



# Water Cycle Study

March 2023



Dover District **Local Plan**  
Supporting document



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## **Executive Summary**

*Dover District Council is in the process of producing a new Local Plan, which will allocate sufficient land for 10,998 additional homes in the period up to 2040. It will also make provision for required gypsy and traveller pitches and employment land and set out the strategic and development management policies which will guide all development in the district over the Plan period.*

*Understanding the impact of the growth proposed in the new Local Plan on the existing water infrastructure and the district's natural environment will be important in enabling sound Policies to be included in the Plan. In the interests of planning for sustainable growth in the district over the lifetime of the Plan, the Council has therefore worked collaboratively with water companies and other stakeholders to produce this Water Cycle Study, which forms part of the evidence base for the Regulation 19 Draft Local Plan. It has been produced with input from relevant stakeholders including both the District's water providers, Southern Water and Affinity Water, on issues relating to water supply, quality and wastewater, as well as the Environment Agency with regard to abstraction and water quality.*

*This Water Cycle Study provides a summary of the policy and legislative context, before giving an overview of the water environment of this district. The different elements of the water cycle – namely, water supply, water quality, groundwater, water abstraction, wastewater and flooding - are then reviewed to produce a high-level summary of existing water cycle processes and supporting infrastructure. Finally, conclusions and recommendations on policy approaches are set out to ensure that the level of development proposed in the emerging Dover Local Plan will not have a detrimental effect on the water environment of the district.*

# 1. Introduction

## What is a Water Cycle Study?

- 1.1 A Water Cycle Study is a voluntary undertaking, usually carried out by a Local Planning Authority (LPA) during the formulation of a new Local Plan. The Study takes into account the levels of development required during the Plan period and encourages the LPA, water authorities and the Environment Agency (EA) to work collaboratively in order to achieve growth that is well-integrated, appropriately located and sustainable in the context of clean and safe water provision.

*“A Water Cycle Study 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 and can identify joined up and cost-effective solutions that are resilient to climate change for the lifetime of the development.”*

*National Policy Practice Guidance Paragraph: 012 Reference ID: 34-012-20140306*

- 1.2 A properly functioning water cycle is vital to both the natural environment and human well-being. Water is a finite resource and it is essential that it is managed appropriately. There is increasing recognition that the ways in which we use water contribute to extreme water situations, and that the planning system, through Local Plan policies, needs to ensure that sufficient management and mitigation is in place so that any increased development that will occur, following the implementation of its policies, does not result in adverse impacts on the water cycle, and thus the well-being of both human health and the natural environment. Such management includes ensuring that adequate supplies of clean water are available to meet the district's domestic, industrial, recreational and agricultural needs and to maintain its rich variety of wildlife and habitats.
- 1.3 The Kent Environment Strategy (2016) identified Kent as one of the driest regions in England and Wales, and while progress has been achieved in recent years reducing average consumption, from 154 l/p/d across Kent in 2012/13 to the most recent figure of 124l/p/d across the two Dover water zones, this does not negate the need to reduce water consumption further, particularly in the current context of a unprecedented warming climate where the need for robust water management strategies is more urgent than ever before.
- 1.4 This Water Cycle Study uses data provided by the District's two water providers, Affinity Water and Southern Water, to understand the current position of each provider, drawing upon information from the providers' Water Resource Management Plans (WRMP) that set out the future water infrastructure in the District. Additionally, the Study is based on input from the Environment Agency (EA) due to their role in Abstraction Licensing, and for the provision of data collected by them relating to water quality.

## Why is a Water Cycle Study needed?

- 1.5 In March 2017 the decision was taken by Dover District Council (the Council) to review its Core Strategy and as a result of this the Council is currently in the process of preparing a new Local Plan (the Plan) for the District. The Plan will set out the quantum and distribution of housing and jobs growth within the District for the years 2022 to 2040.
- 1.6 This Water Cycle Study forms part of the Council's evidence base to support the new Local Plan, updating the District's previous Water Cycle Study which was published in 2009. It addresses the key water-centric considerations for Plan-making, namely water supply, groundwater, water abstraction, water quality, wastewater and flooding.
- 1.7 Such considerations are not readily confined to the District's boundaries as in practice water providers usually operate across several LPA areas. In addition, there are processes of water transfer within companies and trade between providers that add layers of complexity to water provision.
- 1.8 The Study will be used to identify current issues and constraints within the District's water cycle and provides evidence to support the policies of the emerging Local Plan. In this regard, it reconciles the forecast development growth for the District with the management plans of the water providers. The Study will also be used to ensure that, in the context of climate change, the Council's plans are well-evidenced and justifiable and align with advice given by the water providers and the Environment Agency.
- 1.9 As Figure 1 illustrates, the water cycle includes rainfall, infiltration, evaporation, surface runoff, interception/transpiration, freshwater and groundwater storage. All development has the potential to impact on all aspects of this cycle. Intervention with these natural processes includes water extraction from rivers, groundwater and reservoirs, and subsequent water treatment to use for water supplies, and wastewater collection before it is recycled back into the water cycle.

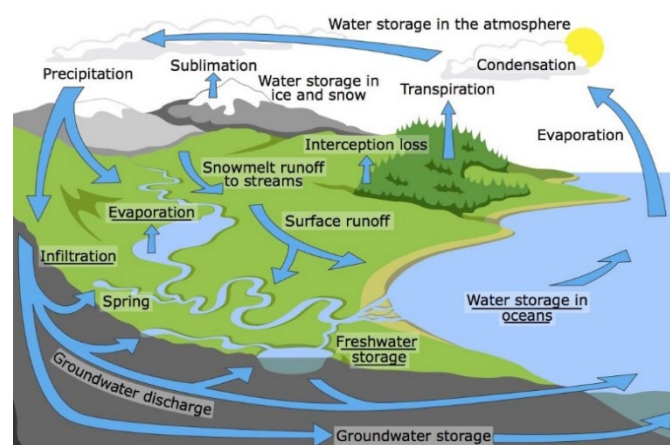


Figure 1 - The Hydrological Cycle

## Climate Change

Source: Environment Agency, 2020

- 1.10 It is now accepted that climate change is one of the greatest challenges facing society and that rising global temperatures are accelerating to a harmful degree as a result of post-industrial human activity. This is likely to have significant effects on the water environment. These effects will tend to increase the size of flood zones associated with rivers and the amount of flooding experienced from other inland sources. Rises in sea level will change the frequency of occurrence of high-water levels relative to today's sea levels, and will also increase the extent of the area at risk should sea defences fail. Changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events are also predicted. With these effects in mind, it will be vital for this Study and the water companies' WRMPs with which its conclusions seek to align, to take account of predicted changes to the water environment as a result of climate change.
- 1.11 Dover District Council declared a [Climate Emergency](#) at its Full Council meeting of 29 January 2020, following the decision of its Cabinet on 4<sup>th</sup> November 2019 that there is a need for urgent action, given the serious impact of climate change globally. The Council has set up a cross party Climate Change Member Working Group, which will prepare a strategy and action plan, with the aspiration that DDC will become a net zero carbon emitter by 2030. In addition, the Council has pledged to help support the wider community so that the district can become carbon neutral by 2050. It also supports the [Kent Environment Strategy](#) and [Kent Fuel Poverty Strategy](#) and is a signatory to the [Emissions Reduction Pledge 2020](#). Officers have also been working with Kent partners on a draft Energy and Low Emissions Strategy.
- 1.12 Changes to the climate will bring new challenges to the district's built and natural environments, as well as adding new pressure onto the district's water environment. Kent is one of the driest regions in England and Wales and hotter, drier summers are likely to further limit water supply. Wetter winters, with an increasing likelihood of extreme weather events and rising sea levels will also place additional and more frequent pressure on the district's flood defences and water infrastructure.

### **How has this Water Cycle Study been prepared?**

- 1.13 A draft Water Cycle Study was prepared in consultation with the water providers during spring and summer 2020. Relevant stakeholders were subsequently consulted on a Draft between 28 October and 19 November 2020. Three responses were received (Appendix A) and the Draft was then amended to take account of the issues raised.
- 1.14 The November 2020 Draft formed part of the evidence base for the Regulation 18 Dover Local Plan 2040 Consultation which ran for a period of eight weeks from 20 January to 17 March 2021. Responses were received on the Water Cycle Study as part of this consultation from the Environment Agency (Appendix B). The Study has been further amended to take account of these representations as well as updates in data on water quality and changes to the National Planning Policy Framework.

## 2. Policy Context

### National Policy and Guidance

- 2.1 The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017) apply to surface waters (including some coastal waters) and groundwater. The Regulations set out requirements to prevent the deterioration of aquatic ecosystems, protect, enhance and restore water bodies to 'good' status, and achieve compliance with standards and objectives for protected areas. To meet the objectives of the Regulations, Local Authorities must have regard to the relevant River Basin Management Plan which, for the South East, was most recently updated by the EA in 2016.
- 2.2 The National Planning Policy Framework (2021) at paragraph 20 requires, among other things, that strategic policies should make sufficient provision for water supply, wastewater, flood risk and coastal change management. Paragraph 169 recommends the incorporation of sustainable drainage systems as part of planning appropriately for flood risk while paragraph 174 states that all planning policies and decisions should contribute to and enhance the natural and local environment including helping to improve water quality (paragraph 174 e) taking account of relevant information such as river basin management plans. Paragraph 185 requires that new development should be appropriate for its location in the context of health, living conditions and the natural environment.
- 2.3 The National Policy Statement for Wastewater (2012) forms part of the overall framework of national planning policy and sets out Government policy for the provision of major wastewater infrastructure. It is used by decision makers as the primary basis for deciding development control applications for wastewater developments that fall within the definition of Nationally Significant Infrastructure Projects (NSIP) as defined in the Planning Act 2008.

### Other Relevant Background Evidence

- 2.4 This Water Cycle Study has also been informed by:

**[Kent County Council's Kent Water for Sustainable Growth Study \(WfSG\) \(2017\)](#)**: The WfSG concluded that the status of water bodies in Kent is adversely affected by a range of pressures on their environmental quality. The WfSG found that due to growth pressures, a range of additional water supply options need to be considered against the requirements for all water companies and that measures should be taken to minimise the impact of further growth. This would be through management of future demand (including the consideration by LPAs of adopting the Building Regulations optional standard for water use (110 l/p/d) as the preferred policy target for new development). In terms of wastewater, the WfSG found that future 'Good' status is not possible for many watercourses due to limits related to current conventional treatment, but that future technologies may change this and so the effect of growth needs to be continually



assessed as Local Plan development continues to ensure growth does not exacerbate the existing limitations

**Dover District Council's Water Cycle Study (2009)**: The 2009 Study advises that future demand for water supply in the District should be met firstly by increasing water efficiency and reducing leakage followed by making more efficient use of existing resources. These steps were based on the EA's identification of all the District's groundwater sources as being over-abstracted. The Study concluded that headroom for wastewater treatment and water quality would not constrain development in the District, although strategic upgrades to sewerage infrastructure would be necessary in order to accommodate the levels of growth forecast, particularly in the Dover/Whitfield catchment.

**Dover District Strategic Flood Risk Assessment and Site-Specific Guidance for Managing Flood Risk (2019)**: Carried out by Herrington Consulting and adopted March 2019, the SFRA provided background and context to sources of flooding in Dover District and historic flood events. The SFRA advised on the impacts of climate change on the District's watercourses and weather, as well as providing evidence to support the Council's Policies for the management of flood risk and to assist with the testing of site proposals.

## The existing Development Plan for Dover District

2.5 The current adopted development plan for Dover comprises:

- **Dover District Core Strategy (2010)**
- **Dover District Land Allocations Local Plan (2015)**
- **Dover District Local Plan 2002 (saved policies)**
- **Worth Neighbourhood Development Plan (2015)**
- **Ash Neighbourhood Development Plan (2021) and,**
- **Kent Minerals and Waste Local Plan (2016) and partial early review (2020)**

2.6 There are three water-related policies in the current development plan:

| <b>Policy Number</b>         | <b>Policy Title</b> | <b>Summary of Policy</b>                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Core Strategy (2010):</b> |                     |                                                                                                                                                                                                                                                                                                                                                                                                               |
| CP6                          | Infrastructure      | <p>Permits development only where infrastructure already exists or there is a reliable mechanism to enable infrastructure provision.</p> <p>A table summarising the infrastructure which would be required to support the Core Strategy was provided alongside the Policy.</p> <p>In terms of <b>water supply</b>, this consisted of a new trunk main, service reservoir and booster station to serve the</p> |

|      |                               |                                                                                                                                                                                                                                                                                                                |
|------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                               | Whitfield urban extension, as well as local network upgrades to serve developments across the district.<br><br>As regards <b>wastewater</b> , the requirements were a new local system and upgrade to serve the Whitfield urban extension, and local sewer upgrades to serve developments across the district. |
| DM17 | Groundwater Source Protection | Restricts the types of development that can be permitted in Groundwater Source Protection Zones 1 and 2 unless adequate safeguards against contamination are provided                                                                                                                                          |
| DM18 | River Dour                    | Development proposals that affect the setting of the River Dour should wherever possible ensure that they create a connected active river frontage, improve public access and enhance wildlife interest.                                                                                                       |

*Figure 2 - Water-related Development Plan Policies*

## **Dover District Strategic Flood Risk Assessment (2019)**

- 2.7 The District's 2019 Strategic Flood Risk Assessment (SFRA) provides an analysis of the main sources of flood risk to the district, alongside a detailed means of appraising development allocation sites and existing planning policies, against the risk posed by flooding over the coming century. The SFRA was prepared in consultation with the Environment Agency, Kent County Council Internal Drainage Board and Southern Water in its role as sewerage undertaker for the district.
- 2.8 The SFRA summarises how the district's three main towns, due to their coastal nature, are all at risk from coastal flooding, and Dover and Sandwich also face a risk of fluvial flooding from the Dour and Stour respectively. Much of the district is susceptible to flooding from groundwater sources due to the permeable underlying geology of the chalk downs, especially at the base of dry valleys where large seasonal fluctuations in groundwater levels can reactivate springs or watercourses. The SFRA advises that flooding from sewers is most likely to occur in the district's urban locations, and that as the majority of the surface water sewer network in Dover Town is hydraulically connected to the River Dour, high-water levels within the Dour can influence the risk of sewer flooding within the town.
- 2.9 The SFRA outlines that there has been extensive investment in defence infrastructure along the district's rivers and coast by both the EA and DDC, providing protection to the low-lying areas inland of the coast. In particular, Deal and Sandwich have benefitted from significant engineering works in order to reduce the towns' flood risk.
- 2.10 The SFRA provides guidance on managing surface water runoff from developments and requires that a Surface Water Management Strategy should be undertaken for all major developments. All development applications which are required to be accompanied by a Flood Risk Assessment are also required to incorporate sustainable drainage systems, unless there is clear evidence that this would be inappropriate.

2.11 As one of its key outputs, the SFRA includes mapping to illustrate the areas at risk of flooding from different sources in the district, designed to assist with the appraisal of flood risk and to assist with spatial planning.

### **3. The Water Environment of Dover District**

#### **Background**

- 3.1 Dover District has a rich and varied landscape, comprising coastal cliffs and marshes, orchards and arable lands, rolling chalk downlands and scattered ancient woodlands. The two largest towns, Dover and Deal, are located on the coast, while the medieval town of Sandwich is located on the River Stour around a mile from the sea. The settlement pattern reflect the district's location and defensive and maritime history. Inland, the landscape of the district is largely the result of agricultural activity with a large number of small attractive villages often with conservation areas at their core. The former mining village of Aylesham, close to the district's western boundary, is being developed as a rural service centre for the north-western part for the district.
- 3.2 Dover District is highly accessible by rail, road and sea. It is home to the nationally important Port of Dover, one of the world's busiest maritime passenger ports. A number of railway stations enjoy high speed rail connections to London via the HS1 service from Dover, Martin Mill, Walmer, Deal and Sandwich. In addition, mainline train services to London Victoria and London Charing Cross operate from stations in the district. Both the A20 and A2 start in the district, linking Dover to Canterbury, Ashford, Maidstone, the Medway towns and London via the M20 and M2 motorways. Road links to adjoining districts are provided by the A256 to Thanet and the A257 to Canterbury.

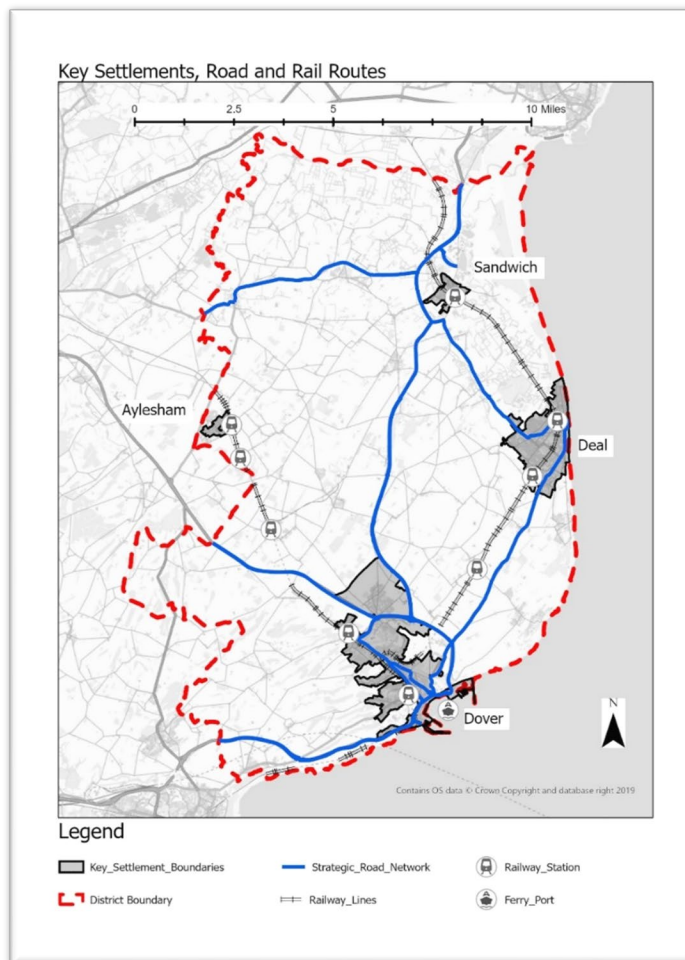


Figure 3 - Key Settlements, Road and Rail Routes

## Topography and Geology

3.3 The topography within the District is closely related closely to the underlying geology. Across the District, the land generally rises to the south. The landform is flat to the north, north-west and north east of the District over largely alluvium and deep clay soils, while at the Coast the landform is characterized by low-lying dunes, shingle beaches and chalk cliffs. In the centre and towards the south of the District, Upper Chalk becomes the dominant rock type, with ribbons of Dry Valley and Nailbourne Deposits resulting in a pattern of ridges and valleys. This pattern becomes more defined to the south of the District. This pattern informs the drainage, with a series of dry valleys and river valleys with marshes to the sea. The topography becomes most dramatic at the very south of the District, north of Lydden, where the true downland character of steep escarpments is most obvious. The map below illustrates the underlying geology and topography within the context of the district's main settlements.

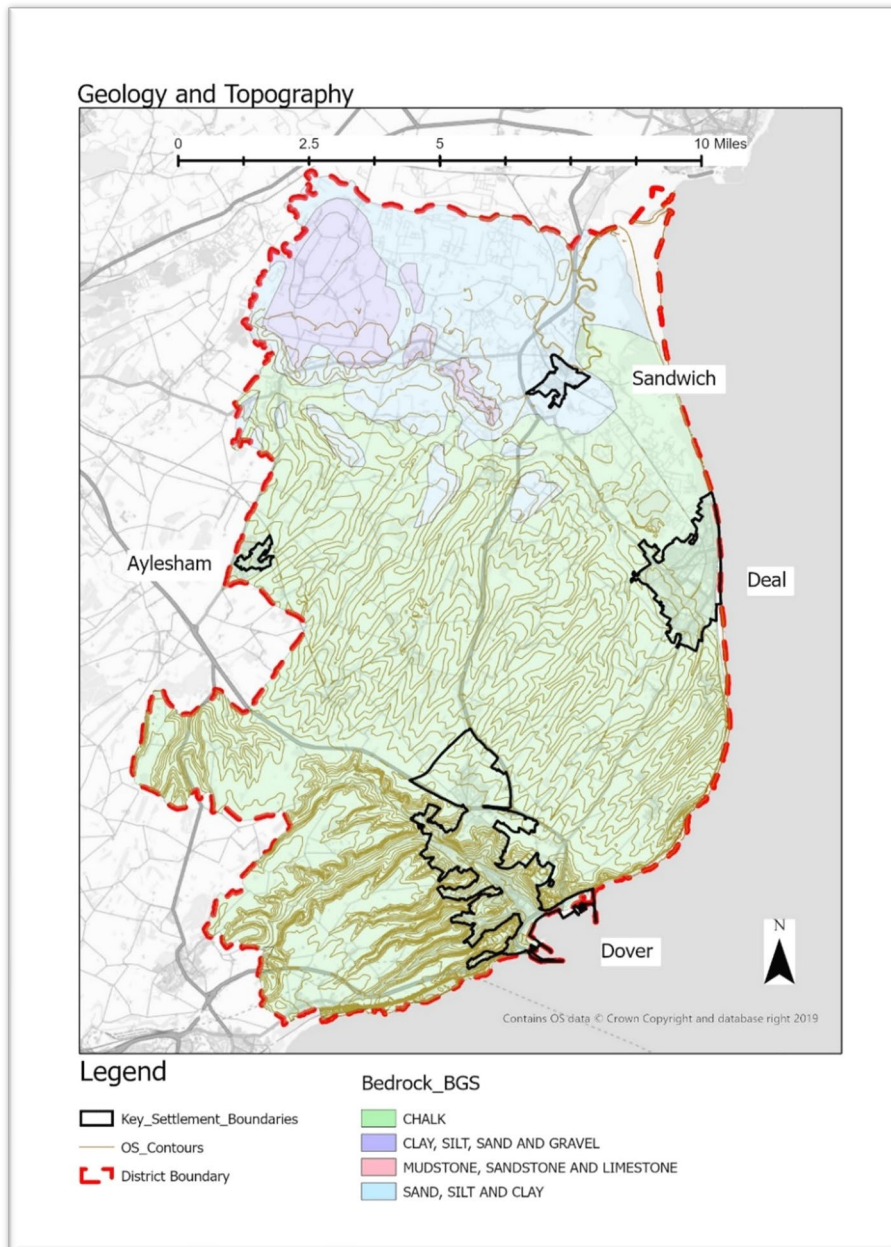


Figure 4 - Geology and Topography

## Landscape

3.4 About 6,900 hectares (21%) of the District are designated as part of the Kent Downs Area of Outstanding Natural Beauty and of these 876 hectares (3%) either side of Dover forms the only Heritage Coasts in Kent, with the objectives of conserving both natural and scenic beauty. The District is also home to five nationally protected Sites of Special Scientific Interest (SSSIs), two National Nature Reserves and two Marine Conservation Zones, with three more lying further offshore.

3.5 Five internationally designated environmental sites fall in full or in part within the boundaries of Dover District. These sites are of international importance in supporting natural habitats and species that are rare, endangered or vulnerable within an



international context The district contains three Special Areas of Conservation (SACs), the Sandwich Bay SAC, the Lydden and Temple Ewell Downs SAC, and the Dover to Kingsdown Cliffs SAC which are designated for their exceptional habitats, the Thanet Coast and Sandwich Bay Ramsar site, an internationally protected wetland under the Ramsar convention and the Special Protection Area (SPA) of Sandwich Bay designated due to its nature conservation interest and its use by large numbers of migratory birds. The map below illustrates the relevant environmental and landscape designations within the district.

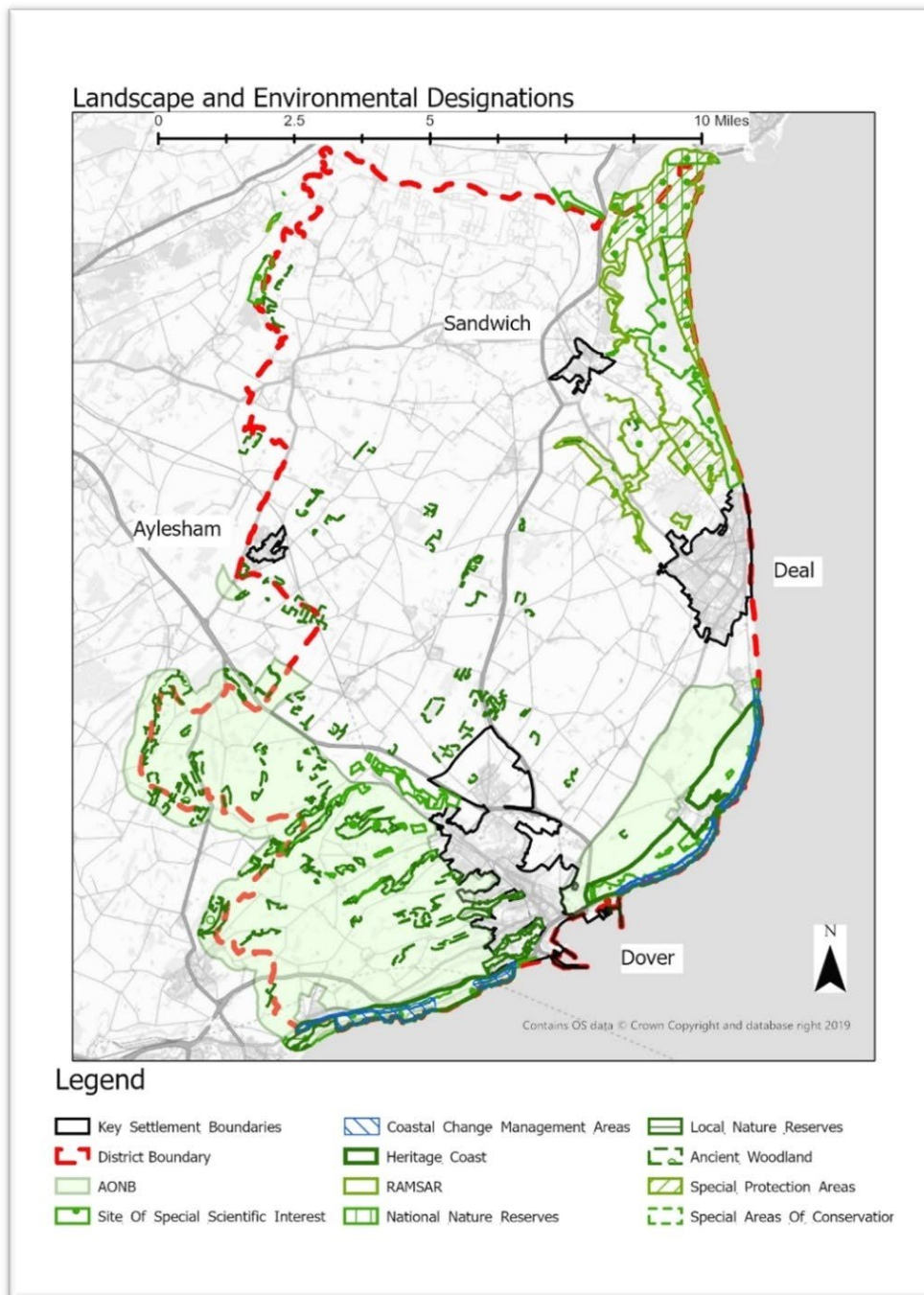


Figure 5 - Landscape and Environmental Designations

## **River Catchments and watercourses**

- 3.6 Dover district falls within the South East River Basin District, within the Stour Management Catchment. The district has three principal rivers - the Stour, the Dour and the Little Stour/Wingham. The River Stour, one of the main rivers of the county, cuts through the northern half of the district to the sea at Pegwell Bay. The reach of the Stour within the district is tidally influenced but the river is also fed by a network of drainage ditches and watercourses.
- 3.7 The River Dour is a short (approximately 4 km) chalk stream that rises in a rural setting north of Dover, before flowing through the highly urban centre of Dover. Chalk streams are rare, with in the region of 200 in the world, 85% of which are in England. They provide unique ecosystems. The Dour river boasts a brown trout population, but the habitat is highly degraded due to urbanisation and structures which fragment the course of the river, in part due to a legacy of watermills.
- 3.8 Part of the catchment of the Little Stour lies within Dover district. The Little Stour is a tributary of the Great Stour, joining the larger river at Plucks Gutter. The Wingham River, a tributary of the Little Stour flows through Wingham, within Wingham and Little Stour operational catchment. To the north of Wingham and Ash is the Ash Levels operational catchment. This catchment is an area of low-lying farmed land, criss-crossed with ditches, with streams such as the Richborough Stream, draining into the Great Stour.
- 3.9 To the east of the district are short waterbodies and their wider catchments. The South Stream flows from Eastry and the North Stream from Deal and Northbourne. There are two north and south streams running through the Lydden valley. A north and south stream start just east of Eastry (near Ham fen). Another north stream starts near Broad Dyke and a south stream starts near Great Mongeham.
- 3.10 Owing to the largely flat nature of the north of the district, extensive areas around, and between, Sandwich and Deal are liable to flooding and are therefore covered by Flood Zones 2 and 3, in addition to locations in Dover which are close to the River Dour. In addition, significant portions of the district have been assessed by the Environment Agency as being at risk of flooding from surface water during heavy rainfall events. Flooding is addressed in more detail in Section 8 of this Study.

## **Groundwater Resources**

- 3.11 There are two groundwater bodies in Dover district. The East Kent Chalk – Stour groundwater body is the chalk aquifer under the Kent Downs and Lydden Valley and is a principal aquifer. The East Kent Tertiaries lies under the Ash Levels and is a secondary aquifer. The overall status of the two groundwater bodies in Dover was poor in 2016. Groundwater supplies 80% of the districts's drinking water. Groundwater also provides important base-flow to the river systems. The groundwater quality across the catchment is at poor status, but the water is treated so there is no risk to drinking water supply.



3.12 A number of Groundwater Protection Zones (defined by the Environment Agency for groundwater sources, including wells, boreholes and springs used for public drinking water supplies) are located in Dover District. These protect the district's rivers and aquifers from pollution. The majority of Zones are concentrated in the southern third of the district, including a concentration to the northwest of the town of Dover.

3.13 Groundwater Source Protection Zones which help to protect groundwater from pollution are divided into three zones:

- Inner zone (Zone 1) – the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres.
- Outer zone (Zone 2) – the 400 day travel time from a point below the water table.
- Total catchment (Zone 3) – the area around a source within which all groundwater recharge is presumed to be discharged at the source.

Significant areas of the chalk aquifer under Dover are covered by groundwater source protection zones including around Dover town.

3.14 The map below shows key water considerations in the district in the context of the main settlements

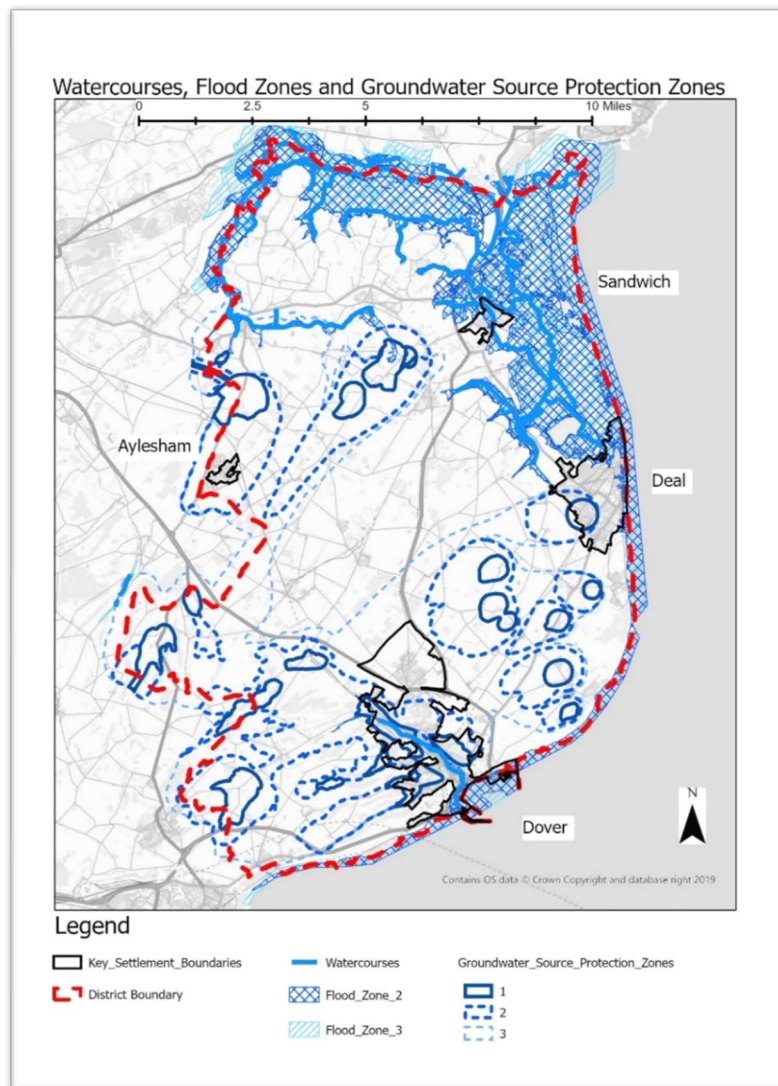


Figure 6 - Watercourses, Flood Zones and Groundwater Source Protection Zones

## 4 Water Supply

- 4.1 Pressure on water resources is increasing as a result of population growth, an increase in household demand for water and the effects of climate change and rising temperatures. Dover District is served by two water companies – Southern Water and Affinity Water. The northern half of the district including Deal, Sandwich, Eastry, Ash, Wingham and Preston is served by Southern Water, while the southern half of the district, including Dover, Whitfield, Shepherdsweil and Eythorne is served by Affinity Water. The map below illustrates the coverage boundaries of each company.

Water Companies in Dover District

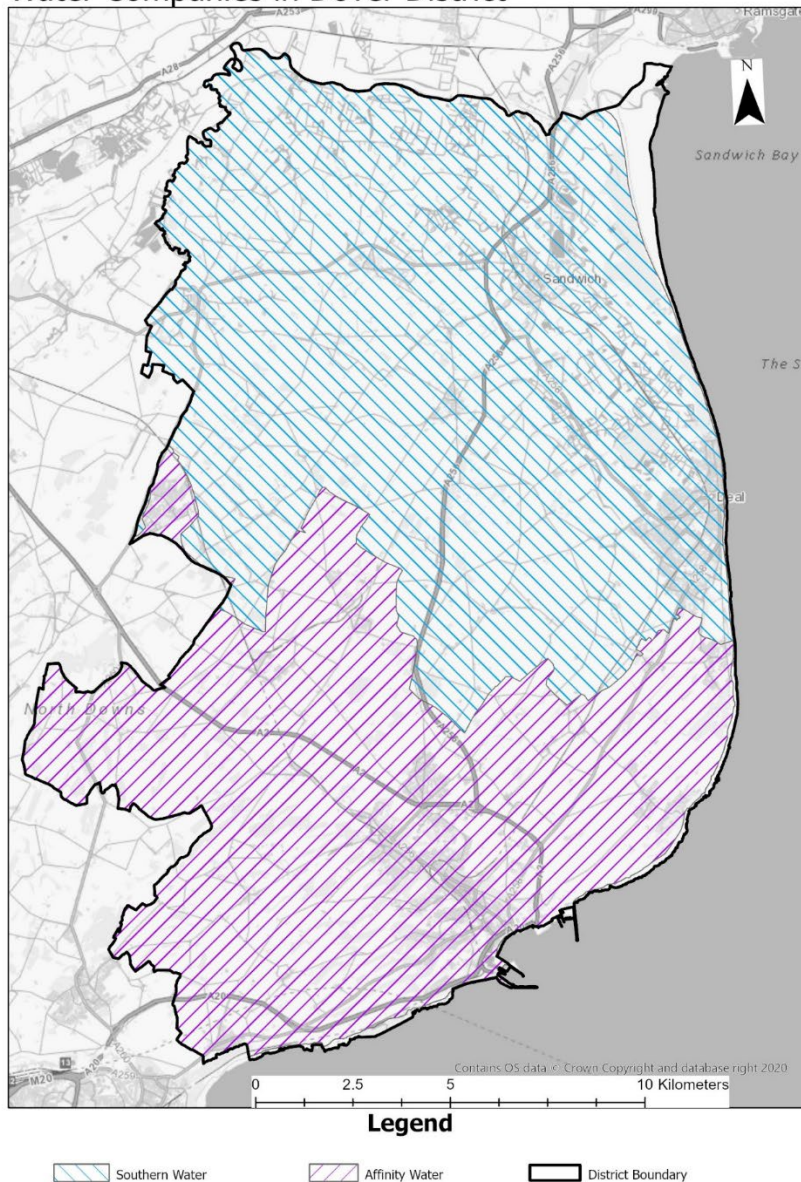


Figure 7- Dover District Water Company Boundaries

4.2 Water companies are required to produce Water Resource Management Plans (WRMP) which set out how they intend to supply healthy, reliable water to homes and businesses. These are reviewed every five years to reflect the latest information, technology and views of customers. The water companies measure time periods in five-year cycles, or Asset Management Periods (AMPs).

### **Affinity Water's Water Resources Management Plan 2020-2080**

4.3 Affinity Water's WRMP was adopted in April 2020 and covers the period from 2020-2080. The southern half of Dover District falls within Affinity Water's 'Southeast Region (Dour Community)'.

4.4 In the Southeast Region, Affinity Water abstracts 90% of its water supply from chalk boreholes, and the remaining 10% is supplied from the shallow gravel aquifer of the Dungeness peninsula. Affinity also benefits from existing imports from Southern Water to the north and South East Water to the west.

4.5 Affinity Water aims to reduce per capita consumption across its supply area to 129l/p/d by 2025 compared to their 2015/16 baseline of 152l/p/d, with a further aspiration to reduce this to 110 l/p/d.

4.6 Affinity Water has assessed its capabilities against four different future scenarios, based on the complexity and severity of issues faced under each. Under all four scenarios, it was found that all of Affinity's demand management options would be required, namely reducing per-capita-consumption of household customers, reducing non-household demand and reducing leakage.

4.7 Affinity Water's WRMP modelling takes account of, and makes adjustments for, the uplift in demand caused by climate change, with reference to UK Water Industry Research's report *Impact of Climate Change on Water Demand*. For leakage reduction, Affinity has determined that it can economically achieve a 40% reduction between 2015 and 2045, and it will look to extend that to 50% as part of its Plan.

4.8 The WRMP forecasts a small supply-demand deficit in the Southeast in 2020 under a Critical Period scenario, as well as under Average Annual consumption in 2045 and 2080 based on a 2016 baseline. The growing deficit forecast is due to the projected population growth in Affinity's Southeast Region. Affinity Water advises that the forecast deficits can be managed through the agreed demand management measures (reducing per-capita-consumption of household customers, reducing non-household demand and reducing leakage), and an extension of bulk supply arrangements with neighbouring water companies. In addition, Affinity Water estimates that there is a 60% chance over the next 60 years that they would need to resort to exceptional drought management measures such as standpipes. Affinity Water will reduce this to around a 25% chance (a 1 in 200 year drought event) by ensuring the availability of increased abstraction rates at four sources in the Southeast supply region to enable more water to be put into supply under drought conditions.

4.9 Under the WRMP (2020), Affinity Water will require some licence changes and infrastructure schemes in Dover District. These primarily include removing constraints

around the Dover source and strengthening of the network around Broome, which will address needs during periods of peak demand. A summary of supply-side developments for the Southeast Region is provided below:

| Scheme Name                                                    | Date Required | Deployable Output (Peak, MI/d) |
|----------------------------------------------------------------|---------------|--------------------------------|
| AFF-EGW-WRZ7-0629: Lye Oak Variation                           | 2021          | 0.14                           |
| AFF-EGW-WRZ7-0908: Tappington South Licence Variation          | 2044          | 0.7                            |
| AFF-RNC-WRZ7-0626: Broome Network Improvement                  | 2066          | 2.27                           |
| AFF-RNC-WRZ7-0900: Dover Constraint Removal                    | 2022          | 1.32                           |
| AFF-RTR-WRZ7-0301: Barham Import Increase (of 2MI/d) to 4 MI/d | 2057          | 2                              |
| AFF-RTR-WRZ7-0639: Deal Continuation After 2020                | 2020          | 0.0714                         |
| AFF-RTR-WRZ7-0909: Barham Continuation (After 2019/20)         | 2020          | 2                              |

Figure 8- Affinity Water supply-side developments for the Southeast Region

4.10 As housing numbers (including completions and allocations) are subject to fluctuation and will have changed since figures were supplied to the water providers for use in their supply-side assessments in the production of WRMPs, DDC regularly engages with water company providers and projected growth and site information has been shared throughout the Local Plan process to ensure that any necessary calculations can be made. Further representations will be invited from the water providers as part of the Regulation 19 Submission Draft Local Plan consultation in the autumn of 2022. WRMPs are reviewed every five years and ongoing discussions with providers inform this process.

4.11 Affinity Water’s WRMP (2020 - 80) plans to address challenges in their supply areas, and these are summarized in the chart below:

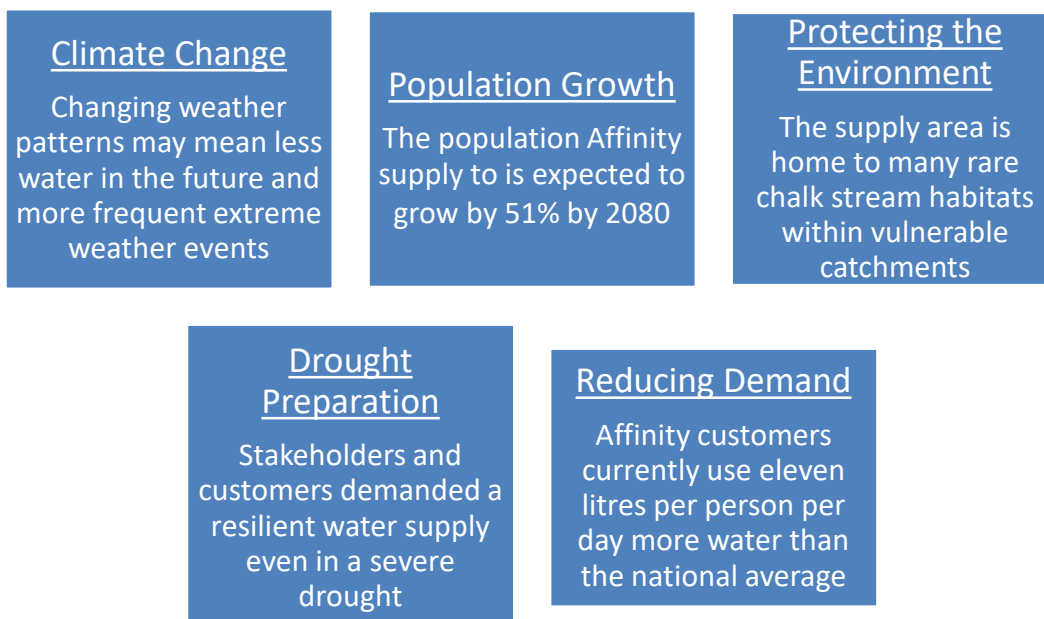


Figure 9 - Affinity Water Flagship scheme challenges

## **Southern Water's Water Resources Management Plan (2020 -70)**

4.12 Southern Water's current WRMP was published in December 2019 and covers the period from 2020-2070. The northern half of the Dover District falls within Southern Water's 'Thanet Kent' Water Resource Zone (WRZ). For strategic purposes Thanet Kent is part of the 'Eastern Area'. The WRMP states that 77% of water is supplied to the Thanet Kent catchment from groundwater sources, with 2% from rivers and 21% from transfers from the River Medway.

4.13 This WRMP tests options against the supply-demand deficits for seven different scenarios in terms of climactic conditions and intra-annual pressures on water resources, as well as different possible 'futures' in terms of the supply-demand balance. This approach allows Southern Water to ensure that their plans cover a wide, but appropriate range of futures to ensure that all the key strategic options are identified. This 'Real Options' approach identifies how solutions may change through time in the face of different possible future water resource pressures. It also identifies a common set of options in the short term which should be developed regardless of which future may materialise.

4.14 Southern Water's analysis on its supply side is informed by the predicted effects of climate change on demand, and there is uncertainty within the Kent Thanet WRZ as to whether a gain or loss of deployable output would be the result of this. However, this is offset by an expected increase in yield from Southern Water's River Medway Scheme, meaning that overall deployable output for Southern's 'Eastern Area' Catchment is expected to increase, enabling bulk transfers to take place between Southern Water's Resource Zones. As part of this, during the 2025-30 period, it is planned to develop the infrastructure to allow the full capacity of the Faversham4 transfer main to be available for transfers from Medway to Thanet.

4.15 Southern Water has committed to 'Target 100', a policy which aims to achieve a per capita consumption of 100l/p/d across the supply area by 2040, from the current level of 124l/p/d in Dover District. This will be achieved by the use of smart meters, home audits and by offering rewards for customers who save water. To encourage the use of water efficiency measures in new homes, Southern Water will incentivize developers by waiving the cost of connection to its network if homes produced are efficient enough to use less than 80l/p/d.

4.16 Southern Water intends to reduce leakage by 15% by 2025 and by 50% by 2050, as well as developing additional nitrate treatment at identified sources and implementing catchment management activity at those sources over AMP7 and AMP8, including some within the Dover District during AMP7 and AMP8.

4.17 Southern Water anticipates a 22-23% decrease in demand by 2030 due to improved efficiency measures as summarized in previous paragraphs.

4.18 Under the WRMP, two schemes are planned which specifically affect the Dover District. The first is a small-scale license variation at the West Sandwich and Sandwich sources to a flatter licence, enabling more extraction at off-peak times, and this is scheduled to be progressed during AMP6 ready for implementation during AMP7. The second scheme



is the provision of a new connection at Wingham enabling a small bulk import from South East Water from 2025 onwards (AMP8). This is envisaged to help support local demand.

4.19 Southern Water's WRMP (2020-70) key plans for their operational catchments are summarized in the chart below:



*Figure 10 - Southern Water Flagship Schemes*

## **Water Abstraction**

4.28 The Environment Agency is responsible for managing water resources in England. The Environment Agency regulates existing water abstraction licenses and grant new ones, using the Abstraction Licensing Strategy (ALS) procedure, formerly known as Catchment Abstraction Management Strategies. A licence is needed where more than 20 cubic metres of water per day will be abstracted from a river or stream, reservoir, lake or pond, canal, spring or from an underground source. Whether or not a licence is granted depends on the amount of water available after the needs of the environment and existing abstractors are met and whether the justification for the abstraction is reasonable.

4.29 The Stour Abstraction Licensing Strategy (2013) applies to Dover District, covering the River Stour and its tributaries, the River Dour and Dover Chalk Block and the Lydden Valley. The Stour ALS confirms the presence of two Abstraction Points (AP) within the district, one at Dover from the River Dour and one at Hacklinge North and South Streams.

4.30 The Stour ALS calculated resource availability at four different flows, Q95 (lowest), Q70, Q50 and Q30 (highest). As can be seen from the below diagram, sections of the Dover district have no additional water available for licensing even at highest flow, while at lowest flow the majority of the district has no additional water available for licensing. Under the Q50 and Q70 flows, the only additional water available for licensing is close to Sandwich and is largely 'restricted'.

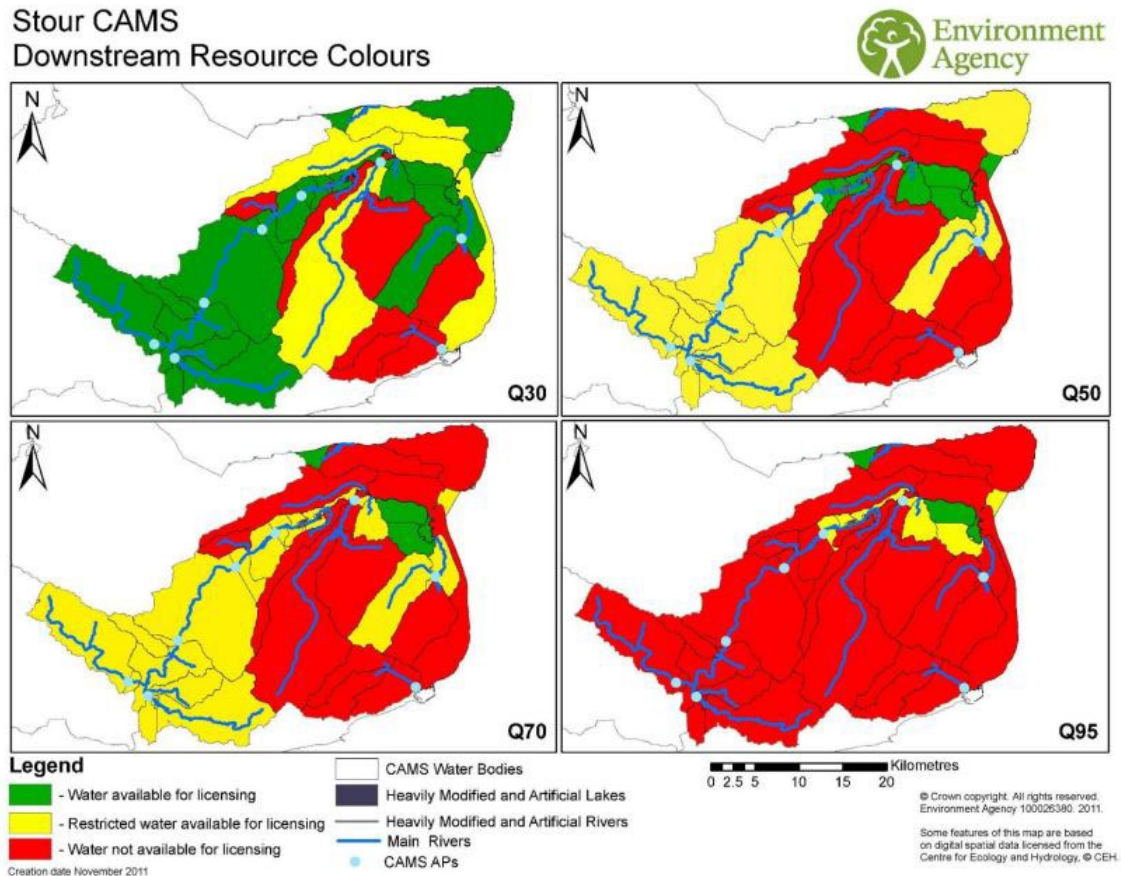
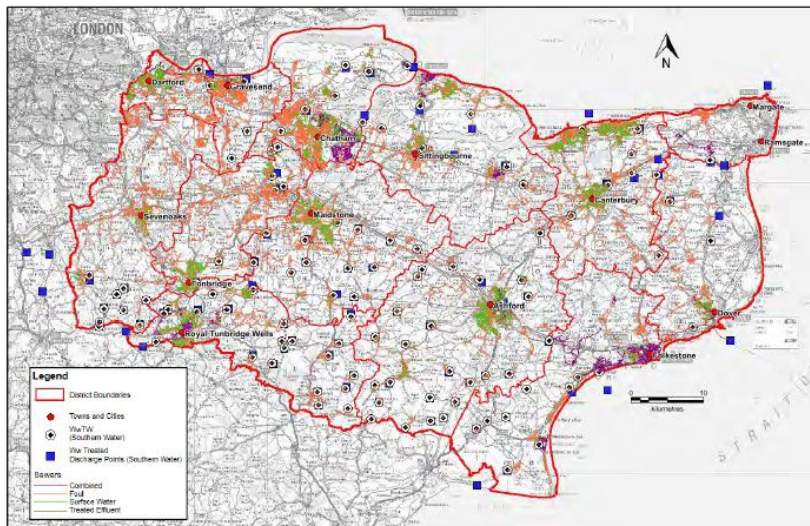


Figure 11 - Stour ALS water availability diagram

4.31 The Stour ALS also demonstrates that only the area surrounding Sandwich has additional water resources available for licensing over and above what is already licensed. Water companies may be able to increase abstraction within their existing licenses as long as they do not cause deterioration of WFD Status (and preferably contribute to achieving 'Good' Status). It is noted that the water which supplies Dover is often abstracted from outside the District boundary.

## 5. Wastewater

5.1 Southern Water is the statutory sewerage undertaker providing wastewater services for the whole district. Water and sewerage companies have a statutory obligation to provide capacity for new development, and to comply with the environmental permits set by the Environment Agency. The locations of its wastewater treatment works (WwTWs) are illustrated by the diagram below:



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Figure 12 - Locations of Wastewater Treatment Works

5.2 Each WwTW has a defined catchment area, determined by the coverage of the sewer network which drains foul water from properties (and surface water where the network is combined) to the treatment facility prior to treatment and discharge. As set out in the water quality section of this Study, none of the District's water sources are achieving 'good' status under the Water Framework Directive, and factors relating to the provision of water supply and wastewater treatment are key contributors to this.

5.3 Analysis carried out as part of the Kent Water for Sustainable Growth Study (2016) identified that all the WwTWs in the District have sufficient capacity to accept the additional wastewater flow from forecast housing growth. The remaining capacities as a percentage of permitted flow after growth to 2031 for WwTWs that serve Dover District are given in the table below:

| WwTW              | WwTW Remaining Capacity as a percentage of permitted flow after growth to 2031 |
|-------------------|--------------------------------------------------------------------------------|
| Broomfield Bank   | 11%                                                                            |
| Dambridge Wingham | 29%                                                                            |
| Eastry            | 49%                                                                            |
| Weatherlees Hill  | 31%                                                                            |

Figure 13 - Treatment Works remaining capacity after growth to 2031



## **WINEP (Water Industry National Environment Programme)**

5.4 The water industry national environment programme (WINEP) establishes the work that water companies in England are required to do in order to meet their obligations from environmental legislation and UK government policy. The WINEP is the most important and substantial programme of environmental investment in England, setting out how the water industry will contribute to improving the natural environment. For 2020 to 2025 it consists of £5.2 billion of asset improvements, investigations, monitoring and catchment interventions.

5.5 The water industry has taken steps over the last 3 decades to improve the water environment. However, there is a collective ambition for the WINEP to deliver more for the environment, for customers and for communities. This reflects society's high expectations and the UK government's ambition to leave the environment in a better state for the next generation. To help meet this ambition, the Environment Agency, Defra and Ofwat have come together to lead a taskforce to improve the WINEP. They have worked with representatives from water companies, Natural England, the Drinking Water Inspectorate, CCW, and environmental non-governmental organisations.

5.6 Southern Water through the WINEP is planning for improved WwTW infrastructure as part of their next investment period 2025-30. For Dover district, a new local system and upgrade to serve the Whitfield urban expansion and local sewer upgrades to serve developments across the district are proposed.

5.7 Drainage and wastewater management plans (DWMPs) are also currently being developed to ensure the sustainability of drainage and wastewater management infrastructure and the services it provides to customers and the environment. These Plans will set out how water and sewerage companies intend to extend, improve and maintain a robust and resilient drainage and wastewater system over the long term. Final DWMPs will be published in March 2023. The first cycle of DWMPs is non-statutory. From 2024 onwards the second cycle of DWMP production will commence. The Environment Act 2021 makes DWMPs statutory for the second cycle of these plans.

## **Southern Water's draft Drainage and Wastewater Management Plan (2022)**

5.8 In June 2022 Southern Water (SW) published its draft Drainage and Wastewater Management Plan (DWMP) for consultation, which builds on previous Drainage Strategies and Drainage Area Plans produced by water companies to provide a strategic, 25-year plan for investments in wastewater and drainage systems that are fit for the future. This includes planning for future climates and population, reducing storm overflows, flooding and pollution, and protecting and improving the water environment.

5.9 The draft DWMP comprises a regional (Level 1) DWMP and five supporting investment plans, as well as a catchment-based DWMP for each of the eleven river catchments across SW's operating region, including the Stour catchment which is of relevance to Dover District. In producing the plan SW has taken account of forecast Local Authority housing growth, as part of its collaborative planning approach which involved 75

different organisations. The Consultation on the draft DWMP closed in September 2022 and the DWMP is scheduled to be adopted by the end of March 2023.

5.10 To form its analysis and inform required investment, SW used a risk assessment model to categorise the probability and impact of the current (2020) and future (2050) performance of wastewater infrastructure on customers and the environment. The risk assessments use incident data from 2017-2019 and the baseline year for the DWMP is 2020. Accordingly, the risk assessments are grouped into the following bands which are set out in national guidance:

Band 0: Not Significant

Band 1: Moderately Significant

Band 2: Very Significant

This analysis resulted in 'moderately significant' risks for storm overflows in 2020 in Dover, and 'not significant' risks in Deal, Sandwich and the remainder of the District.

5.11 The risk assessments informed the production of SW's Prioritised Investment Needs List for the Stour Catchment, which covers Dover, Canterbury and Ashford Districts. SW provided indicative costs as part of this list alongside an indicative timescale for the relevant improvement to be carried out. For timescale purposes, short term means before 2030 (Asset Management Period (AMP) 8), medium term means between 2030 and 2040 (AMP9 and AMP10) and long term means beyond 2040 and 2050 (AMP11 and AMP12).

5.12 SW note that the Prioritised Investment Needs List is indicative and is therefore not a commitment to deliver any option, and that some options may take several investment periods to achieve the desired outcomes. Nevertheless, the options identified will inform SW's future business plans as part of the Ofwat periodic review process to secure the finance to implement options and have led to the formation of the investment needs for each wastewater catchment.

5.13 A sample of assessed schemes which are within Dover District are included in the table below, along with their indicative cost, timescale and Prioritisation Score. The Prioritisation Score derives from a methodology based on SW's Planning Objectives, the number of risks mitigated by each option, the cost of each option and benefit of achieving the specified risk band reduction. A higher prioritization score therefore means a higher return on investment in terms of risk mitigated for every pound spent. Schemes scoring above 1 in terms of prioritisation score have been included here:

**DWMP Assessed schemes with prioritisation score above 1**

| <b>Catchment</b>     | <b>Location</b>        | <b>Option</b>                                                                           | <b>Indicative Cost (£)</b> | <b>Indicative Timescales</b> | <b>Prioritisation Score</b> |
|----------------------|------------------------|-----------------------------------------------------------------------------------------|----------------------------|------------------------------|-----------------------------|
| Dambridge<br>Wingham | Larch Road, Hyde Place | Improve frequency of sewer jetting to reduce FOG(fats, oils & greases) and unflushables | 25K                        | Short to Long                | 20.00                       |

|                   |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                           |      |               |       |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------|---------------|-------|
|                   |                                                                                                                                                                                                                                                                                                                                                                  | discharged into the sewer network.                                                                                        |      |               |       |
| Dambridge Wingham | Network upstream of Grove Road Preston WPS                                                                                                                                                                                                                                                                                                                       | Improve frequency of sewer jetting to reduce FOG and unflushables discharged into the sewer network.                      | 10k  | Short to Long | 12.50 |
| Broomfield Bank   | Buckland Avenue, Dover, Short Lane, Alkham, Alkham Road, Temple Ewell                                                                                                                                                                                                                                                                                            | Improve frequency of sewer jetting to reduce FOG and unflushables discharged into the sewer network.                      | 55k  | Short to Long | 11.36 |
| Broomfield Bank   | Catchment Wide                                                                                                                                                                                                                                                                                                                                                   | Target customers with a campaign to reduce FOG and unflushables discharged into the sewer network.                        | 115k | Short to Long | 5.43  |
| Weatherlees Hill  | St. Andrews Road, Cattle Market, High Street, York Street, Harbour Parade, Queen Street, Broad Street, Sandown Lees, The Old Vicarage, The Street, Hereson Road, Denmark Road, Albion Road, Pysons Road, The Strand, Victoria Road, Campbell Road, Beach Street, Channel Lea, Richmond Road, The Fairway, West Cliff Road                                        | Target customers with a campaign to reduce FOG and unflushables discharged into the sewer network.                        | 115k | Short to Long | 5.17  |
| Broomfield Bank   | St. James Lane, The Bayle, Castle Street, London Street, Bench Street, Norman Street, Sandgate Road, Oswald Road, Snargate Street, Cheriton High Street, Vale View Road, London Road, Wallace Mews, Ross Way, Cannon Street, Godwyne Road, Guildhall Street, Tontine Street, Canterbury Road, Sandgate High Street, Biggin Street, Clifton Crescent, Valley Road | Target customers with a campaign to reduce FOG (fats, oils & greases) and unflushables discharged into the sewer network. | 115k | Short to long | 4.93  |
| Broomfield Bank   | Elizabeth Street Dover WPS                                                                                                                                                                                                                                                                                                                                       | Enhanced maintenance to                                                                                                   | 465k | Short         | 2.69  |

|                   |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                   |      |               |      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------|------|
|                   |                                                                                                                                                                                                                                                                                                                                                                  | improve WPS resilience and reduce pollution incidents                                                                                             |      |               |      |
| Dambridge Wingham | Grove Road Preston WPS                                                                                                                                                                                                                                                                                                                                           | Enhanced maintenance to improve WPS resilience and reduce pollution incidents                                                                     | 235k | Short         | 2.13 |
| Dambridge Wingham | High Street, Wingham and areas upstream                                                                                                                                                                                                                                                                                                                          | Surface Water Separation (0.31 Ha) and sustainable drainage systems (SuDS) to attenuate storm runoff (538 m3)                                     | 970k | Short to Long | 2.06 |
| Broomfield Bank   | St. James Lane, The Bayle, Castle Street, London Street, Bench Street, Norman Street, Sandgate Road, Oswald Road, Snargate Street, Cheriton High Street, Vale View Road, London Road, Wallace Mews, Ross Way, Cannon Street, Godwyne Road, Guildhall Street, Tontine Street, Canterbury Road, Sandgate High Street, Biggin Street, Clifton Crescent, Valley Road | Improve frequency of sewer jetting to reduce FOG and unflushables discharged into the sewer network.                                              | 390k | Short to Long | 1.45 |
| Dambridge Wingham | Catchment wide                                                                                                                                                                                                                                                                                                                                                   | Targeted CCTV or electroscan surveys and proactive sewer rehabilitation to reduce risk of leaking sewers contaminating aquifers (East Kent Chalk) | 865k | Short         | 1.16 |
| Weatherlees Hill  | St. Andrews Road, Cattle Market, High Street, York Street, Harbour Parade, Queen Street, Broad Street, Sandown Lees, The Old Vicarage, The Street, Hereson Road, Denmark Road, Albion Road, Pysons Road, The Strand, Victoria Road, Campbell Road, Beach Street, Channel Lea, Richmond Road, The Fairway, West Cliff Road                                        | Improve frequency of sewer jetting to reduce FOG and unflushables discharged into the sewer network.                                              | 515k | Short to Long | 1.15 |

|                   |                                           |                                                                                                                                 |      |               |      |
|-------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------|---------------|------|
| Dambridge Wingham | Burgess Road, Ayelsham and areas upstream | Surface Water Separation (1.23 Ha) and sustainable drainage systems (SuDS) to attenuate storm runoff (44 m3)                    | 960k | Short to Long | 1.09 |
| Weatherlees Hill  | Loop Street Sandwich WPS                  | Construct 165m3 storage tank to reduce spill frequency to Bathing Waters, aquifers (Thanet Chalk) and Monkton & Minster Marshes | 595k | Short         | 1.06 |

Figure 14 - DWMS Assessed Schemes with prioritisation score

5.14 The assessment of schemes led SW to the formation of options and investment needs on a catchment basis, which have then been filtered down to the wastewater system level. The investment needs identified for Dover's wastewater systems (Broomfield Bank, Dambridge Wingham and Weatherlees Hill) have been presented in the tables below. For timescale purposes, short term means before 2030 (Asset Management Period (AMP) 8), medium term means between 2030 and 2040 (AMP9 and AMP10) and long term means beyond 2040 and 2050 (AMP11 and AMP12).

#### Broomfield Bank Wastewater System Investment Needs

| Location of Risk                                                                                                                                                                                                                                                                                                                                                 | Issues                             | Option                                                                                                                    | Indicative Cost | Indicative Timescale |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|
| St. James Lane, The Bayle, Castle Street, London Street, Bench Street, Norman Street, Sandgate Road, Oswald Road, Snargate Street, Cheriton High Street, Vale View Road, London Road, Wallace Mews, Ross Way, Cannon Street, Godwyne Road, Guildhall Street, Tontine Street, Canterbury Road, Sandgate High Street, Biggin Street, Clifton Crescent, Valley Road | Internal Flooding due to Blockages | Target customers with a campaign to reduce FOG (fats, oils & greases) and unflushables discharged into the sewer network. | £115K           | Short to Long        |
| Catchment Wide                                                                                                                                                                                                                                                                                                                                                   | Pollution due to Blockages         | Target customers with a campaign to reduce FOG (fats, oils & greases) and unflushables discharged into the sewer network. | £115K           | Short to Long        |

|                                                                                                                                                                                                                                                                                                                                                                                                                              |                                       |                                                                                                                                                                                                                                                                                                     |         |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------|
| Elizabeth Street<br>Dover WPS                                                                                                                                                                                                                                                                                                                                                                                                | Pollution due to<br>WPS faults        | Enhanced maintenance to improve<br>WPS resilience and reduce pollution<br>incidents                                                                                                                                                                                                                 | £465K   | Short         |
| St. James Lane, The<br>Bayle, Castle Street,<br>London Street,<br>Bench Street,<br>Norman Street,<br>Sandgate Road,<br>Oswald Road,<br>Snargate Street,<br>Cheriton High Street,<br>Vale View Road,<br>London Road,<br>Wallace Mews, Ross<br>Way, Cannon Street,<br>Godwyne Road,<br>Guildhall Street,<br>Tontine Street,<br>Canterbury Road,<br>Sandgate High<br>Street, Biggin Street,<br>Clifton Crescent,<br>Valley Road | Internal Flooding<br>due to Blockages | Improve frequency of sewer jetting<br>to reduce FOG and unflushables<br>discharged into the sewer network                                                                                                                                                                                           | £390K   | Short to Long |
| Buckland<br>Avenue, Dover, Short<br>Lane, Alkham,<br>Alkham Road,<br>Temple Ewell L                                                                                                                                                                                                                                                                                                                                          | Pollution due to<br>Blockages         | Improve frequency of sewer jetting<br>to reduce FOG and unflushables<br>discharged into the sewer network                                                                                                                                                                                           | £55K    | Short to Long |
| Boston Close - Dover                                                                                                                                                                                                                                                                                                                                                                                                         | Foul / Combined<br>Sewer Flooding     | Flood Storage (889m3): Attenuate<br>excess flows in sewer network using<br>storage tanks to reduce risk of<br>flooding.<br>Option priced based on storage<br>tanks but surface water separation<br>is the preferred approach and will<br>be developed as part of the solution<br>with our partners. | £1,105K | Medium        |
| Crabble area - Dover                                                                                                                                                                                                                                                                                                                                                                                                         | Foul / Combined<br>Sewer Flooding     | Flood Storage (472m3): Attenuate<br>excess flows in sewer network using<br>storage tanks to reduce risk of<br>flooding.<br>Option priced based on storage<br>tanks but surface water separation<br>is the preferred approach and will<br>be developed as part of the solution<br>with our partners. | £810K   | Medium        |
| ELIZABETH STREET<br>DOVER WPS                                                                                                                                                                                                                                                                                                                                                                                                | Storm Overflow                        | Storage or separation of surface<br>water to reduce spill frequency<br>below annual threshold at Elizabeth<br>Street Dover CSO (volume / area of<br>separation to be determined)                                                                                                                    | £1,000K | Short         |
| BROOMFIELD BANK<br>WTW                                                                                                                                                                                                                                                                                                                                                                                                       | Pollution due to<br>WTW faults        | Enhanced maintenance to improve<br>WTW resilience and reduce<br>pollution incidents                                                                                                                                                                                                                 | £6,970K | Short         |
| BROOMFIELD BANK<br>WTW                                                                                                                                                                                                                                                                                                                                                                                                       | WTW Quality<br>Compliance             | WTW Assessment indicates there is<br>sufficient or surplus treatment<br>capacity in 2050                                                                                                                                                                                                            | £TBC    |               |

## Dambridge, Wingham Wastewater System Investment Needs

| <b>Location of Risk</b>                    | <b>Issues</b>                                    | <b>Option</b>                                                                                                                                                                 | <b>Indicative Cost</b> | <b>Indicative Timescale</b> |
|--------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------|
| The Forstal, Preston and areas upstream    | Foul / Combined Sewer Flooding                   | Surface Water Separation (0.14 Ha) and sustainable drainage systems (SuDS) to attenuate storm runoff (126 m3)                                                                 | £620K                  | Medium                      |
| Pudding Lane, Ash and areas upstream       | Foul / Combined Sewer Flooding                   | Surface Water Separation (0.48 Ha) and sustainable drainage systems (SuDS) to attenuate storm runoff (721 m3)                                                                 | £1,165K                | Long                        |
| High Street, Wingham and areas upstream    | Foul / Combined Sewer Flooding                   | Surface Water Separation (0.31 Ha) and sustainable drainage systems (SuDS) to attenuate storm runoff (538 m3)                                                                 | £970K                  | Long                        |
| Burgess Road, Ayselsham and areas upstream | Foul / Combined Sewer Flooding                   | Surface Water Separation (1.23 Ha) and sustainable drainage systems (SuDS) to attenuate storm runoff (44 m3)                                                                  | £960K                  | Long                        |
| Catchment Wide                             | Internal Flooding and Pollution due to Blockages | Target customers with a campaign to reduce FOG and unflushables discharged into the sewer network.                                                                            | £115K                  | Short to Long               |
| Grove Road Preston WPS                     | Pollution due to WPS faults                      | Enhanced maintenance to improve WPS resilience and reduce pollution incidents                                                                                                 | £235K                  | Short                       |
| Network upstream of Grove Road Preston WPS | Pollution due to Blockages                       | Improve frequency of sewer jetting to reduce FOG and unflushables discharged into the sewer network.                                                                          | £10K                   | Short to Long               |
| Grove Road Preston WPS                     | Pollution due to Rising Main Burst               | Proactive sewer rehabilitation to reduce risk of rising main bursts                                                                                                           | £420K                  | Short                       |
| Larch Road, Hyde Place                     | Internal Flooding due to Blockages               | Improve frequency of sewer jetting to reduce FOG and unflushables discharged into the sewer network.                                                                          | £25K                   | Short to Long               |
| Catchment wide                             | Ecological Status of Waterbodies                 | Targeted CCTV or electroscan surveys and proactive sewer rehabilitation to reduce risk of leaking sewersv contaminating aquifers (East Kent Chalk)                            | £865K                  | Short                       |
| Dambridge Wingham WTW                      | WTW Dry Weather Flow Compliance                  | Review DWF permit for the WTW with the EA, and increase capacity of Primary and Final Settlement Tanks                                                                        | £1,540K                | Short to medium             |
| Catchment wide                             | Nutrient Balance in Habitat Sites                | Study & Investigations: Link to EA-commissed CSMG Study (revised common standards for monitoring guidance) to achieve targets for total N (1.5 mg/l) and total P (49 ug/l)    | £TBC                   | Short                       |
| Catchment wide                             | Ecological Status of Waterbodies                 | Study & Investigations to understand the impact of wastewater discharges and identify measures required to achieve good ecological status in the Sarre Penn and River Wantsum | £695K                  | Short                       |
| Catchment Wide                             | Foul / Combined Sewer Flooding                   | Model Study: Surveys and reverification to improve model confidence and accuracy of simulations                                                                               | £200K                  | Short                       |

## Weatherlees Hill Wastewater System Investment Needs

| <b>Location of Risk</b>                                                                                                      | <b>Issues</b>                  | <b>Option</b>                                                                                                                                                                                                               | <b>Indicative Cost</b> | <b>Indicative Timescale</b> |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------|
| Catchment Wide                                                                                                               | Sewer Collapse                 | Targeted CCTV or electroscan surveys and proactive sewer rehabilitation to reduce risk of sewer collapse: Link to AMP6 & AMP7 funded Thanet Sewers rehabilitation scheme                                                    | £12,225K               | Short to Medium             |
| Groundwater Capture Zone & Source Protection Zones including hotspots Lord of the Manor, Martin Mill, Ringwold and Minster B | Groundwater Pollution          | Targeted CCTV or electroscan surveys and proactive sewer rehabilitation to reduce risk of groundwater contamination                                                                                                         | £9,305K                | Short to medium             |
| Woodensborough Road - Sandwich                                                                                               | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Upsize sections of local sewers                                                                                                                                                            | £625K                  | Medium                      |
| Woodensborough Road - Sandwich                                                                                               | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Increase pumping capacity at the Bulwark Sandwich WPS from 38l/s to 73l/s                                                                                                                  | £625K                  | Medium                      |
| Deal, Golf Road WPS - Deal                                                                                                   | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Increase pumping capacity at Golf Road WPS                                                                                                                                                 | £625K                  | Medium                      |
| Sholden Fields eastern bend of The Street - Deal                                                                             | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Upsize sections of local sewers to 300mm and 450mm diameter                                                                                                                                | £625K                  | Medium                      |
| Dola Avenue & William Pitt Avenue - Deal                                                                                     | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Construct new storage tank in sewer network                                                                                                                                                | £625K                  | Medium                      |
| Church Lane - Deal                                                                                                           | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Upsize sections of local sewers to 600mm diameter                                                                                                                                          | £625K                  | Medium                      |
| Middle Deal Road - Deal                                                                                                      | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Upsize sections of local sewers to 600mm diameter                                                                                                                                          | £625K                  | Medium                      |
| Granville Road - Deal                                                                                                        | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Upsize sections of local sewers on Granville Rd and increase pumping capacity of Mongham Road Deal WPS                                                                                     | £625K                  | Medium                      |
| Mongham Road Deal WPS - Deal                                                                                                 | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Increase pumping capacity of Mongham Road Deal WPS                                                                                                                                         | £625K                  | Medium                      |
| Walmer, Station Rd - Deal                                                                                                    | Foul / Combined Sewer Flooding | Growth Drainage Area Plan (DAP): Upsize sections of local sewers                                                                                                                                                            | £625K                  | Medium                      |
| LOOP STREET SANDWICH WPS                                                                                                     | Storm Overflow                 | Construct 165m <sup>3</sup> storage tank to reduce spill frequency to Bathing Waters, aquifers (Thanet Chalk) and Monkton & Minster Marshes                                                                                 | £595K                  | Short                       |
| Albert Road - Deal                                                                                                           | Foul / Combined Sewer Flooding | Flood Storage: Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach and will be developed as | £1,155K                | Long                        |



|                                 |                                  |                                                                                                                                                                                                                                                                     |         |                |
|---------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|
|                                 |                                  | part of the solution with our partners.                                                                                                                                                                                                                             |         |                |
| Middle Deal Road - Deal         | Foul / Combined Sewer Flooding   | Flood Storage: Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach and will be developed as part of the solution with our partners. | £2,240K | Long           |
| Manor Road, Gilham Grove - Deal | Foul / Combined Sewer Flooding   | Flood Storage: Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach and will be developed as part of the solution with our partners. | £620K   | Medium         |
| Walmer - Deal                   | Foul / Combined Sewer Flooding   | Flood Storage: Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach and will be developed as part of the solution with our partners. | £1,640K | Long           |
| Granville Road - Deal           | Foul / Combined Sewer Flooding   | Flood Storage: Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach and will be developed as part of the solution with our partners. | £2,735K | Long           |
| Church Street - Deal            | Foul / Combined Sewer Flooding   | Flood Storage: Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach and will be developed as part of the solution with our partners. | £880K   | Medium         |
| Undercliffe Road - Deal         | Foul / Combined Sewer Flooding   | Flood Storage: Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach and will be developed as part of the solution with our partners. | £1,735K | Long           |
| WEATHERLEES HILL A WTW          | WTW Dry Weather Flow Compliance  | Review DWF permit for the WTW with the EA, and increase capacity of Primary and Secondary Settlement Tanks                                                                                                                                                          | £2,745K | Medium to Long |
| Catchment Wide                  | Ecological Status of Waterbodies | Study & Investigations to understand the impact of wastewater discharges and identify                                                                                                                                                                               | £695K   | Short          |

|                          |                                   |                                                                                                                                                                              |         |        |
|--------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|
|                          |                                   | measures required to achieve good ecological status in the Sarre Penn and River Wantsum                                                                                      |         |        |
| Catchment Wide           | Nutrient Balance in Habitat Sites | Study & Investigations to understand the impact of wastewater discharges and identify measures required to secure Nutrient Neutrality in The Swale, Medway Estuary & Marshes | £75K    | Short  |
| THE BULWARK SANDWICH WPS | Storm Overflow                    | Improve model and develop solution to construct storage tank to reduce spill frequency to Bathing Waters, aquifers (Thanet Chalk) and Monkton & Minster Marshes              | £1,000K | Short  |
| GOLF ROAD DEAL CSO       | Storm Overflow                    | Improve model and develop solution to construct storage tank to reduce spill frequency to Bathing Waters, aquifers (Thanet Chalk) and Monkton & Minster Marshes              | £1,000K | Medium |
| Catchment Wide           | Foul / Combined Sewer Flooding    | Hydraulic Model improvements: Surveys and reverification to improve model confidence and accuracy of simulations.                                                            | £400K   | Short  |
| Catchment Wide           | Bathing Waters Quality            | Link to ongoing Bathing Waters studies within business and use recommended measures to develop solutions in next DWMP cycle                                                  | £TBC    | Short  |
| Deal                     | Foul / Combined Sewer Flooding    | Study and Investigation: Investigate the condition of existing storage tanks in town centre and remobilise to full storage capacity.                                         | £100K   | Short  |

5.15 The Consultation on Southern Water’s draft DWMP closed in September 2022, with a report on the consultation expected shortly thereafter. SW expect to submit their DWMP to Ofwat in early 2023.



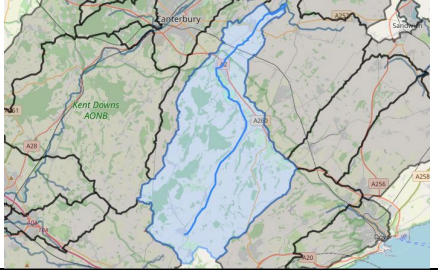
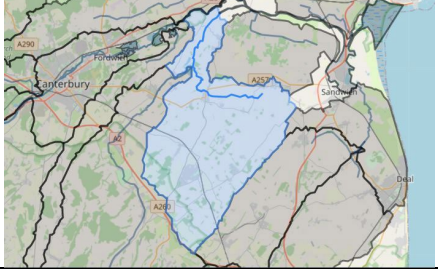
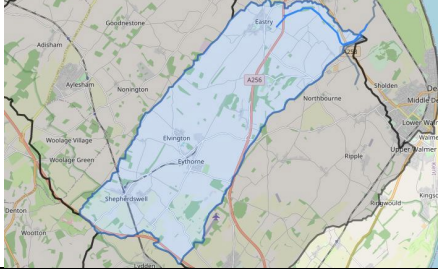

## 6. Water Quality


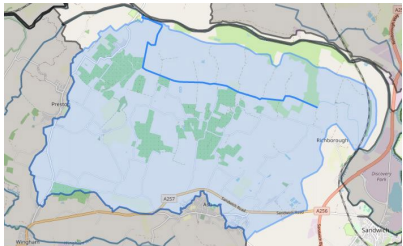
6.1 Water quality is a key indicator of the health of the water environment. Good quality water can support and enhance biodiversity and has a higher value for recreation and amenity use. Historically, it has been easy to take water quality for granted but today it is widely recognized that the quality of the water of our river systems is under threat, with many rivers in the country currently failing to meet standards set by the Water Framework Directive.

6.2 As noted in earlier sections of this Study, Dover District is host to three main watercourses, the River Dour, the River Stour, and the Wingham/Little Stour (tributaries of the Stour – the Little Stour being a tributary of the Stour and the Wingham a tributary of the Little Stour). The most recent available water quality analysis on these watercourses was produced in May 2022. This classification scores water bodies based on ecological and chemical status, before an overall classification for the water body from the five status classes is arrived at: high, good, moderate, poor and bad. It is important to note that the

Water Framework Directive uses the 'lowest common denominator' rule when determining a status. Therefore, water quality may show improvement in all indicators, but if one of these elements is classified as 'poor' for example, the whole waterbody returns an overall 'poor' classification, so one poor score may hide improvements in other factors. Reasons for not achieving good status (RNAGs) are also given for each watercourse. A summary of water quality in the District's watercourses is provided in Figure 14 below.



| Water Body                             | Map                                                                                 | Current Ecological Status | Current Chemical Status | Reasons for not achieving Good status                                                              |
|----------------------------------------|-------------------------------------------------------------------------------------|---------------------------|-------------------------|----------------------------------------------------------------------------------------------------|
| Upper Dour                             |    | Bad                       | Fail                    | Sewage discharge, Ecological discontinuity, Groundwater abstraction                                |
| Dour from Kearsney to Dover            |    | Moderate                  | Fail                    | Physical modification, groundwater abstraction                                                     |
| Nailbourne and Little Stour            |   | Poor                      | Fail                    | Sewage discharge, ecological discontinuity, surface water abstraction, low flow                    |
| Wingham and Little Stour               |  | Poor                      | Fail                    | Poor soil/nutrient management, sewage discharge, ecological discontinuity, groundwater abstraction |
| North and South Streams at Eastry      |  | Moderate                  | Fail                    | Mining and quarrying, sewage discharge                                                             |
| North and South Streams at Northbourne |  | Moderate                  | Fail                    | Mining and quarrying, poor soil management, groundwater/surface water abstraction                  |

|                                              |                                                                                   |          |      |                                                                                                                                   |
|----------------------------------------------|-----------------------------------------------------------------------------------|----------|------|-----------------------------------------------------------------------------------------------------------------------------------|
| North and South Streams in the Lydden Valley |  | Poor     | Fail | Mining and quarrying, agriculture and rural land management, ecological discontinuity                                             |
| Ash Level                                    |  | Moderate | Fail | Poor nutrient management, poor soil management, sewage discharge, ecological discontinuity, agriculture and rural land management |

Source: Environment Agency Catchment Data Explorer, 2022

Figure 15 – Water Quality Classification

## The South East River Basin Management Plan

6.3 The South East River Basin Management Plan (2022) summarises the progress of surface water bodies towards the objectives set by the Water Framework Directive. It sets out the current state of the water environment, pressures affecting the water environment, environmental objectives for protecting and improving water, and actions needed to achieve its objectives. The majority of water bodies have an objective of achieving 'Good' status by 2027, although this is an extended deadline where there is not enough confidence that the required improvements can be improved by 2021. In many cases, the reason for not achieving the target sooner is that the required improvements are either technically infeasible or disproportionately expensive.

### East Kent Catchment Improvement Partnership' Stour Catchment Plan (2018)

6.4 The East Kent Catchment Improvement Partnership' Stour Catchment Plan (2018) drawn up by public, private and third-sector organisations, sets out why the rivers of East Kent are not meeting environmental requirements and summarises the solutions and work already in progress. This Plan establishes, for river waterbodies across the area, that the issues which are consistently observed include low fish populations, due to structures which obstruct their passage, high phosphate levels due to discharges from wastewater treatment works and run-off from urban areas and agriculture, as well as low flows caused by abstraction for public supply, commerce and agriculture and modifications to natural conditions due to human intervention, such as flood risk management, mining and urbanisation. It identifies measures for improving the water quality of both the river Stour and the river Dour, including on-site improvements to address fish passage, the promotion of agri-environment schemes to reduce nutrients in waterbodies, and for the Dour in particular, the de-culverting of the river as opportunities arise.

## **Issues surrounding water quality of the Stodmarsh SPA, SAC, Ramsar, SSSI and NNR protected sites**

6.5 In November 2020 Natural England issued guidance on the potential impact of new residential development (and any other overnight stays) on water quality, as a result of additional wastewater from new development. The advice impacts the catchment of Stodmarsh Lakes International Protected Sites in neighbouring Canterbury District. Stodmarsh Lakes include sites designated as a Special Protection Area, a Special Area of Conservation and a Ramsar site, as well as a National Nature Reserve and SSSI. The advice was issued to the Local Authorities within its catchment, including Ashford Borough Council, Canterbury City Council, Maidstone Borough Council, Folkestone and Hythe District Council and Dover District Council. This guidance means that no planning permission for residential development can be granted unless the development can deliver nutrient neutrality. As a result of the mitigation measures for demonstrating this being difficult to deliver it has effectively resulted in an embargo on the granting of permissions for new housing in the areas affected, since the advice was issued nearly two years ago. It should be noted that the intention of nutrient neutrality is not to stop development, but instead to allow for sustainable development.

6.6 For Dover District this advice impacted upon the Little Stour and Wingham Operational Catchment which covers the north-western part of the District, including the settlements of Aylesham, Preston, Wingham, Ash, Staple, Chillenden, Woodnesborough (part) and Nonington. The villages of Elvington and Eythorne are not within the river catchment but are served by the Dambridge WwTW and are therefore also impacted by the advice.

6.7 The Little Stour and Wingham catchment is located downstream of Stodmarsh. The Dambridge WwTW discharges into the Wingham River which flows to join the Little Stour. The Little Stour then joins the Great Stour at Plucks Gutter, where most of the water and nutrients pass out to sea. As the Great Stour is tidal, during certain conditions some water from the Little Stour and potentially a very small level of nutrients are pushed back to Stodmarsh by the incoming tide. The catchment was therefore included within the NE guidance on a precautionary basis.

6.8 Since the publication of the advice Dover District Council has demonstrated that the amount of nutrients reaching Stodmarsh are so insignificant that they do not amount to a 'significant effect' which would require assessing under the Habitats Regulations. An initial report was produced and shared with NE at the end of 2021, which it was considered demonstrated that due to the significant levels of dilution to the amount of nutrients reaching Stodmarsh from Dambridge WwTW, the quantum of any such nutrients was below detectable levels. However, NE did not initially agree and requested further detailed modelling be carried out. This has now been completed and shared with NE. In September 2022 NE confirmed in writing that it was now their view that any additional nutrients reaching Stodmarsh SAC/SPA/Ramsar as a result of new connections to Dambridge WwTW would be insignificant alone and in combination. NE advise that their guidance will be updated to reflect this position. The HRA 2022 therefore does not include this as a potential effect.

## 7. Flooding

7.1 There are many sources of flood risk in Dover District; from the sea, from rivers and watercourses, from surface water runoff and overland flow, from groundwater and from sewerage infrastructure. The risk of flooding within the district is diverse. The northern and some eastern parts of the district are low-lying, including areas around the River Stour and the coast to Deal. In much of this area flood defences are in place, such as the Deal Coastal Defence Scheme. Around 15-20% of the district is accounted for in these low-lying areas. In the southern part of the district is the North Downs. Dover town itself lies in the steep-sided Dour Valley.

### Sources of Flooding

7.2 Flooding can occur in the district from rivers and watercourses:

- The **River Dour** rises in the Alkham Valley. River is fed by groundwater and from surface flow after prolonged or extreme rainfall. The Dour valley is steep sided and the channel is heavily urbanised along much of its length. This exacerbates issues when the water enters the town centre. Sustainable drainage systems in Dover town centre could help to relieve localised issues.
- The **River Stour** in the north of the district is both tidally influenced and fed by several watercourses. The area surrounding the river is marshland and is within the floodplain, and numerous drainage ditches deposit water into the river. The tidal influence on this river means that extreme tidal surges encroach upriver. Sea level rise due to climate change could therefore increase flooding risk;
- Around the **North and South Streams**, south of Sandwich, is another extensive area of wetland which is drained through ditches, many of them pumping out water. Occasionally the capacity of these pumps is exceeded following extreme rainfall or the failure of a pump.
- The risk of flooding from the **River Wingham**, which discharges to the Little Stour, is mainly to rural areas in close proximity to the river.

7.3 The district is also at risk of flooding from the sea, which can occur in two ways. The first is through a surge event, when an already high tide coincide with a low-pressure weather event resulting in the surface of these becoming elevated. A wave overtopping event usually happens when larger, powerful waves collide with the shoreline, forcing sea water landwards. This can be exacerbated by strong onshore winds.

7.4 Twenty-six kilometres of the district's council has some formal sea defence, with the remaining length protected by chalk cliffs. The sea defences offer a good level of protection against flooding from the sea and are designed to protect against increases in water level. However, low-lying areas behind the defences could be flooded if the extreme sea level exceeded the crest of the defences.



7.5 The River Dour, although not tidal itself, is tidally influenced. The river can also become 'tide locked' at high tide when the outfall structure is submerged, meaning the water cannot flow into the sea. In extreme events this can cause the water to flow upstream. The River Stour within Dover district is tidal, but in the event of a surge water levels are likely to be contained within the channel by the sea defences constructed as part of the Sandwich Town Tidal Defence Scheme.

7.6 The Sandwich Town Tidal Defence Scheme was completed in September 2015. The scheme provided a 1 in 200 standard of protection to both banks with 50 years of sea level rise included in the design. This protects 486 homes and 94 commercial properties in Sandwich. The scheme consisted of 14.4km of strengthening and improving the existing tidal river defences, and creation of a 240ha tidal flood relief area between Sandwich and the mouth of the River Stour. Part of this enabled the creation of new wetland habitats.

## **Surface Water Flooding**

7.7 Flooding from surface water runoff typically happens following an extreme rainfall event when water flows over land and accumulates in depressions. This is exacerbated by steeply sloping ground, low permeability (e.g. urban surfaces) or where the surface water drainage system become overwhelmed.

7.8 In the north of the district surface water runoff is intercepted by drainage ditches. In the southern part of the district water infiltrates the chalk bedrock. However, surface water flooding occurs in the River Dour valley due to the steep sides and impermeable urban surfaces. Localised flooding also occurs in the centre of Deal. There are also areas at risk from surface water flooding in Deal. Infiltration into the ground is limited in Deal, but sustainable drainage systems in suitable locations could help to reduce peak flows into the combined sewers.

7.9 Flooding is also a risk from other sources.

- Flooding from groundwater – typically occurs in areas with permeable geology. There is potential for groundwater flooding across the chalk downs where springs appear from the chalk aquifer. There is also in the low-lying land around the River Stour;
- Flooding from sewers – flooding from sewers occurs when the sewer system is overwhelmed by heavy rainfall, becomes blocked or has inadequate capacity. Foul water may then flood properties or exit via manholes, contaminating other flood water. Sewer flooding in Dover town and the Dour Valley is fairly common. Similar to Dover, the Deal sewerage infrastructure is mixed and relies on pump and a sea outfall.

## **Sustainable Urban Drainage Systems**

7.10 The Flood and Water Management Act (2010) promoted an increased awareness of the management of surface water run-off from new development, and in March 2016 the National Technical Sustainable Drainage Systems Standards were released, which mean that a detailed Surface Water Management Strategy (SWMS) needs to be submitted to the

LLFA (KCC) for all major development applications. The SWMS is expected to evidence how SUDS can be incorporated within the proposed development, demonstrating compliance with the Technical Standards.

7.11 Dover's SFRA issued local guidance to encourage best practice for managing run-off within all new development, regardless of size. Namely, all development applications which are required to be accompanied by a Flood Risk Assessment will be required to incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. In addition, [Construction Industry Research and Information Association's \(CIRIA\) SUDS Manual](#) (2015) provides comprehensive information on all the aspects of the life cycle of sustainable drainage from initial planning through to design, construction, management and costs.

7.12 Sustainable Urban Drainage Systems (SUDS) aim to manage rainwater runoff in a natural way by replicating natural processes, thereby reducing the impact of urbanisation on flooding and protecting natural flow regimes in watercourses. SUDS, as opposed to the more traditional approach of using gullies and pipes to move water away as quickly as possible, can therefore also benefit water quality by slowing the rate at which polluted water from urban areas is washed into rivers or groundwater.

7.13 In addition to reducing the effects of development on the quantity and quality of water runoff, SUDS can provide additional social and environmental benefits such as providing space for biodiversity and ecology, improving amenity in the locality and carbon sequestration. SUDS features can be categorised as either 'green' comprising landscaped features such as landscaping and vegetation, or 'grey' comprising engineered features such as swales and other control structures. The below diagram taken from the Susdrain website shows the four 'pillars' of SUDS design:

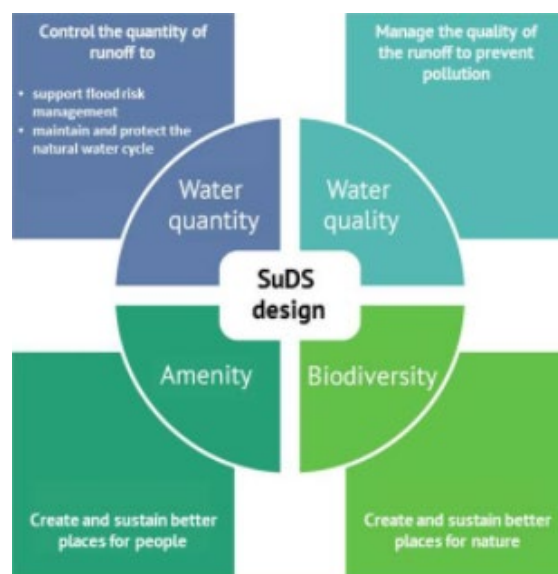


Figure 16 - Four Pillars of SUDS Design

## 8. Identifying the Issues

8.1 The table below sets out a range of options available to the Council in order to address the district's water cycle position, as set out in the preceding sections of this Study. The information provided within these options and the firmer recommendations below have been used to inform the drafting of Policies in the Local Plan, while the Water Cycle Study itself will form part of the evidence base to support the Plan.

| Area of Focus        | Method for Improvement via Local Planning Policy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Environmental</b> | Local planning policy can require Sustainable Urban Drainage Systems (SuDS) for new developments. SuDS aim to manage rainwater runoff in a natural way by replicating natural processes, and examples of the technology include green roofs, permeable pavement and shallow ditches or swales. It is important that the maintenance of SuDS features is secured through planning policy and conditions. The main benefits of SuDS include water attenuation, treatment and reuse, and can also be used provide an amenity benefit. Proposals for Sustainable Drainage Systems involving infiltration must be assessed and discussed with the Environment Agency, to determine their suitability in terms of the impact of any drainage into the groundwater aquifer. |
| <b>Social</b>        | Local planning policy can protect the district's green infrastructure and open spaces, providing safe access to water-facing green sites, as well as avoiding inappropriate development close to water courses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Water supply</b>  | Local planning policy can ensure that the levels of growth forecast in the district are aligned with the supply strategies of the district's two water suppliers. By working collaboratively with the providers as part of the Local Plan process, the LA can help the providers plan required infrastructure upgrades, which often require significant lead-in times. In addition, securing Section 106 contributions can help facilitate connections on individual development sites                                                                                                                                                                                                                                                                               |
| <b>Water demand</b>  | Local planning policy can facilitate reductions in the demand for water, with a resultant easing in pressure on the availability of supply. Requiring higher water efficiency standards in new homes would help achieve this. Other methods for reducing water demand include smart metering, incentives and rainwater harvesting and water reuse. Non-domestic consumption can also be reduced by encouraging new developments to be built to 'Very Good' or 'Excellent' BREEAM standards.                                                                                                                                                                                                                                                                          |
| <b>Wastewater</b>    | Local planning policy can require adequate wastewater treatment facilities to be in place prior to new development and can also limit the phasing of development to ensure that sufficient wastewater drainage is provided in conjunction with new                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | development. Local Planning policy can also address the need of increased suitable wastewater drainage cover (extension of existing network) and potentially promote the use of first sewerage to remove the load on area of high groundwater vulnerability.                                                                                                                                                                        |
| <b>Flood risk and drainage</b> | Local planning policy can require Sustainable Urban Drainage Systems (SuDS) for new developments which aids the appropriate disposal of surface water and therefore avoids any increase in flood risk resulting from development. Via measures specified in the Council's Strategic Flood Risk Assessment, local planning policy can seek to locate new development in areas which are at lower risk of coastal or fluvial flooding |
| <b>Climate change</b>          | Local planning policy can help facilitate sustainable design and construction, including improved water efficiency measures. By being mindful of the Strategic Flood Risk Assessment, local planning policy can mitigate as far as possible the impacts of climate change on the water environment in the district                                                                                                                  |

*Figure 17 - Strategic Options for Local Planning Policy*

## 9. Conclusion and Recommendations

9.1 This Study provides a high-level assessment of the hydrology and topography of the District, a summary of the legislation which underpins the provision of and access to clean and safe water and capitalising on water cycle input from stakeholders to inform the drafting of strategic and development management policies in the new Local Plan. It sets out the key considerations relating to the Dover district's water environment, with a particular focus on supply, infrastructure and water quality. Input from water providers and the Environment Agency has been used in order to integrate supplier strategies with the levels of growth forecast by the district's new Local Plan.

### The new Dover District Local Plan

9.2 As part of the preparation of the Local Plan, significant consultation has taken place with the local community and key stakeholders in accordance with the Council's Statement of Community Involvement and the relevant legal and policy requirements. The Draft Regulation 18 version Local Plan was published for consultation on 20<sup>th</sup> January 2021, for a period of 8 weeks, to the 17<sup>th</sup> March 2021. In total over 3,400 comments were received in response to the consultation, from 1,280 individuals and organisations across the breadth of the Plan. Three representations were received to the Draft Water Cycle Study November 2020 (Appendix B). These representations have fed into this updated Water Cycle Study 2022.

9.3 The Water Cycle Study 2022 forms part of the evidence base for the new Dover District Local Plan, due to be submitted to government in spring 2023 following a Regulation 19 consultation in the autumn of 2022. The Study is important in working to ensure that the levels of growth forecast in the Plan are aligned with the strategies of the relevant water providers so that sufficient resources are available to serve new dwellings. The recommendations of this Study have been used to inform the drafting of Policies of the new Local Plan as set out in Figure 22 below.

9.4 The Local Plan sets out a bold new vision for Dover District in 2040. This vision has 17 supporting strategic objectives based on analysis of the local population, including age structure, health and socio-economic characteristics, in addition to the housing, economic, environmental, transport and infrastructure issues facing the district. Fifteen Strategic Policies are proposed to guide the future development, which alongside detailed Site Allocations and Development Management Policies, will shape all development that comes forward over the plan period, which runs to 2040.

9.5 The Local Plan will as a minimum provide for the objectively assessed need for housing within the District (NPPF para 11). Applying the Government's standard method to the District results in a minimal housing need of 611 dwellings per annum, which equates to 10,998 dwellings over the 18 year Plan period. With an existing supply of 8,567 dwellings permitted and/or awaiting completion, the Plan has to allocate sites for a minimum of 2,431 new dwellings.

9.6 In respect of water supply, the Environment Agency's ALS details that there is significant pressure on sources of abstraction, especially in lower-flow scenarios. It therefore follows that both the district's water suppliers have committed to significant leakage reduction targets as well as demand management policies, and both companies also plan to extend existing supply arrangements with neighbouring providers. This is also reflected in the WRMPs of both the providers, Southern Water and Affinity Water. These strategies have undertaken detailed modelling work in order to account for proposed housing growth and environmental conditions. They include a range of measures to accommodate growth in their respective catchments through including increasing yield from infrastructure, increased water efficiency measures in new properties and existing building stock and a commitment to a programme of works to reduce the level of water lost to leakages.

9.7 Both the District's water providers have also addressed the predicted effects of climate change in their Water Resource Management Plans, to ensure that the likelihood of droughts in future is minimised and that their water infrastructure undergoes required upgrades enabling it to remain functional through a greater intensity of inclement weather conditions.

9.8 The findings of the Water Cycle Study are delivered through the following policies in the Regulation 19 Submission version of the Local Plan:

- **Strategic Objectives** these include the conservation and enhancement of the district's water environments and ensuring that natural resources are used prudently, waste is minimised and environmental pollution is reduced or avoided.
- **Strategic Policy SP1**: establishes criteria to which all new development must adhere to contribute to the mitigation and adaption to climate change

- **Strategic Policy SP14:** requires all development to retain, conserve and enhance water features and green and blue corridors.
- **Policy CC4:** requires all new dwellings to be built to water efficiency standards that deliver a maximum use of 110l/p/d. It advises that the Council will strongly support proposals that secure greater levels of water consumption reductions.
- **Policy CC5:** requires flood risk assessments for all sites in areas at risk of flooding and compliance with appropriate guidance and SFRA requirements.
- **Policy CC6:** works to ensure that new development does not increase, and where possible decreases, the risk from surface water run-off through the use of such surface water management measures as SuDS
- **Policy NE5:** sets out the requirements for all development on matters of water supply and quality
- **Policy NE6:** addresses development requirements for proposals that adjoin or affect the setting of the River Dour.

## **APPENDIX A**

### **Water Companies Responses to Draft Water Cycle Study Nov 2020**



## APPENDIX B

### Representations on the Draft Water Cycle Study

As part of the Regulation 18 Draft Local Plan Consultation (Jan- March 2021)

| Comments [from the Environment Agency]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Councils Response                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <p>[paragraph] 1.2 presents more recent figures for water consumption than those quoted above from the Kent Environment Strategy. Pleased to see this document presenting up-to-date information from the latest Water Resource Management Plans.</p> <p>4.20 Affinity Water's target consumption is for its whole supply area, and its Dour resource zone is already below the target for 2025. Other of its zones (north and west of London) have more unmetered customers and therefore higher consumption.</p> <p>5.20 suggests that the Council could "aspire to even more stringent standards" of water efficiency than the 110 litres standard. I would caution that under current Building Regulations it could not require such standards, it could only encourage them. The preferred options under para 7.3 are consistent with this.</p> <p>Section 7 of the report (Options and recommendations) the "Environmental focus" is centred on the use of SuDS, however we believe there should be a mention to the potential legacy of contamination which should be taken into account as essential part of the Water Cycle study, with the scope of achieving growth that is well-integrated, appropriately located and sustainable in the context of clean and safe water provision. Proposals for Sustainable Drainage systems involving infiltration must be assessed and discussed with the Environment Agency to determine their suitability in terms of the impact of any drainage into the groundwater aquifer.</p> <p>In the same section 7, with regard to the item focused on wastewater, the study identifies the need for adequate wastewater treatment facilities to be in place prior to new development and the need to phase developments to allow the wastewater treatment capacity to be the upgraded. We are in full agreement with this aspect and we will would like to add a comment with regard to the need of increased suitable wastewater drainage cover (extension of existing network) and potentially promote the use of first sewerage to remove the load on area of high groundwater vulnerability. On this regard we would recommend to consider in the study the Drainage and Wastewater Management Plans (DWMPs) which the water companies have started drafting in line with Water UK guidelines, and the potential beneficial impact DWMPs might have on safe water provision for a sustainable development.</p> | <p>Comments will be reviewed and included in the updated Water Cycle Study</p> |