TECHNICAL NOTE

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Contract	Adur and Worthing SFRA
Client	Adur District and Worthing Borough Councils
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Reviewer / Sign-off	Ed Hartwell
Subject	Review of Southern Water's DWMP

1 Introduction

Water companies were required to publish Drainage Water Management Plans (DWMPs) for river basin catchments across England as part of the Environment Act. Southern Water published their DWMP in May 2023. This provides information over a wider geographical extent on sewer flood risk than has previously been available. In doing this, the DWMP's include risk assessment and mapping which could potentially be used in the proposed land use planning prioritisation process and could potentially be perceived as being appropriate for consideration in the Sequential and Exception Tests. As this is a matter that could be raised at Examination this review is performed to understand the nature of the DWMP mapping and data that is now available and the extent to which it can appropriately be used to support the preparation of the Sequential Test. The intention is that this review is used to support consultation with Southern Water so formal confirmation can be given to the proposed methods and approach used in the preparation of the SFRA and the Plan.

2 Southern Water DWMP

2.1 Background

The DWMP describes the basis for long term investment proposals by Southern Water that span the next 25 years and set out the commitment needed to ensure they're robust and resilient to future pressures.

Southern Water's plan contains substantive volumes of mapping, information and data that has not previously been made available by water companies. The focus is on planning for the future, so customer flooding is reduced. However, catchments were hydraulically modelled for the 2% Annual Exceedance Probability (AEP) event. By comparison, fluvial, tidal and surface water modelling already used within the Sequential Test is for the 3.3%, 1% and 0.1% AEP events.

Southern Water has prepared a regional (Level 1) DWMP which is supported by plans for each of the 11 River Basin Catchments (Level 2 DWMP) and wastewater systems (Level 3 DWMP). Adur District and Worthing Borough are located within Southern Water's Adur and Ouse catchment and the Arun and Western Streams catchment.

2.2 DWMP objectives

The planning objectives in the DWMP assess the current and future performance of the drainage and wastewater systems and identify where action and/or future investment is required. The performance is considered as a risk where failure could have an impact on people and/or the environment. A total of 14 objectives were identified by Southern Water to assess:

1 Internal Sewer Flooding
2 Pollution
3 Sewer collapse
4 Flooding in a 1 in 50-year storm
5 Storm overflows

6 Wastewater Treatment Works Quality Compliance
7 Annualised flood risk
8 Wastewater Treatment Works Dry Weather Flow compliance
9 Good Ecological Status / Potential
10 Surface water management
11 Nutrient Neutrality
12 Groundwater pollution
13 Bathing Waters
14 Shellfish Waters.

Further details can be found here:
https://www.southernwater.co.uk/dwmp/planning-objectives

2.3 Risk based catchment screening

As part of the DWMP, a risk based catchment screening (RBCS) exercise was completed, where existing, readily available data was used to identify where there is a current and/or potential risk or vulnerability in the wastewater system to future changes, such as new residential development or changes in climate.

The screening exercise informed the scope of the Baseline Risk and Vulnerability Assessment (BRAVA) enabling comparison across wastewater systems based on different levels of risk. However, as some catchments have been screened out through the RBCS, the BRAVA does not provide an assessment of the entirety of either catchment within the Adur and Worthing administrative area.

2.4 Baseline Risk and Vulnerability Assessment

Southern Water conducted a BRAVA to understand their current system performance and future vulnerabilities. This includes substantial volumes of mapping, information, and data that has not previously been made available. Further details regarding the BRAVA methodology can be found here:
https://www.southernwater.co.uk/dwmp/baseline-risk-and-vulnerability-assessment

As part of the BRAVA, each wastewater system was provided a result for each of the 14 planning objectives listed in Section 2.2 using the following grades:

- Not flagged
- Not applicable
- Not significant
- Moderately significant
- Very significant

Tables were prepared outlining the results and can be found here:
https://www.southernwater.co.uk/media/4250/arun-ws-wastewater-systems.pdf

https://www.southernwater.co.uk/media/4247/adur-and-ouse_combined.pdf

The tables also highlight whether the wastewater system requires improvements to the proposed investment strategy and the level of concern.

Southern Water produced maps showing the results of the BRAVA for each of the DWMP planning objectives listed in Section 2.2.

The BRAVA results indicate that storm overflows, flooding in a 1 in 50 year storm and sewer collapse are the main concerns for the Adur and Ouse Catchment. For the Arun and Western Streams Catchment area, storm overflows and nutrients are of the greatest concern.

3 Implications

The implications of the DWMP BRAVA data are outlined below:

- It is understood that the BRAVA table and mapping have been prepared for the purpose of Long-Term Investment Planning and not for the sequential placement of new development. The mapping shows where certain wastewater systems would require investment. However, as there is no certainty about any potential investment and the benefits this may bring, it is not necessarily possible to conclude that this should be used as the basis for the Sequential Test.
- The BRAVA results provide one risk category for each wastewater system, the actual level of risk within the areas shown might potentially vary substantially and thus the spatial resolution might not be appropriate for use in a comparative analysis of specific sites. The data resolution used as part of the DWMPs does not appear to be comparable to the river and sea flooding information and thus could not easily used alongside the existing data and mapping on a site-specific basis.
- The data provided on Southern Water's website is not provided in GIS format, which would be required to undertake the site screening as part of the Level 1 SFRA.
- Whilst it might not be possible to use the DWMP data and mapping in a comparative assessment to support the Sequential Test the content might influence the timing and viability of potential allocations that are identified. It isn't possible to report on the extent to which these considerations might affect viability from the information available, but this matter should be discussed and a formal position agreed with Southern Water. For sites where it is understood that the DWMP data does potentially introduce sewer flooding matters that affect the implementation of development then appropriate content should be included in the Level 2 SFRA by way of demonstrating that the principle of development can be supported.

3.1 Summary of implications

A summary of the implications of the BRAVA products is outlined in **Error! Reference source not found.**. We will seek clarification with Southern Water that our understanding about each BRAVA product and whether intended use (or not) in the Sequential Test is appropriate. All data is provided on a sewer catchment basis.

Table 3-1: Summary of implications of BRAVA products

BRAVA product	Implication
Internal Sewer Flooding	A risk category is assigned to each sewer catchment based on historical incidents, flood mitigation schemes and data on sewer connections. Although this is potentially informative, it is not clear that the spatial resolution is appropriate for use in the Sequential Test.
Pollution	Data sources include historic pollution incidents and sewer length. Could have implications for other planning considerations

	which are outside the scope of this report.
Sewer collapse	Data is based on Historic Sewer Collapse and Rising Main Burst Data and sewer length. This could be useful information in terms of flood risk. However, the spatial resolution is not appropriate for use in the Sequential Test.
Flooding in a 1 in 50-year storm	Data sources include population growth and planned development, climate change, hydraulic models, urban creep and historical flooding. Although this is useful information in terms of flood risk, the spatial resolution is not appropriate for use in the Sequential Test.
Storm overflows	Data is based on event and duration monitoring, time series rainfall, population growth and new development, urban creep, environmental designations and combined sewer overflow investigations. Again, although this is useful information in terms of flood risk, the spatial resolution is not appropriate for use in the Sequential Test. These datasets could also have implications for other planning considerations which are outside the scope of this report.
Wastewater Treatment Works Quality Compliance	Data is based on WTW Compliance, WTW Capacity Assessment, Population Growth, Asset Risk Management. Although this is useful information in terms of flood risk, the spatial resolution is not appropriate for use in the Sequential Test. These datasets could also have implications for other planning considerations which are outside the scope of this report.
Annualised flood risk	Data sources include population growth and planned development, climate change, hydraulic models, Urban Creep, historical flooding. Although this is useful information in terms of flood risk, the spatial resolution is not appropriate for use in the Sequential Test.
Wastewater Treatment Works Dry Weather Flow compliance	Data is based on permitted dry weather flow, per capita consumption of water, baseline dry weather flow, infiltration and future dry weather flow projection. Again, although this is useful information in terms of flood risk, the spatial resolution is not appropriate for use in the Sequential Test. These datasets could also have implications for other planning considerations which are outside the scope of this report.
Good Ecological Status / Potential	Data sources include Water Framework Directive, Wastewater Treatment Works and Sewer Overflow locations, Wastewater Treatment Works tertiary plant capacity and Water Industry National Environment Programme. These datasets could have implications for other planning considerations which are outside the scope of this report.
Surface water management	Data is based on surface water flood maps, hydraulic models, historical flooding incidents and partnership knowledge on

	surface water flooding. This is useful information in terms of flood risk. However, the spatial resolution is not appropriate for use in the Sequential Test and EA surface water mapping is already used in the Test.
Nutrient Neutrality	Data sources include habitats' sites, Wastewater Treatment Works and Sewer Overflows, Wastewater Treatment Works tertiary treatment, Water Industry National Environment Programme and Water Framework Directive. These datasets could have implications for other planning considerations which are outside the scope of this report.
Groundwater pollution	Data is based on sewer Length / Sewer Structural Grade, Aquifer Designation Mapping, Safeguard Zone (SGZ) / Source Protection Zone (SPZ) mapping, CSOs discharging to ground, event and duration monitoring data, baseline Dry Weather Flow and groundwater infiltration. These datasets could have implications for other planning considerations which are outside the scope of this report.
Bathing Waters	Data is based on bathing water quality data and analysis as published on the UK Government website. This dataset could have implications for other planning considerations which are outside the scope of this report.
Shellfish Waters.	Data sources include outfalls to shellfish waters, overflow event and duration monitoring, and CEFAS shellfish harvesting areas and classifications. The influence of wastewater treatment works with UV equipment on the risk of water contamination has also been assessed. These datasets could have implications for other planning considerations which are outside the scope of this report.

4 Recommendation

4.1 Sewer flood risk mapping and data

On the basis of our understanding it is recommended that the DWMP information and mapping is not used to assess sewer flooding in the Sequential Test alongside river, sea and surface water flooding on the basis that the available information is not of appropriate resolution or format. This understanding should be addressed with Southern Water and formal confirmation obtained as necessary to support the Plan and Examination. This will be clearly stated in the Level 1 SFRA and where possible the DWMP information will be used to inform the scope of site specific FRAs.

Further consultation with Southern Water should clarify the necessity and extent to which identified DWMP sewer flood risk should be addressed at sites where this is potentially an influential matter. This can then inform the necessity to include content on sewer flood risk in a Level 2 SFRA.

From assessing the implications of the BRAVA products, it is recommended that confirmation should be sought from Southern Water that the different BRAVA products do not affect the viability or timing of development at particular locations (this could be included in a Level 2 SFRA if necessary).