, trading and resource development schemes to meet growth in demand from new development and to restore abstraction to sustainable levels; and
- In the medium to long term, that sufficient water continues to be available for growth and that the supply systems are flexible enough to adapt to climate change.

Thames Water's final WRMP is published [here](#). Severn Trent Water's revised WRMP is published [here](#). Bristol Water's final WRMP is published [here](#).

## Drought Plan

Linked to the WRMP is a water company's drought plan. This is a requirement under the Water Industry Act 1991 (as amended by the water Act 2003). A water company must state how it will maintain a secure water supply and protect the environment during dry weather and drought. The plan will contain:

- **Drought triggers** - these are points where a water company will take action to manage supply and demand. They are based on monitoring of rainfall levels, river flows, groundwater levels, and reservoir stocks.
- **Demand management actions** - how a water company will reduce demand for water during a drought. Actions that save water before taking more water from the environment must be prioritised. These could include:
  - reducing leakage;
  - carrying out water efficiency campaigns with customers;
  - reducing mains pressure; and
  - restricting water use, for example through temporary use band which limit hosepipe and sprinkler use.
- **Supply management actions** - how a water company will maintain water supply during a drought. Actions that have the least effect on the environment must be prioritised. This could include:
  - carrying out engineering work to improve its supply;
  - transferring water in bulk from other water companies;
  - using drought permits and drought orders to abstract more water;
  - using desalination - permanent or temporary plants; and
  - using tankers to supply customers with water directly.
- **Extreme drought management actions** - the actions it could take in an extreme drought. These could delay the need to use emergency restrictions standpipes and rota cuts.
- **Communicating during a drought** - a water company must set out how it will communicate in a clear and timely way during a drought with customers, partners or other stakeholders.
- **Environmental assessment, monitoring and mitigation** - a drought plan must include:
  - an environmental assessment;
  - an environmental monitoring plan for each supply management action; and
  - details of mitigation measures the company plans to take for each supply management action.
- **End of a drought** - a water company must explain how it will identify when a drought is over or ending and the actions it will take during this stage, communicate this information to customers, and review its performance.

## Regional water resource planning

Water resource planning is taking an increasingly regional focus, recognising the need for collaboration between water companies and sectors in order to address the challenges of climate change, increasing demand for water and protecting the water environment. Five regional groupings having been formed, including the Water Resources South East (WRSE) group which covers most of Cotswold District. An advisory group consisting of their regulators (Environment Agency and Ofwat) and Defra regularly attend meetings of WRSE.

WRSE published their [final regional plan](#) in 2025 which will inform the next round of company WRMPs to be published in 2028/9.

The West Country Water Resources (WCWR) group covers the south-west area of the Cotswold that is supplied by Bristol Water. WCWR published their [draft regional plan](#) in January 2023

The Water Resources West (WRW) group covers the north area and areas along the western boundary of Cotswold District that is supplied by Severn Trent. WRW published their [final regional plan](#) in June 2025.

## 2.5.4 Planning for Wastewater

### 21st Century Drainage

The UK Water Industry Research (UKWIR) “21st Century Drainage” programme has brought together water companies, governments, regulators, local authorities, academics, and environmental groups to consider how planning can help to address the challenges of managing drainage in the future. These challenges include climate change, population growth, urban creep and meeting the Water Framework Directive.

The group recognised that great progress has been made by the water industry in its drainage and wastewater planning over the last few decades, but that, in the future, there needs to be greater transparency and consistency of long-term planning. The Drainage and Wastewater Management Plan (DWMP) framework (Water UK, 2018) sets out how the industry intends to approach these goals. Companies were required to published finalised DWMPs in 2023 to inform their business plans for the 2024 Price Review.

### Drainage and Wastewater Management Plans (DWMPs)

Drainage and Wastewater Management Plans (DWMPs) are consistently structured plans delivered at three spatial scales; company-wide, regional groupings and individual wastewater catchments. The framework defines drainage to include all organisations and all assets which have a role to play in drainage, although, as the plans will be water company led, it does not seek to address broader surface water management within catchments.

The first cycle of DWMPs were published in 2023, following a [consistent national framework](#), to inform their business plans for the 2024 Price Review.

The Environment Agency has set out [new guidance](#) for the second cycle of DWMPs to be published for public consultation in 2027.

LPAs and LLFAs are recognised as key stakeholders and are invited to join, alongside other stakeholders, the Strategic Planning Groups (SPGs) organised broadly along river basin district catchments.

DWMPs aim to provide more transparent and consistent information on sewer flooding risks and the capacity of sewerage networks and treatment works, and this should be taken into account in SFRAs, Water Cycle Studies, as well as in site-specific FRAs and Drainage Strategies.

Thames Water's final DWMP, including interactive mapping, is published [here](#) and is reviewed in detail for the study area in sections 6.3.1.

Severn Trent Water's final DWMP, including interactive mapping, is published [here](#) and is reviewed in detail for the study area in sections 6.3.2.

Wessex Water's final DWMP, including interactive mapping, is published [here](#), and is reviewed in detail for the study area in sections 6.3.3.

#### 2.5.5 Developer Contributions and connection charges

A significant part of water company business is the interface with developers to facilitate connection to the public water supply and sewerage systems, through their developer services functions. Developments with planning permission have a right to connect to the public water and sewerage systems, where this is for domestic use. However, there is no guarantee that the capacity exists to serve a development.

Developers may requisition a water supply connection or sewerage system, or alternatively, self-build and offer them for adoption by the water company or sewerage undertaker. Self-build and adoption are usually practiced for assets within the site boundary, whereas requisitions are normally used where an extension of upgrading the infrastructure requires construction on third party land. The cost of requisitions is shared between the water company and developer as defined in the Water Industry Act 1991.

The above arrangements are third party transactions, because the Town and Country Planning Act Section 106 agreements and Community Infrastructure Levy agreements may not be used to obtain funding for water or wastewater infrastructure.

Ofwat published [revised charging rules](#) covering how water and wastewater companies may charge customers for new connections. (Ofwat, 2021) These rules have applied to all companies in England since April 2018. The key changes are listed below.

- **Increased transparency** - More charges will be fixed and published on water company websites. This will provide greater transparency to developers and will also allow alternative connection providers to offer competitive quotations more easily.
- **Fixed infrastructure charges** - There will be a fixed infrastructure charge for water and one for wastewater.
- **Revised approach to network reinforcement costs** - The costs of network reinforcement will no longer be charged directly to the developer in their

connection charges. Instead, the combined costs of all of the works required on a company's networks, over a five-year rolling period, will be covered by the infrastructure charges paid for all new connections.

- **Updated definition of network reinforcement** - The definition of network reinforcement has changed and will now apply only to works required as a direct consequence of the increased demand due to a development. Where the water company has not been notified of a specific development, for example when developing long-term strategic growth schemes, the expenditure cannot be recovered through infrastructure charges.

Thames Water publish their charging arrangements annually [here](#). These include incentives to encourage good design by developers, including:

- £2,500 per property for designing rainwater or greywater harvesting technologies in the development
- £3,200 per property for water neutral developments (does not add additional water demand pressures to its water resource zone supply needs)
- £280 per property for reducing the surface water run-of leaving the property into the sewerage network.

Severn Trent Water (STW) publish their charging arrangements annually [on their website](#).

For the period 1 April 2026 to 31 March 2027 the infrastructure charges per property are as follows:

- £385.36 water infrastructure charge
- £499.62 sewerage infrastructure charge
- £48.65 water environmental component
- £43.11 waste environmental component

The environmental component charges are used to fund environmental incentives to encourage good design by developers, including water efficiency and flood prevention incentives for home builders.

Water efficiency incentives can be applied for where developers can demonstrate they have built a premises with a domestic water usage of 100l/p/d or less and specified criteria are met. The incentives offered are:

- Water usage of 100 litres per person per day or less: £250 per property,
- Water usage of 90 litres per person per day or less: £300 per property,
- Water usage of 85 litres per person per day or less: £350 per property.

Severn Trent will also allow non-household premises with domestic usage only to apply for the 100 l/p/d water efficiency incentive.

Severn Trent also offer incentives for flood prevention measures. Where specified conditions are met, the following incentives are offered:

- Installation of a rain garden: £100 per property,
- Use of permeable surfaces for driveways or parking spaces that attenuate water to the sewer network: £150 per property,

- Use of permeable surfaces for driveways or parking spaces that infiltrate and do not connect to the network: £275 per property.

Wessex Water publish their charging arrangements annually [here](#). These include discounted charges based on the separation of surface water run-off produced by the development to encourage good design by developers. This is based upon the development having no separation, surface water attenuation or full surface water separation.

Bristol Water publish their charging arrangements annually [here](#). There is a discount on the charge to encourage good design by developers based on water usage, including:

- 75% reduction if 95 litres/person/day is achieved.
- 50% reduction of the infrastructure charge if 100 litres/person/day is achieved.
- 0% reduction of infrastructure charge if the current Building Regulation standard of 110 litres/person/day is achieved.

#### 2.5.6 Water companies and the planning system

Water companies are currently not statutory consultees to planning applications, although they do monitor planning applications and respond to potentially significant applications, or where requested to do so by the LPA. Defra are intending to consult on making water companies statutory consultees for some applications (Department for Environment, Food & Rural Affairs, 2023).

Where a water company is concerned that a new development may impact upon their service to customers or the environment (for example by causing foul sewer flooding or pollution) they may request the LPA to impose a Grampian condition, whereby the planning permission cannot be implemented until a third-party secures the necessary upgrading or contributions.

Defra has issued National Policy Statements (NPSs) on Nationally Significant Infrastructure Projects (NSIPs) for wastewater (Department of Environment, Food & Rural Affairs, 2012) and water (Department of Environment, Food & Rural Affairs, 2023), to be used as the primary basis when considering applications for Development Consent Orders (DCOs).

#### 2.5.7 The Independent Water Commission

The [Independent Water Commission](#) was set up in October 2024 to provide recommendations to government on reforms to the water sector. The objectives are to ensure a sufficiently robust and stable regulatory framework in order to:

- attract the investment needed for the future;
- speed up infrastructure delivery; and
- restore confidence in the sector.

Chaired by Sir John Cunliffe, the resulting report which was published in June 2025 is often referred to as the 'Cunliffe Report'.



The full report can be found on the [gov.uk website](https://www.gov.uk). It contains 88 recommendations centred around seven themes:

- Chapter one: Strategic direction for the water system.
- Chapter two: Planning.
- Chapter three: Legislative framework.
- Chapter four: Regulator reform.
- Chapter five: Regulation reform.
- Chapter six: Company structures, ownership, governance, and management.
- Chapter seven: Infrastructure and asset health.

It should be noted that the recommendations in the Cunliffe report are not mandatory, and the government will respond to the report in due course. In the meantime, these recommendations should be treated with the caution.

A simplification of the water planning system is recommended, with a comprehensive systems planning framework for England and Wales with responsibility for integrated and holistic water system planning. It goes on to recommend a review and update to the current legal framework, along with clearer targets to allow water companies to be held to account.

Chapter four of the Cunliffe report is designed to restore the confidence of both the public and regulated water companies in the regulatory framework. It recommends that the UK government should establish a new integrated regulator in England. This should combine the functions of Ofwat, DWI, and water functions from the EA and Natural England (NE). Changes were also recommended to economic and environmental regulations, including strengthening abstraction permitting.

Following the recommendations set out in the Cunliffe Report, the [government announced that Ofwat would be abolished](#) and replaced by 'a new, single, powerful regulator' with the objective of cutting water pollution in England's rivers, lakes and seas, and protecting families from large increases in their water bills.

The new regulator will take responsibility for the water functions across Ofwat, EA, NE and Drinking Water Inspectorate. During the transition to the new regulator, Ofwat will remain in place, and following its creation, the EA and NE will retain their non-water role.

Until there is more information on the role of the new regulator and which other recommendations will be adopted by government, the LPA should assume the current regulatory environment will continue.

#### 2.5.8 A New Vision for Water: White Paper

On 20 January 2026 [A New Vision for Water white paper](#) was presented to Parliament by the Secretary of State for Environment, Food & Rural Affairs. The white paper responds to the 88 recommendations made in the Cunliffe Report and puts forward a "*once-in-a-generation plan to transform the water system for good*".

Changes proposed in the white paper include:



- Expanding the price review system to capture the 25-year planning horizon with further details provided in five-year periods.
- A Chief Engineer will sit inside the new single water regulator. Their job will be to bring back hands-on checks of water infrastructure.
- The regulator will introduce a new inspection approach for water companies, requiring health checks on pipes, pumps, and other assets. Self-monitoring will come to an end.
- Where companies fall short, a new Performance Improvement Regime will give the regulator the power to act fast and fix failures so that underperforming water companies recover faster, protecting customers and the environment and giving stability to investors.
- The price control process will reflect a focus on maintenance and resilience. Ringfenced budgets will ensure there's enough funding for maintenance and renewal alongside building new assets.
- Improve joined-up regional planning by requiring regional plans that will set out investment priorities to meet national objectives.
- Work with existing groups such as catchment partnerships to design a new regional planning framework with Defra, set to be implemented in 2027.
- Confirms the roll out of smart metering and mandatory efficiency labels on white goods.

Recommendations in the Cunliffe Report that the white paper does not pick up include:

- Updated legislation to provide a clear framework for approving nature based solutions.
- Mandatory SuDS for new developments in England.

It should be noted that white papers set out the Government's proposals for future legislation, providing a basis for further consultation and discussion to allow final changes to be made before a Bill is formally presented to Parliament. The white paper states that a 2026 Transition Plan will set out the path to this new system and a new water reform Bill will bring forward the legislation needed to enable the system to take effect.

## 2.6 Flood Risk and Surface Water

### 2.6.1 Flood and Water Management Act 2010

The [Flood and Water Management Act](#) (FWMA) aims to improve both flood risk management and the way water resources are managed (HM Government, 2010).

The FWMA has created clearer roles and responsibilities and helped to define a more risk-based approach to dealing with flooding. This included the creation of a lead role for LAs, as LLFAs, designed to manage local flood risk (from surface water, ground water and ordinary watercourses) and to provide a strategic overview role of all flood risk for the EA.

The content and implications of the FWMA provide considerable opportunities for improved and integrated land use planning and flood risk management by LAs and other key

partners. The integration and synergy of strategies and plans at national, regional, and local scales, is increasingly important to protect vulnerable communities and deliver sustainable regeneration and growth.

Schedule 3 of the FWMA 2010 will provide a framework for the approval and adoption of drainage systems, a SuDS Approving Body (SAB) within unitary and county councils, and national standards on the design, construction, operation, and maintenance of SuDS for the lifetime of the development. The previous government affirmed its commitment for enacting Schedule 3. However, it is currently unknown whether the new government intends to do this or what the proposed timescales would be.

### 2.6.2 Local Flood Risk Management Strategy (LFRMS)

Local Flood Risk Management Strategies set out how Lead Local Flood Authorities (LLFA) will manage local flood risk from surface water runoff, groundwater and ordinary watercourses, for which they have a responsibility as LLFA. They also set out the work that other Risk Management Authorities are doing to manage flood risk within the area.

Gloucestershire County Council's Local Flood Risk Management Strategy (2014) sets out the following objectives:

- improve our understanding of local flood risk;
- put in place plans to manage these risks;
- avoid inappropriate development and ensure new development does not increase flooding elsewhere;
- increase public awareness of flooding and encourage local communities to take action;
- ensure close partnership working and co-ordination with other risk management authorities in Gloucestershire, and;
- support response to, and recovery from, flooding incidents.

### 2.6.3 Strategic Flood Risk Assessment (SFRA)

All LPAs are required, under NPPF, to prepare a SFRA, which forms a key part of the evidence base for their Local Plan. The SFRA must consider flood risks from all sources, collating up-to-date flood risk data and in some cases developing new flood risk modelling. The SFRA is used to inform the Sequential Test, by which Local Plan allocations should be sequentially selected to direct development towards areas of lower flood risk, taking into consideration the vulnerability to flooding of the proposed land use. Cotswold District Council's current Level 1 SFRA was published in 2023 ([which can be found here](#)). At the time of writing, a new Level 1 and 2 SFRA for Cotswold District Council is being prepared.

### 2.6.4 Surface Water Management Plan

Surface Water Management Plans (SWMPs) outline the preferred surface water management strategy in a given location and establish a long-term action plan to manage surface water. SWMPs are undertaken, when required, by LLFAs in consultation with key

local partners who are responsible for surface water management and drainage in their area. Gloucestershire County Council has published SWMPs for four locations but these cover areas outside of Cotswold District. ([Which can be found here](#)).

### 2.6.5 Sustainable Drainage Systems

From April 2015, LPAs were given the responsibility for ensuring that sustainable drainage is implemented on all major developments, including developments of ten or more homes, or commercial developments creating 1,000m<sup>2</sup> of new floor space.

Previously SuDS guidance was developed by Defra to sit alongside the NPPF PPG and provide non-statutory standards as to the expected design and performance for SuDS.

As of July 2025, the [Defra National standards for sustainable drainage systems \(SuDS\)](#) were brought in to comply with the principles of surface water drainage design.

The national standards contain two sets of standards. The first type (standard one) is known as the hierarchy standard and sets the criteria for the prioritisation of final surface water runoff destinations. The other standards (standards two to seven) detail the minimum design criteria that SuDS should satisfy alongside how they are to be appropriately built, maintained, and operated.

These National Standards form a material consideration for LPAs when assessing planning applications. These standards aim to reflect and reinforce good practice and use of SuDS, reflecting the four pillars of SuDS design. All appropriate planning applications should demonstrate how the national standards have been met in the site design (principle ten).

#### **Standard one: runoff destinations**

Runoff from development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- Priority one: collected for non-potable use (rainwater harvesting)
- Priority two: infiltrated to ground
- Priority three: discharged to an above ground surface water body
- Priority four: discharged to a surface water sewer, or another piped surface water drainage system
- Priority five: discharged to a combined sewer.

#### **Non-potable use**

There is potential for rainwater harvesting for non-potable uses to decrease the water demand from new developments and help improve water efficiency.

Rainwater harvesting shall be considered in all circumstances where any of the following apply:

- There is a demand for non-potable water and available contributing catchment area that will deliver safe and efficient water savings.
- Examples include industrial, commercial, horticultural, educational, public sector, residential and multiple-occupancy buildings.

- There is a need for landscape irrigation.
- The development is in an area identified as seriously water stressed.

Gloucestershire County Council are the LLFA and play a key role in ensuring that the proposed drainage schemes for all new developments comply with technical standards and policies in relation to SuDS. Further information on surface water drainage can be found [here](#).

An updated version of the Construction Industry Research and Information Association (CIRIA) SuDS Manual was published in 2015. The guidance covers the planning, design, construction and maintenance of SuDS for effective implementation within both new and existing developments. The guidance is relevant for a range of roles with the level of technical detail increasing throughout the manual. The guidance does not include detailed information on planning requirements, SuDS approval and adoption processes and standards, as these vary by region and should be checked early in the planning process. The manual itself can be found on the [CIRIA website \(ciria.org\)](http://ciria.org).

CIRIA also published '[Guidance on the Construction of SuDS' \(C768\) \(ciria.org\)](http://ciria.org), which contains detailed guidance on all aspects of SuDS construction, with specific information on each SuDS component available online as a downloadable chapter, free to CIRIA members.

Thames Water provides guidance on their website through their Surface Water Management Programme available [here](#). Applications for projects should be made through their website.

Wessex Water provides their SuDS and surface water sewer adoption requirements [here](#).

Severn Trent Water provides [SuDS guidance on their website](#) including:

- General Design Manual,
- Landscape Specification,
- Planting Schedule,
- Landscape Maintenance Guidance,
- Flow Control Chamber Details,
- Sewer Connection Detail, and
- Gully Abandonment Detail.

#### 2.6.6 Design and Construction Guidance

The [Design and Construction Guidance \(water.org.uk\)](http://water.org.uk) forms part of a new Codes for Adoption covering the adoption of new water and wastewater infrastructure by water companies. The Design and Construction Guidance contains details of the water sector's approach to the adoption of SuDS, which meet the legal definition of a sewer. This replaces the formerly voluntary Sewers for Adoption. The new guidance came into force in April 2020 and compliance by water companies in England is mandatory.

The previous standards, up to and including Sewers for Adoption Version 7, included a narrow definition of sewers to mean below-ground systems comprising of gravity sewers

and manholes, pumping stations, and rising mains. This excluded the adoption of SuDS by water companies, except for below-ground storage comprising of oversized pipes or chambers.

The new guidance provides a mechanism for water companies to secure the adoption of a wide range of SuDS components which are now compliant with the legal definition of a sewer. There are however several non-adoptable components such as green roofs, pervious pavements, and filter strips. These components may still form part of a drainage design so long as they remain upstream of the adoptable components.

The Design and Construction Guidance states that the drainage layout of a new development should be considered at the earliest stages of design. It is hoped that the new guidance will lead to better managed and more integrated surface water systems which incorporate amenity, biodiversity, and water quality benefits.

## 2.7 Environmental Protection and Biodiversity

### 2.7.1 The Environment Act 2021

The [Environment Act](#) (HM Government, 2021) came into UK law in November 2021 with the aim of protecting and enhancing the environment. The Act has objectives to improve air and water quality, biodiversity, waste reduction, and resource efficiency. The implementation of the policies within the Environment Act has begun, and legally binding environmental targets are being developed. This will be enforced by the Office for Environmental Protection (OEP). More information is available on the [OEP website \(theoep.org.uk\)](https://theoep.org.uk).

The Environment Act (Part 5) contains policies concerning improvements to the water environment. These policies have the following aims:

- Effective collaboration between water companies through statutory water management plans;
- Minimise the damage that water abstraction may cause on environment; and
- Modernise the process for modifying water and sewerage company licence conditions.

Further to this, there is specific legislation regarding storm overflows aiming to reduce the discharge of untreated sewage into waterways. This plan includes requirements for water companies to:

- Report on the discharges from storm overflows;
- Monitor the quality of water potentially affected by discharges;
- Progressively reduce the harm caused by storm overflows; and
- Report on elimination of discharges from storm overflows.

## 2.7.2 25-year Environment Plan

The [Environmental Improvement Plan](#) (EIP) is the first revision of the 25-year environment plan (25YEP) published in 2018 and updated in 2023. It contains ten goals which are shown in Figure 2.1. The government must review and revise the plan, if needed, every five years to ensure continued progress against the ten 25YEP goals.

Of particular importance to a WCS is Goal 3 - Clean and plentiful water.

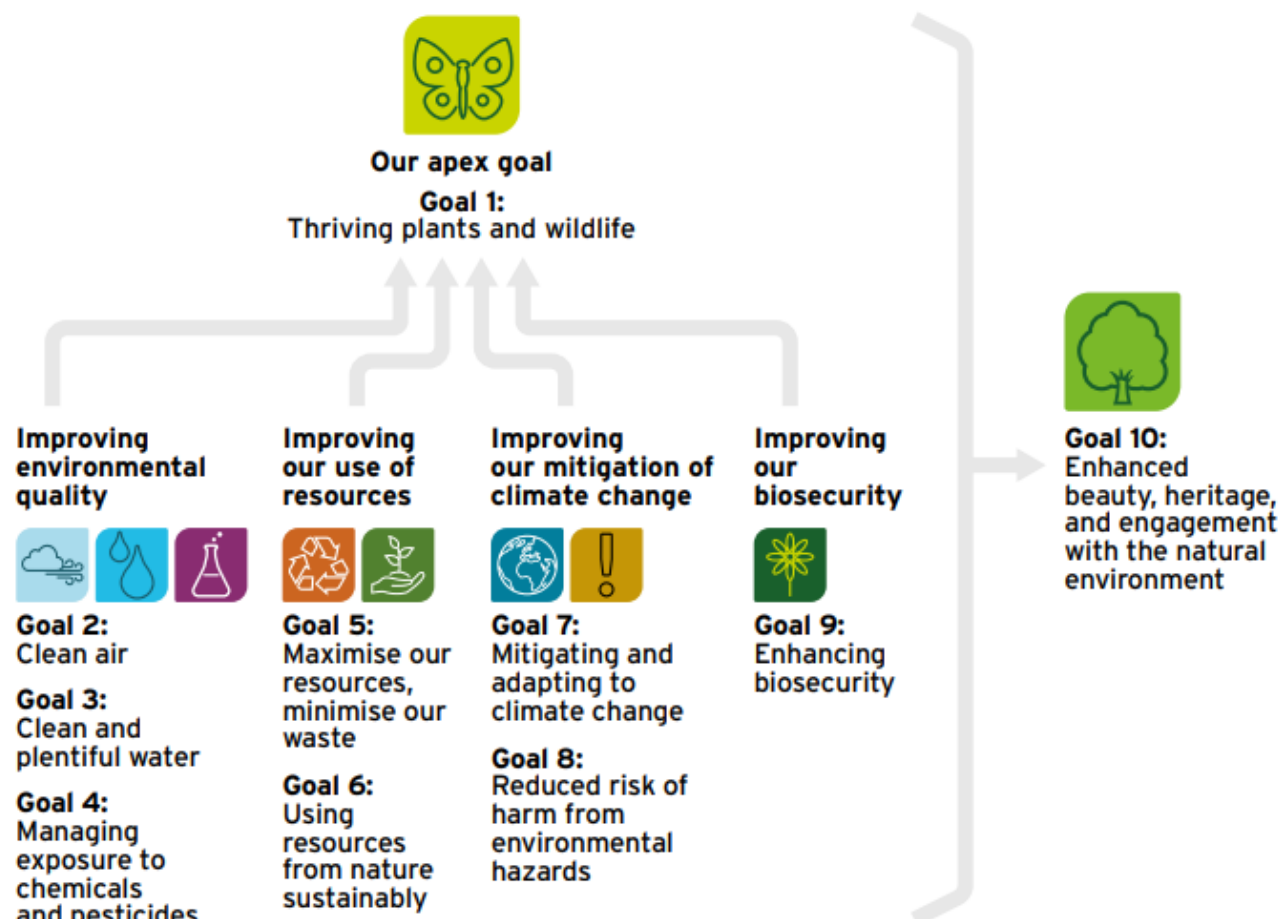


Figure 2.1 The 10 Environmental Improvement Plan goals

Under Goal 3 - Clean and plentiful water, there are eight sets of targets and commitments relating to different aspects of the water environment:

- "Reduce nitrogen, phosphorus, and sediment pollution from agriculture into the water environment by at least 40% by 2038, compared to a 2018 baseline, with an interim target of 10% by 31 January 2028, and 15% in catchment containing protected sites in unfavourable condition due to nutrient pollution by 2028.
- Reduce phosphorus loadings from treated wastewater by 50% by 2028 and 80% by 2038 against a 2020 baseline.
- Halve the length of rivers polluted by harmful metals from abandoned mines by 2038, against a baseline of around 1,500km (approximately 930 miles).



- Reduce the use of public water supply in England per head of population by 20% from the 2019-20 baseline, 2038, with interim targets of 9% by 2027 and 14% by 2032, and to reduce leakage by 20% 2027 and 30% by 2032.
- Restore 75% of our water bodies to good ecological status.
- Require water companies to have eliminated all adverse ecological impact from sewage discharges at all sensitive sites by 2035, and at all overflows by 2050.
- Target a level of resilience to drought so that emergency measures are needed only once in 500-years."

To deliver these goals, the EIP outlines action across these areas:

- Improving wastewater infrastructure and water company environmental performance;
- Reducing pressures on the water environment from agriculture;
- enabling the sustainable use of water for people, business and the environment;
- Tackling pressures from chemicals and pollutants;
- Restoring natural function and iconic water landscapes; and
- Joined-up management of the water system.

Progress towards delivering the EIP will be monitored annually.

### 2.7.3 Defra Plan for Water

Defra's [Plan for Water](#) (Department for Environment, Food & Rural Affairs, 2023) provides further detail on the actions towards achieving Goal 3 of the EIP23 It promotes an integrated approach to water management as the foundation of the plan. While many of the actions contained within the Plan for Water are outside of the responsibilities of areas of influence of the LPAs, the following summarises those actions that LPAs should have regard to:

- Require standardised SuDS in new housing developments in 2024, subject to final decisions on scope, threshold, and process following consultation in 2023.
- Designate all chalk catchments as water stressed and high priority under the sewer overflows reduction plan, driving action to improve water management.
- The plan reflects the predicted four billion litre per day (4,000 ml/d) gap between supply and demand across England and contains measures to both boost supply and reduce demand. Of interest to LPAs is the plan to reduce demand which will address half of the gap.
- A key component in reducing demand for water is improving water efficiency and there is a target under the Environment Act to reduce the use of public water supply in England per head of population by 20% by 2038. A road map on water efficiency in new developments and retrofits has been developed with ten actions to improve water efficiency:
  - **Action one** - Implement schedule 3 to the Flood and Water Management Act 2010. The 2024 consultation will consider rainwater harvesting in developing the statutory SuDS National Technical Standards.



- **Action two** - Review the Water Supply (Water Fittings) Regulations 1999, the Water Supply (Water Quality) Regulations 2016 and/or any other relevant legislation to address wasteful product issues with toilets and enable new water efficient technologies.
- **Action three** - Develop clear guidance on 'water positive' or 'net zero water' developments and roles for developers and water companies.
- **Action four** - Review water efficiency options in planning, building regulations and through voluntary schemes for non-household buildings.
- **Action five** - Work with Ofwat to ensure the water industry can play a central role in retrofitting water efficient products in households, businesses, charities and the public sector.
- **Action six** - Work across government to integrate water efficiency into energy efficiency advice and retrofit programmes.
- **Action seven** - Review the Building Regulations 2010, and the water efficiency, water reuse and drainage standards including considering a new standard for new homes in England of 105 l/p/d and 100 l/p/d where there is a clear local need.
- **Action eight** - Mandatory water efficiency labelling scheme.
- **Action nine** - Investigate dual pipe systems (rainwater harvesting) and water reuse options for new housing development as part of the review of the planning framework.
- **Action ten** - Enable innovative water efficiency approaches in buildings, including technologies and approaches to funding and maintenance.

#### 2.7.4 Biodiversity Net Gain

Biodiversity net gain (BNG) is designed to contribute to the recovery of nature while developing land. The principle is that the natural environment is in measurably better state after development than it was before. The Environment Act 2021 has, since 2024 required all planning permissions granted in England to achieve 10% BNG.

Defra publishes a [biodiversity metric tool](#), the latest version of which must be used for calculating the BNG deriving from a proposed development.

#### 2.7.5 Local Nature Recovery Strategy

The Environment Act (HM Government, 2021) also established a duty to prepare, by March 2025, Local Nature Recovery Strategies (LNRS), recognising that England is one of the most nature-depleted countries in the world. Gloucestershire County Council are the authority responsible for preparing the LNRS In the study area. They are tasked with working with local partners to agree priorities for nature recover and identify "practical, achievable proposals" (Department for Environment Food & Rural Affairs, 2023) to address these priorities. The LNRS should also co-ordinate with neighbouring strategies to form a national Nature Recovery Network.

There is a close linkage with BNG, as developments proposing to create, enhance or recover habitat in locations mapped by the LNRS receive a higher value in the biodiversity metric calculator than in other locations.

#### 2.7.6 Storm Overflow Reduction Plan

The Environment Act 2021 placed a legal duty on water companies to progressively reduce the adverse impacts of discharges from storm overflows. The [storm overflow discharge reduction plan](#) sets the following targets:

- By 2035, water companies will have: improved all overflows discharging into or near every designated bathing water; and improved 75% of overflows discharging to high priority sites.
- By 2050, no storm overflows will be permitted to operate outside of unusually heavy rainfall or to cause any adverse ecological harm.

There is also an expectation that water companies ensure their infrastructure keeps pace with increasing external pressures, such as urban growth and climate change, without these pressures leading to greater numbers of discharges.

#### 2.7.7 The Water Framework Directive (WFD) and Water Environment Regulations

##### Introduction

The European Union WFD 2000 is currently transposed into English and Welsh law by the [Water Environment Regulations 2017](#). They apply to all waterbodies (watercourses, canals, lakes, estuaries and coastal waters), with the objective of meeting Good Ecological Status (GES) or, where heavily modified, Good Ecological Potential (GEP). To meet GES or GEP, a water body must achieve a good or high score for all elements - in the case of surface water, these are biological, physico-chemical, specific pollutants and hydromorphology. These elements are shown in Figure 2.2, which is from the webpage on how to use the [Catchment Data Explorer \(environment.data.gov.uk\)](#). UK policy remains to meet GES or GEP for all waterbodies by 2027.

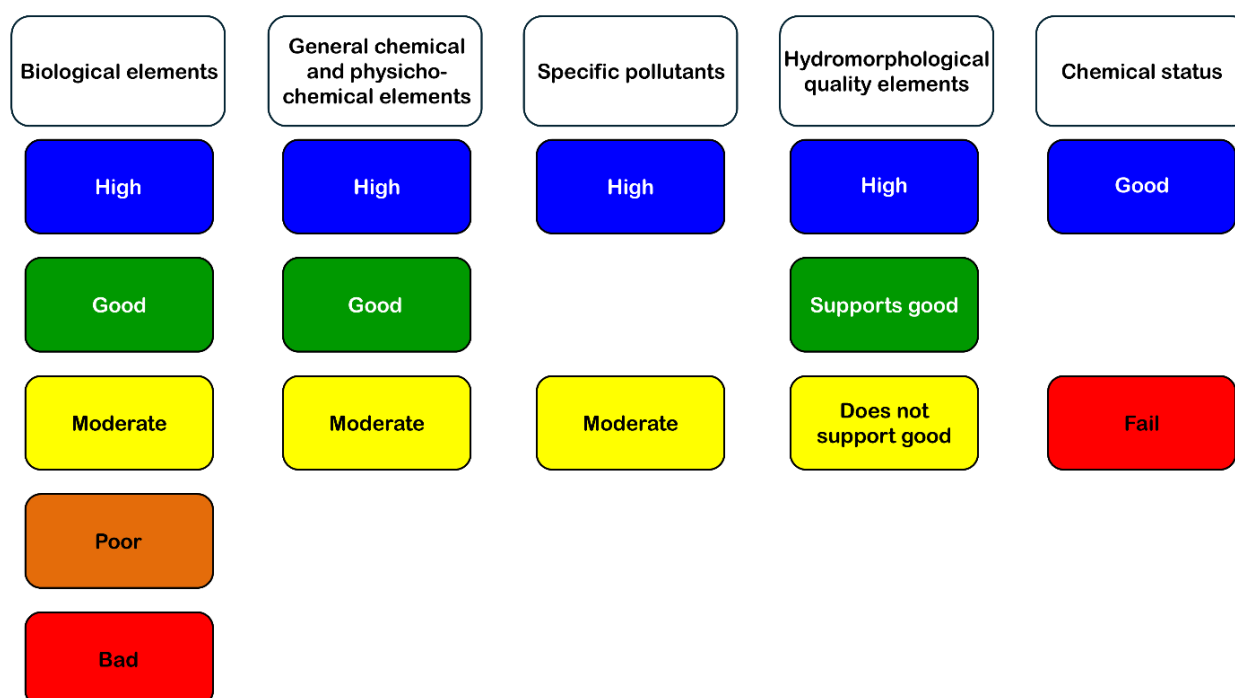


Figure 2.2: Status classification for surface water (EA, 2023)

Chemical Status is separately assessed. The WFD and the EA recognise a group of ubiquitous chemicals which are persistent, bioaccumulative or toxic (uPBT), and without which over 90% of England's waterbodies would achieve Good Chemical Status. Mercury, Perfluorooctanesulfonic acid (PFOS) and Polybrominated diphenyl ethers (PBDE) are the most ubiquitous causes of failures. Due to the persistent nature of these chemicals, the date for getting all waterbodies to Good Chemical Status is set for 2063.

### River Basin Management Plans

River Basin Management Plans (RBMP) are required under the WFD and document the baseline classification of each waterbody in the plan area, the objectives, and a programme of measures to achieve those objectives. Cotswold District falls within the [Thames RBMP \(2022\)](#). The third cycle RBMPs were published in 2022. A primary WFD objective is to ensure 'no deterioration' in environmental status, therefore all water bodies must meet the class limits for their status class as declared in the Anglian and Thames River Basin Management Plan. Another equally important objective requires all water bodies to achieve good ecological status. Future development needs to be planned carefully so that it helps towards achieving the WFD and does not result in further pressure on the water environment and compromise WFD objectives. The WFD objectives as outlined in the updated RBMPs are summarised below:

- Preventing deterioration of the status of surface waters and groundwater.
- Achieving objectives and standards for protected areas.
- Aiming to achieve good status for all water bodies.
- Reversing any significant and sustained upward trends in pollutant concentrations in groundwater.

- Cessation of discharges, emissions and losses of priority hazardous substances into surface waters.
- Progressively reducing the pollution of groundwater and preventing or limiting the entry of pollutants.

LPAs must have regard to the WFD as implemented in the RBMP. It is of primary importance when assessing the impact of additional wastewater flows on local river quality.

Alongside the RBMP documents, the data behind them can be explored further using the [Catchment Data Explorer \(environment.data.gov.uk\)](https://environment.data.gov.uk) and [map viewer \(environment.maps.arcgis.com\)](https://environment.maps.arcgis.com).

### Protected Area Objectives

The Water Environment Regulations specify that areas requiring special protection under other EU Directives, and waters used for the abstraction of drinking water, are identified as protected areas. These areas have their own objectives and standards.

Some areas may require special protection under more than one piece of European Union-derived legislation or may have additional (surface water and/or groundwater) objectives. In these cases, all the objectives and standards must be met.

The types of protected areas are:

- Areas designated for the abstraction of water for human consumption (Drinking Water Protected Areas);
- Areas designated for the protection of economically significant aquatic species (Freshwater Fish and Shellfish);
- Bodies of water designated as recreational waters, including Bathing Waters;
- Nutrient-sensitive areas, including areas identified as Nitrate Vulnerable Zones under the Nitrates Directive or areas designated as sensitive under Urban Waste Water Treatment Regulations; and
- Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection including relevant National sites.

#### 2.7.8 Conservation of Habitats Regulations 2017 (as amended)

The [Conservation of Habitats and Species Regulations 2010](#) (commonly referred to as the Habitats Regulations) consolidated the Conservation (Natural Habitats, &c.) Regulations 1994 and transposed the EU Habitats Directive in England and Wales which was aimed at protecting plants, animals and habitats that make up the natural environment. The regulations were further amended in 2017.

The Habitats Regulations define the requirement for a Habitats Regulations Assessment (HRA) to be carried out. The purpose of this is to determine if a plan or project may affect the protected features of a “habitats site”. These include:

- A Special Area of Conservation (SAC) or candidate SAC.
- A Site of Community Importance (SCI).

- A site hosting a priority natural habitat type or priority species protected in accordance with Article 5(4) of the Habitats Directive.
- A Special Protection Area (SPA) or potential SPA.
- Ramsar sites.

All plans and projects (including planning applications) which are not directly connected with, or necessary for the conservation management of a habitat site require consideration of whether the plan or project is likely to have significant effects on that site.

This is referred to as the “Habitats Regulations Assessment screening” and should take into account the potential effects of both the plan/project itself and in combination with other plans or projects.

Part 6 of the conservation of Habitats and Species Regulations 2017 states that where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view of the site’s conservation objectives.

The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site.

If adverse effects cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured.

The “People over Wind” ECJ ruling (C-323/17) clarifies that when making screening decisions for the purposes of deciding whether an appropriate assessment is required, competent authorities cannot take into account any mitigation measures. This must be part of the appropriate assessment itself.

The implementation of the Conservation of Habitats Regulations have had particular significant implications in two areas related to water and planning:

- **Nutrient Neutrality.** Natural England (NE) has identified a number of catchment areas where Habitats Sites are in unfavourable condition due to eutrophication (an excess of the nutrients phosphorous and/or nitrogen in water). NE have advised that developments in these catchments must demonstrate that they do not cause harm, and that one way to do this is to introduce mitigation measures in the catchment area which offset the additional nutrients emitted as a result of the development, an approach known as nutrient neutrality. There are no parts of the study area which are currently within a nutrient neutrality catchment area, however NE may designate additional areas in the future.
- **Water Neutrality.** Natural England (NE) has issued a position statement that it cannot be concluded with sufficient certainty that groundwater abstractions in the Arun Valley, West Sussex are causing no adverse effect on Habitats Sites. NE have advised that developments in Sussex North Water Resource Zone must demonstrate that they do not cause harm, and that one way to do this is to introduce mitigation measures in the zone which offset the additional water consumed as a result of the development, an approach known as water

neutrality. There are no parts of the study area which are currently within a water neutrality zone, however NE may designate additional areas in the future.

Both nutrient and water neutrality designations have resulted in significant impacts on the granting of planning permission in the designated areas.

#### 2.7.9 Wildlife and Countryside Act

Sites of Special Scientific Interest (SSSI) are designated and legally protected under the Wildlife and Countryside Act 1981, Section 28G places a duty to take reasonable steps, consistent with the proper exercise of the authority's functions, to "further to the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which the site is of special scientific interest." (HM Government, 1981).

The Government's 25-year Environment Plan has a target of "restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term." In line with this, and the Wildlife and Countryside Act 1981, Local Authorities should look put forward options that contribute to conservation or restoration of favourable condition, and at the very least must not introduce policies that hinder the restoration of favourable condition by increasing existing issues.

A site is said to be in "favourable condition" when the designated feature(s) within a unit are being adequately conserved and the results from monitoring demonstrate that the feature(s) in the unit are meeting all the mandatory site-specific monitoring targets set out in the favourable condition targets (FCT).

#### 2.7.10 Ramsar

The Convention on Wetlands of International Importance, more commonly known as the Ramsar convention, aims to protect important wetland sites. Member counties commit to:

- '[Wise use](https://www.ramsar.org)' ([ramsar.org](https://www.ramsar.org)) of all their wetlands, defined under the convention as 'the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development';
- Designating sites for the Ramsar list of 'Wetlands of International Importance' (Ramsar Sites) and their conservation; and
- Cooperating on transboundary wetlands and other shared interests.
- In the UK, Ramsar Sites are designated by the Joint Nature Conservation Committee (JNCC).

In general, the designation of UK Ramsar sites is underpinned through prior notification of these areas as SSSIs. Additionally, the NPPF states, (Paragraph 194), that Ramsar sites should be given the same protection in the planning process as sites designated under the European Union Habitats Directive.

#### 2.7.11 Bathing Water Regulations

The Bathing Water Directive was first published in 2006 and are currently transposed into English and Welsh law through the Bathing Water Regulations 2013. The aims of the



directive are the protection of public health whilst bathing, standardisation of publicly available water quality information and to improve management practices at bathing waters.

The UK has over 600 designated bathing waters defined as areas of inshore waters designated for public swimming, these areas are typically characterised by large numbers of swimmers and visitors per year. The Environment Agency are required to monitor water quality at these sites regularly (usually weekly) throughout the Bathing Water season, between 15th May and 30th September.

Water quality standards are based on the incidence of potentially harmful bacteria, *E. coli* and intestinal enterococci and are categorised as ‘excellent’, ‘good’, ‘sufficient’ or ‘poor’ on the basis of bacteria levels. Sites are rated annually and on a short-term basis in response to any temporary pollution incidents.

Achieving compliance with the [Bathing Water Directive](#) has driven some £2.5bn of investment by UK water companies since the early 1990s to reduce the impact of sewerage systems and treated wastewater discharges. Measures have included storage and surface water management to reduce storm overflow spills, moving or extending effluent outfalls and improving wastewater treatment, including ultra-violet (UV) treatment of final effluent.

In contrast to some other European nations, the UK has not previously designated stretches of river as bathing waters. However, following [consultation \(gov.uk\)](#), 27 proposed sites were added to a list of designated bathing waters from the 2024 bathing season. Consultation on the designation of a further 13 proposed bathing water sites was completed in March 2026. At the time of writing, analysis of the responses and supporting evidence are currently under review. Across England there are numerous campaigns by NGOs and members of the public to designate other stretches of river. Defra has [published guidance](#) on applying for bathing water status, including a requirement for at least 100 bathers per day during the season.

### 2.7.12 Environmental Permitting Regulations

Environmental permitting is a process used to manage and regulate activities which may cause harm to the environment. The [Environmental Permitting Regulations 2016](#) were introduced in order to streamline a wide-ranging number of environmental permitting laws under one set of regulations. These include permits for emissions to air, water and land, and cover a range of industrial sectors and waste management streams.

Of particular relevance to this study are the [regulations for permitting sewage effluent discharges to surface waters and groundwaters](#), known as water discharge activities.

- The regulations are used to permit discharges from water company and private WwTW, and for sewer overflows.
- The EA will usually object to applications for a new private Package Treatment Plan (PTP) or septic tank where it is feasible to connect the development to a public sewerage system. A general rule of 30m per dwelling is used to define a reasonable distance from the site boundary to a public sewer. Hence a

development of ten homes should connect to a public sewer within 300m of the boundary, unless there are significant barriers, such as a river or motorway.

- Where an existing or new development treats its own wastewater, a PTP must be installed if the discharge is directly to surface water. Where the discharge is to ground, a PTP or septic tank may be used, but must be connected to a suitably designed drainage field.

### 2.7.13 Groundwater protection

Under the regulations, the EA have published a set of [position statements](#) on protecting groundwater from various activities (Environment Agency, 2018). The position statements that are relevant to this study with regard to discharges to groundwaters, include surface water drainage and the use of SuDS, discharges from contaminated surfaces (e.g., lorry parks) and from treated sewage effluent.

The EA also maintain a set of maps of [Source Protection Zones \(SPZs\)](#) to help identify high risk areas within which pollution prevention measures should be implemented. The SPZs show the risk of contamination to public water supplies from activities that may cause pollution in the area, the closer the activity, the greater the risk:

- **Zone 1 (Inner protection zone)** This zone is designed to protect against the transmission of toxic chemicals and water-borne disease. It indicates the area in which pollution can travel to the borehole within 50 days from any point within the zone and applies at and below the water table. There is also a minimum 50 metre protection radius around the borehole.
- **Zone 2 (Outer protection zone)** This zone indicates the area in which pollution takes up to 400 days to travel to the borehole, or 25% of the total catchment area, whichever area is the largest. This is the minimum length of time the Environment Agency think pollutants need to become diluted or reduce in strength by the time they reach the borehole.
- **Zone 3 (Total catchment)** This is the total area needed to support removal of water from the borehole, and to support any discharge from the borehole.
- **Zone of special interest** This is defined on occasions, usually where local conditions mean that industrial sites and other polluters could affect the groundwater source even though they are outside the normal catchment.

## 2.8 Summary of key new and emerging policy and legislation

The policy and legislation covering the water environment, water and wastewater services and planning is wide and frequently changing. The new and emerging policy and legislation below have been identified as particularly important for consideration in the development of the Local Plan:

- In July 2024 a new Government was formed and committed to reform the planning system, including a new standardised method of calculating local housing need.

- The Water (Special Measures) Act 2025, which received Royal Assent in February 2025, gives regulators stronger powers to act swiftly against water companies that harm the environment or fail customers. It allows Ofwat to ban executive bonuses if firms fall short on environmental, customer service, or financial standards. Other measures include automatic penalties to speed up enforcement, independent monitoring of all sewage outlets, and mandatory real-time reporting of emergency overflows within an hour of a spill.
- The Storm Overflow Assessment Framework (SOAF) was updated in 2025. This guidance builds on the implementation of the SOAF during the PR19 period (2020 to 2025) to improve and make the process more effective. Changes since the first framework include: a reduction in the trigger threshold for high spill frequency overviews to reflect requirements to improve storm overflow performance; linking to the most up to date process for water quality modelling investigations; and updates to related documentation including that on the process of the cost benefit assessment.
- The Independent Water Commission report (AKA The Cunliffe Report) recommended a simplification of the water planning system is recommended, with a comprehensive systems planning framework for England and Wales with responsibility for integrated and holistic water system planning. In response, the government announced that Ofwat would be abolished and replaced by 'a new, single, powerful regulator'.
- As of July 2025, the Defra National standards for SuDS were brought in to comply with the principles of surface water drainage design.
- Schedule 3 of the Flood and Water Management Act will designate LLFAs as SuDS Approval Bodies (SABs) with a duty to adopt new SuDS and removing the automatic right to connect to public sewers. The previous Government affirmed its commitment for enacting Schedule 3; however, it is currently unknown whether the current Government intends to do this or what the proposed timescales would be.
- Defra has recently consulted on a revised national water efficiency standard for new homes of 105 l/p/d or 100 l/p/d where there is a clear local need.
- All developments are now expected to demonstrate at least a 10% biodiversity net gain.

## 3 Future growth in Cotswold District

### 3.1 Growth in Cotswold District

The current Local Plan, covering the period from 2011 to 2031, was adopted in August 2018 by the Cotswold District Council (CDC) (Cotswold District Council, 2018). Prior to July 2025, the Council was preparing a partial update of the adopted Local Plan (the Local Plan Partial Update (LPPU)). In July 2025 Full Council voted to combine the Partial Update and Development Strategy and Sites Allocation Plan into a single Full Local Plan Update. The adoption of the next plan is anticipated in the winter of 2027 (Cotswold District Council, 2025).

For the purpose of this report, the local plan period will be 2025- 2043 although at the time of writing CDC are exploring the avenue of shortening it to 2026- 2043 prior to the Regulation 19 consultation.

The following section summarises expected growth across CDC during the plan period. This generates a forecast that can be used to estimate the volume of water and wastewater required in the future and assess the impact of the resulting pressure on water infrastructure.

The forecast consists of:

- **Allocations** - sites specifically defined in the Local Plan review.
- **Committed sites** - sites which have been granted planning permission.
- **Recent completions** - sites completed in the last year (2023/24) that may not yet appear in flow data provided by water companies. This does not include completions prior to April 2023 as these are already represented in baseline water company flow data.
- **Windfall** - sites that have not been specifically identified in the Local Plan, normally comprised of previously developed sites that have unexpectedly come available.
- **Neighbouring authority growth** - growth located outside of the district, but which will be served by infrastructure within or shared with the study area.

The government establishes specific housing needs for each council annually to ensure that housing development aligns with the unique demographic, economic, and social requirements of different regions. By setting tailored housing targets, the government can better manage population growth, support local economies, and provide adequate housing for communities.

In December 2024, the government increased the annual housing requirement for Cotswold District to 1,036 homes.

Table 3.1 All potential growth in Cotswold district by wastewater treatment works catchment

| WwTW                               | Potential housing | Employment space (m <sup>2</sup> ) |
|------------------------------------|-------------------|------------------------------------|
| Ampney St Peter STW                | 5,062             | 109,000                            |
| Andoversford STW                   | 109               | 0                                  |
| Blockley (WRW)                     | 65                | 0                                  |
| Bourton-on-the-Water STW           | 934               | 0                                  |
| Broadwell STW                      | 198               | 0                                  |
| Chipping Campden (WRW)             | 198               | 0                                  |
| Cirencester STW                    | 11,600            | 252,912                            |
| Fairford STW                       | 2,018             | 42,000                             |
| Honeybourne (WRW)                  | 1,412             | 0                                  |
| Lechlade STW                       | 220               | 0                                  |
| Moreton-in-Marsh STW               | 4,302             | 51,000                             |
| Tetbury STW                        | 336               | 0                                  |
| No public sewerage in the vicinity | 153               | 0                                  |
| <b>Total</b>                       | <b>26,607</b>     | <b>454,912</b>                     |

### 3.2 Windfall

An estimate of Windfall during the Local Plan period was provided by CDC, broken down by parish. This has been assigned to the appropriate WwTW as shown in Table 3.2.

Table 3.2 All potential windfall in Cotswold district by wastewater treatment works catchment

| WwTW                     | Potential housing |
|--------------------------|-------------------|
| Andoversford STW         | 47                |
| Blockley (WRW)           | 0                 |
| Bourton-on-the-water STW | 501               |
| Broadwell STW            | 57                |
| Cirencester STW          | 1,300             |
| Fairford STW             | 206               |
| Honeybourne (WRW)        | 7                 |
| Lechlade STW             | 52                |
| Moreton-in-marsh STW     | 266               |
| Tetbury STW catchment    | 55                |
| <b>Total</b>             | <b>2,491</b>      |

### 3.3 Growth outside of Cotswold District

#### 3.3.1 General approach

Where growth within a neighbouring Local Planning Authority (LPA) area may be served by infrastructure within or shared with Cotswold district, the LPA were contacted as part of a Duty to Cooperate request to provide information on:

- The latest growth forecast (housing and employment) for the local plan area.
- Details of future growth within the catchments of WwTW which serve part of their council area and Cotswold district.

#### 3.3.2 Cheltenham

Heyden WwTW serves a population in both Cotswold district and Cheltenham. There is not expected to be any growth in this catchment from CDC within the Local Plan period. This WwTW has not been assessed further.

#### 3.3.3 Stratford-on-Avon

Nethercote WwTW serves a population in both Cotswold district and Stratford-upon-Avon District. There is not expected to be any growth from either Cotswold district or Stratford-upon-Avon District Council at this WwTW within the Local Plan period. This WwTW has not been assessed further.

#### 3.3.4 Wiltshire

Didmarton WwTW serves a population in both Cotswold district and Wiltshire. Wiltshire Council provided the location and size of future housing development sites from their Neighbourhood Plan and outlined permissions. There is not expected to be any growth from either Cotswold district or Wiltshire Council at this WwTW within the Local Plan period. This WwTW has not been assessed further.

#### 3.3.5 Wychavon

Wychavon District Council provided the allocated sites from the draft South Worcestershire Development Plan. There is one site within the Honeybourne WwTW catchment, which serves Cotswold District and would be serving the proposed allocations.

Table 3.3 Growth from Wychavon using infrastructure shared with Cotswold district

| WwTW        | Proposed number of dwellings | Potential employment space (m <sup>2</sup> ) | Period     |
|-------------|------------------------------|----------------------------------------------|------------|
| Honeybourne | None identified              | 31                                           | Up to 2041 |



### 3.3.6 Neighbouring authorities with no shared wastewater infrastructure

The following LPAs share a boundary with Cotswold district but do not share any wastewater infrastructure:

- South Gloucestershire
- Stroud
- Swindon
- Tewkesbury
- West Oxfordshire
- Vale of White Horse

## 3.4 Growth and water demand

### 3.4.1 Water demand from housing

The estimate of water demand from each housing site was based on the number of houses, and per capita consumption and average occupancy statistics taken from the relevant water supply companies Water Resource Management Plan (WRMP24) tables. The base year 2024/25 was used and was assumed to stay the same throughout the plan period. This represents the baseline "business-as-usual" scenario, not accounting for water efficient design and supply and demand measures from the water companies' WRMPs.

### 3.4.2 Water demand from employment sites

Demand from employment sites was calculated assuming a rate of 100l/d per employee. Where the forecast number of employees for a site was not specified by CDC, employment floorspace and assumed density based on employment use classes was used to calculate an indicative number of employees for a site. Table 3.4 below outlines the assumed densities of employment space derived from the Homes and Communities Agency (2015) Employment Density Guide third edition. This guide pre-dates recent changes in working practices including the Covid-19 pandemic and technological changes to support working from home and automation.

Table 3.4: Employment use classes and assumed densities used to calculate water demand.

| Use class | Description                    | Density (m <sup>2</sup> /employee) |
|-----------|--------------------------------|------------------------------------|
| B1        | Offices (assumed)              | 32                                 |
| B1a       | Offices                        | 8                                  |
| B1b       | Research and development space | 40                                 |
| B1c       | Light industrial               | 47                                 |
| B2        | Industrial and manufacturing   | 36                                 |
| B8        | Storage and distribution       | 70                                 |

| Use class  | Description | Density<br>(m <sup>2</sup> /employee) |
|------------|-------------|---------------------------------------|
| Mixed B    | Mixed       | 32.75                                 |
| B1, B2, B8 | Mixed       | 38                                    |
| Mixed A    | Mixed       | 15                                    |

### 3.4.3 Business as usual Water Demand Forecast

The impact of planned growth across the CDC's Local Plan Review period on water demand is summarised in Figure 3.1 below, displaying demand from each source of growth outlined in Table 3.1 and from neighbouring authorities. Additional water demand from planned development in CDC is forecast to grow by 9.78 Ml/d across the five-water industry Asset Management Plan (AMP) periods spanning the Local Plan period.

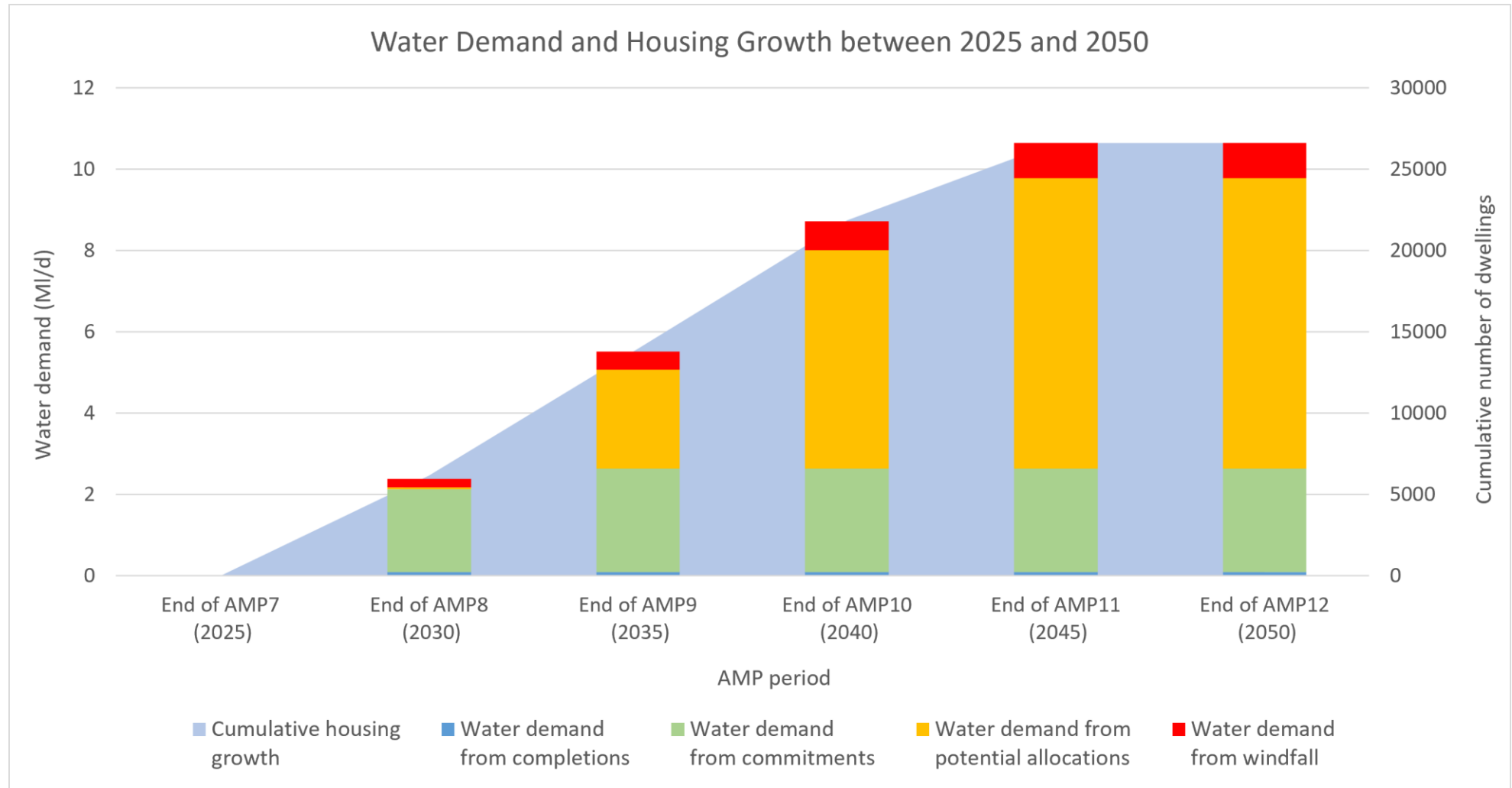


Figure 3.1: Cumulative water demand driven by additional dwellings forecast across the Local Plan period

## 4 Water resources

### 4.1 Introduction

#### 4.1.1 Objectives

The aim of the water resources assessment is to ensure that sufficient water is available in the region to serve the proposed level of growth, and that it can be abstracted without a detrimental impact on the environment, both during the plan period and into the future. The assessment characterises the study area, identifying the key surface water and groundwater bodies, and local geology. It highlights the pressures on water resources in the region, identifies existing constraints on abstraction, and provides evidence for adopting tighter water efficiency targets.

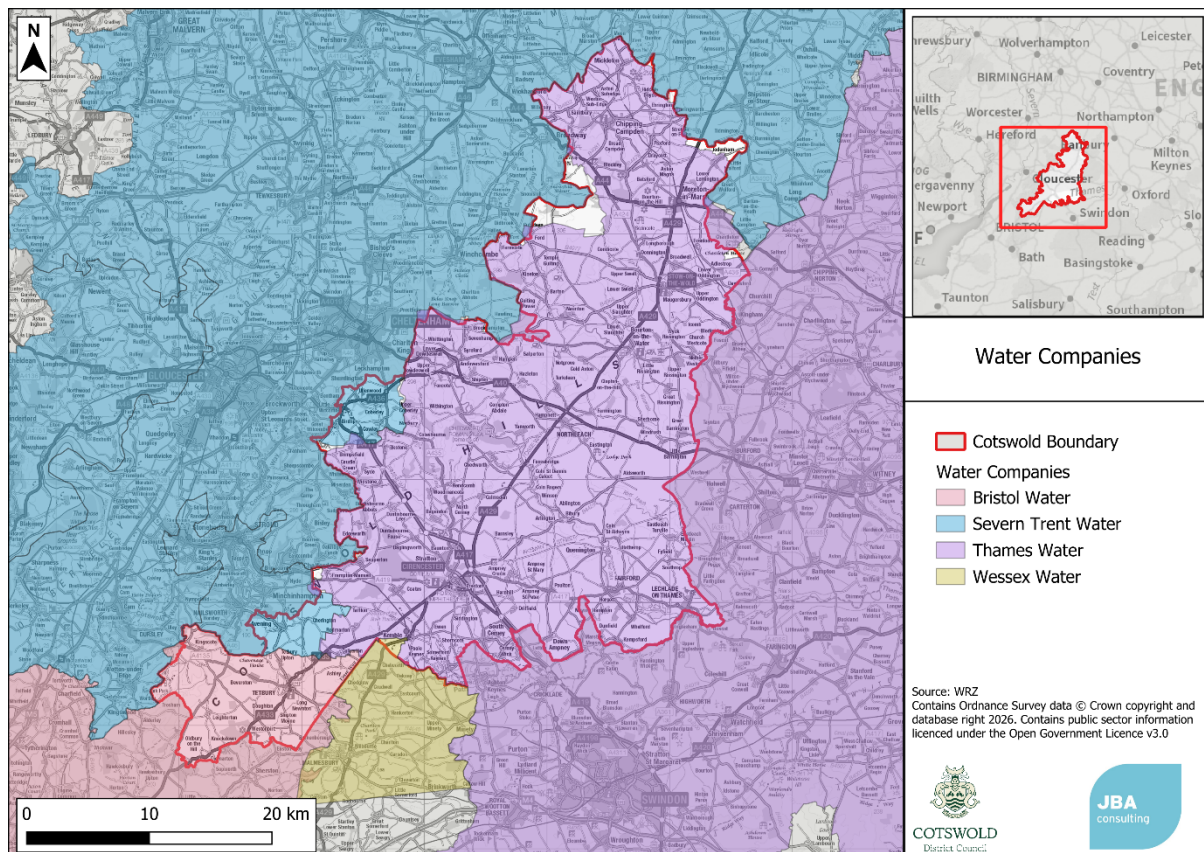


Figure 4.1 Water supply areas

#### 4.1.2 Water resources in England

It is important to set water resources in Cotswold District within the context of the overall national picture.

The EA (Environment Agency, 2024) published [a summary of England's revised draft regional and water resources management plans \(gov.uk\)](#) which includes their view

on the overall state of water resources in the UK and the challenges the country faces. They state that:

'In England, our climate is changing, our population is growing, and as a nation we want an improved environment along with a thriving economy, enabled by resilient water supplied. Action is required now to meet these objectives'.

'The scale of the challenge we face increases with time, and, by 2050, we are looking at a shortfall of nearly 5 billion litres of water per day between the sustainable water supplied available and the expected demand.'

'Demand reductions are crucial, particularly in the short term. The Environment Act 2021 sets a target to reduce the use of public water supply in England, per head of population, by 20% by 2037-38 from the 2019-20 baseline.'

'Government will be looking to water companies to act quickly and take significant steps forward on installing smart meters and delivering on their wider water efficiency commitments and reducing leakage. This will happen alongside the introduction of a mandatory water label which will enable water efficient decisions across the country. The government has also committed to review water efficiency requirements of building regulations which will be a key action to ensure new homes are water efficient.'

There have been several important documents published in recent years, all highlighting the growing awareness and concern about this issue. The National Water Resources Framework led to the creation of the regional water resources planning groups and defined the objective to achieve an average household water efficiency of 110l/p/d by 2050 (including existing housing).

The Government's EIP published in January 2023 contains a roadmap for improving water efficiency in new developments and retrofits. This contains an action to review Building Regulations (2010) and consider a new standard for new homes in England of 105 l/p/d and 100 l/p/d where there is a clear local need, such as in areas of serious water stress. Whilst this is not current policy, it is likely that a tighter standard than the 110l/p/d will be adopted in Building Regulations early in the Local Plan period.

## 4.2 Characteristics of the study area

### 4.2.1 Introduction

This section aims to review the geological and hydrogeological setting of the Cotswolds (the "study area") and the aquifer properties of the groundwater bodies, which will both supply and receive water discharges from the area and be affected by continued development.



#### 4.2.2 Topography

The topography of the study area is shown in Figure 4.2 below. The southern and eastern sections of the district are relatively flat river floodplains (green), which extend into river valleys orientated north to south through the district with the highest elevations in the north (red and white). The river valley basins range between 75-80 mAOD which increase to at maximum 265mAOD in the north. Therefore, the majority of overland surface water (and consequently groundwater) will flow from the northern district boundary towards the south, with minor exceptions where smaller river valleys are orientated south to north towards the Stroud and Cheltenham districts.

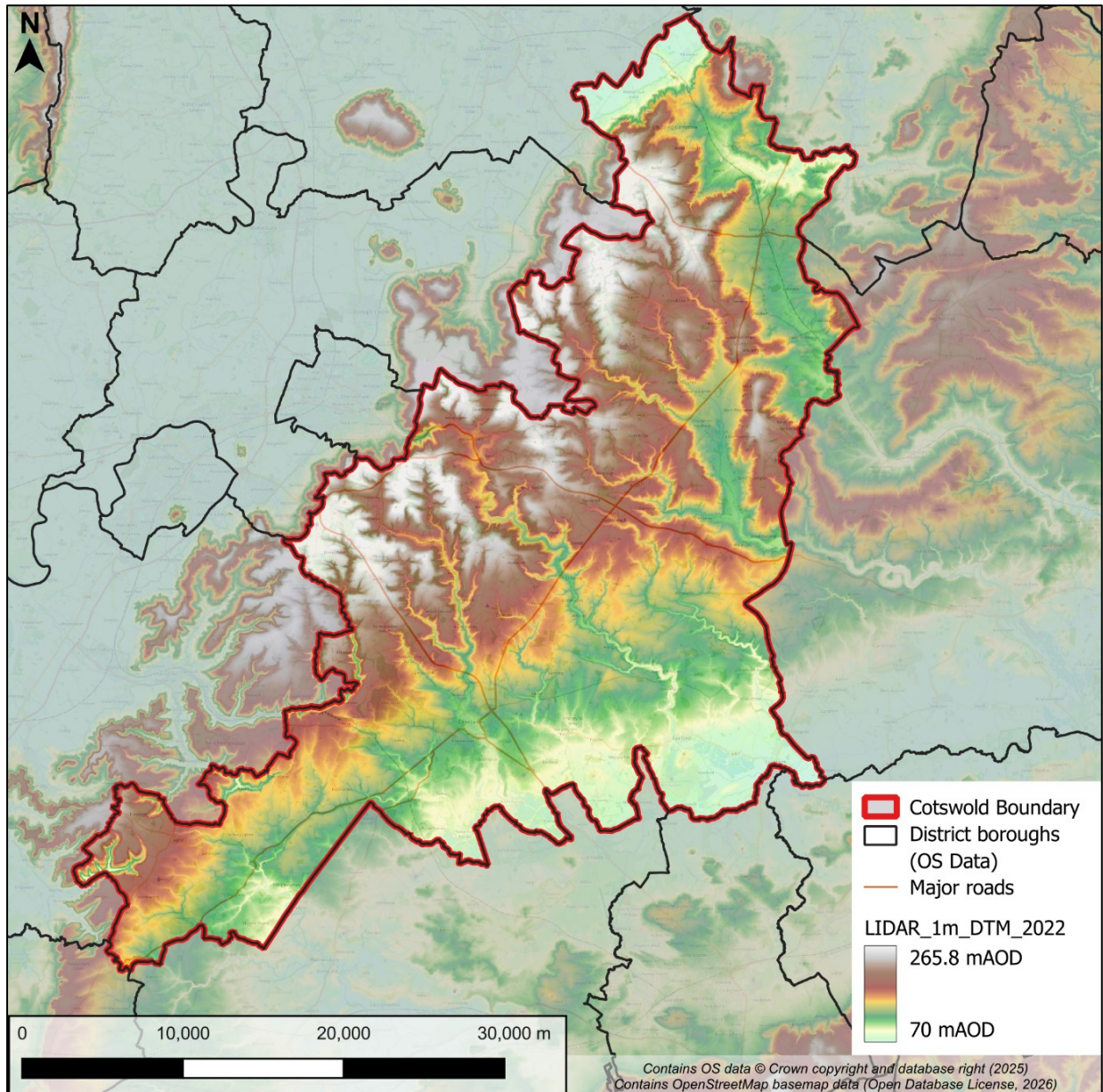


Figure 4.2- Cotswolds topography



### 4.2.3 Catchment

There are ten EA gauging stations identified from the UK Hydrometric Register (2008) within the study area, which can be seen in Figure 4.3. The Baseflow Index (BFI) of these rivers and the standard average annual rainfall (SAAR) given by the gauge data is summarised in Table 4.1 below. The BFI represents the proportion of total streamflow made up of baseflow (groundwater input); the higher the BFI, the more reliant on short term surface water flow (rainfall) the river is.

Table 4.1: River Base Flow Index and Standard Annual Average Rainfall within study area

| River name                | Gauging Station                                   | Base Flow Index (BFI) <sup>3</sup> | SAAR period 1941 - 1970 | SAAR period 1961 - 1990 | SAAR period 1991 - 2020 |
|---------------------------|---------------------------------------------------|------------------------------------|-------------------------|-------------------------|-------------------------|
| River Eye                 | Windrush at Bourton on the Water (Station: 39142) | 0.94                               | 801 mm/yr               | 799 mm/yr               | 918 mm/yr               |
| River Eye                 | Dikler at Bourton on the Water (Station: 39143)   | 0.83                               | 794 mm/yr               | 759 mm/yr               | 867 mm/yr               |
| River Leach               | Leach at Priory Mill Lechlade (Station: 39042)    | 0.80                               | 776 mm/yr               | 736 mm/yr               | 823 mm/yr               |
| River Coln                | Coln at Fossebridge (Station: 39109)              | 0.9                                | 816 mm/yr               | 832 mm/yr               | 938 mm/yr               |
| River Coln                | Coln at Bibury (Station: 39110)                   | 0.92                               | 818 mm/yr               | 821 mm/yr               | 914 mm/yr               |
| River Coln                | Coln at Fairford (Station: 39143)                 | 0.93                               | 814 mm/yr               | 808 mm/yr               | 898 mm/yr               |
| Ampney and Poulton Brooks | Ampney Brook at Ampney St Peter                   | 0.77                               | 836 mm/yr               | 809 mm/yr               | 873 mm/yr               |

| River name   | Gauging Station                           | Base Flow Index (BFI) <sup>3</sup> | SAAR period 1941 - 1970 | SAAR period 1961 - 1990 | SAAR period 1991 - 2020 |
|--------------|-------------------------------------------|------------------------------------|-------------------------|-------------------------|-------------------------|
|              | (Station: 39099)                          |                                    |                         |                         |                         |
| River Churn  | Churn at Perrott's Brook (Station: 39108) | 0.88                               | 878 mm/yr               | 855 mm/yr               | 945 mm/yr               |
| River Churn  | Churn at Cirencester (Station: 39073)     | 0.91                               | 879 mm/yr               | 854 mm/yr               | 927 mm/yr               |
| River Churn  | Churn at Cerney Wick (Station: 39035)     | 0.84                               | 860 mm/yr               | 833 mm/yr               | 896 mm/yr               |
| River Thames | Thames at Ewen (Station: 39071)           | 0.69                               | 887 mm/yr               | 815 mm/yr               | 873 mm/yr               |

The high baseflow index of the rivers in the study area (between 0.69-0.91) reflects that these rivers are highly reliant on groundwater flow for their water supply rather than shorter term rainfall and surface water flow. It should be noted however that due to the highly permeable, karstic nature of the limestones in the Cotswolds, these BFI values are limited in representing the rapid nature of groundwater to the rivers via subsurface voids and cave systems; a higher BFI assumes the groundwater is slower with delayed flow to rivers, but karstic limestone will behave more rapidly like surface water.

The SAAR is the average rainfall across a catchment over a 30-year period derived from the National River Flow Archive<sup>1</sup>. Annual rainfall has generally increased over the three periods, which matches trends across the UK. The Cotswolds receives slightly less rain than the majority of the southwest of the UK according to 50-year datasets<sup>2</sup>.

1 River gauge and rainfall data available at: <https://nrfa.ceh.ac.uk/data/search>

2 50 year average annual rainfall data across the UK available at: <https://www.arcgis.com/apps/dashboards/d29ad7056f3548eb8affeb1c0ad50106>

#### 4.2.4 Surface water hydrology

Several Environment Agency-designated main rivers flow through the Cotswold district study area, forming a critical component of the district's hydrological infrastructure.

Surface waterbodies in and around the study area are shown in Figure 4.3. They are summarised here:

- The source of the River Thames can be found near Kemble, and it runs south-east through Somerford Keynes and then along the eastern boundary of the Cotswold District. The River Churn, Ampney Brook, River Coln, River Leach, River Windrush, and the River Evenlode are all tributaries to the River Thames, the sources of each can be found in the Cotswold District.
- The River Churn begins in Coberly, running south through Cirencester and then through South Cerney where it begins to join the River Thames.
- Ampney Brook begins just east of Cirencester, outside of Ampney Crucis and runs south through Down Ampney.
- Brockhampton, in the west of the district, is where the source of the River Coln is. The River Coln then runs south-east towards and through Fairford and then east towards Lechlade where it joins the River Thames.
- The River Leach begins in Northleach, running south-east, around the west and south of Aldsworth and towards Eastleach. The River Leach joins the River Thames just south-east of Lechlade.
- The source of the River Windrush can be found to the east of Taddington (Gloucestershire) where it flows south through Guiting Power, and then east towards Bourton-on-the-Water where it is joined by the River Dikler. The River Windrush then runs south towards Windrush where it is joined by the Sherbourne Brook before running east towards Oxfordshire.
- The River Evenlode runs south from Moreton-in-Marsh, through Evenlode and towards Bledington.

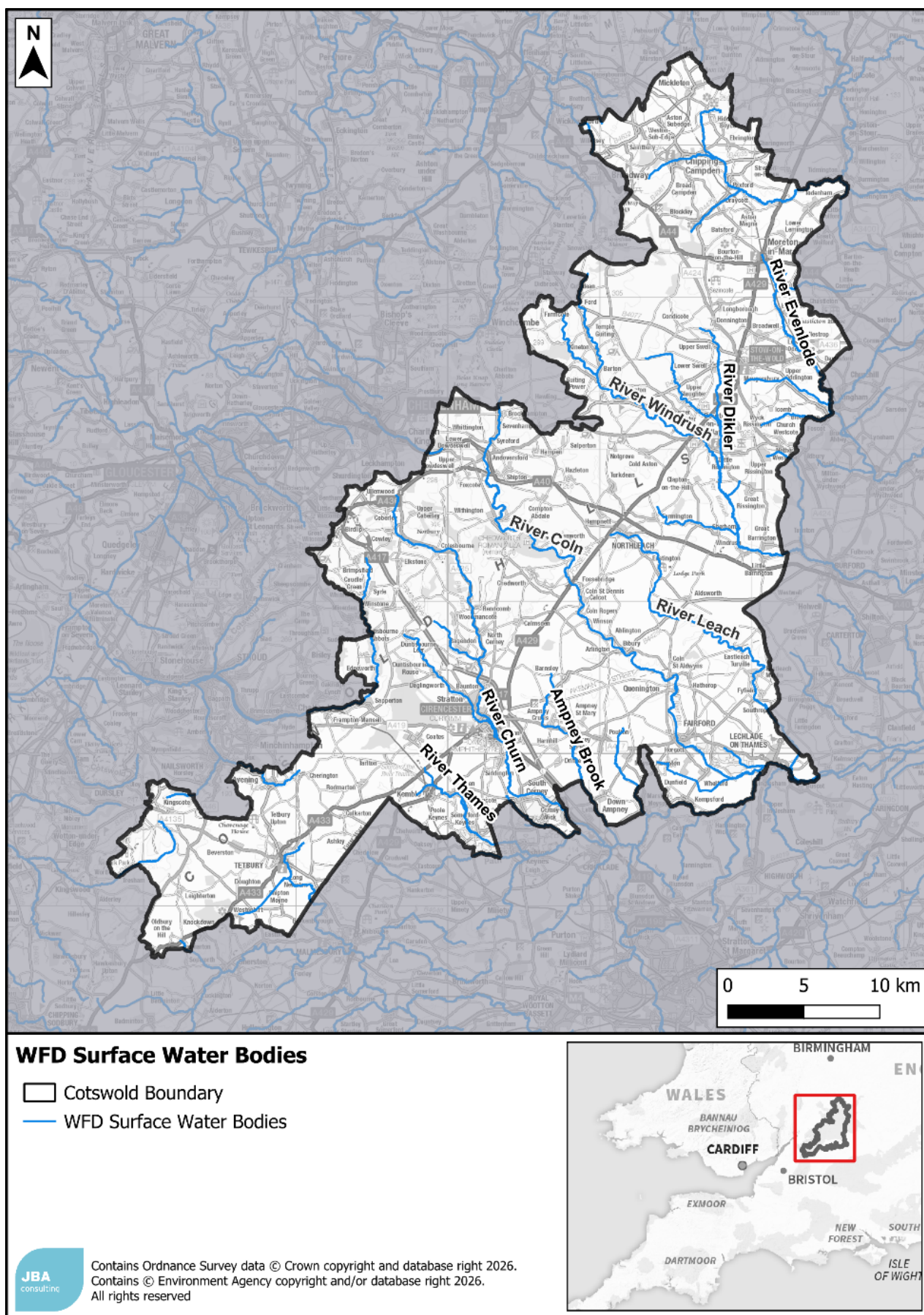


Figure 4.3 Surface waterbodies in and around Cotswold District



#### 4.2.5 Groundwater hydrology

A WFD groundwater body represents a distinct body of groundwater flow with a coherent flow unit including recharge and discharge areas with little flow across the boundaries. Groundwater bodies are shown in Figure 4.4 below.

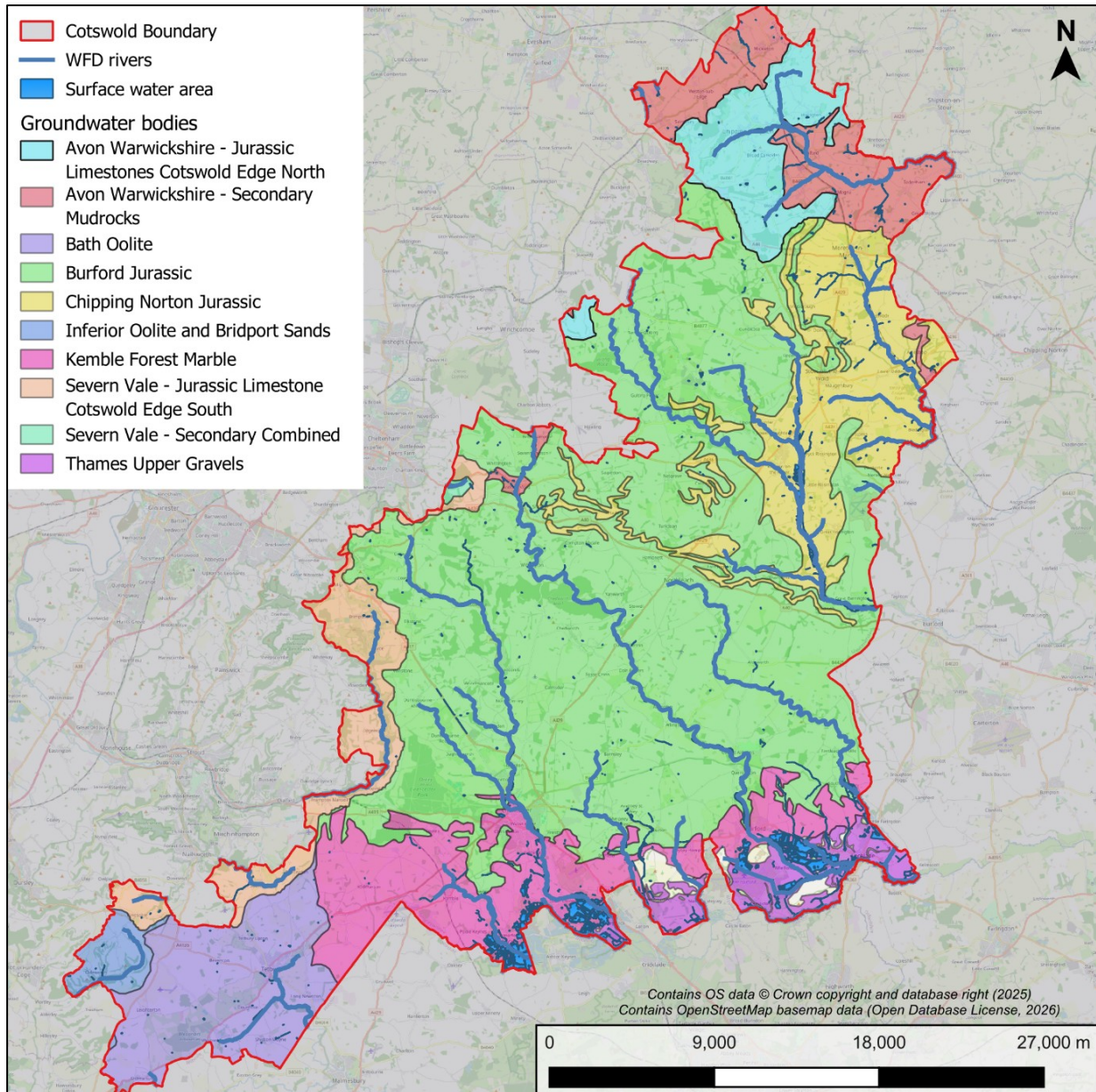


Figure 4.4 Groundwater bodies in Cotswold District

The majority of the study area is covered by the Burford Jurassic groundwater body. A band of Kemble Forest Marble lies to the south of the study area, with the furthest southern section underlain by the Bath Oolite. A small area to the southeast is part of the Thames Upper Gravels groundwater body. To the east, there is a section of the Chipping Norton Jurassic, while small areas to the north are covered by the Avon Warwickshire – Secondary Mudrocks and Avon Warwickshire – Jurassic Limestones (Cotswold Edge North) groundwater bodies.

WFD classification of the groundwater bodies Figure 4.4 can be found in Table 4.2.

Table 4.2: WFD status of groundwater bodies in the study area.

| Groundwater bodies                                          | Waterbody ID   | Quantitative status | Chemical status | Overall status |
|-------------------------------------------------------------|----------------|---------------------|-----------------|----------------|
| Warwickshire Avon - Jurassic Limestones Cotswold Edge North | GB40901G304400 | Good                | Good            | Good           |
| Severn Vale - Jurassic Limestone Cotswold Edge South        | GB40901G305700 | Good                | Good            | Good           |
| Inferior Oolite and Bridport Sands                          | GB40901G305800 | Poor                | Poor            | Poor           |
| Bath Oolite                                                 | GB40901G805500 | Poor                | Poor            | Poor           |
| Severn Vale - Secondary Combined                            | GB40902G204900 | Good                | Good            | Good           |
| Warwickshire Avon - Secondary Mudrocks                      | GB40902G990900 | Good                | Good            | Good           |
| Burford Jurassic                                            | GB40601G600400 | Poor                | Poor            | Poor           |
| Chipping Norton Jurassic                                    | GB40602G600300 | Poor                | Poor            | Poor           |
| Kemble Forest Marble                                        | GB40602G600500 | Poor                | Poor            | Poor           |
| Upper Thames Gravels                                        | GB40603G000200 | Poor                | Poor            | Poor           |

Quantitative status of poor means that the water bodies failed the quantitative groundwater balance test, indicating the total existing abstraction may not be sustainable in the long term. This failure is associated with abstraction for agricultural and rural land management, as well as public water supply. Poor chemical status is associated with agriculture, rural and urban land management, point, and diffuse sources of pollution.



## 4.3 Geology

### 4.3.1 Summary

The geology of catchments is an influencing factor in water runoff from the ground surface, and how appropriate the type of SuDS is for a development due to the variations in the permeability of surface material and bedrock stratigraphy.

Information on the geology of the study area has been derived from 1:625,000 British Geological Survey geology mapping (BGS online map viewer), BGS Solid & Drift Geology Map, and BGS online borehole archive.

The geology underlying the study area is summarised in Table 4.3 below.

Table 4.3: Stratigraphy of lithologies underlying the study area

| Age        | Group   | Unit                                | Description                                                                                                                                                                                                                                                                                                          | Thickness (m)                                 |
|------------|---------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Quaternary | Topsoil | Soilscape 3<br>(>60% of study area) | Shallow lime-rich soils over chalk or limestone with arable grassland landcover*. Particularly vulnerable to leaching of nitrate and pesticides to groundwater; surface capping and erosion of chalk soils on steeper slopes, linked with eutrophication and silting of chalk streams and their gravel spawning beds | 0.2-0.9m***                                   |
| Quaternary | Topsoil | Soilscape 18<br>(~20% study area,   | Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*. Landcover is seasonally wet arable grassland and some woodland. Main risks are associated with overland flow from compacted or poached fields.                                                                                  | 0.3 - 0.4m***                                 |
| Quaternary | Topsoil | Soilscape 9                         | Lime-rich loamy and clayey soils with impeded drainage*. Landcover is arable pastures and "classic chalky boulder clay ancient woodlands"*.                                                                                                                                                                          | Unknown<br>(limited shallow borehole records) |
| Quaternary | Topsoil | Soilscape 5                         | Freely draining lime-rich loamy soils with landcover of herb-rich chalk and limestone pastures and deciduous woodlands.                                                                                                                                                                                              | 0.3- 0.9m                                     |
| Quaternary | Topsoil | Soilscape 22                        | Loamy soils with naturally high groundwater, landcover of arable grassland, wet meadows and woodlands*. Limited extent around rivers especially in the south (Cirencester).                                                                                                                                          | 0.1-0.4m                                      |
| Quaternary | Topsoil | Soilscape 20                        | Loamy and clayey floodplain soils with naturally high groundwater*. Limited extent around existing rivers.                                                                                                                                                                                                           | Variable, 0.15-0.4m                           |

| Age             | Group                                                               | Unit                                          | Description                                                                                                        | Thickness (m)                                                       |
|-----------------|---------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Quaternary      | Topsoil                                                             | Soilscape 8                                   | Slightly acid loamy and clayey soils with impeded drainage*.                                                       | Unknown<br>(limited borehole records due to sparse patches of soil) |
| Quaternary      | Superficial deposits<br><br>(1:625,000 scale)<br><br>(in age order) | Alluvium                                      | Unconsolidated clay, silt, sand and gravel river deposits.**                                                       | 4-6m***                                                             |
| Quaternary      | Superficial deposits                                                | River Terrace deposits                        | Undifferentiated sands and gravels locally with lenses of silt, clay or peat.                                      | 3-5m***                                                             |
| Quaternary      | Superficial deposits                                                | Till                                          | Over consolidated, unsorted clay, sand, gravel, boulders**                                                         | 4-7m***                                                             |
| Quaternary      | Superficial deposits                                                | Glacial Sand and gravel                       | Sand and gravel with rare clay interbeds**                                                                         | 3-7m***                                                             |
| Quaternary      | Superficial deposits                                                | Landslip (undifferentiated rock)              | Variable rock, earth and debris material dependant on the nature of the upslope material and type of slip failure. | Highly variable and dependent on slope gradient.                    |
| Middle Jurassic | Bedrock<br><br>(1:625,000)                                          | Kellaways Formation and Oxford Clay Formation | Silicate grey mudstone with local thin beds of siltstone and sandstone and nodules of argillaceous limestone.      | 50-70m (Oxford Clays, northeast**)                                  |

| Age             | Group                        | Unit                  | Description                                                                                                                                                                                                | Thickness (m)                                                              |
|-----------------|------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
|                 | scale)<br><br>(in age order) | (undifferentiated)    |                                                                                                                                                                                                            |                                                                            |
| Middle Jurassic | Bedrock                      | Great Oolite group    | Variety of mudstone-dominated and ooidal, bioclastic and fine-grained limestone formations consisting of sandstone, limestone and argillaceous rocks.                                                      | 60-90m**                                                                   |
| Middle Jurassic | Bedrock                      | Inferior Oolite group | (Specific to the Cotswolds-Weald area, varies across the UK) Varied succession of ooidal, peloidal, sandy, ferruginous and shelly limestones, with subordinate sandstone, lime-mudstone and mudstone beds. | 10-20m (south Cotswolds)<br>20-106m (north Cotswolds)**                    |
| Triassic        | Bedrock                      | Lias group            | Predominantly grey, well bedded, marine calcareous mudstone and silty mudstone with thin beds of limestone (lower part), thick siltstone and sandstone beds (upper part) and some ironstone (middle part). | 120m (Whitby Mudstone member)**<br>Generally less than 300m (Lias Group)** |

Sources:

\*Soil Landscapes Online Viewer

\*\*BGS Online Lexicon of Named Rock Units

\*\*\*BGS Borehole Records

### 4.3.2 Topsoil

Soil classification by the Soil Landscapes Online Viewer (DEFRA, 2022) has classified the soils throughout the study area into seven types (see Table 4.3). Soilscape 3, which covers the majority of the area across the east, is described as shallow lime-rich soils over chalk or limestone with arable grassland landcover. This soil is noted to be particularly vulnerable to leaching of nitrate and pesticides to groundwater; surface capping and erosion of chalk soils on steeper slopes, which is linked with eutrophication and silting of chalk streams and their gravel spawning beds.

Soilscape 18 is the second dominant soil type in the Cotswolds, described as slowly permeable, seasonally wet and slightly acidic but base-rich loamy and clayey soils. The landcover is seasonally wet arable grassland and some woodland with main risks associated with overland flow from compacted or poached fields.

The remaining four soil types are limited in their extent and patchy in areas directly adjacent to rivers and the river valley basins. They are generally all lime rich, loamy soils associated with floodplains.

### 4.3.3 Artificial (Made) ground

The BGS GeoIndex indicates that Artificial Made Ground is very sparse across the study area and found in relatively small patches underlying existing building footprints. The most concentrated area of made ground according to the BGS data is across South Cerney and surrounding Ashton Keynes, which represents the quarries which have now been filled with water to form reservoirs, rather than artificial fill material. Made Ground will be associated with all building footprints and roads within the study area and be highly variable in thickness. Open-source data of building footprints alone (not including roads, or surrounding infrastructure or the BGS data) make up less than 0.1% of the total study area, which is an underestimate of Made Ground. This can be seen in Figure 4.5, which provides the distribution of made ground across the study area.



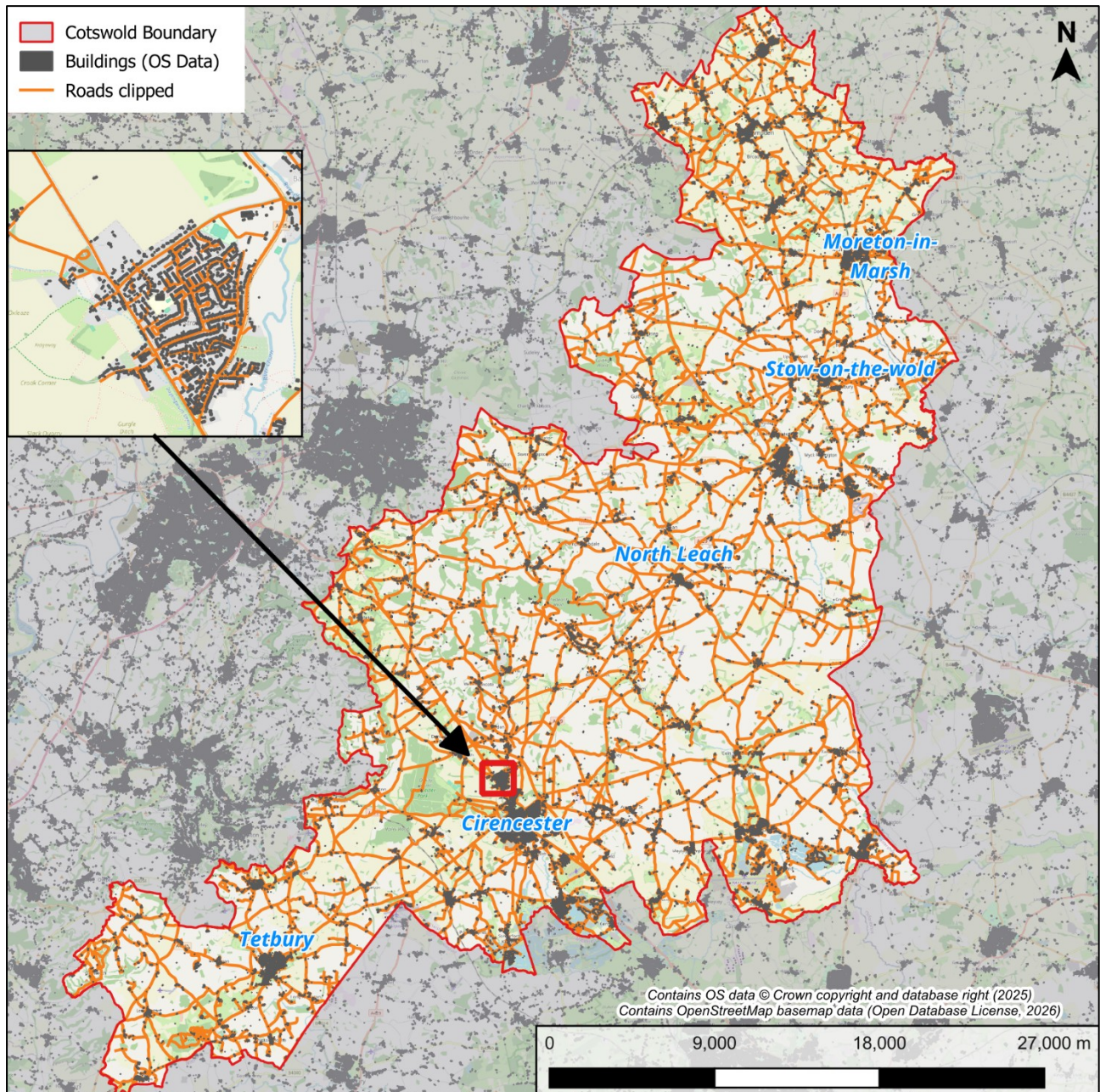


Figure 4.5- Artificial land cover

#### 4.3.4 Superficial geology

The superficial deposits of the study area and the surrounding local area are shown in Figure 4.6. The BGS GeoIndex (1:625k) indicates that the main superficial deposits in the study area comprise Alluvium, Till, Glacial Sand and gravel, River Terrace deposits, and Landslip (undifferentiated rock).

- The Alluvium is limited to the inner river valleys in the centre and south of the study area is generally between 4-6m thick (BGS historical borehole records) and consists of sands, silts and clays with some bands of gravel. It is deposited by a glacier and often found on valley floors. The most extensive deposits are found



along the River Churn near Cirencester (south), the River Coln (especially around Burton-on-the-water) and the River Eye.

- The Till (Devensian) found only in the northeast of the study area (around Moreton-in-marsh) consists of over consolidated, unsorted clays, sand, gravel and boulders of varying sizes. The limited borehole records in this area indicate thicknesses of between 4-7m (the majority are deep wells recording stratigraphy after 20mbgl) and are concentrated in bulb-like floodplain areas around the River Evenlode source and upper course.
- The glacial sand and gravel deposits are very localised to patches near the source of the River Knee Bk (northwest of Chipping Campden), the River Evenlode (north of Crawthron Wood) and Ozelworth Bk (underlying Newark Park). These deposits are between 3-7m thick beds of sand and gravel.
- The River Terrace deposits, concentrated in a east to west orientated band across the south of the study area, comprise undifferentiated fluvial sands and gravels with clasts of Jurassic limestone (beneath this layer) and some alluvium (above this layer). It lines the slopes in elevated benches of the wider river basin valleys as remnants of former floodplains. These deposits are generally between 3 and 5m thick, thinning towards existing river channels where the river has incised the valley.
- The Landslip ("undifferentiated rock") deposits line the southwest border of the study area and are described as highly variable rock, earth and debris dependant on the type of slip failure and upslope material. In these areas of the Cotswolds, these deposits are likely made of weak Jurassic limestone bedrock, mudstone and sandstone formed by ancient rotational landslips, which have mixed the inferior oolite limestone (see Section 4.3.5) into the weaker Charmouth and Whitby mudstones which underlie the limestone. Thicknesses will be highly variable and characterised by hummocky terrain on upper slopes in the study area.

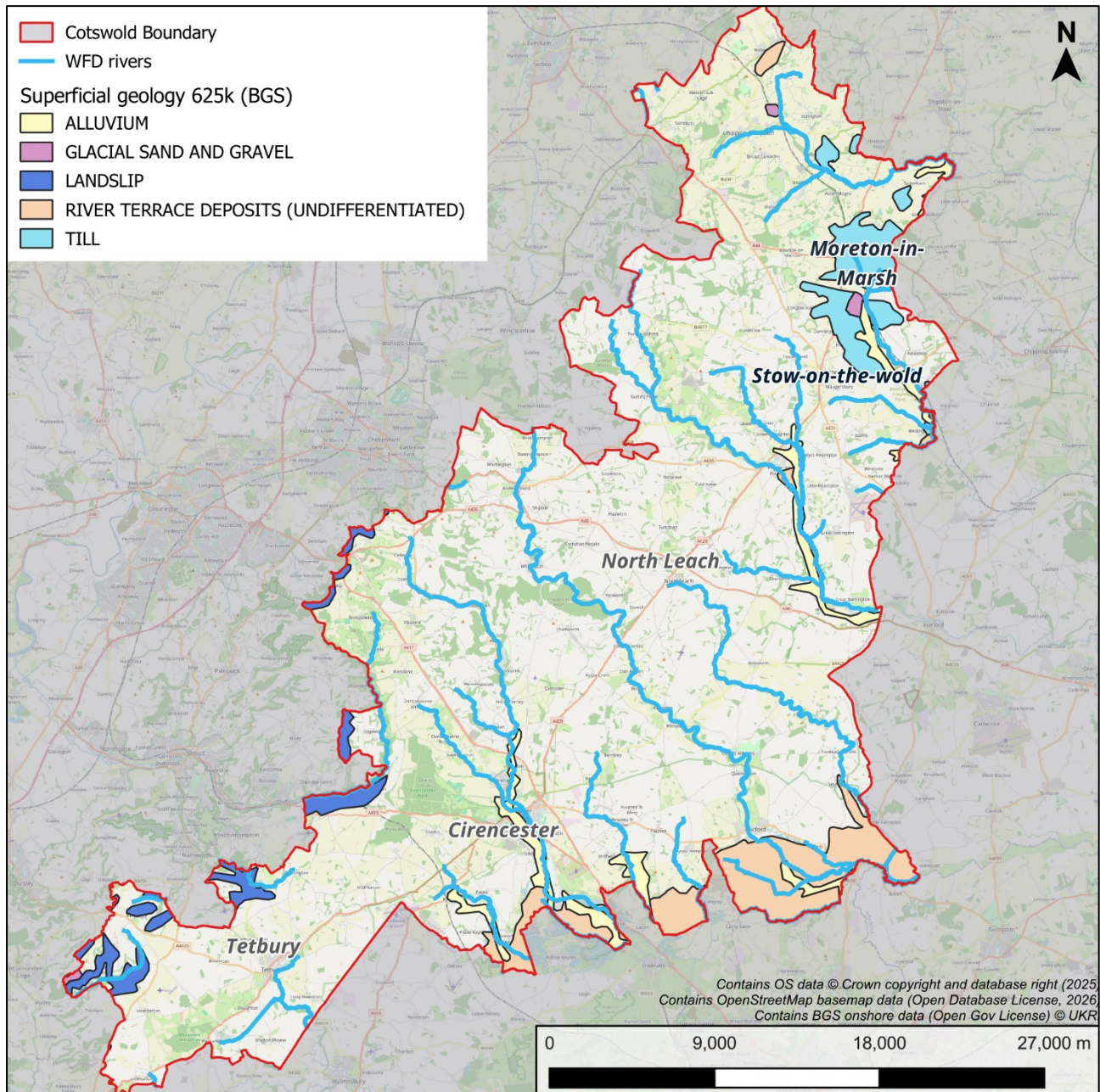


Figure 4.6- Superficial geology of the Cotswolds

#### 4.3.5 Bedrock geology

The BGS 1:625k geology mapping shows that the bedrock geology of the study area comprises four main bedrock lithologies, predominantly the Great Oolite group (limestone) across the majority of the area, bordered by the Kellaways Clay formation to the south, the Inferior Oolite Group across the northern half of the area (roughly outlines the river valleys) and the Lias group across the northeast. These are shown in Figure 4.7 below.



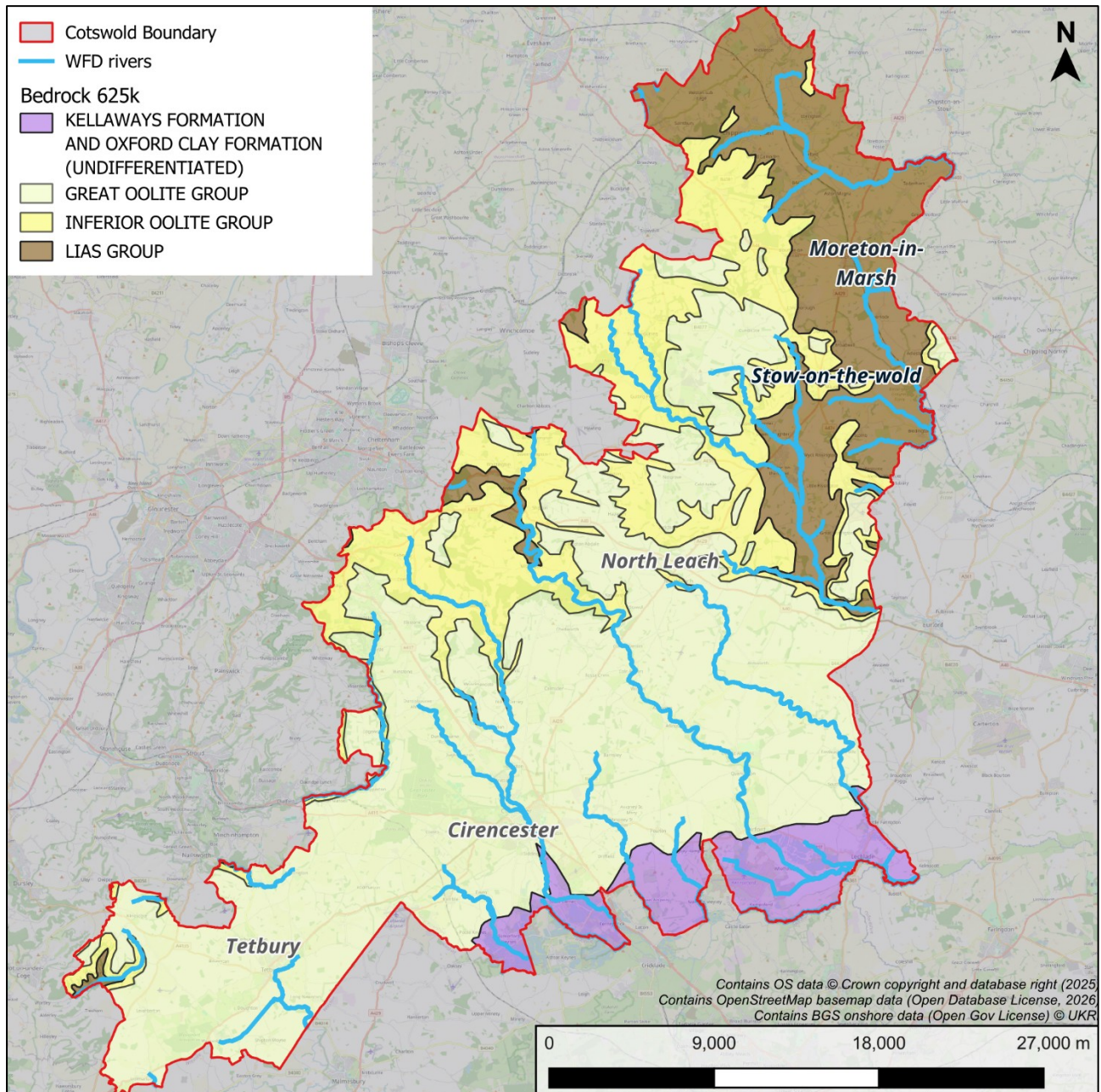


Figure 4.7- Bedrock geology of the Cotswolds

The Greater Oolite Group bedrock across the majority of the study area is a mixture of different 'hard' limestones and argillaceous rock formations alternating with clay, the majority of which capable of forming large conduit and fracture systems underground. The Inferior Oolite group also consists of limestones but is more ferruginous and underlies the greater oolite group. The Lias Group underlying this in the northeast is also a limestone group, but in contrast comprises predominantly mixed mudstones, limestone and marl formations. The Kellaway Clays and Oxford Clays Group (undifferentiated) is the youngest formation on top of the Oolite Limestones, which in the Cotswolds comprises primarily Oxford Clays (BGS 1:50k mapping).

#### 4.3.6 Mining risk areas

There are no development high risk areas (DHRA) within the Cotswolds district boundary according to the mining layout data from the Mining Remediation Authority. There are also no mapped mine shafts, adits or gutter pits within the Cotswolds according to the BGS dataset. However, due to the karstic nature of the bedrock limestones, it is very likely that underground conduits and cave systems are widespread and due to not being 'man-made' are underrepresented in the BGS database.

### 4.4 Hydrogeology

#### 4.4.1 Aquifer classification

Table 4.4 summarises the Environment Agency's (EA) hydrogeological classification of the bedrock and superficial deposits underlying the study area.

Table 4.4: Hydrogeology of Cotswold District

| Drift/Bedrock                | Unit                                                             | Environment Agency Aquifer Classification   |
|------------------------------|------------------------------------------------------------------|---------------------------------------------|
| Superficial (drift) deposits | Alluvium                                                         | Secondary A aquifer (moderately productive) |
| Superficial (drift) deposits | River Terrace deposits                                           | Secondary A aquifer (moderately productive) |
| Superficial (drift) deposits | Till                                                             | Secondary undifferentiated aquifer          |
| Superficial (drift) deposits | Glacial Sand and gravel                                          | Non aquifer (unproductive)                  |
| Superficial (drift) deposits | Landslip (undifferentiated rock) Mass Movement Deposit           | Non aquifer (unproductive)                  |
| Bedrock                      | Kellaways Formation and Oxford Clay Formation (undifferentiated) | Non aquifer (unproductive)                  |
| Bedrock                      | Great Oolite group                                               | Principal Aquifer (highly productive)       |
| Bedrock                      | Inferior Oolite group                                            | Principal Aquifer (highly productive)       |
| Bedrock                      | Lias Group                                                       | Secondary undifferentiated aquifer          |

Explanation of aquifer classes (from Environment Agency website):

- Principal aquifers - "may support water supply and/or baseflow to rivers on a strategic scale."
- Secondary A aquifers - "permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of baseflow to rivers."

- Secondary B aquifers - "predominantly lower permeability layers which may store and yield limited amounts of groundwater."
- Secondary undifferentiated aquifers: "It is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type"

#### 4.4.2 Aquifer vulnerability

The BGS's groundwater vulnerability mapping indicates underlying bedrock units of the majority of the study area as high risk combined with soluble rock risk. This correlates with the underlying Oolite Limestone and Inferior Oolite Limestone bedrocks, which underlie the majority of the Cotswolds, with limited protection from superficial deposits. There are some patches of medium and medium to low risk in areas to the northeast (e.g. Moreton-on-marsh) which correlates to where superficial deposits along the river are found, and the transition to the Lias Group (overlying the more vulnerable limestones). Due to the lack of widespread natural cover from superficial deposits and impermeable bedrock, this results in a medium-high pollution risk to groundwater from surface activities across the Cotswolds. Additional measures over and above good practice pollution prevention requirements to ensure that groundwater isn't impacted will be required, especially across the centre and southwest.

#### 4.4.3 Groundwater source protection zones

Source Protection Zones (SPZs) are used to protect areas of vulnerable groundwater that are used for abstraction and where water quality is of high importance (such as drinking water abstractions). SPZs are categorised into three zones, 1-3, with 1 being most sensitive to pollution, and 3 representing the lowest risk but still within the groundwater catchment of the abstraction. These are identified and shown in 9.5.4, alongside the guidance from the EA.

### 4.5 Availability of water resources

#### 4.5.1 Abstraction Licensing Strategy

The Environment Agency working through the Catchment Abstraction Management Strategy (CAMS) process, prepare an Abstraction Licensing Strategy (ALS) for each sub-catchment in a river basin. The strategy sets out how water resources are managed within England and contributes to the implementation of the WFD. The ALS report provides information on the resources available and what conditions might apply to new licences. The licences require abstractions to stop or reduce when a flow or water level falls below a specific threshold, as a restriction to protect the environment and manage the balance between supply and demand for water users.

All new licences, and some existing licences are time limited, allowing for periodic review of the area as circumstances may have changed since the licence was first issued. The duration is generally twelve years, but shorter licences may be granted if they are based on



resource assessment and environmental sustainability grounds. In some cases, future plans or changes may mean that the EA will grant a shorter time limited licence, so it can be re-assessed following the change. If a licence is only required for a short time, it can be granted either as a temporary licence or with a short time limit. If a licence is considered to pose a risk to the environment it may be granted with a short time limit while monitoring is carried out. The licences are then replaced with a changed licence, revoked or renewed near to the expiry date.

The ALS are important in terms of the Water Resource Management Plan (WRMP) as this helps to determine the current and future pressures on water resources and how the supply and demand will be managed by the relevant water companies. An abstraction license is needed from the Environment Agency if abstraction is above 20m<sup>3</sup>/ day (4,400 gallons) a day from:

- rivers or streams
- reservoirs, lake or pond
- canal
- spring or
- an underground source

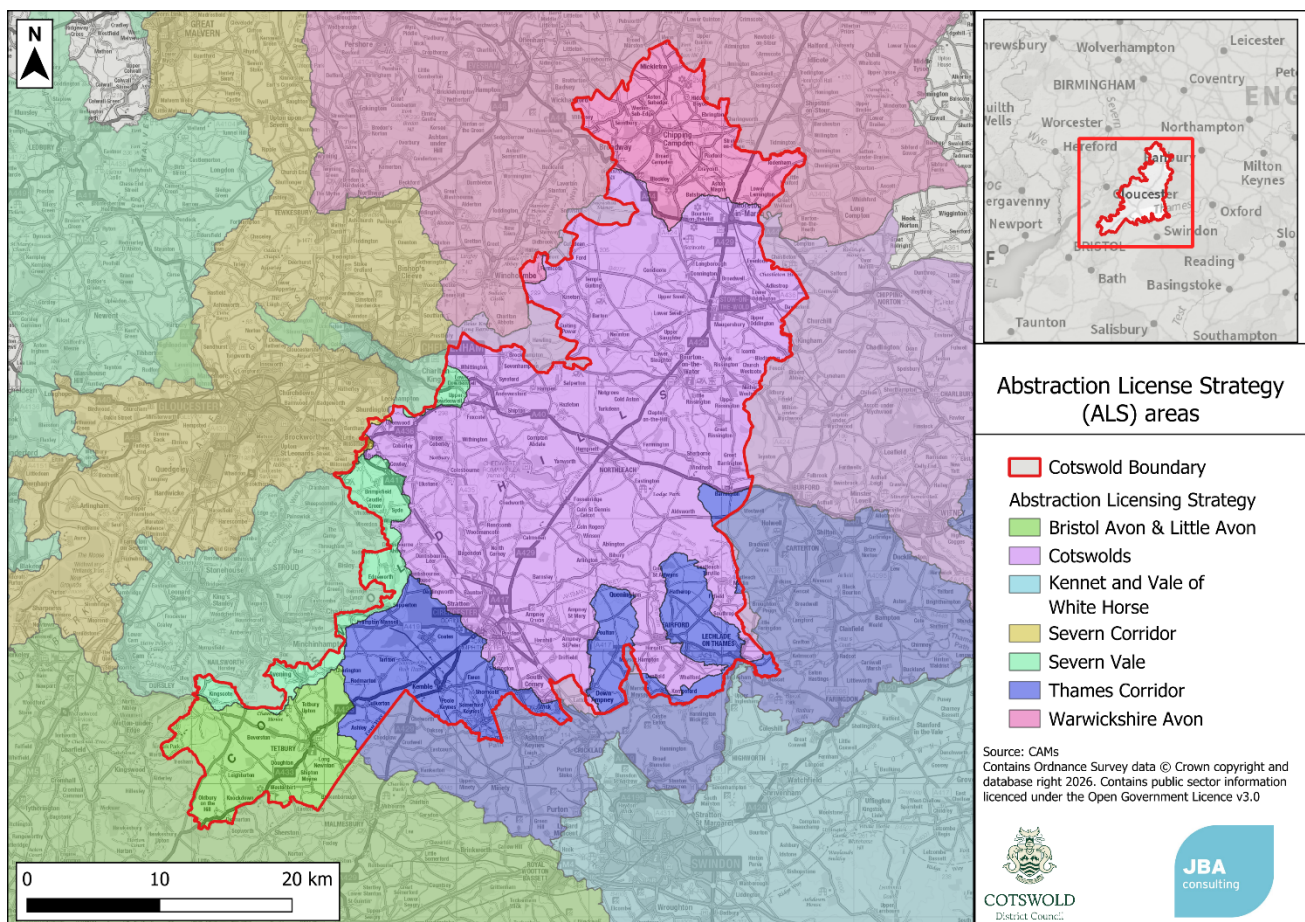


Figure 4.8 Abstraction License Strategy (ALS) areas within Cotswold district



#### 4.5.2 Resource availability assessment

In order to abstract surface water, it is important to understand what water resources are available within a catchment and where abstraction for consumptive purposes may pose a risk to resources or the environment. The Environment Agency has developed a classification system which shows:

- the relative balance between the environmental requirements for water and how much has been licensed for abstraction;
- whether there is more water available for abstraction in the area; and
- areas where abstraction may need to be reduced.

The availability of water for abstraction is determined by the relationship between the fully licensed (all abstraction licences being used to full capacity) and recent actual flows (amount of water abstracted in the last six years) in relation to the Environmental Flow Indicator (EFI). Results are displayed using different water resource availability colours, further explained in Table 4.5

Table 4.8. In some cases, water may be scarce at low flows, but available for abstraction at higher flows. Licences can be granted that protect low flows, this usually takes the form of a "Hands-off Flow" (HOF) or Hands-off Level (HOL) condition on a licence. The assessment is performed at Assessment Points (APs), which are usually significant points on a river such as a confluence or gauging station.

Groundwater availability as a water resource is assessed similarly, unless better information on principle aquifers is available or if there are local issues that need to be considered.

Table 4.5: Implications of surface water resource availability colours.

| Water Resource Availability Colour              | Implications for Licensing                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BLUE- High hydrological regime                  | There is more water than required to meet the needs of the environment. Due to the need to maintain the near pristine nature of the water body, further abstraction is severely restricted.                                                                                                                                                 |
| GREEN-Water available for licensing             | There is more water than required to meet the needs of the environment. Licences can be considered depending on local/downstream impacts.                                                                                                                                                                                                   |
| YELLOW-Restricted water available for licensing | Fully Licensed flows fall below the Environmental Flow Indicator (EFI). If all licensed water is abstracted there will not be enough water left for the needs of the environment. No new consumptive licences would be granted. It may also be appropriate to investigate the possibilities for reducing fully licensed risks. Water may be |

| Water Resource Availability Colour               | Implications for Licensing                                                                                                                                                                                                                                                                 |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | available via licence trading.                                                                                                                                                                                                                                                             |
| RED- Water not available for licensing           | Recent Actual flows are below the Environmental Flow Indicator (EFI). This scenario highlights water bodies where flows are below the indicative flow requirement to help support Good Ecological Status. No further licences will be granted. Water may be available via licence trading. |
| GREY-HMWBs (and /or discharge rich water bodies) | These water bodies have a modified flow that is influenced by reservoir compensation releases, or they have flows that are augmented. There may be water available for abstraction in discharge rich catchments.                                                                           |

Water resource availability is assessed under four different flow conditions:

- At Q95 conditions - very low flows which are exceeded 95% of the time
- At Q70 conditions - low flows which are exceeded 70% of the time
- At Q50 conditions - median flows which are exceeded 50% of the time
- At Q30 conditions - high flows which are exceeded 30% of the time

## 4.6 ALS Overviews

### 4.6.1 Bristol Avon, Axe and North Somerset (Bristol Avon and Little Avon)

Significant tributaries in the ALS area include the Tetbury and Sherston Avon and the Bristol Frome from the Cotswolds. The Little Avon rises at Horton, on the edge of the Cotswolds (Environment Agency, Gov.uk, 2012).

There are no Assessment Points (AP) within the overlapping area of the ALS and the Cotswold boundary. The ALS report mapping shows that within the overlap area water resources are available less than 30% of the time and water resources are available at least 30% of the time.

At Q30 and Q50, 'water is available for licensing' and at Q70 and Q95 there is 'restricted water availability for licensing' in the overlap area.

### 4.6.2 Severn Vale

To the southeast of the Severn Vale ALS are the Cotswold Hills which are composed of Jurassic limestones that form the basis for the Cotswold principal aquifer. This feeds into the springs and watercourses in the Cotswold Hills. There are no Assessment Points (AP) within the overlapping area of the ALS and the Cotswold boundary.

The Severn Vale ALS is split into two groundwater management units (GWMUs) nominally; Cotswold North and Cotswold South. The area in Cotswold South that overlaps with the LPA boundary is listed as 'restricted water available GWMU' at Q30, Q50 and Q70. At Q95 the overlap area is partially in a 'restricted water available' area and a 'water not available' area. There is a reliable resource in this area less than 30% of the time.

The Severn Vale-Jurassic Limestone Cotswold Edge South, the groundwater body within the South Cotswold GWMU, is listed to be in 'good quantitative status not at risk of deterioration' (Environment Agency B, 2022). The ALS report states that:

"Resources are available from this unit for further groundwater development. New groundwater licences from this unit will be granted with a Hands-off Flow (HoF) condition to be measured at Ebley Mill gauging station. The condition will offer the same level of protection as the surface water HoF on the River Frome. This is required as the surface water and groundwater in this area is extremely well connected."

It should be noted that there will still be license restrictions:

"Any application will be subject to the assessment of impacts on existing water users, groundwater dependent terrestrial ecosystems, surface water level and flow impacts. This is to ensure that no deterioration of the water environment is allowed to occur. Opportunities to reduce fully licensed risks will be taken where surface water body deterioration is a risk. In these locations, time limited license renewals will require changes to reflect historic usage to manage the risk of future deterioration to the environment."

#### 4.6.3 Thames Corridor

The Thames ALS covers 2,700 km<sup>2</sup> encompassing both tidal and non-tidal watercourses. The River Thames is a major abstraction source for the south of England as well as being highly valued for navigational and recreational uses. The River Thames originates from the Cotswold Hills, from where it flows towards and through London. There are no Assessment Points (AP) within the overlapping area of the ALS and the Cotswold boundary.

The majority of the ALS has 'restricted water available' at Q30, including the LPA boundary overlap area. Water availability at Q50, Q75 and Q95 has 'water not available' across the whole ALS area. Additionally, consumptive abstraction is available across the whole ALS area for 'less than 30% of the time' (Environment Agency C, 2019).

#### 4.6.4 Warwickshire Avon

The Warwickshire Avon covers a small portion to the north of the LPA boundary. The Warwickshire Avon ALS area covers 2900 km<sup>2</sup> with agriculture being a major land use in the area. There are no Assessment Points (AP) within the overlapping area of the ALS and the LPA boundary.

At Q30, Q50 and Q75 there is water available for abstraction in the overlap area of the LPA boundary and the ALS, apart from an area close to Moreton in Marsh that has 'water not available for abstraction' across all scenarios. At Q95 the larger area has 'restricted water

available' with the area close to Moreton-in-Marsh still having 'water not available for abstraction' (Environment Agency D, 2023).

#### 4.6.5 Cotswold

The Cotswold ALS area covers most of the LPA boundary. The ALS area covers 1200 km<sup>2</sup> with main rivers such as River Churn, Ampney Brook and the River Coln to the west, and the Rivers Leach, Windrush, and Evenlode to the northeast running through it.

Seven APs are present within the overlap area of the LPA boundary and the ALS area:

- Assessment point 1, Upper Churn
- Assessment point 2, Lower Churn
- Assessment point 3, Ampney Brook
- Assessment point 4, Upper Coln and Unconfined Oolites
- Assessment point 5, Lower Coln
- Assessment point 6, Leach
- Assessment point 7, Upper Windrush and Unconfined Oolites

Assessment points 1,2, and 3 have HoF restrictions to protect from over-abstraction.

Assessment point 1 has a HoF of 9.8 MI/d to "protect AP2". AP2 has a HoF restriction of 8.3 MI/d, and AP3 a restriction of 7.9 MI/d. APs 4-7 do not have a specific HoF but have additional restrictions. The additional restrictions are listed as Thames Q50 HoF (182 days). This means that for 182 days of a year, there is a HoF restriction of water abstraction at Q50.

At Q30 the whole ALS area has restricted water availability. As for the area at Q50, Q75 and Q90, 'water is not available' for licensing. Consumptive abstraction is available at least 30% of the time.

#### 4.6.6 Overview of water resource availability in Cotswold District

Figure 4.9 shows the water resource availability across Cotswold district under different flow conditions. This gives an indication of whether there are sufficient water resources to support a healthy ecology and sustainable abstraction, and how much water might be available for additional future licencing, and under what conditions. Existing abstraction licences held by Severn Trent Water for public supply are considered within this assessment, so a "red" rating does not indicate that water is not available for public supply, only that there is no additional water available for abstraction. Severn Trent Water's abstraction is evaluated as part the Water Resources Management Plan process.



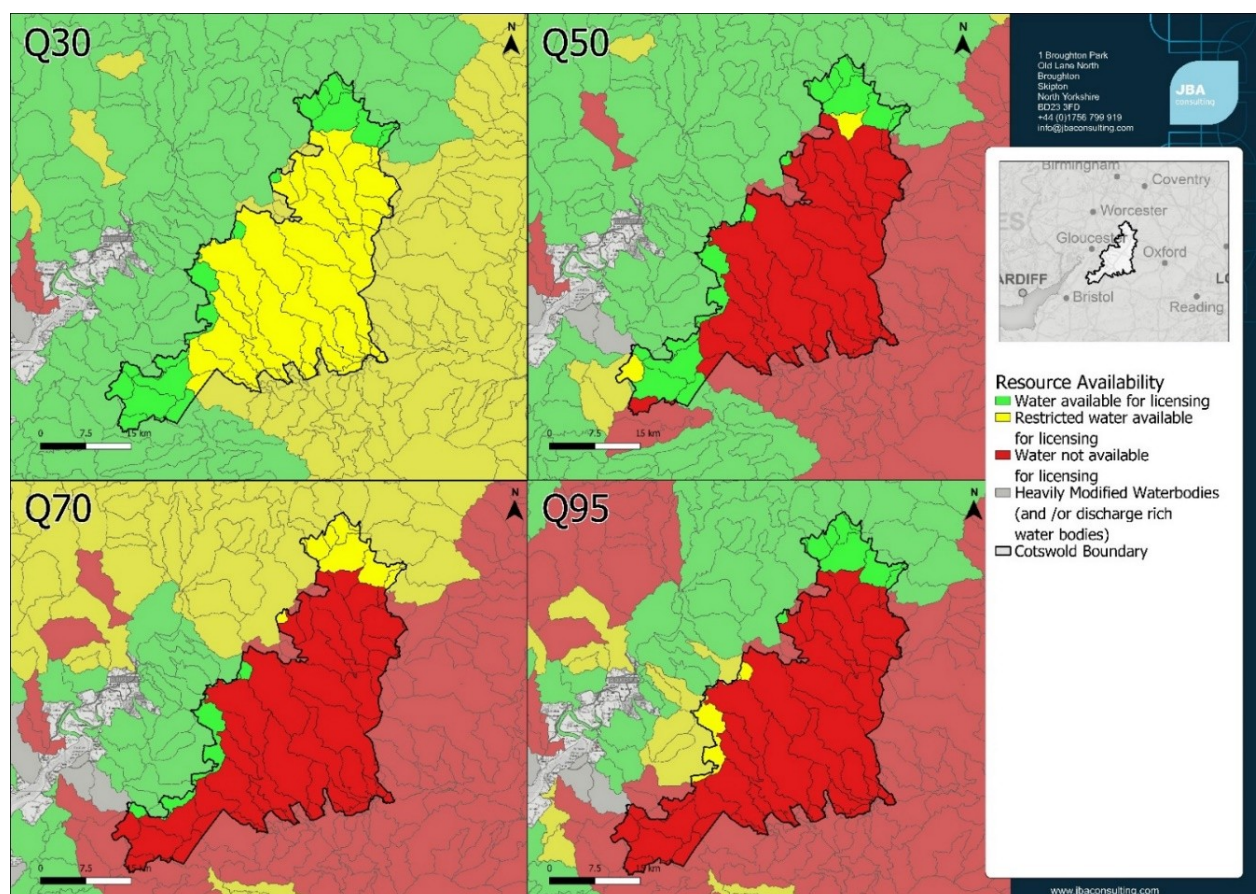


Figure 4.9 Water resources availability in Cotswold District

Figure 4.9 shows that within most of Cotswold District there is restricted water available for licensing at the 30% exceedance flow. There is no water available for licensing at the 50%, 70% and 95% exceedance flows across the vast majority of the district.

## 4.7 Water resources planning

### 4.7.1 National Water Resources Framework

An updated National Water Resources Framework was published in 2025 replacing the previous 2020 framework. The first framework described the scale of the challenge facing water resources in the UK and led to the creation of the five regional planning groups. It also set an objective for per capita consumption to be reduced to 110l/p/d on average across the UK (including existing housing). The new National Framework:

- sets out the pressures and challenges for the water environment to 2055 and beyond;
- sets the ambition for a sustainable abstraction regime and a protected and improved water environment;
- explores potential new demands for water;
- sets greater ambition for integrated, joined-up planning between water using sectors and with drainage and wastewater planning;



- proposes actions and expectations for different sectors to rise to the challenge of planning for and improving the resilience of water supplies; and
- provides a steer for regional water resources groups to evolve and continue to innovate.

The framework states that by 2055 England will need up to an additional 5 billion litres of water per day for public water supply, increased from the previous 2020 publication due to updated demand forecasts and additional reductions for the environment.

As well as the challenges of an increasing population, the 2025 Framework also outlines the challenge from non-household growth, and emerging sectors such as data centres which can require significant amounts of water for cooling servers, with large centres consuming millions of litres daily. Concrete production accounts for 9% of global industrial water withdrawals. Agriculture is significant with spray irrigation expected to increase due to the changing climate.

The new National Framework for Water Resources outlines next steps to improve water planning across all sectors. These include: continuing the Environment Agency's strategic assessment of national water challenges; developing multi-sector plans through regional water resource groups; evaluating and identifying new solutions via regulators like RAPID; expanding engagement with other water-using sectors; and strengthening local planning efforts through groups like Water Abstractor Groups and Catchment Partnerships.

Of relevance to the WCS is the strengthening of local water resources planning which includes supporting farmers to establish Water Abstractor Groups (WAGs) and to "identify, screen and prioritise collaborative 'local resource option' solutions to improve water supply resilience".

#### 4.7.2 The regional plans

Water resource planning is taking an increasingly regional focus. The primary objective of water resources planning is to ensure that there are always enough supplies available to meet anticipated demands, under various weather conditions, but in particular in dry and very dry conditions.

Cotswold district is predominantly within the Water Resources South East (WRSE) region, with small areas to the west within the Water Resources West Region.

The WRSE [final Regional Plan for the South East](#) of England was published in June 2025. WRSE is an alliance of the six water companies which cover the South East of England: Affinity Water, Portsmouth Water, SES Water, Southern Water, South East Water and Thames Water. WRSE is one of five regional groups across England, each of which has produced a strategic water resources plan. The primary objective of water resources planning is to ensure that there are always enough supplies available to meet anticipated demands, under various weather conditions, but in particular in dry and very dry conditions.

The challenges facing the region are set out in the report:

“The South East faces some of the most significant challenges to water resources in the future. Most of the region is already classified as water stressed and its population is set to grow, with major growth corridors planned in some areas. The impact of climate change will be felt acutely in the region, bringing changes to the amount and pattern of rainfall which are likely to, in turn, change the types of droughts we face in the future.”

“Of all the regions, the National Framework identified that the South East faces the greatest pressures on public water supplies. If surplus water can be made available, we will still need to develop options to supply more water, equivalent to all new water resource options and transfers currently selected in company WRMPs, as well as achieving ambitious efficiency reductions. If surplus water cannot be accessed, demand will need to be reduced or further resources developed.”

“The scale of the deficits we have forecast is very significant, and requires significant action and investment on the part of our member companies, the Government and customers to ensure that water supplies will be protected into the future, whilst at the same time ensuring greater protection for the environment. This is the outcome that our regional plan seeks to achieve.”

The Water Resources South East (WRSE) plan covers a period out to 2075 and seeks to:

- Ensure there is enough water for a growing population and to support economic growth.
- Improve the environment by leaving more water in the region's rivers, streams and underground sources.
- Increase the region's resilience to severe drought and other extreme shocks and stresses.
- Addresses the impacts of climate change on demand for water and how much is available.

The plan forecasts that if no action were taken, by 2075 in a 1 in 500-year drought there would be a deficit of between 1.2 billion and 3 billion litres of water per day (based on the least and most challenging planning scenarios). The need for additional water is driven by:

- The need to improve the environment (47%)
- The challenges of climate change (6%)
- Population growth and non-household growth (32%)
- Increasing resilience to extreme drought events (15%)

The majority of the water used in the region goes into the public water supply, with only 3% going into non-public supply. The breakdown of the non-public supply is shown in Figure 4.9.

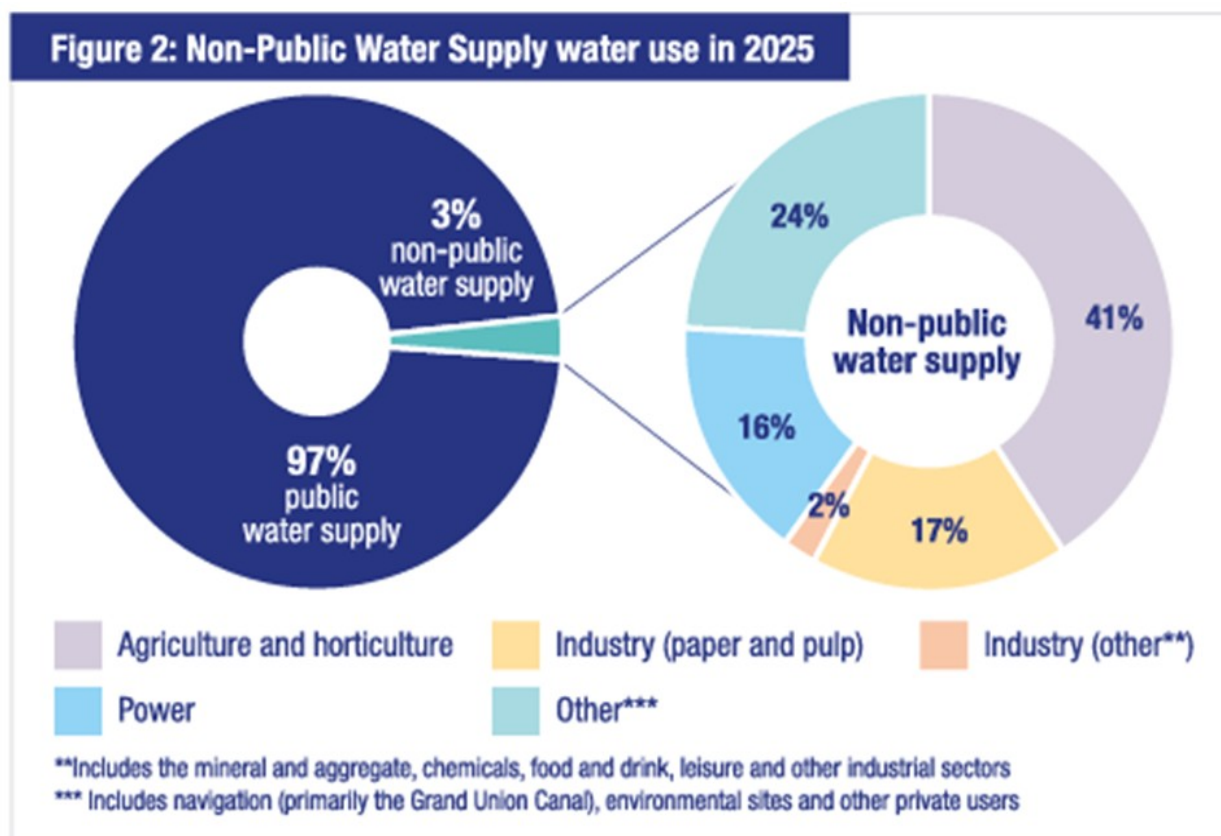


Figure 4.9 Non-public water supply water use in 2025

(WRSE, 2025)

The regional plan contains a mix of demand management and new supply options. The majority of the total water needed in the first 15 years of the regional plan period will come from reducing how much water is used (demand management), and how much is wasted through leakage. The plan also outlines longer term water resource options including transfers of water into the southeast and between water companies, new reservoirs, water recycling schemes and desalination plants and additional storage.

- By 2035 the regional plan proposes to:
- Complete the construction of one new reservoir in Hampshire and start to build one new reservoir in Oxfordshire (SESRO) and one in Kent.
- Develop an inter-regional water transfer scheme using the Grand Union Canal to transfer water from the midlands to the southeast.
- Develop six water recycling schemes in London, Kent, West Sussex, Hampshire and the Isle of Wight.
- Develop six groundwater schemes across the region to store extra water in these sources.

Between 2035 and 2075 the plan proposes to:

- Complete the construction of the new reservoirs in Oxfordshire and Kent and construct new reservoirs in West Sussex and East Sussex.
- Build six desalination plants in Kent and West Sussex.

- Develop eleven groundwater schemes across the region.
- Develop three more water recycling schemes in Kent, West Sussex and East Sussex.
- Develop new transfers from new strategic sources of water (such as reservoirs) to move more water around the southeast.

A small area of Cotswold district is within the Water Resources West (WRW) area. The Water Resources West Final Regional Plan (2025–2085) sets out a long-term strategy to secure water supplies for approximately 18 million people across the North West and Midlands of England, including cross-border catchments with Wales. Developed under the National Framework for Water Resources, the plan addresses key challenges such as climate change, population growth, and environmental pressures by promoting a “best value” approach that integrates demand management, leakage reduction, nature-based solutions, and new infrastructure. It identifies nationally significant projects to enhance connectivity between water company zones and improve resilience through inter-regional transfers, while safeguarding ecosystems via Strategic Environmental Assessment (SEA) and Habitat Regulations compliance.

As only a small area of Cotswold district is covered, this plan has not been reviewed in detail in the WCS.

Cotswold Canal is mentioned within the regional report in parallel with the Severn to Thames Transfer (STT).

*"The Severn to Thames Transfer (STT) project is a proposed raw water transfer from the River Severn to the River Thames to support the South East of England with additional water during drought events. The scheme would supply water for Affinity Water, Southern Water and Thames Water customers. The capacity of STT is up to 500 Ml/d, with the raw water transferred to the River Thames via either a direct pipeline or pipelines using sections of a restored Cotswold canal. From work undertaken to date, the favoured option is a direct pipeline. This would be subject to future consultation. Water for transfer would be provided either from flows in the River Severn (when available), or when there is insufficient river water available, additional support sources of water could be provided by Severn Trent and United Utilities." (Water Resources West, 2025)*

## 4.8 Water Resource Management Plans

### 4.8.1 Introduction

WRMPs are 50-year strategies that water companies are required to prepare, with full updates every five years (see Section 3.5.3 for further details).

When new development within an LPA is being planned, it is important to ensure that there are sufficient water resources in the area to cover the increase in demand without risk of shortages in the future or during periods of high demand, and without causing a negative impact on the waterbodies from which water is abstracted.



The aim of this assessment was to compare the future additional demand as a result of development proposed within the new Local Plan, with the demand accounted for by Severn Trent Water within their WRMPs.

WRZs are defined by the EA as areas in which the management of supply and demand is largely self-contained and where the supply infrastructure is linked such that customers within the zone experience the same risk of supply failure. Within a WRZ a customer may receive their water from anywhere within the zone, and not necessarily from the nearest source. Cotswold district is mostly located within Thames Water's Swindon and West Oxfordshire (SWOX) WRZ as seen in Figure 4.10 below. Small areas in the south west are served by Severn Trent Water's Forest and Stroud WRZ and Bristol Water.

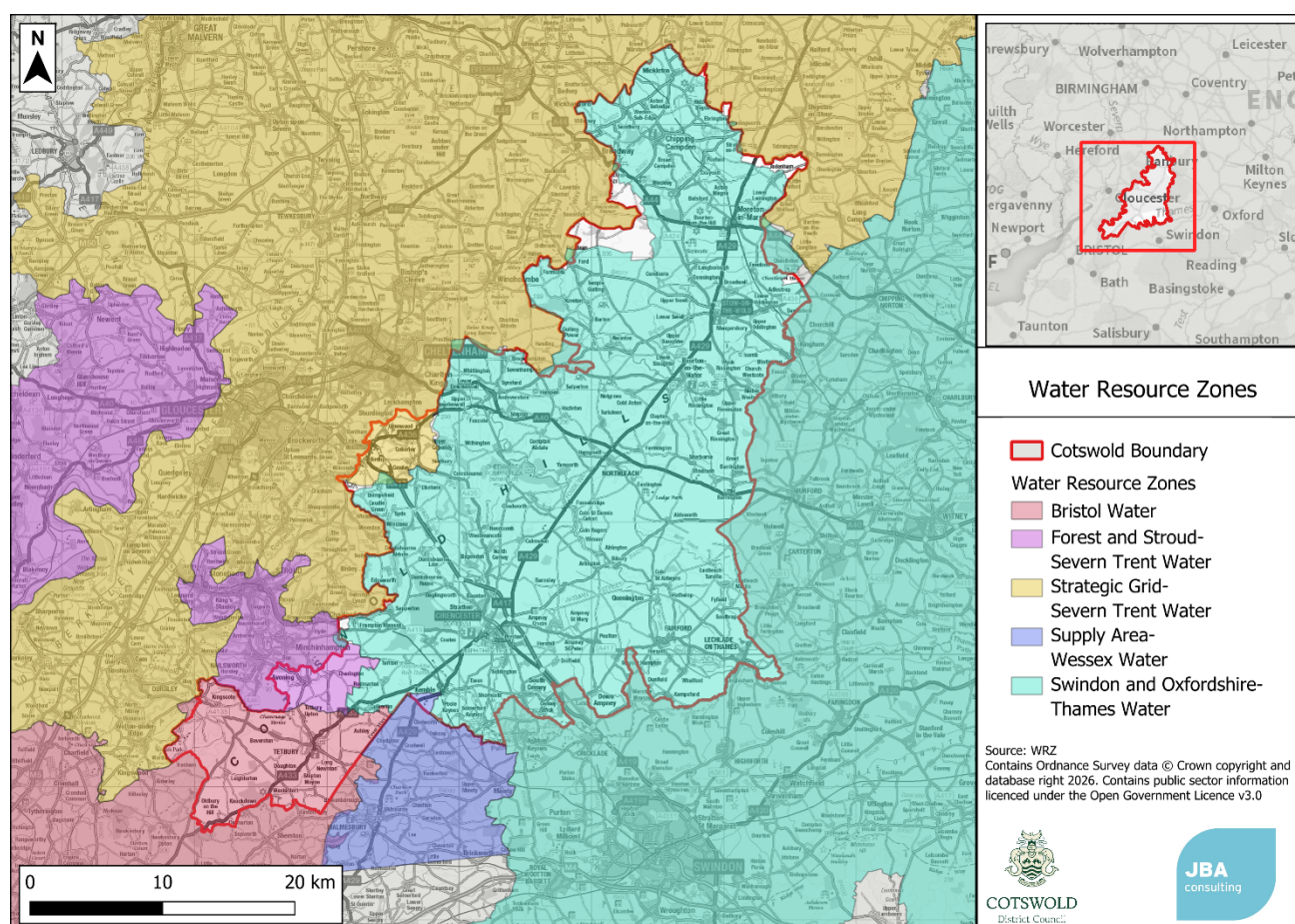


Figure 4.10 Water Resource Zones in and around Cotswold district

#### 4.8.2 Severn Trent Water's WRMP24

Severn Trent Water's WRMP24 (Severn Trent Water, 2024) predicts that if no action is taken, they will see a future supply/demand deficit of 290MI/d by 2040, growing to 600MI/d by 2050. Since WRMP19, the EA has updated its water scarcity status assessment and has designated Severn Trent as being in a seriously water stressed area.

The key challenges identified in the WRMP for the region Severn Trent Water supplies are:



- **Climate change** - longer, drier summers and more extreme rainfall events in winter.
- **Population growth** - an increase of 1.1 million people over the next 25 years, and 2.6 million people over the next 60 years.
- **Leakage** - currently around 21% of water supply is lost through leakage.
- **Value for customers** - change requiring investment could increase bills for customers.
- **Environmental Improvement** – reductions in amount permitted for abstraction to meet Water Framework Directive needs and future environmental destination ambition.

Severn Trent Water's preferred plan focuses on halving leakage by 2045 and implementing universal household metering by 2035, supported by enhanced water efficiency measures to reduce consumption. It also includes no/low regret water supply options for the next five to ten years and long-term infrastructure to address environmental and climate challenges, ensuring security of supply under regulatory scenarios.

#### 4.8.2.1 Demand side options

To meet their reduction in leakage goal, Severn Trent Water has planned a number of interventions, including active leakage control, mains renewal, pressure management, reducing trunk mains leakage, and household water metering. Halving leakage by 2045 is predicted to result in a benefit of 121 million litres per day.

Severn Trent Water also plan to install 1.1 million new smart meters and proactively upgrade over 600,000 existing meters by 2035. They also aim to start upgrading the remaining non-smart meters to Advanced Metering Infrastructure (AMI) in 2025.

These initiatives are also complemented by proactive water efficiency activities to help customers reduce their water consumption. This includes the provision of free and subsidised products, as well as providing advice through continuing with their site visits, online interactive sessions, and work with schools.

Water Labelling is a government-led initiative aimed at promoting water-saving by encouraging the use of more efficient fittings and appliances in homes, when replacing existing products. Severn Trent Water have committed to supporting the rollout of the programme and highlighting it to customers through targeted messaging.

#### 4.8.2.2 Supply side options

Severn Trent Water's preferred plan includes a mix of supply-side schemes that complement its demand management efforts.

From AMP8 (2025-2030), the expansion of multiple Water Treatment Works (WTWs) is planned. This includes Shelton WTWs, which is thought to provide an increase of 18 million litres per day.

Several Water transfers were also mentioned in the WRMP24, such as between Birmingham to Wolverhampton (AMP10 20235-2040), which was not included in the 2019

WRMP. By transferring water between WRZs that need water it can help reduce pressure on reservoirs and abstraction sites.

In AMP11 (2040-2045) and AMP 12 (2045-2050), Severn Trent Water has plans to start work on new WTWs and water sources. This includes a new source in Manchester and East Cheshire, expecting to provide a benefit of 5 million litres per day.

The WRMP24 and linked documents can be found on [Severn Trent Water's website \(severntrent.com\)](https://severntrent.com).

#### 4.8.3 Thames Water

The Thames Water supply region is organised into six WRZs. Cotswold district is served from the Swindon and Oxfordshire (SWOX).

Thames Water's WRMP24 highlights major pressures on future water resources, driven by population growth, climate change and increasing drought risk. The London and Thames Valley region is one of the most densely populated areas of the UK with over 10 million people living and working in the area and this figure forecast to grow to over 12 million by 2050 and 13 million by 2075. Climate change predictions estimate that water availability could reduce by up to 185.8 MI/d by 2070 and require an additional 320 MI/d to maintain resilience to a one in 500-year drought.

Approximately 60% of the water supply across the Thames Valley region is from groundwater sources in the upper Kennet Valley and the Cotswolds. The remaining 40% is abstracted from surface water sources (mostly supplied from large storage reservoirs supplied from the River Thames and River Lee). A desalination water treatment works on the River Thames (Tideway) is also used to supplement water supplies during periods of high demand and/ or drought conditions. In developing the WRMP, Thames Water have worked with the Environment Agency, Natural England and other environmental organisations to develop a plan to reduce environmental abstractions, which is identified as the largest driver of investment in the plan.

If no action is taken, Thames Water predict that they could face a water shortfall of over 1 billion litres of water per day by 2050. To address this, WRMP24 sets out demand reduction measures such as leakage reduction, improved water efficiency through smart metering, innovation, new tariffs and temporary drought restrictions. It also identifies a range of supply side options including desalination, water recycling, regional transfers, a new reservoir, groundwater enhancements and Aquifer Storage and Recovery, alongside work with WRSE to strengthen connectivity across the South East.

The WRMP also identifies the need for a Strategic approach to planning future water supply. Strategic Resource Options (SROs) for Buckinghamshire include surface water abstraction at Medmenham (24 MI/d by 2050) and an interzonal transfer from Henley to SWOX (5 MI/d by 2042).

#### 4.8.4 Population and household growth

The growth forecast used in the WRMP24 planning tables does not break down the WRZ forecast into individual LPAs. It is not therefore possible to directly compare the WRMP24 forecast with the housing need. Instead, the percentage growth in the number of households is used.

The baseline number of households in CDC was taken from the Office for National Statistics (ONS) household projections for England (ONS.gov.uk) - 2022 based forecast. The housing need for CDC calculated using the Standard Method and added to the 2025 baseline number of households. This results in a 42% increase in the number of households during the plan period.

Table 4.4 shows the household growth accounted for in each water company's WRMP. SWOX is predicted to have an increase in the number of households of 24%, Strategic Grid is expected to grow by 11% and Bristol Water's WRZ by 13%.

The growth accounted for in WRMP24 is significantly lower as a percentage than the housing need. A WRMP must be based on published plans at the time of writing, and so can often be out of date. This is particularly true at the time of writing, where the WRMP forecasts are several years old, and many LPAs have seen an increase to their housing need due to changes in the way this is calculated. WRMPs are updated every five years, and so there is an opportunity for the WRMP to adapt to higher growth levels in WRMP29.

Table 4.6 Comparison of household growth forecasts over the plan period

| Forecast       | Number of households - 2025 | Number of households - 2043 | Increase in households | Percentage change |
|----------------|-----------------------------|-----------------------------|------------------------|-------------------|
| Local Plan     | 42,796                      | 60,704                      | 17,918                 | 42%               |
| Bristol Water  | 572,860                     | 647,450                     | 74,590                 | 13%               |
| Strategic Grid | 2,451,200                   | 2,717,240                   | 266,220                | 11%               |
| SWOX           | 488,750                     | 606,540                     | 117,790                | 24%               |

#### 4.9 Water Industry National Environment Programme (WINEP) Measures

There are seven water resource related WINEP actions on surface waterbodies in the study area listed in Table 4.7. Groundwater bodies listed are in Appendix B alongside an explanation of the driver codes used for each action.

Table 4.7 Surface water resources WINEP actions within the study area

| Waterbody name                                   | Unique ID                                                                                                            | Scheme name(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Avon (Wark) conf R Leam to Tramway Br, Stratford | 08ST100344a<br>08ST100348a<br>08ST100351a<br>08ST100352a<br>08ST100353a<br>08ST100354a<br>08ST100086w<br>08ST100086x | August Hill: Priority C WFD No Deterioration Investigation<br>Heath End: Priority C WFD No Deterioration Investigation<br>Ryon Hill: Priority C WFD No Deterioration Investigation<br>Thelsford: Priority C WFD No Deterioration Investigation<br>Warwick Road: Priority C WFD No Deterioration Investigation<br>Welcombe Fields: Priority C WFD No Deterioration Investigation<br>***Holding line awaiting outcome of AMP7 INV - Budbrooke (WARWICKSHIRE)***<br>***Holding line awaiting outcome of AMP7 INV - Campion Terrace (WARWICKSHIRE)*** |
| Avon (Warks) - conf R Sowe to conf R Leam        | 08ST100349a                                                                                                          | Lillington: Priority C WFD No Deterioration Investigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Canley Bk - source to conf with Finham Bk        | 08ST100500i                                                                                                          | ***Holding line awaiting outcome of AMP7 Priority A Investigation and options appraisal - Green Lane (WARWICKSHIRE)***                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Dene - Butlers Marston to conf R Avon            | 08ST100355a                                                                                                          | Wellesbourne: Priority C WFD No Deterioration Investigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Finham Bk - source to conf Canley Bk             | 08ST100086y<br>08ST100086z                                                                                           | ***Holding line awaiting outcome of AMP7 INV - Hatton (WARWICKSHIRE)***<br>***Holding line awaiting outcome of AMP7 INV - Haseley (WARWICKSHIRE)***                                                                                                                                                                                                                                                                                                                                                                                               |

| Waterbody name                           | Unique ID                                    | Scheme name(s)                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preston Bagot Bk - source to conf R Alne | 08ST100376a                                  | Rowington: Priority D WFD No Deterioration Investigation                                                                                                                                                                                                                                                                                                                                                   |
| Sherbourne - source to conf R Sowe       | 08ST100086aa<br>08ST100086ag<br>08ST100086ah | ***Holding line awaiting outcome of AMP7 Priority B Investigation and options appraisal - Waveley Road (WARWICKSHIRE)***<br>***Holding line awaiting outcome of AMP7 Priority D Investigation and options appraisal - Meriden Shafts (Meriden Pumping Station ) (WARWICKSHIRE)***<br>***Holding line awaiting outcome of AMP7 Priority B Investigation and options appraisal - Mount Nod (WARWICKSHIRE)*** |

## 4.10 Water demand reduction

### 4.10.1 Water efficiency

It is widely recognised that the climate is changing. Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand deficit in the future, and making environmental damage from over abstraction of water resources more likely. Furthermore, the delivery of water and wastewater services and the heating of water in the home require high energy inputs and therefore contribute directly to emissions of greenhouse gases. Water efficiency therefore reduces energy use and carbon emissions.

It is important therefore that new development does not result in an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new houses through to achieving 'water neutrality' in a region by offsetting a new development's water demand by improving efficiency in existing buildings.

It is for Local Authorities to establish a clear need to adopt the tighter water efficiency target through the building regulations. This should be based on existing sources of evidence such as:

- the EA classification of water stress;
- Water resource management plans produced by water companies;
- RBMPs which describe the river basin district and the pressure that the water environment faces. These include information on where water resources are contributing to a water body being classified as 'at risk' or 'probably at risk' of failing to achieve good ecological status, due to low flows or reduced water availability;
- Defra Plan for Water;



- consultations with the local water and sewerage company, the EA and catchment partnerships; and
- consideration of the impact on viability and housing supply of such a requirement.

This evidence is laid out below.

#### 4.10.2 Water stress

Water stress is a measure of the level of demand for water (from domestic, business and agricultural users) compared to the available freshwater resources, whether surface or groundwater. Water stress causes deterioration of the water environment in both the quality and quantity of water and consequently restricts the ability of a waterbody to achieve a 'good' status under the WFD.

The EA has undertaken an assessment of [water stress across the UK](#). This defines a water stressed area as where:

- the current household demand for water is a high proportion of the current effective rainfall which is available to meet that demand; or
- the future household demand for water is likely to be a high proportion of the effective rainfall available to meet that demand.

In the EA's assessment, the Thames Water, Severn Trent Water and Wessex Water supply regions are classified as being in areas of serious water stress. The Cotswold District Council area is therefore classified as a water stressed area.

#### 4.10.3 Environmental Improvement Plan

Through their Plan for Water<sup>3</sup> Defra has signalled their intention to review the water efficiency standards for new homes, including consideration of a new national 105 l/p/d standard and 100 l/p/d where there is a clear local need.

The [Future Homes Hub \(futurehomes.org.uk\)](https://futurehomes.org.uk) was established to 'facilitate the collaboration needed within and beyond the new homes sector to help meet the climate and environmental challenges ahead'. It consists of representatives from the building industry, regulators, water companies, and environmental groups. Defra asked them to support them in the creation of the roadmap towards greater water efficiency. They have proposed a road map for water efficient homes in England and set out a framework for the homebuilding sector to work in partnership with other stakeholders such as the water sector, local authorities and regulators to deliver it. The proposed roadmap is shown in Figure 4.11 below and outlines a staged approach to reducing per capita consumption. It also allows for

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<sup>3</sup> Plan for Water: our integrated plan for delivering clean and plentiful water, Department for Environment, Food & Rural Affairs (2023). Accessed online at:

<https://www.gov.uk/government/publications/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water> on: 06/11/2025.

a tighter figure of 90 l/p/d by 2025 in seriously water stressed areas to enable sustainable growth.



Figure 4.11: Future Homes Hub proposed water efficiency roadmap.

Cotswold district is classified as a water stressed area on the roadmap and this supports a tighter water efficiency standard than the 110 l/p/d target in the building regulations

The Environment Act 2021 (and Environmental Improvement Plan 2023 (EIP)) introduces a National Water Target that requires 20% reduction in public water supply in England per head of population by 2038, against a 2019 to 2020 baseline — with interim targets of 9% by 2027 and 14% by 2032. These targets cannot be achieved by new development alone. This guidance is aimed to complement other demand management measures, including leakage reduction, to support delivery of these targets alongside sustainable growth and nature recovery. The government has an ambition to tighten Building Regulations water efficiency standards.

#### 4.10.4 Environmental obligations

Section 9 identifies protected sites in the region that may be sensitive to changes in river flow or groundwater levels and therefore could be impacted by increases in abstraction (either from surface water or groundwater) to support growth in Cotswold District.

Natural England have a "plan-led" approach to water scarcity through which they are robustly responding to WRMPs and negotiating licence changes with the EA. The third element of their approach is to provide advice to LPAs on water efficiency, encouraging LPAs to adopt more stringent water efficiency targets.

#### 4.10.5 Consideration of viability and feasibility

Any water efficiency target adopted has to be feasible: i.e., do the products exist that allow a particular standard to be met, and viable, i.e., can the standard be achieved without making the development financially unviable.

In the Anglian Water area in the east of England, a shared standard for water efficiency has been defined. Whilst this standard goes beyond what is currently recommended in this region, Annex C of this Shared Standard provides useful examples of products that are available on the market that can achieve an efficiency standard of 85l/p/d based on the capacity and flow rates they deliver.

The Future Homes Hub provides some indicative costs for achieving different water efficiency targets. It states that there is no additional cost to achieve 110l/p/d. The cost of achieving 100l/p/d is estimated to be £350 per unit (Future Homes Hub, 2024).

Research undertaken for the devolved Scottish and Welsh governments by the Energy Saving Trust indicated potential annual savings on water and energy bills for householders of approximately £31 per year as a result of water efficiency measures that would allow a target of 100l/p/d to be met (Energy Saving Trust, 2020). Water efficiency is therefore not only viable but of positive economic benefit to both private homeowners and tenants. In addition, financial incentives are available from the water companies to developers to encourage water-efficient design.

Research published by Building Research Establishment (BRE) on the [delivery of sustainable buildings](#) reports that the cost of achieving lower BREEAM ratings incurs little or no additional cost and targeting higher BREEAM ratings incurs a typical cost of less than 2% above the baseline for that development. The same study reports that the cost of achieving 3 credits in WAT01 (a 40% reduction in water consumption for baseline) would be £13,361 and payback could be achieved between 1 and 2.5 years depending on the price of water (BRE, 2018).

Research by Water UK (Water UK, 2022), found that the average household of four could save £472 per year by making small changes to save water. These changes include fixing leaks, taking shorter showers, washing clothes at lower temperatures, and only using appliances when full.

#### 4.10.6 Water company advice

##### **Severn Trent Water**

Severn Trent Water have published a number of water-saving tips on [their website \(stwater.co.uk\)](http://stwater.co.uk). At home, they recommend changes like switching from baths to showers and installing dual-flush toilets or water displacement devices such as Hippo bags to reduce flush volume. For the garden, they suggest reusing domestic wastewater for watering plants and setting up a water butt to collect rainwater. They also provide advice on saving water at work and checking for leaks.

Severn Trent Water offers a range of incentives to developers to adopt water efficient fixtures and fittings which achieve per capita consumption of 100l/p/d or less (see also section 2.4).

##### **Thames Water**

Thames Water provides some recommendations for reducing water use on their [website](#). For the garden they recommend watering plants during the early morning or late evening; allowing lawns to turn golden during dry periods due to the ability of grass to recover quickly; reusing water from paddling pools or washing-up for plants; and using a watering can instead of a hosepipe.

Around the home, suggestions include avoiding unnecessary water use by keeping a jug of cold water in the fridge rather than running the tap; postponing activities such as car washing during hot weather and using a bucket instead of a hose. Thames Water also promotes the use of eco-settings on washing machines and dishwashers to reduce both water and energy consumption.

Thames Water also offer water efficiency incentives where developers can demonstrate they have built a premises with a domestic water usage of 100l/p/d or less and have met the specified criteria as detailed in section 2.5.5.

### **Bristol Water**

[Bristol Water's website](#) provides a number of water saving tips and advice such as taking shorter showers and reducing bath water levels. It also suggests running washing machines and dishwashers on full loads. Bristol Water also encourage people to check for leaks, use dual-flush toilets correctly, and install water-saving devices such as tap aerators, showerheads, and cistern-saving products.

Bristol Water provides advice on longer-term water-saving measures, including switching to a water meter, collecting rainwater with water butts, and adopting water-efficient gardening practices. It also provides seasonal advice, such as protecting pipes during winter and using water carefully during summer activities.

Bristol Water also encourages improved water efficiency by offering various incentives to developers to promote good design including reduced infrastructure charges if  $\leq 110$  litres/person/day is achieved (see section 2.5.5).

#### **4.10.7 Summary of evidence for tighter efficiency standard**

Water resources in England are under considerable pressure. The Environment Agency has stated that "the scale of the challenge we face increases with time and, by 2050, we are looking at a shortfall of nearly 5 billion litres of water per day between the sustainable water supplied available and the expected demand."

The strategic direction in the UK set out in the new National Water Resources Framework is to attain an average household water efficiency of 110 l/p/d by 2050. There would also be a positive economic impact for residents in terms of reduced energy and water bills.

Part G of Building regulations currently states that new build housing should achieve a minimum of 125 l/p/d. A tighter target of 110l/p/d is allowed if the local authority can establish a clear need based on available evidence. Many LPAs are now going further than this. The Written Ministerial Statement (WMS) by the former Secretary of State for Levelling Up, Housing and Communities (DLUHC) states that:

"...in areas of serious water stress, where water scarcity is inhibiting the adoption of Local Plans or the granting of planning permission for homes, I encourage local planning authorities to work with the Environment Agency and delivery partners to agree standards tighter than the 110 litres per day that is set out in current guidance."

Cotswold district is in an area classified by the Environment Agency as being under serious water stress.

The WCS recommends that the Council adopts a policy requiring a water efficiency target of 100l/p/d in their Local Plan and allow for a reduction in this target to 90l/p/d from 2030.

This should be achieved using a fittings-based approach and supported by an equivalent non-household target where development will aim to achieve full credits in the BREEAM water calculator with a minimum of 3 credits in WAT01.

This should be aligned with a robust enforcement approach to ensure that correct fixtures and fittings are being installed at site level.

#### 4.10.8 Water neutrality concept

Water neutrality is a relatively new concept for managing water resources, but one that is receiving increased interest as deficits in future water supply/demand are identified. The definition adopted by the Government and the Environment Agency (Environment Agency, 2009) is:

**“For every development, total water use in the wider area after the development must be equal to or less than total water use in the wider area before development”**

It is useful to also refer to the refined definition developed by Ashton:

**“For every new significant development, the predicted increase in total water demand in the region due to the development should be offset by reducing demand in the existing community, where practical to do so, and these water savings must be sustained over time”** (Booth and Charlesworth, 2014).

This definition states the need to sustain water saving measures over time, and the wording “predicted increase in total water demand” reflects the need for water neutrality to be designed in at the planning stage.

Both definitions refer to water use in the region or “wider area”, and the extent of this area should be appropriate to local authority boundaries, water resource zones, or water abstraction boundaries depending on what is appropriate for that particular location. For instance, if a development site is in an area of water stress relating to a particular abstraction source, offsetting water use in a neighbouring town that is served by a different water source will not help to achieve water neutrality.

In essence water neutrality is about accommodating growth in a region without increasing overall water demand.

Water neutrality can be achieved by:

- reducing leakage from the water supply networks;
- making new developments more water-efficient;
- “offsetting” new demand by retrofitting existing homes with water-efficient devices;
- encouraging existing commercial premises to use less water;



- implementing metering and tariffs to encourage the wise use of water; and
- education and awareness-raising amongst individuals.

Suggestions for water-efficiency measures are listed in

Table 4.8: below.

Table 4.8: Consumer water efficiency measures, adapted from Booth and Charleswell 2014.

| Topic                                           | Measures                                                                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Educational and promotional campaigns           | Encourage community establishments (e.g., schools, hospitals) to carry out self-audits on their water use.<br>Deliver water conservation message to schools and provide visual materials for schools.<br>Building awareness with homeowner/ tenants |
| Water-efficient measures for toilets            | Cistern displacement devices to reduce volume of water in cistern.<br>Retro-fit or replacement dual flush devices<br>Retro-fit interruptible flush devices<br>Replacement low-flush toilets                                                         |
| Water-efficient measures for taps               | Tap insert, such as aerators.<br>Low flow restrictors<br>Push taps<br>Infrared taps                                                                                                                                                                 |
| Water-efficient measures for showers and baths  | Low-flow shower heads<br>Aerated shower heads<br>Low-flow restrictors<br>Shower timers<br>Reduced volume baths (e.g., 60 litres)<br>Bath measures                                                                                                   |
| Rainwater harvesting and water reuse            | Large-scale rainwater harvesting<br>Small-scale rainwater harvesting for example with a water butt, or rainwater tank for toilet flushing.<br>Grey water recycling                                                                                  |
| Water efficient measures addressing outdoor use | Hosepipe flow restrictions<br>Hosepipe siphons<br>Hose guns (trigger hoses)<br>Drip irrigation systems<br>Mulches and composting                                                                                                                    |
| Commercial properties                           | Commercial water audits<br>Rainwater recycling<br>Grey water recycling<br>Optimising processes<br>Provide water efficiency information to all newly metered businesses                                                                              |

| Topic    | Measures                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Metering | Promote water companies' free meter option<br>Compulsory metering (in water stressed areas)<br>Smart metering (to engage customer with their consumption)<br>Provide interactive websites that allow customers to estimate the savings associated with metering (environmental and financial)<br>Innovative tariffs (seasonal, peak, rising block)<br>Customer supply pipe leakages- supply pipe repair and replacement |
| Other    | Household water audits, including DIY or with help of plumber.<br>Seek and fix internal leaks and/ or dripping taps.<br>Water efficient white goods, including washing machines and dishwashers.<br>Ask customers to spot and report leaks                                                                                                                                                                              |

Many interventions are designed to reduce water use if operated in a particular way and so rely on the user being aware and engaged with their water use. The educational aspect is therefore important to ensure that homeowners, community establishments and businesses are aware of their role in improving water efficiency.

#### 4.10.9 Rainwater Harvesting and Greywater Recycling

##### Rainwater harvesting

Rainwater recycling or rainwater harvesting (RwH) is the capture of water falling on buildings, roads or pathways that would normally be drained via a surface water sewer, infiltrate into the ground or evaporate. In the UK this water cannot currently be used as a drinking water supply as there are strict guidelines on potable water, but it can be used in other systems within domestic or commercial premises.

Systems for collection of rainwater can be simple water butts attached to a drainpipe on a house, or it could be a complex underground storage system, with pumps to supply water for use in toilet flushing and washing machines. By utilising rainwater in this way there is a reduced dependence on mains water supply for a large proportion of the water use in a domestic property.

##### Benefits of RwH

- RwH reduces the dependence on mains water supply – reducing bills for homeowners and businesses.
- Less water needs to be abstracted from river, lakes and groundwater.
- Stormwater is stored in a RwH system reducing the peak runoff leaving a site providing a flood risk benefit (for smaller storms).
- By reducing surface water flow, RwH can reduce the first flush effect whereby polluted materials adhering to pavement surfaces during dry periods are removed by the first flush of water from a storm and can cause pollution in receiving watercourses.

## Challenges of RWH

- Dependency on rainfall can limit availability of harvested rainwater during drought and hot weather events.
- Increased capital (construction) costs to build RWH infrastructure into new housing (£900 to £3,000 for a small-scale domestic system) (Waterwise, 2020)
- Payback periods are long as the cost of water is low so there is little incentive for homeowners to invest.

## Greywater Recycling

Greywater refers to water that has been 'used' in the home in appliances such as washing machines, showers and hand basins. Greywater recycling or greywater harvesting (GwH) is the treatment and re-use of this water in other systems such as for toilet flushing. By their nature, GwH systems require more treatment and are more complex than RWH systems, and there are limited examples of their use in the UK.

Greywater re-use refers to systems where wastewater is taken from source and used without further treatment. An example of this would be water from a bath or shower being used on plants in the garden. This sort of system is easy to install and maintain. However, as mentioned above the lack of treatment to remove organic matter means the water cannot be stored for extended periods.

Greywater recycling refers to systems where wastewater undergoes some treatment before it is used again. These systems are complex and require a much higher level of maintenance than RWH or greywater re-use systems.

Domestic water demand can be significantly reduced by using GwH, and unlike with a RWH system where the availability of water is dependent on the weather, the source of water is usually constant (for instance if it is from bathing and showering). However, the payback period for a GwH system is usually long, as the initial outlay is large, and the cost of water relatively low.

Viability of greywater systems for domestic retrofit applications is therefore currently limited. However, communal systems may offer more opportunities where the cost can be shared between multiple households particularly on larger new build developments, or in new settlements.

## Eddington case study

The North-West Cambridge development at Eddington incorporates the UK's largest communal rainwater harvesting system, designed to address water stress in the East of England. The development took place between 2013 and 2018, with a strong focus on water efficiency. Rainwater is collected from roofs and public spaces, stored in Brook Leys Lake, treated, and distributed via a separate network for non-potable uses such as toilet flushing, laundry, and irrigation. The system was intended to reduce mains water consumption for these uses by up to 50%, lowering average demand from around 150 litres per person per day (l/pp/d). The aim was to reduce water consumption to approximately 80

l/pp/d, in line with local planning policy (Greater Cambridge A, 2025), although there is no official council source confirming that this target has been achieved.

In addition to reducing potable water demand, the design integrates SuDS, to help manage surface water and support biodiversity.

#### 4.10.10 Energy and water use

18% of the UK's domestic energy usage is for water heating (HM Government, 2022). If less water was being used within the home, for instance through more water efficient showers, less water would need to be heated, and overall domestic energy usage would be reduced.

In 2020-2021 the Government consulted on a Future Homes Standard that will involve changes to Part L (conservation of fuel and power) of the Building Regulations for new dwellings (HM Government, 2019). However, this does not identify the role of water efficiency in the home in also reducing energy usage.

#### 4.11 Conclusions and recommendations

Water supply and wastewater services within the study area are provided by Bristol Water, Severn Trent, Thames Water and Wessex Water. Cotswold district is located across several water resource zones, but predominantly in Thames Water's SWOX WRZ.

It is widely recognised that the climate is changing. In response, CDC declared a climate emergency in 2019. Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand deficit in the future, and making environmental damage from over abstraction of water resources more likely. Furthermore, the delivery of water and wastewater services and the heating of water in the home require high energy inputs and therefore contribute directly to emissions of greenhouse gases. Water efficiency therefore reduces energy use and carbon emissions.

It is important that new development does not result in an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new houses through to achieving water neutrality in a region by offsetting a new developments water demand by improving efficiency in existing buildings.

The WINEP is a set of actions that the EA have requested all 20 water companies operating in England to complete in a particular AMP as part of their environmental commitments. A number of investigations are planned or underway to ensure that abstraction of water from both groundwater and rivers, is not leading to unsustainable reductions in flow. Development and population growth can increase abstraction, and so CDC have an opportunity to contribute to these actions indirectly by pursuing policies that promote water efficiency in new development.

The National Water Resources Framework sets the objective to reduce the average per capita consumption in the UK to 110 l/p/d by 2050. This is now part of the Environmental Improvement Plan and water companies WRMPs. Within Defra's Plan for Water is the

commitment to review Building Regulations and a target of 100 l/p/d in severely water stressed areas is suggested.

The Future Homes Hub, who are supporting Defra to produce a roadmap to greater water efficiency propose a stages reduction in PCC, with a target of 100 l/p/d in water stressed areas in place from 2025, and a reduced target of 90 l/p/d in place by 2030 (depending on market conditions and customer acceptance).

This study recommends that as a minimum the proposed new Building Regulations target of 100 l/p/d outlined in Defra's Plan for Water be adopted across the study area. This should be achieved using a fittings-based approach. The target would be subject to viability testing by the LPA.

This should be supported by the requirement for non-household development to achieve three credits in the assessment category WAT01 of the Building Research Establishment Environmental Assessment Methodology (BREEAM) UK New Construction Standard.

Table 4.9: Recommendations for water resources.

| Action                                                                                                                                                                                                                                                                                                                                                                    | Responsibility                                                   | Timescale             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------------------|
| Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with LPAs.                                                                                                                                                                               | All water companies; Severn Trent, Thames Water and Wessex Water | Ongoing               |
| Provide yearly profiles of projected housing growth to water companies to inform the WRMP update.                                                                                                                                                                                                                                                                         | All water companies and CDC                                      | Ongoing               |
| The Council adopts a policy requiring a water efficiency target of 100 l/p/d in their joint Local Plan and allow for a reduction in this target to 90 l/p/d from 2030. This should be achieved using a fittings-based approach. This should be aligned with a robust enforcement approach to ensure that correct fixtures and fittings are being installed at site level. | CDC                                                              | In the CDC Local Plan |
| Use planning policy to require new build non-residential development to achieve at least three credits in the Wat01 Measure for water in the BREEAM New Construction standard.                                                                                                                                                                                            | CDC                                                              | In the CDC Local Plan |
| The concept of water neutrality or water positive development has the potential to provide a benefit in improving resilience to climate change and enabling all waterbodies to be brought up to 'Good' status. Explore further with the water companies and the EA how the Council's planning and climate change policies can                                             | CDC, all water companies, and the EA                             | In the CDC Local Plan |



| Action                                                                                                                                                                                      | Responsibility      | Timescale |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|
| encourage this approach. This approach could have application in strategic sites and new settlements.                                                                                       |                     |           |
| Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with LPAs. | All water companies | Ongoing   |

## 5 Water supply infrastructure

### 5.1 Introduction

An increase in water demand due to growth can exceed the hydraulic capacity of the existing supply infrastructure. This is likely to manifest itself as low pressure at times of high demand. An assessment is required to identify whether the existing infrastructure is adequate or whether upgrades will be required. The time required to plan, obtain funding and construct major pipeline works can be considerable and therefore water companies and planners need to work closely together to ensure that the infrastructure is able to meet growing demand.

Water supply companies make a distinction between supply infrastructure, the major pipelines, reservoirs and pumps that transfer water around a WRZ, and distribution systems, smaller scale assets which convey water around settlements to customers. This outline study is focused on the supply infrastructure. It is expected that developers should engage early with the Developer Services functions of the water and wastewater companies local to their site, and fund water company impact assessments and modelling of the distribution systems to determine requirements for local capacity upgrades to the distribution systems.

In addition to the work undertaken by water companies, there are opportunities for the local authority and other stakeholders to relieve pressure on the existing water supply system by increasing water efficiency in existing properties. This can contribute to reducing water consumption targets and help to deliver wider aims of achieving water neutrality.

A cost-effective solution can be for local authorities to co-ordinate with water supply companies and "piggyback" on planned leakage or metering schemes, to survey and retrofit water efficient fittings into homes (Waterwise, 2009). This is particularly feasible within property owned or managed by local authorities, such as social housing.

Severn Trent Water were not able to provide comments on the potential allocations within the timetable of the Local Plan evidence base and expect to respond during the consultation period.

### 5.2 Location of existing supply infrastructure

No development is permitted within a specified distance of water mains. For example, there should be no building, planting or other heavy earth works within a minimum of 4m of trunk and raw water trunk mains. For other mains there is a minimum of 2-3m no dig exclusion zone, unless mains are to be diverted. The costs of diverting mains would need to be met by the developer.

A guide to working near Severn Trent Water's assets can be found here: [Guidance-for-working-near-our-assets \(stwater.co.uk\)](https://www.stwater.co.uk/guidance-for-working-near-our-assets). Local Authorities can obtain free infrastructure maps from Severn Trent Water as well as supplying infrastructure information under a non-disclosure agreement.

Thames Water and Bristol Water have also have guidance for working near their assets which can be found on their websites here:

- [Working near our pipes \(thameswater.co.uk\)](https://www.thameswater.co.uk/working-near-our-pipes)
- [Landowner Resources \(bristolwater.co.uk\)](https://www.bristolwater.co.uk/landowner-resources)

It is recommended that developers engage with the relevant water supply company early in the planning process to ensure that any direct impacts on the water supply network are addressed early.

### 5.3 TW assessment of impact on supply network

#### 5.3.1 Methodology

TW were sent a list of the Cotswold Local Plan potential site allocations in August 2025 TW gave the sites a red, amber, green (RAG) value based on the estimated water demand of the development. Five sites, now within the potential local plan allocations were not included in the initial list of sites sent to TW to assess.

The following criteria were applied to the potential allocations.

| GREEN                                                                                                                                                                                                    | AMBER                                                                                                                                            | RED                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| On the information provided we do not envisage infrastructure concerns in relation to this development/s. There may be a requirement for hydraulic modelling and potential small scale network upgrades. | On the information provided, hydraulic modelling will be required, and it is likely network upgrades or supply system upgrades will be required. | On the information provided, hydraulic modelling will be required, and it is anticipated that extensive upgrades to the local water network and strategic supply system will be necessary. |

#### 5.3.2 Results

Of the 55 potential allocations, 52 are located within the SWOX WRZ. TW gave 15 sites a red assessment, 20 amber and 12 green. Five sites were not assessed. The location of these sites is shown in Figure 5.1. The complete list of sites and their RAG scores can be found in Appendix F.

A red or amber assessment does not imply that a site could or should not be developed, merely that additional infrastructure may be required in order to accommodate it.

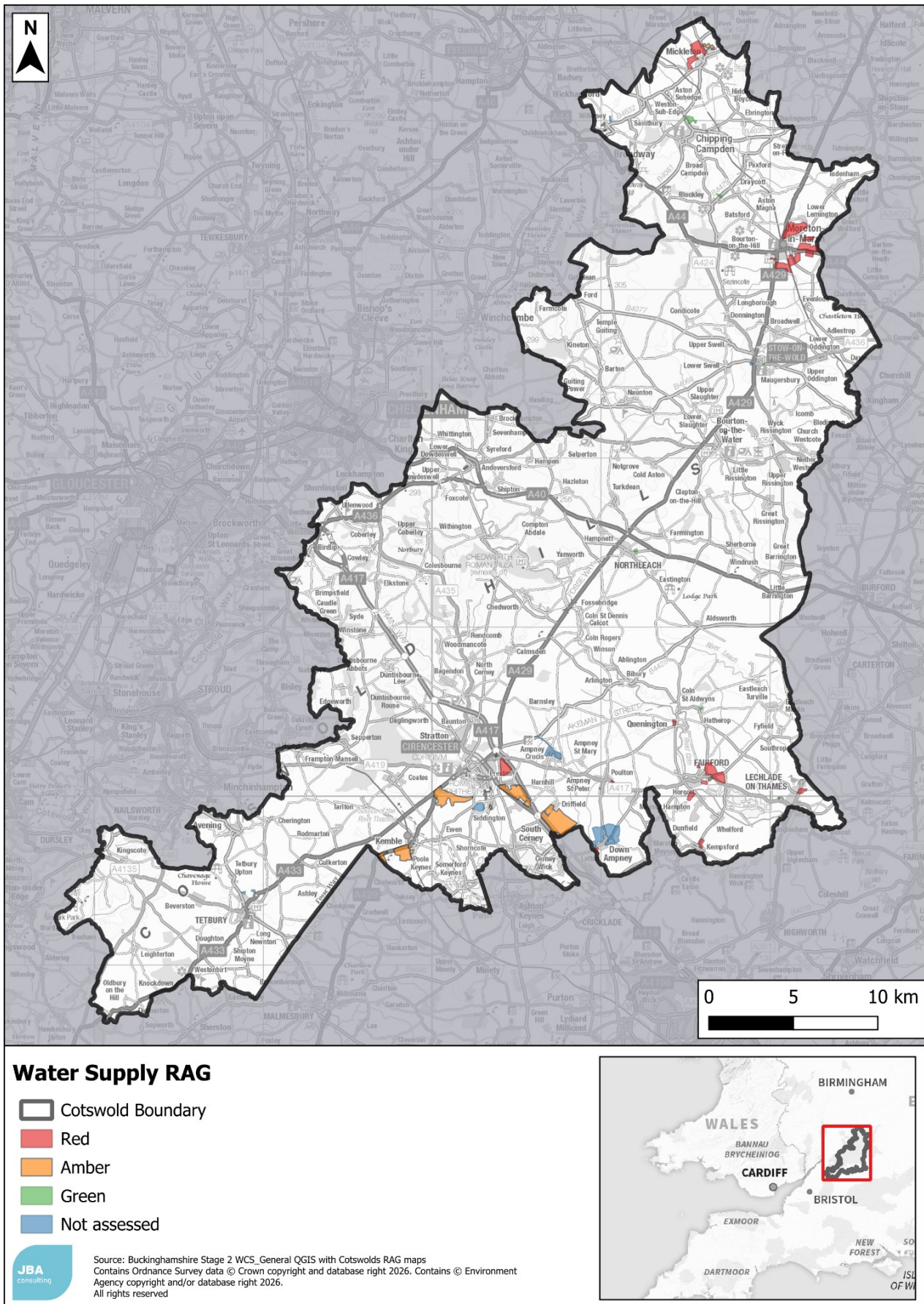


Figure 5.1: Water supply network RAG (Thames Water)

## 5.4 Conclusion and recommendations

TW provided a site-by-site assessment of potential allocations in their supply area. This identified 15 sites where further modelling by TW would definitely be required, and a further 20 where modelling may be required, in both cases, upgrades to the water supply network may be needed to accommodate development.

Upgrades to the local supply network would be funded as part of the developer Infrastructure Charge. Early engagement between developers, BDBC and the water companies is recommended to ensure upgrades are in place prior to occupation.

Recommendations for water supply infrastructure are provided in Table 5.1.

Table 5.1: Recommendations for water supply infrastructure.

| Action                                                                                                                                                   | Responsibility                                    | Timescale                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|
| Undertake network modelling to ensure adequate provision of water supply is feasible.                                                                    | Thames Water and Bristol Water and CDC            | Ahead of planning applications |
| CDC and developers should engage early with water companies to ensure supply infrastructure is in place prior to occupation.                             | Thames Water and Bristol Water and CDC developers | Ongoing                        |
| Developers should engage early with water companies to ensure that the capacity of distribution systems is adequate prior to development coming forward. | Thames Water and Bristol Water and developers     | Ongoing                        |



## 6 Wastewater collection

### 6.1 Sewerage undertaker

Thames Water is the main water and wastewater company that serves as the sewerage undertaker for the study area, see Figure 6.1. The role of the sewerage undertaker includes the collection and treatment of wastewater from domestic and commercial premises. In some areas, it also includes the drainage of surface water from building curtilages to combined or surface water sewers. It excludes, unless adopted by the sewerage undertaker, systems that do not connect directly to the wastewater network, e.g., SuDS or highway drainage.

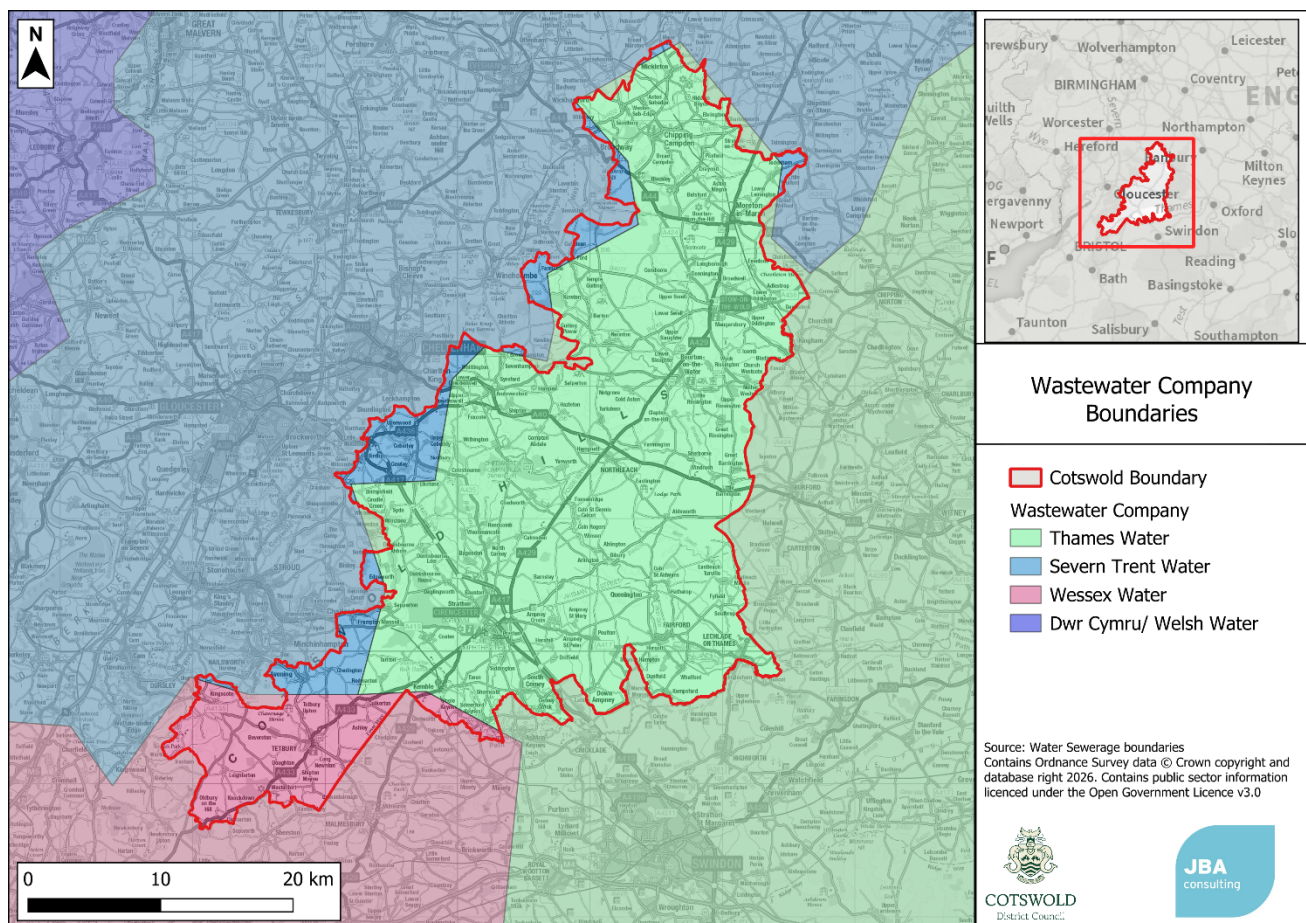


Figure 6.1 Wastewater Companies in Cotswold District

Increased wastewater flows into collection systems due to growth in populations or per-capita consumption can lead to an overloading of the infrastructure, increasing the risk of sewer flooding and, where present, increasing the frequency of discharges from storm overflows. Seasonal and yearly variations in weather and infiltration can reduce headroom at WwTW.

Headroom at WwTW can be eroded by growth in population or per-capita consumption, requiring investment in additional treatment capacity. As the volumes of treated effluent rises, even if the effluent quality is maintained, the pollutant load discharged to the receiving

watercourse will increase. In such circumstances the EA as the environmental regulator, may tighten effluent consents to achieve a 'load standstill', i.e., ensuring that as effluent volume increases, the pollutant discharged does not increase. Again, this would require investment by the water company to improve the quality of the treated effluent. Consents can also be tightened to prevent a deterioration in water quality due to growth, or to achieve environmental objectives.

In combined sewerage systems, or foul systems with surface water misconnections, there is potential to create headroom in the system, thus enabling additional growth, by the removal of surface water connections and reducing infiltration. This can most readily be achieved during the redevelopment of brownfield sites which have combined sewerage systems, where there is potential to discharge surface waters via SuDS to groundwater, watercourses or surface water sewers.

## **6.2 Sewerage system capacity assessment**

New residential developments add pressure to existing sewerage systems. An assessment is required to identify the available capacity within the existing wastewater network, and the potential to upgrade overloaded systems to accommodate future growth. The scale and cost of upgrading works may vary significantly depending upon the location of the development in relation to the network itself and the receiving WwTW.

It may be the case that an existing sewerage system is already working at its full capacity, and further investigations must be carried out to define which solution is necessary to implement an increase in its capacity. New infrastructure may be required if, for example, a site is not served by an existing system. Such new infrastructure will normally be secured through private third-party agreements between the developer and utility provider.

Sewerage Undertakers must consider the growth in demand for wastewater services when preparing their five-yearly Strategic Business Plans (SBPs) which set out investment for the next Asset Management Plan (AMP) period. Typically, investment is committed to provide new or upgraded sewerage capacity to support allocated growth with a high certainty of being delivered. Additional sewerage capacity to service windfall sites, smaller infill development or to connect a site to the sewerage network across third party land is normally funded via developer contributions, as third-party arrangements between the developer and utility provider.

## **6.3 Drainage and Wastewater Management Plan (DWMP)**

### **6.3.1 Thames Water DWMP**

Thames Water's DWMP outlines their strategy for addressing future challenges in wastewater services, detailing the necessary investments to expand, enhance, and sustain wastewater systems and drainage networks over the next 25 years. The overall vision of the DWMP is 'to identify future catchment risks to our drainage and wastewater treatment systems and develop sustainable, efficient solutions to address them.' With the aim to deliver in three areas:

- Customers and communities – fair charges for the services we provide, improved health and wellbeing, increased amenity, and a resilient service.
- Drainage and wastewater services – reduce sewer flooding and achieve 100% Sewage Treatment Works (STW) compliance.
- The environment – restore river health, increase biodiversity, environmental net gain.

Thames Water's DWMP includes Catchment Strategic Plans (CSPs) for each Thames regional Flood and Coastal Committee (TRFCC) area. The study area falls under the Swindon and Oxfordshire (SWOX) (Level 2) CSP, which then falls into one of the 382 planning catchments (Level 3). Initial risk-based screening found that 77% of the L3 catchments in this CSP were vulnerable to growth and climate change, warranting long-term planning. 7% of properties are forecast to be at risk of internal hydraulic sewer flooding in a 1 in 50-year storm by 2050. With no action, by 2050 Thames Water predict that 44% of L3 catchments will have storm overflow discharge of greater than 10 discharges per year on average by 2050.

The targets for catchments in this CSP are to:

- Reduce the number of customers at risk of internal and external hydraulic sewer flooding up to a 1 in 50-year storm by 100%.
- Reduce storm discharges (where overflows are present) to <10 in an average year by 2050
- Achieve 100% STW permit compliance

### 6.3.2 Severn Trent DWMP

The Severn Trent DWMP explains that "the overall objective of DWMP is to provide visibility of the current and future challenges, outline what strategic interventions are best to mitigate these future pressures and inform the appropriate pace of investment to meet the long term aims".

Severn Trent Water's Drainage and Wastewater Management Plan (DWMP) outlines eight key goals:

- Secure future water supply
- Promote efficient water use
- Provide a high-quality, affordable service
- Reduce the risk of flooding and pollution
- Protect and enhance the environment
- Support a circular economy
- Make a positive social impact
- Maintain a safe, inclusive workplace

The region contains 2,647 storm overflows, with 1,097 predicted to become high priority by 2050, as they activate more than 10 times annually, exceeding national guidelines. Severn Trent aims to address 39% of harmful storm overflows and 26% of those that exceed the annual activation limit by 2030, aligning with the Storm Overflow Discharge Reduction Plan.

Reducing the frequency of storm overflow operations will involve upgrading wastewater treatment works (WwTWs) and sewer systems to ensure overflows occur only during extreme rainfall.

A Baseline Risk and Vulnerability Assessment (BRAVA) evaluated the risk of sewer flooding for various climate change scenarios (no temperature change, and 2°C or 4°C increases). Currently, around 112,000 properties (2.58% of connected properties) are at risk of flooding. Without WwTW upgrades, this could increase by 39% (to 155,998 properties) by 2050 under a 2°C rise in temperature.

The DWMP identifies investment opportunities to reduce flooding and storm overflow spills, such as separating surface water from combined sewers and improving pollutant screening. There is also a focus on maximising nature-based solutions, like Sustainable Drainage Systems (SuDS), to sustainably manage surface water and reduce its impact on the sewer network.

Overall, the plan emphasises reducing storm overflow events, upgrading WwTWs, and developing sustainable water management strategies like SuDS

### 6.3.3 Wessex Water DWMP

Wessex Water's DWMP outlines their strategy to manage current and future challenges to drainage and wastewater systems while increasing investment in infrastructure and environmental protection. In addition to the national planning goals, six objectives specific to Wessex Water were established in the DWMP process:

- Reducing groundwater infiltration
- Promoting sustainable drainage
- Expanding partnership opportunities
- Improving river water quality
- Reducing the risk of flow compliance failures at water recycling centres
- Minimizing the risk of blockages

To achieve these objectives, protect public health, and enhance the environment, Wessex Water plans the following investments by 2030:

- Continue maintaining and operating assets to high standards
- Invest £1.4 billion to upgrade water recycling centres, meet stricter treatment standards, and support population growth
- Spend £550 million to improve the performance of 148 storm overflows
- Implement nature-based solutions where they provide the best value
- Allocate nearly £100 million to monitor the water quality impacts of treatment works and storm overflow discharges
- Increase investment to reduce groundwater infiltration into sewers and manholes.

Wessex Water's DWMP contains an assessment of risk at catchment level, which has been carried out using a Baseline Risk and Vulnerability Assessment (BRAVA), including how



risk is anticipated to change over the next 5, 10 and 25 years. Overall, BRAVA results showed predicted flooding in 2050 to be 57% higher than 2025 for the 1 in 30-year event.

## 6.4 Methodology

Severn Trent Water, Thames Water and Wessex Water were provided with a list of the sites and forecast housing numbers. Using this information, they were asked to assess each site using the range of datasets they hold.

A red assessment does not mean that a site cannot or should not be developed (unless stated in the comments) and instead reflects the requirement for extensive new infrastructure to order to accommodate the site. It should be remembered that the water companies have a statutory duty to serve new development under the Water Industry Act 1991.

## 6.5 Results

### Overview

The scores and comments from each sewerage undertaker are contained in the three section below. Figure 6.2 shows the RAG assessments applied to each of the potential allocations. These scores are also summarised in Appendix F.

#### 6.5.1 Thames Water

The following red/amber/green scoring was applied by TW to each potential allocation based on the expected impact of the wastewater network.

| GREEN                                                                                                    | AMBER                                                                                         | RED                                                                                                                        |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| On the information provided we do not envisage infrastructure concerns in relation to this development/s | On the information provided modelling may be required to understand the impact of development | On the information provided, modelling will be required, and it is anticipated that upgrades to network will be necessary. |

12 sites were given a "red" assessment by TW, indicating that upgrades to the network are likely to be necessary. 23 sites were given a green assessment and could be accommodated without upgrades to the network. Four sites were not assessed by TW.

The location of these sites, and their RAG assessment is shown in Figure 6.2.

#### 6.5.2 Severn Trent Water

STW carried out a desktop assessment of the 3 sites in their area. Five of these were given a "green" assessment indicating a low level of impact on the wastewater network. Seven sites were given an amber assessment indicating a medium level of concern (reflecting either historic flooding or capacity constraints at sewer pumping stations). One site (the strategic site at Honeybourne) was given a red assessment. This was due to the size of the



development, and the scale of additional infrastructure required to serve this site. In this case an additional pump station and an increase in the rising main may be required in order to serve this site. Other sites within this wastewater catchment have been given an amber assessment. The cumulative impact of these sites should be considered, and the larger strategic site being developed first would change the rating of the other sites to red as capacity would be used up. The scores and accompanying comments are contained in

Table 6.1.

STW provided the following general comment:

"As a water company we have an obligation to provide water supplies and sewage treatment capacity for future development. It is important for us to work collaboratively with Local Planning Authorities to provide relevant assessments on the impacts of future developments and to provide advice regarding policy wording on other relevant areas such as water efficiency, Sustainable Drainage Systems (SuDS), biodiversity, and blue green infrastructure. Where more detail is provided on site allocations, we will provide specific comments on the suitability of the site with respect to the water and sewerage network. In the instances where there may be a concern over the capacity of the network, we may look to undertake modelling to better understand the potential risk. For most developments there is unlikely to be an issue connecting. However, where an issue is identified, we will look to discuss in further detail with the Local Planning Authority. Where there is sufficient confidence that a development will go ahead, we will look to complete any necessary improvements to provide additional capacity.

For most new development provided the surface water is managed sustainably through use of a SuDS the additional foul only flows will have a negligible impact on existing sewer performance, but where there are pre-existing capacity constraints additional capacity improvements may be required.

Where subsequent detailed modelling indicates capacity improvements are required such work will be phased to align with development occupancy with capacity improvement works will be funded by Severn Trent Water. However, whilst Severn Trent have a duty to provide additional capacity to accommodate planned development, we also have a requirement to manage our assets efficiently to minimise our customers' bills. Consequently, to avoid potential inefficient investment we generally do not provide additional capacity until there is certainty that the development is due to commence. Where development proposals are likely to require additional capacity upgrades to accommodate new development flows it is highly recommended that potential developers contact Severn Trent as early as possible to confirm flow rates and intended connection points. This will ensure provision of additional capacity can be planned into our investment programme to ensure development is not delayed.

Table 6.1 Severn Trent Water comments on potential allocations

| Site           | Potential impact on sewerage infrastructure | Known network constraints                                                                                                                                                                                                                                                                          |
|----------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BK14A          | Low                                         | No known network constraints downstream of the proposed development sites.                                                                                                                                                                                                                         |
| W7A2/W7C       | Medium                                      | Historic flooding incidents downstream of the site.                                                                                                                                                                                                                                                |
| BK11           | Low                                         | No known network constraints downstream of the proposed development sites.                                                                                                                                                                                                                         |
| CC66B          | Low                                         | Historic flooding incidents downstream of the proposed site. - on the downstream line there are no Sewage Pumping Stations.                                                                                                                                                                        |
| CC68           | Medium                                      | Historic flooding incidents downstream of the proposed site. - on the downstream line there are no Sewage Pumping Stations.                                                                                                                                                                        |
| CC10A          | Low                                         | Historic flooding incidents downstream of the proposed site. - in the nearby network there is only 1 SPS that could be impacted. As the site is in close proximity to the works and a gravity sewer that leads to the works, the site will more than likely not impact the Sewage Pumping Station. |
| MK2B/C         | Medium                                      | There is a chain of sewage pumping stations to the works that could be impacted by this proposed development.                                                                                                                                                                                      |
| W4B            | Medium                                      | Site would likely be served by two pumping stations and there are historic flooding incidents downstream of site.                                                                                                                                                                                  |
| Strategic Site | High                                        | Served by two small pumping stations which are likely not have the capacity to accept flows from an additional 1000+ dwellings. A development of this size could necessitate pumping station and rising main upsize.                                                                               |
| MK11A          | Medium                                      | There is a chain of sewage pumping stations to the works that could be impacted by this proposed development.                                                                                                                                                                                      |
| MK7            | Low                                         | There is a chain of sewage pumping stations to the works that could be impacted by this proposed development.                                                                                                                                                                                      |

| Site  | Potential impact on sewerage infrastructure | Known network constraints                                                                                                                                                                                        |
|-------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCNE1 | Medium                                      | Historic flooding incidents downstream of the proposed site. Small pumping station near the proposed site, however depending on the type of employment a new pumping station that serves the site may be needed. |
| W7A   | Medium                                      | Site would likely be served by two pumping stations and there are historic flooding incidents downstream of site.                                                                                                |

### 6.5.3 Wessex Water

Wessex Water provided comments on the two potential allocations within their area:

Table 6.2 Wessex Water comments on potential allocations

| Site                               | Foul network                                                                                                                                                                                                                                                                                                                                                                                                           | Infiltration comments                                                                                                                                                                                                                                                                                                    |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T31B - Land adjacent to Blind Lane | There is a potential connection point in Lowfield Road. However our records are incomplete in this location and the diameter of the closest public foul sewer is unknown. If the development was to proceed a review will be needed to identify the most appropriate point of connection into the existing network. This can be done prior to planning submission through Wessex Water's pre-planning enquiry service. | Based on an initial review, the site has high potential for infiltration and is likely to be suited to infiltration SuDS. Considering infiltration and the appropriate use of SuDS at an early stage of the design is important to embed suitable SuDS, and ultimately reduce surface water runoff from new development. |

| Site                                        | Foul network                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Infiltration comments                                                                                                                                                                                                                                                                                            |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T71A - Land north-west of Highfield Cottage | Foul sewers in the new development to the south of the proposed development site have not been offered for adoption by Wessex Water and remain private. There is no clear point of connection into the public sewer network. If the development was to proceed a review will be needed to identify the most appropriate point of connection into the existing network. This can be done prior to planning submission through Wessex Water's pre-planning enquiry service. | Based on an initial review, the site has low potential for infiltration and will require alternative SuDS consideration. Considering infiltration and the appropriate SuDs at an early stage of the design is important to embed suitable SuDS, and ultimately reduce surface water runoff from new development. |



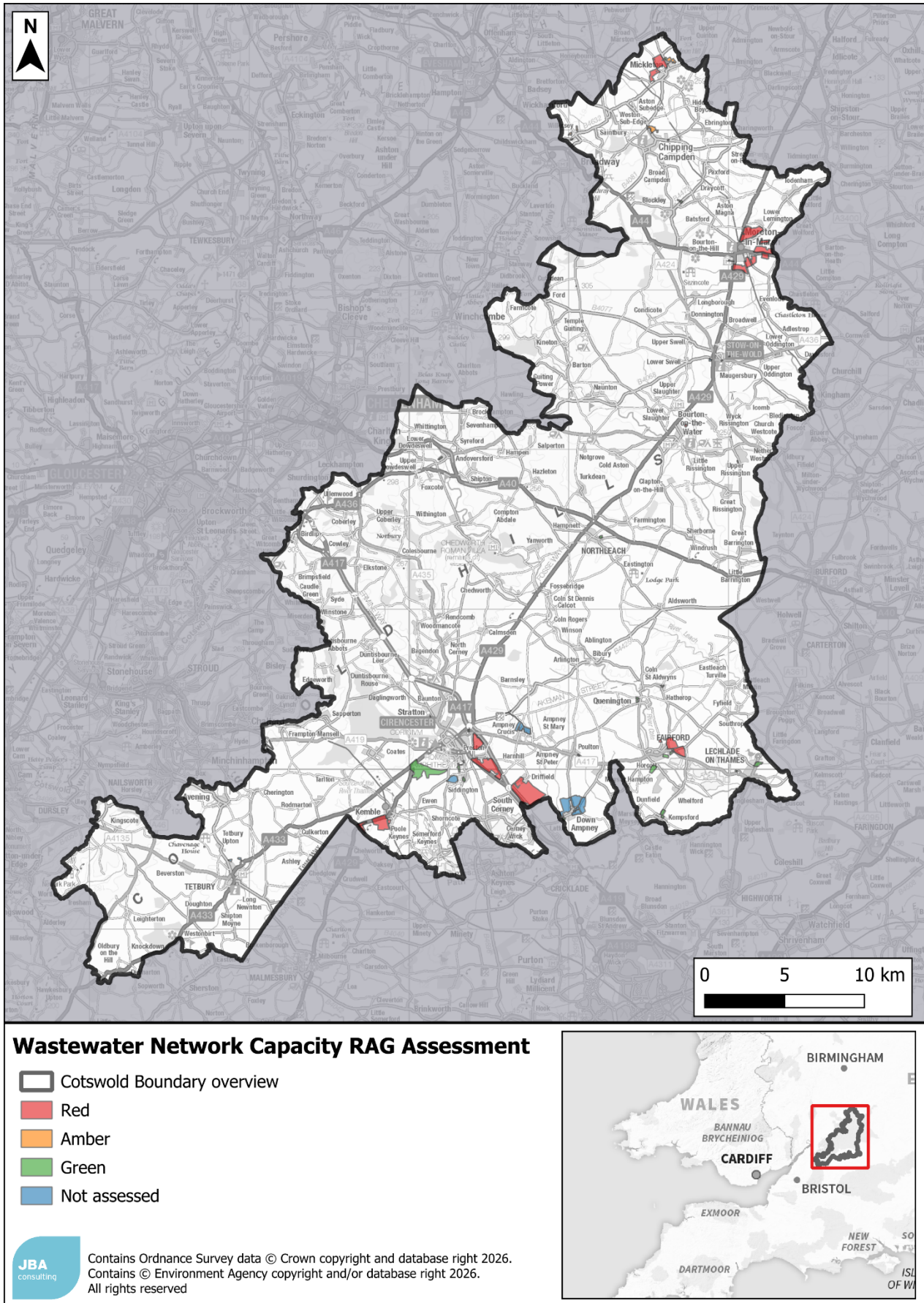


Figure 6.2: Wastewater Network RAG Assessment of Local Plan Allocations

## 6.6 Storm overflows

### 6.6.1 Background

Storm overflows are an essential component in the sewer network. However, when they operate, they can cause environmental damage. They occur on combined sewer systems where the sewer takes both foul flow (sewage from homes and offices) and rainwater runoff. In normal conditions (Figure 6.3), all of this flow passed through the sewer network and is treated at a wastewater treatment works.

In periods of exceptional rainfall (Figure 6.4), the capacity in a combined sewer may be used up by the additional flow from rooftops and storm drains. Once the capacity is exceeded, wastewater would back up into homes, businesses and on to roads. A storm overflow acts as a relief valve, preventing this from happening.

Storm overflows become problematic when they operate frequently in moderate or light rainfall, or for long periods as a result of groundwater infiltration in the sewerage system – possibly in breach of their permit.

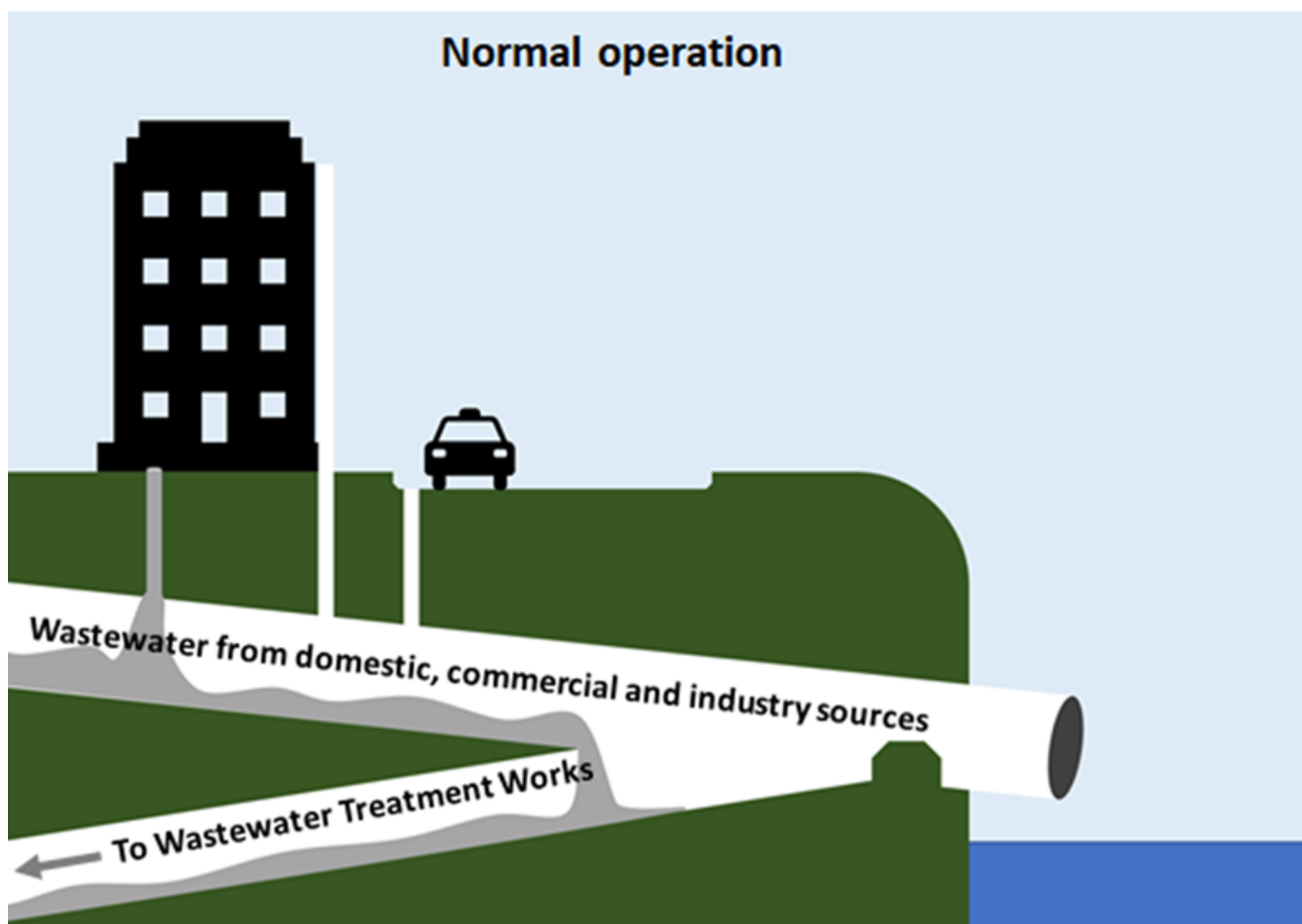


Figure 6.3: Storm overflow operation in normal conditions.

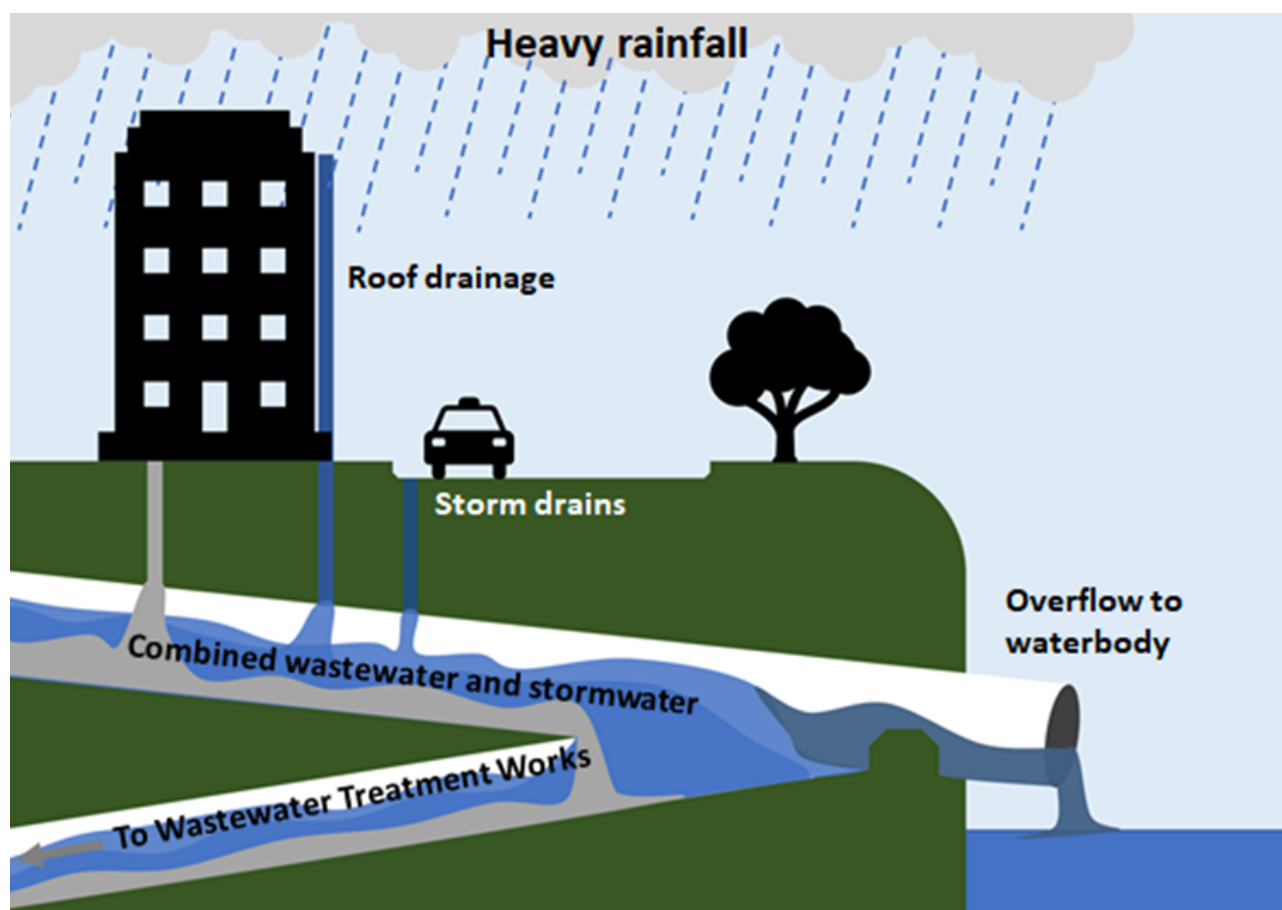


Figure 6.4: Storm overflow operation in exceptional rainfall.

#### 6.6.2 Storm overflow assessment

The Environment Act now requires water companies to report and monitor storm overflows as well as reduce the harm caused to the rivers they discharge to. There are 9 network storm overflows and 20 WwTW storm tank overflow (including those located outside of the borough but at WwTW serving potential growth) present in Cotswold district, the location of these are shown in Table 7.5 and Figure 7.4. Storm tank overflows at WwTWs are assessed in Section 0.

There are 14 network storm overflows in the study area, and 14 WwTW storm tank overflows.

Unmitigated development within Cotswold District could cause the frequency or duration of operation of storm overflows to increase. There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Details of the storm overflows in and around the study area are presented in Table 6.4.

The Storm Overflow Taskforce has agreed a long-term goal to end the damaging pollution caused by the operation of storm overflows. An important component of this is the monitoring of overflows, and a target has been set to monitor the frequency and duration of operation at all storm overflows by 2023. This is called Event Duration Modelling (EDM). The EDM dataset (which contains performance data on the 16,791 storm overflows monitored in 2022) has been used to provide information on storm overflows in the district. Severn Trent Water have confirmed that work is underway to investigate storm overflows with the long-term aim of reducing the number of operations of the storm overflows.

The Storm Overflow Assessment Framework (SOAF) 2025 set a threshold of 30 operations in a year (based on 1 year's data, 20 if based on 2 year's data, and 10 if based on 3 year's), above which a storm overflow should be investigated. The Environment Agency state that a revised SOAF methodology will be realised to coincide with the Environment Act obligation on storm overflows, which will require all overflows to ensure that they are not causing adverse ecological harm. The overflows identified in the district were assessed on the average number of operations over three years.

The Storm Overflow Reduction Plan which was published in August 2022 sets an objective that "storm overflows will not be permitted to discharge above an average of 10 rainfall events per year by 2050". 10 of the 17 monitored network storm overflows are operating on average above 10 times per year so require investigation under the Storm Overflow Assessment Framework 2025 and action to meet the long-term target. In this report storm overflows associated with WwTWs have been moved to the section on wastewater treatment.

Unmitigated development within Cotswold district could cause the frequency or duration of operation of storm overflows to increase.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Table 6.3: Criteria used for RAG assessment of network and WwTW storm overflows.

| Sewer Overflows RAG Score | Number of operations per year (average of available data) | Commentary                                                                                                                                                                                                                               |
|---------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green                     | 0-4                                                       | Overflow is currently operating within the long-term (2050) target. Need to ensure that this is maintained in the long-term considering upstream development, climate change and urban creep.                                            |
| Amber                     | 5-9                                                       | An investigation is not required at present, but improvements may be needed in the network and/or catchment to meet the long-term target.                                                                                                |
| Red                       | 10+                                                       | The overflow may already be operating beyond the threshold which would trigger an investigation. Upstream development could further increase the discharge frequency, so mitigation should be required prior to significant development. |

### 6.6.3 Results

There nine storm overflows on the network that are currently operating above the threshold for investigation. These are shown in Table 6.4 and Figure 6.5.



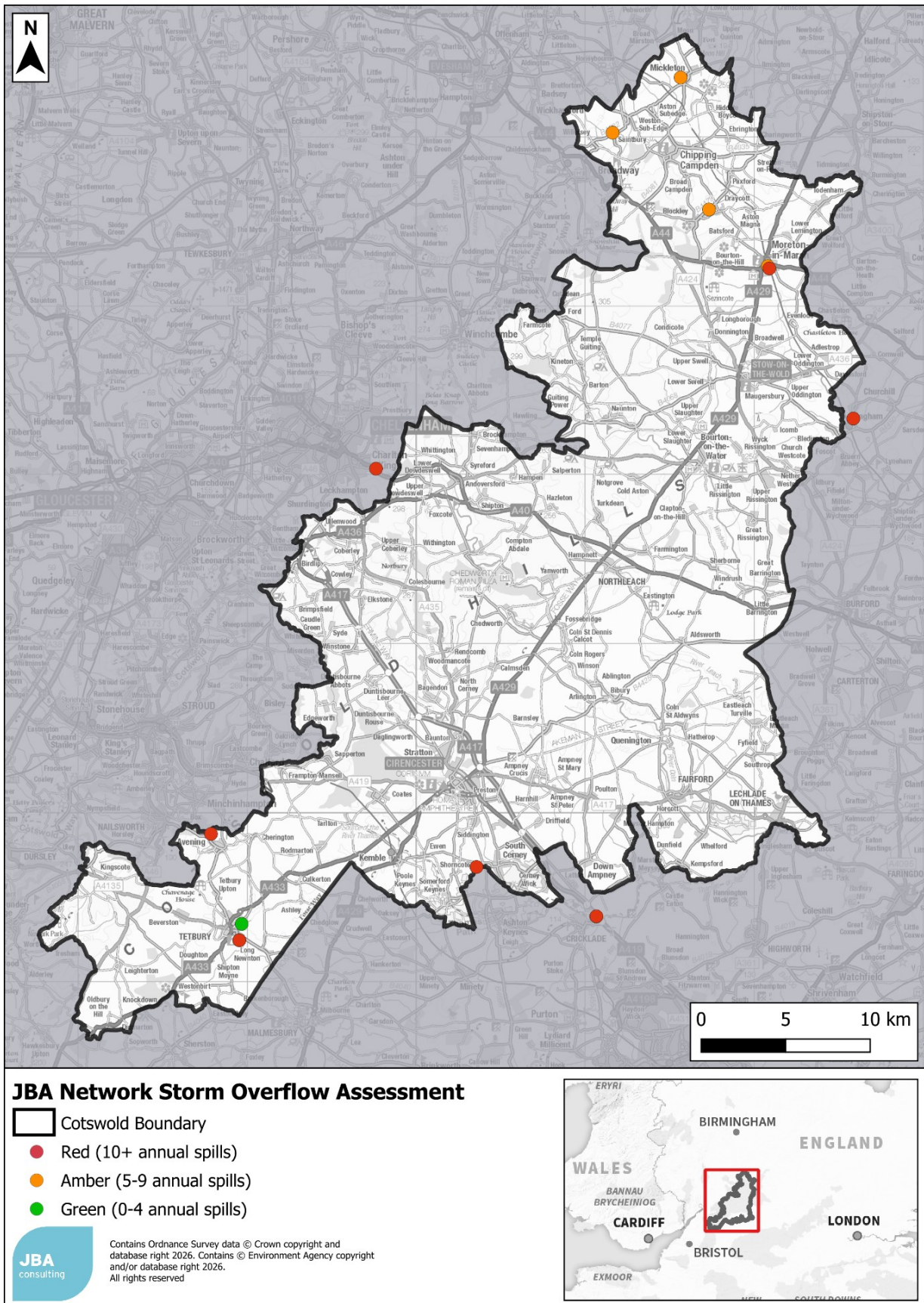


Figure 6.5: Network storm overflow RAG assessment

Table 6.4 Network storm overflow EDM records within Cotswold district

| Overflow                       | Number of operations 2023 | Duration of operation in 2023 (hours) | Number of operations in 2024 | Duration of operation in 2024 (hours) | Number of operations in 2025 | Duration of operation in 2025 (hours) | Average number of operations 2023-2025 | RAG score | Above threshold for investigation? (Y/N) |
|--------------------------------|---------------------------|---------------------------------------|------------------------------|---------------------------------------|------------------------------|---------------------------------------|----------------------------------------|-----------|------------------------------------------|
| AVENING STW (CSO)              | 118                       |                                       | 154                          |                                       | 113                          |                                       | 128                                    | Red       | YES                                      |
| Cirencester STW                | 165                       |                                       | 236                          |                                       | 125                          |                                       | 175                                    | Red       | YES                                      |
| Cricklade STW                  | 114                       |                                       | 107                          |                                       | 59                           |                                       | 93                                     | Red       | YES                                      |
| CSO AT MORETON-IN-MARSH SPS    | 4                         | 20.75                                 | 10                           | 37.75                                 | 9                            | 54.75                                 | 8                                      | Amber     | NO                                       |
| DOWDESWELL CSO                 | 25                        | 533.19                                | 1                            | 0.02                                  | 4                            | 20.54                                 | 10                                     | Red       | YES                                      |
| HATCHETTS SPS                  | 31                        | 477.63                                | 56                           | 698.43                                | 33                           | 378.1                                 | 40.0                                   | Red       | YES                                      |
| KINGHAM SEWAGE PUMPING STATION | 18                        | 40.75                                 | 23                           | 108.5                                 | 17                           | 79.5                                  | 19.3                                   | Red       | YES                                      |
| MICKLETON - COTSWOLD EDGE SPS  | 2                         | 3.74                                  | 15                           | 93.15                                 | 8                            | 40.15                                 | 8                                      | Amber     | NO                                       |

| Overflow                                                       | Number of operations 2023 | Duration of operation in 2023 (hours) | Number of operations in 2024 | Duration of operation in 2024 (hours) | Number of operations in 2025 | Duration of operation in 2025 (hours) | Average number of operations 2023-2025 | RAG score | Above threshold for investigation? (Y/N) |
|----------------------------------------------------------------|---------------------------|---------------------------------------|------------------------------|---------------------------------------|------------------------------|---------------------------------------|----------------------------------------|-----------|------------------------------------------|
| SAINTBURY - THE CROSS (CSO)                                    | 3                         | 18.18                                 | 17                           | 157.08                                | 1                            | 0.37                                  | 7                                      | Amber     | NO                                       |
| SHEAFHOUSE FARM CSO                                            | 4                         | 6.88                                  | 15                           | 38.63                                 | 4                            | 17.76                                 | 8                                      | Amber     | NO                                       |
| SPRINGFIELDS PUMPING STATION                                   | 0                         | 0                                     | 0                            | 0                                     | 0                            | 0                                     | 0                                      | Green     | NO                                       |
| STORM SEWAGE IRRIGATION AREA (Moreton-in-Marsh Primrose court) | 128                       | 2012.5                                | 138                          | 2055.75                               | 77                           | 1143.25                               | 114                                    | Red       | YES                                      |
| TETBURY INLET                                                  | 138                       |                                       |                              |                                       | 49                           |                                       | 79                                     | Red       | YES                                      |
| TETBURY STORM TANK                                             | 138                       |                                       |                              |                                       | 78                           |                                       | 118                                    | Red       | YES                                      |

Figure 6.6 below shows the forecast annual average number of spills from 2025 to 2050, based on data from the [National Storm Overflows Plan \(NSOP\)](#) published by Water UK. Based on the NSOP, it is predicted that spills (from baseline) will be reduced by 20% in 2030 and 84% in 2050.

Additionally, the NSOP indicates that 75% of priority sites are expected to be improved under the NSOP, with all priority sites forecast to be addressed by 2045. To achieve these improvements, the planned interventions comprise a mix of approaches, with 29% involving nature-based solutions and 71% relying on traditional engineering methods. Additionally, five of the eight storm overflows are planned to be upgraded using either nature-based or mixed solutions to enhance their performance.

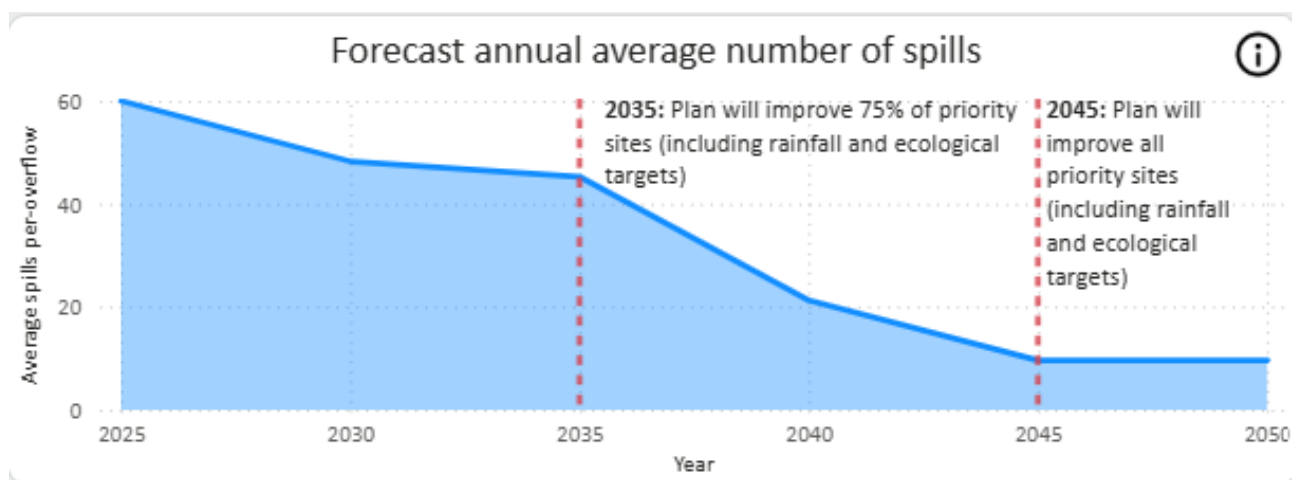


Figure 6.6 Forecast annual average number of spills in Cotswold district council © Water UK 2024

Source: [National Storm Overflows Plan | Water UK](#)

#### 6.6.4 Surface water disposal

Management of surface water is an important feature of new development as the increased coverage of impermeable area on a site can increase the rainwater flowing off the site. The introduction of these flows to the public sewerage system can increase the risk of flooding for existing residents. It is therefore vital that surface water flows are managed sustainably, avoiding connections into the foul or combined sewerage system and where possible directed back into the natural water systems.

STW provided the following policy recommendation for the Local Plan:

New developments shall demonstrate that all surface water discharges have been carried out in accordance with the principles laid out within the drainage hierarchy, whereby a discharge to the public sewerage system is avoided where possible.

The drainage hierarchy is summarised in 9.6.1.

## 6.7 Conclusions and recommendations

Thames Water is the primary water and wastewater provider and the designated sewerage undertaker for the study area. Wessex Water, and Severn Trent Water also operate within small parts of the area.

Development in areas where there is limited wastewater network capacity will increase pressure on the network, increasing the risk of a detrimental impact on customers, and increasing the likelihood of storm overflow operation. Early engagement with developers, Thames Water, Wessex Water and Severn Trent Water is required, and modelling of the network may be required at the planning application stage.

Where network capacity constraints are identified, network reinforcement may be required which would be funded as part of the developer infrastructure charge. It may be necessary for development sites to be phased in line with the provision of any network upgrades.

The drainage network includes 14 storm overflows that are likely to serve the study area. Storm overflow performance is generally poor with nine of these overflows currently exceeding the threshold for investigation. The poorest performing of these is at Avening WwTW, with a 3- year operation average of 128 spills per year.

2024 was a particularly bad year, in part because it was a wetter than average year. This was not the case in 2023 and 2025 when many of the storm overflows also operated well above the threshold.

Further development in catchments where there are poorly performing overflows increase the risk of storm overflow operation due to increased sewage flows and surface runoff.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Table 6.5 Recommendations for wastewater collection

| Action                                                                                                                                                                                                                                 | Responsibility   | Timescale |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------|
| Early engagement between CDC and Severn Trent Water is required to ensure that where strategic infrastructure is required, it can be planned in by STW, TW or WW and will not lead to any increase in discharges from sewer overflows. | CDC, STW, TW, WW | Ongoing   |
| Take into account wastewater infrastructure constraints in phasing development in partnership with the sewerage undertaker.                                                                                                            | CDC, STW, TW, WW | Ongoing   |
| Developers will be expected to work with the sewerage undertaker closely and early in the planning promotion process to develop an Outline Drainage Strategy for sites. The                                                            | CDC, STW, TW, WW | Ongoing   |



| Action                                                                                                                                                                                                                                                                  | Responsibility        | Timescale |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------|
| Outline Drainage strategy should demonstrate the wastewater assets required, their locations including points of connection to the public foul sewerage, whether the site drainage will be adopted by the water company and if any sewer requisitions will be required. |                       |           |
| Developers will be expected to demonstrate to the LLFA that surface water from a site will be disposed using a SuDS with connection to surface water sewers seen as the last option. New connections for surface water to foul sewers will be resisted by the LLFA.     | CDC, LLFA, developers | Ongoing   |

# 7 Wastewater treatment

## 7.1 Introduction

Thames Water (TW), Severn Trent Water (STW) and Wessex Water (WW) provide wastewater services for development in Cotswold District. Most wastewater companies refer to their wastewater processing plants as Wastewater Treatment Works (WwTW). They may also be referred to as Sewage Treatment Works (STW) in some documents and data sources.

Sites already allocated in the adopted local plan, or already in the planning system (commitments) as well as an allowance for windfall, were assigned to a WwTW using the sewerage drainage area boundaries provided by the sewerage undertaker to set a baseline for WwTW capacity. Actual connection of a development site to a particular WwTW may be different and will depend on the capacity of the receiving works, and the local sewer network.

Very small developments in rural areas may be suitable for on-site treatment and discharge. However, the Environment Agency will not usually permit this where there is a public sewerage system within a distance calculated as 30m per dwelling. There is therefore a localised risk to water quality if all of these small developments were to be served by septic tanks, especially where there are clusters of small-scale new development. It needs to be noted that the Environment Agency have stated they 'would also object to a proposal which included septic tanks if they were within a 'sewered area'.

## 7.2 Wastewater Treatment Works Flow Permit Assessment

New residential developments and new employment land add pressure to the existing treatment works. An assessment is required to identify the available capacity within the existing WwTWs, and the potential to upgrade overloaded systems to accommodate future growth. The scale and cost of upgrading works may vary significantly depending upon the location of the development in relation to the network itself and the receiving WwTW.

The Environment Agency is responsible for regulating sewage discharge releases via a system of Environmental Permits (EPs). Monitoring for compliance with these permits is the responsibility of both the EA and the plant operators. Figure 7.1 summarises the different types of wastewater releases that might take place, although precise details vary from works to works depending on the design.

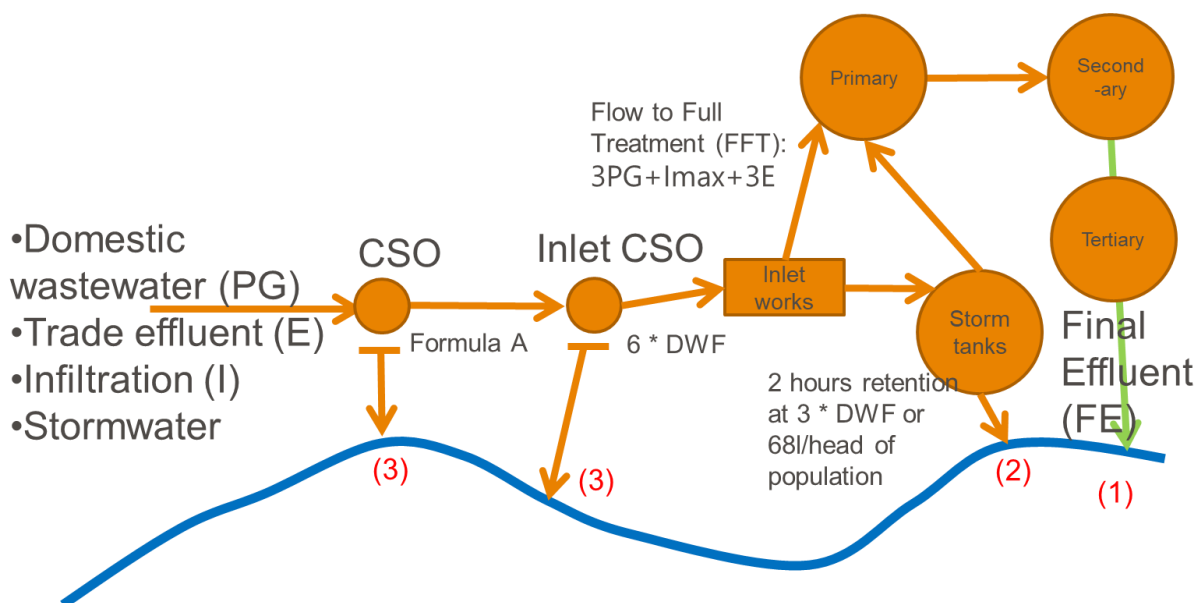


Figure 7.1: Overview of typical combined sewerage system and WwTW discharges.

During dry weather, the final effluent from the WwTW should be the only discharge (1). With rainfall, the storm tanks fill and eventually start discharging to the watercourse (2) and Combined Sewer Overflows (CSOs) upstream of the storm tanks start to operate (3). The discharge of storm sewage from treatment works is allowed only under conditions of heavy rain or snow melt, and therefore the flow capacity of treatment systems is required to be sufficient to treat all flows arising in dry weather and the increased flow from smaller rainfall events. After rainfall, storm tanks should be emptied back to full treatment as soon as reasonably possible, freeing their capacity for the next rainfall event.

Environmental permits are used alongside water quality limits as a means of controlling the pollutant load discharged from a WwTW to a receiving watercourse. Sewage flow rates must be monitored for all WwTWs where the permitted discharge rate is greater than 50 m<sup>3</sup>/day in dry weather.

Permitted discharges are based on a statistic known as the Dry Weather Flow (DWF). As well as being used in the setting and enforcement of effluent discharge permits, the DWF is used for WwTW design, as a means of estimating the 'base flow' in sewerage modelling and for determining the flow at which discharges to storm tanks will be permitted by the permit (Flow to Full Treatment, FFT).

WwTW Environmental Permits also consent for maximum concentrations of pollutants, in most cases Suspended Solids (SS), Biochemical Oxygen Demand (BOD) and Ammonia (NH<sub>4</sub>). Some works (usually the larger works) also have permits for Phosphorous (P). These are determined by the Environment Agency with the objective of ensuring that the receiving watercourse is not prevented from meeting its environmental objectives, with specific regard to the Chemical Status element of the Water Framework Directive (WFD) classification.

Increased domestic population and/or employment activity can lead to increased wastewater flows arriving at a WwTW. Where there is insufficient headroom at the works to treat these flows, this could lead to failures in flow consents.

Areas not covered by WwTW catchments may not have an existing public sewer system. Where this is the case, small developments in more rural areas may be suitable for on-site treatment and discharge, however the Environment Agency will not usually permit this where there is a public sewerage system within a distance calculated as 30m per dwelling from any part of the site boundary.

### 7.2.1 Methodology

Thames Water provided a RAG assessment of their assets using the following criteria:

|                                                                                                                       | AMBER                                                                                                                                                                                                | RED                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GREEN - On the information provided we do not envisage infrastructure concerns in relation to the capacity at the STW | We are aware of capacity concerns at the STW and a scheme is planned to accommodate future growth, or we are likely to have to carry out further assessment, but do not envisage a significant issue | We are aware of capacity concerns at the STW and there isn't currently a scheme planned to accommodate future growth. Further assessment is definitely required and may involve extensive upgrade works |

A parallel assessment of WwTW capacity was carried out using measured flow data supplied by the water companies. The process was as follows:

- Severn Trent Water, Wessex Water and Thames Water provided their DWF data for WwTW serving the study area, JBA then calculated 80th percentile exceedance flow statistic for each WwTW.
- Development sites within the growth scenario including windfall and neighbouring authority growth were assigned to a WwTW using the sewerage drainage area boundaries.
- For each site, the future DWF was calculated using the occupancy rates and per-capita consumption values obtained from the WRMPs (Section 4.8), and the assumption that 95% of water used is returned to sewer. Permitted headroom was used as a substitute for actual designed hydraulic capacity for each WwTW being assessed.
- For employment sites, wastewater demand was estimated based on the predicted number of new employees. Floor space, employment use types, and employment densities were used to estimate the number of employees.
- The current and estimated future flow was then compared to the permitted flow obtained from the Environment Agency "Consented Discharges to Controlled Waters with Conditions" database.

- Headroom (expressed as the number of homes that could be accommodated before the permit is exceeded) was estimated by calculating the difference between the current and permitted flow and using the occupancy and per capita consumption for the WRZ the sewer catchment is in to provide an estimate for the number of houses.
- A red/amber/green score was then assigned to each WwTW based on whether it was likely to exceed its permitted flow.
- An amber score was given where there was less than 10% headroom remaining.

Table 7.1: Per capita consumption values used in water demand calculations.

| Water Company and Water Resource Zone | Average occupancy (persons per household) | Per capita domestic consumption (m <sup>3</sup> /person/day) | Per capita employment consumption (m <sup>3</sup> /person/day) |
|---------------------------------------|-------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------|
| Thames Water-SWOX                     | 2.5                                       | 0.139                                                        | 0.1                                                            |
| Severn Trent Water-Forest and Stroud  | 2.3                                       | 0.170                                                        | 0.1                                                            |
| Bristol Water- Bristol Water WRZ      | 2.3                                       | 0.1439                                                       | 0.1                                                            |

### 7.2.2 Results

TW provided a RAG assessment the WwTWs operated by them which can be seen in



Table 7.3. Two WwTWs (Ampney St Peter and Moreton-in-Marsh WwTWs) were given a "red" rating indicating a known capacity issue with no upgrade scheme currently planned.

An amber assessment was given to Andoversford, Bourton-on-the-Water and Fairford indicating a known capacity issue, but where a scheme was already planned.

Severn Trent Water were not able to provide comments on the potential allocations within the timetable of the Local Plan evidence base and expect to respond during the consultation period.

Wessex Water provided comments on the two potential allocations in their area.

Table 7.2 Wessex Water comments on potential allocations

| Site                                        | Wastewater treatment comments                                                                                                                                                                                                       |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T31B - Land adjacent to Blind Lane          | The development site is located within the Tetbury Water Recycling Centre (WRC) catchment. The WRC does have some headroom and we anticipate that the works will be able to accommodate the additional flows from this development. |
| T71A - Land north-west of Highfield Cottage |                                                                                                                                                                                                                                     |

JBA carried out an independent assessment of capacity at WwTW in the study area which can be seen in Table 7.4. This can differ from water company assessments as the water company has access to information and long-term plans unavailable to the WCS. The JBA assessment also takes a conservative view of WwTW headroom scoring any WwTW as amber where there is less than 10% headroom remaining at the end of the plan period.

Cirencester was given a Green assessment by TW. The JBA headroom assessment (has given this WwTW amber assessment as there is less than 10% capacity left by the end of the Local Plan period.

Table 7.3 TW RAG assessment

| WwTW                 | Thames Water assessment  |
|----------------------|--------------------------|
| Ampney St Peter      | RED                      |
| Andoversford         | AMBER                    |
| Blockley             | Operated by STW          |
| Bourton-on-the-Water | AMBER                    |
| Broadwell            | GREEN                    |
| Chipping Campden     | GREEN                    |
| Cirencester          | GREEN                    |
| Fairford             | AMBER                    |
| Honeybourne          | Operated by STW          |
| Lechlade             | GREEN                    |
| Moreton-in-Marsh     | RED                      |
| Tetbury              | Operated by Wessex Water |

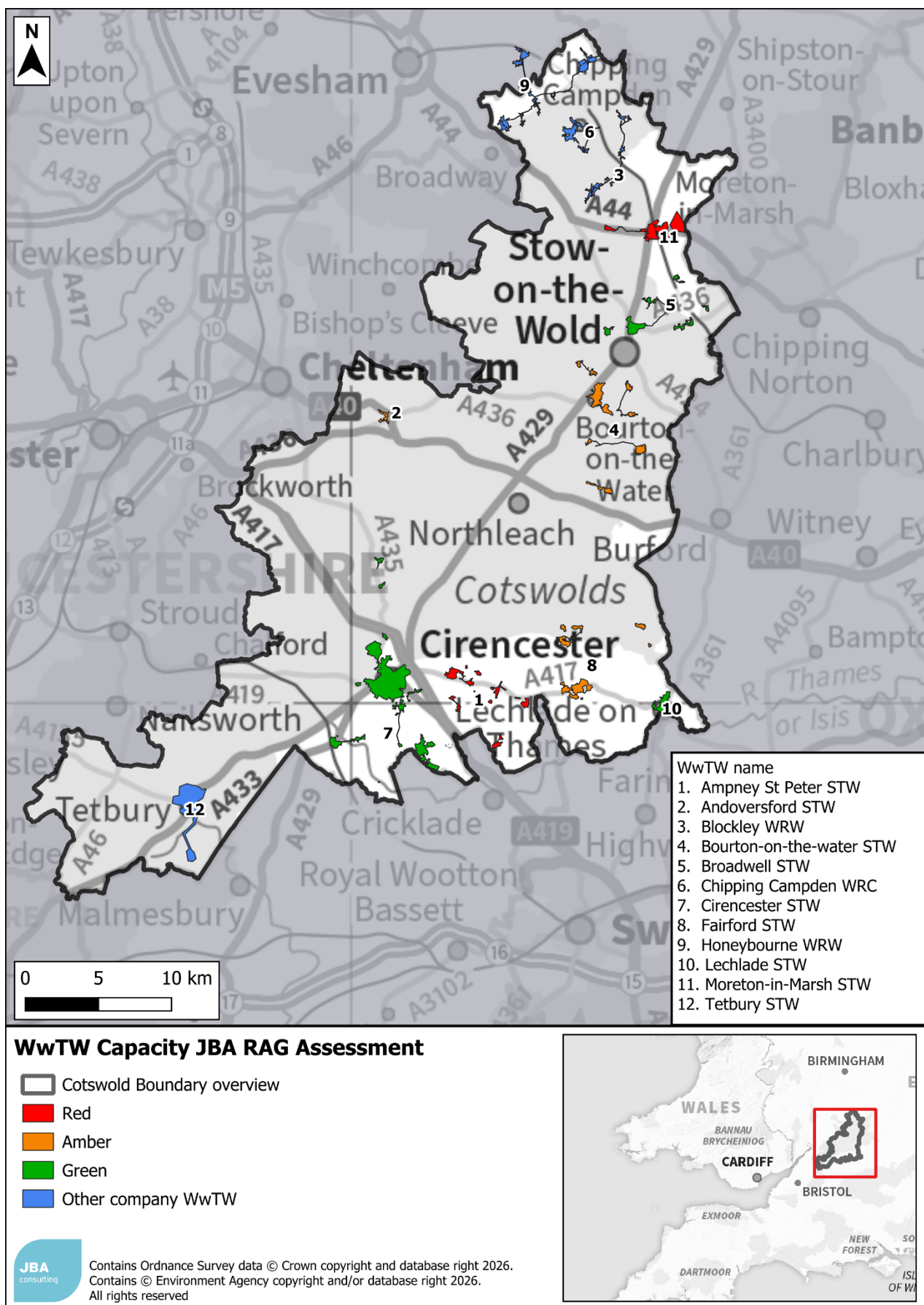


Figure 7.2 TW WwTW assessment

There are 12 WwTWs expected to serve growth during the Local Plan period. Table 7.4 contains a summary of the expected growth and the predicted remaining capacity by the end of the plan period. Seven WwTWs are expected to be close to or exceeding their permit limit by the end of the plan period. An increase in flow permit, and/or upgrades to treatment capacity will be required at these WwTW.

Where a WwTW is likely to exceed its permit, the permit would be reviewed by the EA and if a higher flow consent was agreed, a tighter permit limit for substance concentrations is very likely to be required. In some cases, this may not be technically feasibly possible if that means concentrations tighter than the Technically Accepted Limit (TAL) which is 0.25 mg/l for phosphate for example.

In addition to hydraulic capacity, it is important to consider water quality considerations which are discussed in Sections 8 and 9.3. For WwTW that need upgrading, typically around five years is required for permit changes to be agreed, funding obtained for the next AMP and major works upgrades to be completed. It is therefore important for CDC to engage early with Severn Trent Water, Thames Water and Wessex Water, to ensure that any required infrastructure is in place prior to development being occupied.

Table 7.4: JBA independent WwTW capacity assessment.

| WwTW                     | Predicted housing during LP period (no. dwellings) | Predicted employment during LP period (sqm) | JBA Assessment                                                                                                                                                                  | Estimated spare hydraulic capacity following planned development (number of dwellings) |
|--------------------------|----------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| AMPNEY ST PETER STW      | 5,062                                              | 109,000                                     | AMBER - Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required. No significant constraints have been identified. | -5,062                                                                                 |
| ANDOVERSFORD STW         | 109                                                | 0                                           | GREEN - Sufficient capacity to accommodate growth.                                                                                                                              | 541                                                                                    |
| BLOCKLEY (WRW)           | 65                                                 | 0                                           | GREEN - Sufficient capacity to accommodate growth.                                                                                                                              | 20                                                                                     |
| BOURTON-ON-THE-WATER STW | 934                                                | 0                                           | GREEN - Sufficient capacity to accommodate growth.                                                                                                                              | 2,559                                                                                  |
| BROADWELL STW            | 198                                                | 0                                           | GREEN - Sufficient capacity to accommodate growth.                                                                                                                              | 984                                                                                    |
| CHIPPING CAMPDEN (WRW)   | 198                                                | 0                                           | GREEN - Sufficient capacity to accommodate growth.                                                                                                                              | 1,729                                                                                  |
| CIRENCESTER STW          | 11,600                                             | 252,912                                     | AMBER - Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required. No significant constraints have been identified. | 1,987                                                                                  |
| FAIRFORD STW             | 2,018                                              | 42,000                                      | AMBER - Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required. No significant constraints have been identified. | -1,631                                                                                 |



| WwTW                  | Predicted housing during LP period (no. dwellings) | Predicted employment during LP period (sqm) | JBA Assessment                                                                                                                                                                  | Estimated spare hydraulic capacity following planned development (number of dwellings) |
|-----------------------|----------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| HONEYBOURNE (WRW)     | 1,412                                              | 0                                           | AMBER - Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required. No significant constraints have been identified. | -393                                                                                   |
| LECHLADE STW          | 220                                                | 0                                           | AMBER - Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required. No significant constraints have been identified. | 225                                                                                    |
| MORETON-IN-MARSH STW  | 4,302                                              | 51,000                                      | AMBER - Likely to be close to or exceed permit during plan period. Upgrades and / or a change to permit limit may be required. No significant constraints have been identified. | -4,012                                                                                 |
| TETBURY STW CATCHMENT | 336                                                | 0                                           | GREEN - Sufficient capacity to accommodate growth.                                                                                                                              | 3,515                                                                                  |

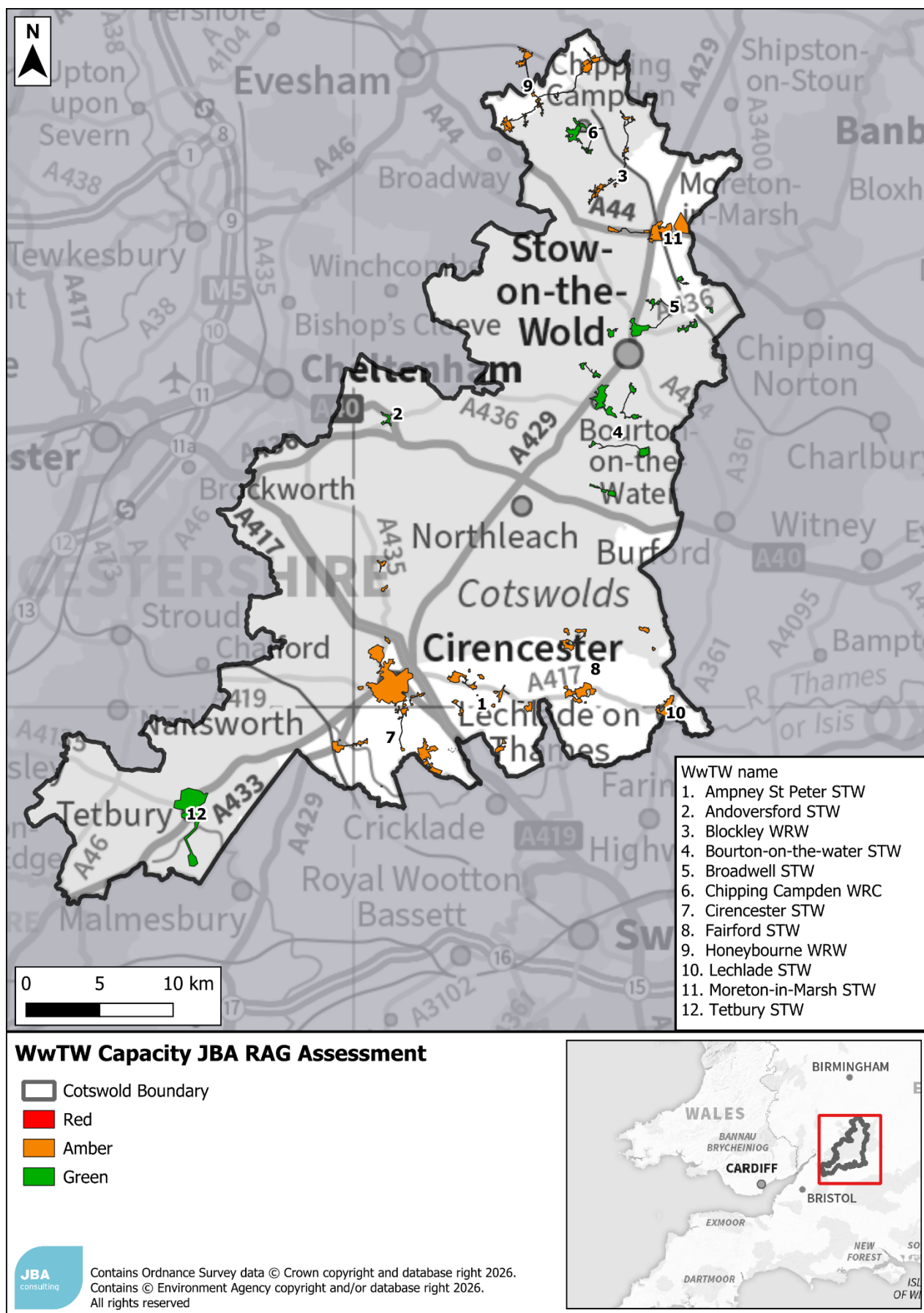


Figure 7.3 JBA headroom assessment

## 7.3 Storm tank overflows

### 7.3.1 Overview

There are 14 storm tank overflows within the Cotswold district area. Table 7.5 and Figure 7.4 present the performance of storm tank overflows at WwTWs, also referred to as Sewage Treatment Works (STW), in Cotswold District.

Where a storm tank overflow is operating in periods of moderate or light rainfall, or even in dry conditions it indicates either an infiltration problem within the network, or that the WwTW or its storm tanks are undersized for the population served. Further development within a catchment that has a poorly performing storm tank overflow is likely to exacerbate the issue.

It is important that development does not increase this frequency. The local plan can contribute to this by encouraging the use of SuDS to divert storm water away from the sewer network, reducing the volume that reaches the WwTW. This opportunity is greatest at brownfield sites connected to existing combined sewerage systems.

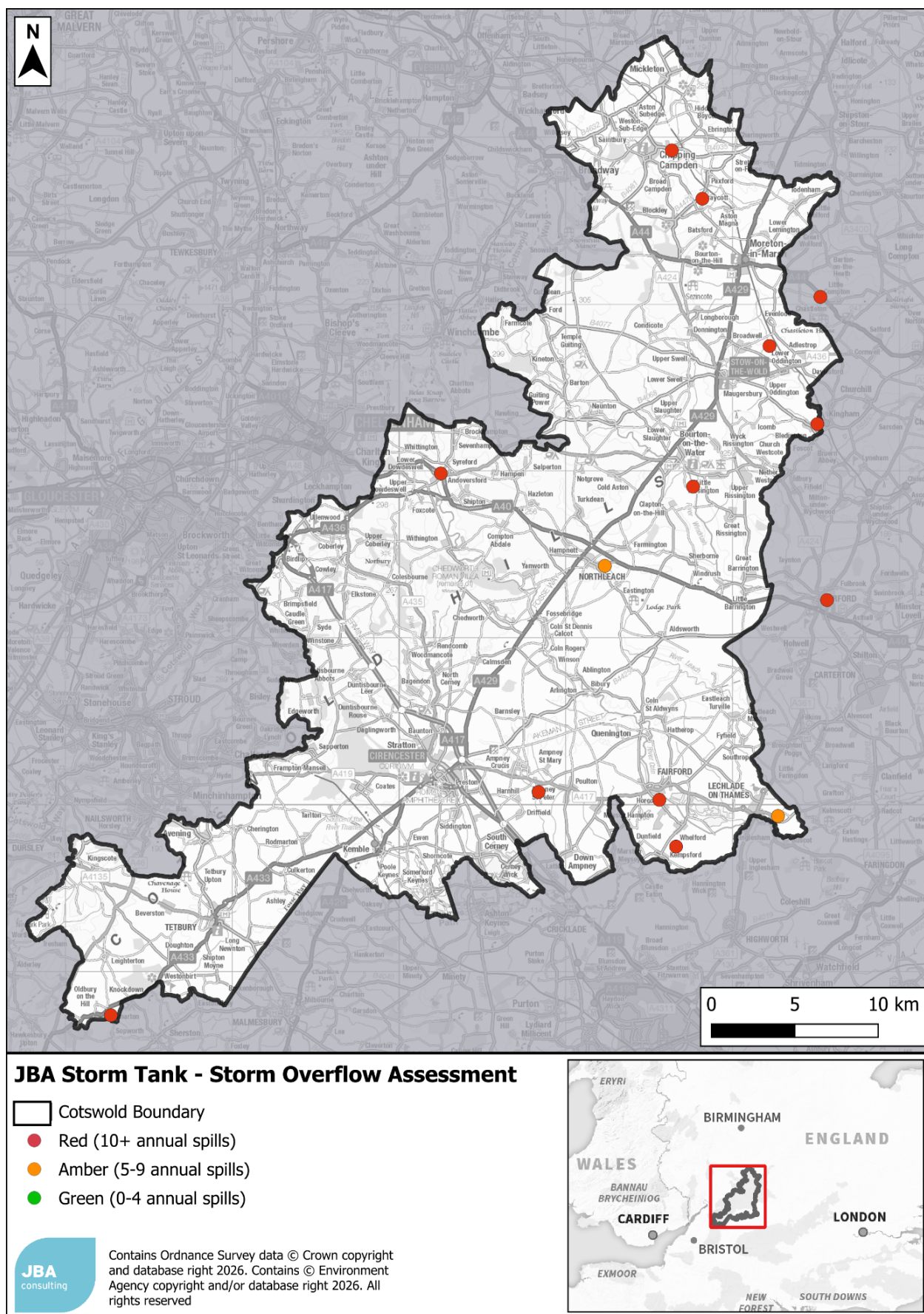


Figure 7.4 WwTW storm tank overflow RAG assessment

Table 7.5 WwTW EDM RAG data

| WwTW                               | Number of operations 2023 | Duration of operation in 2023 (hours) | Number of operations in 2024 | Duration of operation in 2024 (hours) | Number of operations in 2025 | Duration of operation in 2025 (hours) | Average number of operations 2023-2025 | Above threshold for investigation? (Y/N) |
|------------------------------------|---------------------------|---------------------------------------|------------------------------|---------------------------------------|------------------------------|---------------------------------------|----------------------------------------|------------------------------------------|
| AMPNEY ST PETER WWTW               | 130                       | 2759.5                                | 147                          | 3103                                  | 68                           | 1436                                  | 115                                    | YES                                      |
| ANDOVERSFORD WWTW                  | 115                       | 2092                                  | 129                          | 2476.25                               | 61                           | 1137.75                               | 102                                    | YES                                      |
| BLINGTON WWTW                      | 65                        | 956.25                                | 114                          | 2248                                  | 50                           | 946.75                                | 76                                     | YES                                      |
| BLOCKLEY SEWAGE TREATMENT WORKS    | 178                       | 3535.17                               | 106                          | 2034.25                               | 32                           | 479.95                                | 105                                    | YES                                      |
| BOURTON ON THE WATER CSO           | 110                       | 1565.25                               | 153                          | 2583.25                               | 49                           | 791.25                                | 104                                    | YES                                      |
| Broadwell STW                      | 48                        | 634.25                                | 58                           | 755.5                                 | 27                           | 367.28                                | 44                                     | YES                                      |
| BURFORD WASTEWATER TREATMENT WORKS | 0                         | 0                                     | 25                           | 338.25                                | 12                           | 152.75                                | 12                                     | YES                                      |
| CHIPPING CAMPDEN STW               | 40                        | 163.24                                | 87                           | 524.33                                | 25                           | 178.81                                | 51                                     | YES                                      |
| DIDMARTON WATER RECYCLING CENTRE   | 93                        | 1817.533                              | 84                           | 1768.73                               | 54                           | 1072.9                                | 77                                     | YES                                      |



| WwTW               | Number of operations 2023 | Duration of operation in 2023 (hours) | Number of operations in 2024 | Duration of operation in 2024 (hours) | Number of operations in 2025 | Duration of operation in 2025 (hours) | Average number of operations 2023-2025 | Above threshold for investigation? (Y/N) |
|--------------------|---------------------------|---------------------------------------|------------------------------|---------------------------------------|------------------------------|---------------------------------------|----------------------------------------|------------------------------------------|
| FAIRFORD STW       | 162                       | 3391                                  | 202                          | 4332.25                               | 107                          | 2234.75                               | 157                                    | YES                                      |
| KEMPSFORD STW      | 8                         | 44                                    | 8                            | 96.5                                  | 0                            | 0                                     | 5                                      | NO                                       |
| LECHLADE STW       | 45                        | 688.5                                 | 128                          | 2365.5                                | 11                           | 161.25                                | 61                                     | YES                                      |
| LITTLE COMPTON STW | 57                        | 683.25                                | 69                           | 931                                   | 30                           | 414.75                                | 52                                     | YES                                      |
| NORTHLEACH WWTW    | 3                         | 18.75                                 | 11                           | 60                                    | 5                            | 30.5                                  | 6                                      | NO                                       |

### 7.3.2 Results

With the exception of Kempsford STW and Northleach STW, all of the storm tanks at WwTWs exceed the threshold for investigation.

The highest spill average occurs at Cirencester WwTW with a three-year average of 175 spills. The lowest number of spills occurs at Honeybourne STW with 36 spills.

## 7.4 Wastewater treatment works odour assessment

### 7.4.1 Introduction

WwTW have a typical range where odour is experienced. Where developments encroach upon this range, there may become a cause for nuisance and complaints from residents. Managing odour at WwTW can add considerable capital and operational costs, particularly when retro fitted to existing WwTW. National Planning Policy Guidance recommends that plan makers consider whether new development is appropriate near to sites used (or proposed) for water and wastewater infrastructure, due to the risk of odour nuisance.

### 7.4.2 Methodology

SUs recommend that an odour assessment may be required if the site of a proposed development is close to a WwTW and is encroaching closer to the WwTW than existing urban areas.

A Geographic Information System (GIS) assessment was carried out to identify areas that the SU considers may be at risk from odour nuisance due to encroachment on an existing WwTW. For Thames Water, this is defined as development sites less than 800m from the WwTW and encroaching closer to the WwTW than existing urbanised areas. For Wessex Water, Bristol Water and Severn Trent Water 400m from the WwTW is the threshold. If there are no existing houses close to a WwTW it is more likely that an odour impact assessment is needed.

### 7.4.3 Results

Allocations have been provided by CDC, and either a 400m or 800m (Thames Water only) buffer created to determine which sites may be affected by nuisance odour.

Sites that fall within the 800m or 400m buffer from WwTWs are listed in Table 7.6 and graphically in Figure 7.5.

Table 7.6 Allocations that are within the 800m and 400m buffer from WwTWs

| Site reference                                                | Site use    | Buffer distance (m) |
|---------------------------------------------------------------|-------------|---------------------|
| N14B                                                          | Residential | 800                 |
| A2                                                            | Residential | 800                 |
| F20A                                                          | Residential | 800                 |
| F53A                                                          | Residential | 800                 |
| L33                                                           | Residential | 800                 |
| R203A-C                                                       | Residential | 800                 |
| Strategic extension to the South and East of Moreton-in-Marsh | Mixed       | 800                 |
| CC10A                                                         | Residential | 400                 |

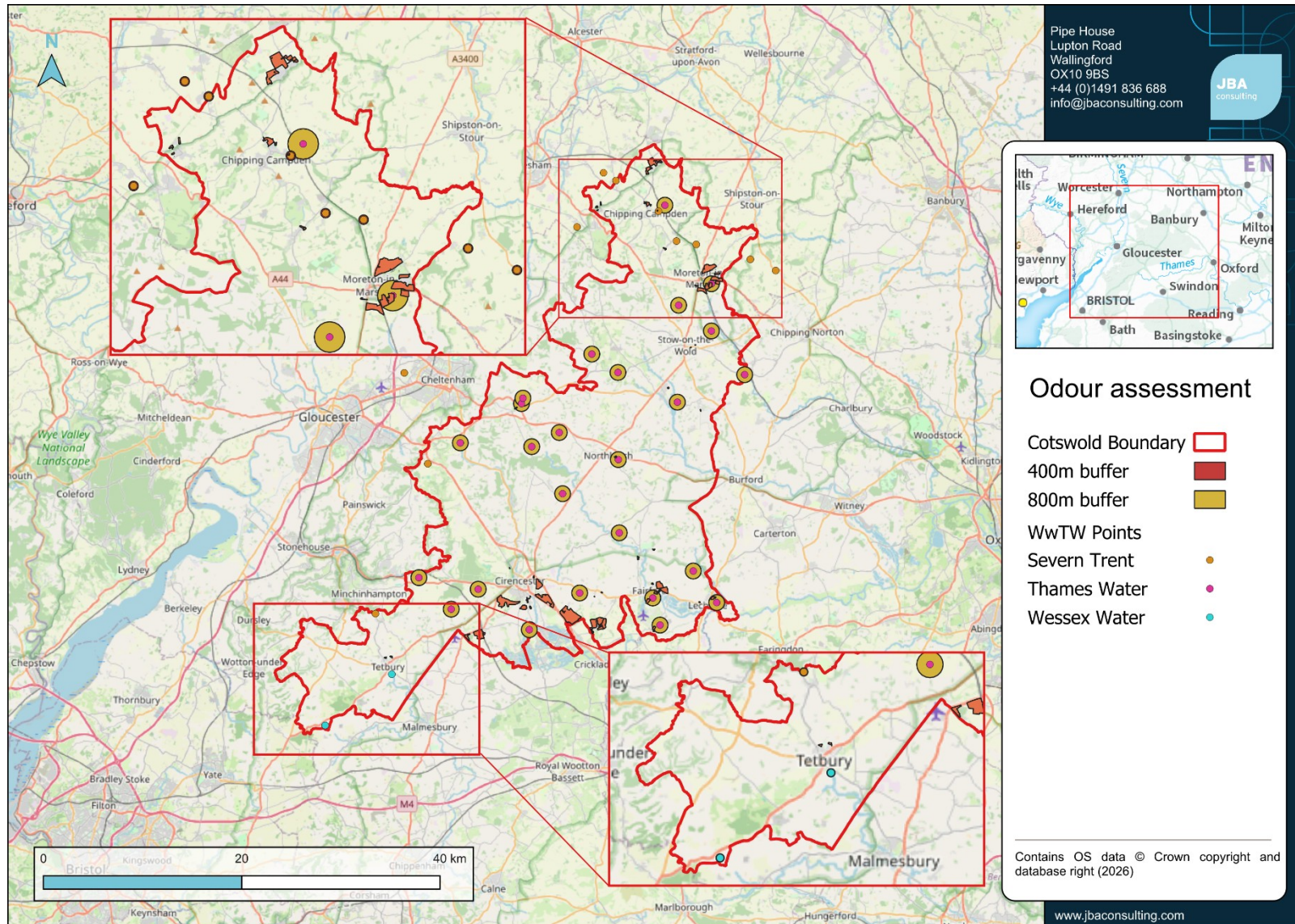


Figure 7.5 Odour assessment

## 7.5 Conclusions and recommendations

There are 25 WwTWs that are within the Cotswold district or outside but serving a population within Cotswold district. Of these, twelve are expected to serve growth during the Local Plan period.

Five WwTW are expected to have capacity for growth during the plan period and will not require further upgrades for capacity. Seven WwTWs are expected to exceed their permit limit during the Local Plan period, or be close to their permit limit by the end of the plan period.

Where an increase in capacity may be required, sufficient time is needed for the water company to plan and deliver the upgrade scheme. This would typically be planned for delivery in the next AMP period. i.e., a need to upgrade a WwTW would be identified in DWMP28 for inclusion in the PR29 business plan and delivered between 2030 and 2035.

There may therefore be a constraint to growth at WwTWs that are already at their permit limit and do not have upgrades planned within this AMP period. Beyond 2030, there should be sufficient time once the Local Plan is adopted for water companies to provide additional capacity where required. It is strongly advised that CDC discuss the phasing of potential allocations with TW, STW and WW early in the Local Plan period to allow infrastructure upgrades to be planned to provide capacity when it is required.

The odour screening assessment identified eight potential allocations that are close enough to a WwTW that an odour impact assessment would be recommended. This would be funded by the developer.

**Table 7.7 Recommendations for wastewater treatment**

| Recommendation                                                                                                                      | Responsibility | Timeframe |
|-------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------|
| Early engagement with STW, TW and WW is required to ensure that provision of WwTW capacity is aligned with delivery of development. | CDC            | Ongoing   |
| Continue to provide Annual Monitoring Reports to STW, TW and WW detailing projected housing growth.                                 | CDC            | Ongoing   |
| STW, TW and WW to assess growth demands as part of their                                                                            | STW, TW, WW    | Ongoing   |



| Recommendation                                                                             | Responsibility  | Timeframe |
|--------------------------------------------------------------------------------------------|-----------------|-----------|
| wastewater asset planning activities and feedback to the Council if concerns arise.        |                 |           |
| Consider odour risk in the sites identified to be potentially at risk from nuisance odour. | CDC, Developers | Ongoing   |
| Carry out an odour assessment for site identified as being at risk of nuisance odour.      | Developers      | Ongoing   |

## 8 Water quality

### 8.1 Introduction

An increase in the discharge of effluent from Wastewater Treatment Works (WwTW) because of development and growth in the area in which they serve can lead to a negative impact on the quality of the receiving watercourse. Under the Water Framework Directive (WFD), a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for individual elements assessed).

It is Environment Agency (EA) policy to model the impact of increasing effluent volumes on the receiving watercourses. Where the scale of development is such that a deterioration is predicted, a variation to the Environmental Permit (EP) may be required for the WwTW to improve the quality of the final effluent, so that the increased pollution load will not result in a deterioration in the water quality of the watercourse. This is known as "no deterioration" or "load standstill". The need to meet river quality targets is also taken into consideration when setting or varying a permit.

The Environment Agency operational instructions on water quality planning and no-deterioration are currently being reviewed. Previous operational instructions (Environment Agency d, 2012) (now withdrawn) set out a hierarchy for how the no-deterioration requirements of the WFD should be implemented on inland waters. The potential impact of development should be assessed in relation to the following objectives:

- Could the development cause a greater than 10% deterioration in water quality? This objective ensures that all the environmental capacity is not taken up by one stage of development and there is sufficient capacity for future growth.
- Could the development cause a deterioration in WFD class of any element assessed? This is a requirement of the Water Framework Directive to prevent a deterioration in class of individual contaminants. The "Weser Ruling" (European Court of Justice, 2015) by the European Court of Justice in 2015 specified that individual projects should not be permitted where they may cause a deterioration of the status of a water body. If a water body is already at the lowest status ("bad"), any impairment of a quality element was considered to be a deterioration. Emerging practice is that a 3% limit of deterioration is applied.
- Could the development alone prevent the receiving watercourse from reaching Good Ecological Status (GES) or Potential? Is GES possible with current technology or is GES technically possible after development with any potential WwTW upgrades.

The overall WFD classification of a water body is based on a wide range of ecological and chemical classifications. This assessment focuses on three physico-chemical quality elements; Biochemical Oxygen Demand (BOD), Ammonia, and Phosphate as set out in the EA guidance (Environment Agency e, 2014).

### **BOD – Biochemical Oxygen Demand**

BOD is a measure of how much organic material – sewage, sewage effluent or industrial effluent – is present in a river. It is defined as the amount of oxygen taken up by micro-organisms (principally bacteria) in decomposing the organic material in a water sample stored in darkness for 5 days at 20°C. Water with a high BOD has a low level of dissolved oxygen. A low oxygen content can have an adverse impact on aquatic life.

### **Ammonia**

Nitrogen is an essential nutrient required by all plants and animals for the formation of amino acids. In its molecular form nitrogen cannot be used by most aquatic plants, and so it is converted into other forms. One such form is ammonia (NH<sub>3</sub>). This may then be oxidized by bacteria into nitrate (NO<sub>3</sub>) or nitrite (NO<sub>2</sub>). Ammonia may be present in water in either the unionized form NH<sub>3</sub> or the ionized form NH<sub>4</sub>. Taken together these forms are called Total Ammonia Nitrogen.

Although ammonia is a nutrient, in high concentrations it can be toxic to aquatic life, in particular fish, affecting hatching and growth rates.

The main sources in rivers include agricultural sources, (fertilizer and livestock waste), residential sources (ammonia containing cleaning products and septic tank leakages), industrial processes and WwTWs.

### **Phosphate**

Phosphorus is a plant nutrient and elevated concentrations in rivers can lead to accelerated plant growth of algae and other plants. Its impact on the composition and abundance of plant species can have adverse implications for other aspects of water quality, such as oxygen levels. These changes can cause undesirable disturbances to other aquatic life such as invertebrates and fish.

Phosphorus (P) occurs in rivers mainly as Phosphate (PO<sub>4</sub>), which are divided into Orthophosphates (reactive phosphates), and organic Phosphates.

Orthophosphates are the main constituent in fertilizers used in agriculture and domestic gardens and provide a good estimation of the amount of phosphorus available for algae and plant growth and is the form of phosphorus that is most readily utilized by plants.

Organic phosphates are formed primarily by biological processes and enter sewage via human waste and food residues. Organic phosphates can be formed from orthophosphates in biological treatment processes or by receiving water biota.

Although it is phosphorus in the form of phosphates that is measured as a pollutant, the term phosphorus is often used in water quality work to represent the total phosphorus containing pollutants.

## 8.2 Water quality modelling

SIMCAT is used by the EA to model water bodies and identify where permit changes are needed to prevent deterioration or improve water quality as well as supporting decision making to guide development to locations where environmental deterioration will be reduced. SIMCAT is a 1D model which represents inputs from both point-source effluent discharges and diffuse sources, and the behaviour of solutes in the river.

SIMCAT can simulate inputs of discharge and water quality data and statistically distribute them from multiple effluent sources along the river reach. It uses the Monte Carlo method for distribution that randomly models up to 2,500 boundary conditions. The simulation calculates the resultant water quality as the calculations cascade further downstream.

Once the distribution results have been produced, an assessment can be undertaken on the predicted mean and ninetieth percentile concentrations or loads compared to the Environmental Quality Standards.

Within SIMCAT, the determinands modelled were Biochemical Oxygen Demand (BOD), ammonia) and phosphorus. In fresh waterbodies, phosphate is usually the limiting nutrient for algal growth. However, in marine environments, nitrogen is considered to be the limiting nutrient. The methodology followed is summarised in Figure 8.1. In this flow chart, all of the questions in the top row must be answered.

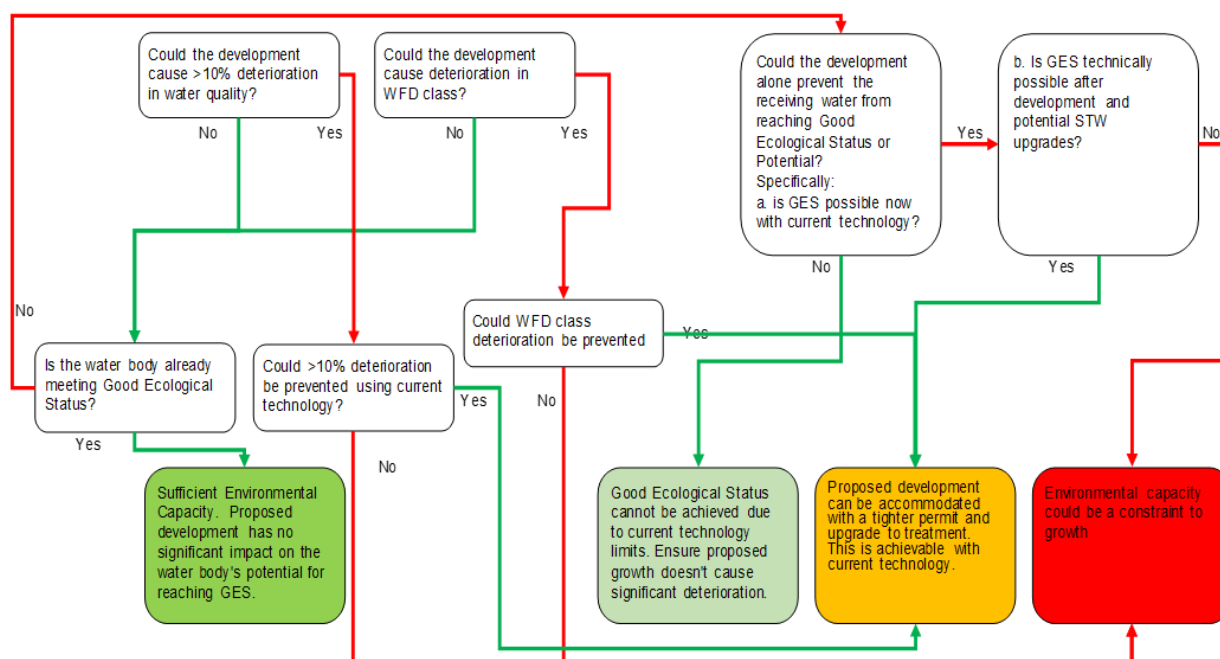


Figure 8.1: Water quality impact assessment following EA guidance.

Where modelling indicated, growth may lead to a deterioration in the watercourse, or where the watercourse is not currently meeting at least a 'Good' class for each determinant, the models were used to test whether this could be addressed by applying stricter discharge limits. In such cases, a Technically Achievable Limit (TAL) was considered.

The EA advised that the following permit values are achievable using treatment at TAL, and that these values should be used for modelling all WwTW potential capacity irrespective of the existing treatment technology and size of the works:

- Ammonia (90%ile): 1 mg/l.
- BOD (90%ile): 5 mg/l.
- Phosphorus (mean): 0.25 mg/l.

This assessment did not take into consideration whether it is feasible to upgrade each existing WwTW to TAL due to constraints of costs, timing, space, carbon costs etc.

### 8.2.1 Methodology

The study area is covered by the three SIMCAT models developed by the EA (Severn, Thames and Bristol Avon). These models have been largely based on observed flow and quality data for the period 2014-2020. A widespread update of the models, and the resultant recalibration were not within scope of this project. It was therefore agreed with the EA to update just the effluent flow at WwTW receiving growth in the study area. Consequently, the modelling work presented should be used to identify areas at risk of water quality deterioration, but not for permit setting.

Flow data from the last three years for each WwTW in the study area was supplied by the sewerage undertakers and used to update the model. Some of the WwTW in the study area already had upgrades completed in AMP7 or planned in AMP8, which would be expected to improve water quality at those locations. These were therefore factored into the model by applying the updated permit limit where it was less than the current discharge in the model. The model was then run in its updated form to set a 2024 baseline.

Additional effluent flow from growth during the Local Plan period was added to current flow at WwTW receiving growth and the model re-run as a future scenario.

STW were unable to provide flow data within the timescale of the Stage 2 WCS. At these three WwTWs, an uplift was made to the data provided in the 2025 WCS based on a comparison of flows at TW WwTWs in the 2025 WCS and the data provided for this study. The data has since been provided and in each case is a lower flow than the assumption used in the water quality modelling resulting in a conservative assessment.



### No deterioration test

The results from the baseline and future versions of the model were compared to assess the predicted percentage deterioration for each of the modelled determinands. WFD targets for each river reach were provided by the EA and used to determine if there was a risk of a class deterioration.

Where a deterioration of 10% or greater was predicted or a change in class (considered to be a significant deterioration under WFD) a further test was conducted to see if this deterioration could be prevented by upgrades to treatment processes. This used another version of the model with each WwTW set to operate at their TAL.

### Good ecological status assessment

Where treatment at TAL and reductions in diffuse sources in the present day could improve water quality to achieve GES, it is important to understand whether this could be compromised as a result of future growth within the catchment.

Guidance from the EA suggests breaking this down into two questions:

- a. Is GES possible now with current technology?
- b. Is GES technically possible after development and any potential WwTW upgrades?

If the answer to questions a) and b) are both 'Yes' or both 'No' then the development can be assessed as having no significant impact on the water bodies potential for reaching GES, i.e., the development alone is not preventing GES from being achieved.

If the answer to a) is 'Yes' and the answer for b) is 'No' then development is having a significant impact, i.e., before development GES could be achieved with upstream improvements, and after growth the additional effluent from growth prevents GES being achieved.

The possible answers are summarised in Table 8.1.

Run type 9 within SIMCAT was used which assumes that upstream flow at each treatment works is at GES. This simulates improvements being made in upstream water quality. The water quality of the discharge from each WwTW in order to maintain GES is then calculated by the model.

Table 8.1 Possible GES assessment results

| Predicted to achieve GES after growth | Could achieve GES today with improvements in upstream water quality? (a) | Could achieve GES in the future with improvements in upstream water quality? (b) | Assessment Result                |
|---------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------|
| YES                                   | N/A                                                                      | N/A                                                                              | GREEN - Sufficient environmental |

| Predicted to achieve GES after growth | Could achieve GES today with improvements in upstream water quality? (a) | Could achieve GES in the future with improvements in upstream water quality? (b) | Assessment Result                                                                                                                            |
|---------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |                                                                          |                                                                                  | capacity. Proposed development has no significant impact on the water body's potential for meeting GES.                                      |
| NO                                    | YES                                                                      | YES                                                                              | AMBER - Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology. |
| NO                                    | NO                                                                       | NO                                                                               | YELLOW - GES cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration.            |
| NO                                    | YES                                                                      | NO                                                                               | RED - Environmental capacity could be a constraint to growth.                                                                                |

If good ecological status is predicted to be achieved within the receiving waterbody following growth during the plan period, a green assessment is given. In this case, it can be said that there is environmental capacity to accommodate growth.

Where GES is not currently being achieved but could be achieved if upstream water quality were improved, then an amber score is given – growth could be accommodated without preventing a waterbody achieving GES in the future.

Where GES cannot be achieved either today or in the future, despite upgrades in treatment processes, and improvements in upstream water quality, then a yellow assessment is given – and it can be said that GES cannot be achieved due to the limits of current technology. Growth alone is not predicted to prevent GES being achieved in the future.

Should GES be achievable today, but not in the future due to growth, a red assessment would be given, and it can be said that environmental capacity could be

a constraint to growth, i.e., growth alone could prevent good ecological status being achieved in the future.

### 8.2.2 Results

The first test applied compares the future scenario to the baseline and assesses whether a significant deterioration in water quality occurs – either a 10% deterioration in water quality or a deterioration in WFD class. Where, a significant deterioration is predicted, the TAL scenario then assesses whether this deterioration could be prevented by improvements in treatment processes.

Where a 'green' score is given, deterioration was less than 10% for each determinand, and no change in WFD class is predicted. Where an 'amber' assessment is given, a 10% deterioration or change in WFD class is predicted, but this could be prevented by improvements in treatment technology. In these cases, upgrades may therefore be required at that WwTW or at WwTW upstream.

A 'red' assessment would be given where a significant deterioration in water quality is predicted, and it cannot be prevented by improvements in treatment processes.

In this assessment, improvements in treatment processes have been modelled by assuming the WwTW is operating at TAL. It has not investigated the feasibility of upgrading individual WwTW. This should be performed by the sewerage undertakers who have the detailed knowledge of their assets, and the EA who are responsible for setting permit limits at WwTWs.

At seven of the twelve WwTWs serving growth a 10% deterioration in water quality is expected. In the case of Cirencester a deterioration in WFD class from Good to Moderate is expected. Both of these are considered to be a significant deterioration in water quality.

With the exception of Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, all of these deteriorations can be prevented by upgrades to treatment processes.

Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, are situated in the upper catchment where the current WFD classification for ammonia and BOD is "High" (i.e., the best water quality). The WwTW is also currently operating either beyond or close to the technically achievable limit. Under these circumstances, a high percentage deterioration in water quality is expected, and as there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains high.

Despite a large percentage deterioration, the resulting water quality remains "High" status for ammonia and BOD.

The EA published guidance in 2012, explaining how the no deterioration requirements of the Water Framework Directive should be implemented. This guidance was subsequently withdrawn and has not been replaced. This indicated

that should it not be feasible to keep deterioration within 10%, "no deterioration" should be assessed based on the class limit immediately downstream of the discharge. At each of the five WwTWs where deterioration could not be kept within 10%, no change in WFD classification was predicted and High status would be maintained for ammonia. The WCS therefore does not consider this a constraint to growth in this catchment.

Appendix C shows the water quality results graphically. The first set of maps in Appendix C show the modelled results if wastewater discharges were increased by the volume predicted during the Local Plan. They show the result at the point of mixing (i.e., where the WwTW discharges) and the results downstream in the river. These are colour coded based on whether deterioration is greater (red) or less than (amber) 10%. Areas where no deterioration is predicted are coloured green.

The second set of maps in Appendix C show the modelled results in the TAL scenario, where each WwTW has been upgraded to the technically achievable limit. This shows areas where deterioration could not be prevented. In each case this is less than 10%.

Table 8.3 shows the results of the GES assessment. At three WwTWs (Ampney St Peter, Blockley, and Cirencester) Good Ecological Status is not currently being met in the baseline, and upgrades to the technically achievable limit would not allow this to be met. Growth alone does not therefore prevent good ecological status being achieved in the future. These have been given a "yellow" rating. At ten WwTW, GES is not currently being achieved, but it could be achieved with upgrades to treatment processes (alongside catchment improvements). These have been given an "amber" rating.

Table 8.2 Water quality modelling results

| WwTW                     | Housing growth over plan period (dwellings) | Employment growth over plan period (m <sup>2</sup> ) | Could the development cause a greater than 10% deterioration in water quality for one or more of BOD, Ammonia or Phosphate? | Could the development cause a deterioration in WFD class of any element? | Can a deterioration of >10% or in class be prevented by treatment at TAL? |
|--------------------------|---------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|
| AMPNEY ST PETER STW      |                                             |                                                      | Yes                                                                                                                         | Yes                                                                      | No                                                                        |
| ANDOVERSFORD STW         |                                             |                                                      | Yes                                                                                                                         | No                                                                       | Yes                                                                       |
| BLOCKLEY (WRW)           |                                             |                                                      | No                                                                                                                          | No                                                                       | Yes                                                                       |
| BOURTON-ON-THE-WATER STW |                                             |                                                      | No                                                                                                                          | No                                                                       | Yes                                                                       |
| BROADWELL STW            |                                             |                                                      | Yes                                                                                                                         | No                                                                       | Yes                                                                       |
| CHIPPING CAMPDEN (WRW)   |                                             |                                                      | No                                                                                                                          | No                                                                       | Yes                                                                       |
| CIRENCESTER STW          |                                             |                                                      | No                                                                                                                          | Yes                                                                      | Yes                                                                       |
| FAIRFORD STW             |                                             |                                                      | Yes                                                                                                                         | No                                                                       | No                                                                        |
| HONEYBOURNE (WRW)        |                                             |                                                      | Yes                                                                                                                         | No                                                                       | Yes                                                                       |
| LECHLADE STW             |                                             |                                                      | No                                                                                                                          | No                                                                       | Yes                                                                       |
| MORETON-IN-MARSH STW     |                                             |                                                      | Yes                                                                                                                         | No                                                                       | No                                                                        |
| TETBURY STW CATCHMENT    |                                             |                                                      | Yes                                                                                                                         | No                                                                       | Yes                                                                       |



Table 8.3 GES assessment results

| WwTW                     | Ammonia assessment                                                                                                                      | Biochemical Oxygen Demand (BOD) assessment                                                                                                  | Phosphate assessment                                                                                                                                |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| AMPNEY ST PETER STW      | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology. | YELLOW- Good ecological status cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration. |
| ANDOVERSFORD STW         | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology. | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology.         |
| BLOCKLEY (WRW)           | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.     | YELLOW- Good ecological status cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration. |
| BOURTON-ON-THE-WATER STW | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.     | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology.         |
| BROADWELL STW            | GREEN- Sufficient environmental capacity. Proposed development has no                                                                   | GREEN- Sufficient environmental capacity. Proposed development has no                                                                       | AMBER- Proposed development can be accommodated with a tighter                                                                                      |

| WwTW                   | Ammonia assessment                                                                                                                      | Biochemical Oxygen Demand (BOD) assessment                                                                                                  | Phosphate assessment                                                                                                                                |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | significant impact on the water body's potential for meeting GES.                                                                       | significant impact on the water body's potential for meeting GES.                                                                           | permit and upgrade to treatment. This is achievable with current technology.                                                                        |
| CHIPPING CAMPDEN (WRW) | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.     | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology.         |
| CIRENCESTER STW        | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology. | YELLOW- Good ecological status cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration. |
| FAIRFORD STW           | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.     | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology.         |
| HONEYBOURNE (WRW)      | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.     | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology.         |

| WwTW                  | Ammonia assessment                                                                                                                      | Biochemical Oxygen Demand (BOD) assessment                                                                                              | Phosphate assessment                                                                                                                        |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| LECHLADE STW          | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology. |
| MORETON-IN-MARSH STW  | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology. |
| TETBURY STW CATCHMENT | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | GREEN- Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES. | AMBER- Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology. |

### 8.3 Summary of WFD status

The WFD aims to ensure 'no deterioration' in the environmental status of rivers and sets objectives to improve rivers to meet 'good' status. LPAs must have regard to the WFD and associated statutory objectives as implemented in the EA's RBMPs.

Figure 8.2 shows the ecological status WFD classification (2022) for waterbodies in Cotswold district. This is broken down into the determinands usually assessed in WCSs for each of the waterbodies that are predicted to receive additional effluent from growth during the plan period. The overall WFD status is not available for Cycle 3, though it is made of Ecological and Chemical status, which are further broken down into sub-elements, the measurement of which is prioritised for each waterbody based on its characteristics and risk, hence not all elements are reported for each river.

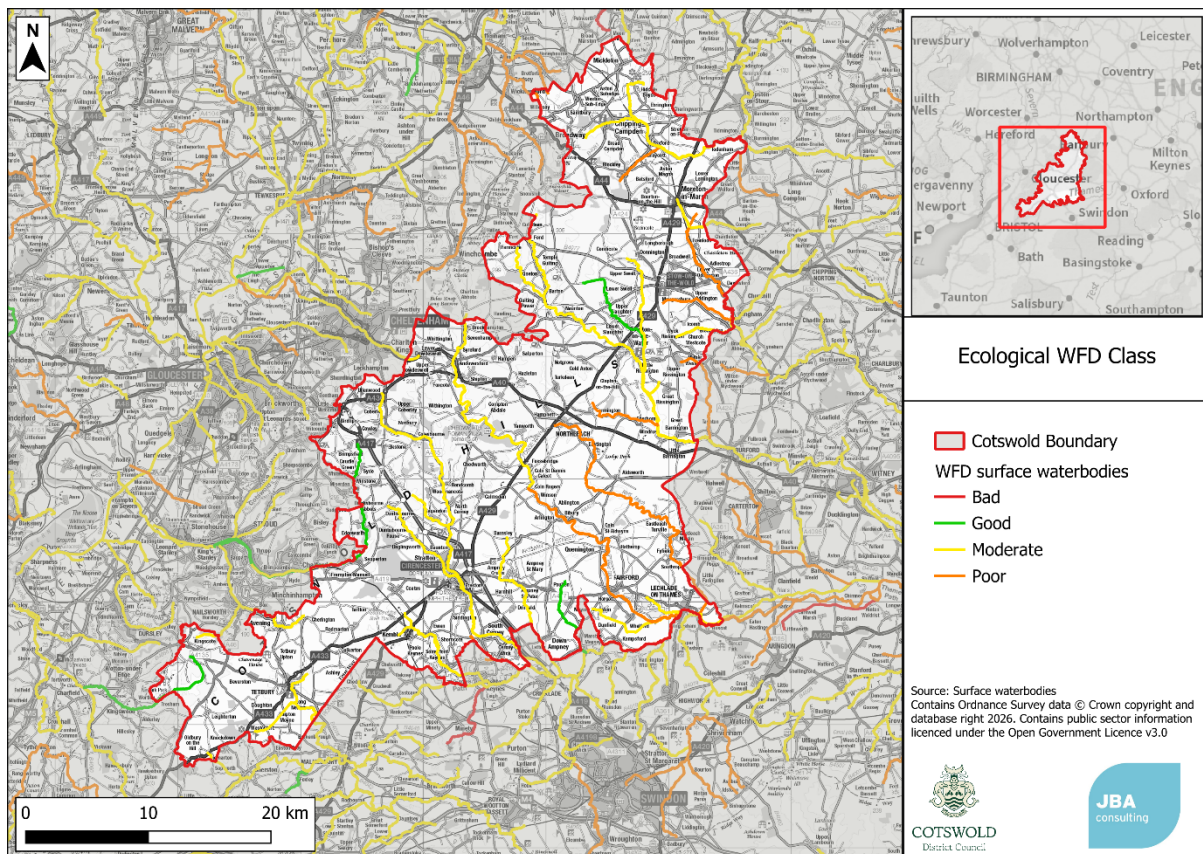


Figure 8.2 WFD Ecological Classification

### 8.4 Reasons for not achieving good

The latest WFD assessment data indicates that watercourses within Cotswold district exhibit a range of overall statuses, including 'good', 'moderate', 'poor', and 'bad'. The EA's Reasons for Not Achieving Good (RNAG) dataset indicates that the sewage discharge (intermittent and continuous), urban and transport sectors (urban development), as well as agriculture and rural land management, are the main reasons for watercourses not achieving good status in this area. However, there are

also several instances in the borough where no sector is responsible, or the sector is under investigation.

## 8.5 WINEP

There are 89 actions from the Water Industry National Environment Programme (WINEP) that relate to water quality in the study area. These are listed in Appendix B.

## 8.6 Priority substances

As well as the physico-chemical water quality elements (BOD, Ammonia, Phosphate etc.) addressed above, a watercourse can fail to achieve GES due to exceeding permissible concentrations of hazardous substances. Currently there are 45 priority substances, of which 21 are priority hazardous substances. Such substances may pose risks both to humans (when contained in drinking water) and to aquatic life and animals feeding in aquatic life. These substances are managed by a range of different approaches, including international bans on manufacturing and use, targeted bans, selection of safer alternatives and end-of-pipe treatment solutions. There is considerable concern within the UK water industry that regulation of these substances by setting permit values which require their removal at wastewater treatment works will place a huge cost burden upon the industry and its customers, and that this approach would be out of keeping with the 'polluter pays' principle.

The following points consider how the planning system might be used to manage priority substances:

- **Industrial sources** – while this report covers potential employment sites, it does not consider the type of industry and therefore likely sources of priority substances are unknown. It is recommended that developers discuss potential uses which may be sources of priority substances from planned industrial facilities at an early stage with the EA and, where they are seeking a trade effluent consent, with the SU.
- **Agricultural sources** - there is limited scope for the planning system to change or regulate agricultural practices. UK water companies are involved in a range of 'Catchment-based Approach' schemes aimed at reducing diffuse sources of pollutants, including agricultural pesticides.
- **Surface water runoff sources** - some priority substances e.g., heavy metals, are present in urban surface water runoff. It is recommended that future developments manage these sources by using SuDS that provide water quality treatment, designed following the CIRIA SuDS Manual. This is covered in more detail in Sections 9.6. Retrofitting of SuDS to existing highways systems would also be recommended, where opportunity and funding allows, in order to treat heavy metal, microplastic and hydrocarbon contaminants present in highways runoff.



- **Domestic wastewater sources** - some priority substances are found in domestic wastewater as a result of domestic cleaning chemicals, detergents, pharmaceuticals, pesticides, or materials used within the home. Whilst an increase in the population due to housing growth could increase the total volumes of such substances being discharged to the environment, it would be more appropriate to manage these substances through regulation at source, rather than through restricting housing growth through the planning system.

No further analysis of priority substances has been undertaken as part of this study.

## 8.7 Conclusions and recommendations

The EA's Reasons for Not Achieving Good (RNAG) dataset indicates that sewage treatment, the urban and transport sectors (urban development), as well as agriculture and rural land management, are the main reasons for watercourses not achieving good status in this area.

Growth during the Local Plan period is predicted to cause a significant deterioration in water quality downstream of seven WwTWs (six have a greater than 10% deterioration in one or more determinands, and one has a deterioration in WFD class).

With the exception of Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, all of these deteriorations can be prevented by upgrades to treatment processes.

At Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, a greater than 10% deterioration is predicted for Ammonia and BOD which is not prevented in the modelling scenario where upgrades to WwTWs are applied.

This is because these WwTWs are situated in an area where the current WFD classification for ammonia is "High" (i.e., the best water quality) and is operating either beyond or close to the technically achievable limit.

Under these circumstances, a high percentage deterioration in water quality is expected, and as there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains high. No change in WFD classification is predicted, and High status is maintained for Ammonia and BOD. The WCS therefore does not consider this a constraint to growth.

The water quality modelling indicates that growth alone will not prevent good ecological status being prevented in the future should improvements in upstream water quality be made.

Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with Thames Water, Severn Trent Water and Wessex Water provide is essential to ensure that infrastructure is in place prior to development to prevent a breach of the environmental permit.

Table 8.4: Recommendations for water quality.

| Actions                                                                                                                                           | Responsibility                                         | Timescale |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-----------|
| Provide annual monitoring reports to Thames Water, Severn Trent Water and Wessex Water detailing projected housing growth in the Local Authority. | CDC                                                    | Ongoing   |
| Take into account the full volume of growth (from CDC and neighbouring authorities) within the catchment.                                         | CDC, Thames Water, Severn Trent Water and Wessex Water | Ongoing   |

## 9 Environmental opportunities and constraints

### 9.1 Introduction

Development has the potential to cause an adverse impact on the environment through several routes, such as worsening of air quality, pollution to the aquatic environment, or disturbance to wildlife. Of relevance in the context of a WCS is the impact of development on the aquatic environment.

A source-pathway-receptor approach can be taken to investigate the risk and identify where further assessment or action is required.

### 9.2 Impact of abstraction

#### 9.2.1 Overview

Abstraction of water within a catchment, either from groundwater or surface water sources, is necessary to provide a public water supply, for industrial processes and for agriculture. When the volume of water being abstracted becomes too high, it can cause environmental damage by reducing river flow or lowering the water table.

Changes in river flow can impact sensitive ecosystems, for example trout require a clean gravel bed to lay their eggs. A reduction in river flow can cause sediment to build up, blocking the spaces the fish require to lay their eggs impacting their reproductive cycle. Changes in groundwater levels can also affect the flow regime in rivers and can cause drying of wetland sites.

The precise location of abstraction points for public water supply in England is not available for reasons of national security. Furthermore, water demand within a WRZ can be met by sources located anywhere within that WRZ, or from a neighbouring WRZ if the transfer between WRZs is used to provide some of the water available for use. It is therefore not possible, in all but the simplest of WRZs, to trace an impact of an individual development site back to a particular water abstraction and therefore to an environmental impact. The assessments in this report therefore rely on information in the public domain.

#### 9.2.2 Methodology

Cotswold district is served by Bristol Water (BW), Severn Trent Water (STW), Thames Water (TW), and Wessex Water (WW) via five WRZ. These WRZs are:

- Bristol Water (Single Zone)
- Forest and Stroud (Severn Trent Water)
- Strategic Grid (Severn Trent Water)
- Swindon and Oxfordshire- SWOX (Thames Water)
- Supply Area (Wessex Water)

Abstraction either from surface water sources or from groundwater sources can occur anywhere within these zones. However, the impact of the abstraction could be felt outside of the WRZ within the same groundwater body, or downstream in surface waterbodies. In both cases this could be well outside the LPA boundary.

### **Groundwater Dependent Terrestrial Ecosystems**

Figure 9.1 shows a schematic of how Groundwater Dependent Terrestrial Ecosystems (GWDTEs) were identified. The LPA boundary is within a WRZ. Water abstracted anywhere within that WRZ could be used to serve growth within the LPA. In the diagram below, there are two abstraction points. Abstraction 1 could impact an area outside of both the LPA boundary and the WRZ. However, there are no protected sites within that groundwater body. Abstraction 2 also impacts an area both within and outside of the LPA boundary. Protected site A is within the WRZ but may not be impacted directly by an abstraction. Protected site B is outside of the WRZ and outside of the groundwater body containing an abstraction and is therefore unlikely to be impacted by growth. Protected site C is within a groundwater body containing an abstraction, hence there is a risk that an increase in abstraction could impact this site.

The location of abstraction points within the study area is not known, and so the approach must be taken that GWDTE anywhere within the combined extent of the WRZ and groundwater bodies overlapping the WRZ could be impacted by an increase in abstraction.

A further check was done on whether abstraction may already be an issue in those GWDTEs. The WFD records "Significant Water Management Issues" (SWMIs) in each water body. These are the pressures on the water environment that put our ability to achieve the environmental objectives of the WFD most at risk.

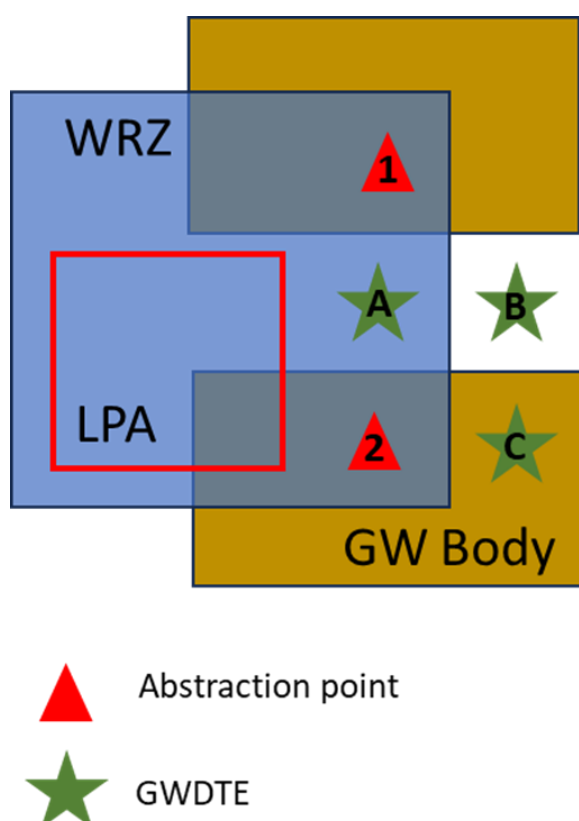


Figure 9.1: Definition of groundwater study area.

The steps taken to identify GWDTEs that may be impacted by abstraction to serve Cotswold district were as follows:

- Define study area for Cotswold district - based on extent of WRZ and WFD Groundwater bodies that overlap with the WRZs.
- Identify GWDTE within the study area using the EA's GWDTE dataset.
- Identify GWDTEs that are within groundwater bodies with flow identified as a SWMI.

### Surface water based ecosystems

Figure 9.2 shows a schematic of how protected sites on surface waterbodies were identified. As in the groundwater example, water could be abstracted from anywhere within the WRZ. Protected site A is downstream of an abstraction and so could be impacted by changes in river flow resulting from the abstraction. Protected site B whilst further downstream in the river basin, it is on a tributary not connected with the WRZ, so abstraction is unlikely to have an impact. Protected site C is upstream of the abstraction so would not be impacted.

As with the groundwater abstractions, the location of surface water abstractions was not available to inform this study. The approach was therefore taken that any protected site directly on a waterbody that flows through or is downstream of the WRZ could be impacted by abstraction. Protected sites upstream or on tributaries that have not flowed through the WRZ are ignored.



In order to identify protected sites that may be at risk, Flood Zone 2 from the Risk of Flooding from Rivers and the Sea mapping was used to define an area that was either adjacent to a river or could be reasonably expected to receive surface water from a river.

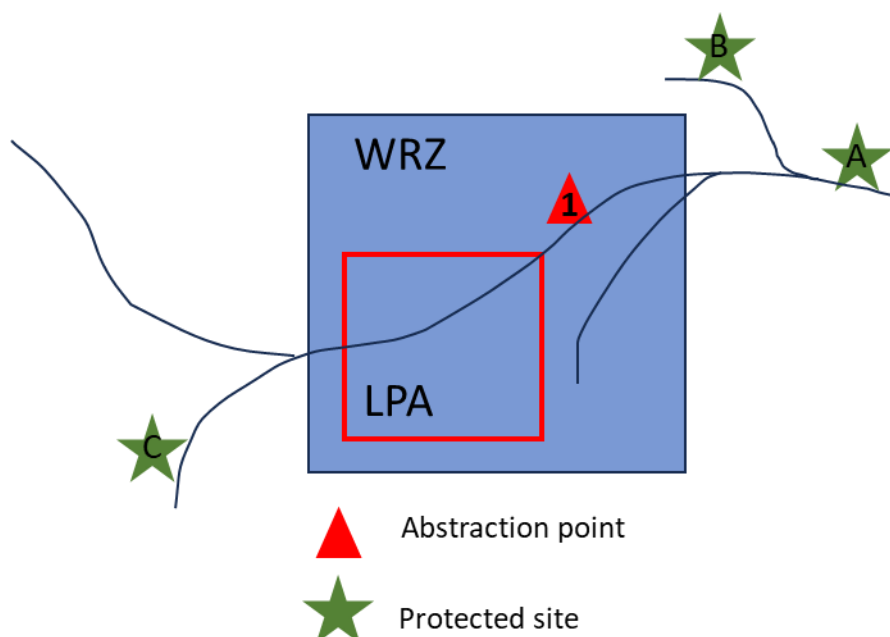


Figure 9.2: Definition of surface water study area.

## 9.2.3 Results

### 9.2.3.1 Surface water assessment

There are 45 SSSIs that are adjacent to waterbodies within the WRZs serving growth across the Local Plan period and downstream of Cotswold District (based on Flood Zone 2). There are also 4 Ramsar sites, 11 Special Areas of Conservation (SACs) and 6 Special Protection Area (SPA) sites.

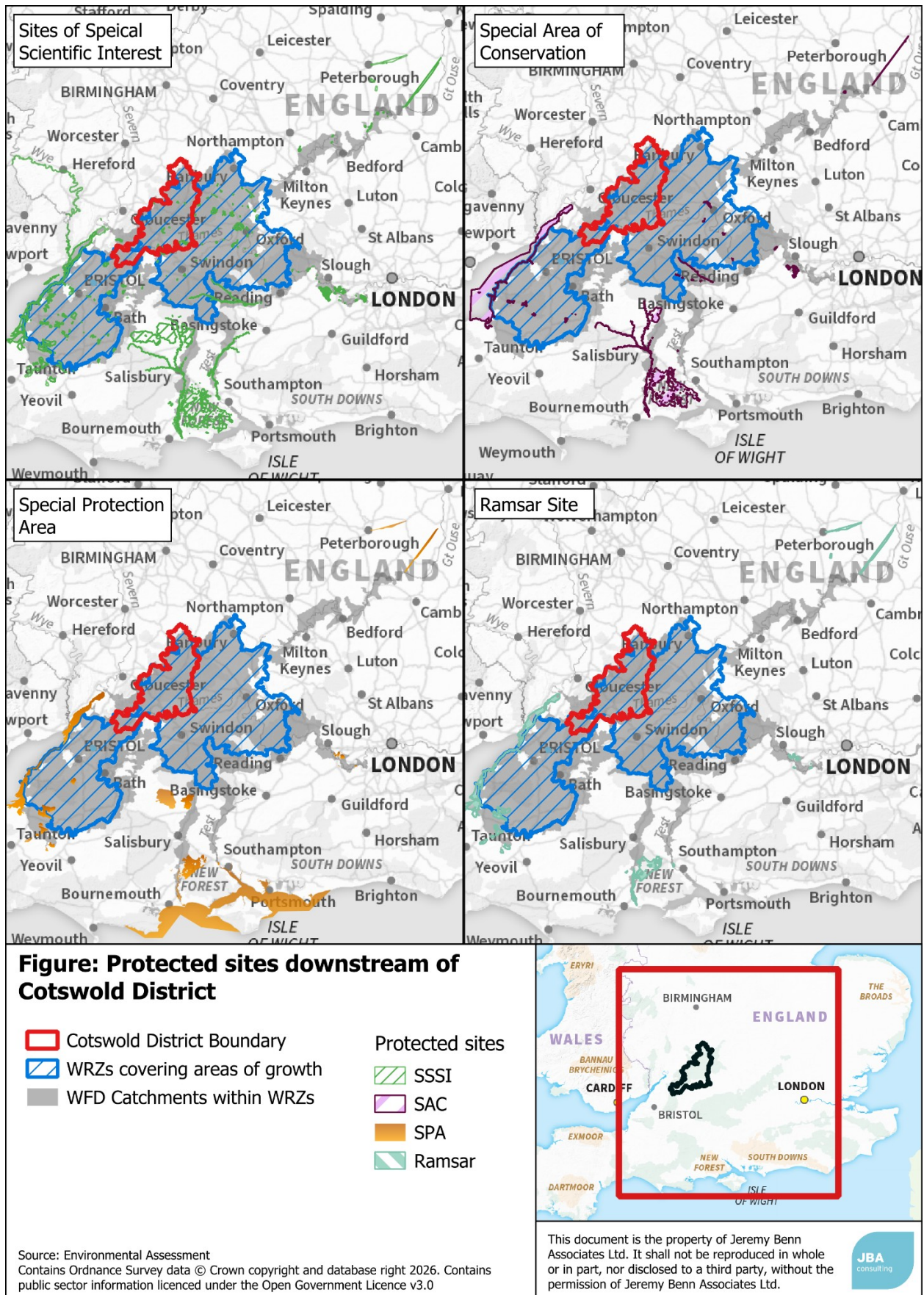


Figure 9.3 Designated sites downstream of Cotswold district

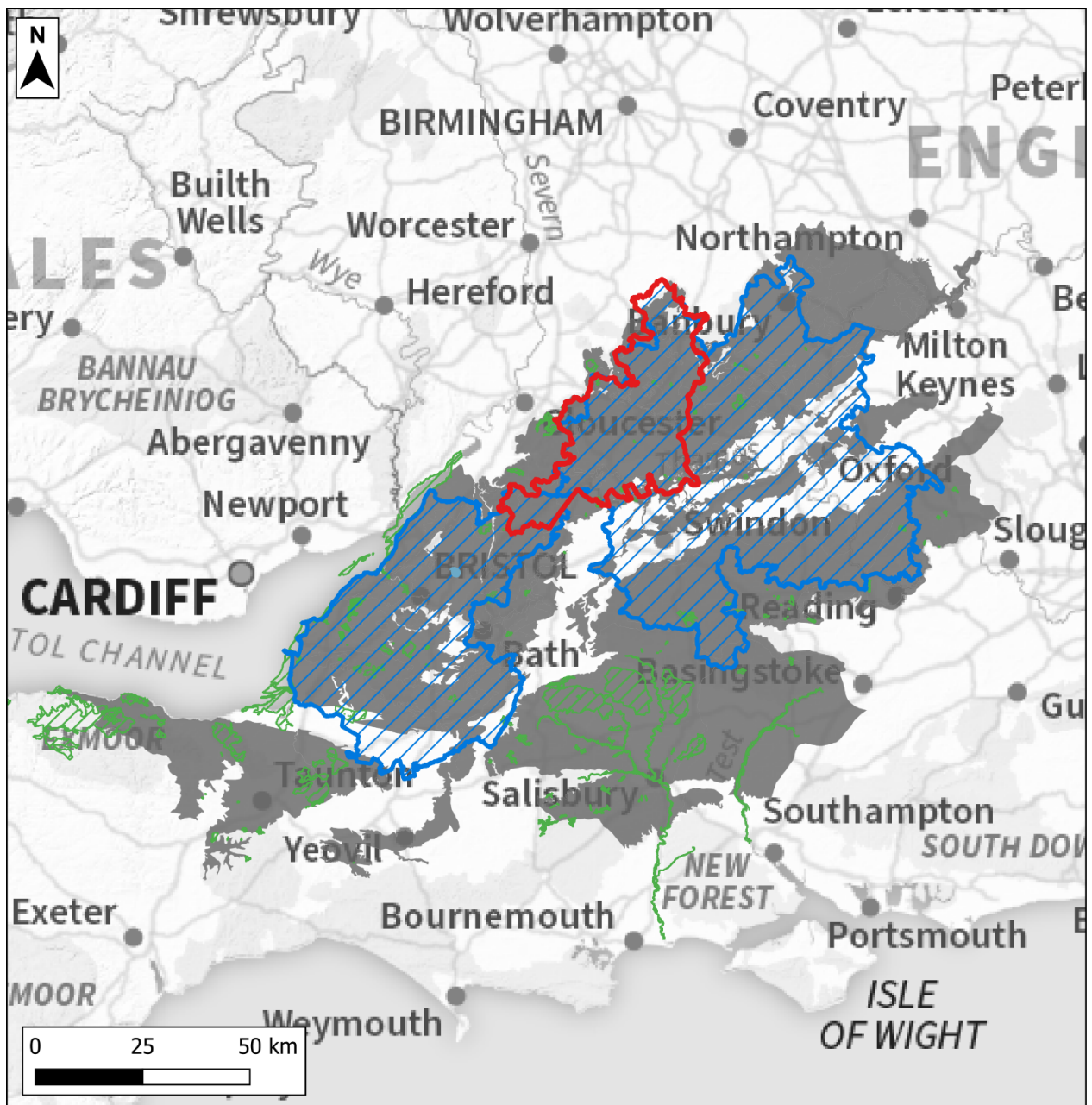
Figure 9.3 illustrates the extent of designated sites located downstream of surface waterbody catchments that fall within Cotswold district's WRZs. Due to the small size and limited visibility of some sites, the figure is not suitable for identifying each designated site individually.

Additionally, designated sites may span multiple surface water catchments. This overlap is reflected in the list provided in this section and in Appendix A.

#### 9.2.3.2 Groundwater assessment

There are 161 GWDTEs within the WRZs serving Cotswold district that are in a groundwater body where flow, from groundwater abstraction, has been identified as a SWMI. WFD groundwater bodies and GWDTEs can be seen in Figure 9.4 and are listed in Appendix A.





**Figure: GWDTEs within WRZs serving growth in Cotswold District**

- ▭ Cotswold District Boundary
- ▨ WRZs covering areas of growth
- ▭ WFD Groundwater bodies within WRZs
- ▨ Groundwater Dependent terrestrial ecosystems

Source: Environmental Assessment  
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Figure 9.4 GWDTE sites within WRZ covering areas of growth in Cotswold District

### 9.3 Water quality impact

Water pollution is usually categorised as either diffuse or point source. Point source sources come from a single well-defined point, an example being the discharge from a WwTW.

Diffuse pollution is defined as 'unplanned and unlicensed pollution from farming, old mine workings, homes and roads. It includes urban and rural activity and arises from industry, commerce, agriculture and civil functions and the way we live our lives.'

The most likely sources of diffuse pollution from new developments include drainage from housing estates, runoff from roads, and discharges from commercial and industrial premises. The pollution risk posed by a site will depend on the sensitivity of the receiving environment, the pathway between the source of the runoff and the receiving waters, and the level of dilution available. After or during heavy rainfall, the first flush of water carrying accumulated dust and dirt is often highly polluting.

Whilst the threat posed by an individual site may be low, a number of sites together may pose a cumulative impact within the catchment.

Runoff from development sites should be managed by a suitably designed SuDS scheme. More information on SuDS can be found in Section 9.5.2.

#### 9.3.1 Pathways

Pollutants can take a number of different pathways from their source to a 'receptor' – a habitat or species that can be impacted. This could be overland via surface water flow paths, via the river system, or via groundwater or a combination of all three. For the purpose of this study, it should be assumed at any protected site has the potential to be impacted by surface runoff from adjacent development sites. Linkages between development sites and protected sites will be explored further in Section 9.4.

#### 9.3.2 Receptors

A receptor in this case is a habitat or species that is adversely impacted by a pollutant. Both the rivers and groundwater as well as being pathways, can also be considered to be receptors. Groundwater bodies are also given a status under the WFD which is reported in Section 4.2.2 for the groundwater bodies across Cotswold district.

A list of environmental designations is provided in Section 9.2.2, and protected sites within Cotswold district can be seen in Section 9.2.3.



## 9.4 Assessment of point source risk

### 9.4.1 Methodology

In order to identify which of the protected sites may be at risk, Flood Zone 2 from the Risk of Flooding from Rivers and the Sea mapping was used to define an area that was either beside a river or could be reasonably expected to receive surface water from a river during times of flood. Where a WwTW serving growth in the plan period was present in the catchment upstream of the protected site, this site was taken forward for further assessment.

Where there were no WwTW serving growth upstream, these protected sites were discounted as no deterioration would be predicted in a water quality model, and the impact would be expected to be minimal. However, in these cases the overall catchment water quality should be considered where for example they are designated for migratory fish species that may spend part of their lifecycle elsewhere in the catchment.

Whilst deterioration in water quality may not always lead to a significant impact at a protected site such as a SSSI, modelled deterioration can be used to highlight areas of risk for further analysis in the Habitats Regulations Assessment.

### 9.4.2 Results

The results of this assessment are presented in Appendix D. Results show there are no significant deteriorations adjacent to environmental sites that cannot be prevented by improvements in treatment to TAL with the exception of Cotswold Water Park SSSI downstream of Ampney St Peter.

As noted in 8.2.2, Ampney St Peter is in the upper catchment discharging to a waterbody with High WFD status for Ammonia. Current performance of the WwTW is at or exceeding the technically achievable limit so there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains 14%.

## 9.5 Groundwater protection

### 9.5.1 Overview

The EA is responsible for the protection of 'controlled waters' from pollution under the Water Resources Act 1991. These controlled waters include all watercourses and groundwater contained in underground strata.

The source protection zones are based on an estimate of the time it would take for a pollutant which enters the saturated zone of an aquifer to reach the source of abstraction or discharge point (Zone 1 = 50 days, Zone 2 = 400 days, Zone 3 is the total catchment area). The EA will use SPZs alongside other datasets such as the

Drinking Water Protected Areas (DrWPAs) and aquifer designations as a screening tool to show:

- Areas where the EA would object in principle to certain potentially polluting activities, or other activities that could damage groundwater.
- Areas where additional controls or restrictions on activities may be needed to protect water intended for human consumption.
- How it prioritises responses to incidents.

The EA have published a position paper outlining its [approach to groundwater protection \(assets.publishing.service.gov.uk\)](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/611111/ea-approach-to-groundwater-protection.pdf) which includes direct discharges to groundwater, discharges of effluents to ground and surface water runoff. This is of relevance to this WCS where a development may manage surface water through SuDS.

### 9.5.2 Sewage and Trade Effluent

Discharges of treated sewage of 2m<sup>3</sup> per day or less to ground are called small sewage discharges (SSDs). The majority of SSDs do not require an EP if they comply with certain qualifying conditions. A permit will be required for all SSDs in Source Protection Zone 1 (SPZ1).

For treated sewage effluent discharges, the EA requires the use of shallow infiltration systems, which maximise the attenuation within the drainage blanket and the underlying unsaturated zone. Whilst some sewage effluent discharges may not pose a risk to groundwater quality individually, the cumulative risk of pollution from aggregations of discharges can be significant. Improvement or pre-operational conditions may be imposed before granting an EP. The EA will only agree to developments where the addition of new sewage effluent discharges to ground in an area of existing discharges is unlikely to lead to an unacceptable cumulative impact.

Generally, the EA will only agree to developments involving release of sewage effluent, trade effluent or other contaminated discharges to ground if it is satisfied that it is not reasonable to make a connection to the public foul sewer. The EA would normally expect to only permit new private discharges where the distance to connect to the nearest public sewer exceeds the number of dwellings multiplied by 30m. So, for example, a development of 100 dwellings would need to be more than 3km from a public sewer. The developer would have to provide evidence of why the proposed development cannot connect to the foul sewer in the planning application. This position will not normally apply to surface water run-off via SuDS and discharges from WwTW operated by sewerage undertakers with appropriate treatment and discharge controls.

Deep infiltration systems (such as boreholes and shafts) are not generally accepted by the EA for discharge of sewage effluent as they bypass soil layers and reduce the opportunity for attenuation of pollutants.

Discharges of surface water run-off to ground at sites affected by land contamination, or from sites for the storage of potential pollutants are likely to require an EP. This could include sites such as garage forecourts and coach and lorry parks. These sites would be subject to a risk assessment with acceptable effluent treatment provided.

### 9.5.3 Discharge of Clean Water

'Clean water' discharges such as runoff from roofs or from roads, may not require a permit. However, they are still a potential source of groundwater pollution if they are not appropriately designed and maintained.

- Where infiltration SuDS schemes are proposed to manage surface runoff they should:
- be suitably designed;
- meet government [non-statutory technical standards for SuDS \(gov.uk\)](#) – these should be used in conjunction with the NPPF and PPG; and
- use a SuDS management treatment train.

A hydrogeological risk assessment is required where infiltration SuDS is proposed for anything other than clean roof drainage in a SPZ1.

### 9.5.4 Source Protection Zones in Cotswold District

SPZs form a key part of the EA's approach to controlling the risk to groundwater supplies from potentially polluting activities and accidental releases of pollutants.

The EA's [groundwater SPZs production manual \(gov.uk\)](#), details position statements which provide information about the EA's approach to managing and protecting groundwater.

As shown in Figure 9.5, there are several SPZs intersecting the whole study area. Several proposed developments are located within SPZs.

There are eight SPZ Zone 1s within the study area, with the radiating zones 2 and 3 from these covering the majority of the centre and southwest of the area. Because these are mainly within the low-lying areas at the base of the river valleys, this hydrologically connects the upper elevations in the north to the south. These SPZs can be seen in Figure 4 9 below. In the event of an incident, widespread groundwater contamination is possible across the entire southern half of the study area; extra preventative precautions should be undertaken when considering developments in these areas.

Table 9.1 shows the potential allocations identified within SPZ with the corresponding EA advice.

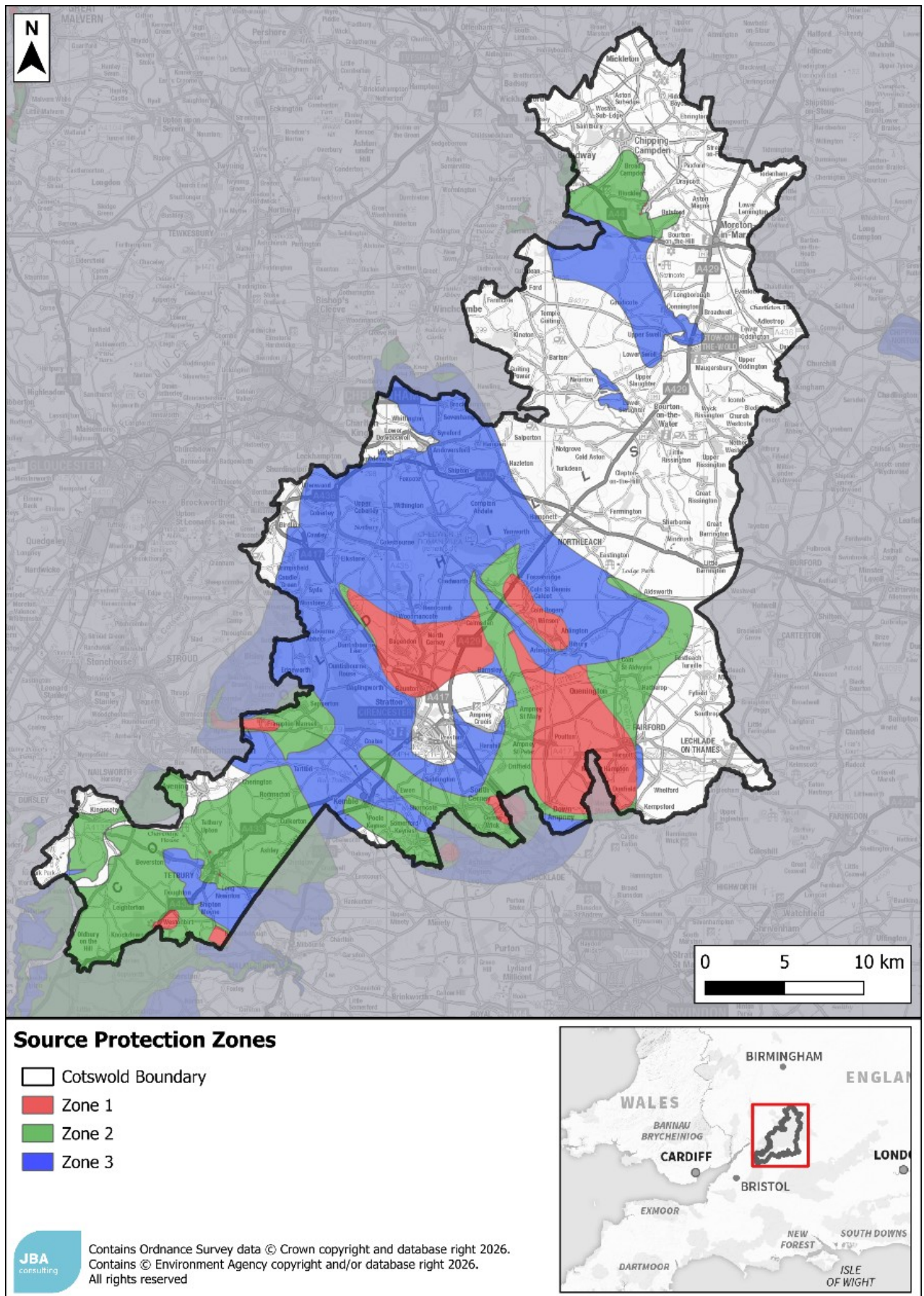


Figure 9.5 Source Protection Zones (SPZ) areas in Cotswold district



Table 9.1 Potential allocations within SPZs and EA guidance

| Source Protection Zone         | Sites                                                                                                                                          | Management advice / EA position statement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zone 1 – Inner Protection Zone | <p>F53A<br/>R469<br/>R607<br/>New settlement to the south of Driffield<br/>Strategic extension to the north, east and south of Down Ampney</p> | <p>G2 – Inside SPZ1 all sewage effluent discharges to ground must have an environmental permit.</p> <p>G4 – Inside SPZ1 the EA will object to any new trade effluent, storm overflow from sewage system or other significantly contaminated discharges to ground where the risk of groundwater pollution is high and cannot be adequately mitigated.</p> <p>G12 – Discharge of clean roof water to ground is acceptable both within and outside SPZ1, provided all roof water down-pipes are sealed against pollutants entering the system from surface runoff, effluent disposal or other forms of discharge. The method of discharge must not create new pathways for pollutants to groundwater or mobilise contaminant already in the ground. No permit is required if these criteria are met.</p> <p>G13 – Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, a hydrogeological risk assessment should be undertaken, to ensure that the system does not pose an unacceptable risk to the source of supply. SuDS schemes must be</p> |



| Source Protection Zone         | Sites                                                                                                                                                                                                                                               | Management advice / EA position statement                                                                                                                                                                 |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                |                                                                                                                                                                                                                                                     | suitably designed.                                                                                                                                                                                        |
| Zone 2 – Outer Protection Zone | T31B<br>T71A<br>DA16A<br>R670<br>R591<br>R592<br>Strategic extension to the south of The Steadings<br>Strategic extension to the north-east of Fairford<br>Strategic extension to the south-west of Kemble<br>Strategic Site North of Ampney Crucis | A hydrogeological risk assessment is not a requirement for SuDS schemes, however they should still be “suitably designed”, for instance following best practice guidance in the CIRIA SuDS Design Manual. |
| Zone 3 – Total Catchment       | A2<br>C71<br>F20A<br>SD15<br>Strategic extension to the south-west of Siddington                                                                                                                                                                    | A hydrogeological risk assessment is not a requirement for SuDS schemes, however they should still be “suitably designed”, for instance following best practice guidance in the CIRIA SuDS Design Manual. |

## 9.6 Surface water drainage

### 9.6.1 Overview

From April 2015, Local Planning Authorities (LPA) were given the responsibility for ensuring that sustainable drainage is implemented on all major developments, including developments of 10 or more homes, or commercial developments creating 1,000m<sup>2</sup> of new floor space.

Previously SuDS guidance was developed by Defra to sit alongside the NPPF Planning Practice Guidance (PPG) and provide non-statutory standards as to the expected design and performance for SuDS.

As of July 2025, the [Defra National standards for sustainable drainage systems \(SuDS\) \(gov.uk\)](#) were brought in to comply with the principles of surface water drainage design.

The national standards contain two sets of standards. The first type (Standard 1) is known as the hierarchy standard and sets the criteria for the prioritisation of final surface water runoff destinations. The other standards (Standards 2-7) detail the

minimum design criteria that SuDS should satisfy alongside how they are to be appropriately built, maintained, and operated.

While remaining as a non-statutory specification, these now form a material consideration for LPAs when assessing planning applications. These standards aim to reflect and reinforce good practice and use of SuDS, reflecting the four pillars of SuDS design. All appropriate planning applications should demonstrate how the national standards have been met in the site design (Principle 10).

### **Standard 1: runoff destinations**

Runoff from development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- Priority 1: collected for non-potable use (rainwater harvesting)
- Priority 2: infiltrated to ground
- Priority 3: discharged to an above ground surface water body
- Priority 4: discharged to a surface water sewer, or another piped surface water drainage system
- Priority 5: discharged to a combined sewer.

### **Non-potable use**

There is potential for rainwater harvesting for non-potable uses to decrease the water demand from new developments and help improve water efficiency.

Rainwater harvesting shall be considered in all circumstances where any of the following apply:

- There is a demand for non-potable water and available contributing catchment area that will deliver safe and efficient water savings.
- Examples include industrial, commercial, horticultural, educational, public sector, residential and multiple-occupancy buildings.
- There is a need for landscape irrigation.
- The development is in an area identified as seriously water stressed.

Gloucestershire County Council is the LLFA for the study area and plays a key role in ensuring that the proposed drainage schemes for all new developments comply with technical standards and policies in relation to SuDS. [Gloucestershire County Council's website](#) contains advice relating to surface water drainage and expectations and design standards for SuDS in the area.

An updated version of the Construction Industry Research and Information Association (CIRIA) SuDS Manual was published in 2015. The guidance covers the planning, design, construction and maintenance of SuDS for effective implementation within both new and existing developments. The guidance is relevant for a range of roles with the level of technical detail increasing throughout the manual. The guidance does not include detailed information on planning requirements, SuDS approval and adoption processes and standards, as these vary

by region and should be checked early in the planning process. The manual itself can be found on the [CIRIA website \(ciria.org\)](https://www.ciria.org/).

CIRIA also published '[Guidance on the Construction of SuDS' \(C768\) \(ciria.org\)](https://www.ciria.org/publications/guidance-on-the-construction-of-suDs/), which contains detailed guidance on all aspects of SuDS construction, with specific information on each SuDS component available online as a downloadable chapter, free to CIRIA members.

Severn Trent Water recommends four core SuDS solutions and supports the installation of them at developments: raingardens, bioswales, detention basins, and permeable paving. They also provide [general SuDS guidance \(stwater.co.uk\)](https://www.stwater.co.uk/guidance/) on their website.

### 9.6.2 Use of sustainable drainage systems in water quality management

SuDS allow the management of diffuse pollution generated by urban areas through the sequential treatment of surface water reducing the pollutants entering lakes and rivers, resulting in lower levels of water supply and wastewater treatment being required. This treatment of diffuse pollution at source can contribute to meeting WFD water quality targets, as well as national objectives for sustainable development.

This is usually facilitated via a SuDS Management Train of a number of components in series that provide a range of treatment processes delivering gradual improvement in water quality and providing an environmental buffer for accidental spills or unexpected high pollutant loadings from the site. Considerations for SuDS design for water quality are summarised in Table 9.2.

Table 9.2: Considerations for SuDS Design for water quality.

| Action                               | Considerations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manage surface water close to source | <p>Where practicable, treatment systems should be designed to be close to source of runoff.</p> <p>It is easier to design effective treatment when the flow rate and pollutant loadings are relatively low.</p> <p>Treatment provided can be proportionate to pollutant loadings and sensitivity receptor.</p> <p>Accidental spills or other pollution events can be isolated more easily without affecting the downstream drainage system.</p> <p>Encourages ownership of pollution.</p> <p>Poor treatment performance or component damage/ failure can be dealt with more effectively without impacting on the whole site.</p> |

| Action                                                       | Considerations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Treat surface water runoff on the surface                    | <p>Where practicable, treatment systems should be designed to be on the surface</p> <p>Where sediments are exposed to UV light, photolysis and volatilisation processes can act to break down contaminants.</p> <p>If sediment is trapped in accessible parts of the SuDS, it can be removed more easily as part of maintenance.</p> <p>It enables use of evapotranspiration and some infiltration to the ground to reduce runoff volumes and associated total contamination loads (provided risk to groundwater is managed appropriately).</p> <p>It allows treatment to be delivered by vegetation.</p> <p>Sources of pollution can be easily identified.</p> <p>Accidental spills or misconnections are visible immediately and can be dealt with rapidly.</p> <p>Poor treatment performance can be easily identified during routine inspections, and remedial works can be planned efficiently.</p> |
| Treat surface water runoff to remove a range of contaminants | <p>SuDS design should consider the likely presence and significance of any contaminant that may pose a risk to the receiving environment.</p> <p>The SuDS component or combination of components selected should include treatment processes that, in combination, are likely to reduce this risk to acceptably low levels.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Minimise risk of sediment remobilisation                     | <p>The SuDS design should consider and mitigate the risks of sediments (and other contaminants) being remobilised and washed into receiving surface waters during events greater than those which the component has been specifically designed for.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Minimise impacts from accidental spills                      | <p>By using several components in series, SuDS can help ensure that accidental spills are trapped in/on upstream component surfaces, facilitating contamination management and removal.</p> <p>The selected SuDS components should deliver a robust treatment design that manages risks appropriately - considering the uncertainty and variability of pollution loadings, sensitivity of receptors and treatment processes.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Managing pollution close to its source can help keep pollutant levels and accumulation rates low, allowing natural processes to be more effective. Treatment

can often be delivered within the same components that are delivering water quantity design criteria, requiring no additional cost or land-take.

SuDS designs should control the 'first flush' of pollutants (usually mobilised by the first 5mm of rainfall) at source, to ensure contaminants are not released from the site. Best practise is that no runoff should be discharged from the site to receiving watercourses or sewers for the majority of small (e.g., less than 5mm) rainfall events.

Infiltration techniques are likely to require consultation with the EA. Early consideration of SuDS within master planning will typically allow a more effective scheme to be designed.

Further guidance on designing SuDS to reduce phosphorus (CIRIA, 2022a) and nitrogen (CIRIA, 2022b) in surface water runoff can be found in the relevant CIRIA guidance documents.

### 9.6.3 Benefits of sustainable drainage systems

#### **Flood Risk**

The Strategic Flood Risk Assessment contains recommendations for SuDS to manage surface water on development sites, with the primary aim of reducing flood risk.

SuDS are most effective at reducing flood risk for relatively high intensity, short and medium duration events, and are particularly important in mitigating potential increases in surface water flooding, sewer flooding and flooding from small and medium sized watercourses resulting from development.

#### **Water Resources**

A central principle of SuDS is the use of surface water as a resource. Traditionally, surface water drainage involved the rapid disposal of rainwater, by conveying it directly into a sewer or Water Recycling Centres.

SuDS techniques such as rainwater harvesting, allow rainwater to be collected and re-used as non-potable water supply within homes and gardens, reducing the demand on water resources and supply infrastructure.

#### **Climate Resilience**

Climate projections for the UK suggest that winters may become milder and wetter, and summers may become warmer, but with more frequent higher intensity rainfall events. This would be expected to increase the volume of runoff, and therefore the risk of flooding from surface water, and diffuse pollution, and reduce water availability.

SuDS offer a more adaptable way of draining surfaces, controlling the rate and volume of runoff leaving urban areas during high intensity rainfall, and reducing flood risk to downstream communities through storage and controlled release of rainwater from development sites.



Through allowing rainwater to soak into the ground, SuDS are effective at retaining soil moisture and groundwater levels, which allows the recharge of the watercourses and underlying aquifers. This is particularly important where water resource availability is limited, and likely to become increasingly scarce under future drier climates.

### **Biodiversity**

The water within a SuDS component is an essential resource for the growth and development of plants and animals, and biodiversity benefits can be delivered even by very small, isolated schemes. The greatest value can be achieved where SuDS are planned as part of a wider green landscape, providing important habitat, and wildlife connectivity. With careful design, SuDS can provide shelter, food, foraging and breeding opportunities for a variety of species including plants, amphibians, invertebrates, birds, bats, and other animals.

### **Amenity**

Designs using surface water management systems to help structure the urban landscape can enrich its aesthetic and recreational value, promoting health and well-being and supporting green infrastructure. Water managed on the surface rather than underground can help reduce summer temperatures, provide habitat for flora and fauna and act as a resource for local environmental education programmes and working groups and directly influence the sense of community in an area.

#### **9.6.4 Suitable sustainable drainage system techniques**

The hydraulic and geological characteristics of each property development site across Cotswold district should be assessed to identify the most appropriate forms of surface water management and any constraining factors to the utilisation of SuDS. These assessments are designed to inform the early-stage site planning process and should be followed up the site-specific detailed drainage assessments.

Appropriate SuDS techniques have been categorised into five main groups, as shown in Table 9.3, with further details provided on the [Susdrain website \(susdrain.org\)](https://www.susdrain.org). Further site-specific investigation should be conducted to determine what SuDS techniques could be used on a particular development, informed by detailed ground investigations.

Table 9.3: Summary of SuDS Categories.

| SuDS Type      | Technique                                                                                                                                                  |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source Control | Green Roof, RWH, Pervious Pavements, Rain Gardens                                                                                                          |
| Infiltration   | Infiltration Trench, Infiltration Basin, Soakaway                                                                                                          |
| Detention      | Pond, Wetland, Subsurface Storage, Shallow Wetland, Extended Detention Wetland, Pocket Wetland, Submerged Gravel Wetland, Wetland Channel, Detention Basin |
| Filtration     | Surface Sand filter, Sub-Surface Sand Filter, Perimeter Sand Filter, Bioretention, Filter Strip, Filter Trench                                             |
| Conveyance     | Dry Swale, Under-drained Swale, Wet Swale                                                                                                                  |

### 9.6.5 Natural flood management

Natural Flood Management (NFM) is used to protect, restore, and re-naturalise the function of catchments and rivers to reduce flood risk. A wide range of techniques can be used that aim to reduce flooding by working with natural features and processes in order to store or slow down flood waters before they can damage flood risk receptors (e.g., people, property, infrastructure, etc.).

Techniques and measures, which could be applied in Cotswold district include:

- peatland and moorland restoration in upland catchments;
- offline storage areas;
- re-meandering streams;
- targeted woodland planting;
- reconnection and restoration of functional floodplains;
- restoration of rivers and removal of redundant structures;
- installation or retainment of large woody material in river channels;
- improvements in management of soil and land use; and
- creation of rural and urban SuDS.

In 2017, the EA published an online evidence base on [working with natural processes to reduce flood risk 2024 \(gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/614441/working_with_natural_processes_to_reduce_flood_risk_2024.pdf) to support the implementation of NFM and with JBA produced maps showing locations with the potential for NFM measures<sup>4</sup>. These maps are intended to be used alongside the evidence directory to help practitioners think about the types of measure that may work in a catchment and the best places in which to locate them. There are limitations with the maps; however, it is a useful tool to help start dialogue with key partners.

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4 Mapping the potential for working with natural process, Environment Agency and JBA (2017). Accessed online at: <https://www.arcgis.com/home/item.html?id=7315f943998847e2b3797a85665f5438> on: 08/11/2024.

### 9.6.6 Multiple benefits of natural flood management

In addition to flood risk benefits, there are also significant benefits in other areas such as habitat provision, air quality, climate regulation and water quality.

Many NFM measures have the ability to reduce nutrient and sediment sources by reducing surface runoff flows from higher ground, reducing soil erosion, trapping sediment at the edge of agricultural land, or encouraging deposition of sediments behind natural dams upstream in watercourses.

Suitable techniques may include:

- leaky dams;
- woodland planting;
- buffer strips;
- runoff retention ponds; and
- land management techniques (soil aeration, cover crops etc.).

#### Case Study - Black Brook Slow the Flow

Four engineered log dams, see Figure 9.6, were installed on Black Brook at an estimated cost of £2,000, funded by Natural England and the EA to restore Stanley Bank SSSI. The scheme aimed to improve habitat and reduce the risk of flooding. However, the scheme also resulted in reduced levels of phosphate and nitrate in Black Brook, with phosphate concentrations falling by 3.6mg/l. By 2035, it is predicted that 792m<sup>3</sup> of sediment will be stored in three ponds retained by the dams.



Figure 9.6: Photograph of leaky dams at Black Brook.

Reproduced from Case Study 17. Black Brook Slow the Flow, St Helens, Norbury, Rogers and Brown, EA WwNP Evidence Base 2017. Photograph taken on 8 May 2015; courtesy of Matthew Catherall.

### 9.6.7 Integrated constructed wetlands

An integrated constructed wetland (ICW) is an artificial wetland created for the purpose of treating polluted water, whether this is municipal wastewater, grey water from residential properties, or agricultural runoff.

They are usually unlined, free surface flow wetlands, designed to contain and treat influents within emergent vegetated areas.

Defra carried out a systematic review of the effectiveness of various wetland types, including ICWs for mitigating agricultural pollution such as phosphate and nitrate. The overall conclusion was that all wetland types are very effective at reducing major nutrients and suspended sediments, with the exception of nitrite in ICWs. Nitrate is only reduced when passing through overland buffer strips and through constructed wetlands with vegetation, where the systematic review showed a mean reduction of 29% across the evidence included in the study. The mean reduction in Total Phosphorus across the evidence base was 78%. More information on this review can be accessed on the Natural Environment Research Council's [open research archive \(nora.nerc.ac.uk\)](https://nora.nerc.ac.uk).

It needs to be noted that in some cases where phosphorus is especially high the effectiveness of removal may be less certain. Although the reduction in total phosphorus is beneficial, stakeholders need to ensure the excess nutrients are dealt with at source, such as storm overflows and at a policy level.

Other techniques to manage nutrients are possible such as catchment nutrient balancing, where excess nutrients are managed at a catchment level, as well as catchment permitting. These techniques are recommended where environmental capacity is restrictive to growth.

Severn Trent Water discusses plans for catchment nutrient balancing in their [2025-2030 Business Plan \(stwater.co.uk\)](https://stwater.co.uk).

### Case Study - Frogshall ICW

The Upper River Mun in Norfolk was experiencing chronic pollution, and a loss in biodiversity in the river. Investigation found that nutrients from a WwTW upstream were contributing to this issue.

A pilot ICW was created consisting of three shallow ponds, filled with 18,000 emergent aquatic plants, and the outfall from the treatment works was diverted to pass through the wetland.

Early monitoring has shown that 90% of the phosphate is being removed by the wetland, and a large increase in biodiversity downstream observed.



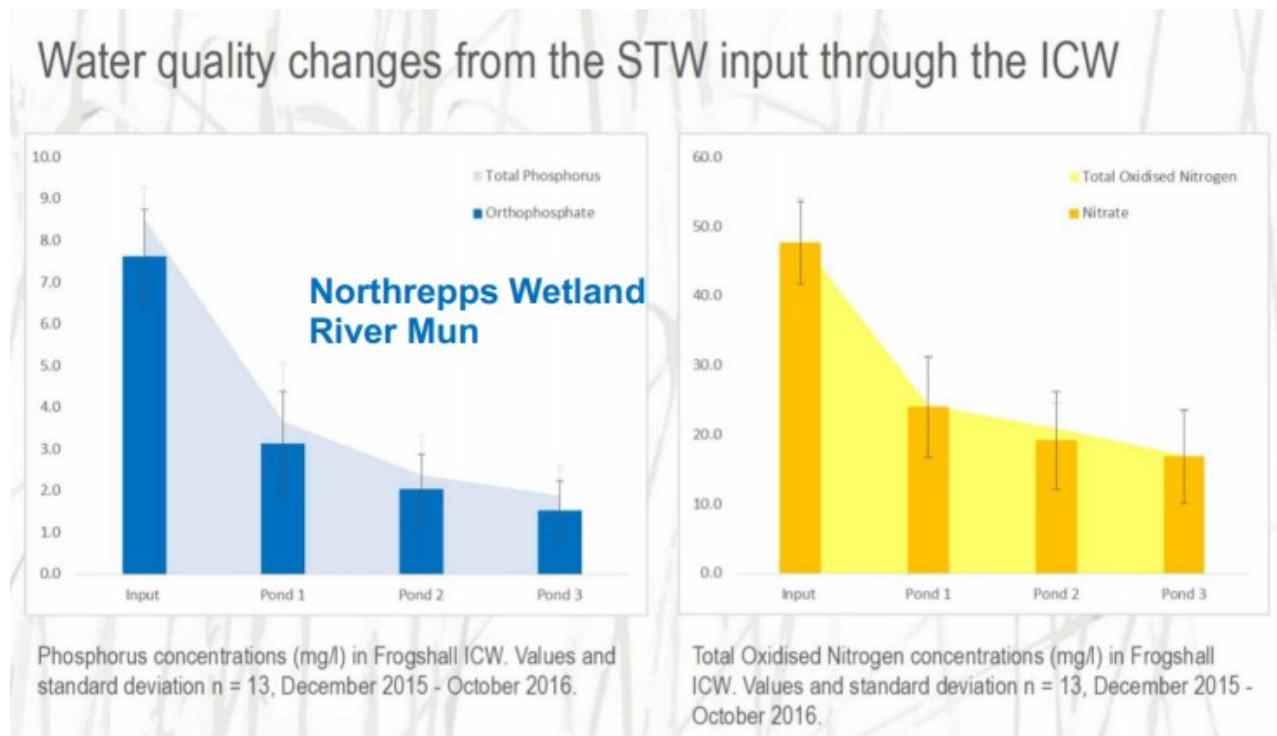


Figure 9.7: Graph of water quality changes

Reproduced from '[Stripping the Phosphate](http://therivertrust.org)' ([therivertrust.org](http://therivertrust.org)), a presentation by the Norfolk Rivers Trust (2018).

#### 9.6.8 Agricultural management

The EA's RNAG database indicates that one of the reasons for some of the watercourses in the area are not meeting 'Good' WFD standards can be related to agriculture and rural land use. The cause of this includes pollution from fertilisers, manures, pesticides and soils washing into streams when it rains or percolating into the groundwater. Other pressures from agriculture include deepening, widening or re-routing of streams for land drainage, gravel removal and bankside erosion.

There is a big potential to improve water quality by interventions aimed at agricultural sources, especially considering the measures already taken by the water companies to reduce their contribution to phosphate load.

Potential schemes could include:

- buffer strips;
- cross slope tree planting;
- runoff retention basins;
- contour ploughing; and
- cover crops.

There is considerable overlap with NFM measures, and the challenges are also very similar. Exact impacts are difficult to measure, although modelling tools such as [Farmscoper](http://Farmscoper.adas.co.uk) ([adas.co.uk](http://Farmscoper.adas.co.uk)) exist to help with this. Once a scheme is implemented it



relies on the landowner to continue to maintain it in order to maintain the mitigation benefit.

Funding for agricultural interventions could come from Catchment Sensitive Farming or a Payment for Ecosystem Services approach.

### **Case Study - Wessex Water - EnTrade**

Wessex Water catchment team used EnTrade to invite farmers to bid to grow cover crops over winter to reduce the nitrogen leaching into the watercourse.

This avoided the need to upgrade Dorchester WwTW to provide the same nitrogen removal capacity.

A trial auction was held in 2015, and two further auctions have since taken place attracting 557 bids from 63 farmers to save 153 tonnes of nitrogen.

*Ruth Barden, Director of Environmental Strategy, Wessex Water, stated that “Using EnTrade to create a market in measures to deliver reductions in nitrogen has delivered a 30% saving for Wessex Water compared to traditional catchment approaches.”*

#### **9.6.9 Barriers**

Whilst there are many benefits to implementing NFM and constructed wetlands, or modifying agricultural practises, the impact of these techniques is hard to quantify, and relies on ongoing maintenance to maintain that benefit. Where a potential scheme is not on a development site it will also require permission and support of the landowner. It may not be possible to influence this through planning policy.

### **9.7 Conclusions and recommendations**

Cotswold district is supplied by four water companies—Bristol Water, Severn Trent Water, Thames Water and Wessex Water—across five Water Resource Zones (WRZs): Bristol Water (single zone), Forest and Stroud and Strategic Grid (Severn Trent Water), Swindon and Oxfordshire (SWOX; Thames Water), and Wessex Water Supply Area.

Within the WRZs serving growth over the Local Plan period and downstream of the district, there are 45 Sites of Special Scientific Interest (SSSIs) associated with waterbodies that are affected by surface water abstraction, identified as a significant water management issue, alongside 4 Ramsar sites, 11 Special Areas of Conservation (SACs) and 6 Special Protection Areas (SPAs). In addition, 290 groundwater-dependent terrestrial ecosystems (GWDTEs) are located within groundwater bodies where abstraction-related impacts on flows have also been identified as significant water management issues.

The water quality modelling results were used to identify the predicted deterioration in water quality in waterbodies adjacent to designated sites downstream of WwTWs serving growth during the Local Plan period. The results show there are no

significant deteriorations adjacent to environmental sites that cannot be prevented by improvements in treatment to TAL with the exception of the Cotswold Water Park SSSI downstream of Ampney St Peter WwTW.

As noted in the Water Quality chapter, Ampney St Peter is in the upper catchment discharging to a waterbody with High WFD status for Ammonia. Current performance of the WwTW is at or exceeding the technically achievable limit so there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains 14%. It remains at High WFD status.

SuDS are required on all development sites. Their design should consider both water quantity and water quality and site level investigations should be undertaken to define the most appropriate SuDS types for each specific development. Opportunities exist for these SuDS schemes to offer multiple benefits of flood risk reduction, amenity value and biodiversity.

CDC should be consulted at an early stage of development to ensure that SuDS are implemented and designed in response to site characteristics and policy factors. In the wider area, opportunities exist to implement NFM techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

Recommendations for environmental constraints and opportunities are provided in Table 9.4.

Table 9.4: Recommendations for environmental constraints and opportunities.

| Action                                                                                                                                                                                                                                                                                                                                 | Responsibility                      | Timescale              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------|
| Consider the environmental impact of development on protected sites downstream of receiving WwTW in the habitat's regulations assessment.                                                                                                                                                                                              | CDC                                 | Local Plan preparation |
| The Local Plan should include policies that require all development proposals with the potential to impact on areas with environmental designations to be considered in line with the relevant legislation and where stated, in consultation with Natural England (for national and international designations and priority habitats). | CDC                                 | In the CDC Local Plan  |
| The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.                                                                                                                                                                                                         | CDC                                 | In the CDC Local Plan  |
| In partnership, identify opportunities for incorporating SuDS into open spaces and green infrastructure, to deliver strategic flood risk management and meet WFD water quality targets.                                                                                                                                                | CDC, Severn Trent Water, TW, WW, EA | Ongoing                |
| Developers should include the design of SuDS                                                                                                                                                                                                                                                                                           | Developers                          | Ongoing                |

| Action                                                                                                                                                                                                                  | Responsibility           | Timescale |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|
| at an early stage to maximise the benefits of the scheme. The design which should demonstrate all four areas of good SuDs design: quantity, quality, amenity, and biodiversity.                                         |                          |           |
| Completed SuDs schemes should be accompanied by a maintenance schedule detailing maintenance boundaries, responsible parties and arrangements to ensure the SuDS are managed in perpetuity.                             | Developers               | Ongoing   |
| Work with developers to discourage connection of new developments into existing surface water and combined sewer networks. Prevent connections into the foul network, as this is a significant cause of sewer flooding. | CDC and developers       | Ongoing   |
| Opportunities for NFM that include schemes aimed at reducing/managing runoff should be considered to reduce nutrient and sediment pollution within CDC.                                                                 | CDC, EA, Natural England | Ongoing   |

# 10 Conclusions and recommendations

## 10.1 Conclusions

| Topic           | Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water resources | <p>Water supply and wastewater services within the study area are provided by Bristol Water, Severn Trent, Thames Water and Wessex Water. Cotswold district is located across several water resource zones, but predominantly in Thames Water's SWOX WRZ.</p> <p>It is widely recognised that the climate is changing. In response, CDC declared a climate emergency in 2019. Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand deficit in the future, and making environmental damage from over abstraction of water resources more likely. Furthermore, the delivery of water and wastewater services and the heating of water in the home require high energy inputs and therefore contribute directly to emissions of greenhouse gases. Water efficiency therefore reduces energy use and carbon emissions.</p> <p>It is important that new development does not result in an unsustainable increase in water abstraction. This can be done in a number of ways from reducing the water demand from new houses through to achieving water neutrality in a region by offsetting a new developments water demand by improving efficiency in existing buildings.</p> <p>The WINEP is a set of actions that the EA have requested all 20 water companies operating in England to complete in a particular AMP as part of their environmental commitments. A number of investigations are planned or underway to ensure that abstraction of water from both groundwater and rivers, is not leading to unsustainable reductions in flow. Development and population growth can increase abstraction, and so CDC have an opportunity to contribute to these actions indirectly by pursuing policies that promote water efficiency in new development.</p> <p>The National Water Resources Framework sets the objective to reduce the average per capita consumption in the UK to 110 l/p/d by 2050. This is now part of the Environmental Improvement Plan and water companies WRMPs. Within Defra's Plan for Water is the commitment to review Building Regulations and a target of 100 l/p/d in severely water stressed areas is suggested.</p> <p>The Future Homes Hub, who are supporting Defra to produce a roadmap to greater water efficiency propose a stages reduction in</p> |

| Topic                       | Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | <p>PCC, with a target of 100 l/p/d in water stressed areas in place from 2025, and a reduced target of 90 l/p/d in place by 2030 (depending on market conditions and customer acceptance).</p> <p>This study recommends that as a minimum the proposed new Building Regulations target of 100 l/p/d outlined in Defra's Plan for Water be adopted across the study area. This should be achieved using a fittings-based approach. The target would be subject to viability testing by the LPA.</p> <p>This should be supported by the requirement for non-household development to achieve three credits in the assessment category WAT01 of the Building Research Establishment Environmental Assessment Methodology (BREEAM) UK New Construction Standard.</p>                                                                                                                                                                                                                                                                                                                                                                            |
| Water supply infrastructure | <p>TW provided a site-by-site assessment of potential allocations in their supply area. This identified 15 sites where further modelling by TW would definitely be required, and a further 20 where modelling may be required, in both cases, upgrades to the water supply network may be needed to accommodate development.</p> <p>Upgrades to the local supply network would be funded as part of the developer Infrastructure Charge. Early engagement between developers, CDC and the water companies is recommended to ensure upgrades are in place prior to occupation</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Wastewater collection       | <p>Thames Water is the primary water and wastewater provider and the designated sewerage undertaker for the study area. Wessex Water, and Severn Trent Water also operate within small parts of the area.</p> <p>Development in areas where there is limited wastewater network capacity will increase pressure on the network, increasing the risk of a detrimental impact on customers, and increasing the likelihood of storm overflow operation. Early engagement with developers, Thames Water, Wessex Water and Severn Trent Water is required, and modelling of the network may be required at the planning application stage.</p> <p>Where network capacity constraints are identified, network reinforcement may be required which would be funded as part of the developer infrastructure charge. It may be necessary for development sites to be phased in line with the provision of any network upgrades.</p> <p>The drainage network includes 14 storm overflows that are likely to serve the study area. Storm overflow performance is generally poor with nine of these overflows currently exceeding the threshold for</p> |



| Topic | Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>investigation. The poorest performing of these is at Avening WwTW, with a 3- year operation average of 128 spills per year.</p> <p>2024 was a particularly bad year, in part because it was a wetter than average year. This was not the case in 2023 and 2025 when many of the storm overflows also operated well above the threshold.</p> <p>Further development in catchments where there are poorly performing overflows increase the risk of storm overflow operation due to increased sewage flows and surface runoff.</p> <p>There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.</p> |

| Topic                | Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wastewater treatment | <p>There are 25 WwTWs that are within the Cotswold district or outside but serving a population within Cotswold district. Of these, twelve are expected to serve growth during the Local Plan period.</p> <p>Five WwTW are expected to have capacity for growth during the plan period and will not require further upgrades for capacity. Seven WwTWs are expected to exceed their permit limit during the Local Plan period, or be close to their permit limit by the end of the plan period.</p> <p>Where an increase in capacity may be required, sufficient time is needed for the water company to plan and deliver the upgrade scheme. This would typically be planned for delivery in the next AMP period. i.e., a need to upgrade a WwTW would be identified in DWMP28 for inclusion in the PR29 business plan and delivered between 2030 and 2035.</p> <p>There may therefore be a constraint to growth at WwTWs that are already at their permit limit and do not have upgrades planned within this AMP period. Beyond 2030, there should be sufficient time once the Local Plan is adopted for water companies to provide additional capacity where required. It is strongly advised that CDC discuss the phasing of potential allocations with TW, STW and WW early in the Local Plan period to allow infrastructure upgrades to be planned to provide capacity when it is required.</p> <p>The odour screening assessment identified eight potential allocations that are close enough to a WwTW that an odour impact assessment would be recommended. This would be funded by the developer.</p> |
| Water quality        | <p>The EA's Reasons for Not Achieving Good (RNAG) dataset indicates that sewage treatment, the urban and transport sectors (urban development), as well as agriculture and rural land management, are the main reasons for watercourses not achieving good status in this area.</p> <p>Growth during the Local Plan period is predicted to cause a significant deterioration in water quality downstream of seven WwTWs (six have a greater than 10% deterioration in one or more determinands, and one has a deterioration in WFD class).</p> <p>With the exception of Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, all of these deteriorations can be prevented by upgrades to treatment processes.</p> <p>At Ampney St Peter, Fairford and Moreton-In-Marsh WwTWs, a greater than 10% deterioration is predicted for Ammonia and BOD</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Topic | Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>which is not prevented in the modelling scenario where upgrades to WwTWs are applied.</p> <p>This is because these WwTWs are situated in an area where the current WFD classification for ammonia is "High" (i.e., the best water quality) and is operating either beyond or close to the technically achievable limit.</p> <p>Under these circumstances, a high percentage deterioration in water quality is expected, and as there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains high. No change in WFD classification is predicted, and High status is maintained for Ammonia and BOD. The WCS therefore does not consider this a constraint to growth.</p> <p>The water quality modelling indicates that growth alone will not prevent good ecological status being prevented in the future should improvements in upstream water quality be made.</p> <p>Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with Thames Water, Severn Trent Water and Wessex Water provide is essential to ensure that infrastructure is in place prior to development to prevent a breach of the environmental permit.</p> |

## Environmental opportunities and constraints

Cotswold district is supplied by four water companies—Bristol Water, Severn Trent Water, Thames Water and Wessex Water—across five Water Resource Zones (WRZs): Bristol Water (single zone), Forest and Stroud and Strategic Grid (Severn Trent Water), Swindon and Oxfordshire (SWOX; Thames Water), and Wessex Water Supply Area.

Within the WRZs serving growth over the Local Plan period and downstream of the district, there are 45 Sites of Special Scientific Interest (SSSIs) associated with waterbodies that are affected by surface water abstraction, identified as a significant water management issue, alongside 4 Ramsar sites, 11 Special Areas of Conservation (SACs) and 6 Special Protection Areas (SPAs). In addition, 290 groundwater-dependent terrestrial ecosystems (GWDTEs) are located within groundwater bodies where abstraction-related impacts on flows have also been identified as significant water management issues.

The water quality modelling results were used to identify the predicted deterioration in water quality in waterbodies adjacent to designated sites downstream of WwTWs serving growth during the Local Plan period. The results show there are no significant deteriorations adjacent to environmental sites that cannot be prevented by improvements in treatment to TAL with the exception of the Cotswold Water Park SSSI downstream of Ampney St Peter WwTW.

As noted in the Water Quality chapter, Ampney St Peter is in the upper catchment discharging to a waterbody with High WFD status for Ammonia. Current performance of the WwTW is at or exceeding the technically achievable limit so there is no theoretical room for further improvement at the WwTW, the TAL scenario does not predict an improvement in water quality and the percentage deterioration compared to the baseline remains 14%. It remains at High WFD status.

SuDS are required on all development sites. Their design should consider both water quantity and water quality and site level investigations should be undertaken to define the most appropriate SuDS types for each specific development. Opportunities exist for these SuDS schemes to offer multiple benefits of flood risk reduction, amenity value and biodiversity.

CDC should be consulted at an early stage of development to ensure that SuDS are implemented and designed in response to site characteristics and policy factors. In the wider area, opportunities

| Topic | Conclusion                                                                                                        |
|-------|-------------------------------------------------------------------------------------------------------------------|
|       | exist to implement NFM techniques to achieve multiple benefits of flood risk, water quality and habitat creation. |

## 10.2 Recommendations

| Topic           | Recommendation                                                                                                                                                                                                                                                                                                                                                            | Responsibility                                                   | Timeframe             |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------------------|
| Water resources | Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with LPAs.                                                                                                                                                                               | All water companies; Severn Trent, Thames Water and Wessex Water | Ongoing               |
| Water resources | Provide yearly profiles of projected housing growth to water companies to inform the WRMP update.                                                                                                                                                                                                                                                                         | All water companies and CDC                                      | Ongoing               |
| Water resources | The Council adopts a policy requiring a water efficiency target of 100 l/p/d in their joint Local Plan and allow for a reduction in this target to 90 l/p/d from 2030. This should be achieved using a fittings-based approach. This should be aligned with a robust enforcement approach to ensure that correct fixtures and fittings are being installed at site level. | CDC                                                              | In the CDC Local Plan |
| Water resources | Use planning policy to require new build non-residential development to achieve at least three credits in the Wat01 Measure for water in the BREEAM New Construction standard.                                                                                                                                                                                            | CDC                                                              | In the CDC Local Plan |
| Water resources | The concept of water neutrality or water positive development has the potential to provide a benefit in improving resilience to climate change and enabling all waterbodies to be brought up to 'Good' status. Explore further with the water companies and the EA how the Council's planning and climate change policies can encourage this                              | CDC, all water companies, and the EA                             | In the CDC Local Plan |



| Topic                       | Recommendation                                                                                                                                                                                                                      | Responsibility                                    | Timeframe                      |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|
|                             | approach. This approach could have application in strategic sites and new settlements.                                                                                                                                              |                                                   |                                |
| Water resources             | Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with LPAs.                                         | All water companies                               | Ongoing                        |
| Water supply infrastructure | Undertake network modelling to ensure adequate provision of water supply is feasible.                                                                                                                                               | Thames Water and Bristol Water and CDC            | Ahead of planning applications |
| Water supply infrastructure | CDC and developers should engage early with water companies to ensure supply infrastructure is in place prior to occupation.                                                                                                        | Thames Water and Bristol Water and CDC developers | Ongoing                        |
| Water supply infrastructure | Developers should engage early with water companies to ensure that the capacity of distribution systems is adequate prior to development coming forward.                                                                            | Thames Water and Bristol Water and CDC developers | Ongoing                        |
| Wastewater collection       | Early engagement between CDC and water companies is required to ensure that where strategic infrastructure is required, it can be planned in by STW, TW or WW and will not lead to any increase in discharges from sewer overflows. | CDC, STW, TW, WW                                  | Ongoing                        |
| Wastewater collection       | Take into account wastewater infrastructure constraints in phasing development in partnership with the sewerage undertaker.                                                                                                         | CDC, STW, TW, WW                                  | Ongoing                        |

| Topic                 | Recommendation                                                                                                                                                                                                                                                                                                                                                                                                                                      | Responsibility        | Timeframe |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------|
| Wastewater collection | Developers will be expected to work with the sewerage undertaker closely and early in the planning promotion process to develop an Outline Drainage Strategy for sites. The Outline Drainage strategy should demonstrate the wastewater assets required, their locations including points of connection to the public foul sewerage, whether the site drainage will be adopted by the water company and if any sewer requisitions will be required. | CDC, STW, TW, WW      | Ongoing   |
| Wastewater collection | Developers will be expected to demonstrate to the LLFA that surface water from a site will be disposed using a SuDS with connection to surface water sewers seen as the last option. New connections for surface water to foul sewers will be resisted by the LLFA.                                                                                                                                                                                 | CDC, LLFA, developers | Ongoing   |
| Wastewater treatment  | Early engagement with STW, TW and WW is required to ensure that provision of WwTW capacity is aligned with delivery of development.                                                                                                                                                                                                                                                                                                                 | CDC                   | Ongoing   |
| Wastewater treatment  | Continue to provide Annual Monitoring Reports to STW, TW and WW detailing projected housing growth.                                                                                                                                                                                                                                                                                                                                                 | CDC                   | Ongoing   |
| Wastewater treatment  | STW, TW and WW to assess growth demands as part of their wastewater asset planning activities and feedback to the Council if concerns arise.                                                                                                                                                                                                                                                                                                        | STW, TW, WW           | Ongoing   |
| Wastewater treatment  | Consider odour risk in the sites identified to be potentially at risk from nuisance odour.                                                                                                                                                                                                                                                                                                                                                          | CDC, Developers       | Ongoing   |

| Topic                                       | Recommendation                                                                                                                                                                                                                                                                                                                         | Responsibility                                         | Timeframe              |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------|
| Wastewater treatment                        | Carry out an odour assessment for site identified as being at risk of nuisance odour.                                                                                                                                                                                                                                                  | Developers                                             | Ongoing                |
| Water quality                               | Provide annual monitoring reports to Thames Water, Severn Trent Water and Wessex Water detailing projected housing growth in the Local Authority.                                                                                                                                                                                      | CDC                                                    | Ongoing                |
| Water quality                               | Take into account the full volume of growth (from CDC and neighbouring authorities) within the catchment.                                                                                                                                                                                                                              | CDC, Thames Water, Severn Trent Water and Wessex Water | Ongoing                |
| Environmental opportunities and constraints | Consider the environmental impact of development on protected sites downstream of receiving WwTW in the habitat's regulations assessment.                                                                                                                                                                                              | CDC                                                    | Local Plan preparation |
| Environmental opportunities and constraints | The Local Plan should include policies that require all development proposals with the potential to impact on areas with environmental designations to be considered in line with the relevant legislation and where stated, in consultation with Natural England (for national and international designations and priority habitats). | CDC                                                    | In the CDC Local Plan  |
| Environmental opportunities and constraints | The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.                                                                                                                                                                                                         | CDC                                                    | In the CDC Local Plan  |
| Environmental opportunities and constraints | In partnership, identify opportunities for incorporating SuDS into open spaces and green infrastructure, to deliver strategic flood risk management and meet WFD water quality targets.                                                                                                                                                | CDC, Severn Trent Water, TW, WW, EA                    | Ongoing                |

| Topic                                       | Recommendation                                                                                                                                                                                                          | Responsibility           | Timeframe              |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------|
| Environmental opportunities and constraints | Developers should include the design of SuDS at an early stage to maximise the benefits of the scheme. The design should demonstrate all four areas of good SuDs design: quantity, quality, amenity, and biodiversity   | Developers               | Ongoing                |
| Environmental opportunities and constraints | Completed SuDs schemes should be accompanied by a maintenance schedule detailing maintenance boundaries, responsible parties and arrangements to ensure the SuDS are managed in perpetuity.                             | Developers               | Ongoing                |
| Environmental opportunities and constraints | Work with developers to discourage connection of new developments into existing surface water and combined sewer networks. Prevent connections into the foul network, as this is a significant cause of sewer flooding. | CDC and developers       | Ongoing                |
| Environmental opportunities and constraints | Opportunities for NFM that include schemes aimed at reducing/managing runoff should be considered to reduce nutrient and sediment pollution within CDC.                                                                 | CDC, EA, Natural England | Ongoing                |
| Environmental opportunities and constraints | Consider the environmental impact of development on protected sites downstream of receiving WwTW in the habitat's regulations assessment.                                                                               | CDC                      | Local Plan preparation |

# 11 Appendices



## A Appendix A- Surface and groundwater assessments

### A.1 Surface water assessment designated sites

| Code    | Name                                      | Designation | Waterbody ID   | Waterbody name                               | SWMI for flow? |
|---------|-------------------------------------------|-------------|----------------|----------------------------------------------|----------------|
| 1006226 | Barnsley Warren SSSI                      | SSSI        | GB106039030300 | Ampney and Poulton Brooks (Source to Thames) | Y              |
| 1000469 | Bisham Woods SSSI                         | SSSI        | GB106039023233 | Thames (Reading to Cookham)                  | Y              |
| 1000486 | Bradley Woods SSSI                        | SSSI        | GB109053022090 | Maiden Bradley Bk - source to conf R Frome   | Y              |
| 1002564 | Brassey Reserve and Windrush Valley SSSI  | SSSI        | GB106039030480 | Windrush (Slade Barn Stream to Dikler)       | Y              |
| 1001375 | Brimble Pit and Cross Swallet Basins SSSI | SSSI        | GB109052021540 | Cheddar Yeo - source to conf River Axe       | Y              |
| 1477753 | Bushy Park and Home Park SSSI             | SSSI        | GB106039023232 | Thames (Egham to Teddington)                 | Y              |
| 1001380 | Cheddar Reservoir SSSI                    | SSSI        | GB109052021540 | Cheddar Yeo - source to conf River Axe       | Y              |
| 1001346 | Chew Valley Lake SSSI                     | SSSI        | GB109053021851 | Chew - source to Chew Valley Lake            | Y              |
| 1000837 | Chilton Foliat Meadows SSSI               | SSSI        | GB106039023173 | Middle Kennet (Marlborough to Hungerford)    | Y              |
| 1000735 | Chimney Meadows SSSI                      | SSSI        | GB106039030333 | Thames (Leach to Evenlode)                   | Y              |
| 1002026 | Cotswold Water Park SSSI                  | SSSI        | GB106039023760 | Thames (Kemble to Waterhay Bridge)           | Y              |

| Code    | Name                                        | Designation | Waterbody ID   | Waterbody name                                          | SWMI for flow? |
|---------|---------------------------------------------|-------------|----------------|---------------------------------------------------------|----------------|
| 1002026 | Cotswold Water Park SSSI                    | SSSI        | GB106039029750 | Churn (Baunton to Cricklade)                            | Y              |
| 1002026 | Cotswold Water Park SSSI                    | SSSI        | GB106039029760 | Thornhill Ditch and tributaries at Cotswolds Water Park | Y              |
| 1002026 | Cotswold Water Park SSSI                    | SSSI        | GB106039030300 | Ampney and Poulton Brooks (Source to Thames)            | Y              |
| 1001573 | Crook Peak to Shute Shelve Hill SSSI        | SSSI        | GB109052021540 | Cheddar Yeo - source to conf River Axe                  | Y              |
| 1001573 | Crook Peak to Shute Shelve Hill SSSI        | SSSI        | GB109052021580 | R Lox Yeo - source to conf Rive Axe                     | Y              |
| 1000115 | Dumsey Meadow SSSI                          | SSSI        | GB106039023232 | Thames (Egham to Teddington)                            | Y              |
| 1002133 | Elmlea Meadows SSSI                         | SSSI        | GB106039029750 | Churn (Baunton to Cricklade)                            | Y              |
| 1000743 | Grafton Lock Meadow SSSI                    | SSSI        | GB106039030333 | Thames (Leach to Evenlode)                              | Y              |
| 1001353 | Harptree Combe SSSI                         | SSSI        | GB109053021851 | Chew - source to Chew Valley Lake                       | Y              |
| 1006181 | Iford Manor SSSI                            | SSSI        | GB109053021840 | R Frome - conf R Mells to conf R Avon (Brist)           | Y              |
| 1002591 | Juniper Hill, Edgeworth SSSI                | SSSI        | GB109054032470 | R Frome - source to conf Slad Bk                        | Y              |
| 1006569 | Kellaways - West Tytherton, River Avon SSSI | SSSI        | GB109053027650 | R Avon (Brist) conf Tetbury Avon to conf R Marden       | Y              |
| 1006175 | Kennet and Lambourn Floodplain SSSI         | SSSI        | GB106039023173 | Middle Kennet (Marlborough to Hungerford)               | Y              |

| Code    | Name                                 | Designation | Waterbody ID   | Waterbody name                               | SWMI for flow? |
|---------|--------------------------------------|-------------|----------------|----------------------------------------------|----------------|
| 1007240 | Knight & Bessborough Reservoirs SSSI | SSSI        | GB106039023232 | Thames (Egham to Teddington)                 | Y              |
| 1000759 | Langley's Lane Meadow SSSI           | SSSI        | GB106039030333 | Thames (Leach to Evenlode)                   | Y              |
| 1001608 | Max Bog SSSI                         | SSSI        | GB109052021580 | R Lox Yeo - source to conf Rive Axe          | Y              |
| 1000871 | North Meadow, Cricklade SSSI         | SSSI        | GB106039029750 | Churn (Baunton to Cricklade)                 | Y              |
| 1000674 | Porton Meadows SSSI                  | SSSI        | GB108043022390 | BOURNE                                       | Y              |
| 1001392 | Priddy Pools SSSI                    | SSSI        | GB109052021540 | Cheddar Yeo - source to conf River Axe       | Y              |
| 1006597 | River Avon System SSSI               | SSSI        | GB108043022390 | BOURNE                                       | Y              |
| 1000437 | River Kennet SSSI                    | SSSI        | GB106039023173 | Middle Kennet (Marlborough to Hungerford)    | Y              |
| 1000560 | Rodbed Wood SSSI                     | SSSI        | GB106039023233 | Thames (Reading to Cookham)                  | Y              |
| 1000900 | Salisbury Plain SSSI                 | SSSI        | GB108043022390 | BOURNE                                       | Y              |
| 1002551 | Salmonsbury Meadows SSSI             | SSSI        | GB106039037470 | Dikler (Source to Wyck Rissington)           | Y              |
| 1002600 | Severn Estuary SSSI                  | SSSI        | GB109052021600 | R Banwell - source to conf R Banwell Estuary | Y              |
| 1002600 | Severn Estuary SSSI                  | SSSI        | GB109052027321 | Land Yeo - Yearling Ditch to mouth           | Y              |

| Code      | Name                                   | Designation | Waterbody ID   | Waterbody name                                   | SWMI for flow? |
|-----------|----------------------------------------|-------------|----------------|--------------------------------------------------|----------------|
| 1002600   | Severn Estuary SSSI                    | SSSI        | GB109054026650 | The Pill - source to conf Redwick Common Rhine   | Y              |
| 1000888   | Silbury Hill SSSI                      | SSSI        | GB106039023171 | Upper Kennet to Marlborough                      | Y              |
| 1006905   | St. Catherine's Valley SSSI            | SSSI        | GB109053027810 | St Catherines Bk - source to conf R Avon (Brist) | Y              |
| 1000725   | Temple Island Meadows SSSI             | SSSI        | GB106039023233 | Thames (Reading to Cookham)                      | Y              |
| 1001379   | The Cheddar Complex SSSI               | SSSI        | GB109052021540 | Cheddar Yeo - source to conf River Axe           | Y              |
| 1001006   | Tickenham, Nailsea and Kenn Moors SSSI | SSSI        | GB109052027322 | Land Yeo - Jacklands Bridge to Yearling Ditch    | Y              |
| 1002450   | Wildmoorway Meadows SSSI               | SSSI        | GB106039029750 | Churn (Baunton to Cricklade)                     | Y              |
| 1000812   | Wytham Woods SSSI                      | SSSI        | GB106039030333 | Thames (Leach to Evenlode)                       | Y              |
| UK0013016 | River Avon                             | SAC         | GB108043022390 | BOURNE                                           | Y              |
| UK0030052 | North Somerset & Mendip Bats           | SAC         | GB109052021540 | Cheddar Yeo - source to conf River Axe           | Y              |
| UK0012724 | Chilterns Beechwoods                   | SAC         | GB106039023233 | Thames (Reading to Cookham)                      | Y              |
| UK0012683 | Salisbury Plain                        | SAC         | GB108043022390 | BOURNE                                           | Y              |
| UK0030203 | Mendip Limestone Grasslands            | SAC         | GB109052021540 | Cheddar Yeo - source to conf River Axe           | Y              |

| Code      | Name                           | Designation | Waterbody ID   | Waterbody name                                 | SWMI for flow? |
|-----------|--------------------------------|-------------|----------------|------------------------------------------------|----------------|
| UK0030203 | Mendip Limestone Grasslands    | SAC         | GB109052021580 | R Lox Yeo - source to conf Rive Axe            | Y              |
| UK0013030 | Severn Estuary                 | SAC         | GB109052021600 | R Banwell - source to conf R Banwell Estuary   | Y              |
| UK0013030 | Severn Estuary                 | SAC         | GB109052027321 | Land Yeo - Yearling Ditch to mouth             | Y              |
| UK0013030 | Severn Estuary                 | SAC         | GB109054026650 | The Pill - source to conf Redwick Common Rhine | Y              |
| UK0030044 | Kennet & Lambourn Floodplain   | SAC         | GB106039023173 | Middle Kennet (Marlborough to Hungerford)      | Y              |
| UK0016372 | North Meadow & Clattinger Farm | SAC         | GB106039029750 | Churn (Baunton to Cricklade)                   | Y              |
| UK9010041 | Chew Valley Lake               | SPA         | GB109053021851 | Chew - source to Chew Valley Lake              | Y              |
| UK9015022 | Severn Estuary                 | SPA         | GB109054026650 | The Pill - source to conf Redwick Common Rhine | Y              |
| UK9015022 | Severn Estuary                 | SPA         | GB109052021600 | R Banwell - source to conf R Banwell Estuary   | Y              |
| UK9015022 | Severn Estuary                 | SPA         | GB109052027321 | Land Yeo - Yearling Ditch to mouth             | Y              |
| UK9012171 | South West London Waterbodies  | SPA         | GB106039023232 | Thames (Egham to Teddington)                   | Y              |
| UK9011102 | Salisbury Plain                | SPA         | GB108043022390 | BOURNE                                         | Y              |
| UK11065   | South West London Waterbodies  | Ramsar      | GB106039023232 | Thames (Egham to Teddington)                   | Y              |



| Code    | Name           | Designation | Waterbody ID   | Waterbody name                                 | SWMI for flow? |
|---------|----------------|-------------|----------------|------------------------------------------------|----------------|
| UK11081 | Severn Estuary | Ramsar      | GB109054026650 | The Pill - source to conf Redwick Common Rhine | Y              |
| UK11081 | Severn Estuary | Ramsar      | GB109052021600 | R Banwell - source to conf R Banwell Estuary   | Y              |
| UK11081 | Severn Estuary | Ramsar      | GB109052027321 | Land Yeo - Yearling Ditch to mouth             | Y              |

## A.2 GWDTE and groundwater assessment

| SSSI Code | GWDTE Name                               | Waterbody ID   | Waterbody Name                    | SWMI for flow? |
|-----------|------------------------------------------|----------------|-----------------------------------|----------------|
| 1000292   | Alvescot Meadows (SSSI)                  | GB40601G600400 | Burford Jurassic                  | Y              |
| 1001332   | Ashculm Turbary (SSSI)                   | GB40802G806400 | Tone and North Somerset Streams   | Y              |
| 1003073   | Avon Gorge (SSSI)                        | GB40901G806800 | Carboniferous Limestone (Bristol) | Y              |
| 1002517   | Bere Mill Meadows (SSSI)                 | GB40701G501200 | River Test Chalk                  | Y              |
| 1003714   | Berrow Dunes (SSSI)                      | GB40902G804700 | Wells                             | Y              |
| 1001413   | Bestmoor (SSSI)                          | GB40602G600200 | Banbury Jurassic                  | Y              |
| 1006788   | Biddle Street, Yatton (SSSI)             | GB40902G804800 | Bristol Triassic                  | Y              |
| 1003718   | Bishop's Hill Wood (SSSI)                | GB40902G303100 | Avonmouth Mercia Mudstone         | Y              |
| 1001558   | Bix Bottom (SSSI)                        | GB40601G601100 | South-West Chilterns Chalk        | Y              |
| 1003750   | Black Down & Sampford Commons (SSSI)     | GB40802G806400 | Tone and North Somerset Streams   | Y              |
| 1000808   | Blagdon Lake (SSSI)                      | GB40902G804800 | Bristol Triassic                  | Y              |
| 1001583   | Bould Wood (SSSI)                        | GB40602G600300 | Chipping Norton Jurassic          | Y              |
| 1003230   | Bowerchalke Downs (SSSI)                 | GB40801G806900 | Upper Hampshire Avon              | Y              |
| 1001463   | Boxford Water Meadows (SSSI)             | GB40601G600900 | Berkshire Downs Chalk             | Y              |
| 1003778   | Bransbury Common (SSSI)                  | GB40701G501200 | River Test Chalk                  | Y              |
| 1000634   | Brassey Reserve & Windrush Valley (SSSI) | GB40601G600400 | Burford Jurassic                  | Y              |
| 1005598   | Bratton Downs (SSSI)                     | GB40801G806900 | Upper Hampshire Avon              | Y              |
| 1003799   | Breamore Marsh (SSSI)                    | GB40801G806900 | Upper Hampshire Avon              | Y              |
| 1001145   | Bridgwater Bay (SSSI)                    | GB40802G806400 | Tone and North Somerset Streams   | Y              |

| SSSI Code | GWDTE Name                           | Waterbody ID   | Waterbody Name                                       | SWMI for flow? |
|-----------|--------------------------------------|----------------|------------------------------------------------------|----------------|
| 1001145   | Bridgwater Bay (SSSI)                | GB40902G804700 | Wells                                                | Y              |
| 1002335   | Brimsdown Hill (SSSI)                | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1002342   | Britford Water Meadows (SSSI)        | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1002376   | Burcombe Down (SSSI)                 | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1004436   | Burghclere Beacon (SSSI)             | GB40601G600900 | Berkshire Downs Chalk                                | Y              |
| 1004436   | Burghclere Beacon (SSSI)             | GB40701G501200 | River Test Chalk                                     | Y              |
| 1003794   | Bushley Muzzard, Brimpsfield (SSSI)  | GB40901G305700 | Severn Vale - Jurassic Limestone Cotswold Edge South | Y              |
| 1003970   | Cheddar Wood (SSSI)                  | GB40902G804700 | Wells                                                | Y              |
| 1002553   | Chew Valley Lake (SSSI)              | GB40902G804800 | Bristol Triassic                                     | Y              |
| 1000099   | Chilbolton Common (SSSI)             | GB40701G501200 | River Test Chalk                                     | Y              |
| 1002533   | Chilton Foliat Meadows (SSSI)        | GB40601G600900 | Berkshire Downs Chalk                                | Y              |
| 1001645   | Chimney Meadows (SSSI)               | GB40603G000200 | Upper Thames Gravels                                 | Y              |
| 1002547   | Clattinger Farm (SSSI)               | GB40602G600500 | Kemble Forest Marble                                 | Y              |
| 1000159   | Cleaves Wood (SSSI)                  | GB40901G305800 | Inferior Oolite and Bridport Sands                   | Y              |
| 1000159   | Cleaves Wood (SSSI)                  | GB40901G805500 | Bath Oolite                                          | Y              |
| 1000720   | Cleeve Common (SSSI)                 | GB40601G600400 | Burford Jurassic                                     | Y              |
| 2000262   | Cloatley Manor Farm Meadows (SSSI)   | GB40602G600500 | Kemble Forest Marble                                 | Y              |
| 1006358   | Cockleford Marsh (SSSI)              | GB40601G600400 | Burford Jurassic                                     | Y              |
| 1003801   | Cotswold Commons & Beechwoods (SSSI) | GB40901G305700 | Severn Vale - Jurassic Limestone Cotswold Edge South | Y              |
| 1003801   | Cotswold Commons &                   | GB40902G204900 | Severn Vale - Secondary Combined                     | Y              |

| SSSI Code | GWDTE Name                         | Waterbody ID   | Waterbody Name                                       | SWMI for flow? |
|-----------|------------------------------------|----------------|------------------------------------------------------|----------------|
|           | Beechwoods (SSSI)                  |                |                                                      |                |
| 1006005   | Cotswold Water Park (SSSI)         | GB40602G600500 | Kemble Forest Marble                                 | Y              |
| 1006005   | Cotswold Water Park (SSSI)         | GB40603G000200 | Upper Thames Gravels                                 | Y              |
| 1001395   | Crickley Hill & Barrow Wake (SSSI) | GB40601G600400 | Burford Jurassic                                     | Y              |
| 1001395   | Crickley Hill & Barrow Wake (SSSI) | GB40901G305700 | Severn Vale - Jurassic Limestone Cotswold Edge South | Y              |
| 1001395   | Crickley Hill & Barrow Wake (SSSI) | GB40902G204900 | Severn Vale - Secondary Combined                     | Y              |
| 1003576   | Curry & Hay Moors (SSSI)           | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 2000415   | Dunster Park & Heathlands (SSSI)   | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 1003152   | East Aston Common (SSSI)           | GB40701G501200 | River Test Chalk                                     | Y              |
| 2000175   | East Harnham Meadows (SSSI)        | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1002628   | Easton Farm Meadow (SSSI)          | GB40601G600900 | Berkshire Downs Chalk                                | Y              |
| 1003435   | Ebsbury Down (SSSI)                | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1000906   | Edford Woods & Meadows (SSSI)      | GB40902G804800 | Bristol Triassic                                     | Y              |
| 1005543   | Elmlea Meadows (SSSI)              | GB40603G000200 | Upper Thames Gravels                                 | Y              |
| 1004152   | Exmoor Coastal Heaths (SSSI)       | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 1003480   | Figsbury Ring (SSSI)               | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1005540   | Fivehead Woods & Meadow (SSSI)     | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 1003609   | Folly Farm (SSSI)                  | GB40902G804800 | Bristol Triassic                                     | Y              |
| 1003472   | Fontmell & Melbury Downs (SSSI)    | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1001426   | Freeman's Marsh (SSSI)             | GB40601G600900 | Berkshire Downs Chalk                                | Y              |

| SSSI Code | GWDTE Name                              | Waterbody ID   | Waterbody Name                                       | SWMI for flow? |
|-----------|-----------------------------------------|----------------|------------------------------------------------------|----------------|
| 1003614   | Frieth Meadows (SSSI)                   | GB40601G601100 | South-West Chilterns Chalk                           | Y              |
| 1001563   | Ge-Mare Farm Fields (SSSI)              | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 1003691   | Glyme Valley (SSSI)                     | GB40601G600400 | Burford Jurassic                                     | Y              |
| 1003691   | Glyme Valley (SSSI)                     | GB40602G600300 | Chipping Norton Jurassic                             | Y              |
| 1001911   | Grafton Lock Meadow (SSSI)              | GB40603G000200 | Upper Thames Gravels                                 | Y              |
| 1004268   | Gutch Common (SSSI)                     | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 2000468   | Harries Ground, Rodbourne (SSSI)        | GB40901G806000 | South of Malmesbury                                  | Y              |
| 1000072   | Hawkesbury Meadow (SSSI)                | GB40902G303100 | Avonmouth Mercia Mudstone                            | Y              |
| 2000263   | Heath Hill Farm (SSSI)                  | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1004460   | Holme Moor & Clean Moor (SSSI)          | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 1004319   | Homington & Coombe Bissett Downs (SSSI) | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1006376   | Honeybrook Farm (SSSI)                  | GB40901G305800 | Inferior Oolite and Bridport Sands                   | Y              |
| 1006376   | Honeybrook Farm (SSSI)                  | GB40901G805500 | Bath Oolite                                          | Y              |
| 1004362   | Inwood, Warleigh (SSSI)                 | GB40901G805500 | Bath Oolite                                          | Y              |
| 1004362   | Inwood, Warleigh (SSSI)                 | GB40902G302900 | Bristol Avon Forest Marble                           | Y              |
| 1004402   | Jones's Mill (SSSI)                     | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1001694   | Juniper Hill, Edgeworth (SSSI)          | GB40901G305700 | Severn Vale - Jurassic Limestone Cotswold Edge South | Y              |
| 2000109   | Kennet & Lambourn Floodplain (SSSI)     | GB40601G600900 | Berkshire Downs Chalk                                | Y              |
| 2000123   | Kennet Valley Alderwoods (SSSI)         | GB40601G600900 | Berkshire Downs Chalk                                | Y              |

| SSSI Code | GWDTE Name                                | Waterbody ID   | Waterbody Name                          | SWMI for flow? |
|-----------|-------------------------------------------|----------------|-----------------------------------------|----------------|
| 1002344   | Kings Sedgemoor (SSSI)                    | GB40802G806400 | Tone and North Somerset Streams         | Y              |
| 1004431   | Knapp & Barnett's Downs (SSSI)            | GB40801G806900 | Upper Hampshire Avon                    | Y              |
| 1002745   | Langley's Lane Meadow (SSSI)              | GB40603G000200 | Upper Thames Gravels                    | Y              |
| 1005918   | Langmead & Weston Level (SSSI)            | GB40802G806400 | Tone and North Somerset Streams         | Y              |
| 1006033   | Lang's Farm (SSSI)                        | GB40802G806400 | Tone and North Somerset Streams         | Y              |
| 2000110   | Little Tew Meadows (SSSI)                 | GB40602G600300 | Chipping Norton Jurassic                | Y              |
| 1001549   | Long Dole Wood & Meadows (SSSI)           | GB40902G804800 | Bristol Triassic                        | Y              |
| 1006543   | Longleat Woods (SSSI)                     | GB40801G806900 | Upper Hampshire Avon                    | Y              |
| 2000393   | Lower Coombe & Ferne Brook Meadows (SSSI) | GB40801G806900 | Upper Hampshire Avon                    | Y              |
| 1000015   | Lower Woodford Water Meadows (SSSI)       | GB40801G806900 | Upper Hampshire Avon                    | Y              |
| 1002798   | Lower Woods (SSSI)                        | GB40902G303100 | Avonmouth Mercia Mudstone               | Y              |
| 1003773   | Max Bog (SSSI)                            | GB40902G804700 | Wells                                   | Y              |
| 1005689   | Middle Barton Fen (SSSI)                  | GB40602G600300 | Chipping Norton Jurassic                | Y              |
| 1002832   | Midger (SSSI)                             | GB40901G305800 | Inferior Oolite and Bridport Sands      | Y              |
| 1000030   | Millwater (SSSI)                          | GB40801G804000 | Yeovil Bridport Sands / Inferior Oolite | Y              |
| 1005472   | Monkswood Valley (SSSI)                   | GB40901G305800 | Inferior Oolite and Bridport Sands      | Y              |
| 1001497   | Moorend Common (SSSI)                     | GB40601G601100 | South-West Chilterns Chalk              | Y              |
| 1002362   | Moorlinch (SSSI)                          | GB40802G806400 | Tone and North Somerset Streams         | Y              |
| 1002879   | Naphill Common (SSSI)                     | GB40601G601100 | South-West Chilterns Chalk              | Y              |
| 1001554   | North Curry Meadow (SSSI)                 | GB40802G806400 | Tone and North Somerset Streams         | Y              |



| SSSI Code | GWDTE Name                         | Waterbody ID   | Waterbody Name                  | SWMI for flow? |
|-----------|------------------------------------|----------------|---------------------------------|----------------|
| 1006541   | North Exmoor (SSSI)                | GB40802G806400 | Tone and North Somerset Streams | Y              |
| 1002417   | North Meadow, Cricklade (SSSI)     | GB40603G000200 | Upper Thames Gravels            | Y              |
| 1002395   | North Moor (SSSI)                  | GB40802G806400 | Tone and North Somerset Streams | Y              |
| 1004185   | Parsonage Down (SSSI)              | GB40801G806900 | Upper Hampshire Avon            | Y              |
| 1002133   | Pike Corner (SSSI)                 | GB40602G600500 | Kemble Forest Marble            | Y              |
| 1002133   | Pike Corner (SSSI)                 | GB40603G000200 | Upper Thames Gravels            | Y              |
| 1004121   | Plaster's Green Meadows (SSSI)     | GB40902G804800 | Bristol Triassic                | Y              |
| 1003140   | Porton Down (SSSI)                 | GB40701G501200 | River Test Chalk                | Y              |
| 1003140   | Porton Down (SSSI)                 | GB40801G806900 | Upper Hampshire Avon            | Y              |
| 1003914   | Porton Meadows (SSSI)              | GB40801G806900 | Upper Hampshire Avon            | Y              |
| 1000349   | Prior's Park & Adcombe Wood (SSSI) | GB40802G806400 | Tone and North Somerset Streams | Y              |
| 1002538   | Puckham Woods (SSSI)               | GB40601G600400 | Burford Jurassic                | Y              |
| 1006787   | Puxton Moor (SSSI)                 | GB40902G804800 | Bristol Triassic                | Y              |
| 1002603   | Quants (SSSI)                      | GB40802G806400 | Tone and North Somerset Streams | Y              |
| 1000497   | Ringdown (SSSI)                    | GB40802G806400 | Tone and North Somerset Streams | Y              |
| 2000183   | River Avon System (SSSI)           | GB40801G806900 | Upper Hampshire Avon            | Y              |
| 2000170   | River Test (SSSI)                  | GB40701G501200 | River Test Chalk                | Y              |
| 2000431   | River Till (SSSI)                  | GB40801G806900 | Upper Hampshire Avon            | Y              |
| 1001609   | Rodbed Wood (SSSI)                 | GB40601G601100 | South-West Chilterns Chalk      | Y              |
| 1003204   | Roebuck Meadows (SSSI)             | GB40802G806400 | Tone and North Somerset Streams | Y              |
| 1005782   | Rotherley Downs (SSSI)             | GB40801G806900 | Upper Hampshire Avon            | Y              |
| 1003209   | Rushmore & Conholt Downs           | GB40701G501200 | River Test Chalk                | Y              |

| SSSI Code | GWDTE Name                               | Waterbody ID   | Waterbody Name                     | SWMI for flow? |
|-----------|------------------------------------------|----------------|------------------------------------|----------------|
|           | (SSSI)                                   |                |                                    |                |
| 1006531   | Salisbury Plain (SSSI)                   | GB40801G806900 | Upper Hampshire Avon               | Y              |
| 1000143   | Salmonsbury Meadows (SSSI)               | GB40602G600300 | Chipping Norton Jurassic           | Y              |
| 1001972   | Savernake Forest (SSSI)                  | GB40601G600900 | Berkshire Downs Chalk              | Y              |
| 1001995   | Scratchbury & Cotley Hills (SSSI)        | GB40801G806900 | Upper Hampshire Avon               | Y              |
| 1002284   | Severn Estuary (SSSI)                    | GB40901G806800 | Carboniferous Limestone (Bristol)  | Y              |
| 1002284   | Severn Estuary (SSSI)                    | GB40902G204900 | Severn Vale - Secondary Combined   | Y              |
| 1002284   | Severn Estuary (SSSI)                    | GB40902G303100 | Avonmouth Mercia Mudstone          | Y              |
| 1002284   | Severn Estuary (SSSI)                    | GB40902G804700 | Wells                              | Y              |
| 1002284   | Severn Estuary (SSSI)                    | GB40902G804800 | Bristol Triassic                   | Y              |
| 1004019   | Snelsmore Common (SSSI)                  | GB40601G600900 | Berkshire Downs Chalk              | Y              |
| 1002636   | Southey & Gotleigh Moors (SSSI)          | GB40802G806400 | Tone and North Somerset Streams    | Y              |
| 1002426   | Southlake Moor (SSSI)                    | GB40802G806400 | Tone and North Somerset Streams    | Y              |
| 2000059   | St Catherine's Valley (SSSI)             | GB40901G305800 | Inferior Oolite and Bridport Sands | Y              |
| 1002820   | Steeple Langford Down (SSSI)             | GB40801G806900 | Upper Hampshire Avon               | Y              |
| 1000182   | Stockbridge Common Marsh (SSSI)          | GB40701G501200 | River Test Chalk                   | Y              |
| 1000342   | Stockbridge Fen (SSSI)                   | GB40701G501200 | River Test Chalk                   | Y              |
| 1002831   | Stockton Wood & Down (SSSI)              | GB40801G806900 | Upper Hampshire Avon               | Y              |
| 1003937   | Sulham & Tidmarsh Woods & Meadows (SSSI) | GB40601G600900 | Berkshire Downs Chalk              | Y              |
| 1000477   | Taynton Quarries (SSSI)                  | GB40601G600400 | Burford Jurassic                   | Y              |
| 1001081   | Tealham & Tadham Moors (SSSI)            | GB40902G804700 | Wells                              | Y              |

| SSSI Code | GWDTE Name                             | Waterbody ID   | Waterbody Name                                       | SWMI for flow? |
|-----------|----------------------------------------|----------------|------------------------------------------------------|----------------|
| 1005595   | Temple Island Meadows (SSSI)           | GB40601G601100 | South-West Chilterns Chalk                           | Y              |
| 1002762   | Thatcham Reed Beds (SSSI)              | GB40601G600900 | Berkshire Downs Chalk                                | Y              |
| 1003940   | The Cheddar Complex (SSSI)             | GB40902G804700 | Wells                                                | Y              |
| 1005794   | The Perch (SSSI)                       | GB40902G804700 | Wells                                                | Y              |
| 1000310   | The Quantocks (SSSI)                   | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 2000021   | Tickenham, Nailsea & Kenn Moors (SSSI) | GB40901G806800 | Carboniferous Limestone (Bristol)                    | Y              |
| 2000021   | Tickenham, Nailsea & Kenn Moors (SSSI) | GB40902G804800 | Bristol Triassic                                     | Y              |
| 1002968   | Upper Waterhay Meadow (SSSI)           | GB40603G000200 | Upper Thames Gravels                                 | Y              |
| 1003186   | Upton Coombe (SSSI)                    | GB40901G305800 | Inferior Oolite and Bridport Sands                   | Y              |
| 1004511   | West Sedgemoor (SSSI)                  | GB40802G806400 | Tone and North Somerset Streams                      | Y              |
| 1001181   | Westhay Moor (SSSI)                    | GB40902G804700 | Wells                                                | Y              |
| 1003804   | Whelford Meadow (SSSI)                 | GB40603G000200 | Upper Thames Gravels                                 | Y              |
| 1003161   | Whitesheet Hill (SSSI)                 | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1002431   | Widdenton Park Wood (SSSI)             | GB40601G601100 | South-West Chilterns Chalk                           | Y              |
| 1003112   | Wildmoorway Meadows (SSSI)             | GB40602G600500 | Kemble Forest Marble                                 | Y              |
| 1003198   | Win Green Down (SSSI)                  | GB40801G806900 | Upper Hampshire Avon                                 | Y              |
| 1003528   | Winson Meadows (SSSI)                  | GB40601G600400 | Burford Jurassic                                     | Y              |
| 1003561   | Woodchester Park (SSSI)                | GB40901G305700 | Severn Vale - Jurassic Limestone Cotswold Edge South | Y              |
| 1003681   | Wychwood Forest (SSSI)                 | GB40601G600400 | Burford Jurassic                                     | Y              |
| 1003681   | Wychwood Forest (SSSI)                 | GB40602G600300 | Chipping Norton Jurassic                             | Y              |

| SSSI Code | GWDTE Name            | Waterbody ID   | Waterbody Name            | SWMI for flow? |
|-----------|-----------------------|----------------|---------------------------|----------------|
| 1000599   | Yanal Bog (SSSI)      | GB40902G804800 | Bristol Triassic          | Y              |
| 1002054   | Yarley Meadows (SSSI) | GB40902G303100 | Avonmouth Mercia Mudstone | Y              |

## B WINEP

### B.1 Driver Code

- **U\_MON3** - Urban Waste Water treatment Regulations - Monitoring Emissions to Air, Land and Water (MCERTS) certified Flow Pass Forward (FPF) overflow operation monitoring at WwTW or last in line Sewage Pumping Station (SPS) overflows.
  - **U\_MON3a** - MCERTS certification of an AMP7 U\_MON3 driver output overflow operation monitor.
  - **U\_MON 3b** - MCERTS certified overflow operation monitor.
- **U\_MON4** - Urban Waste Water treatment Regulations - MCERTS certified FPF flow monitoring at WwTW or last in line SPS overflows.
  - **U\_MON4a** - Move AMP7 U\_MON4 driver output to 2-minute flow monitoring.
  - **U\_MON4b** - Move AMP7 U\_INV2 driver output to 2-minute flow monitoring.
  - **U\_MON4c** - PR24 U\_MON4 from U\_INV2 investigation.
  - **U\_MON4d** - MCERTS certified Flow passed forward flow monitor
  - **U\_MON4e** - MCERTS certified Flow passed forward flow monitor including civils.
- **EnvAct\_IMP4** - Improvements to reduce storm overflows spills so that they do not discharge above an average of ten rainfall events per year by 2050.
- **EnvAct\_INV4** - Investigations to reduce storm overflow spills to protect the environment so that they have no local adverse ecological impact.
- **WFD\_IMP** - Implementation of actions to improve water quality in terms of relevant WFDR status objectives.
  - The driver WFD\_IMP should have a suffix letter applied to indicate what target the measure is aimed at achieving: the status objective standard. The following are to be used:
    - h – measure to meet High status for the element
    - g – measure to meet Good status for the element
    - m – measure to meet Moderate status for the element
    - p – measure to meet Poor status for the element.

- Potential changes to current water body objectives, as a result of PR24 planning, may be included in the 2027 river basin management plans.
- Where a water company is willing to do more for WFDR than is required then the work should be represented on the WINEP with two driver codes; one WFD\_IMP driver code to reflect the statutory work and one 25 Year Environment Plan driver code (25YEP\_IMP) to reflect the discretionary work. Please see the separate driver guidance on the 25 Year Environment Plan driver.
- If we know that a water company is going to implement an action, irrespective of our economic appraisal, then we should include that action in the programme of measures and build the expected outcome into the water body objective.
- **WFD\_NDLS\_Chem1** - Measures related to load standstill requirements for chemicals (where Environmental Quality Standards (EQS) exceedance is predicted, but measures fail economic assessments associated with EQS).
- **WFD\_NDLS\_Chem2** - Measures related to load standstill requirements for chemicals (below EQS). These are set where a WwTW is discharging significant concentrations of a chemical, but the EQS is not threatened immediately downstream. Targets are set to ensure that current effluent quality does not deteriorate and to contribute to broader aims to cease and phase out emissions, discharges and losses of priority hazardous substances and prevent pollution swapping. This driver would be used where there is no risk that growth between 2015 and 2021 would cause an actual failure of the EQS.
- **WFD\_IMP\_CHEM** - To meet either good ecological status or good chemical status. Needed where an EQS is exceeded downstream of a WwTW discharge. Measures that fail economic tests will receive standstill limits under WFD\_NDLS\_CHEM1.
- **WFD\_ND\_WRFlow** - Action to protect/ensure no deterioration in status (surface water).
- **WFDGW\_INV** - Groundwater good status improvement action relating to water resource or water quality.
- **EDWRMP\_INV** - Investigations, options appraisals or feasibility studies for measures identified within the WRMP to meet regional planning requirements that do not fit with WFD driver requirements.



## B.2 WINEP table

### B.2.1 Groundwater WINEP actions

| WB_ID          | Waterbody name                                                        | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                    |
|----------------|-----------------------------------------------------------------------|-------------|---------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40901G202700 | Severn Vale/<br>Wye -<br>Carboniferous<br>Limestone<br>Forest of Dean | 08ST100363a | WFD_NDINV_WRFlow    | 31/03/2030      | Rodmore: Priority D WFD<br>No Deterioration<br>Investigation: Investigate<br>the risk of WFD<br>deterioration to water<br>bodies associated with<br>the Rodmore source.        |
| GB40901G202700 | Severn Vale/<br>Wye -<br>Carboniferous<br>Limestone<br>Forest of Dean | 08ST100457a | WFD_NDINV_WRFlow    | 31/03/2030      | Lydbrook: Priority D WFD<br>No Deterioration<br>Investigation: Investigate<br>the risk of WFD<br>deterioration to water<br>bodies associated with<br>the Lydbrook source.      |
| GB40901G305700 | Severn Vale -<br>Jurassic<br>Limestone<br>Cotswold Edge<br>South      | 08ST100458a | WFD_INV_WRFlow      | 31/12/2026      | Severn Vale - Jurassic<br>Limestone Cotswold Edge<br>South: Investigate the risk<br>of WFD deterioration to<br>water bodies associated<br>with the Millend (Spring)<br>source. |

| WB_ID          | Waterbody name                              | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                         |
|----------------|---------------------------------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40902G205200 | Wye Secondary Devonian ORS                  | 08ST100321a | WFD_NDINV_WRFlow    | 31/03/2030      | Unused licence investigation<br>: Investigate implication of using licence that has not been used for at least 4 years.                                             |
| GB40902G804800 | Bristol Triassic                            | 08WW100034b | WFDGW_INV           | 09/03/2023      | WRC nitrogen to groundwater investigations - Lulsgate Downside WRC: Investigation of contribution of WRC discharge to failure of nitrogen standards in groundwater. |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08SS100002b | WFDGW_ND            | 31/03/2030      | Churchill: Licence Capping to prevent deterioration                                                                                                                 |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08SS100002c | WFDGW_ND            | 31/03/2030      | Kinver: Licence Capping to prevent deterioration                                                                                                                    |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08SS100002u | WFDGW_ND            | 31/03/2030      | Ashwood: Licence Capping to prevent deterioration                                                                                                                   |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08SS100002v | WFDGW_ND            | 31/03/2030      | Hinksford: Licence Capping to prevent deterioration                                                                                                                 |

| WB_ID          | Waterbody name                              | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                                                                                 |
|----------------|---------------------------------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08SS100002w | WFDGW_ND            | 31/03/2030      | Cookley: Licence Capping to prevent deterioration                                                                                                                                                                                                                           |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08SS100002x | WFDGW_ND            | 31/03/2030      | Prestwood: Licence Capping to prevent deterioration                                                                                                                                                                                                                         |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100073a | DrWPA_ND            | 31/03/2030      | Beckbury nitrate scheme: Catchment Management Scheme implemented targeting high risk areas within Beckbury Safeguard Zone with dedicated catchment advisor to engage with targeted farms and facilitate working towards a modelled nitrate reduction of [0.5 mg/l by 2050]. |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100501b | WFDGW_ND            | 31/03/2030      | licence cap (outcome from AMP7 investigation) (WORCESTERSHIRE): "Maximum Peak" licence cap. Reduce the risk of deterioration by reducing the annual abstraction to 2,233.67 Ml/y, plus a new condition to review abstraction against the No                                 |

| WB_ID          | Waterbody name                              | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                         |
|----------------|---------------------------------------------|--------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------|
|                |                                             |              |                     |                 | Det Baseline.                                                                                                       |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100500f  | WFD_ND_WRFlow       | 31/03/2030      | ***Holding line awaiting outcome of Priority A AMP7 Investigation and options appraisal - Grindleforge (CENTRAL)*** |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100500g  | WFD_ND_WRFlow       | 31/03/2030      | ***Holding line awaiting outcome of Priority A AMP7 Investigation and options appraisal - Neachley (CENTRAL)***     |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100500h  | WFD_ND_WRFlow       | 31/03/2030      | ***Holding line awaiting outcome of Priority A AMP7 Investigation and options appraisal - Bratch (CENTRAL)***       |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100086r  | WFD_ND_WRFlow       | 31/03/2035      | ***Holding line awaiting outcome of AMP7 INV - ***                                                                  |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100500j  | WFD_ND_WRFlow       | 31/03/2030      | ***Holding line awaiting outcome of AMP7 Priority A Investigation and options appraisal - Cosford (CENTRAL)***      |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100086ab | WFD_ND_WRFlow       | 31/03/2035      | ***Holding line awaiting outcome of AMP7 INV - Blackstone                                                           |

| WB_ID          | Waterbody name                              | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                                      |
|----------------|---------------------------------------------|--------------|---------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------|
|                |                                             |              |                     |                 | (WORCESTERSHIRE)***                                                                                                              |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100086ac | WFD_ND_WRFlow       | 31/03/2035      | ***Holding line awaiting outcome of AMP7 Priority B Investigation and options appraisal - Chaddesley Corbett (WORCESTERSHIRE)*** |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100086ad | WFD_ND_WRFlow       | 31/03/2035      | ***Holding line awaiting outcome of AMP7 Priority B Investigation and options appraisal - Dunhampton (WORCESTERSHIRE)***         |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100086ae | WFD_ND_WRFlow       | 31/03/2035      | ***Holding line awaiting outcome of AMP7 INV - Norton Racecourse Lane (WORCESTERSHIRE)***                                        |
| GB40901G300800 | Worcestershire Middle Severn - PT Sandstone | 08ST100086af | WFD_ND_WRFlow       | 31/03/2035      | ***Holding line awaiting outcome of AMP7 INV - Westwood (WORCESTERSHIRE)***                                                      |

| WB_ID          | Waterbody name                                | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------|-----------------------------------------------|-------------|---------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40902G303300 | Shropshire Middle Severn - Secondary Combined | 08ST100336a | WFD_NDINV_WRFlow    | 31/12/2026      | Much Wenlock: Priority C WFD No Deterioration Investigation: Investigate the risk of WFD deterioration to water bodies associated with the Much Wenlock source.                                                                                                                                                                                                                                                   |
| GB40902G991000 | Teme - Secondary Combined                     | 08ST100007a | SSSI_INV            | 30/04/2027      | River Teme SSSI Investigation: water company contribution to meeting the favourable condition targets for flow attributes<br>: Investigation into Severn Trent Water Limited's public water supply abstractions at Diddlebury and Munslow and contribution to meeting the favourable condition targets for flow attributes for the River Teme SSSI and if required, options appraisal to define options for PR29. |



| WB_ID          | Waterbody name            | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------|---------------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40902G991000 | Teme - Secondary Combined | 08ST100107a | HD_INV              | 30/04/2027      | River Clun SAC Investigation: water company contribution to meeting the favourable condition targets for flow attributes: Investigation into Severn Trent Water Limited's public water supply abstractions in the catchment upstream of the River Clun SAC (Oakley Farm and Clungunford) and contribution to meeting the favourable condition targets for flow attributes for the River Clun SAC/River Teme SSSI and if required, options appraisal to define options for PR29. |
| GB40902G991000 | Teme - Secondary Combined | 08ST100334a | WFD_NDINV_WRFlow    | 31/12/2026      | Clungunford: Priority C WFD No Deterioration Investigation : Investigate the risk of WFD deterioration to water bodies associated with the Clungunford source.                                                                                                                                                                                                                                                                                                                  |

| WB_ID          | Waterbody name            | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                  |
|----------------|---------------------------|-------------|---------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40902G991000 | Teme - Secondary Combined | 08ST100335a | WFD_NDINV_WRFlow    | 31/12/2026      | O: Priority C WFD No Deterioration Investigation: Investigate the risk of WFD deterioration to water bodies                                                  |
| GB40902G991000 | Teme - Secondary Combined | 08ST100346a | WFD_NDINV_WRFlow    | 31/12/2026      | Diddlebury: Priority C WFD No Deterioration Investigation : Investigate the risk of WFD deterioration to water bodies associated with the Diddlebury source. |
| GB40902G991000 | Teme - Secondary Combined | 08ST100350a | WFD_NDINV_WRFlow    | 31/12/2026      | Munslow: Priority C WFD No Deterioration Investigation : Investigate the risk of WFD deterioration to water bodies associated with the Munslow source.       |
| GB40601G600400 | Burford Jurassic          | 08TW100039a | WFD_INV_WRFlow      | 31/12/2026      | Bibury Source investigation: Detailed source-pathway-receptor investigation                                                                                  |

| WB_ID          | Waterbody name        | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                   |
|----------------|-----------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40601G600900 | Berkshire Downs Chalk | 08TW100003a | WFD_ND_WRFlow       | 31/03/2030      | Bradfield WTW sustainability reduction: Engineering solutions to enable reduction                                                                                                                             |
| GB40601G600900 | Berkshire Downs Chalk | 08TW100037a | WFD_INV_WRFlow      | 31/12/2026      | Pangbourne Source investigation: Further phase of investigation                                                                                                                                               |
| GB40601G600900 | Berkshire Downs Chalk | 08TW104004a | WFD_NDINV_WRFlow    | 31/12/2026      | W licence growth investigation : Investigate implication of licence growth                                                                                                                                    |
| GB40601G600900 | Berkshire Downs Chalk | 08SO100035a | WFD_ND_WRFlow       | 31/03/2030      | Kingsclere Brook Ecological Resilience Scheme: The AMP7 investigation will inform the requirement for in-river enhancements to be implemented in AMP8 to provide improved ecological resilience to the brook. |

| WB_ID          | Waterbody name             | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                                                             |
|----------------|----------------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40601G601000 | Vale of White Horse Chalk  | 08WW100074a | DrWPA_IMP           | 31/03/2030      | Cherhill SGZ enhanced CM<br>: Reduce agricultural N loss (diffuse and point source) through deeper and wider farmer engagement driven by renewed engagement by the EA. Previous levels of CM suggest that an enhanced approach may be more effective    |
| GB40601G601000 | Vale of White Horse Chalk  | 08WW100081a | DrWPA_IMP           | 31/03/2030      | Shepherds Shore SGZ enhanced CM: Reduce agricultural N loss (diffuse and point source) through deeper and wider farmer engagement driven by renewed engagement by the EA. Previous levels of CM suggest that an enhanced approach may be more effective |
| GB40601G601100 | South-West Chilterns Chalk | 08TW100036a | WFD_INV_WRFlow      | 31/12/2026      | 4c groundwater investigation<br>: Further phase of investigation                                                                                                                                                                                        |
| GB40601G601100 | South-West Chilterns Chalk | 08TW100035a | WFD_INV_WRFlow      | 31/12/2026      | SONNING COMMON STW                                                                                                                                                                                                                                      |

| WB_ID          | Waterbody name             | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                    |
|----------------|----------------------------|-------------|---------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                            |             |                     |                 | : Further phase of investigation                                                                                                                               |
| GB40601G601100 | South-West Chilterns Chalk | 08SE100044a | WFD_ND_WRFlow       | 31/03/2030      | SONNING COMMON STW<br>: Action to protect / ensure no deterioration in status (surface water)                                                                  |
| GB40601G601200 | Mid-Chilterns Chalk        | 08TW100280c | WFDGW_INV           | 30/04/2027      | Mid-Chilterns Chalk - continuous discharge, groundwater investigation: Investigation, and if required, options appraisal to address reasons for deterioration. |
| GB40601G601200 | Mid-Chilterns Chalk        | 08AF100044c | WFD_IMP_WRFlow      | 31/03/2030      | Kensworth Lynch sustainability reduction: Reduction in abstraction by 31 March 2030                                                                            |
| GB40601G601200 | Mid-Chilterns Chalk        | 08AF100044d | WFD_IMP_WRFlow      | 31/03/2030      | Redbourn sustainability reduction: Cessation of groundwater abstraction by 31 March 2030                                                                       |
| GB40601G601200 | Mid-Chilterns Chalk        | 08AF100044e | WFD_IMP_WRFlow      | 31/03/2030      | Piccotts End sustainability reduction: Reduction in abstraction by 31 March 2030                                                                               |
| GB40601G601200 | Mid-Chilterns Chalk        | 08AF100044f | WFD_IMP_WRFlow      | 31/03/2030      | Great Missenden sustainability reduction:                                                                                                                      |

| WB_ID          | Waterbody name      | Unique ID   | Primary driver code | Completion date | Action name and description                                                           |
|----------------|---------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------|
|                |                     |             |                     |                 | Reduction in abstraction by 31 March 2030                                             |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100044g | WFD_IMP_WRFlow      | 31/03/2030      | Amersham sustainability reduction: Reduction in abstraction by 31 March 2030          |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100045a | WFD_ND_WRFlow       | 31/03/2030      | Chalfont St Giles ND SR: Reduction in abstraction by 31 March 2030                    |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100044h | WFD_IMP_WRFlow      | 31/03/2030      | Gerrards Cross sustainability reduction: Reduction in abstraction by 31 March 2030    |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100044i | WFD_IMP_WRFlow      | 31/03/2030      | Chalfont St Giles sustainability reduction: Reduction in abstraction by 31 March 2030 |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046a | WFD_IMP_WRFlow      | 31/03/2030      | Berkhamsted DO relocation SR: Reduction in abstraction by 31 March 2030               |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046b | WFD_IMP_WRFlow      | 31/03/2030      | Chalfont St Giles DO relocation SR: Reduction in abstraction by 31 March 2030         |



| WB_ID          | Waterbody name      | Unique ID   | Primary driver code | Completion date | Action name and description                                                                          |
|----------------|---------------------|-------------|---------------------|-----------------|------------------------------------------------------------------------------------------------------|
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046c | WFD_IMP_WRFlow      | 31/03/2030      | Piccotts End DO relocation SR: Reduction in abstraction by 31 March 2030                             |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046d | WFD_IMP_WRFlow      | 31/03/2030      | Marlowes DO relocation SR: Reduction in abstraction by 31 March 2030                                 |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046e | WFD_IMP_WRFlow      | 31/03/2030      | Northmoor DO relocation increase: Relocated abstraction volume from upper catchment by 31 March 2030 |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046f | WFD_IMP_WRFlow      | 31/03/2030      | West Hyde DO relocation increase: Relocated abstraction volume from upper catchment by 31 March 2030 |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046g | WFD_IMP_WRFlow      | 31/03/2030      | Blackford DO relocation increase: Relocated abstraction volume from upper catchment by 31 March 2030 |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100046h | WFD_IMP_WRFlow      | 31/03/2030      | The Grove DO relocation increase: Relocated abstraction volume from upper catchment by 31 March 2030 |

| WB_ID          | Waterbody name      | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                              |
|----------------|---------------------|-------------|---------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100044j | WFD_IMP_WRFlow      | 31/03/2030      | Marlowes sustainability reductions: Reduction in abstraction by 31 March 2030                                                                                                            |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100032a | SSSI_INV            | 30/04/2027      | Company contribution to Regional Plan environmental destination: Investigation into potential impact of changes in abstraction regime on SSSI                                            |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100033b | WFDGW_INV           | 30/04/2027      | Investigation into secondary effects of planned sustainability reductions: Investigation into secondary effects of planned SR, GW emetrgence, fluvial flooding and aquifer water quality |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100032b | SSSI_INV            | 30/04/2027      | Company contribution to Regional Plan environmental destination: Investigation into potential impact of changes in abstraction regime on SSSI                                            |

| WB_ID          | Waterbody name      | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                                                                                                                                 |
|----------------|---------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100032c | SSSI_INV            | 30/04/2027      | Company contribution to Regional Plan environmental destination: Investigation into potential impact of changes in abstraction regime on SSSI                                                                                                                                                                               |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100041a | WFD_ND_WRFlow       | 31/03/2030      | ****Holding line**** : Capping licences within groundwater body to prevent deterioration (NO DO reduction)                                                                                                                                                                                                                  |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100047a | WFD_ND_WRFlow       | 31/03/2030      | ****Holding line****: Implementation of Colne SW OA                                                                                                                                                                                                                                                                         |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100011u | WFDGW_ND            | 31/03/2030      | Catchment and Nature Based Solutions programme for Multiple benefits - Colne operational catchment: AMP8 land management focused C&NBS for multiple benefits including prevention of deterioration of groundwater (nitrate), chalk stream health and biodiversity as part of the Colne operational catchment holistic C&NBS |

| WB_ID          | Waterbody name      | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|---------------------|-------------|---------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                     |             |                     |                 | scheme delivered in combination with river restoration                                                                                                                                                                                                                                                                                                                                                     |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100015a | WFDGW_ND            | 31/03/2030      | Catchment and nature based solutions for 'At risk' pesticide and nitrate - North Mymms, Tyttenhanger and Roestock sources: AMP8 land management focused C&NBS for prevention of deterioration of groundwater including 'at risk' pesticides (flufenacet and propyzamide), nitrate, microbiological and turbidity, as well as delivering wider benefits to contribute to WINEP wider environmental outcomes |
| GB40601G601200 | Mid-Chilterns Chalk | 08AF100015c | WFDGW_ND            | 31/03/2030      | Catchment and nature based solutions for 'At risk' pesticide and nitrate - Clay Lane (Upper Colne) group of sources: AMP8 land management focused C&NBS for prevention of deterioration                                                                                                                                                                                                                    |

| WB_ID          | Waterbody name   | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                  |
|----------------|------------------|-------------|---------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                  |             |                     |                 | of groundwater including 'at risk' pesticides (flufenacet and propyzamide), nitrate, microbiological and turbidity, as well as delivering wider benefits to contribute to WINEP wider environmental outcomes |
| GB40601G602600 | Maidenhead Chalk | 08SE100400a | EDWRMP_INV          | 31/03/2030      | White Waltham River Thames deterioration risk: Action to protect / ensure no deterioration in status - No deterioration investigation into potential growth at White Waltham time limited licence            |
| GB40601G602600 | Maidenhead Chalk | 08SE100015a | DrWPA_ND            | 31/03/2030      | College Avenue Catchment Measures: To carry out a programme of catchment management measures to reduce seasonal and long term trend in nitrate.                                                              |

| WB_ID          | Waterbody name                         | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                       |
|----------------|----------------------------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB40601G602600 | Maidenhead Chalk                       | 09SE100021a | DrWPA_ND            | 31/03/2030      | Cookham Catchment Measures: To carry out a programme of catchment management measures to reduce seasonal and long term trend in nitrate.                                          |
| GB40601G602600 | Maidenhead Chalk                       | 08SE100022a | DrWPA_ND            | 31/03/2030      | College Avenue Catchment Measures<br>***Holding line awaiting outcome from AMP7***:<br>To carry out a programme of catchment measures at College Avenue for chlorinated solvents. |
| GB40601G602600 | Maidenhead Chalk                       | 08SE100035a | WFD_IMP_WRFlow      | 31/03/2030      | Maidenhead Ditch - College Avenue (Cookham) ***Holding line awaiting outcome from AMP7***: Action to protect / ensure no deterioration in status                                  |
| GB106039030480 | Windrush (Slade Barn Stream to Dikler) | 08ST100458a | WFD_NDINV_WRFlow    | 31/12/2026      | Millend (Spring): Priority C WFD No Deterioration Investigation<br>: Investigate the risk of WFD deterioration to water bodies associated with the Millend (Spring) source.       |



| WB_ID          | Waterbody name                         | Unique ID   | Primary driver code | Completion date | Action name and description                                   |
|----------------|----------------------------------------|-------------|---------------------|-----------------|---------------------------------------------------------------|
| GB106039037460 | Windrush (Source to Slade Barn Stream) | 08TW101402g | WFDGW_ND            | 31/03/2026      | Necessary scope to move from groundwater authorisation to EPR |
| GB106039029750 | Churn (Baunton to Cricklade)           | 08TW100040a | WFD_INV_WRFlow      | 31/12/2026      | Further phase of investigation                                |
| GB106039037460 | Windrush (Source to Slade Barn Stream) | 08TW101402g | WFDGW_ND            | 31/03/2026      | Necessary scope to move from groundwater authorisation to EPR |
| GB106039030333 | Thames (Leach to Evenlode)             | 08TW101402g | WFDGW_ND            | 31/03/2026      | Necessary scope to move from groundwater authorisation to EPR |

### B.2.2 Surface waterbody WINEP actions

| WB_ID          | Waterbody name         | Unique ID   | Primary driver code | Completion date | Action name and description                                                         |
|----------------|------------------------|-------------|---------------------|-----------------|-------------------------------------------------------------------------------------|
| GB106039022990 | Thames (Churn to Coln) | 08TW100321a | U_MON4              | 29/03/2023      | CRICKLADE STW: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a) |

| WB_ID          | Waterbody name                       | Unique ID   | Primary driver code | Completion date | Action name and description                                                                              |
|----------------|--------------------------------------|-------------|---------------------|-----------------|----------------------------------------------------------------------------------------------------------|
| GB106039022990 | Thames (Churn to Coln)               | 08TW100705a | U_MON3              | 16/03/2023      | CRICKLADE STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB106039023110 | Dudgrove Brook                       | 08TW100440a | U_MON4              | 31/12/2026      | KEMPSFORD STW: UMON4c                                                                                    |
| GB106039023110 | Dudgrove Brook                       | 08TW100630a | U_MON3              | 31/12/2025      | KEMPSFORD STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB106039023800 | Cerney Wick Brook (source to Thames) | 08TW100118a | WFD_NDLS_Chem2      | 31/03/2027      | Reduce Nonylphenol loading: Cirencester STW, Nonylphenol, 0.52 ug                                        |

| WB_ID          | Waterbody name                       | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                                   |
|----------------|--------------------------------------|--------------|---------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| GB106039023800 | Cerney Wick Brook (source to Thames) | 08TW100316a  | U_MON4              | 31/12/2026      | CIRENCESTER STW: U_MON4a                                                                                                      |
| GB106039023800 | Cerney Wick Brook (source to Thames) | 08TW100582a  | U_MON3              | 31/12/2025      | CIRENCESTER STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)                    |
| GB106039023800 | Cerney Wick Brook (source to Thames) | 08TW101108ar | EnvAct_INV4         | 30/04/2027      | Storm Overflows investigation at CIRENCESTER STW: ThW0056                                                                     |
| GB106039023800 | Cerney Wick Brook (source to Thames) | 08TW100890a  | EnvAct_IMP1         | 31/03/2030      | Reduce Phosphorus Loadings at Cirencester STW: 0.25 mg/l Phosphorus permit with stretch target of 0.2 mg/l at Cirencester STW |

| WB_ID          | Waterbody name               | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                         |
|----------------|------------------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------|
| GB106039029991 | Coln (Source to Coln Rogers) | 08TW104009a | WFD_NDINV_WRFlow    | 31/12/2026      | Unused licence investigation: Investigate implication of using licence that has not been used for at least 4 years. |
| GB106039029991 | Coln (Source to Coln Rogers) | 08TW101405c | EDWRMP_INV          | 31/12/2026      | Syreford - Environmental Destination: Large catchment investigation                                                 |
| GB106039029991 | Coln (Source to Coln Rogers) | 08TW100413a | U_MON4              | 31/12/2026      | ANDOVERSFORD STW: UMON4c                                                                                            |
| GB106039029991 | Coln (Source to Coln Rogers) | 08TW100546a | U_MON3              | 31/12/2025      | ANDOVERSFORD STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)         |

| WB_ID          | Waterbody name                                     | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                                                                             |
|----------------|----------------------------------------------------|--------------|---------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB106039029991 | Coln (Source to Coln Rogers)                       | 08TW101108ac | EnvAct_INV4         | 30/04/2027      | Storm Overflows investigation at ANDOVERSFORD STW: ThW0006                                                                                                              |
| GB106039029991 | Coln (Source to Coln Rogers)                       | 08TW100978a  | ENVAct_IMP2         | 31/03/2030      | Storm Overflows action at ANDOVERSFORD STW: Option C1: Investigation and Solution in AMP 8: 1,044m of sewer relining, 66m3 storage, 0.43Ha SUDS IA Removal, 20m3 screen |
| GB106039029992 | Coln (from Coln Rogers) and Thames (Coln to Leach) | 08TW100039a  | WFD_INV_WRFlow      | 31/12/2026      | Bibury Source investigation : Detailed source-pathway-receptor investigation                                                                                            |
| GB106039029992 | Coln (from Coln Rogers) and Thames (Coln to Leach) | 08TW100214a  | WFD_INV_PHYSHAB     | 30/04/2027      | Whelford Mill Fish Pass: Undertake detailed feasibility and design prior to                                                                                             |

| WB_ID          | Waterbody name                                     | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                            |
|----------------|----------------------------------------------------|-------------|---------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|
|                |                                                    |             |                     |                 | AMP9 implementation                                                                                                    |
| GB106039029992 | Coln (from Coln Rogers) and Thames (Coln to Leach) | 08TW100208a | WFD_INV_PHYSHAB     | 30/04/2027      | River Coln (Fairford) River Restoration Scheme: Undertake detailed feasibility and design prior to AMP9 implementation |
| GB106039029992 | Coln (from Coln Rogers) and Thames (Coln to Leach) | 08TW100432a | U_MON4              | 31/12/2026      | FAIRFORD STW: UMON4c                                                                                                   |
| GB106039029992 | Coln (from Coln Rogers) and Thames (Coln to Leach) | 08TW100601a | U_MON3              | 31/12/2025      | FAIRFORD STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)                |



| WB_ID          | Waterbody name           | Unique ID   | Primary driver code | Completion date | Action name and description                                                                               |
|----------------|--------------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------------|
| GB106039030040 | Leach (Source to Thames) | 08TW100371a | U_MON4              | 31/12/2026      | NORTHLEACH STW: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                      |
| GB106039030040 | Leach (Source to Thames) | 08TW100357a | U_MON4              | 31/12/2026      | LECHLADE STW: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                        |
| GB106039030040 | Leach (Source to Thames) | 08TW100715a | U_MON3              | 31/12/2025      | NORTHLEACH STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |

| WB_ID          | Waterbody name                                    | Unique ID   | Primary driver code | Completion date | Action name and description                                                                             |
|----------------|---------------------------------------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------|
| GB106039030040 | Leach (Source to Thames)                          | 08TW100635a | U_MON3              | 31/12/2025      | LECHLADE STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB106039029950 | Westcote Brook (source to Evenlode at Bledington) | 08TW100204a | WFD_INV             | 30/04/2027      | WFD Investigation of in river Dissolved Oxygen to inform future action: Investigation                   |
| GB106039029750 | Churn (Baunton to Cricklade)                      | 08TW100040a | WFD_INV_WRFlow      | 31/12/2026      | Latton and Meysey Hampton Source investigation : Further phase of investigation                         |
| GB106039029750 | Churn (Baunton to Cricklade)                      | 08TW100209a | WFD_INV_PHYSHAB     | 30/04/2027      | River Churn (U/s Cirencester) River Restoration Scheme: Undertake detailed                              |

| WB_ID          | Waterbody name                                            | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                 |
|----------------|-----------------------------------------------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------|
|                |                                                           |             |                     |                 | feasibility and design prior to AMP9 implementation                                                                         |
| GB106039029750 | Churn (Baunton to Cricklade)                              | 08TW100207a | WFD_INV_PHYSHAB     | 30/04/2027      | River Churn (South Cerney) River Restoration Scheme: Undertake detailed feasibility and design prior to AMP9 implementation |
| GB106039037390 | Little Compton Brook and tributaries (Source to Evenlode) | 08TW100359a | U_MON4              | 31/12/2026      | LITTLE COMPTON STW: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                                    |

| WB_ID          | Waterbody name                                            | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                   |
|----------------|-----------------------------------------------------------|-------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB106039037390 | Little Compton Brook and tributaries (Source to Evenlode) | 08TW100711a | U_MON3              | 31/12/2025      | LITTLE COMPTON STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)                                                 |
| GB106039037390 | Little Compton Brook and tributaries (Source to Evenlode) | 08TW101023a | EnvAct_IMP2         | 31/03/2030      | Storm Overflows action at LITTLE COMPTON STW: Option C1: Solution in AMP 08: 648m of sewer relining, 27m3 storage, 0.26Ha SUDS IA Removal, No screen required |

| WB_ID          | Waterbody name                                            | Unique ID    | Primary driver code | Completion date | Action name and description                                                                        |
|----------------|-----------------------------------------------------------|--------------|---------------------|-----------------|----------------------------------------------------------------------------------------------------|
| GB106039037390 | Little Compton Brook and tributaries (Source to Evenlode) | 08TW100916a  | EnvAct_IMP1         | 31/03/2030      | Reduce Phosphorus Loadings at Little Compton STW: 0.4 mg/l Phosphorus permit at Little Compton STW |
| GB106039037390 | Little Compton Brook and tributaries (Source to Evenlode) | 08TW101108tj | EnvAct_INV4         | 30/04/2027      | LITTLE COMPTON STW- Storm Overflows investigation: Storm Overflows investigation                   |
| GB106039037410 | Evenlode (Compton Bk to Bledington Bk) and 4 Shires       | 08TW100129a  | WFD_NDLS_Chem2      | 31/03/2027      | Reduce Nonylphenol loading: Moreton-in-Marsh STW, Nonylphenol, 0.48 ug                             |
| GB106039037410 | Evenlode (Compton Bk to Bledington Bk) and 4 Shires       | 08TW100092a  | WFD_NDLS_Chem2      | 31/03/2027      | Reduce cypermethrin loading: Moreton-in-Marsh STW,                                                 |

| WB_ID          | Waterbody name                                      | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                      |
|----------------|-----------------------------------------------------|-------------|---------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                                                     |             |                     |                 | cypermethrin, 0.000557 ug                                                                                                                        |
| GB106039037410 | Evenlode (Compton Bk to Bledington Bk) and 4 Shires | 08TW100444a | U_MON4              | 31/12/2026      | MORETON IN MARSH STW (Last in Line Overflow off site): UMON4c                                                                                    |
| GB106039037410 | Evenlode (Compton Bk to Bledington Bk) and 4 Shires | 08TW100299a | U_MON4              | 31/12/2026      | BROADWELL STW: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                                                              |
| GB106039037410 | Evenlode (Compton Bk to Bledington Bk) and 4 Shires | 08TW100645a | U_MON3              | 31/12/2025      | MORETON IN MARSH STW (Last in Line Overflow off site): MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB106039037410 | Evenlode (Compton Bk to                             | 08TW100565a | U_MON3              | 31/12/2025      | BROADWELL STW: MCERTS                                                                                                                            |



| WB_ID          | Waterbody name                                               | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                   |
|----------------|--------------------------------------------------------------|-------------|---------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
|                | Bledington Bk)<br>and 4 Shires                               |             |                     |                 | certification of an<br>AMP7 U_MON3<br>driver output<br>overflow operation<br>monitor<br>(U_MON3a)                             |
| GB106039037410 | Evenlode<br>(Compton Bk to<br>Bledington Bk)<br>and 4 Shires | 08TW100923a | EnvAct_IMP1         | 31/03/2030      | Reduce<br>Phosphorus<br>Loadings at<br>Moreton-in-Marsh<br>STW: 0.25 mg/l<br>Phosphorus permit<br>at Moreton-in-<br>Marsh STW |
| GB106039037410 | Evenlode<br>(Compton Bk to<br>Bledington Bk)<br>and 4 Shires | 08TW100879a | EnvAct_IMP1         | 31/03/2030      | Broadwell STW<br>Phosphorus load<br>recution: 0.25 mg/l<br>Phosphorus permit<br>at Broadwell STW                              |

| WB_ID          | Waterbody name                                            | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                |
|----------------|-----------------------------------------------------------|-------------|---------------------|-----------------|------------------------------------------------------------------------------------------------------------|
| GB106039037420 | Evenlode (Source to Four Shires S) and Longborough Stream | 08TW100918a | EnvAct_IMP1         | 31/03/2030      | Reduce Phosphorus Loadings at Longborough STW: 1 mg/l Phosphorus permit at Longborough STW                 |
| GB106039037460 | Windrush (Source to Slade Barn Stream)                    | 08TW101402g | WFDGW_ND            | 31/03/2026      | GW authorisation to EPR: Temple Guiting STW: Necessary scope to move from groundwater authorisation to EPR |
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames)    | 08TW100101a | WFD_NDLS_Chem2      | 31/03/2027      | Reduce cypermethrin loading: Witney STW, cypermethrin, 0.000163 ug                                         |
| GB106039030440 | Windrush and tributaries (Little                          | 08TW100449a | U_MON4              | 31/12/2026      | STANDLAKE STW: UMON4c                                                                                      |

| WB_ID          | Waterbody name                                         | Unique ID   | Primary driver code | Completion date | Action name and description                                                                         |
|----------------|--------------------------------------------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------|
|                | Rissington to Thames)                                  |             |                     |                 |                                                                                                     |
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW100408a | U_MON4              | 31/12/2026      | WITNEY SEWAGE TREATMENT WORKS: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a) |
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW100302a | U_MON4              | 31/12/2026      | BURFORD STW: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                   |

| WB_ID          | Waterbody name                                         | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                              |
|----------------|--------------------------------------------------------|-------------|---------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------|
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW100730a | U_MON3              | 31/12/2025      | WITNEY SEWAGE TREATMENT WORKS: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW100666a | U_MON3              | 31/12/2025      | STANDLAKE STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)                 |

| WB_ID          | Waterbody name                                         | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                        |
|----------------|--------------------------------------------------------|--------------|---------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW100567a  | U_MON3              | 31/12/2025      | BURFORD STW: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)             |
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW101108qr | EnvAct_INV4         | 30/04/2027      | Storm Overflows investigation at Witney STW: ThW0218                                                               |
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW101108cj | EnvAct_INV4         | 30/04/2027      | Storm Overflows investigation at STANDLAKE STW: ThW0184                                                            |
| GB106039030440 | Windrush and tributaries (Little Rissington to Thames) | 08TW101033a  | ENVAct_IMP2         | 31/03/2030      | Storm Overflows action at STANDLAKE STW: Option C2: 1,851m2 wetland equivalent treatment, 1.15 Ha SUDS IA Removal, |

| WB_ID          | Waterbody name                                     | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                    |
|----------------|----------------------------------------------------|-------------|---------------------|-----------------|----------------------------------------------------------------------------------------------------------------|
|                |                                                    |             |                     |                 | 44m3 storage and 20m3 screen                                                                                   |
| GB106039030470 | Dikler (Wyck Rissington to Windrush) and Lower Eye | 08TW100877a | EnvAct_IMP1         | 31/03/2026      | Reduce Phosphorus Loadings at Bourton-on-the-Water STW: 0.4 mg/l Phosphorus permit at Bourton-on-the-Water STW |
| GB106039030480 | Windrush (Slade Barn Stream to Dikler)             | 08TW101405d | EDWRMP_INV          | 31/12/2026      | Seven Springs - Environmental Destination: Large catchment investigation                                       |
| GB106039030300 | Ampney and Poulton Brooks (Source to Thames)       | 08TW100284a | U_MON4              | 31/12/2026      | AMPNEY ST PETER STW: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                      |
| GB106039030300 | Ampney and Poulton Brooks                          | 08TW100545a | U_MON3              | 31/12/2025      | AMPNEY ST PETER STW:                                                                                           |



| WB_ID          | Waterbody name                       | Unique ID   | Primary driver code | Completion date | Action name and description                                                                  |
|----------------|--------------------------------------|-------------|---------------------|-----------------|----------------------------------------------------------------------------------------------|
|                | (Source to Thames)                   |             |                     |                 | MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)    |
| GB109054039830 | Blockley Bk - source to conf Knee Bk | 08TW101405e | EDWRMP_INV          | 31/12/2026      | Dovedale and Blockley - Environmental Destination: Large catchment investigation             |
| GB109054039830 | Blockley Bk - source to conf Knee Bk | 08ST100023e | EnvAct_IMP1         | 31/03/2030      | Phosphate load removal in the river Stour (Avon catchm't): Phosphate removal at Blockley STW |

| WB_ID          | Waterbody name                             | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                       |
|----------------|--------------------------------------------|--------------|---------------------|-----------------|-------------------------------------------------------------------------------------------------------------------|
| GB109054039830 | Blockley Bk - source to conf Knee Bk       | 08ST100450ac | U_MON3              | 31/12/2025      | BLOCKLEY (STW): MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)         |
| GB109054039830 | Blockley Bk - source to conf Knee Bk       | 08ST100453z  | U_MON4              | 31/12/2025      | BLOCKLEY (STW): U_MON4c - install flow meter inc civils                                                           |
| GB109054039840 | Knee Bk - conf Blockley Bk to conf R Stour | 08ST100450at | U_MON3              | 31/12/2025      | CHIPPING CAMPDEN (STW): MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB109054039830 | Blockley Bk - source to conf Knee Bk       | 08ST100453ak | U_MON4              | 31/12/2025      | CHIPPING CAMPDEN (STW):                                                                                           |

| WB_ID          | Waterbody name                             | Unique ID   | Primary driver code | Completion date | Action name and description                                                                          |
|----------------|--------------------------------------------|-------------|---------------------|-----------------|------------------------------------------------------------------------------------------------------|
|                |                                            |             |                     |                 | U_MON4c - install flow meter inc civils                                                              |
| GB109054039870 | Knee Bk - source to conf Blockley Bk       | 08ST100023g | EnvAct_IMP1         | 31/03/2030      | Phosphate load removal in the river Stour (Avon catchm't): Phosphare removal at Chipping Campden STW |
| GB109053027800 | Tetbury Avon - source to conf unnamed trib | 08WW100812a | U_MON4              | 31/12/2026      | Tetbury WRC Flow Monitoring: Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)    |

| WB_ID          | Waterbody name                             | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                |
|----------------|--------------------------------------------|-------------|---------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------|
| GB109053027800 | Tetbury Avon - source to conf unnamed trib | 08WW100585a | U_MON3              | 31/12/2026      | Tetbury WRC Overflow Monitoring: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB109053027800 | Tetbury Avon - source to conf unnamed trib | 08WW100228a | WFD_ND_CHEM3        | 31/03/2030      | Tetbury WRC - Chemical Improvements: Improvements to WRC to achieve new chemical permit.                                   |
| GB109053027800 | Tetbury Avon - source to conf unnamed trib | 08WW100244a | WFD_NDLS_Chem2      | 31/03/2027      | Tetbury WRC - Chemical Improvements: Improvements to WRC to achieve new chemical permit.                                   |

| WB_ID          | Waterbody name                             | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                                                                                                 |
|----------------|--------------------------------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GB109053027800 | Tetbury Avon - source to conf unnamed trib | 08WW103011a | WFD_IMPg            | 31/03/2030      | Tetbury WRC - Phosphorus Removal: Improvements to WRC to achieve tightened phosphorus permit.                                                                                                                               |
| GB109053027800 | Tetbury Avon - source to conf unnamed trib | 08WW100046b | WFD_INV             | 30/04/2027      | Malmesbury Avon dissolved oxygen investigation and options appraisal: Investigate water quality (dissolved oxygen) impact of augmentation using groundwater (Tetbury Stream Support) and options appraisal (e.g. aeration). |
| GB109054026531 | Nailsworth Stream - source to conf R Frome | 08ST100450q | U_MON3              | 31/12/2025      | AVENING (STW): MCERTS certification of an AMP7 U_MON3 driver output                                                                                                                                                         |

| WB_ID          | Waterbody name                              | Unique ID   | Primary driver code | Completion date | Action name and description                                                                                                                         |
|----------------|---------------------------------------------|-------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                |                                             |             |                     |                 | overflow operation monitor (U_MON3a)                                                                                                                |
| GB109054026531 | Nailsworth Stream - source to conf R Frome  | 08ST100453o | U_MON4              | 31/12/2026      | AVENING (STW): U_MON4c - install flow meter inc civils                                                                                              |
| GB109054026610 | Ozleworth Bk - source to conf Little Avon R | 08ST100345a | WFD_NDINV_WRFlow    | 31/12/2026      | Coombe: Priority C WFD No Deterioration Investigation: Investigate the risk of WFD deterioration to water bodies associated with the Coombe source. |
| GB109054026610 | Ozleworth Bk - source to conf Little Avon R | 08WW100659a | U_MON4              | 31/12/2026      | Charfield WRC Flow Monitoring: Move AMP7 U_INV2 driver output to 2-minute flow monitoring (U_MON4b)                                                 |



| WB_ID          | Waterbody name                                    | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                                  |
|----------------|---------------------------------------------------|--------------|---------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------|
| GB109054026610 | Ozleworth Bk - source to conf Little Avon R       | 08WW100433a  | U_MON3              | 31/12/2026      | Charfield WRC Overflow Monitoring: MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB109054026610 | Ozleworth Bk - source to conf Little Avon R       | 08WW101000mw | EnvAct_INV4         | 30/04/2027      | HACK MILL COMBINED SEWER OVERFLOW: Storm overflows - Investigations                                                          |
| GB109054039341 | Bretforton Bk - source to conf Broadway-Badsey Bk | 08ST100441a  | WFD_IMP_CHEM        | 31/03/2026      | Flexible chemicals permitting for Cypermethrin: Honeybourne STW                                                              |
| GB109054039341 | Bretforton Bk - source to conf Broadway-Badsey Bk | 08ST100600a  | WFD_NDLS_Chem1      | 31/03/2027      | Cypermethrin Load Standstill permitting: Honeybourne STW                                                                     |

| WB_ID          | Waterbody name                                    | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                  |
|----------------|---------------------------------------------------|--------------|---------------------|-----------------|--------------------------------------------------------------------------------------------------------------|
| GB109054039341 | Bretforton Bk - source to conf Broadway-Badsey Bk | 08ST100450ki | U_MON3              | 31/12/2025      | HONEYBOURNE (STW): MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB109054039341 | Bretforton Bk - source to conf Broadway-Badsey Bk | 08ST100451fe | U_MON4              | 31/12/2025      | HONEYBOURNE (STW): Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                      |
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon        | 08ST100054b  | WFD_ND              | 31/03/2026      | ammonia load removal (permittting exercise only): Ammonia removal at Broadway STW                            |

| WB_ID          | Waterbody name                             | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                   |
|----------------|--------------------------------------------|--------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------|
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100160a  | WFD_IMP_CHEM        | 31/03/2026      | Flexible chemicals permitting for Cypermethrin: Broadway STW                                                  |
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100444a  | WFD_NDLS_Chem1      | 31/03/2027      | Cypermethrin Load Standstill permitting: Broadway STW                                                         |
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100450aa | U_MON3              | 31/12/2025      | BLACKMINSTER (STW): MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a) |
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100451p  | U_MON4              | 31/12/2025      | BROADWAY (STW): Move AMP7 U_MON4 driver output to 2-minute flow monitoring (U_MON4a)                          |

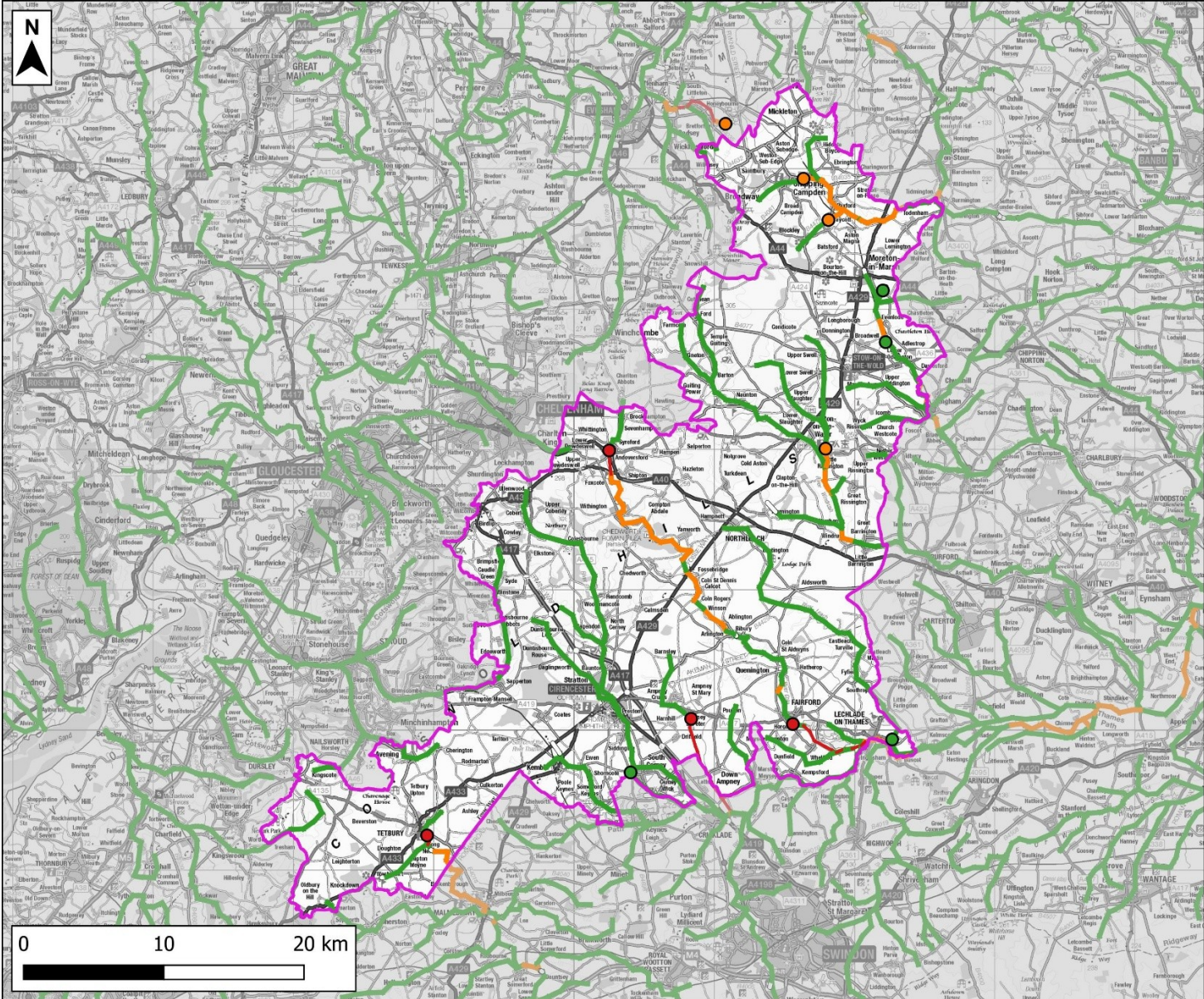
| WB_ID          | Waterbody name                             | Unique ID    | Primary driver code | Completion date | Action name and description                                                                                         |
|----------------|--------------------------------------------|--------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------|
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100453x  | U_MON4              | 31/12/2025      | BLACKMINSTER (STW): U_MON4c - install flow meter inc civils                                                         |
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100450ib | U_MON3              | 31/12/2025      | BROADWAY (STW): MCERTS certification of an AMP7 U_MON3 driver output overflow operation monitor (U_MON3a)           |
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100328a  | WFD_NDINV_WRFlow    | 31/03/2030      | Unused licence investigation: Investigate implication of using licence that has not been used for at least 4 years. |
| GB109054039350 | Broadway-Badsey Bk - source to conf R Avon | 08ST100358a  | WFD_NDINV_WRFlow    | 31/03/2030      | Broadway: Priority D WFD No Deterioration Investigation: Investigate the risk                                       |

| WB_ID | Waterbody name | Unique ID | Primary driver code | Completion date | Action name and description                                               |
|-------|----------------|-----------|---------------------|-----------------|---------------------------------------------------------------------------|
|       |                |           |                     |                 | of WFD deterioration to water bodies associated with the Broadway source. |

## **C    Appendix C - Water Quality Mapping**



## C.1 Future Scenario



Ammonia Deterioration

Cotswold Boundary

Deterioration at WwTW Outfall

- No Deterioration
- Deterioration <10%
- Deterioration >10%

Deterioration in Watercourse

- No Deterioration
- Deterioration <10%
- Deterioration >10%

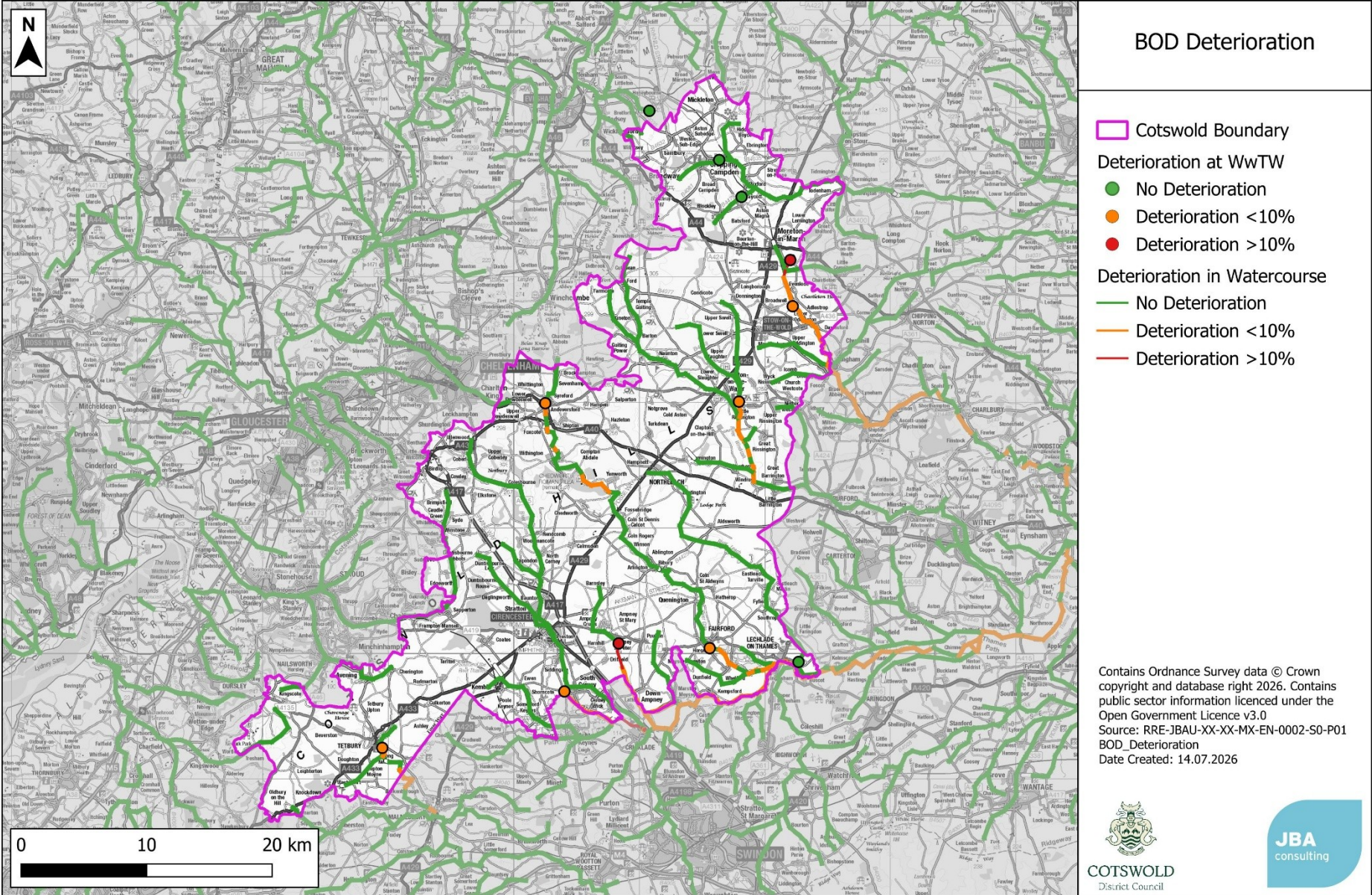
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Source: RRE-JBAU-XX-XX-MX-EN-0001-S0-P01  
Ammonia\_Deterioration  
Date Created: 14.07.2026



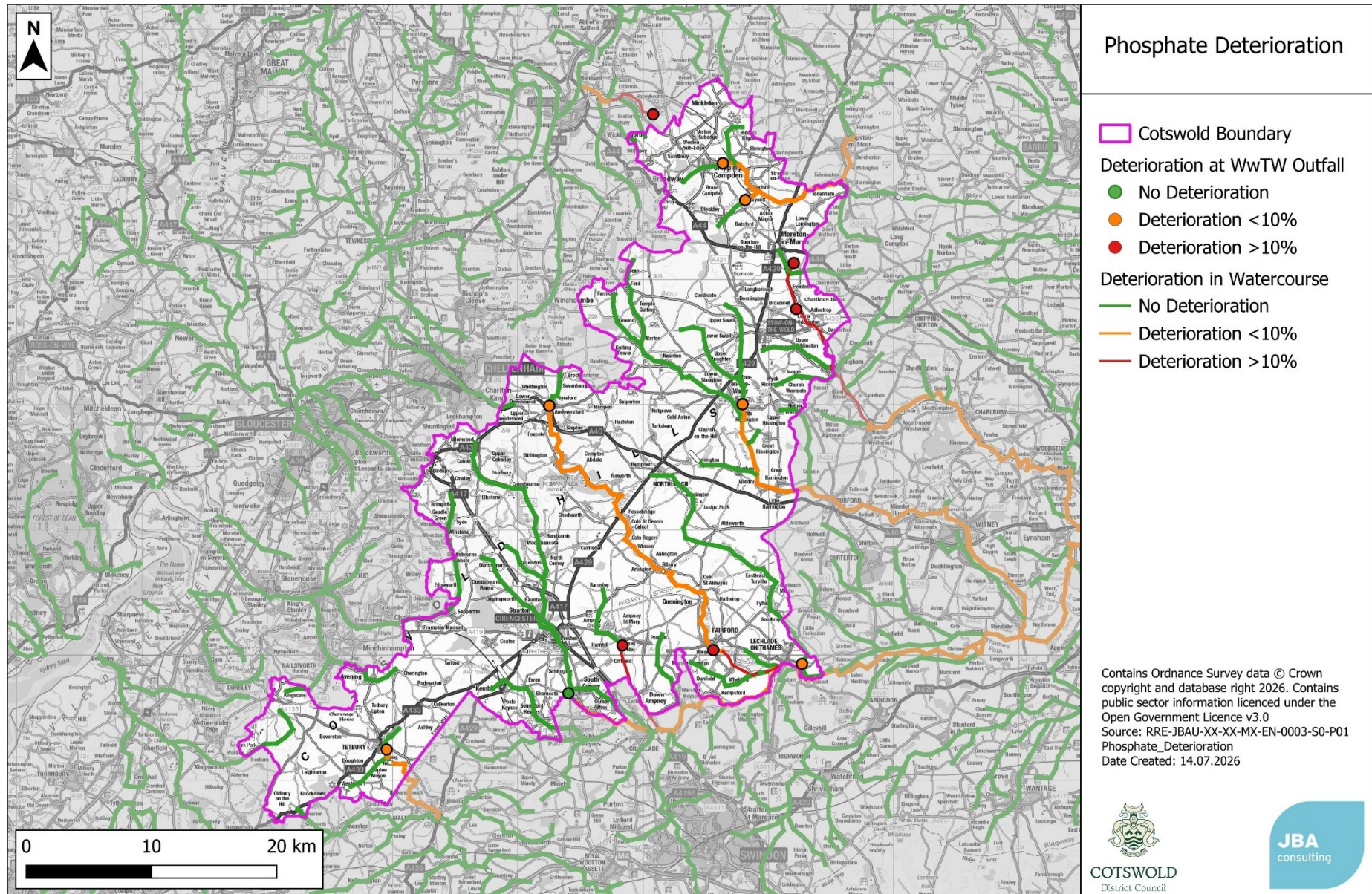
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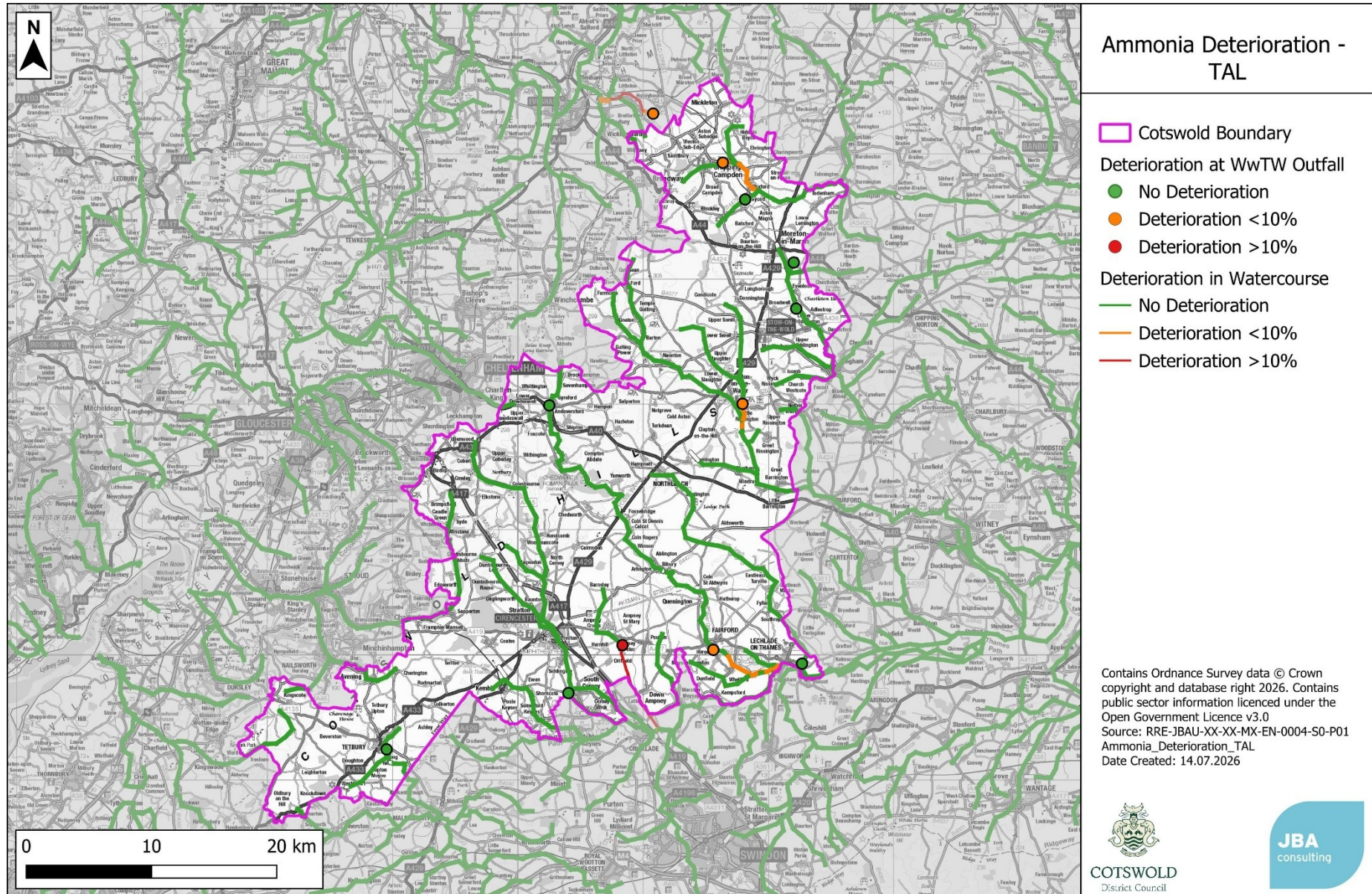




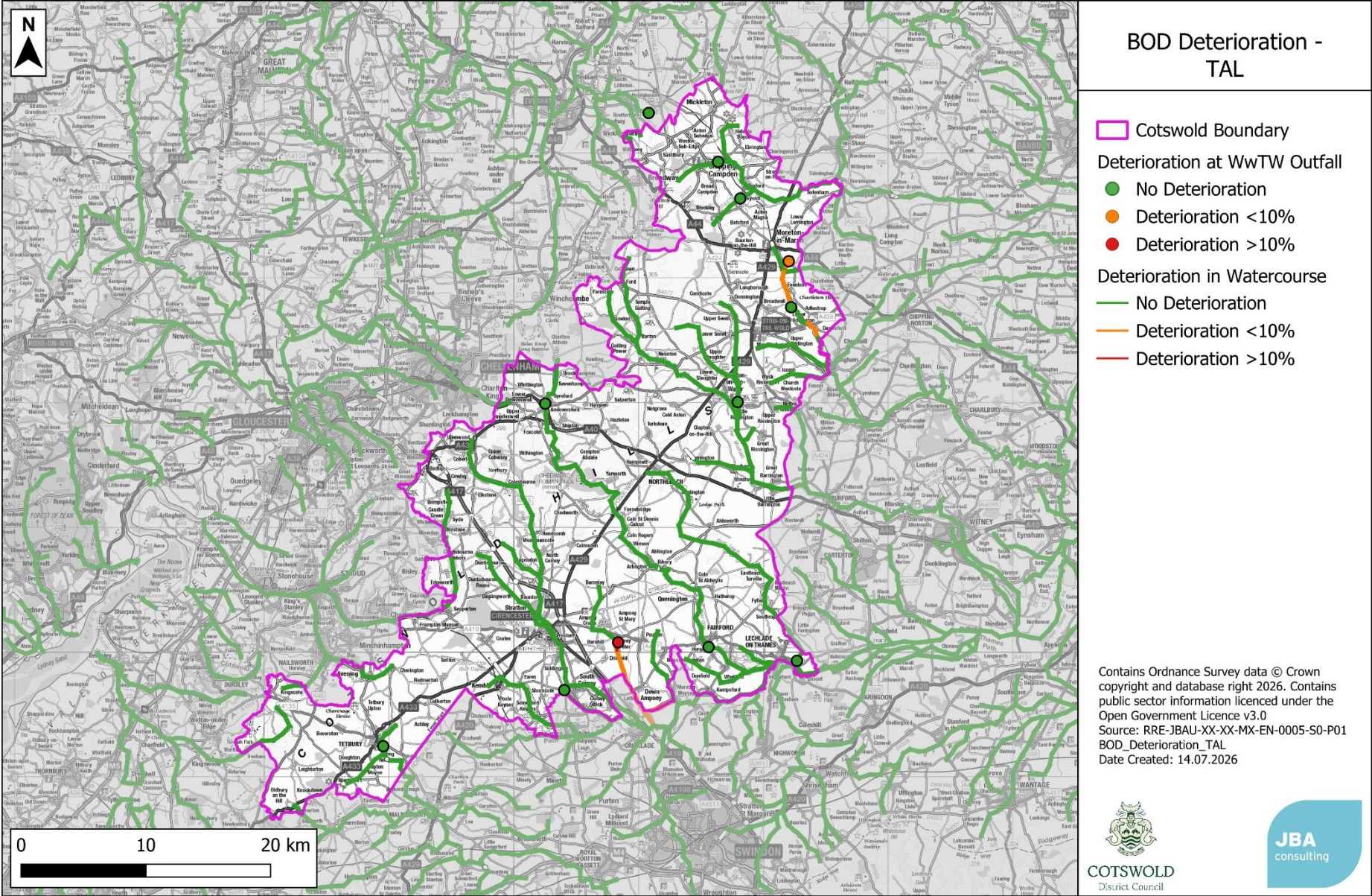


## C.2 TAL Scenario

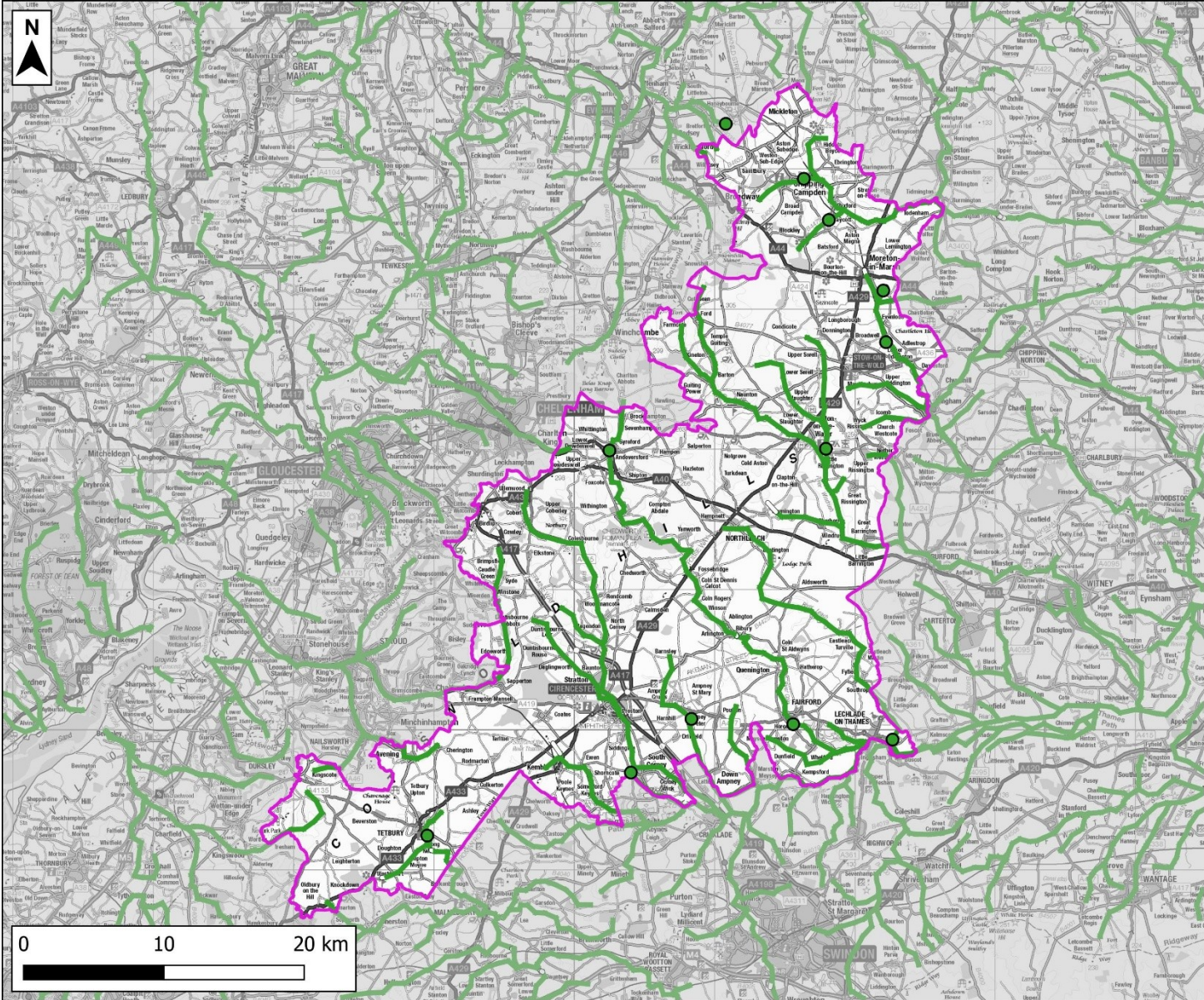












# Phosphate Deterioration - TAL

Cotswold Boundary

Deterioration at WwTW Outfall

- No Deterioration
- Deterioration <10%
- Deterioration >10%

Deterioration in Watercourse

- No Deterioration
- Deterioration <10%
- Deterioration >10%

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Phosphate\_Deterioration\_TAL  
Date Created: 14.07.2026



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## D Appendix D - Water Quality Results

### D.1 Ammonia results

| WwTW (SIMCAT name)       | Baseline Conc (mg/l) | Future Conc (mg/l) | Percentage Deterioration (%) | TAL Conc (mg/l) | TAL Percentage Deterioration (%) | Baseline Class | Future Class | TAL Class |
|--------------------------|----------------------|--------------------|------------------------------|-----------------|----------------------------------|----------------|--------------|-----------|
| AMPNEY ST PETER STW      | 0.0694               | 0.0998             | 44%                          | 0.0998          | 44%                              | HIGH           | HIGH         | HIGH      |
| ANDOVERSFORD STW         | 0.0595               | 0.0658             | 11%                          | 0.0529          | -11%                             | HIGH           | HIGH         | HIGH      |
| BLOCKLEY (WRW)           | 0.4055               | 0.4116             | 2%                           | 0.2494          | -38%                             | GOOD           | GOOD         | HIGH      |
| BOURTON-ON-THE-WATER STW | 0.0629               | 0.0637             | 1%                           | 0.0637          | 1%                               | HIGH           | HIGH         | HIGH      |
| BROADWELL STW            | 0.1280               | 0.128              | 0%                           | 0.1257          | -2%                              | HIGH           | HIGH         | HIGH      |
| CHIPPING CAMPDEN (WRW)   | 0.2280               | 0.2308             | 1%                           | 0.2308          | 1%                               | HIGH           | HIGH         | HIGH      |
| CIRENCESTER STW          | 0.2227               | 0.1993             | -11%                         | 0.1993          | -11%                             | HIGH           | HIGH         | HIGH      |
| FAIRFORD STW             | 0.0454               | 0.0541             | 19%                          | 0.0464          | 2%                               | HIGH           | HIGH         | HIGH      |
| HONEYBOURNE (WRW)        | 0.3680               | 0.4001             | 9%                           | 0.4001          | 9%                               | GOOD           | GOOD         | GOOD      |
| LECHLADE STW             | 0.0908               | 0.0908             | 0%                           | 0.0908          | 0%                               | HIGH           | HIGH         | HIGH      |
| MORETON-IN-              | 0.3396               | 0.3306             | -3%                          | 0.3306          | -3%                              | GOOD           | GOOD         | GOOD      |



| WwTW (SIMCAT name) | Baseline Conc (mg/l) | Future Conc (mg/l) | Percentage Deterioration (%) | TAL Conc (mg/l) | TAL Percentage Deterioration (%) | Baseline Class | Future Class | TAL Class |
|--------------------|----------------------|--------------------|------------------------------|-----------------|----------------------------------|----------------|--------------|-----------|
| MARSH STW          |                      |                    |                              |                 |                                  |                |              |           |
| TETBURY STW        | 0.1786               | 0.1969             | 10%                          | 0.1715          | -4%                              | HIGH           | HIGH         | HIGH      |

## D.2 BOD Results

| WwTW (SIMCAT name)       | Baseline Conc (mg/l) | Future Conc (mg/l) | Percentage Deterioration (%) | TAL Conc (mg/l) | TAL Percentage Deterioration (%) | Baseline Class | Future Class | TAL Class |
|--------------------------|----------------------|--------------------|------------------------------|-----------------|----------------------------------|----------------|--------------|-----------|
| AMPNEY ST PETER STW      | 1.18                 | 1.427              | 21%                          | 1.2995          | 10%                              | HIGH           | HIGH         | HIGH      |
| ANDOVERSFORD STW         | 1.4306               | 1.4461             | 1%                           | 1.4185          | -1%                              | HIGH           | HIGH         | HIGH      |
| BLOCKLEY (WRW)           | 7.3518               | 7.3523             | 0%                           | 7.3523          | 0%                               | POOR           | POOR         | POOR      |
| BOURTON-ON-THE-WATER STW | 1.2871               | 1.3003             | 1%                           | 1.214           | -6%                              | HIGH           | HIGH         | HIGH      |
| BROADWELL STW            | 1.4552               | 1.5158             | 4%                           | 1.4312          | -2%                              | HIGH           | HIGH         | HIGH      |
| CHIPPING CAMPDEN (WRW)   | 8.0362               | 8.0276             | 0%                           | 8.0276          | 0%                               | POOR           | POOR         | POOR      |
| CIRENCESTER STW          | 4.9727               | 5.0478             | 2%                           | 4.3532          | -12%                             | GOOD           | MODERATE     | GOOD      |
| FAIRFORD STW             | 1.6952               | 1.7189             | 1%                           | 1.6654          | -2%                              | HIGH           | HIGH         | HIGH      |
| HONEYBOURNE (WRW)        | 3.1327               | 3.0695             | -2%                          | 3.0695          | -2%                              | HIGH           | HIGH         | HIGH      |
| LECHLADE STW             | 2.1411               | 2.1439             | 0%                           | 2.112           | -1%                              | HIGH           | HIGH         | HIGH      |

| WwTW (SIMCAT name)   | Baseline Conc (mg/l) | Future Conc (mg/l) | Percentage Deterioration (%) | TAL Conc (mg/l) | TAL Percentage Deterioration (%) | Baseline Class | Future Class | TAL Class |
|----------------------|----------------------|--------------------|------------------------------|-----------------|----------------------------------|----------------|--------------|-----------|
| MORETON-IN-MARSH STW | 2.0326               | 2.4578             | 21%                          | 2.2164          | 9%                               | HIGH           | HIGH         | HIGH      |
| TETBURY STW          | 1.9874               | 2.0099             | 1%                           | 1.9645          | -1%                              | HIGH           | HIGH         | HIGH      |

### D.3 Phosphate results

| WwTW (SIMCAT name)       | Baseline Conc (mg/l) | Future Conc (mg/l) | Percentage Deterioration (%) | TAL Conc (mg/l) | TAL Percentage Deterioration (%) | Baseline Class | Future Class | TAL Class |
|--------------------------|----------------------|--------------------|------------------------------|-----------------|----------------------------------|----------------|--------------|-----------|
| AMPNEY ST PETER STW      | 1.18                 | 1.427              | 21%                          | 1.2995          | 10%                              | HIGH           | HIGH         | HIGH      |
| ANDOVERSFORD STW         | 1.4306               | 1.4461             | 1%                           | 1.4185          | -1%                              | HIGH           | HIGH         | HIGH      |
| BLOCKLEY (WRW)           | 7.3518               | 7.3523             | 0%                           | 7.3523          | 0%                               | POOR           | POOR         | POOR      |
| BOURTON-ON-THE-WATER STW | 1.2871               | 1.3003             | 1%                           | 1.214           | -6%                              | HIGH           | HIGH         | HIGH      |
| BROADWELL STW            | 1.4552               | 1.5158             | 4%                           | 1.4312          | -2%                              | HIGH           | HIGH         | HIGH      |
| CHIPPING CAMPDEN (WRW)   | 8.0362               | 8.0276             | 0%                           | 8.0276          | 0%                               | POOR           | POOR         | POOR      |
| CIRENCESTER STW          | 4.9727               | 5.0478             | 2%                           | 4.3532          | -12%                             | GOOD           | MODERATE     | GOOD      |
| FAIRFORD STW             | 1.6952               | 1.7189             | 1%                           | 1.6654          | -2%                              | HIGH           | HIGH         | HIGH      |
| HONEYBOURNE (WRW)        | 3.1327               | 3.0695             | -2%                          | 3.0695          | -2%                              | HIGH           | HIGH         | HIGH      |

| WwTW (SIMCAT name)   | Baseline Conc (mg/l) | Future Conc (mg/l) | Percentage Deterioration (%) | TAL Conc (mg/l) | TAL Percentage Deterioration (%) | Baseline Class | Future Class | TAL Class |
|----------------------|----------------------|--------------------|------------------------------|-----------------|----------------------------------|----------------|--------------|-----------|
| LECHLADE STW         | 2.1411               | 2.1439             | 0%                           | 2.112           | -1%                              | HIGH           | HIGH         | HIGH      |
| MORETON-IN-MARSH STW | 2.0326               | 2.4578             | 21%                          | 2.2164          | 9%                               | HIGH           | HIGH         | HIGH      |
| TETBURY STW          | 1.9874               | 2.0099             | 1%                           | 1.9645          | -1%                              | HIGH           | HIGH         | HIGH      |



## E Appendix E - Environmental impact assessment

### E.1 SSSIs

| SSSI name                     | Ref ID  | SIMCAT Model Point                 | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|-------------------------------|---------|------------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Appleton Lower Common SSSI    | 1000716 | Extra Plot Point - Reach 200 No 1  | 0                       | 1                   | 4                         | -4                          | -2                      | -50                           |
| Ashleworth Ham SSSI           | 1002558 | Extra Plot Point - Reach 1034 No 2 | 0                       | 0                   | 0                         | -31                         | -1                      | -41                           |
| Ashton Court SSSI             | 1007161 | CSO 448                            | 0                       | 0                   | 0                         | 0                           | -1                      | -7                            |
| Avon Gorge SSSI               | 1001330 | CSO 448                            | 0                       | 0                   | 0                         | 0                           | -1                      | -7                            |
| Barn Elms Wetland Centre SSSI | 1008706 | Extra Plot Point - Reach 1158 No 1 | 0                       | 0                   | 0                         | 0                           | 0                       | -5                            |
| Blenheim Park SSSI            | 1000732 | Extra Plot Point - Reach 240 No 15 | 0                       | 0                   | 6                         | -53                         | -2                      | -67                           |
| Bould Wood                    | 1000733 | Extra Plot Point - Reach 236 No    | -1                      | 2                   | 14                        | -5                          | -1                      | -75                           |

| SSSI name                     | Ref ID  | SIMCAT Model Point                | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|-------------------------------|---------|-----------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| SSSI                          |         | 1                                 |                         |                     |                           |                             |                         |                               |
| Bray Meadows SSSI             | 1007106 | Extra Plot Point - Reach 731 No 1 | 0                       | 0                   | 0                         | -21                         | -8                      | -34                           |
| Bray Pennyroyal Field SSSI    | 1000819 | CSO 574                           | 0                       | 0                   | 0                         | -19                         | -11                     | -34                           |
| Bushy Park and Home Park SSSI | 1477753 | CSO 1550                          | 0                       | 0                   | 0                         | -18                         | -14                     | -37                           |
| Cassington Meadows SSSI       | 1000771 | Start Of Reach 244                | 1                       | 1                   | 3                         | -8                          | -2                      | -54                           |
| Chaceley Meadow SSSI          | 1002056 | FS Severn Deerhurst               | 0                       | 0                   | 0                         | -32                         | -1                      | -41                           |
| Chimney Meadows SSSI          | 1000735 | Extra Plot Point - Reach 193 No 6 | 1                       | 0                   | 5                         | -2                          | -1                      | -46                           |
| Cock Marsh SSSI               | 1000475 | Extra Plot Point - Reach 722 No 6 | 0                       | 0                   | 0                         | -27                         | -7                      | -35                           |
| Coombe                        | 100257  | Extra Plot Point                  | 0                       | 0                   | 0                         | -31                         | -1                      | -41                           |

| SSSI name                | Ref ID  | SIMCAT Model Point                 | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|--------------------------|---------|------------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Hill Canal SSSI          | 1       | - Reach 1034 No 2                  |                         |                     |                           |                             |                         |                               |
| Cotswold Water Park SSSI | 1002026 | WQ DWPUTE0044                      | -12                     | 2                   | -2                        | -12                         | -12                     | -35                           |
| Cotswold Water Park SSSI | 1002026 | Extra Plot Point - Reach 146 No 11 | 14                      | 5                   | 189                       | 14                          | 3                       | -29                           |
| Cotswold Water Park SSSI | 1002026 | Extra Plot Point - Reach 167 No 6  | 0                       | 0                   | 0                         | 0                           | 0                       | 0                             |
| Cotswold Water Park SSSI | 1002026 | Extra Plot Point - Reach 139 No 11 | 18                      | 1                   | 28                        | 1                           | -1                      | -69                           |
| Culham Brake SSSI        | 1000738 | Extra Plot Point - Reach 261 No 3  | -1                      | 0                   | 2                         | -5                          | -9                      | -43                           |
| Dumsey Meadow SSSI       | 1000115 | Extra Plot Point - Reach 815 No 4  | 0                       | 0                   | 0                         | -16                         | -10                     | -37                           |
| Elmlea Meadows SSSI      | 1002133 | Extra Plot Point - Reach 152 No 2  | -13                     | 5                   | 7                         | -13                         | -8                      | -31                           |
| Grafton Lock Meadow      | 1000743 | Extra Plot Point - Reach 189 No 5  | 0                       | 1                   | 7                         | 0                           | -1                      | -49                           |

| SSSI name                                   | Ref ID  | SIMCAT Model Point                | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|---------------------------------------------|---------|-----------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| SSSI                                        |         |                                   |                         |                     |                           |                             |                         |                               |
| Hartslock SSSI                              | 1000745 | Extra Plot Point - Reach 392 No 6 | 0                       | 0                   | 1                         | -15                         | -11                     | -44                           |
| Holly Court Bank SSSI                       | 1000492 | WQ DWPEVE0013                     | -1                      | 0                   | 6                         | -62                         | -3                      | -66                           |
| Hook Meadow and The Trap Grounds SSSI       | 1000569 | Start Of Reach 250                | 0                       | 2                   | 3                         | -10                         | -3                      | -53                           |
| Iffley Meadows SSSI                         | 1000916 | CSO 1126                          | 0                       | 0                   | 2                         | -10                         | -3                      | -45                           |
| Kellaways - West Tytherton, River Avon SSSI | 1006569 | Extra Plot Point - Reach 48 No 3  | 0                       | 0                   | 0                         | -17                         | -8                      | -34                           |
| Langham Pond SSSI                           | 1000156 | Extra Plot Point - Reach 753 No 1 | 0                       | 0                   | 0                         | -23                         | -11                     | -33                           |

| SSSI name                                  | Ref ID  | SIMCAT Model Point                | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|--------------------------------------------|---------|-----------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Langley's Lane Meadow SSSI                 | 1000759 | Extra Plot Point - Reach 199 No 2 | 1                       | 2                   | 4                         | -1                          | -2                      | -45                           |
| Little Wittenham SSSI                      | 1007362 | WQ PTHR0083                       | 0                       | 0                   | 1                         | -15                         | -12                     | -43                           |
| North Meadow, Cricklade SSSI               | 1000871 | Extra Plot Point - Reach 162 No 1 | -2                      | 13                  | 3                         | -2                          | -6                      | -40                           |
| Old River Severn, Upper Lode SSSI          | 1002623 | Start Of Reach 1022               | 0                       | 0                   | 0                         | -31                         | -1                      | -42                           |
| Pixey and Yarnton Meads SSSI               | 1000777 | Cassington STW                    | 0                       | 2                   | 3                         | -11                         | -4                      | -54                           |
| Port Meadow with Wolvercote Common & Green | 1000778 | Start Of Reach 250                | 0                       | 2                   | 3                         | -10                         | -3                      | -53                           |

| SSSI name                                | Ref ID  | SIMCAT Model Point                | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|------------------------------------------|---------|-----------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| SSSI                                     |         |                                   |                         |                     |                           |                             |                         |                               |
| Rectory Farm Meadows SSSI                | 1006893 | CSO 381                           | 0                       | 0                   | 0                         | -57                         | -2                      | -38                           |
| Severn Estuary SSSI                      | 1002600 | GB109054032450 Boundary           | 0                       | 0                   | 0                         | 0                           | -3                      | -31                           |
| Severn Ham, Tewkesbury SSSI              | 1002616 | Start Of Reach 1020               | 0                       | 0                   | 0                         | -56                         | -2                      | -39                           |
| Stidham Farm SSSI                        | 1001523 | WQ Z1010804                       | 0                       | 0                   | 0                         | -81                         | -8                      | -32                           |
| Stonesfield Common, Bottoms & Banks SSSI | 1000790 | Extra Plot Point - Reach 240 No 7 | -2                      | 1                   | 6                         | -58                         | -2                      | -66                           |
| Sturt Copse SSSI                         | 1000793 | Extra Plot Point - Reach 240 No 9 | -1                      | 0                   | 6                         | -54                         | -2                      | -66                           |
| Syon Park SSSI                           | 1000134 | WQ PTHR0107                       | 0                       | 0                   | 0                         | -14                         | -15                     | -35                           |



| SSSI name                           | Ref ID  | SIMCAT Model Point                 | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|-------------------------------------|---------|------------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Thorpe Hay Meadow SSSI              | 1000366 | CSO 933                            | 0                       | 0                   | 0                         | -19                         | -10                     | -37                           |
| Upham Meadow and Summer Leasow SSSI | 1002380 | CSO 377                            | 0                       | 0                   | 0                         | -57                         | -2                      | -38                           |
| Upper Severn Estuary SSSI           | 1002603 | GB109054032450 Boundary            | 0                       | 0                   | 0                         | 0                           | -3                      | -31                           |
| Upper Waterhay Meadow SSSI          | 1000899 | Extra Plot Point - Reach 152 No 2  | -13                     | 5                   | 7                         | -13                         | -8                      | -31                           |
| Walmore Common SSSI                 | 1002629 | GB109054032740 Boundary            | 0                       | 0                   | 0                         | 0                           | 0                       | -13                           |
| Welford Field SSSI                  | 1007187 | Start Of Reach 974                 | 0                       | 0                   | 0                         | -74                         | -4                      | -39                           |
| Whelford Meadow SSSI                | 1002642 | Extra Plot Point - Reach 139 No 10 | 14                      | 1                   | 28                        | 0                           | -1                      | -69                           |

| SSSI name                              | Ref ID  | SIMCAT Model Point                | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|----------------------------------------|---------|-----------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Whitehill Wood SSSI                    | 1000807 | WQ PEVR0013                       | -2                      | 0                   | 6                         | -62                         | -3                      | -66                           |
| Winson Meadows SSSI                    | 1002630 | Extra Plot Point - Reach 138 No 1 | 4                       | 0                   | 1                         | 0                           | 0                       | -6                            |
| Wolvercote Meadows SSSI                | 1000952 | Extra Plot Point - Reach 248 No 1 | 0                       | 2                   | 3                         | -10                         | -3                      | -54                           |
| Wraysbury & Hythe End Gravel Pits SSSI | 1000509 | Extra Plot Point - Reach 753 No 1 | 0                       | 0                   | 0                         | -23                         | -11                     | -33                           |
| Wraysbury No. 1 Gravel Pit SSSI        | 1007244 | Start Of Reach 753                | 0                       | 0                   | 0                         | -20                         | -9                      | -33                           |
| Wythwood SSSI                          | 1000811 | Extra Plot Point - Reach 240 No 3 | -1                      | 1                   | 6                         | -25                         | -1                      | -64                           |
| Wytham Ditches and Flushes SSSI        | 1000913 | Start Of Reach 244                | 1                       | 1                   | 3                         | -8                          | -2                      | -54                           |

| SSSI name         | Ref ID  | SIMCAT Model Point | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|-------------------|---------|--------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Wytham Woods SSSI | 1000812 | Start Of Reach 244 | 1                       | 1                   | 3                         | -8                          | -2                      | -54                           |

## E.2 SAC

| SAC name                       | Ref ID    | SIMCAT Model Point                | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|--------------------------------|-----------|-----------------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| North Meadow & Clattinger Farm | UK0016372 | Extra Plot Point - Reach 162 No 1 | -2                      | 13                  | 3                         | -2                          | -6                      | -40                           |
| Severn Estuary                 | UK0013030 | GB109054032450 Boundary           | 0                       | 0                   | 0                         | 0                           | -3                      | -31                           |
| Chilterns Beechwoods           | UK0012724 | CSO 1368                          | 0                       | 0                   | 0                         | -27                         | -7                      | -34                           |

## E.3 SPA

| SPA name       | Ref ID    | SIMCAT Model Point      | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|----------------|-----------|-------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Severn Estuary | UK9015022 | GB109054032450 Boundary | 0                       | 0                   | 0                         | 0                           | -3                      | -31                           |

| SPA name        | Ref ID    | SIMCAT Model Point      | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|-----------------|-----------|-------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Walmor e Common | UK9007051 | GB109054032740 Boundary | 0                       | 0                   | 0                         | 0                           | 0                       | -13                           |

#### E.4 Ramsar

| Ramsar name     | Ref ID  | SIMCAT Model Point      | Ammonia Deterioration % | BOD Deterioration % | Phosphate Deterioration % | Ammonia Deterioration TAL % | BOD Deterioration TAL % | Phosphate Deterioration TAL % |
|-----------------|---------|-------------------------|-------------------------|---------------------|---------------------------|-----------------------------|-------------------------|-------------------------------|
| Severn Estuary  | UK11081 | GB109054032450 Boundary | 0                       | 0                   | 0                         | 0                           | -3                      | -31                           |
| Walmor e Common | UK11076 | GB109054032740 Boundary | 0                       | 0                   | 0                         | 0                           | 0                       | -13                           |

## F Appendix F - Site assessments

| Site Reference / Policy No. / PP Application No. | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW                     | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|--------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|--------------------------|------------------------------------|------------------------|
| T31B                                             | Bristol Water | BWXBRS              | Not assessed              | Wessex Water                | TETBURY STW CATCHMENT    | Not assessed                       | Green                  |
| BK14A                                            | Thames Water  | SWOX                | Green                     | Severn Trent                | BLOCKLEY (WRW)           | Green                              | Green                  |
| N14B                                             | Thames Water  | SWOX                | Green                     | Thames Water                | BOURTON-ON-THE-WATER STW | Green                              | Green                  |
| A2                                               | Thames Water  | SWOX                | Amber                     | Thames Water                | ANDOVERSFORD STW         | Green                              | Green                  |
| L19                                              | Thames Water  | SWOX                | Green                     | Thames Water                | LECHLADE STW             | Green                              | Amber                  |
| W7A2/W7C                                         | Thames Water  | SWOX                | Not assessed              | Severn Trent                | HONEYBOURNE (WRW)        | Amber                              | Amber                  |
| BK11                                             | Thames Water  | SWOX                | Green                     | Severn Trent                | BLOCKLEY (WRW)           | Green                              | Green                  |
| B56                                              | Thames Water  | SWOX                | Amber                     | Thames Water                | BOURTON-ON-THE-WATER STW | Red                                | Green                  |

| Site Reference / Policy No. / PP Application No. | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW                   | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|--------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|------------------------|------------------------------------|------------------------|
| CC66B                                            | Thames Water  | SWOX                | Green                     | Severn Trent                | CHIPPING CAMPDEN (WRW) | Green                              | Green                  |
| CC68                                             | Thames Water  | SWOX                | Green                     | Severn Trent                | CHIPPING CAMPDEN (WRW) | Amber                              | Green                  |
| C71                                              | Thames Water  | SWOX                | Green                     | Thames Water                | CIRENCESTER STW        | Green                              | Amber                  |
| C81B                                             | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW        | Green                              | Amber                  |
| F20A                                             | Thames Water  | SWOX                | Red                       | Thames Water                | FAIRFORD STW           | Green                              | Amber                  |
| F39C/F52                                         | Thames Water  | SWOX                | Amber                     | Thames Water                | FAIRFORD STW           | Green                              | Amber                  |
| F53A                                             | Thames Water  | SWOX                | Red                       | Thames Water                | FAIRFORD STW           | Green                              | Amber                  |



| Site Reference / Policy No. / PP Application No. | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW                   | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|--------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|------------------------|------------------------------------|------------------------|
| CC10A                                            | Thames Water  | SWOX                | Green                     | Severn Trent                | CHIPPING CAMPDEN (WRW) | Green                              | Green                  |
| L33                                              | Thames Water  | SWOX                | Red                       | Thames Water                | LECHLADE STW           | Green                              | Amber                  |
| MK2B/C                                           | Thames Water  | SWOX                | Amber                     | Severn Trent                | HONEYBOURNE (WRW)      | Amber                              | Amber                  |
| S14B                                             | Thames Water  | SWOX                | Green                     | Thames Water                | BROADWELL STW          | Green                              | Green                  |
| S55B                                             | Thames Water  | SWOX                | Green                     | Thames Water                | BROADWELL STW          | Green                              | Green                  |
| T71A                                             | Bristol Water | BWXBRS              | Not assessed              | Wessex Water                | TETBURY STW CATCHMENT  | Not assessed                       | Green                  |
| DA16A                                            | Thames Water  | SWOX                | Red                       | Thames Water                | AMPNEY ST PETER STW    | Green                              | Amber                  |
| R670                                             | Thames Water  | SWOX                | Green                     | Thames Water                | FAIRFORD STW           | Green                              | Amber                  |

| Site Reference / Policy No. / PP Application No. | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW                 | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|--------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|----------------------|------------------------------------|------------------------|
| R591                                             | Thames Water  | SWOX                | Red                       | Thames Water                | FAIRFORD STW         | Green                              | Amber                  |
| R592                                             | Thames Water  | SWOX                | Red                       | Thames Water                | FAIRFORD STW         | Green                              | Amber                  |
| R607                                             | Thames Water  | SWOX                | Red                       | Thames Water                | AMPNEY ST PETER STW  | Green                              | Amber                  |
| W4B                                              | Thames Water  | SWOX                | Amber                     | Severn Trent                | HONEYBOURNE (WRW)    | Amber                              | Amber                  |
| M28B                                             | Thames Water  | SWOX                | Red                       | Thames Water                | MORETON-IN-MARSH STW | Green                              | Amber                  |
| SD15                                             | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW      | Green                              | Amber                  |
| SD17                                             | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW      | Green                              | Amber                  |
| MK7                                              | Thames Water  | SWOX                | Amber                     | Severn Trent                | HONEYBOURNE (WRW)    | Green                              | Amber                  |
| R203A-C                                          | Thames Water  | SWOX                | Red                       | Thames Water                | FAIRFORD STW         | Green                              | Amber                  |

| Site Reference / Policy No. / PP Application No.  | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW              | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|---------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|-------------------|------------------------------------|------------------------|
| W8C                                               | Thames Water  | SWOX                | Amber                     | Severn Trent                | HONEYBOURNE (WRW) | Red                                | Amber                  |
| SD23                                              | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW   | Green                              | Amber                  |
| UR1A                                              | Thames Water  | SWOX                | Green                     | N/a                         | No public sewer   | Green                              | Not assessed           |
| MK11A                                             | Thames Water  | SWOX                | Amber                     | Severn Trent                | HONEYBOURNE (WRW) | Amber                              | Amber                  |
| Strategic extension to the south of The Steadings | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW   | Green                              | Amber                  |
| Strategic extension to the south of The Steadings | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW   | Green                              | Amber                  |

| Site Reference / Policy No. / PP Application No.  | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW                | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|---------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|---------------------|------------------------------------|------------------------|
| Strategic extension to the south of Preston       | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW     | Red                                | Amber                  |
| Strategic extension to the south of Preston       | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW     | Red                                | Amber                  |
| Strategic extension to the east of Kingshill Lane | Thames Water  | SWOX                | Red                       | Thames Water                | CIRENCESTER STW     | Red                                | Amber                  |
| New settlement to the south of Driffield          | Thames Water  | SWOX                | Amber                     | Thames Water                | AMPNEY ST PETER STW | Red                                | Amber                  |
| New settlement to                                 | Thames Water  | SWOX                | Amber                     | Thames Water                | AMPNEY ST PETER STW | Red                                | Amber                  |

| Site Reference / Policy No. / PP Application No.  | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW            | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|---------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|-----------------|------------------------------------|------------------------|
| the south of Driffield                            |               |                     |                           |                             |                 |                                    |                        |
| Strategic extension to the north-east of Fairford | Thames Water  | SWOX                | Red                       | Thames Water                | FAIRFORD STW    | Red                                | Amber                  |
| Strategic extension to the north-east of Fairford | Thames Water  | SWOX                | Red                       | Thames Water                | FAIRFORD STW    | Red                                | Amber                  |
| Strategic extension to the south-west of Kemble   | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW | Red                                | Amber                  |
| Strategic extension to the south-west of Kemble   | Thames Water  | SWOX                | Amber                     | Thames Water                | CIRENCESTER STW | Red                                | Amber                  |

| Site Reference / Policy No. / PP Application No.              | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW                 | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|---------------------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|----------------------|------------------------------------|------------------------|
| Strategic extension to the north and west of Mickleton        | Thames Water  | SWOX                | Red                       | Severn Trent                | HONEYBOURNE (WRW)    | Red                                | Amber                  |
| Strategic extension to the South and East of Moreton-in-Marsh | Thames Water  | SWOX                | Red                       | Thames Water                | MORETON-IN-MARSH STW | Red                                | Amber                  |
| Strategic extension to the South and East of Moreton-in-Marsh | Thames Water  | SWOX                | Red                       | Thames Water                | MORETON-IN-MARSH STW | Red                                | Amber                  |
| Strategic extension to the south-                             | Thames Water  | SWOX                | Not assessed              | Thames Water                | CIRENCESTER STW      | Not assessed                       | Amber                  |



| Site Reference / Policy No. / PP Application No.                | Water Company | Water Resource Zone | Water Supply Networks RAG | Company Treating Wastewater | WwTW                | Foul Sewerage Network Capacity RAG | WwTW Flow Capacity RAG |
|-----------------------------------------------------------------|---------------|---------------------|---------------------------|-----------------------------|---------------------|------------------------------------|------------------------|
| west of Siddington                                              |               |                     |                           |                             |                     |                                    |                        |
| Strategic extension to the north, east and south of Down Ampney | Thames Water  | SWOX                | Not assessed              | Thames Water                | AMPNEY ST PETER STW | Not assessed                       | Amber                  |
| S68                                                             | Thames Water  | SWOX                | Not assessed              | Thames Water                | Broadwell STW       | Not assessed                       | Green                  |
| R583B-C                                                         | Thames Water  | SWOX                | Not assessed              | Thames Water                | AMPNEY ST PETER STW | Not assessed                       | Amber                  |

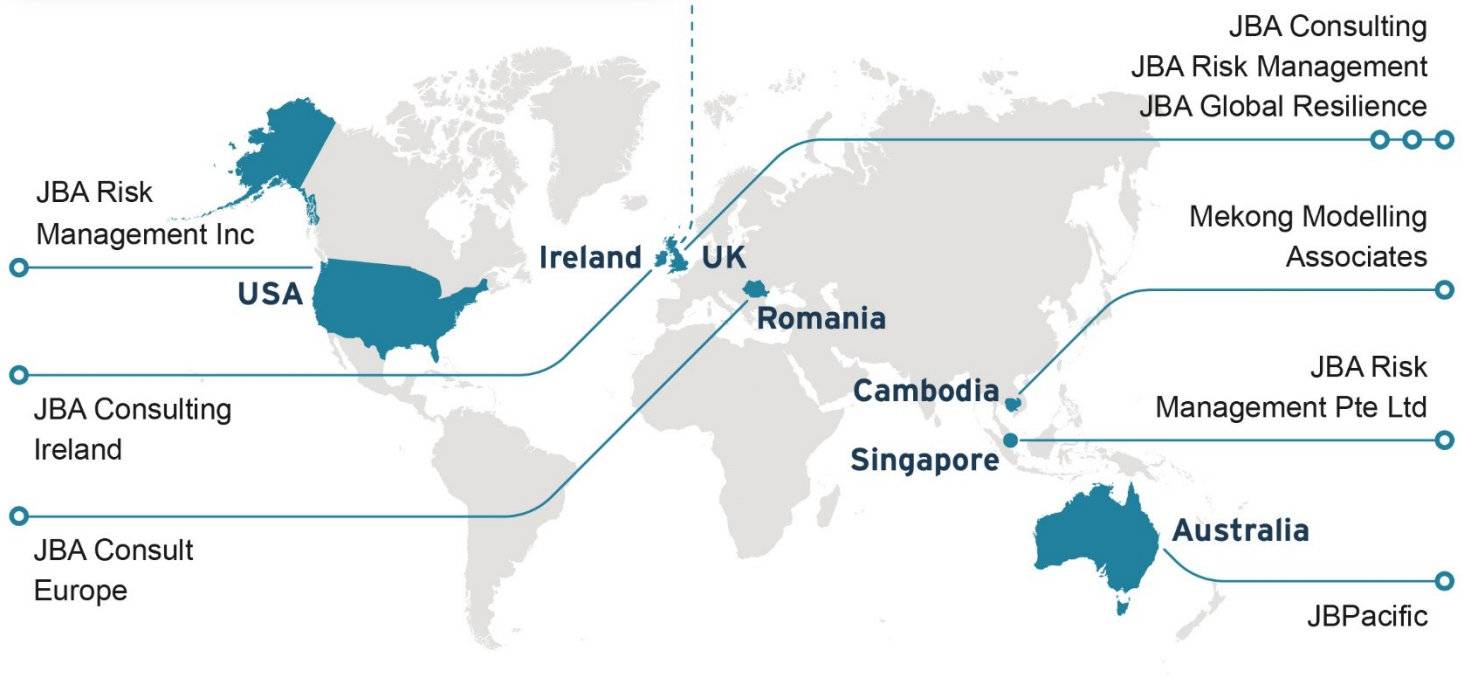




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