

Hampshire Avon catchment factsheet

We recognise the international importance of the chalk streams of the Hampshire Avon catchment and the iconic habitats and species they support. We provide water supply and wastewater treatment services for the northern portion of the catchment, but in the southern section of the catchment, south of Downton, Bournemouth Water provides water supply services while Wessex Water provides wastewater services.

Key issues

Sewage treatment

Within the Hampshire Avon catchment, we operate 37 water recycling centres (WRC, formerly known as sewage treatment works), over 230 sewage pumping stations (SPS) and 55 storm overflows (SO).

Nutrients

One of the main issues to affect the Hampshire Avon catchment is the impact of nutrients on its chalk streams and associated habitats. This is primarily from phosphorus, although nitrogen can also have an effect. Phosphorus causes eutrophication (where the nutrients cause excessive growth of plant life) in rivers and wetlands and is a particular problem for the streams and rivers in the catchment. Nutrients come from our own sewage assets but also from diffuse sources, such as agricultural and urban run-off.

Storm overflows

We operate 55 storm overflows in the catchment, many at water recycling centres. They exist because many sewers were laid at a time when drains carried both rainwater and sewage. Our overflows should only operate during periods of intense rainfall, where they act as relief valves to allow excess stormwater to be released to rivers or the sea to protect properties from flooding and prevent sewage backing up into streets and homes during heavy storm events. During storms, or during periods of high groundwater, any foul water released from a storm overflow is heavily diluted by large volumes of rainwater. Flows are further diluted by the watercourse as this will also be swollen by the same heavy rain.

Some of these overflows operate for extended periods of time due to groundwater infiltration into the sewerage system. Due to the underlying chalk geology of the catchment, in wet weather the ground water table can become very high, and this water can enter into and inundate our (public) and others' (private) sewers. We have produced a video explaining this phenomenon and what can be done ([here](#)). Information on how often these assets discharge, and for how long, can be found on our Drainage and Wastewater Management Plan Portal ([Managing Drainage and Wastewater, Planning the future \(wessexwater.co.uk\)](#)).

To combat this infiltration, we have an Infiltration Reduction Programme ([Infiltration reduction plans - Reducing the risk of groundwater. \(wessexwater.co.uk\)](#)) which sets out how we will monitor our network and renovate or seal affected sewers to prevent groundwater entering them.

We aim to eliminate all harm from overflows, starting with the ones that have the greatest impact. However, this is not a simple matter and will require several decades of sustained increased investment. It is estimated that to eliminate

all overflows in England and Wales will cost in excess of £300 billion. Our programme starts with monitoring and reporting all overflow operations, identifying the ones that will potentially cause environmental or public health harm, addressing those and then progressively working through the others.

Our website contains further details on storm overflows ([Storm overflows \(wessexwater.co.uk\)](#)) and on our plans for tackling overflows which will be set out in our Drainage and Wastewater Management Plans.

Water supply and resources

Within the catchment, we operate 19 water treatment centres (with the majority of water sourced from groundwater), four stream supports (where we add water to rivers when flows are low) and more than 50 distribution sites (such as storage reservoirs or pumping stations).

River flows

The water we supply to our customers comes from the local environment and, approximately, 75% from boreholes and springs that tap into the chalk and Upper Greensand aquifers of Wiltshire and Dorset. Abstracting water from the aquifers that feed the chalk streams of the catchment has to be done without taking too much water, leaving too little for the streams and rivers to flow and support the wide range of species and habitats for which they are important.

For decades we have sought to balance the need to supply water to our customers without compromising healthy flows in our chalk streams, and we have taken steps to minimise the impact of our abstractions. The impact of all of Wessex Water's abstractions in the Hampshire Avon catchment was the subject of a major low flow study during Asset Management Plan (AMP) 4 (2005-2010). This involved extensive monitoring of river flows and river ecology, as well as numerical modelling of the interaction between groundwater abstractions, groundwater storage and river flows. Further investigations continue to understand more about how our abstractions can affect river flows (see below).

This resulted in the need to reduce our abstractions from several sites and so, over the last decade, we have invested more than £230 million to reduce the amount of water we take from the Hampshire Avon by 23.5 million litres per day, in order to preserve the unique ecology of these rivers. We are undertaking an extensive survey programme of aquatic plants and invertebrates to assess how the ecology has responded to these reductions in abstraction.



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Key investments completed up to 2020

Nutrients

Our long-term programme to reduce nutrients from our assets started in AMP3 (2000-2005) when, as a first stage, phosphorus removal to 2mg/l at many WRCs in the catchment was installed. AMP5 (2005-10) saw a further phosphorus removal to 1mg/l at many WRCs with more than 100 tonnes per year removed in the Hampshire Avon. Our investment in treatment processes for phosphorus removal at these WRCs amounts to £30 million, with additional annual operating costs for phosphorus removal at these sites of over £2.0million/year.

By the end of AMP6 (2020) we had installed phosphorus removal at the following treatment works:

River flows

We completed our integrated water supply grid, a £230m scheme delivering 23.5Ml/d abstraction reductions (c7% of water put into supply) and improved resilience for customers' water supplies. The scheme involved the construction of 200km new trunk mains, 24 refurbished or new pumping stations and 12 new storage reservoirs. This has allowed us to deliver the major reductions in abstractions required in the catchment by moving water from other areas of our region.

Future sustainability reductions in our abstractions will be informed by our AMP7 investigation into the revised [Common Standards Monitoring Guidance for the River Avon](#) SSSI.

WRC	Permitted Phosphorus Level (mg/l)	Approximate phosphorus removed (kg/yr)	WRC	Permitted Phosphorus Level (mg/l)	Approximate phosphorus removed (kg/yr)
All Cannings	1	430	Pewsey	1	2,900
Amesbury	1	3,300	Ratfyn	1	8,290
Barford St Martin	2	110	Ringwood	1	8,330
Downton	1	2,200	Salisbury	1	42,800
East Knoyle	1	370	Shrewton	1	870
Fordingbridge	1	5,000	Tisbury	1	1,600
Fovant	1	630	Upavon	1	750
Hurdcott	1	3,700	Warminster	1	10,000
Marden	2	260	Wishford	1	1,400
Netheravon	1	2,700			

Environmental investigations completed up to 2020

Environmental investigations

We have completed the following investigations within the catchment:

- Upper Avon Western Arm - established the impact of abstraction on river flows at normal rates of abstraction and theoretical full licence condition in this section of the river. It compared these values to guideline values to see if changes to flow and water quality altered the stream ecology (see below for further details).
- Warminster WRC Phosphorus Removal Trials - investigated phosphorus removal using iron dosing to see how much phosphorus removal is possible using existing technology.
- Heytesbury Brook Hydrology - evaluated the effect of our abstraction on the ability of the Brook to meet the standards set by the Water Framework Directive.
- Teffont Stream Investigation - worked to understand the current ecology of the stream and to consider the effect of groundwater abstraction both at its actual rates of abstraction and at theoretical full licence.
- Ecology of the Hampshire Avon - ongoing collection of long-term ecological datasets (to be reported at the end of AMP7) to help us understand changes in the river system resulting from reductions in the amount of water we abstract from sources in the Hampshire Avon.
- Water quality in the Hampshire Avon catchment - a programme of sampling and analysis to determine the influence of our operations on nutrients in the Hampshire Avon catchment.
- Blashford Lakes Phosphorus - reviewed the sources and means of reduction of phosphorus levels in the lakes.
- Blashford Lakes Habitat Management Plan - delivered a plan for the lakes which aims to manage and reduce existing phosphorus levels and established whether there were significant inputs of phosphorus from fishing bait and the bird population of the lakes.



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Environmental investments completed up to 2020

Our AMP5 (2010-2015) investigation into the Western Arm of the Upper Avon found that groundwater abstraction from the headwaters of the catchment affects river flow and ecology. The abstraction impacts are made worse by poor river morphology (the shape of the river channel) and a high level of nutrients. As a result, we have reduced the amount of water we abstract from Bishops Cannings and Bourton groundwater sources and improved treatment at All Cannings WRC to reduce the amount of phosphorus entering the river.

In order to improve the river morphology, we worked with Wiltshire Wildlife Trust to develop and implement a river restoration scheme to enhance habitat quality and floodplain connectivity over a 3km stretch of the River Avon between Chirton and Wilsford. This involved:

- Regrading 350m of riverbank at Wilsford
- Reconnecting the river to floodplain at Wilsford and the creation of an offline pond
- 43 in-stream installations, for example, flow deflectors, brushwood berms, woody material between Chirton and Wilsford

Biodiversity Partners Programme

We have provided support and funding of more than £450,000 to projects working on the Hampshire Avon, or within its catchment since 1998, including:

- The Wessex Chalk Streams project (with Wiltshire Wildlife Trust and other partners, from 1998-2020)

- Avon Valley Advisory Project (Hampshire & Isle of Wight Wildlife Trust, 2006-2010)
- South Wiltshire Farmland Bird Initiative (Cranborne Chase and West Wiltshire Downs AONB Team, 2010-2015)
- South Wiltshire Farmland Conservation Project (Cranborne Chase and West Wiltshire Downs AONB Team, 2015-2020)
- River Nadder Invasive Non-Native Species Control (Wiltshire Wildlife Trust, 2017)
- Great Bustard Hedging Project (Great Bustard Group, 2018)

Conservation Access and Recreation

In 1989, Wessex Water developed a new water supply source at Blashford Lakes, using worked-out gravel pits. They have since evolved into an important wildlife site, especially for waterfowl and other birds, and are designated as a Site of Special Scientific Interest. The Lakes are now home to an education centre and variety of recreational uses managed through a partnership between Hampshire & Isle of Wight Wildlife Trust, Bournemouth Water and Wessex Water.

We have also undertaken projects delivering improvements for biodiversity and access on our sites across the catchment, including: 5 bat roost assessments at sites and a public access review.

Catchment Partnership

We have supported the Hampshire Avon Catchment Partnership since its inception and provide £10,000 annual funding.

Planned investment 2020-2025

In addition to ongoing expenditure on our waste and water supply treatment and network assets, our business plan sets out the following key expenditure:

- Further tightening of phosphorus removal at Warminster WRC to achieve a discharge of 0.5mg/l phosphorus from 2021.
- Great Wishford WRC - enhancements at this water recycling centre to accommodate development in the catchment (with investment proposed towards the end of AMP7 or early AMP8) and to reduce infiltration into the sewerage network to lessen storm overflow operation.
- Hurdcott WRC - enhancements at this water recycling centre to accommodate development in the catchment (with investment proposed towards the end of AMP7 or early AMP8) and to reduce infiltration into the sewerage network to lessen storm overflow operation.
- Maiden Bradley WRC - major maintenance works at the storm overflow on site.
- Salisbury WRC - major maintenance works.

- Ringwood WRC - storm storage improvements at the water recycling centre.
- Commitment to monitor all storm overflows by 2023, currently 80% across our region are monitored.

We recognise that many of our stakeholders feel that additional phosphorus removal is required at our works during AMP7 to further improve the condition of the river, but our regulators decided that the water sector, having already achieved more than its fair share of phosphorus removal, should not be obliged to remove any more. Given the level of customer support for further improvements, we have implemented a voluntary performance commitment to deliver greater phosphorus removal through asset optimisation. During 2020, our WRCs removed on average an additional 13.7 tonnes of phosphorus per year over the permitted requirement.

The issue has also driven a phosphorus neutral development condition set by Wiltshire Council, which is affecting house building and economic development within the catchment. We have initiated a Landscape Enterprise Network (LENs)



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Planned investment 2020-2025 continued

approach, bringing together a wider range of organisations across the catchment to address this problem. The primary focus is phosphorus, but we expect that wider natural capital benefits will be delivered.

This has developed an approach to deliver solutions through the EnTrade platform to procure the relevant landscape

services from a range of suppliers. As a result, we have been working with farmers in the Pewsey Vale in 2020, which has resulted in an additional 32.45kg/yr phosphorus reduction, or a total of 129.8kg reduction over the following four years. The measures are also delivering 3.15 hectares of biodiversity improvement and 80tCO₂e/yr carbon reduction.

Measure completed	Phosphorus offset (kg)	Additional Benefits
Buffer strips + wildflower planting	6.19kgP/yr	2.68ha biodiversity benefit
Cover Crops	0.16kgP/yr	Farmer engagement
Innovation: wildflower planting adjacent to Sewage Pumping Station	0.13kgP/yr	0.47ha biodiversity benefit
Innovation: Minimum Till	25.97kgP/yr 390kgP over a lifetime of 15 years	80tCO ₂ e/y carbon sequestration 645ha reduced pesticide application

Environmental investigations

We will be undertaking the following investigations between 2020 and 2025:

- Water quality investigation at Tilshead and Hindon WRCs - borehole water quality monitoring with an aim to understand the behaviour and persistence of trace chemicals in groundwaters that are in close proximity to water recycling centres that discharge to ground.
- Tilshead, Hindon, Maiden Bradley and Collingbourne Ducis WRCs groundwater nitrogen investigations - water quality monitoring and modelling to determine the effect of our WRCs on nitrate concentrations in groundwater in the context of catchment influences and determine whether treatment improvements are required.
- Mechanisms of removal investigation at Ratfyn WRC - this investigation will improve our understanding of the presence of trace chemicals in the final sludge product produced at sludge treatment centres as part of the Chemical Investigations Programme Phase 3.
- Hampshire Avon Water Quality Common Standards Monitoring Guidance - this investigation will determine whether we need to improve the performance of our wastewater assets on the Hampshire Avon to meet water quality targets that protect Sites of Special Scientific Interest.
- Invasive Non-Native Species (Blashford) - implementation of measures (such as washdown facilities) to restrict the spread of species and an investigation to determine the risk our water transfers pose to the spread of such species.

- Hampshire Avon Common Standards Monitoring Guidance Water Resources investigation - water resources modelling to determine the impact of our abstractions.
- During 2020/21, we have a 12-month placement to work with angling clubs to provide rapid and frequent ecological assessment at identified sites (Amesbury & Ratfyn).

Biodiversity and partnership funding

Wessex Water Foundation's Partners Programme is supporting the Wider Wylde project in the catchment with the Wessex Rivers Trust and Wiltshire Wildlife Trust (£15,000 per year 2020-2025).

In addition, Wessex Water will continue to support the Hampshire Avon Catchment partnership (£10,000 per year).

During the period, we will be undertaking scrub clearance on an important Salisbury Plain grassland site and other works to benefit the Desmoulins whorl snail at a site in the upper catchment. In addition, the following projects will be undertaken across the Wessex Water region but are likely to include sites within the catchment:

- Maximising opportunities for birds at our water recycling centres.
- Priority habitat restoration and recreation.

