REPORT

# PC5245 Test Valley Water Cycle Study

Client: Test Valley Borough Council

Reference: PC5245-RHD-XX-XX-RP-X-0001

Status: S0/P01.02

Date: 5 February 2024

Royal HaskoningDHV

*Enhancing Society Together*

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# 1 Introduction

## 1.1 A New Local Plan for Test Valley

Test Valley Borough Council (TVBC; hereinafter referred to as “the Council”) is actively engaged in responding to the needs of the growing population. The Council is committed to meet its housing and related infrastructure needs by responding and planning to ensure this growth is undertaken sustainably, and thus will allow for the delivery of sustainable communities.

The Council is in the process of preparing its next Local Plan, to replace the current adopted Local Plan (2016) which has a plan period of 2011-2029. The next Local Plan 2040 is still in an early stage of development, with an Issues and Options consultation and a Refined Issues and Options consultation having been undertaken in 2018 and 2020 respectively, and a draft Local Plan 2040 Regulation 18 Stage 1 consultation undertaken February-April 2022, which covers strategic matters. A full draft Local Plan 2040 Regulation 18 Stage 2 will follow in 2024 Q1 and will include proposed allocations to meet development needs (including for employment) and a full suite of development management policies used to determine planning applications. Following public consultation, the council are intending to finalise the draft Plan for the Regulation 19 stage. The evidence provided in this Water Cycle Study may need to be updated to inform the Regulation 19 plan.

This Water Cycle Study (WCS) provides evidence for the Local Plan on the constraints and requirements for potential growth based on the local water infrastructure, with consideration to the proposed growth targets and how they can be met without adversely affecting the water environment.

## 1.2 Overview of Area

### 1.2.1 Water Supply and Treatment

Potable water is supplied to the majority of the Borough by Southern Water, although some areas are not covered by mains water supply and some small areas are covered by other companies, including Bournemouth Water, Wessex Water and Cholderton & District Water. Wastewater is collected and treated by Southern Water, although some areas do not have connections to the mains sewerage system.

Water resources in the Borough are subject to a range of developmental, environmental and climate change pressures. The Borough contains internationally important chalk rivers such as the River Test and its tributaries (**Section 1.2.2**). These highly sensitive rivers are dependent upon groundwater inputs to maintain flows.

As part of a Section 20 Agreement in the Water Resources Management Plan 19 (WRMP), licence changes set new limits on the amount of water that Southern Water (SW) can abstract from both surface water and groundwater sources without resulting in environmental impacts. As a result of these licence changes, SW has indicated there will be a significant reduction in the amount of water that can be abstracted during severe drought conditions, and this will impact on the water company’s ability to maintain supplies to customers.

Water quality is also under pressure, particularly from nutrients that can be derived from discharges from wastewater treatment works (WwTWs). This is a particular issue for watercourses that drain into the Solent, which is under considerable pressure because of the supply of nitrates from the river catchments that drain into it (**Section 1.2.3**).

### 1.2.2 The River Test Catchment

The majority of the Test Valley Borough is in the catchment of the River Test, and major tributaries such as the Rivers Dever, Anton, Dun and Blackwater. The River Test rises at Ashe near Basingstoke and flows southwards to its estuary at Southampton Water. The south eastern corner of the Borough falls within the Monks Brook catchment, a smaller watercourse that drains into the River Itchen at Swaything, upstream of its confluence with Southampton Water. The River Test is a chalk river designated a Site of Special Scientific Interest (SSSI), with 65 areas designated as SSSIs within its catchment and recognised because of the ecological importance of their geological features. The UK is estimated to have 85% of chalk rivers found globally, situated in southern and eastern England. Therefore, the River Test and its tributaries are of national and international importance. The area is predominantly rural with both chalk rivers supporting a rich diversity of flora and fauna. The geology in the north of the catchment is dominated by chalk, where the rivers and aquifers afford high quality water for abstraction. In contrast, the geology in the southern catchment is mostly clay and as such the water bodies demonstrate quite different characteristics.

The landscape of the River Test catchment falls into two principal categories: narrow valleys with steeper sides that contain the tributaries (known as bournes, or if ephemeral, winterbournes) of the main river system, and the wider flat valleys of the main river system that are predominantly under pasture and have characteristic tree species running alongside individual watercourses and areas of meadow grassland, marshlands and other wetland habitats.

Natural England and the Environment Agency have set standards that need to be achieved for environmental quality that support conservation objectives for the River Test SSSI. In 2019, the Environment Agency designated the River Test Chalk groundwater body overall status as “poor” under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, primarily due to chemical elements failure in the water quality. Many of the river water bodies supported by this groundwater are also failing to achieve their targets, with pressures on fish and macrophyte populations. The pressures on the natural chalk river systems are immense, and the River Test catchment falls into a nitrate vulnerable zone and the conservation objectives are there to protect the aquifers for abstraction of drinking water.

As part of the Environment Agency water stressed areas classification (2021), Southern Water’s supply area for the River Test Valley is concluded to be in an area of ‘serious water stress’. As a result, Southern Water is currently developing a scheme to transfer recycled water from Havant into the Hampshire water supply zone, allowing it to reduce abstraction from the chalk aquifer and connected chalk rivers.

### 1.2.3 Nutrient Neutrality in the Solent

A joint legal case was brought to the Court of Justice of the European Union (CJEU) regarding authorisations for schemes with respect to agricultural activities on sites protected by the *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and species* (‘The Habitats Directive’) and where nitrogen deposition levels already exceeded the critical load.

In response, the CJEU which ruled that where a European important site, i.e., Special Areas of Conservation (SACs) and/ or Special Protection Areas (SPAs), is failing to achieve condition due to pollution, the potential for a new development to add to the nutrient load is "*necessarily limited*". Similarly, internationally important wetland sites which are designated as Ramsar sites are also included in the judgement, as under national policy they are afforded the same protection as SACs and SPAs. The Dutch-N has informed the way in which Regulation 63 of the Habitats Regulations 2017 should apply to pollution related incidents.

The Dutch-N ruling has resulted in greater scrutiny of proposed developments that are likely to increase nutrient loads to internationally important sites where a reason for unfavourable condition is an excess of a specific pollutant. The Dutch-N case applies to National Site Network sites which are already in an unfavourable condition due to high nutrient levels in combination with the importance of the designation. The following developments which are impacted include new residential units, student accommodation, care

homes, tourist attractions including campsites, glamping pods, and holiday lets, commercial developments where overnight accommodation is provided, agricultural development including additional barns, slurry stores, and Anaerobic Digesters.

In March 2022 Natural England published updated guidance on water quality and nutrient neutrality (NN) advice (NE785) which identified a further twenty protected sites that are adversely affected by nutrient pollution. Designated sites within the Solent (principally the Solent Maritime SAC and the Solent and Southampton Water SPA) were identified being in an unfavourable condition due to high loads of nitrogen. As a result, in order to comply with the Habitats Regulations, Test Valley Borough Council is not able to grant planning permission for new residential development or for developments that provide overnight accommodation that result in increased nutrient loads within the catchment of the Solent unless it can be clearly demonstrated that they will be nutrient neutral and therefore will not have a detrimental impact in terms of nitrogen loading to the designated protected areas. The two main sources of harmful nutrients and related chemicals are from agriculture (e.g., manures, fish farms, slurry and soil entering the rivers) and discharges from sewage treatment works.

## 1.3 The Water Cycle Study

### 1.3.1 Objectives

A WCS is a voluntary study that helps organisations work together to plan for sustainable growth. It uses water and planning evidence to understand environmental and infrastructure capacity. It can identify joined up and cost-effective solutions, that are resilient to climate change for the lifetime of the development. When prepared at an early stage of plan-making, water cycle studies provide evidence for plans and sustainability appraisals. They are usually led by local authorities (or groups of local authorities), since their chief aim is to provide evidence for robust plans. Other partners often include the Environment Agency, Natural England, and water companies.

Unlike a strategic flood risk assessment, a WCS is not a requirement of the National Planning Policy Framework (NPPF). However, the NPPF states that strategic policies in development plan documents should make ‘sufficient provision’ for infrastructure for water supply and wastewater, and planning practice guidance states that a water cycle study can help in the preparation of a plan for sustainable growth.

Water cycle studies provide evidence for plans and sustainability appraisals and are ideally completed at an early stage of plan-making. Local authorities (or groups of local authorities) usually lead water cycle studies, as the chief aim is to provide evidence for sound plans.

The WCS has been prepared to inform the site selection process in the Local Plan and aims to identify existing connections between planning and water related policies and needs in an integrated way. The main objective of the WCS is to identify any constraints on planned housing growth that may be imposed by the water cycle. The WCS then identifies how these can be resolved, i.e., by ensuring that appropriate Water Services Infrastructure (WSI) can be provided to support the proposed development. Furthermore, it provides a strategic approach to the management and use of water which ensures that the sustainability of the water environment in the area is not compromised.

The water cycle representation is presented in **Figure 1.1**, which shows how natural and man-made processes and systems interact to collect, store and/or transport water in the environment.

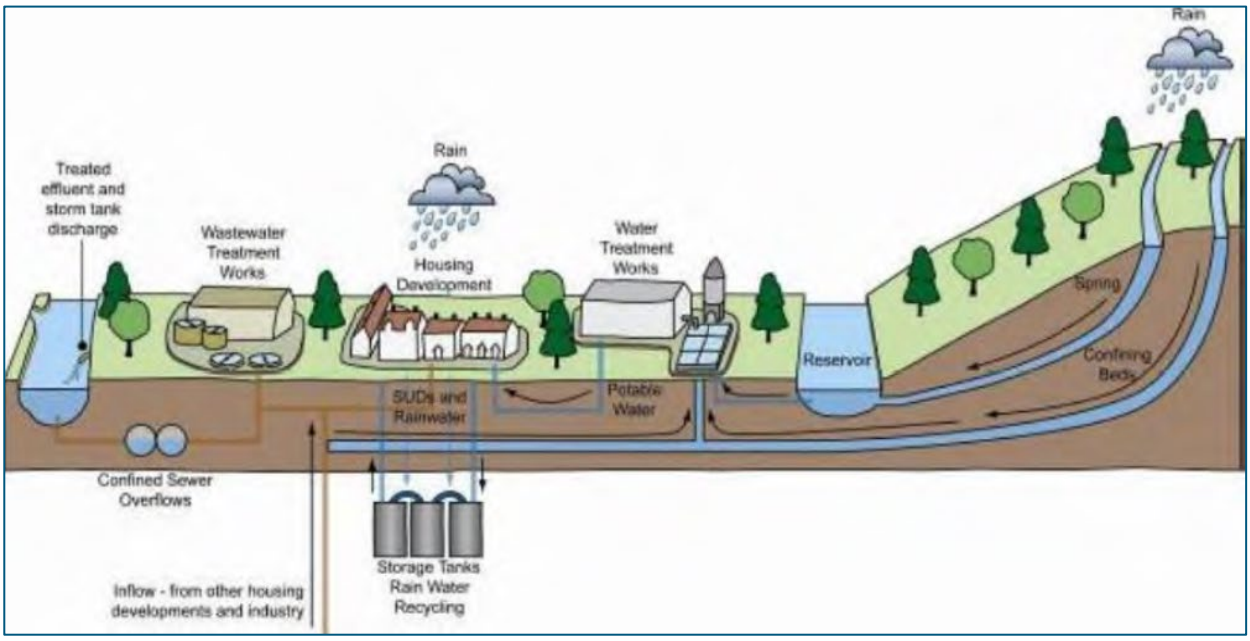



*Figure 1.1 The Water Cycle. (Source Environment Agency Ref 54)*

### 1.3.2 Overarching Drivers

There are two key overarching drivers shaping the direction of the WCS as a whole:

- Delivering sustainable water management, to ensure that provision of Water Services Infrastructure (WSI) and mitigation is sustainable, contributes to the overall delivery of sustainable growth and development and that the Local Plan meets with the requirements of the National Planning Policy Framework (NPPF) with respect to water, wastewater and water quality.
- Compliance with environmental legislation and standards, including the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (commonly referred to as the “Water Environment Regulations”) and The Conservation of Habitats and Species Regulations 2017 (commonly referred to as the "Habitats Regulations"). This legislation sets out requirements to ensure that growth requiring additional abstraction of water for supply and the discharge of treated effluent does not prevent water bodies within the Test Valley (and more widely) from achieving the standards required of them as set out in the Water Environment Regulations and specific standards for water dependent sites protected under the Habitats Regulations.

### 1.3.3 Sources of Data

The data used in the study has been obtained from several sources. A review of publicly available documents for the study area has been undertaken and refreshed with valuable up to date information obtained in consultation with all stakeholders involved:

- Test Valley Borough Council
- Southern Water
- Environment Agency
- Natural England

A detailed list of all data used in the study and corresponding sources is presented in **Appendix A**.

### 1.3.4 Data Quality and Assumptions

As with all studies of this nature, the analysis relies heavily on data and information supplied by third parties. This WCS has collated data from many parties, using the best available information at the time of preparation. Data has been checked and reviewed for accuracy wherever possible, but it is generally assumed that all data provided is accurate and up to date.

Much of this data is not static and is regularly being updated and revised as new information is collected or trends in development change. This study reflects a point in time and may need to be reconsidered at a later point when data updates or review against changes to legislation or planning guidance may be required.

### 1.3.5 Structure of this Report

**Section 1** introduces this report and **Section 2** sets out a brief description of the proposed developments in Test Valley based on the current version of the emerging Local Plan. **Section 3** provides a concise summary of the legal and policy framework that underpins the WCS.

The specific technical information for each WCS topic is presented in **Sections 4** to **6**. **Section 4** covers Water Resources and Supply and Wastewater Collection, Treatment and Water Quality are assessed in **Section 5** The outcomes of the assessment are summarised in **Section 6**.

Reports, documents, and websites referenced by this report are listed at the end of the document, followed by supporting appendices.

Maps of the key datasets relating to all aspects of this Outline WCS are presented at a district-wide scale and provided alongside this report.

# 2 Development in the Test Valley Catchment

## 2.1 Estimated Growth

The TVBC area has experienced moderate population growth in the past decade and is expected to experience a significant increase in housing requirement and economic growth over the period to 2040. This Water Cycle Study has assessed the additional growth from proposed sites which were calculated based on the Planning Practice Guidance's Housing Need Assessment (National Planning Policy Framework), which sets out the government's standard methodology for assessing Local Housing Need (LHN).

### 2.1.1 Site Allocations for Development

The council are proposing potential site allocations in regulation 18 Stage 2 document for public consultation informed by current evidence. The draft Local Plan is currently considering 10 proposed sites to be evaluated for potential development. The proposed sites are shown in **Table 2-1**, and a map of the catchments showing the Test Valley Borough Council administrative boundary and proposed development sites is shown in **Table 2-1**.

In addition to proposed dwelling sites, the Council have allocated two sites for other forms of development, including employment sites. The site at Velmore Farm would include 1,070 dwellings, 5,000sqm flexible office, 250sqm co-working space, 450sqm retail, a Primary School and green space. The land at Manor Farm would include approximately 800 dwellings and an employment area with an indicative space of 5,000sqm.

The Council has proposed a site at 'Land at Upton Lane' for predominately employment uses with some limited residential (up to 80 dwellings) development in the Draft Local Plan 2040 Regulation 18 Stage 2. The scale of the residential development will be informed by the impact of noise. As such, consideration of this site is likely to be required to inform the Regulation 19 Stage.

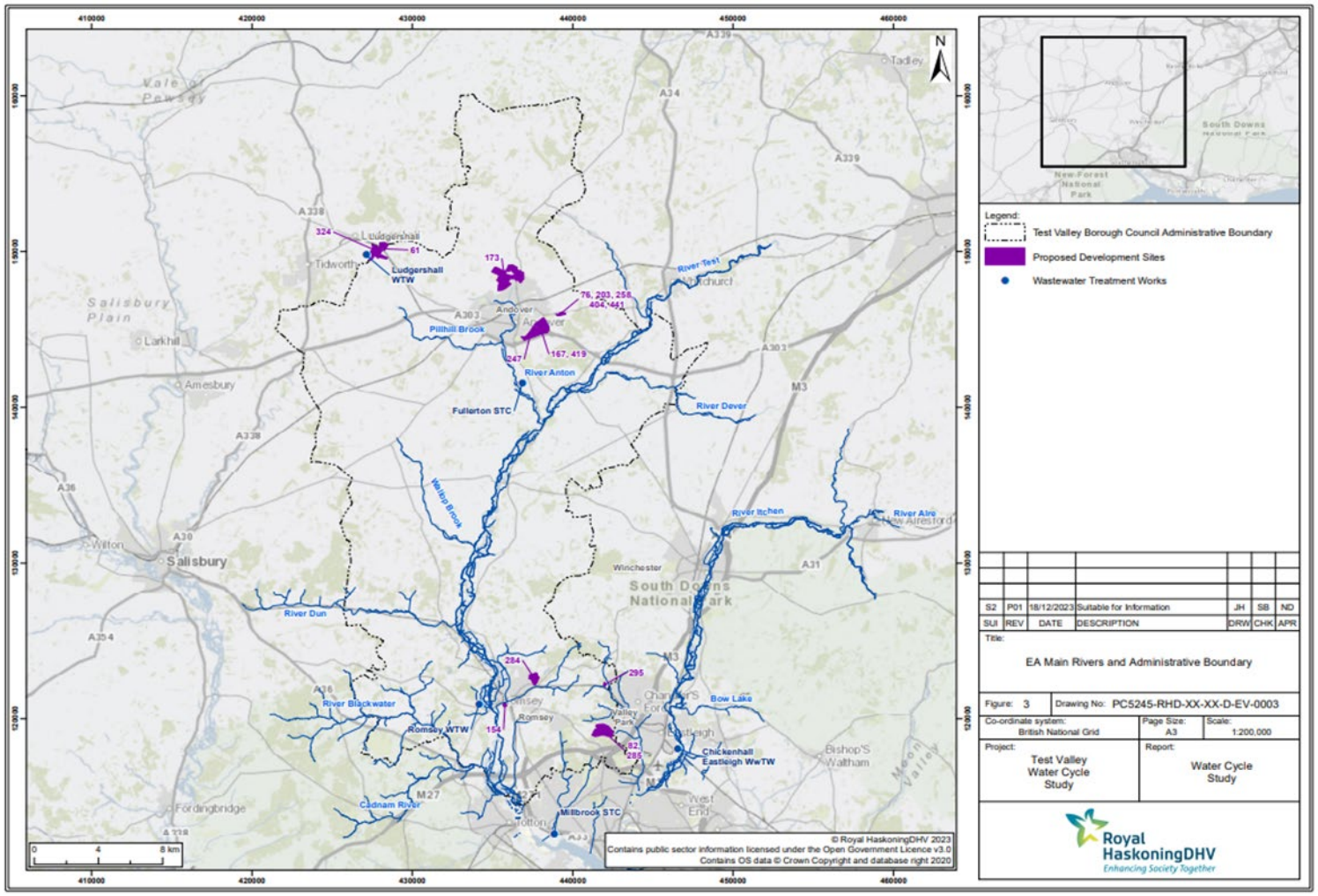
*Table 2-1 Details of Allocated Sites (Source: TVBC)*

| SHELAA Ref No. | Site Name | Proposed Use | Settlement | Existing Use | Proposed Capacity |
|---|---|---|---|---|---|
| 247[1] | Land at Bere Hill Farm | Residential | Andover | Greenfield | 600 |
| 167 and 419*[2] | Land at Bere Hill and Land at Bailiffs Bottom | Residential, 12ha country park | Andover | Greenfield | 792 |
| 76, 203, 258, 404 and 441 | Land South of London Road | Residential | Andover | Greenfield | 90 |
| 173 | Land at Manor Farm | Residential / Employment (5,000sqm, 1.5ha) (E(g)(i), | Enham Alamein/Andover | Greenfield / Agricultural | 1050[3] |

[1] *This site is adjacent to the site 'Land at Bere Hill and Land at Bailiffs Bottom*
[2] *This site is adjacent to the site 'Land at Bere Hill Farm'*
[3] *Following an initial officer assessment of 1050 this site is being considered for allocation in the Local Plan for 800 dwellings*

| SHELAA Ref No. | Site Name | Proposed Use | Settlement | Existing Use | Proposed Capacity |
|---|---|---|---|---|---|
| | | (ii), (iii), B8), (0.35 plot ratio). | | | |
| 61 | Land east of Ludgershall | Residential | Ludgershall | Greenfield | 350 |
| 324 | Land south of A342 and east of Shoddesden Lane | Residential | Ludgershall | Greenfield | 1150 |
| 154 | Land south of bypass | Residential | Romsey | Greenfield | 110 |
| 284 | Land at Ganger Farm (South) | Residential | Romsey | Greenfield | 340 |
| 82, 285 | Velmore Farm (and Land at Castle Lane) | Residential / Employment (offices, 5,000sqm, 1.5ha) | Valley Park | Greenfield | 1070 |

*Figure 2.1 River Test catchment showing the Test Valley Borough Council administrative boundary and proposed development sites*



# 3 Legislative and Policy Framework

## 3.1 Planning and the Water Framework Directive (WFD)

### 3.1.1 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

The Water Framework Directive 2000/60/EC (WFD) was transposed into UK law through the Water Environment (WFD) (England and Wales) Regulations 2017. These remain in force following the UK's withdrawal from the European Union under the amendments presented in the Floods and Water (Amendment etc.) (EU Exit) Regulations 2019.

The Water Environment Regulations require 'good ecological status' to be achieved in all surface freshwater bodies, i.e., having biological, chemical, and structural characteristics similar to those expected in nearly undisturbed conditions. Development proposals affecting the water environment may impact the biological, hydro morphological, physio-chemical and/or chemical quality elements. Impacts leading either to deterioration in the status of a water body or to the water body being unable to achieve its status objectives are unlikely to be permitted.

Current levels of water abstraction are causing or are at risk of causing environmental damage in various river catchments across Hampshire. Measures have been identified in the South East River Basin Management Plan (RBMP) to address this and have been allocated to the water companies for delivery through the Water Industry National Environment Programme for the period 2020-25.

### 3.1.2 Assessments of Developments

The duty to ensure that the requirements of the Water Environment Regulations are met by developers lies with the Environment Agency. Early engagement with the local planning authority, the Environment Agency and relevant water and sewerage companies can help to establish if water quality is likely to be a significant planning concern and, if it is, to clarify what assessment will be needed to support the application.

During the planning process a screening of the development is carried out, based on three issues, in this order of importance:

- Causing deterioration: Does the development have the potential to cause deterioration in the WFD status of a water body? What is the expected impact of additional loads of treated sewage effluent?
- Preventing improvements: Does the development prevent future improvement to the water body and therefore prevent it from reaching good ecological status/potential?
- Protecting and enhancing: Are there opportunities for development to assist with protecting and improving the ecological status of water bodies and meeting WFD objectives.

Where water quality has the potential to be a significant planning concern an applicant should be able to explain how the proposed development would affect a relevant water body in a river basin management plan and how they propose to mitigate the impacts. Applicants should provide sufficient information for the local planning authority to be able to identify the likely impacts on water quality. The information supplied should be proportionate to the nature and scale of development proposed and the level of concern about water quality.

In those cases where it is likely that a proposal would have a significant adverse impact on water quality then a more detailed assessment will be required, alongside liaison with the water company. The water company will assess whether there is sufficient capacity within the existing infrastructure to accommodate foul flows from the site and within the sewerage catchment. If there is insufficient capacity to accommodate foul flows, then a detailed site wide Foul Water Drainage Strategy shall be submitted to and agreed in writing by the local planning authority. The strategy should include the phasing of such works.

The assessment and drainage strategy should form part of the environmental statement if one is required because of a likely significant effect on water. Development which may require further assessment includes, but is not limited to:

- Development within 20 metres of a watercourse where changes are proposed to the channel or bank form or where the long-term management of the watercourse would be affected;
- Development requiring EIA for reasons linked to the water environment;
- Where WRC/WTW capacity is at or close to permitted DWF capacity;
- New water infrastructure; and
- Developments on contaminated land

Deterioration can be mitigated and multiple benefits for people and the environment can be achievable through good design such as SuDS, green infrastructure, and river restoration. For example, flood risk can be reduced, and biodiversity and amenity improved by designing development that includes permeable surfaces and other sustainable drainage systems, removing artificial physical modifications and recreating natural features. Water quality can be improved by protecting and enhancing green infrastructure.

Test Valley Borough Council produces annual Authority Monitoring Reports (AMR) which provide a review of performance in the delivery of the Local Plan policies. The latest AMR covers the period 1st April 2022 to 31st March 2023.

## 3.2 National Planning Policy Framework

A WCS is not a requirement of the NPPF. However, the NPPF states that strategic policies in development plan documents should make ‘sufficient provision’ for infrastructure for water supply and wastewater, and planning practice guidance states that a water cycle study can help in the preparation of a plan for sustainable growth.

## 3.3 Building Regulations and Optional Technical Standards

In 2013-2014 the Government undertook a significant amendment to the existing Building Regulations, carrying out a Housing Standards Review followed by a Ministerial Statement on Building Regulations and related notes in March 2014. The initiative aimed to simplify government regulations and multiple local standards into one key set of ‘tiered’ standards in relation to Access, Security, Water, Energy and Space. Significantly, the Ministerial Statement proposed to introduce a new, tighter (Housing) Optional Technical Standard for water efficiency to be set at 110 litres/person/day (l/p/d) to replace the existing water consumption target of 125 l/p/d.

The NPPF enables LPAs to set out optional water efficiency requirements in a Local Plan, with the aim of improving efficiency standards for new development where it can be demonstrated there is a clear need. Given the location of the Test Valley in an area of water stress, the draft Local Plan by Test Valley has proposed a more stringent water efficiency requirement of 100 l/p/d.

In addition, the Water Act 2003 (s.83) states that “in exercising its function and conducting its affairs, each public authority shall take into account, where relevant, the desirability of conserving water supplied or to be supplied to premises.”

An investigation by the Environment Agency and the Energy Saving Trust found that as sustainable building standards are tightened in new homes, $CO_2$ emissions from hot water use are likely to form a progressively larger component of overall household emissions and may eventually exceed emissions from heating the home. It also found that more efficient water use could contribute to lower $CO_2$ emissions.

# 4 Water Resources and Supply

## 4.1 Introduction

The Test Valley Catchment is located primarily within Southern Water's Resource Zones for both the northern and southern catchments of the river. The area was classified in 2021 by the Environment Agency as being under "serious water availability stress" in their 'Water stressed areas final classification 2021' document (Water stressed areas policy, Environment Agency 2021). Southern Water is responsible for the supply of potable water and treatment of waste/sewage for the entire Test Valley Catchment. For the purposes of this WCS, five of the relevant WwTW within the catchments are being included as indicated in Figure 4.1.

For the northern Test Valley catchment, 100% of Southern Water's water resource comes from groundwater sources and falls within the SW Hants Andover, Hants Winchester, and Hants Rural zones. For the southern catchment, 52% of the water is abstracted from the river and 48% is from groundwater sources in Southampton East, and 100% of the water is abstracted from the river in Southampton West water resource zone.

The company has predicted that "competing priorities" and increased risk of drought would put a strain on the network in its draft Water Resources Management Plan 2024. Long-term forecasts for population increase were "being realised" and visitor numbers were also expected to rise, further increasing water demand.

### 4.1.1 Catchment Abstraction Management Strategy (CAMS)

A Catchment Abstraction Management Strategy (CAMS) sets out how the Environment Agency will manage water abstraction in each catchment. CAMS documents describe where water is available for abstraction, the implications that water resource availability has for new and existing water abstraction licences, and contributes to the Water Framework Directive (WFD) by:

- Providing a water resource assessment of rivers, lakes, reservoirs, estuaries, and groundwater;
- Identifying water bodies that fail the flow conditions expected to support good ecological status;
- Preventing deterioration of water body status due to new abstractions; and
- Providing results which inform River Basin Management Plans (RBMPs).

### 4.1.2 Test and Itchen Abstraction Licencing Strategy

The study area falls within the Test and Itchen catchment licensing strategy (Environment Agency, 2019). The Test and Itchen catchments together cover an area of almost 1675 square kilometres within Hampshire and a significant part of both catchments is underlain by chalk. The characteristic flow regimes and drainage patterns give rise to several seasonal winterbournes which dry up for periods along some stretches. The water company abstracts significant volume of water for **public water supply** from **groundwater sources** in the upper and middle reaches. The rivers support agriculture including watercress farms and fish farms. The biodiversity and quality of habitats along the rivers and much of the coastal water around Southampton are nationally and internationally protected. This strategy is set within the context of the water resources, pressures faced and the assigned designations. The aim is to ensure that River Basin Management Plan objectives for water resources activities are met and deterioration within this combined catchment is avoided.

#### 4.1.2.1 Surface water resource availability

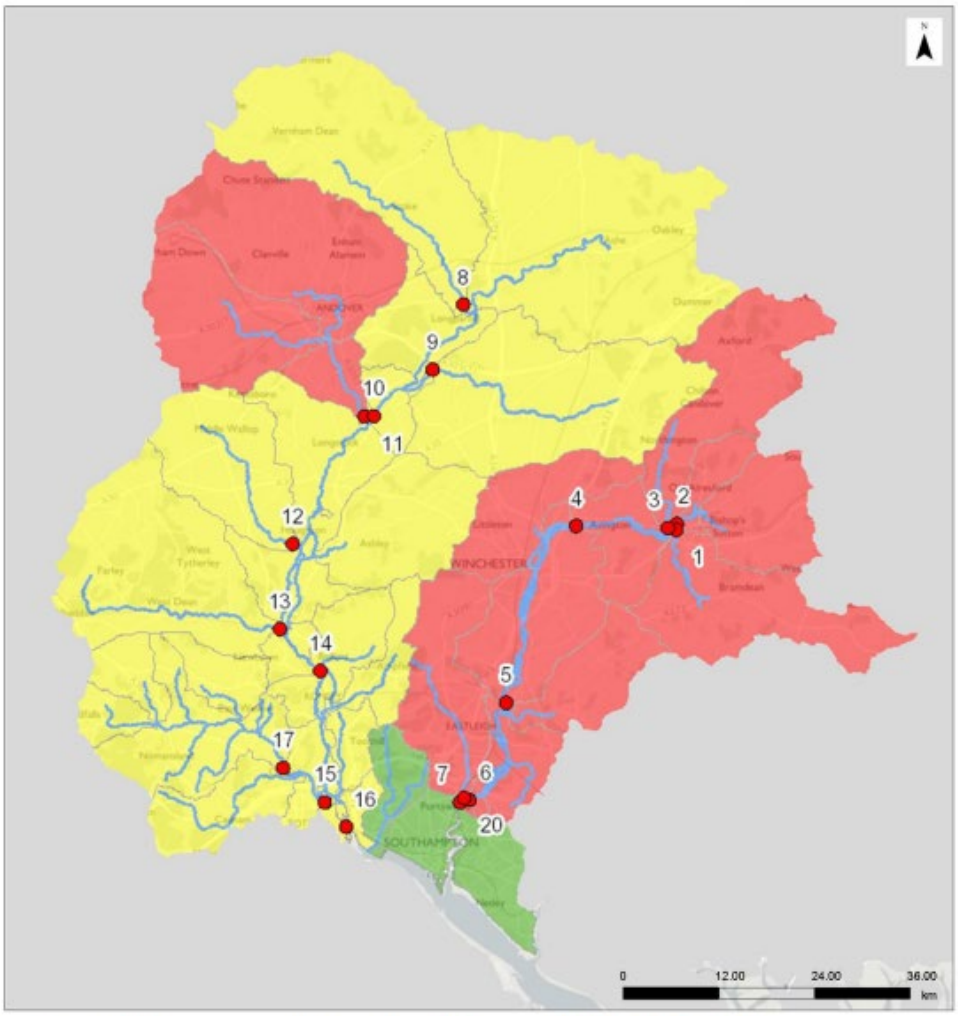
The Environment Agency has assessment points along both rivers to monitor flow at various times. Water resource availability is calculated by four different flow rates:

- Q95 - the flows which are exceeded on average for 95% of the time i.e., low flow.
- Q70 - the flows which are exceeded 70% of the time.
- Q50 – the flows which are exceeded 50% of the time i.e., median flows.
- Q30 – the flows which are exceeded 30% of the time i.e., higher flow.

**Figure 4.1** shows water resource availability at Q95 for Test and Itchen during dry weather periods. Environment Agency assessment points (AP) numbered 8 to 17 are in the River Test catchment. The areas highlighted in red indicate severe water stress/water unavailable, e.g., the River Anton at Fullerton.

The categories of resource availability status are shown in the **Table 4-1**. The classification is based on an assessment of a river system's ecological sensitivity to abstraction-related flow reduction (Environment Agency, 2019). The classification can later be used to assess the potential for additional water resource abstractions. The classification for each of the Water Resource Management Units (WRMU) in the catchment has been summarised for surface water bodies in **Table 4-2**.

*Figure 4.1 Water source availability at Q95 (low flow) for Test and Itchen ALS*






Legend:

- Assessment Points
- Rivers

Water Availability at Q95:

- Water available
- Restricted water available
- Water not available

*Table 4-1 Water resource availability status categories*

| Indicative resource availability status | Licence availability |
|---|---|
| Water available for licensing | There is more water than required to meet the needs of the environment.<br>New licences can be considered depending on local and downstream impacts. |
| Restricted water available for licencing | Full Licensed flows fall below the Environmental Flow Indictors (EFIs).<br><br>If all licensed water is abstracted there will not be enough water left for the needs of the environment.<br><br>No new consumptive licences would be granted. It may also be appropriate to investigate the possibilities for reducing fully licensed risks. Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder, although it may be for reduced quantities. |
| No water available for licencing | Recent actual flows are below the EFI. This scenario highlights water bodies where flows are below the indicative flow requirement to help support Good Ecological Status (as required by the Water Framework Directive).<br><br>No further consumptive licences will be granted. Water may be available if you can buy (known as licence trading) the amount equivalent to recently abstracted from an existing licence holder. Any water rights trading proposal in these water bodies would need to demonstrate improvements in flow. |

*Table 4-2 Surface water Resource availability classification (Source; Environment Agency, 2019)*

| River – WRMU (Number refers to the location in Figure 5.2). | CAMS Area | Surface water (flow exceedance scenarios) | | | |
|---|---|---|---|---|---|
| | | Q30 (Flow exceeded 30% of the time) | Q50 (Flow exceeded 50% of the time) | Q70 (Flow exceeded 70% of the time) | Q95 (Flow exceeded 95% of the time) |
| 1 – Sewards Bridge GS | Itchen | | | | |
| 2 – Drove Lane GS | | | | | |
| 3 – Borough Bridge GS | | | | | |
| 4 – Easton GS | | | | | |
| 5 – Allbrook & Highbridge GS | | | | | |
| 6 – Riverside Park GS | | | | | |
| 7 – Itchen Total | | | | | |
| 20 – Monks Brook | | | | | |
| 8 – Bourne GS | Test Lower and Southampton Streams | | | | |
| 9 – Bransbury GS | | | | | |

| River – WRMU (Number refers to the location in Figure 5.2). | CAMS Area | Surface water (flow exceedance scenarios) | | | |
|---|---|---|---|---|---|
| | | Q30 (Flow exceeded 30% of the time) | Q50 (Flow exceeded 50% of the time) | Q70 (Flow exceeded 70% of the time) | Q95 (Flow exceeded 95% of the time) |
| 10 – Chilbolton GS | | | | | |
| 11 – Fullerton GS | | | | | |
| 12 – Bossington GS | | | | | |
| 13 – Dunbridge GS | Test Upper and Middle | | | | |
| 14 – Timsbury Bridge GS | | | | | |
| 15 – Blackwater Total | | | | | |
| 16 – River Test Total | | | | | |
| 17 – Ower GS | | | | | |

#### 4.1.2.2 Groundwater resource availability

Groundwater availability is a measure of how much groundwater is available for abstraction after the river flow requirements for ecology have been met. Groundwater availability inside the catchment area is determined by an assessment that considers:

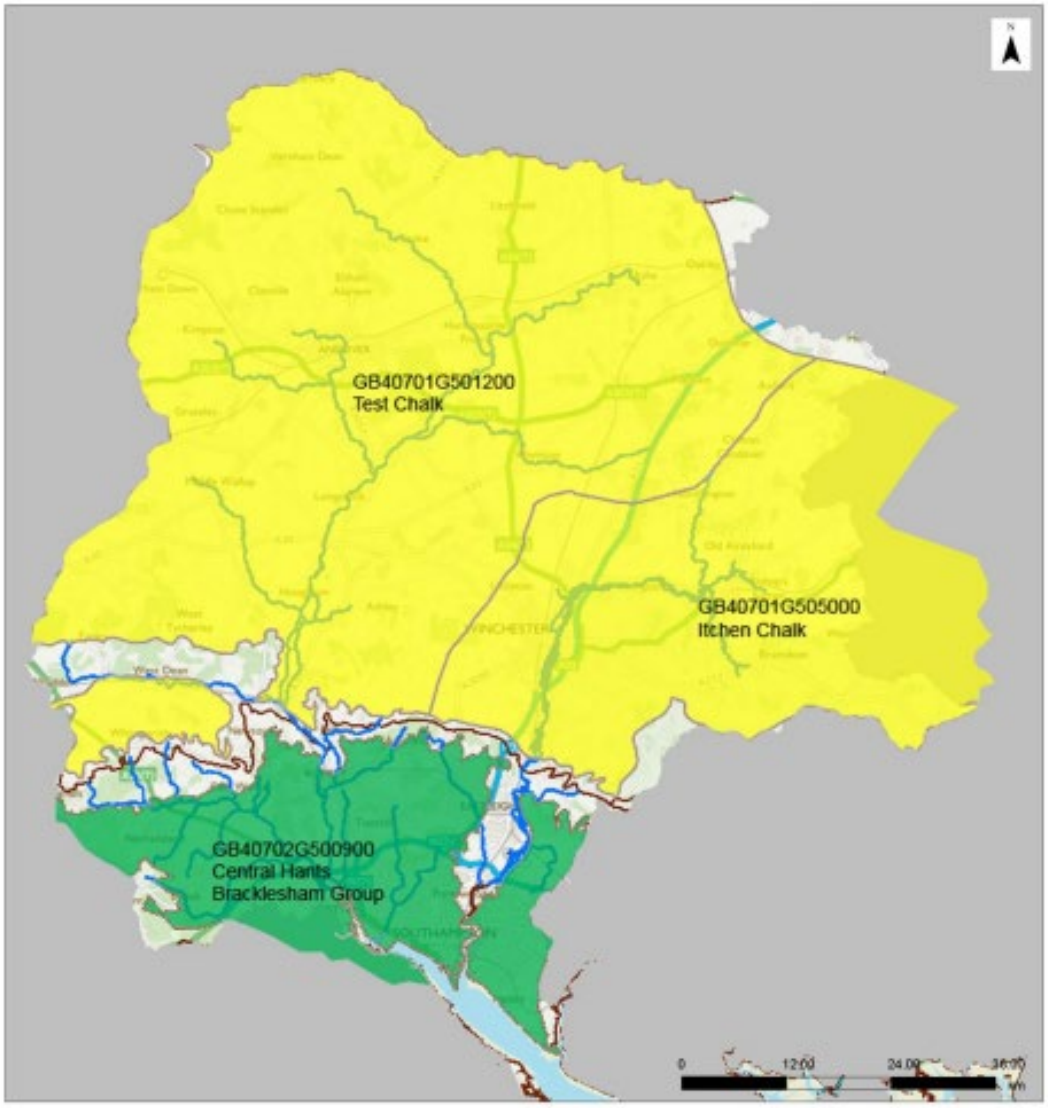
- The recharge to that groundwater body;
- The groundwater contribution to rivers crossing that groundwater body;
- The flow needed to support ecology.

The Test and Itchen catchment comprises three groundwater bodies:

- River Test Chalk – Primarily covers the upper and middle reaches of the River Test catchment and includes settlement areas such as Andover and Ludgershall.
- River Itchen Chalk - Covers the upper and middle reaches of the River Itchen and includes Winchester.
- Central Hants Bracklesham Group - Includes key areas such as Southampton, Eastleigh and Romsey.

**Figure 4.2** shows Groundwater resource availability. The areas highlighted in yellow indicate there are restrictions on water available for licensing. The categories of resource availability status are shown in **Table 4-3**. The resource availability for each groundwater body in the catchments is shown in **Table 4-4**.

*Figure 4.2 Groundwater resource availability for Test and Itchen ALS*






Legend:

- Assessment Points
- Rivers

Water Availability for groundwater:

- Water available
- Restricted water available

*Table 4-3 Groundwater resource availability status categories*

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

*Table 4-4 Groundwater resource availability (Source; Environment Agency, 2019)*

| Groundwater body | Groundwater body ID | Ground water (resource availability) |
|---|---|---|
| River Test Chalk | GB40701G501200 | |
| River Itchen Chalk | GB40701G505000 | |
| Central Hants Bracklesham Group | GB40702G500900 | |

### 4.1.3 Abstraction Management

#### 4.1.3.1 Surface Water

The River Test catchment and its tributaries are constrained by hands off flow (HOF) restriction for water availability by AP16 which is the most downstream point. To protect flows in the riverine and coastal protected sites, abstraction is only considered when flows are sufficiently high across the catchment. These conditions specify that if the flow in the river drops below what is needed for environmental protection, abstraction must reduce or stop.

**Table 4-5** gives an indication of how much water is available for further abstraction and the associated restrictions that may apply to new and varied abstraction licences from the main river.

*Table 4-5 Potential HOF restrictions that may be applied to abstraction licences*

| Assessment Point (AP) River Test River Test | Name | Water Resource Availability | HOF Restriction (Ml/d) | Number of days per annum abstraction may be available | Approx volume available at restriction (Ml/d) | Additional restrictions |
|---|---|---|---|---|---|---|
| 8 | Bourne GS | Restricted water available for licensing | 29 | 266 | 7.5 | HOF@AP16 |
| 9 | Bransbury GS | Restricted water available for licensing | 56 | 266 | 18 | HOF@AP16 |
| 10 | Chilbolton GS | Restricted water available for licensing | 344 | 266 | 23 | HOF@AP16 |
| 11 | Fullerton GS | Restricted water available for licensing | 9 | 208 | 6 | To protect flows in lower River Test |
| 12 | Bossington GS | Restricted water available for licensing | 15 | 266 | 7 | HOF@AP16 |
| 13 | Dunbridge GS | Restricted water available for licensing | 47 | 266 | 12 | HOF@AP16 |
| 14 | Timsbury Bridge GS | Restricted water available for licensing | 621 | 266 | 23 | HOF@AP16 |
| 15 | Blackwater Total | Restricted water available for licensing | 70 | 266 | 18.5 | HOF@AP16 |
| 16 | River Test Total | Restricted water available for licensing | 647 | 266 | 23 | To protect flows in River Test SSSI and Solent Maritime SAC |
| 17 | Ower GS | Restricted water available for licensing | 20 | 266 | 7.5 | HOF@AP16 |

The flows in the River Anton (10 on map) catchment are impacted by a major water abstraction by the Southern Water treatment works that supplies potable water to Andover, and a Wastewater Treatment Works discharge at Fullerton. These influences serve to deplete the River Anton. The Environment Agency is investigating the impact of abstraction and licence changes were being implemented.

The Environment Agency state that they will not grant further abstraction licences in those areas the groundwater unit balance shows more water has been abstracted based on the amount available, thus restricting the supply of potable water for human consumption.

In addition, there are abstraction constraints in the River Anton and Pillhill Brook catchments at moderate flows.

The constraints at relevant assessment points limit the opportunity for abstraction which means that no new unconstrained licences will be granted within the Test catchment.

#### 4.1.3.2 Groundwater

Groundwater abstractions can directly impact on surface water flows and reduce river base flow levels. The impact of reduced flows is measured at the surface water assessment point. In such conditions, restrictions may be applied to abstraction licences included Hands off Level (HOL) conditions. The HOL is the groundwater level below which the abstraction of water is to be reduced or stopped to protect the environment.

- River Test Chalk: Restricted water available. Analysis indicates that there is very little scope for further abstraction that would not cause additional impacts on sensitive water features. Therefore, the Environment Agency state “there is a presumption against new consumptive groundwater abstractions from the Chalk”.
- Central Hants Bracklesham Group: Water available for licensing. New abstraction licences can be considered depending on impacts on surface water and other abstractors. The Environment Agency will decide on a case-by-case basis.

## 4.2 Status of Groundwater Bodies

The Test Valley Borough is underlain by four groundwater bodies, as defined in the South East River Basin Management Plan (Environment Agency, 2022) and set out on the Catchment Data Explorer (Environment Agency, 2023). The quantitative status of each water body is summarised in **Table 4-6**.

The River Test Chalk, Central Hants Lambeth Group and Central Hants Bracklesham Group water bodies are all at good quantitative status. This demonstrates that abstraction does not currently result in pressures on the quantity of groundwater that are sufficient to result in adverse impacts to groundwater dependent surface waters or ecosystems, does not result in saline intrusion, and does not adversely affect the water balance at a water body scale. However, abstraction for potable water from the River Itchen Chalk results in pressures on connected surface water bodies (i.e., the River Itchen and other chalk streams that are supported by the underlying Chalk aquifer).

*Table 4-6: Quantitative Status of Groundwater Bodies underlying Test Valley District (Environment Agency, 2023)*

| Water Body | Quantitative Status (overall) | Dependent Surface Water Body Status | Groundwater Dependent Terrestrial Ecosystems | Saline Intrusion | Water Balance |
|---|---|---|---|---|---|
| River Test Chalk (GB40701G501200) | **Good** | Good | Good | Good | Good |
| River Itchen Chalk (GB40701G505000) | **Poor** | Poor | Good | Good | Good |
| Central Hants Lambeth Group (GB40702G503800) | **Good** | Good | Good | Good | Good |
| Central Hants Bracklesham Group (GB40702G500900) | **Good** | Good | Good | Good | Good |

## 4.3 Water Stress Classification for England and Wales

The Environment Agency and Natural Resources Wales have reviewed the current and future water usage and climate change scenarios, to provide an indicative water stress classification for areas in England and Wales. Water stress is defined as:

*"Water stress in a region is when the demand for potable water exceeds the amount of water available for supply during a certain period. This can be caused by factors such as a lack of effective rainfall, over exploitation of aquifers and surface water sources, resulting in deterioration of fresh water resources in terms of quantity and quality because of organic matter pollution, eutrophication or saline intrusion (European Environment Agency 2023)."*

High population density and high levels of demand increase the pressure on available supplies, as well as environmental factors such as local water resource availability.

Two assessments of water stress are undertaken. The first relates to the water companies' stress, in which the following criteria were used to determine the relative level of water stress for water company areas:

- Current per capita demand for water[1] ;
- Forecast growth in per capita demand for water;
- Forecast population growth;
- Current water resource availability; and
- Forecast resource availability.

The Environment Agency states in the final classification 2021 on water stressed areas:

*"Water stress applies both to the natural environment and to public water supplies. Both will be affected by climate change. Public water supplies are under pressure from reductions in abstraction to make them more environmentally sustainable. There is also a need to make public water supplies more resilient to droughts and meet additional demands associated with development and population growth".*

The water stress methodology provides an indication of relative water stress in individual water company areas by assessing the degree to which the resources in each water body within the area are exploited.

There have been two classifications on water stress for each supply area carried out by the Environment Agency. The first is water stress for 'metering' (consumer water meters) and the second is 'water body' stress which are both classed as high as discussed below. see Annex 1 of 'Environment Agency Water stressed areas - final classification 2021'.

Water companies are required to better manage the volume of water they supply, due to fresh water supplies coming under increasing pressure, especially in water stressed areas and due to higher demand in peak season, i.e., summer/drought. To manage this, water companies need to measure the volume of potable water supplied to each property with the aim to reduce the volume of water used and accurately inform on usage per person per day. Water meters installed in new property developments and retrofitted in older properties allow accurate data to be used.

The water bodies within the Test Valley are classed as being under **serious water stress,** indicating that the level of stress placed on the water environment using water through abstraction, discharge and management of storage is significantly high. The population change, and development proposed in the Local Plan would have an impact on the level of water stress for both the water company and the water bodies.

## 4.4 Water Resources Management Plan (WRMP)

Water companies are obliged to produce water resources management plans (WRMPs) every 5 years, with the current draft plans, published in 2023, setting out how the companies will maintain customer supplies over the period 2020-2045. The regulatory assessments show which companies have been identified as having sufficient supplies, within present legislation, to meet growth. They also show any strategic schemes that are needed to achieve this, along with reducing demands and leakage.

Southern Water's draft WRMP (dWRMP) 2024 shows how the company plans to maintain the balance between water supplies and demand. It also provides robust justification for securing a tighter water efficiency standard and shows the water company's plans to meet the longer-term challenge of population increase, climate change and growing environmental need.

The dWRMP is the result of a comprehensive water resource planning exercise and consultation with stakeholders. Established cost-benefit and cost-effectiveness methods have been applied to assess supply-demand needs and the uncertainties regarding the future have been covered using target headroom allowances. The process allows identification of priority actions to optimise economic and water resources.

### 4.4.1 Southern Water's Priorities for the Future

In the dWRMP, SW's pledge to put in place an overall strategic approach and vision for the next 25 years. This will form an essential basis to create sustainable plans for the future of the region with the challenge of meeting increasing demand and adapt to climate change while protecting the environment. The company plans to champion the following issues:

- **Efficient water uses with minimal wastage** – working with stakeholders to encourage home improvement grants to allow the installation of rainwater harvesting and grey water collection equipment. This should reduce the need for potable water to wash driveways and water gardens etc. To cut leaks by at least 50% by 2050.
- **Nurturing the environment** – catchment level commitment to increase restoration and nature-based solutions to improve the environment. Address abstraction constraints at sensitive locations to protect river levels and the wildlife that depends on water habitats.

- **New water sources to provide resilient and sustainable supplies** – commitment to provide water for all needs. To develop a diverse mix of water resource solutions including:
    - Desalination;
    - Building in greater capacity to the network by building more reservoirs and facilitating transfers of water to where it is most needed;
    - Better interconnection facilitating greater transfers of water; and
    - Water recycling.
- **A resilient infrastructure** – a network to meet the challenge of climate change boosted by the decarbonisation of operations and investments.
- **Working with household and business customers and stakeholders** – commitment to encourage thriving communities by ensuring affordable bills. Seeking active community participation to help understand and address their needs. Working with local partners to deliver shared objects for people and the environment.

### 4.4.2 Existing Situation

Based on Southern Water's draft Water Resources Management Plan (dWRMP 2024), the existing water resources and associated supply infrastructure in the Test Valley water resources zones will be unable to accommodate the anticipated increase in demand and supply needed for any of the proposed sites without adequate water demand management, improved water treatment works infrastructure, transfers between adjacent Resource Zones and more stringent water quality permits.

## 4.5 Impact of Development on Water Resources

### 4.5.1 Baseline Supply Demand Balance

Test Valley's adopted Local Plan (2016) is ambitious and the Council plans to build a minimum of 5,292 new homes with a 40% provision for affordable housing delivery where possible between 2020 and 2029. As per the Draft Local Plan 2040, the borough requires 11,000 homes between 2020 and 2040, averaging approximately 550 homes annually. Adequate water resources for households and non-household customers will have to be factored in for the additional homes and infrastructure needed to be living and working within the region.

The increase in population will require more land to be cultivated for crops, for livestock and irrigation needs. There are growing concerns and expectations of customers and the regulators that the landscape will be preserved, and any future work carried out will not be detrimental, but beneficial to nature. This means more stringent targets will need to be met to minimise the effect of human development on the environment.

There are targets imposed by the government for its 25-year plan to 2050 which require the environment to be improved for future generations within a generation. This means water companies are to reduce leakage by half and per capita consumption by a quarter. Water companies are also required to have plans in place to reduce abstractions from rivers going forward to meet Government's objectives. During periods of water stress and drought, this plan is to facilitate resilience and security of supply.

**Deployable output changes**:

- Andover – reduction in Peak Deployable Output (PDO) of -1.48 Ml/d (mega litres per day) from 2023-24. This is to reflect a revised reliable yield due to a hydraulic constraint.
- Near Whitchurch – increase in Minimum Deployable Output (MDO) and PDO of 0.79 Ml/d in a 1-in-200-year drought scenario from 2023-24 to reflect new infrastructure.

*Table 4-7: Deployable Dry Year Annual Average (DYAA), Dry Year Critical Period (DYCP) and Annual Licensed quantity of the WRZs that cover the WwTW (Source: Southern Water)*

| WRZ | DYAA deployable output (Ml/d) | DYCP deployable output (Ml/d) | Annual licensed quantity (Ml/d) |
|---|---|---|---|
| Andover (HAZ) | 22.86 | 24.8 | 16.02 |
| South Hampshire Rural (HRZ) | 10.35 | 10.35 | 13.68 |
| Southampton West (HSW) | 0 | 0 | 80 |

Tables below correspond to the WRZ table summaries from the draft WRMP (Southern Water, 2024) for the baseline supply-demand and the preferred final plan supply-demand scenario by Southern Water.

### Baseline DYAA and DYCP

Andover WRZ, that encompasses the Fullerton WwTW areas this shows a forecast surplus of 4.71Ml/d Dry Year Annual Average (DYAA) and 3.41Ml/d Dry Year Critical Period (DYCP) supply and demand balance by the end of this AMP cycle. The South Hampshire Rural WRZ, that encompasses Romsey WwTW and surrounding areas, there is a forecasted 0.6Ml/d DYAA and 1.07Ml/d DYCP supply and demand balance by the end of this AMP cycle. Both WRZs DYAA supply demand baseline balance is in deficit by AMP cycle 9 and both the WRZs DYCP are in deficit by AMP cycle 10.

Southampton West WRZ, that encompasses the Chickenhall Eastleigh WwTW, forecast a large deficit in this AMP cycle of -41.12 Ml/d DYAA and -48.77Ml/d DYCP. Both the DYAA and DYCP across the next 6 AMP cycles are predicted to have a deficit for Southampton West WRZ supply-demand balance.

*Table 4-8 Andover WRZ baseline supply demand balance to 2050 for the baseline Dry Year Annual Average (DYAA) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Andover | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 22.63 | 19.61 | 14.22 | 8.14 | 7.09 | 7.09 |
| Net transfers into Area (Ml/d) | -0.33 | -0.33 | -0.33 | -0.33 | -0.33 | -0.33 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 22.3 | 19.28 | 13.89 | 7.81 | 6.76 | 6.76 |
| Total DYAA Distribution Input (Ml/d) | 16.89 | 16.68 | 16.6 | 16.66 | 16.64 | 16.63 |
| Total DYAA Target Headroom (Ml/d) | 0.69 | 0.71 | 0.72 | 0.44 | 0.44 | 0.43 |
| DYAA supply-demand balance (Ml/d) | 4.71 | 1.89 | -3.43 | -9.29 | --10.32 | -10.3 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-9 Andover WRZ baseline supply demand balance to 2050 for Dry Year Critical Period (DYCP) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Andover | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYCP Water available for use: Area sources* (Ml/d) | 24.37 | 24.37 | 24.37 | 6.85 | 6.85 | 6.85 |
| Net transfers into Area (Ml/d) | -0.41 | -0.41 | -0.41 | -0.41 | -0.41 | -0.41 |

| Andover | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYCP Water available for use: including transfers* (Ml/d) | 23.96 | 23.96 | 23.96 | 6.44 | 6.44 | 6.44 |
| Total DYCP Distribution Input (Ml/d) | 20.02 | 19.64 | 19.62 | 19.76 | 19.84 | 19.94 |
| Total DYCP Target Headroom (Ml/d) | 0.69 | 0.69 | 0.69 | 0.49 | 0.49 | 0.46 |
| DYCP supply-demand balance (Ml/d) | 3.41 | 3.62 | 3.65 | -13.82 | --13.89 | -13.97 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-10 South Hampshire Rural WRZ baseline supply demand balance to 2050 for dry year annual average (DYAA) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| South Hampshire Rural | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 8.75 | 8.75 | 5.3 | 5.3 | 5.3 | 5.3 |
| Net transfers into Area (Ml/d) | 0 | 0 | 0 | 0 | 0 | 0 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 8.75 | 8.75 | 5.3 | 5.3 | 5.3 | 5.3 |
| Total DYAA Distribution Input (Ml/d) | 7.63 | 7.44 | 7.33 | 7.45 | 7.58 | 7.75 |
| Total DYAA Target Headroom (Ml/d) | 1.12 | 1.31 | -2.03 | -2.15 | -2.28 | -2.45 |
| DYAA supply-demand balance (Ml/d) | 0.64 | 0.82 | -2.51 | -2.53 | --2.65 | -2.80 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-11 South Hampshire Rural WRZ baseline supply demand balance to 2050 for Dry Year Critical Period (DYCP) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| South Hampshire Rural | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 8.78 | 8.78 | 8.78 | 5.33 | 5.33 | 3.33 |
| Net transfers into Area (Ml/d) | 0 | 0 | 0 | 0 | 0 | 0 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 8.78 | 8.78 | 8.78 | 5.33 | 5.33 | 3.33 |
| Total DYAA Distribution Input (Ml/d) | 8.54 | 8.35 | 8.26 | 8.4 | 8.57 | 8.78 |
| Total DYAA Target Headroom (Ml/d) | 0.36 | 0.37 | 0.36 | 0.27 | 0.27 | 0.24 |
| DYAA supply-demand balance (Ml/d) | 1.07 | 0.06 | 0.16 | -3.34 | --3.51 | -3.69 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-12 Southampton West WRZ baseline supply demand balance to 2050 for the baseline Dry Year Annual Average (DYAA) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Southampton West | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 0 | -0.17 | -0.17 | -0.17 | -0.17 | -0.17 |
| Net transfers into Area (Ml/d) | 0 | -10 | -10 | -10 | -10 | -10 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 0 | -10.17 | -10.17 | -10.17 | -10.17 | -10.17 |
| Total DYAA Distribution Input (Ml/d) | 34.1 | 34.34 | 34.79 | 35.1 | 35.41 | 35.78 |
| Total DYAA Target Headroom (Ml/d) | 3.72 | 3.33 | 3.09 | 1.23 | 1.24 | 1.26 |
| DYAA supply-demand balance (Ml/d) | -41.12 | -47.84 | -48.04 | -46.5 | -46.82 | -47.2 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-13 Southampton West WRZ baseline supply demand balance to 2050 for Dry Year Critical Period (DYCP) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Southampton West | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 0 | -1.34 | -1.34 | -1.34 | -1.34 | -1.34 |
| Net transfers into Area (Ml/d) | 0 | -10 | -10 | -10 | -10 | -10 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 0 | -11.34 | -11.34 | -11.34 | -11.34 | -11.34 |
| Total DYAA Distribution Input (Ml/d) | 38.8 | 38.96 | 39.63 | 40.08 | 40.56 | 41.12 |
| Total DYAA Target Headroom (Ml/d) | 10.17 | 2.31 | 0.17 | 0.06 | 0.03 | 0.11 |
| DYAA supply-demand balance (Ml/d) | -48.77 | -52.6 | -51.14 | -51.48 | -51.93 | -52.97 |

** bulk imports, exports, and inter-zone transfers*

### Preferred Final Plan DYAA and DYCP

For Andover WRZ the Final Plan Option put forward by Southern Water shows a forecast surplus of 4.71Ml/d Dry Year Annual Average (DYAA) and 3.41Ml/d Dry Year Critical Period (DYCP) supply and demand

balance by the end of this AMP cycle. The South Hampshire Rural WRZ there is a forecasted 0.64Ml/d DYAA and deficit of -0.12Ml/d DYCP supply and demand balance by the end of this AMP cycle. Both WRZs DYAA supply demand balance does not go into deficit across AMP cycles 8 - 12 in this Final Plan option.

Southampton West WRZs Final Plan for DYAA and DYCP still predicts a large deficit for the end of this AMP cycle, but the forecasted final plan now predicts positive supply demand balances for AMP cycles 8-12.

*Table 4-14 Andover WRZ Final Plan supply demand balance to 2050 for the baseline Dry Year Annual Average (DYAA) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Andover | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 22.63 | 21.76 | 16.37 | 10.29 | 9.24 | 9.24 |
| Net transfers into Area (Ml/d) | -0.33 | -3.86 | -0.33 | 4.14 | 5.07 | 4.93 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 22.35 | 17.9 | 16.04 | 14.43 | 14.27 | 14.17 |
| Total DYAA Distribution Input (Ml/d) | 16.89 | 15.72 | 14.74 | 13.98 | 13.83 | 13.74 |
| Total DYAA Target Headroom (Ml/d) | 0.69 | 0.71 | 0.72 | 0.44 | 0.44 | 0.43 |
| DYAA supply-demand balance (Ml/d) | 4.71 | 1.46 | 0.58 | 0.0048 | 0.0018 | 0.0026 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-15 Andover WRZ Final Plan supply demand balance to 2050 for Dry Year Critical Period (DYCP) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Andover | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYCP Water available for use: Area sources* (Ml/d) | 24.37 | 27.42 | 27.42 | 9.9 | 9.9 | 9.9 |
| Net transfers into Area (Ml/d) | -0.41 | -0.41 | -0.41 | 7.21 | 7.12 | 7.1 |
| Total DYCP Water available for use: including transfers* (Ml/d) | 23.96 | 27.01 | 27.01 | 17.11 | 17.02 | 17.00 |
| Total DYCP Distribution Input (Ml/d) | 19.86 | 18.27 | 16.64 | 15.21 | 15.15 | 15.16 |
| Total DYCP Target Headroom (Ml/d) | 0.69 | 0.69 | 0.68 | 0.49 | 0.49 | 0.46 |
| DYCP supply-demand balance (Ml/d) | 3.41 | 8.04 | 9.68 | 1.41 | 1.39 | 1.38 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-16 South Hampshire Rural WRZ Final Plan supply demand balance to 2050 for dry year annual average (DYAA) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| South Hampshire Rural | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 8.75 | 10.49 | 11.84 | 11.84 | 11.84 | 11.84 |
| Net transfers into Area (Ml/d) | 0 | -3.04 | -0.14 | -4.2 | -4.2 | -4.2 |
| Total DYAA Water available | 8.75 | 7.45 | 11.70 | 7.64 | 7.64 | 7.64 |

| South Hampshire Rural | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| for use: including transfers* (Ml/d) | | | | | | |
| Total DYAA Distribution Input (Ml/d) | 7.63 | 6.96 | 6.42 | 6.17 | 6.23 | 6.36 |
| Total DYAA Target Headroom (Ml/d) | 1.12 | 0.49 | 5.28 | 1.47 | 1.44 | 1.27 |
| DYAA supply-demand balance (Ml/d) | 0.64 | 0 | 4.81 | 1.1 | -1.04 | 0.92 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-17 South Hampshire Rural WRZ Final Plan supply demand balance to 2050 for Dry Year Critical Period (DYCP) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| South Hampshire Rural | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 8.78 | 10.9 | 15.7 | 12.25 | 12.25 | 12.25 |
| Net transfers into Area (Ml/d) | 0 | -2.17 | -1.1 | -0.21 | -4.2 | -4.2 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 8.78 | 8.19 | 14.6 | 12.04 | 8.05 | 8.05 |
| Total DYAA Distribution Input (Ml/d) | 8.54 | 7.82 | 7.26 | 6.97 | 7.08 | 7.25 |
| Total DYAA Target Headroom (Ml/d) | 0.36 | 0.37 | 0.36 | 0.27 | 0.27 | 0.24 |
| DYAA supply-demand balance (Ml/d) | -0.12 | 0 | 6.99 | 4.8 | 0.71 | 0.56 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-18 Southampton West WRZ Final Plan supply demand balance to 2050 for Dry Year Critical Period (DYCP) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Southampton West | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYCP Water available for use: Area sources* (Ml/d) | -2.97 | 82.79 | 82.79 | 82.79 | 8.29 | 8.29 |
| Net transfers into Area (Ml/d) | 0 | -46.5 | -48.01 | -51.33 | 23.14 | 23.42 |
| Total DYCP Water available for use: including transfers* (Ml/d) | -2.97 | 36.29 | 34.78 | 31.47 | 31.44 | 31.71 |
| Total DYCP Distribution Input (Ml/d) | 34.44 | 33.06 | 31.66 | 30.17 | 30.13 | 30.37 |
| Total DYCP Target Headroom (Ml/d) | 3.82 | 3.33 | 3.09 | 1.23 | 1.24 | 1.26 |
| DYCP supply-demand balance (Ml/d) | -37.29 | 0.01 | 0.04 | 0.06 | 0.07 | 0.06 |

** bulk imports, exports, and inter-zone transfers*

*Table 4-19 Southampton West WRZ Final Plan supply demand balance to 2050 for Dry Year Critical Period (DYCP) conditions (deficits highlighted in red) (Source: dWRMP 2023, Southern Water)*

| Southampton West | 2024-25 (end of AMP7) | 2029-30 (end of AMP8) | 2034-35 (end of AMP9) | 2039-40 (end of AMP10) | 2044-45 (end of AMP11) | 2049-50 (end of AMP12) |
|---|---|---|---|---|---|---|
| Total DYAA Water available for use: Area sources* (Ml/d) | 0 | 83.4 | 83.4 | 83.4 | 8.9 | 8.9 |
| Net transfers into Area (Ml/d) | 0 | -43.71 | -26.3 | -37.89 | 25.65 | 26.16 |
| Total DYAA Water available for use: including transfers* (Ml/d) | 0 | 39.7 | 56.68 | 45.51 | 34.55 | 35.07 |
| Total DYAA Distribution Input (Ml/d) | 38.6 | 37.38 | 36.02 | 34.36 | 34.47 | 34.9 |
| Total DYAA Target Headroom (Ml/d) | 10.17 | 2.31 | 0.17 | 0.06 | 0.03 | 0.11 |
| DYAA supply-demand balance (Ml/d) | -48.77 | 0.01 | 20.49 | 11.1 | 0.06 | 0.06 |

** bulk imports, exports, and inter-zone transfers*

## 4.6 Proposed Strategy to Address Supply Deficit

Southern Water's dWRMP sets out a strategy for water resources which redresses the water supply deficit and allows sufficient additional capacity (referred to as 'headroom') for uncertainties in development and capacity. In the previous WRMP 2019, as part of the RAPID Gate 2 process, the final plan to resolve predicted deficits involved implementing a long-term and large-scale water resource solution. The preferred strategy from WRMP19 identified a 75Ml/d desalination plant on the West Southampton Coast as the main strategic resource option (SRO). During the progression of RAPID Gate 2, various environmental, planning, and socio-economic factors were considered, and a Future Needs Assessment was conducted. Through this process, and written into the current dWRMP, the West Southampton Coast desalination scheme was replaced with the Havant Thicket Winter Storage Reservoir Project (HTWSRP). This project was considered better value for customers and suited for meeting long-term regional supply requirements. Additionally, the plan included an agreement with Portsmouth Water Company (PWC) to develop and govern the development and operation of Havant Thicket Reservoir, which would bring in an additional 21Ml/d.

Lowering demand level to offset development is also a priority that Southern Water aims to achieve through a use a combined strategy of:

- Preventing and fixing leaks (15% reduction by 2025; 50% by 2050).
- Promoting water efficiency by installing smart meters can reduce water consumption by 3-5% over a year. Planned meter penetration from 88% to 92%.
- Deliver SW's Target 100 campaign to reduce personal water use to 100 litres per day by promoting community water efficiency.

**Target 100**

The Target 100 initiative involves adopting a policy for new developments including within Test Valley to achieve a per capita consumption (PCC) water efficiency goal of 100 litres per person per day (l/p/d) by 2040. This target is more stringent than the tighter optional Building Regulations' allowance of 110 l/p/d and is supported by the local water companies, such as Southern Water. The lower target considers the region's specific needs to adapt to climate change and address water stress. Southern Water has also recommended a further reduced target of 80 l/p/d for strategic developments where master planning can yield greater water savings. Although water neutrality is not a policy for Hampshire, achieving a reduced target aligns with water neutrality concepts, that should encourage developments to offset any increase in water demand by saving water elsewhere in the community. Regional water companies and the Environment Agency have expressed support for to achieve 80 l/p/d, as it aligns with climate change resilience and efforts to achieve 'Good' status for water bodies under the Water Framework Directive.

Further water supply options for 2025 to 2030, within the relevant WRZs, that are being explored in the dWRMP are:

- Additional import from PWC (additional 9Ml/d): Delivery expected 2024-2025
- Hampshire grid (reversible link HWZ-HAZ): Delivery expected 2027-2028
- Southampton link main (reversible link HSW-HSE): Delivery expected 2027-2028
- Romsey Town and Broadlands valve (HSW-HR reversible): Delivery expected 2024-2025

### 4.6.1 Impact of Climate Change on Water Resources

Work carried out by the UK Climate Impacts Programme (UKCIP) predicts that winter rainfall will increase whereas summer rainfall will decrease in future. In addition, increasing temperatures will reduce the length of the winter recharge season and increase water supply demand.

The impact of climate change has been analysed by Southern Water as part of their dWRMP 2024. The impact assessment confirmed that while the amount of rainfall received is more plentiful than many parts of the UK, it will becoming more concentrated and more intensive in just a few months of the year. More summers like 2022 will put pressure on resources, for example hotter, drier summers will mean more water is lost through evaporation during periods of high demand because of additional visitors to the region and the increased need for water. In extreme hot weather conditions with a lack of rainfall, the water resources in the water resource zones may suffer from depletion in not managed adequately to maintain supply. Therefore, there is the potential risk of drought measures being implemented to maintain supplies in extreme circumstances.

Working to understand what is changing and how to increase security of supply will leave the environment better than found. Two well-known options for conserving water are repairing leaks and Temporary Use Bans. Southern Water has been evaluating a blend of measures to support communities and the environment by identifying opportunities to improve how water is managed throughout the region by working with communities, co-create the dWRMP by working with all stakeholders, beneficiaries, and policy makers, aligning the plan with broader regional plans in the country, and working with nature.

# 5 Wastewater Collection, Treatment and Water Quality

## 5.1 Introduction

Southern Water is the provider for wastewater services to the parts of Test Valley District where the proposed development sites are located. These areas are served by multiple wastewater treatment works (**Figure 5.1**). WwTWs are permitted by the Environment Agency to operate within stipulated environmental guidelines such as stringent discharge water quality parameters and flow limits. Water quality monitoring requirements are set in place to prevent and minimise adverse effects such as pollution to the environment.

Through application of the best available technologies in terms of wastewater treatment, the reliable limits of conventional treatment (LCT) have been determined for the key parameters of Biochemical Oxygen Demand (BOD), ammonia and phosphate. These are provided in **Table 5-1**.

*Table 5-1 Reliable limits of conventional treatment technology for wastewater (Source; Permitted LCT Environment Agency, 2021)*

| Water Quality Parameters | LCT |
|---|---|
| Ammonia | 1.0 mg/l 95 percentile limit |
| BOD | 5.0 mg/l 95 percentile limit |
| Phosphate | 0.25 mg/l annual average |

## 5.2 Wastewater Infrastructure

### 5.2.1 Sewage and Wastewater Treatment Catchments

Southern Water's Drainage and Wastewater Management Plan (DWMP) establishes a strategy for upgrading the region's drainage and wastewater treatment systems, marking a pathway for future infrastructure investments. The foundational step in developing the DWMP is the risk-based catchment screening (RBCS) that assesses each sewer catchment against a set of 17 indicators set out in guidance by Water UK (**Table 5-2**). The guidance categorises and measures the level of current and/or potential risk or vulnerability in the sewer catchment to future changes from developments or climate change (**Table 5-3**). This assessment is used to determine if a sewer catchment progresses onwards to the Baseline Risk and Vulnerability Assessment (BRAVA) stage of the DWMP. It is from these 17 indicators that the specific planning objectives for each catchment is derived.

The planning objectives, and options to fulfil them, are evaluated by Southern Water at each sewage and wastewater treatment catchment. The evaluation process starts with a broad set of generic options, refined through collaboration with partner organisations, and set out into unconstrained options. These are filtered down to a set of 'feasible' options after screening for financial viability and effectiveness. Only those options demonstrating clear benefits then undertake a costing analysis by Southern Water. Resulting in the selection of preferred options that provide either the 'least cost' or 'best value' to achieve the planning objectives.

Southern Water's sewage and treatment catchment areas that fall within the Test Valley Borough Council area is Chickenhall Eastleigh, Fullerton, Romsey and Ludgershall (**Figure 5.1**). The indictor vulnerability to future changes (**Table 5-4**) and POs (**Table 5-5**) for these catchments are summarised below. Notably, the Ludgershall catchment is excluded from this level of detailed evaluation, being deemed not of sufficient size to warrant such assessment. For the Ludgershall sewage treatment, Southern Water has indicated that there are no planned options or future investments planned for this catchment.

*Figure 5.1: Southern Water Wastewater Treatment Works that will serve the proposed developments and the catchments they drain into*

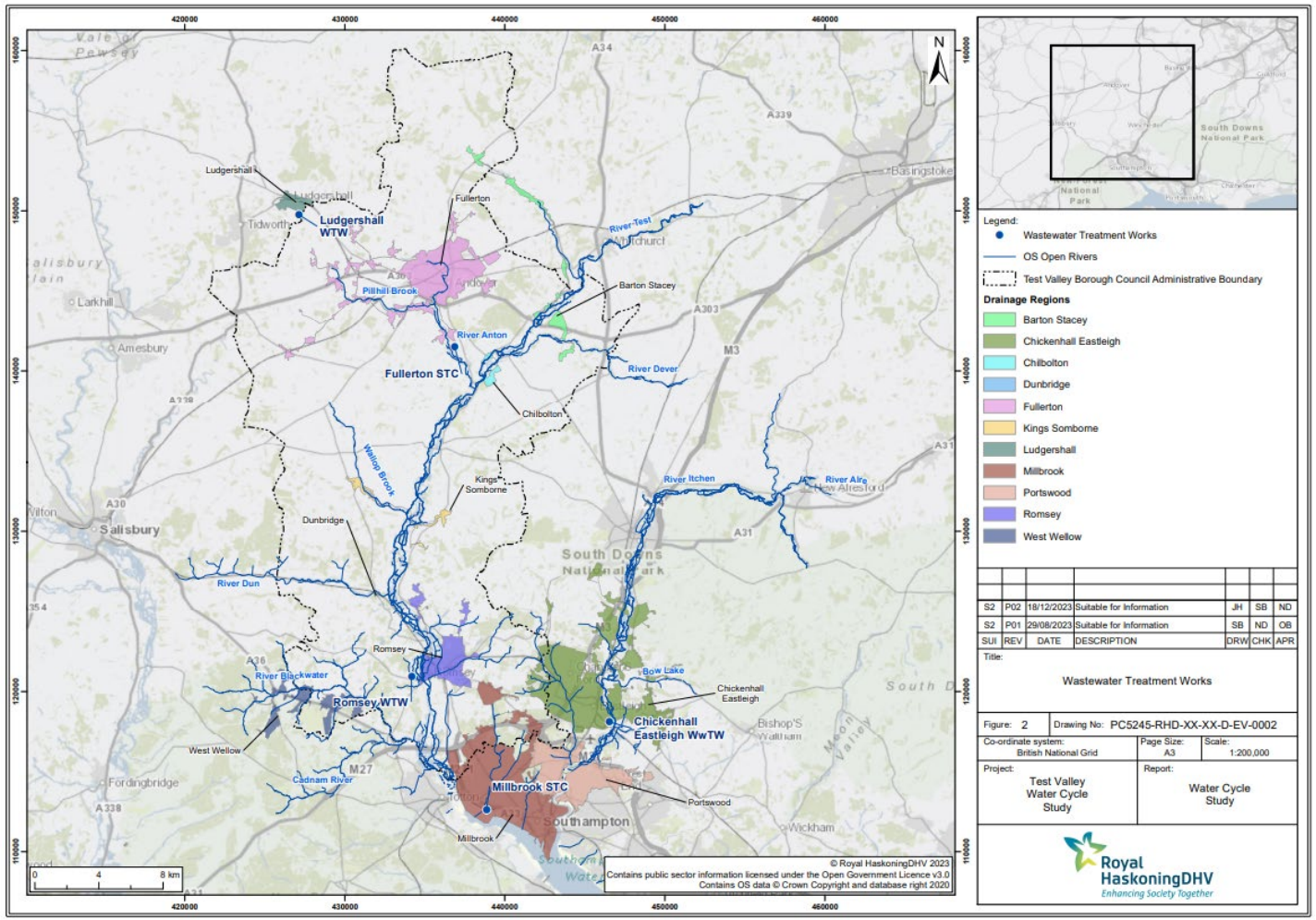


*Table 5-2 RBCS Indicators of risk in sewer catchments (Source; Southern Water 2020)*

| Indicator No. | Indicator | Description | Criteria for the indicator to flag as a concern and needing further investigation in the BRAVA stage |
|---|---|---|---|
| 1 | Catchment characterisation | This provides a mechanism to understand the vulnerability of the sewer catchment to sewer flooding because of an extreme wet weather event (defined as a 1-in-50-year storm event). | Catchment vulnerability score = 4 or 5 (i.e. the most vulnerable or sensitive to a one in 50 year storm) |
| 2 | Intermittent discharges impact upon bathing or shellfish waters | This is a mechanism to understand the significance of any impact of water company operations on bathing or shellfish waters. | Exceeding the permitted number of spills in each bathing water season, or per annum for shellfish waters. |
| 3 | Continuous or intermittent discharges impact upon other sensitive receiving waters (Part A) | This mechanism is to understand the significance of any impact of water company operations on sensitive receiving waters not addressed by other indicators. | 'Remedy' on Natural England's Designated Sites system (associated with freshwater pollution discharges or freshwater drainage). |
| 4 | Continuous or intermittent discharges impact upon other sensitive receiving waters (Part B) | A mechanism to understand the significance of any impact of water company operations on sensitive receiving waters not addressed by other indicators. | 'Threat' on Natural England's Designated Sites system (associated with water pollution). |
| 5 | Storm Overflow Assessment Framework (SOAF) | This considers the current / potential future activity to identify and address high spilling storm overflows. | If spill frequency investigation triggers are likely to be crossed within next five years. |
| 6 | Capacity Assessment Framework (CAF) | The measure provides an indication of capacity constraints in the sewer network. There are accepted issues around the confidence in outputs from the Initial CAF model which does not include for surface water inputs. | When categorised as 4 or 5 (due to performance, in full or part, within the catchment) will progress to the next stage of the process. |
| 7 | Internal sewer flooding | This is a common performance commitment by water companies to reduce flooding inside customer properties. It is a historical measure that records the number of internal flooding incidents per year, and it is indicative of | The number of incidents is more than one in total over the last three years (and other specific criteria depending upon size of sewer catchment). |

| Indicator No. | Indicator | Description | Criteria for the indicator to flag as a concern and needing further investigation in the BRAVA stage |
|---|---|---|---|
| | | capacity constraints within the sewer network. | |
| 8 | External sewer flooding | This is a common performance commitment by water companies to reduce flooding within the external curtilage of customer properties. It is a historical measure that records the number of external flooding incidents per year, and is indicative of sewer capacity constraints. | The number of incidents is more than 10 in total over the last three years (and other specific criteria depending upon size of sewer catchment). |
| 9 | Pollution incidents (categories 1, 2 and 3) | This is a historical measure that identifies incidents of unexpected release of contaminants that have resulted in environmental damage. Categorised in accordance with the 2017 definition in the Environmental Performance Assessment (EPA). | For any of the previous three years data, a category 1 or 2 pollution incident has occurred. |
| 10 | WwTW quality compliance | This is a historical measure relating to the performance of the wastewater treatment works (WwTWs). | In any of the previous three years, the WwTW discharge has been confirmed as failing and was included as such in the calculation of overall permit compliance. |
| 11 | WwTW dry weather flow compliance (DWF) | This is a historical measure of compliance with DWF permits at WwTWs. | Has the Q90 of the measured yearly flows exceeded the DWF permit condition on two consecutive years in the last five years? Or is the works at risk of exceeding its flow permit conditions? |
| 12 | Storm overflows | A measure that focuses on using available data to examine permit risks that have not been captured by other indicators (e.g., pass forward flow conditions). | Is there evidence to indicate that over the last three years any overflow is not operating in accordance with permit conditions? |
| 13 | Risks from interdependencies between Risk Management Authority (RMA) drainage systems | A mechanism to understand risk posed by interdependencies / interactions between other RMA drainage systems in the catchment. | Where it is considered that significant risks arise from interaction with other RMA drainage systems / receiving waterbodies. |

| Indicator No. | Indicator | Description | Criteria for the indicator to flag as a concern and needing further investigation in the BRAVA stage |
|---|---|---|---|
| 14 | Planned residential new development | A measure to understand the risks from forecast residential population growth in the sewer catchment. | Planned residential development is greater than thresholds set out in the guidance. |
| 15 | Water Industry National Environment Programme (WINEP) | The WINEP sets out the actions that water companies need to complete to meet their environmental obligations. Where there are specific WINEP drivers it is considered necessary that a long-term approach to managing the issues is developed. | Known WINEP drivers impacting the specific Level 3 catchment. |
| 16 | Sewer collapses | This is a historical measure that identifies risks to the integrity of the sewer system. | Sewer collapses are more than two per year in any of the preceding three years |
| 17 | Sewer blockages | This is a historical measure that records obstructions in a sewer (that require clearing) which causes a reportable problem (not caused by hydraulic overload), such as flooding or discharge to a watercourse, unusable sanitation, surcharged sewers or odour. | If the number of blockages (normalised by sewer length) in any of the preceding three years is greater than the company average. |

*Table 5-3 RBCS indicator categories and associated risk and vulnerability criteria (Source; Southern Water 2020)*

| RBCS indicator categories | Risk and Vulnerability criteria |
|---|---|
| | No indicators are flagged. This implies that there is no current evidence to suggest that the sewer catchment is likely to be vulnerable to changes in the future. |
| | If two or more indicators are flagged of this colour (excluding sewer collapses and blockages) then a BRAVA is required to identify whether and to what extent changes in future inputs impact on planning objectives. |
| | If one or more indicators are flagged in this colour (again, excluding sewer collapses and blockages) then a BRAVA is required. |

*Table 5-4 Indicator vulnerability and risk categories for each Sewage and Wastewater Catchments within Test Valley Borough Council District (Source, Southern Water 2020)*

| Indicator No. | Sewage and Wastewater Catchments | | |
|---|---|---|---|
| | Chickenhall Eastleigh | Fullerton | Romsey |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |

*Table 5-5 Planning Objectives for Southern Water's DWMP (Source; Southern Water 2020)*

| ID | Planning Objectives | How Objective is Measured | Regulatory Driver |
|---|---|---|---|
| PO1 | Internal Flooding | Risk of sewer flooding in a 1 in 50 year storm – this is a severe storm that is likely to occur once in every 50 years or, put another way, a 2% chance of happening in any 12 month period | Flood and Water Management Act 2010 |
| PO2 | Pollution Risk | Storm overflow performance – this is non-compliance of a storm overflow with the permit issued by the Environment Agency which specifies the amount, frequency and concentration allowed to be discharged into the receiving water | Environment Act, 2021 |
| PO3 | Sewer Collapse | Risk of WwTW quality compliance failure – this is non-compliance of a WwTWs with its permit | Water Industry Act, 1991 |
| PO4 | Risk of Sewer Flooding in 1 in 50 Years | Internal sewer flooding risk – which is internal flooding of a domestic or business premises by wastewater | Resilience metric (obligation under the Flood and Water Management Act 2010) |
| PO5 | Storm Overflow Performance | Pollution risk - pollution from any wastewater source on land or in water | Environment Act, 2021 |
| PO6 | Risk of WwTW Compliance Failure | Sewer collapses risk. | The Urban Wastewater Treatment Regulations, 1994 |
| PO7 | Annualised Flood Risk/Hydraulic Overload | Annualised Flood Risk (Hydraulic Overload):. Storms are taking place with increasing frequency, different levels of severity and with many geographical variations, all of which affects where and how much rain water enters, and fills, our sewers causing them to overload and flood. | Resilience metric (obligation under the Flood and Water Management Act 2010) |
| PO8 | DWF Compliance | WTW Compliance with the Environment Agency's permit relating to the dry weather flow (DWF) arriving at the treatment works: The national planning | The Urban Wastewater Treatment Regulations, 1994 |

| ID | Planning Objectives | How Objective is Measured | Regulatory Driver |
|---|---|---|---|
| | | objective for Wastewater Treatment Works Compliance combined both Water Quality and Dry Weather Flow components. | |
| PO9 | Achieve Good Ecological Status | Achieve Good Ecological Status or Good Ecological Potential (GES/GEP) | EU Water Environment Regulations, 2017 |
| PO10 | Improve Surface Water Management | Improve Surface Water Management | Resilience metric (obligation under the Flood and Water Management Act 2010) |
| PO11 | Secure Nutrient Neutrality | Secure Nutrient Neutrality | Habitats Regulation, 1992 |
| PO12 | Reduce Groundwater Pollution | Reduce Groundwater Pollution | The Groundwater Regulations, 2009 |
| PO13 | Improve Bathing Water Quality | Improve Bathing Water Quality | The Bathing Waters Regulations, 2013 |
| PO14 | Improve Shellfish Water Quality | Improve Shellfish Water Quality | Water Environment Regulations 2017 |

It is important to note that the preferred options described by Southern Water do not translate into firm commitments or assurances regarding funding or implementation. Instead, they provide the financial scope that may be required for anticipated investments within the catchment.

#### 5.2.1.1 Chickenhall Eastleigh Catchment

The indicator vulnerability assessment for Chickenhall Eastleigh (**Table 5-4**) demonstrates that the catchment is vulnerable to nine of the 17 indicators; 1, 4, 7, 9, 12, 13, 14, 15 and, 17. Each indicator is paired with a relevant PO that include options that can be undertaken to address each indictor at specific locations within the catchment (**Table 5-6**):

- Indicator 1 (Catchment Characterisation) aligns with PO1 in addressing the risks of severe flooding from rare extreme weather events.
- Indicator 4, although not directly linked to a PO, supports PO2's goals by monitoring water quality impacts from discharges on sensitive waters.
- Indicator 7 (Internal sewer flooding) correlates with PO4, using historical flooding data to inform flood risk prevention strategies within properties.
- Indicator 9 (Pollution incidents) ties into PO5's aim to minimize environmental pollution from the water company's operations.
- Indicator 12 (Storm overflows) also supports PO5 by ensuring compliance with regulations to prevent pollution.

- Indicator 13 (Interconnected drainage system risks) feeds into PO7's concerns with managing hydraulic overload and flood risk due to varying rainfall and system interactions.
- Indicator 14 (Residential development impact) informs PO10's strategy for managing growth-related sewage capacity issues.
- Indicator 15 (Alignment with WINEP) drives action on strategic, long-term objectives like PO8 and influences PO11 and PO12's focus on nutrient neutrality and groundwater pollution.
- Indicator 17 (Sewer blockages) is key for PO10's surface water management strategies, indicating maintenance needs and influencing stormwater management.

*Table 5-6 Chickenhall Eastleigh preferred options (source; Southern Water)*

| Location | Option | Indicative Costs | Indicative Timescales | Planning Objective ID |
|---|---|---|---|---|
| Hotspot 1 - Hiltingbury / Chandler's Ford | Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network | £115K | AMP8 onwards | PO1 |
| Hotspot 1 - Hiltingbury | Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network | £115K | AMP8 onwards | PO2 |
| Botley Road Horton Heath WPS | Sewer Rehabilitation: Targeted CCTV or electroscan surveys and sewer rehabilitation to reduce the risk of sewer bursts and collapses | £930K | AMP8 onwards | PO2 |
| Hotspot 1 - Hiltingbury / Chandler's Ford | Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network | £35K | AMP8 onwards | PO2 |
| Otterbourne-Inner & Outer Zone TCZ, Twyford-Inner & Outer Zone TCZ | Sewer Rehabilitation: Targeted CCTV or electroscan surveys to check the integrity of sewers and reline or renew them to reduce the risk of groundwater pollution | £2,840K | AMP9 | PO12 |
| Chickenhall Eastleigh WTW | Improve the operational resilience of wastewater treatment works (WwTW) to reduce pollution incidents | £6,970K | AMP8 onwards | PO2 |
| Chickenhall Eastleigh WwTW | Increase capacity to allow for planned new development | £2,570K | AMP9 | PO8 |
| System Wide | Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy | £300K | AMP8 | PO4, PO5, PO7 PO10 |
| Chickenhall Eastleigh SSO | Reduce the number of storm discharges from Chickenhall Eastleigh SSO by a combination of SuDS and storage options | £13,780K | AMP10 | PO4, PO5, PO7 |

| Location | Option | Indicative Costs | Indicative Timescales | Planning Objective ID |
|---|---|---|---|---|
| Burnetts Lane Horton Heath CSO | Reduce the number of storm discharges from Burnetts Lane Horton Heath CSO by a combination of SuDS and storage options | £1,435K | AMP12 | PO4 PO5 PO7 |
| Templars Way Chandlers Ford CSO | New or improved screen to reduce aesthetics impacts from storm discharges at Templars Way Chandlers Ford CSO | £130K | AMP12 | PO5 |
| Valley Road Chandlers Ford CSO | New or improved screen to reduce aesthetics impacts from storm discharges at Valley Road Chandlers Ford CSO | £130K | AMP12 | PO5 |
| Park Road Chandlers Ford CSO | New or improved screen to reduce aesthetics impacts from storm discharges at Park Road Chandlers Ford CSO | £130K | AMP12 | PO5 |
| Chestnut Avenue Eastleigh CSO | New or improved screen to reduce aesthetics impacts from storm discharges at Chestnut Avenue Eastleigh CSO | £130K | AMP12 | PO5 |
| Consort Road Eastleigh CSO | Reduce the number of storm discharges from Consort Road Eastleigh CSO by a combination of SuDS an WTW | £10,079K | AMP8 | PO11 |

#### 5.2.1.2 Fullerton Catchment

The indicator vulnerability assessment for Fullerton (**Table 5-4**) demonstrates that the catchment is vulnerable to ten of the 17 indicators; 1, 6, 7, 9, 12, 13, 14, 15, 16 and, 17. Each indicator is paired with a relevant PO that include options that can be undertaken to address each indictor at specific locations within the catchment (**Table 5-7**):

- Indicator 1 examines the sewer catchment's vulnerability to extreme weather, contributing to flood risk preparedness strategies relevant to PO6.
- Indicator 7 focuses on the risk of flooding within customer properties, aligning with objectives in PO9 related to customer property protection and resilient service delivery.
- Indicator 6 has a broad scope that includes pollution control (PO2), ecological sustainability (PO12), regulatory compliance (PO8), flood risk and drainage system management (PO4, PO5, PO7), and infrastructure planning in response to population dynamics (PO10).
- Indicator 9 tracks pollution events and informs objectives like PO2 and PO12, aimed at mitigating pollution and enhancing the ecological performance of water services.
- Indicator 12 ensures compliance with storm overflow permits, supporting PO8's focus on regulatory adherence.
- Indicator 13 addresses the interconnectedness of drainage systems and their associated risks, feeding into integrated water management goals as contemplated in PO5.
- Indicator 14 anticipates the effects of population growth on sewer infrastructure, contributing to sustainable development goals potentially covered by PO11.
- Indicator 15 promotes actions in line with WINEP, furthering environmental obligations and possibly influencing PO9 on environmental sustainability.

- Indicator 16 gauges sewer collapse incidents, which is critical for maintaining infrastructure integrity and could be a part of PO9's scope.
- Indicator 17 looks at sewer blockages, key for maintenance and service continuity and linked to objectives related to infrastructure's resilient function, PO6 or PO9.

*Table 5-7 Fullerton preferred options (source; Southern Water)*

| Location | Option | Indicative Costs | Indicative Timescales | Planning Objective ID |
|---|---|---|---|---|
| Furzedown Lane Amport WPS | Improve the operational resilience of wastewater pumping station (WPS) to reduce pollution incidents | £235K | AMP8 onwards | PO2 |
| Andover- Inner & Outer Zone TCZ | Sewer Rehabilitation: Targeted CCTV or electroscan surveys to check the integrity of sewers and reline or renew them to reduce the risk of groundwater pollution | £5,595K | AMP9 | PO12 |
| Fullerton WwTW | Increase treatment capacity to allow for planned new development | £35,100K | AMP11 | PO6 |
| Fullerton WwTW | Increase capacity to allow for planned new development | £4,000K | AMP8 | PO8 |
| Anton Lane Andover CEO | New or improved screen to4008) | £7,167K | AMP8 | PO9, PO11 |
| Fullerton WwTW | Optimise existing process (WINEP OAR 08SO102635) | £120K | AMP8 | PO9 |

#### 5.2.1.3 Romsey Catchment

The indicator vulnerability assessment for Romsey (**Table 5-4**) demonstrates that the catchment is vulnerable to eight of the 17 indicators; 1, 4, 7, 12, 13, 14, 15, and, 17. Each indicator is paired with a relevant PO that include options that can be undertaken to address each indictor at specific locations within the catchment (**Table 5-8**):

- Indicators 1 and 7 both feed into PO1, focusing on managing flood risks, with Indicator 1 assessing system-wide vulnerability to weather events and Indicator 7 targeting the reduction of internal property flooding.
- Indicator 4 aligns with PO6, highlighting the need to protect water quality from wastewater discharges.
- Indicator 12 is connected to PO1 and PO7, monitoring storm overflow compliance to manage flood risks and uphold operational standards.
- Indicator 13 links to PO4, PO5, and PO7, addressing complex risks from interconnected drainage systems, with implications for integrated management and environmental protection.
- Indicator 14 is tied to PO5, looking at how population growth may strain sewer Infrastructure and calling for growth-sensitive management strategies.
- Indicator 15 relates to PO5, ensuring water company actions are aligned with environmental objectives set by WINEP.

- Indicator 17 associates with PO9 and PO11, monitoring blockages for service reliability, infrastructure resilience, and customer satisfaction.

*Table 5-8 Romsey preferred options (source; Southern Water)*

| Location | Option | Indicative Costs | Indicative Timescales | Planning Objective ID |
|---|---|---|---|---|
| Central Romsey (Abbey Water, Tadburn Road, Chambers Avenue | Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network | £115K | AMP8 onwards | PO1 |
| Hotspot 1 - Central Romsey (Abbey Water, Tadburn Road, Chambers Avenue | Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network | £90K | AMP8 onwards | PO1 |
| Romsey WwTW | Increase treatment capacity to allow for planned new development | £2,010K | AMP9 | PO6 |
| System Wide | Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy | £300K | AMP8 | PO1, PO7 |
| Romsey SSO | Reduce the number of storm discharges from Romsey SSO by a combination of SuDS and storage options | £2,860K | AMP11 | PO4, PO5, PO7 |
| Memorial Park Romsey CEO | New or improved screen to reduce aesthetics impacts from storm discharges at Memorial Park Romsey CEO | £130K | AMP11 | PO5 |
| The hundred Romsey CSO | New or improved screen to reduce aesthetics impacts from storm discharges at The Hundred Romsey CSO | £130K | AMP12 | PO5 |
| Eight Acres Romsey CSO | Reduce the number of storm discharge to denitrification to achieve 10mg/l Total N | £5,990K | AMP8 | PO9, PO11 |

| Location | Option | Indicative Costs | Indicative Timescales | Planning Objective ID |
|---|---|---|---|---|
| | permit. (WINEP OAR 08SO104007) | | | |
| Romsey WwTW | Optimise existing process (WINEP OAR 08SO102639) | £120K | AMP8 | PO9 |

#### 5.2.1.4 Consultation with Southern Water

Consultation with Southern Water was undertaken in December 2023 to determine whether the company is currently planning to undertake any upgrades to the WwTWs located within Test Valley Borough. Southern Water's response is summarised below:

- Chickenhall Eastleigh WwTW: Southern Water have no plans to upgrade the site and are not planning on increasing capacity in terms of flow.
- Fullerton WwTW: There are plans for a new growth scheme for dry weather flow permit compliance, but this is still in the planning stage and no timescale has been confirmed, at present.
- Romsey WwTW: Southern Water have no plans to upgrade the site and are not planning on increasing capacity in terms of flow.
- Ludgershall WwTW: There are plans for a new growth scheme for treatment capacity which will be delivered in combination with the Total Nitrogen (TN) driver. This is still in the planning stage and no timescale has been confirmed, at present.

### 5.2.2 Wastewater Treatment Capacity

SW have an adaptive strategy to manage growth uncertainty. The capacity risk assessment process for WwTW is undertaken on an annual basis, to ensure investment is continually prioritised. Once potential developments and expected build rates per site are established and adopted in the Local Plan, a detailed assessment of the long-term required infrastructure upgrades regarding WwTWs can be undertaken.

The permitted and measured dry weather flows (DWF) for each WwTW are provided in **Table 5-9**, these include WwTW outside of the TVBDs area but are responsible for the discharge into main areas of growth within TVBC. The Q80, or average value exceeded by 80 percent of all daily measured flows, is the accurate DWF measure. To allow for weather variations, Q90 is the average value which is exceeded by 90 percent of all daily measured flows and is the compliance measure for the permitted DWF. The current permitted DWF is also provided in the table for each WwTW, where available. Should a site be non-compliant, investigations are undertaken to identify the cause and remedial actions where appropriate. The calculations are based on the Q80 DWF.

The sewer capacity is influenced by flow rates, root ingress, misconnections, infiltration, silt and the build-up of fats, oils, and greases. Capacity assessment levels are calculated off the percentage permitted DWF in use after factoring in the headroom against the actual DWF.

*Table 5-9 Test WwTW locations and flow data (Source: Environment Agency Catchment Data Explorer, Test Valley)*

| WwTW | Receiving watercourse | DWF Q80 ($m^3$/d) | DWF Q90 ($m^3$/d) | Permitted DWF, $m^3$/day | Actual DWF[4] (Q80), m3/day | headroom, $m^3$/day (Q80) | % of permitted DWF in use (Q80) | Capacity Assessment |
|---|---|---|---|---|---|---|---|---|
| Romsey | River Test (Middle) | 4,538 | 4,284 | 7,379 | 4,538 | 2,841 | 61 | >30% |
| Fullerton | River Test | 17,270 | 16,742 | 19,291 | 17,270 | 2,021 | 90 | <10% |
| Ludgershall | Ludgershall Brook and Muswellhill Brook | 607 | 588 | 887 | 607 | 280 | 68 | >25% |
| Chickenhall Eastleigh | Monks Brook | 23,840 | 22,514 | 32,000 | 23,840 | 8,160 | 75 | <25% |

## 5.3 Existing Water Quality

Water quality can be affected by new residential development due to point source and/or diffuse pollution:

- Point source pollution enters a water body at a specific site and is generally readily identified. Potential point sources of pollution include discharges of effluent from sewage treatment works and combined sewer outfalls, discharges from industrial sites, and leachate from landfill sites.
- Diffuse pollution cannot be attributed to a precise point or incident but is the cumulative effect of activities over a large area, including agriculture, construction, road runoff and domestic misconnections to the surface drainage network. It is often difficult to identify specific sources of such pollution and therefore take immediate action to prevent it.

### 5.3.1 Current Status of the Water Bodies

For the purposes of the Water Environment (Water Framework Directive) (England and Wales) Directions 2017, surface water bodies are classified based on both Ecological status and Chemical status (see **Appendix B** for further details of assessment criteria):

- Ecological status is an assessment of the quality of water ecosystem, and shows the influence of pressures (e.g., pollution and habitat degradation) on a range of biological, physio-chemical and hydro morphological quality elements. The overall ecological status classification for a water body is determined by the element with the worst status out of all the biological and supporting quality elements.
- Chemical status is an assessment of the chemical concentrations in the water body. Good Chemical status means that no concentrations of priority substances exceed the relevant environmental quality standards set out in the WFD. The environmental quality standards aim to protect the most sensitive species from direct toxicity, including predators and humans via secondary poisoning.

**Table 5-10** provides a summary overview of the status of all river water bodies located within the Test Valley Borough Council District, according to the Environment Agency's web resource *Catchment Data Explorer* (Environment Agency, 2023). Objectives to be achieved and detailed information for each water body has been reviewed and can be found in **Appendix B**.

*Table 5-10 WFD status and objectives of water bodies in Test Valley Borough (Source: Environment Agency Catchment Data Explorer)*

| Water Body | Operational Catchment | Ecological Status | | Chemical Status | |
|---|---|---|---|---|---|
| | | Current Status (2022) | Objective status | Current Status (2022) | Objective status |
| Bow Lake | Itchen | Bad | Good (2027), low confidence | Does not require assessment, fail in 2019 | Good (2063) |
| River Arle | Itchen | Moderate | Good (2015) | Does not require assessment, fail in 2019 | Good (2063) |
| River Itchen | Itchen | Good | Good (2015) | Does not require assessment, fail in 2019 | Good (2063) |
| Cadnum River | Test Lower and Southampton Streams | Poor | Good (2027), low confidence | Does not require assessment, fail in 2019 | Good (2063) |
| River Blackwater | Test Lower and Southampton Streams | Moderate | Good (2027), low confidence | Does not require assessment, fail in 2019 | Good (2063) |
| River Dun | Test Lower and Southampton Streams | Moderate | Good (2027), low confidence | Does not require assessment, fail in 2019 | Good (2063) |
| River Anton Lower | Test Upper and Middle | Moderate | Good (2027), low confidence | Does not require assessment, fail in 2019 | Good (2063) |

| Water Body | Operational Catchment | Ecological Status | | Chemical Status | |
|---|---|---|---|---|---|
| | | Current Status (2022) | Objective status | Current Status (2022) | Objective status |
| River Anton Upper | Test Upper and Middle | Good | Good (2015) | Does not require assessment, fail in 2019 | Good (2063) |
| River Dever | Test Upper and Middle | Good | Good (2015) | Does not require assessment, fail in 2019 | Good (2063) |
| Pillhill Brook | Test Upper and Middle | Good | Good (2021) | Does not require assessment, fail in 2019 | Good (2063) |
| River Test (upper) | Test Upper and Middle | Good | Good (2015) | Does not require assessment, fail in 2019 | Good (2063) |
| Wallop Brook | Test Upper and Middle | Good | Good (2015) | Does not require assessment, fail in 2019 | Good (2063) |

### 5.3.2 Discharge Consents

The capacity of the receiving watercourse to dilute WwTW discharges is important for determining future impacts of development. WwTW discharge consents refer to physio-chemical elements, e.g., ammonia, Biological Oxygen Demand (BOD), or phosphates. Information on discharge consent quality requirements for the three identified key parameters to ensure 'no deterioration' occurs in the current WFD status has been provided by the Environment Agency for the WwTWs in Test Valley and is presented in **Table 5-11**. Not all WwTWs will have permitted consent limit for physio-chemical elements and may only have a singular limit for each chemical this is shown as dash in the Table below.

*Table 5-11 Discharge consent quality requirements for WwTW* (Source: Environment Agency)

| WwTW | Phosphorous (mg/l) | | Biological Oxygen Demand (BOD) (mg/l) | | Ammonia (mg/l N) | | Consented DWF Flow ($m^3/d$) |
|---|---|---|---|---|---|---|---|
| | Limit | Upper Tier Limit | Limit | Upper Tier limit | Limit | Upper Tier limit | |
| Romsey | 2 | - | 25 | 50 | 8 | 30 | 7,379 |
| Fullerton | - | - | 15 | 20 | 10 | 10 | 19,291 |

| WwTW | Phosphorous (mg/l) | | Biological Oxygen Demand (BOD) (mg/l) | | Ammonia (mg/l N) | | Consented DWF Flow ($m^3/d$) |
|---|---|---|---|---|---|---|---|
| | Limit | Upper Tier Limit | Limit | Upper Tier limit | Limit | Upper Tier limit | |
| Chickenhall Eastleigh | 1 | - | 12 | 46 | 2.8 | 11 | 32,000 |
| Ludgershall | - | - | 40 | 80 | 5 | 20 | 887 |

## 5.4 Impact of Development on Wastewater and Water Quality

### 5.4.1 Sewerage Network

New development leads to an increase in demand for sewerage services and hence increased treated discharge flows from WwTW (that will be regarded to as Water Recycling Centres, WRCs, in future policy documents). Sewage effluent is collected and directed to the closest WwTW. Increased discharges from WwTW may have an adverse impact on flood risk that needs to be taken into consideration.

### 5.4.2 Proposed Strategy for Wastewater Collection, Treatment and Water Quality

An additional assessment of WwTW capacity in terms of the new development proposed in the emerging Local Plan has been made to inform this report the findings of this assessment are provided in Table 5-12, only WwTW that have predicted growth were projected using the Q80 scenario. The future DWF ($m^3$/day) capacity is calculated using the proposed number of dwellings TVBC is planning to build within the WwTW areas. From this assessment we see that the proposed residential development will significantly reduce the wastewater network capacity at Fullerton and Ludgershall and these WwTW will likely exceed the permitting capacity limits. Therefore, mitigation measures are required so that sewer flooding risk is not increased in these areas.

*Table 5-12 Capacity within permitted DWF headroom to accept future flows based on the Q80 scenario (Sources, Southern Water)*

| WwTW | Estimated Properties | Current PE (2023) | Estimated Population Growth by 2050 (%) | Projected DWF ($m^3$/day) | Permitted DWF ($m^3$/day) | Capacity (% of $m^3$/day permit used) | Proposed Dwellings | Future Capacity |
|---|---|---|---|---|---|---|---|---|
| Romsey | 10,773 | 22,792 | +22.0 | 4,583 | 7,379 | 61 | 450 | 64 |
| Fullerton | 28,438 | 66,520 | +41.0 | 17,270 | 19,291 | 90 | 2,282 | 97 |
| Ludgershall | 2,521 | 5,835 | +20.0 | 607 | 887 | 68 | 1,500 | 109 |
| Chickenhall Eastleigh | 41,616 | 98,437 | +35.0 | 23,840 | 32,000 | 75 | 1,114 | 76 |

Several studies, including this WCS, will inform the Council in the decision of the location and scale of housing and employment allocations in the Local Plan. The joint approach with all relevant stakeholders needs to ensure an adequate available wastewater treatment capacity over the assessed period.

### 5.4.3 Water Body Status

The receiving WFD water body has its own corresponding ecological, chemical and mitigation assessment status which is critical to factor in before any developments or plans are made that may add to the water stress. Full details on these WFD water bodies can be found in **Appendix B**.

*Table 5-13*: Associated closest WFD water body for each WwTW *(Source: Environment Agency Catchment Data Explorer)*

| WwTW | WFD water body |
|---|---|
| Romsey | Test – conf Dun to Tadburn Lake Water Body (GB107042016460) |
| Fullerton | Test – conf Dever to conf Anton Water Body (GB107042022750) |
| Chickenhall Eastleigh | Monks Brook Water Body (GB107042016310) |
| Ludgershall | Ludgershall Brook and Muswellhill Brook Water Body (GB106039030060) |

## 5.5 RQP Modelling

### 5.5.1 Background

The RQP (River Quality Planning) modelling methodology is a systematic process used to assess the water quality impact of discharge from Water Recycling Centres (WRCs) on receiving watercourses, ensuring compliance with the Water Framework Directive (WFD) targets and The Conservation of Habitats and Species Regulations (2017) (as amended).

Data is collected from various WRCs, focusing on the current and future Dry Weather Flows (DWF), concentrations of pollutants such as Biochemical Oxygen Demand (BOD), Ammonia (NH4), and Phosphate (P), as well as the projected increase in pollutant load due to proposed developments. The RQP modelling is essential for long-term planning, predicting the environmental consequences of proposed developments, and guiding the implementation of Technically Achievable Limit (TAL) to minimize ecological disruption.

### 5.5.2 Methodology

The RQP tool was made available by the Environment Agency and was deemed an acceptable approach for this assessment. The tool uses a Monte Carlo Mass Balance approach to calculate the permit limit values needed for each pollutant to achieve a specified river quality standard.

The following data is required to run the RQP software:

- Upstream River flow data (Source: National River Flow Archive)
    - Mean average flow
    - 95% exceedance flow (i.e. low flow)
- Upstream river concentration data (Source: Environment Agency)
    - Mean average concentration for each pollutant
    - Standard deviation
    - Number of samples
- Wastewater treatment works flow data (Source: Southern Water / LPA Growth projections)
    - Mean average discharge flow
    - Standard deviation
- Wastewater treatment works concentrations data (Source: Southern Water)

- Mean discharge quality
- Standard deviation
- Number of samples

Within the RQP modelling for the relevant WwTW there were certain chemicals that did not have recorded amounts for Phosphates, BOD or Ammonia. For these circumstances 60% of the consented amount was used as the measurement and a third of that total was used as the standard deviation as per the recommendation by SEPA guidance (2016). The model's predictions were validated by comparing them with the EA's classification system and the objectives for each watercourse. Compliance or non-compliance with the WFD targets is ascertained through this comparison.

The following downstream target scenarios were modelled:

- **Maintain current mixing point quality** – maintain current mixing point quality for the pollutant, after growth. This is a precautionary approach which ensures no deterioration from the current conditions.
- **Limit deterioration to 10%** - limiting deterioration at the mixing point to 10% for the pollutant, after growth. This is required to minimise deterioration within WFD status class.
- **Limiting status deterioration** – Ensuring no deterioration from the current WFD status for the pollutant. This is to ensure the WFD policy requirement that 'development must not cause a deterioration in WFD status' is met.
- **Meet future target status** – WFD target status for the pollutant (where the physio-chemical status is not currently being achieved). This ensures the WFD policy requirement 'development must not prevent a waterbody from achieving its Future Target Status' is met.

The following criteria was used to scope in treatment works for the RQP modelling:

- The wastewater treatment works will exceed the permitted flow headroom capacity after growth.
- The Wastewater treatment works would be operating with less than 10% of the permitted DWF limit after growth.
- The Wastewater treatment works discharges into the Solent and Southampton Water SPA / Ramsar and Solent Maritime SAC (regardless of residual headroom capacity after growth).

Treatment works with greater than 10% headroom after growth and those that discharge into a transitional / tidal waterbody or to groundwater were scoped out of RQP modelling and selected for Load Standstill calculations. Treatment works which would not receive any growth were scoped out of all modelling. **Table 5-14** outlines which WwTWs were selected for RQP modelling.

*Table 5-14: WwTWs selected for RQP modelling*

| WwTW | Capacity headroom post growth | Scoped in for RQP? |
|---|---|---|
| Romsey | 64 | Yes |
| Fullerton | 97 | Yes |
| Chickenhall Eastleigh | 76 | No – tidal discharge |

| | | |
|---|---|---|
| Ludgershall | 109 | No – discharge to ground |

### 5.5.3 Technically Achievable Limit

For the purposes of this modelling, the TAL for each of the pollutants is summarised in **Table 5-15**. TAL is the lowest possible effluent concentration that can be achieved for each pollutant, using conventional existing treatment technology.

*Table 5-15 Technical Achievable limit for pollutants (SEPA, 2016).*

| Pollutant | Statistic | Concentration (mg/l) |
|---|---|---|
| BOD | 95%ile | 5 |
| Ammonia | 95%ile | 1 |
| Phosphate | Mean | 0.25 |

### 5.5.4 Model Outputs

The results below show the required discharge quality at the 95$^{th}$ percentile, and therefore provides the lower tier permit which water companies would be expected to work to. A Red Amber Green (RAG) assessment is presented in **Table 5-16** with the results of the RQP modelling. The RAG assessment refers to the following categories:

Green: No changes to existing permit limits are required – growth can be accepted with no significant changes to the permits.
Amber: Changes to the discharge permit is required to meet WFD / Habitats Regulations objectives. Upgrades may have phasing implication for growth.
Red: Changes to the discharge permit are beyond what can be achieved with conventional treatment (i.e., below the TAL). The WFD objectives cannot be met.

*Table 5-16: Results of RQP modelling*

| WwTWs | Scenarios | Phosphate | Ammonia | BOD |
|---|---|---|---|---|
| Fullerton | No deterioration | 0.033 | 0.011 | N/A due to no WFD status – BOD scoped in for Load Standstill |
| | Limit deterioration to 10% | 0.052 | 0.053 | |
| | Ensure no class deterioration | 0.27 | 1.63 | |
| | Not limit future to achieve good | Not less than good | Not less than good | |

| WwTWs | Scenarios | Phosphate | Ammonia | BOD |
|---|---|---|---|---|
| Romsey | No deterioration | 0.053 | - | - |
| | Limit deterioration to 10% | 1 | - | - |
| | Ensure no class deterioration | 3.8 | 122 | 581 |
| | Not limit future to achieve good | Not less than good | Not less than good | Not less than good |

The results of the RQP show that discharges from Fullerton treatment works for Phosphate and Ammonia will lead to a greater than 10% deterioration at the mixing point after growth. Whilst the WFD aims to prevent within class deterioration, this can be allowed. Preventing a between class deterioration in WFD boundaries can be achieved by reducing the permitted discharges. Phosphorus would need to be reduced to TAL (i.e. 0.25mg/l), whereas Ammonia would need to be reduced from 3 mg/l to 1.5 mg/l. The receiving waterbody is already at a High status. There could be some time implications associated with Fullerton operating to TAL which may impact on when future growth can be accepted.

There is environmental capacity to accept additional flows at Romsey WwTWs without preventing a deterioration in within the WFD classification or a between class deterioration, under the current permit limits. As such, no significant changes will be required at Romsey.

Both treatment works assessed are unable to prevent no deterioration at the mixing point between the tributary and the effluent of the treatment works. However, both of the treatment works do not discharge directly to a designated site which would be subject to the Habitat Regulations. As such, the no deterioration test does not draw conclusions on the potential impacts to the downstream designated site(s). This test only concludes that no deterioration at the mixing point will not be possible, but this will not impact on the ability to deliver the potential sites.

## 5.6 Load Standstill Calculations

Load standstill calculations have been used to determine the future permits required for phosphate, ammonia and BOD at the respective treatment works. These calculations are appropriate for WwTWs that discharge into an estuarine water body.

The findings of the load standstill calculations are presented in **Table 5-17**. The RAG assessment criteria for the effluent quality refers to the following categories:

Green: No changes to existing permit limits are required – growth can be accepted with no significant changes to the permits.
Amber: Changes to the discharge permit is required, but within conventional treatment processes.
Red: Changes to the discharge permit are beyond what can be achieved with conventional treatment (i.e., below the TAL).

*Table 5-17: Results of Load Standstill calculations*

| Parameter | Ludgershall | Chickenhall Eastleigh | Fullerton |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Current DWF permit ($m^3$/day) | 887 | 32,000 | 19291 |
| Q80 flow ($m^3$/day) | 607 | 23,840 | 17270 |
| Headroom ($m^3$/day) | 280 | 8160 | 2021 |
| Phosphate permit limit (mg/l) (annual average) | - | 1 | N/A |
| Ammonia permit limit (mg/l) (95%ile) | 5 | 2.8 | N/A |
| BOD permit limit (mg/l) (95%ile) | 25 | 12 | 15 |
| Future flow post growth ($m^3$/day) | 968 | 24,478 | 18656 |
| Phosphate effluent quality permit required (mg/l) (annual average) | - | 0.97 | - |
| Ammonia effluent quality permit required (mg/l) (95%ile) | 3.13 | 2.73 | - |
| BOD effluent quality permit required (mg/l) (95%ile) | 15.67 | 11.69 | 13.89 |

The results show that in all cases there may be a need for improvements to the quality standards. However, these improvements are all possible within conventional treatment. Minor alterations to the permits at Eastleigh will be required to ensure there is no deterioration in the current quality for all of the watercourses. Due to the significant increase in flow at Ludgershall, more significant changes to the permits may be required, however, these are still within conventional treatment processes. As a result, growth at these treatment works can be achieved without an impact on downstream water dependant designated sites. Following growth, Ludgershall will exceed the current DWF permit, which could lead to minor timing implications for the acceptance of new growth.

# 6 Summary of WCS Outcomes

## 6.1 Summary review of Southern Water's dWRMP (compiled)

**Deployable output (DO)** (SW potable water) changes:

SW have implemented the following changes to the supply of potable water at two of its water treatment works (WTW), resulting in a constraint as its Andover WTW as follows:

- Andover WTW has had a reduction in peak DO of 1.48 mega litres per day (1,480,000 litres/day) to reflect hydraulic yield constraint. However, SW have plans to update their pipes network to connect Andover with Winchester and Southampton East supply zones to enable circulation of water to areas where there is need. No timescale has been given.
- Whitchurch WTW has had an increase in minimum DO of 0.79% due to infrastructure improvement, however this site is northeast of the administrative boundary of TVBC, so it is unclear if this will have any impact.

**Consultation response from SW with reference to WwTW capacity (13/12/2023):**

- For Fullerton WwTW, there are plans for a new growth scheme for dry weather flow permit compliance, but this is still in the planning stage and no timescale has been confirmed, at present.
- For Ludgershall WwTW, there are plans for a new growth scheme for treatment capacity which will be delivered in combination with the Total Nitrogen (TN) driver. This is still in the planning stage and no timescale has been confirmed, at present.
- For Romsey WwTW, SW have no plans to upgrade the site and are not planning on increasing capacity in terms of flow.
- For Chickenhall Eastleigh WwTW SW have no plans to upgrade the site and are not planning on increasing capacity in terms of flow.

Southern Water has **proposed strategies** in its dWRMP to bring in changes and updates to address the supply deficit of potable water going forward by:

- A1: Preventing leaks
- A2: Installing smart meter penetrations from 88% to 92%
- A3: Target 100 campaign to reduce personal water use to 100 litres per day by promoting water efficiency.

**Water supply options for their next 5-year plan:**

- Catchment schemes to protect the rivers.
- Update their pipes network to connect Andover, Winchester and Southampton East supply zones (will provide more water circulation to areas where there is need).
- Build a desalination plant on the Solent to supply drinking water and a new transfer pipeline.
- Working with Portsmouth Water to develop the Havant Thicket Reservoir which will be able to provide an extra 21 million litres of water once up and running.
- Recycle water from WwTWs in Portsmouth or Southampton to augment flows in the River Itchen.
- Apply for drought permits to continue abstracting water in dry weather from the Rivers Test and Itchen and Andover groundwater source (subject to Environment Agency scrutiny and approval).

## 6.2 Environment Agency CAMS – Abstraction Management Plan

A Catchment Abstraction Management Strategy (CAMS) sets out how the Environment Agency will manage water abstraction in each catchment (e.g., the Rivers Test and Itchen catchments). CAMS documents describe where water is available for abstraction and the implications that water resource availability has for new and existing water abstraction licences.

The EA has assessment points along both rivers to monitor flow at different times of the year. Water resource availability is calculated by four different flow rates, i.e., Q95 (the flow of a river which is exceeded on average for 95% of the time i.e., low flow), Q70, Q50, and Q30 (higher flow).

The flows in the River Anton catchment (part of the wider River Test catchment) are impacted by a major public water abstraction by the Southern Water treatment works that supplies potable water to Andover, and a Wastewater Treatment Works discharge at Fullerton . These influences serve to deplete the River Anton. The Environment Agency is investigating the impact of abstraction and licence changes were being implemented.

The assessment of impacts from abstractions on the River Itchen have led the EA to review their consents process. As a result, three fish farm licences have been modified to protect flows in the river. The EA have been working with water companies and other private schemes to add conditions to their abstraction licences to protect the River Itchen SAC.

The EA state that they will not grant further abstraction licences in those areas the groundwater unit balance shows more water has been abstracted based on the amount available, thus restricting the supply of potable water for human consumption.

In addition, both rivers have constraints to licences such as ‘hands off flow’ (HOF) conditions to protect the environment. These conditions specify that if the flow in the river drops below what is needed for environmental protection, abstraction must reduce or stop. Some water abstraction permits can also have limitations based on the hydrometric year, i.e., from October to March.

The HOF restrictions that affect the TVBC development sites are:

- River Anton at Fullerton
- Lower River Test and Solent Maritime SAC
- The River Itchen near Chickenhall

To conclude, there is very little scope for any additional abstraction that would not cause additional impacts on sensitive water features. Consequently, the EA state “there is a presumption against new consumptive groundwater abstractions from the Chalk”.

## 6.3 Southern Water’s Drainage and Wastewater Management Plan

SW's Drainage and Wastewater Management Plan (DWMP) establishes a strategy for upgrading the region's drainage and wastewater treatment systems, marking a pathway for future infrastructure investments. The guidance categorises and measures the level of current and/or potential risk or vulnerability in the sewer catchment to future changes from developments or climate change. SW’s sewage and treatment catchment areas for proposed development allocations that fall within the Test Valley Borough are Chickenhall Eastleigh, Fullerton, Romsey and Ludgershall. The indictor vulnerability to future changes and Planning Objectives for these catchments are summarised in two table within the report. Notably, the Ludgershall catchment is excluded from this level of detailed evaluation, being deemed not of sufficient size to warrant such assessment. For the Ludgershall sewage treatment, SW has communicated that there are no planned options or future investments planned for this catchment (RHDV, 2023).

Based on Chickenhall Eastleigh's indicator vulnerability assessment, it is shown that the catchment is vulnerable to 9 of the 17 indicators.

Consultation Response from Southern Water (13/12/2023): For Chickenhall Eastleigh WwTW SW have no plans to upgrade the site and are not planning on increasing capacity in terms of flow.

Based on Fullerton's indicator vulnerability assessment, it is shown that the catchment is vulnerable to ten of the 17 indicators. For Fullerton WwTWs, there are plans for a new growth scheme for dry weather flow permit compliance, but this is still in the planning stage and no timescale has been confirmed, at present.

Based on Romsey's indicator vulnerability assessment, it is shown that the catchment is vulnerable to 8 of the 17 indicators. For Romsey WwTW, SW have no plans to upgrade the site and are not planning on increasing capacity in terms of flow. For Ludgershall WwTWs, there are plans for a new growth scheme for treatment capacity which will be delivered in combination with the Total Nitrogen (TN) driver. This is still in the planning stage and no timescale has been confirmed, at present. With the addition of the proposed sites at Ludgershall, the treatment works is projected to exceeds it's DWF permit. As such, the new growth scheme may need to be in place prior to the connection of the proposed sites, which is likely to have implications on phasing.

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https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fassets.publishing.service.gov.uk%2Fgovernment%2Fuploads%2Fsystem%2Fuploads%2Fattachment_data%2Ffile%2F998237%2FWater_stressed_areas___final_classification_2021.odt&wdOrigin=BROWSELINK

# Appendices

# Appendix A – Data Sources

*A1- Data sources used in the WCS Tables and Figures and where they were sourced from.*

| Type of Information | Data Source |
|---|---|
| DEFRA MAGIC map | MAGIC (defra.gov.uk) |
| Habitat Regulations Assessment Regulations 18 | www.testvalley.gov.uk/assets/attach/2500/REG-18-HRA.pdf |
| Draft Test Valley local plan | https://testvalley.gov.uk/planning-and-building/planningpolicy/local-development-framework/draft-local-plan-2040 |
| dWRMP Southern Water | https://www.southernwater.co.uk/dwmp |
| Environment Agency Catchment Data Explorer | England \| Catchment Data Explorer |
| JNCC UK BAP Priority species | UK BAP Priority Species \| JNCC - Adviser to Government on Nature Conservation |
| NBN Atlas Test Valley Species Occurrence records | Test Valley \| NBN Atlas |
| Natural England Site Viewer | https://designatedsites.naturalengland.org.uk/SiteSearch.aspx |
| Office for National Statistics Census 2021 | Census - Office for National Statistics (ons.gov.uk) |

# Appendix B - Water Framework Directive status and objectives of water bodies

*Table B 1 Itchen WFD Water Body Information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | Itchen Water Body | |
| | **Water body ID** | | GB107042022580 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Itchen | |
| | **Hydromorphological designation** | | Not Designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ and Hampshire Chalk<br>Special Protection Area (Solent and Dorset Coast SPA)<br>Special Area of Conservation (River Itchen SAC)<br>Shellfish Water Directive (Southampton Water)<br>Drinking Water Protected Area (Itchen)<br>Urban Waste Water Treatment Directive (River Itchen (Hampshire)) | |
| | **Current Overall Status** | | Good ecological status | |
| | **Objective Status** | | | |
| | **Ecological Status / Potential** | | Good | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Good | Good (2015) |
| | | Fish | High | Good (2015) |
| | | Invertebrates | High | Good (2015) |
| | | Macrophytes and Phytobenthos Combined | Good | Good (2015) |
| | Hydromorphological | Overall | Supports Good | Supports Good (2015) |
| | | Hydrological Regime | Does not support good | Supports Good (2027) low confidence |
| | Physico-chemical | Overall | High | Good |
| | | Acid Neutralising Capacity | High | Good (2015) |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | High | Good (2015) |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | - | Not Assessed (2015) |
| | | Mitigation Measures Assessment | - | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Good (2015) |
| **Mitigation Measures Assessment** | Reasons for not achieving Good Status | Benzo(g-h-i) perylene | | |
| | | Hydrological regime | | |
| | | Mercury and its compounds | | |
| | | Polybrominated diphenyl ethers (PBDE) | | |
| | | Hydrological Regime | | |
| **Water Body Level Measu** | | | | |

*Table B 2 Bow Lake WFD Water Body Information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | Bow Lake | |
| | **Water body ID** | | GB107042016650 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Itchen | |
| | **Hydromorphological designation** | | Not designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ (TraC) and Bow Lake NVZ) | |
| | **Current Overall Status** | | Bad | |
| | **Objective Status** | | | |
| | **Ecological Status / Potential** | | Bad | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Bad | Good (2027) Low confidence |
| | | Fish | Bad | Good (2027) Low confidence |
| | | Invertebrates | Moderate | Good (2027) Low confidence |
| | | Macrophytes and Phytobenthos Combined | Good | Good (2015) |
| | Hydromorphological | Overall | Supports good | Supports good (2015) |
| | | Hydrological Regime | Does not support good | Supports good (2027) low confidence |
| | Physico-chemical | Overall | Gppd | Good (2015) |
| | | Acid Neutralising Capacity | High | Good (2015) |
| | | Ammonia (Phys-Chem) | Good | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | Good | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | Good | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | - | Not Assessed |
| | | Mitigation Measures Assessment | - | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment (good in 2019) | Good (2015) |
| **Mitigation Measures Assessment** | Reasons for not achieving Good Status | Invertebrates – poor nutrient management and commercial fin fisheries | | |
| | | Fish – poor soil management and barriers – ecological discontinuity | | |
| | | Perfluorooctane sulphonate – unknown (pending investigation) | | |
| | | Benzo(g-h-i)perylene – unknown (pending investigation) | | |
| | | Mercury and its compounds | | |
| | | Polybrominated diphenyl ethers (PBDE) | | |
| | | Hydrological regime | | |

| | |
|---|---|
| **Water Body Level Measures** | |

*Table B 3 River Arle WFD Water body information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | River Arle | |
| | **Water body ID** | | GB107042022610 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Itchen | |
| | **Hydromorphological designation** | | Heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Esutary Eutrophic NVZ (TraC) and Hampshire Chalk)<br>Special Area of Conservation (River Itchen) | |
| | **Current Overall Status** | | Moderate | |
| | **Objective Status** | | | |
| | **Ecological Status / Potential** | | Moderate | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Moderate | Good (2015) |
| | | Fish | - | Good (2027) low confidence |
| | | Invertebrates | - | Good (2015) |
| | | Macrophytes Sub Element | Moderate | Not assessed |
| | Hydromorphological | Overall | Supports good | Supports Good (2015) |
| | | Hydrological Regime | Supports good | Supports Good (2015) |
| | Physico-chemical | Overall | High | Good (2015) |
| | | Acid Neutralising Capacity | High | Good (2015) |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | High | Good (2015) |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | Moderate | Not assessed |
| | | Mitigation Measures Assessment | Moderate or less | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2015) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Does not require assessment |
| **Mitigation Measures Assessment** | Reasons for not achieving Good Status | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| **Waste** | | | | |

| | | | | |
|---|---|---|---|---|
| Water Body Details | **Water body name** | | River Blackwater | |
| | **Water body ID** | | GB107042016810 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Test Lower and Southampton Streams | |
| | **Hydromorphological designation** | | Not designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directives (R. Blackwater NVZ and Hamble Estuary Eutrophic NVZ (TraC)<br>Special Area of Conservation (The new forest SAC) | |
| | **Current Overall Status** | | Moderate | |
| | **Objective Status** | | | |
| | **Ecological Status / Potential** | | Moderate | |
| | **Chemical Status** | | Does not require assessment (Fail in 2019) | |
| Ecological | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Moderate | Good (2017) low confidence |
| | | Fish | - | - |
| | | Invertebrates | Good | Good (2015) |
| | | Macrophytes Sub Element | Moderate | Good (2017) low confidence |
| | Hydromorphological | Overall | Supports Good | Supports Good (2015) |
| | | Hydrological Regime | Supports Good | Supports Good (2015) |
| | Physico-chemical | Overall | Moderate | Good (2027) |
| | | Acid Neutralising Capacity | High | Good (2015) |
| | | Ammonia (Phys-Chem) | Moderate | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | Poor | Good (2027) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | Supports Good | Not Assessed |
| | | Mitigation Measures Assessment | Supports Good | - |
| Chemical | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Not Assessed |
| Mitigation Measures Assessment | Reasons for not achieving Good Status | Macrophytes and Phytobenthos Combined - sewage discharge (continuous) | | |
| | | Phosphate - sewage discharge (continuous) | | |
| | | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| Water Body | | | | |

*Table B 4 River Blackwater WFD Water body information*

*Table B 5 River Dun WFD Water body information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | Dun | |
| | **Water body ID** | | GB107042022640 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Test Lowe and Southampton Streams | |
| | **Hydromorphological designation** | | Heavily Modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ (TraC) and Hampshire Chalk)<br>Safeguard zone (River Test) | |
| | **Current Overall Status** | | Moderate | |
| | **Objective Status** | | Moderate | |
| | **Ecological Status / Potential** | | Moderate | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Poor | Good (2027) – low confidence |
| | | Fish | Poor | Good (2027) – low confidence |
| | | Invertebrates | High | Good (2015) |
| | | Macrophytes Sub Element | - | Not Assessed |
| | Hydromorphological | Overall | Supports good | Supports Good (2015) |
| | | Hydrological Regime | High | Supports Good (2015) |
| | Physico-chemical | Overall | High | Good (2015) |
| | | Acid Neutralising Capacity | - | - |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | - | - |
| | Supporting elements (Surface Water) | Overall | - | Good (2027) – low confidence |
| | | Mitigation Measures Assessment | - | Good (2027) – low confidence |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (fail in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment (fail in 2019) | Good (2015) |
| **Mitigation Measures Assessment** | Reasons for not achieving Good Status | Fish – Poor soil management and barriers (ecological discontinuity) | | |
| | | Mitigation Measures Assessment | | |
| | | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| **Waste** | | | | |

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| | |

*Table B 6 Wallop Brook WFD Water body information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | Wallop Brook | |
| | **Water body ID** | | GB107042022650 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Test Upper and Middle | |
| | **Hydromorphological designation** | | Not designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ (TraC), Hampshire Chalk and Wallop Brooks NVZ) Safeguard Zone (River Test) | |
| | **Current Overall Status** | | Good | |
| | **Objective Status** | | Good | |
| | **Ecological Status / Potential** | | Good | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Good | Good (2015) |
| | | Fish | - | - |
| | | Invertebrates | High | Good (2015) |
| | | Macrophytes Sub Element | Good | Good (2015) |
| | Hydromorphological | Overall | Supports good | Supports good (2015) |
| | | Hydrological Regime | Supports good | Supports good (2015) |
| | Physico-chemical | Overall | Good | Good (2015) |
| | | Acid Neutralising Capacity | High | Good (2015) |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | Good | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | - | Not Assessed |
| | | Mitigation Measures Assessment | - | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Does not require assessment |
| **Mitigation Measures Assessment** | Reasons for not achieving Good Status | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| **Water Body Level Measu** | | | | |

*Table B 7 Anton Upper WFD Water body information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | Anton – Upper | |
| | **Water body ID** | | GB107042022810 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Test Upper and Middle | |
| | **Hydromorphological designation** | | Heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive – Hamble Estuary Eutrophic NVZ and Hampshire Chalk<br>Safeguard Zone – river test | |
| | **Current Overall Status** | | Good | |
| | **Objective Status** | | Good | |
| | **Ecological Status / Potential** | | Good | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Good | Good (2015) |
| | | Fish | - | - |
| | | Invertebrates | High | Good (2015) |
| | | Macrophytes Sub Element | Good | Not assessed (2017 – low confidence) |
| | Hydromorphological | Overall | Supports good | Supports good (2015) |
| | | Hydrological Regime | Does not support good | Supports good (2027 – low confidence) |
| | Physico-chemical | Overall | High | Good (2015) |
| | | Acid Neutralising Capacity | - | - |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | - | Not assessed |
| | Supporting elements (Surface Water) | Overall | Good | Good (2015) |
| | | Mitigation Measures Assessment | Good | Good (2015) |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Does not require assessment |
| **Mitigation Measures** | Reasons for not achieving Good Status | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| | | Hydrological Regime | | |
| **Water Body Level Measures** | | | | |

*Table B 8 Anton Lower WFD Water body information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | Anton – lower | |
| | **Water body ID** | | GB107042022780 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test And Itchen | |
| | **Operational catchment** | | Test Upper and Middle | |
| | **Hydromorphological designation** | | Not designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ and Hampshire Chalk)<br>Safeguard zone (River Test) | |
| | **Current Overall Status** | | Moderate | |
| | **Objective Status** | | Moderate | |
| | **Ecological Status / Potential** | | Moderate | |
| | **Chemical Status** | | Does not require assessment, fail in 2019 | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Moderate | Good – 2027 low confidence |
| | | Fish | - | - |
| | | Invertebrates | High | Good (2015) |
| | | Macrophytes Sub Element | Moderate | Good – 2027 low confidence |
| | Hydromorphological | Overall | Supports good | Supports good (2015) |
| | | Hydrological Regime | Supports good | Supports good (2027) low confidence |
| | Physico-chemical | Overall | High | Good (2015) |
| | | Acid Neutralising Capacity | - | - |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | - | Not assessed |
| | | Mitigation Measures Assessment | - | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Does not require assessment |
| **Mitigation Measures Assessment** | Reasons for not achieving Good Status | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| | | Macrophytes and Phytobenthos Combined | | |
| | | Hydrological Regime – groundwater abstraction | | |
| **Water Body Level Measures** | | | | |

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|---|---|
| | |

*Table B 9 Pillhill Brook WFD Water body information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | Pillhill Brook | |
| | **Water body ID** | | GB107042022790 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Test Upper and Middle | |
| | **Hydromorphological designation** | | Not designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ and Hampshire Chalk)<br>Safeguard zone (river test) | |
| | **Current Overall Status** | | Good | |
| | **Objective Status** | | Good | |
| | **Ecological Status / Potential** | | Good | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Moderate | Good (2015) |
| | | Fish | - | - |
| | | Invertebrates | High | Good (2015) |
| | | Macrophytes Sub Element | Moderate | - |
| | Hydromorphological | Overall | Supports good | Supports good (2015) |
| | | Hydrological Regime | Supports good | Supports good (2015) |
| | Physico-chemical | Overall | High | Good (2021) |
| | | Acid Neutralising Capacity | - | Good (2015) |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2021) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | - | Not assessed |
| | | Mitigation Measures Assessment | - | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Does not require assessment |
| **Mitigation Mea** | Reasons for not achieving Good Status | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| **Water Body Level Measures** | | | | |

*Table B 10 River Test upper WFD Water body information*

| | | | | |
|---|---|---|---|---|
| **Water Body Details** | **Water body name** | | River test – upper | |
| | **Water body ID** | | GB107042022710 | |
| | **Water body type** | | River | |
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Test Upper and Middle | |
| | **Hydromorphological designation** | | Not designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ and Hampshire Chalk)<br>Safeguard zone (river test) | |
| | **Current Overall Status** | | Good | |
| | **Objective Status** | | - | |
| | **Ecological Status / Potential** | | Good | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Good | Good (2015) |
| | | Fish | - | - |
| | | Invertebrates | Good | Good (2015) |
| | | Macrophytes Sub Element | Good | Good (2015) |
| | Hydromorphological | Overall | Supports good | Supports Good (2015) |
| | | Hydrological Regime | High | Supports Good (2015) |
| | Physico-chemical | Overall | High | Good (2015) |
| | | Acid Neutralising Capacity | High | - |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | - | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | - | Not assessed |
| | Supporting elements (Surface Water) | Overall | - | Not assessed |
| | | Mitigation Measures Assessment | - | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Does not require assessment |
| **Mitigation Measures** | Reasons for not achieving Good Status | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| **Water Body Level Measures** | | | | |

*Table B 11 Dever WFD Water body information*

| | | |
|---|---|---|
| **Water Body Details** | **Water body name** | Dever |
| | **Water body ID** | GB107042022770 |
| | **Water body type** | River |

| | | | | |
|---|---|---|---|---|
| | **Management catchment** | | Test and Itchen | |
| | **Operational catchment** | | Test Upper and Middle | |
| | **Hydromorphological designation** | | not designated artificial or heavily modified | |
| | **Sensitive habitats** | | Nitrates Directive (Hamble Estuary Eutrophic NVZ and Hampshire Chalk)<br>Safeguard zone (river test) | |
| | **Current Overall Status** | | Good | |
| | **Objective Status** | | Good | |
| | **Ecological Status / Potential** | | Good | |
| | **Chemical Status** | | Does not require assessment (fail in 2019) | |
| **Ecological** | **Quality elements** | **Elements** | **Classification** | **Objective** |
| | Biological | Overall | Good | Good (2015) |
| | | Fish | - | - |
| | | Invertebrates | High | Good (2015) |
| | | Macrophytes Sub Element | Good | Good (2015) |
| | Hydromorphological | Overall | Supports good | Supports Good (2015) |
| | | Hydrological Regime | Supports good | Supports Good (2015) |
| | Physico-chemical | Overall | High | Good (2015) |
| | | Acid Neutralising Capacity | High | - |
| | | Ammonia (Phys-Chem) | High | Good (2015) |
| | | BOD | High | - |
| | | Dissolved oxygen | High | Good (2015) |
| | | pH | High | Good (2015) |
| | | Phosphate | High | Good (2015) |
| | | Temperature | High | Good (2015) |
| | Specific pollutants | Overall | High | High (2015) |
| | Supporting elements (Surface Water) | Overall | - | Not assessed |
| | | Mitigation Measures Assessment | - | - |
| **Chemical** | Priority hazardous substances | Overall | Does not require assessment (fail in 2019) | Good (2063) |
| | Priority substances | Overall | Does not require assessment (good in 2019) | Good (2015) |
| | Other Pollutants | Overall | Does not require assessment | Does not require assessment |
| **Mitigation Measures** | Reasons for not achieving Good Status | Polybrominated diphenyl ethers (PBDE) | | |
| | | Mercury and Its Compounds | | |
| **Water Body Level Measures** | | | | |

Royal HaskoningDHV

# Acronyms

| Acronym | Acronym description |
|---|---|
| **AEP** | Annual Exceedance Probability |
| **AMP** | Asset Management Plan |
| **AMR** | Annual Monitoring Report |
| **BAP** | (UK) Biodiversity Action Plan |
| **BGS** | British Geographical Society |
| **CAMS** | Catchment Abstraction Management Strategy |
| **CDA** | Critical Drainage Area |
| **CFMP** | Catchment Flood Management Plan |
| **CROW** | Countryside and Rights of Way Act |
| **CSO** | Combined Sewer Overflow |
| **CWS** | County Wildlife Sites |
| **DEFRA** | Department for Environment, Food and Rural Affairs |
| **DG5** | Director General Performance Measure 5 |
| **DPD** | Development Plan Documents |
| **DWF** | Dry Weather Flow |
| **DYAA** | Dry Year Annual Average |
| **DYCP** | Dry Year Critical Period |
| **EIA** | Environmental Impact Assessment |
| **FCERM** | Flood and Coastal Erosion Risk Management |
| **FMS** | Flood Risk Management Strategy |
| **TVC** | Test Valley Catchment |
| **TVBC** | Test Valley Borough Council |
| **FRA** | Flood Risk Assessment |
| **FRMP** | Flood Risk Management Plan |
| **FRR** | Flood Risk Regulations (2009) |
| **FWMA** | Flood and Water Management Act (2010) |
| **HOF** | Hands-off flow |
| **HRA** | Habitat Regulations Assessment |
| **IDB** | Internal Drainage Board |
| **l/p/d** | Litres per person per day |
| **l/h/d** | Litres per household per day |
| **LFRMS** | Local Flood Risk Management Strategy |
| **LLFA** | Lead Local Flood Authority |
| **LPA** | Local Planning Authority |
| **NNR / LNR** | National Nature Reserve / Local Nature Reserve |
| **NPPF** | National Planning Policy Framework |
| **NPPG** | National Planning Practice Guidance |
| **NVZ** | Nitrate Vulnerable Zone |
| **OAN** | Objectively Assessed Need |
| **PCC** | Per Capita Consumption |
| **PE** | Population Equivalent |

| Acronym | Acronym description |
|---|---|
| **PFRA** | Preliminary Flood Risk Assessment |
| **RBMP** | River Basin Management Plan |
| **RMA** | Risk Management Authority |
| **SAC** | Special Area of Conservation |
| **SFRA** | Strategic Flood Risk Assessment |
| **SHMA** | Strategic Housing Market Assessment |
| **SPA** | Special Protection Area |
| **SPD** | Supplementary Planning Document |
| **SSSI** | Site of Special Scientific Interest |
| **SuDS** | Sustainable Drainage Systems |
| **SWMP** | Surface Water Management Plan |
| **uFMfSW** | Updated Flood Map for Surface Water |
| **UKCIP** | UK Climate Impacts Programme |
| **WCS** | Water Cycle Study |
| **WFD** | Water Framework Directive |
| **WRC** | Water Recycling Centre |
| **WRMP** | Water Resources Management Plan |
| **WRLTMP** | Water Recycling Long Term Management Plan |
| **WRZ** | Water Resource Zone |

Royal HaskoningDHV is an independent consultancy which integrates 140 years of engineering expertise with digital technologies and software solutions. As consulting engineers, we care deeply about our people, our clients and society at large. Through our mission Enhancing Society Together, we take responsibility for having a positive impact on the world. We constantly challenge ourselves and others to develop sustainable solutions to local and global issues related to the built environment and the industry.

Change is happening. And it's happening fast – from climate and digital transformation to customer demands and hybrid working. The speed and extent of these changes create complex challenges which cannot be addressed in isolation. New perspectives are needed to accommodate the broader societal and technological picture and meet the needs of our ever-changing world.

Backed by the expertise of over 6,000 colleagues working from offices in more than 20 countries across the world, we are helping organisations to turn these challenges into opportunities and make the transition to smart and sustainable operations. We do this by seamlessly integrating engineering and design knowledge, consulting skills, software and technology to deliver more added value for our clients and their asset lifecycle.

We act with integrity and transparency, holding ourselves to the highest standards of environmental and social governance. We are diverse and inclusive. We will not compromise the safety or well-being of our team or communities – no matter the circumstances.

We actively collaborate with clients from public and private sectors, partners and stakeholders in projects and initiatives. Our actions, big and small, are driving the positive change the world needs, and are enhancing society now and for the future.

Our head office is in the Netherlands, and we have offices across Europe, Asia, Africa, Australia and the Americas.

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