Revised Draft Water Resources Management Plan

Technical Appendix Y – DWMP and WRMP Alignment

Contents

Figures

Tables

Background and Introduction

This Appendix sets out the alignment of our long-term strategies for water and wastewater services.

The development of the first cycle of Drainage and Wastewater Management Plans (DWMP) alongside established Water Resources Management Plans (WRMP) provides an excellent opportunity to promote catchment-wide systems thinking and partnership working.

Both plans respond to the main drivers for change and uncertainty in the long-term (e.g. population growth, climate change) and are developed using a similar risk-based methodology with the aim of improving system performance, enhancing resilience and increasing public value at an affordable cost.

Our stakeholders are not limited by our structural constraints and expect us to be aligned across water and waste. We have established a WRMP/DWMP alignment group to promote joint strategic planning at each stage of the planning process. Full alignment will require time, particularly as the DWMP matures and becomes statutory. However, we consider our 2024 plans are as aligned as far as practicable.

We have set out an illustrative 'alignment pathway' that could lead towards full catchment-based systems thinking and joint strategic planning.

We then look at alignment in our baseline assessments and in developing our preferred plans. Lastly, we provide five case studies to highlight examples of joint plan development and working.

We provide three practices.

Towards joint strategic planning

Approach for WRMP / DWMP24

Y.1 The WRMP and DWMP both set out how we intend to manage external pressures (such as growth, climate change and environmental need) on our water and wastewater systems and ensure we are planning a secure and sustainable water and wastewater service for the future. Both plans directly provide, and support, the investment proposals made within our 5-year Business Plan, the next being for the period 2025-2030.

Y.2 We are fully supportive of the move to develop long-term DWMPs alongside the established WRMP process. We recognise the opportunities this will bring to provide a coherent system-based set of solutions to our planning problems and give a consistent basis on which to explain our decisions to our customers and stakeholders.

Y.3 We also recognise a longer-term goal of bringing together not only water company plans, but those of other water stakeholders, to provide a coherent future water strategy. 'Joined-up' management of the water system is part of Defra's delivery plan for their recently published Environmental Improvement Plan[1].

Y.4 A risk-based approach to strategic planning is advocated by both the Water Resources Planning Guideline (WRPG)[2] and the DWMP Framework[3]. As the processes used to develop the strategic plans are very similar, they can be used to compare approaches between plans.

Y.5 To facilitate co-ordinated development of the DWMP and WRMP, we set up an alignment group. This group meets regularly and reports to the Executive-level Steering Groups for each plan.

Y.6 At each stage in the development of our plans we have asked ourselves:

- What is current approach for this stage?
- How well are our activities aligned? How sensitive are our plans to any differences in approach?
- How can we share best practice technical approaches and methods, and coordinate activity to achieve common goals?
- What is the future development plan, for the next cycle of strategic plans?

Y.7 There are some specific challenges to bringing our WRMP and DWMP together:

Maturity

- WRMPs are entering their 6th planning cycle. They are statutory, well established and understood
- The DWMP is a new, non-statutory plan in its first cycle
- Although there can be shared learning, the DWMP process, methods and tools will need time to mature

Scale

- The plans are broken down to differing geographic blocks (or planning units)
- The WRMP is comprised of six Water Resource Zones (WRZs). The focus for WRMPs is increasingly on regional planning and regional solutions

[1] DEFRA (2023) Environment Improvement Plan (p.107)
[2] Environment Agency (2022) The Water Resources Planning Guideline
[3] Water UK (2019) A framework for the production of Drainage and Wastewater Management Plans

- The DWMP is comprised of 382 waste and drainage systems, with separate models for network and treatment. Whilst there will be aggregations for reporting purposes, the underlying modelling of system response is carried out at the system level
- Due to the relatively smaller geographies of the DWMP regions, along with their complexity, DWMP problems and solutions are generally at system or sub-system level

Timing

- Producing a DWMP in line with the WRMP means assessment and consultation happens much earlier in the 5-year business planning cycle than would normally be the case for wastewater planning
- As plans are developed, they currently enter into different statutory and non-statutory processes with different consultation periods and timetables to bring them to final. They can also be subject to changes in regulatory guidance, further consultation and ultimately, periods of public scrutiny. Maintaining alignment when timescales for these processes diverge is difficult, however company Business Plans pull together the outcomes of the DWMP and WRMP and ensure they are complimentary.
- Joint strategic planning should increasingly bring the timetables together and reduce the risk of divergence. Also adoption of adaptive principles, should mean plans can be agile to changes which may prevent the need for re-consultation

An alignment pathway

Y.8 We have worked closely to align WRMP, DWMP and regional water resources planning (via the Water Resources in the South East (WRSE) Group) as far as is practical for this round of planning; however, we consider that alignment will evolve over several planning cycles, recognising that changes will need time to be delivered.

Y.9 A potential DWMP/WRMP alignment pathway is presented over the next two planning cycles, to 2034 in Table Y-1 below.

Topic/Theme	2024	2029	2034
Customer engagement	Separate activity using a common methodology	Integrated programme	
Stakeholder engagement	Separate, specific channels Integrated catchment focus	Integrated programme	
Strategic Context	Objectives aligned Different geographies	Objectives aligned Catchment based reporting	
Baseline assessment	Alignment of base data (Growth, Climate change), with explanation of variance	Full alignment of supporting data Separate modelling	Integrated catchment-based modelling
Problem characterisation	Risk levels compared at different geographies	Risk levels compared at a catchment level	
Options development	Separate processes using similar methods Review of opportunities	Joint procurement Same methods Targeted development Increased Risk Management Authority involvement	Catchment wide, stakeholder-integrated identification and assessment process

Topic/Theme	2024	2029	2034
Best value planning	Separate processes using similar methods Different models Output review	Same methods Different models Semi-integrated	Integrated
Documentation	Joint statement in WRMP and DWMP Main Reports Appendix in both plans with further details and integration pathway	Statutory WRMP and DWMP Evidence of greater integration as per integration pathway Lobby for a single integrated strategic plan	Single System Management Plan Supported by Catchment-based systems plans
Governance	Separate Exec/Board sessions Separate steering groups	Joint Exec/Board sessions Separate steering groups	Fully-integrated strategic planning governance

Table Y-1: An initial view of a potential alignment pathway for DWMP/WRMP

Alignment of baseline assessments

Y.10 The WRMP and DWMP respond to the same long-term challenges, as such similar base data on those key drivers should be used in the development of both plans. We examine the alignment of the base data for population and property growth, Water consumption and Climate change projections in the following sub-sections.

Y.11 The final stage of baselining in both planning processes is Problem Characterisation. This stage examines the severity and complexity of the problems identified and uses that information to establish an overall risk status for each planning unit (6 WRZs and 382 wastewater systems). That risk status is then used to focus efforts in the next phases of work; to identify options available to meet the problems; and to select appropriate methods to combine those options to deliver best value solutions. We explain how we've brought the problem characterisations together and identified key areas of joint risk.

Growth forecasts

What is our current approach?

Y.12 We have a company-wide property and population group that oversees the use of growth data in all our strategic plans. The group co-ordinates discussions with our external demographic specialists, Edge Analytics, and agrees when updates to the base data are required (i.e. the next cut of data is taken).

How do we align?

Y.13 Key messages:

- We source our growth data from a single expert supplier, Edge Analytics, who deliver a range of forecasts for us from a variety of demographic sources. These can be trend-based, local authority housing plan-based and also include variants incorporating potential growth hubs, including the Oxford-Cambridge Arc, or using alternative demographic assumptions.
- The data produced by Edge Analytics is used in both plans and is also used in regional water resource planning via WRSE
- Water Resources Planning Guidance (WRPG, produced jointly by regulators to guide the development of WRMPs) requires that WRMPs do not limit planned growth. As such the baseline 'central' forecast for growth is based on local plans.
- Once local plan periods have ended, we then revert to trend-based information from the Office of National Statistics. Alternative growth forecasts are used for adaptive planning purposes
- Given the number of wastewater systems we have (382), we currently update our models on a continuous rolling cycle ahead of each Business Plan. This is currently a manual process and the timing of the DWMP development cycle has resulted in some systems not being as up to date as others with the latest Edge Analytics data
- In the systems that do not have data produced by Edge Analytics we use our existing update process which also takes local plan data, but sourced directly
- This effectively means that we are using similar base data
- It is not uncommon for new population and property projections to become available during the development of the plans. As a result, the projections used between the plans can become unaligned
- We overcome this by undertaking sensitivity analysis

Future development

Y.14 We will develop methods to automate and speed up the transfer of Edge Analytics data for input and use into all our DWMP models, thus removing the need to get the same information from two sources.

Water consumption

Y.15 Forecasts of water consumption are important for water resources planning and drainage and wastewater planning. The foundation of WRMP is to ensure we are using available resources efficiently and as such we are working to reduce resources lost through leakage, and to help our customers to use water more efficiently. Driving down water demand will impact the volume of wastewater to be collected and treated at our STWs.

Y.16 We also incorporate effluent returns from STWs to rivers into the modelling of our supply capability for WRMP. This incorporates data also used in DWMPs (STW catchment), in conjunction with water supply zone information (FMZs). We use this information to determine the proportions of water used in a WRZ will be returned to which rivers.

What is our current approach?

Y.17 Details of how we forecast water consumption in our WRMP are provided in the WRMP Main Report Section 3.

Y.18 DWMP STW demand forecasts incorporate WRMP water consumption in their Dry Weather Flow (DWF) projections. Details of how we forecast DWF in our DWMP are provided in the DWMP Baseline Risk and Vulnerability Assessment (BRAVA) Technical Appendix.

How do we align?

Y.19 Key messages:

- There is a long-established process for sharing information on water consumption (per capita consumption) between the water and waste forecasts
- We use relevant WRZ level PCC forecasts, sourced from our WRMP team and those from other water companies that connect into our drainage and wastewater network (Affinity, Anglian, Essex & Suffolk, Severn Trent, South East Water, Southern Water and Sutton & East Surrey), to inform the DWMP
- We use DYAA PCCs (dry year annual average)
- For STWs draining multiple WRZs, we proportionally allocate to generate an average
- We assume that 95% of the water consumed will reach the STW for treatment. We express this as per capita flow (l/head/day)
- Water consumption forecasts are often confirmed late in the planning process because they are a key factor in public consultation and discussion with regulators. As a result, the consumption forecasts used between the plans are often not aligned
- We overcome this by undertaking sensitivity analysis of flow assumptions and by prioritising updates to STW demand forecasts

Future development

Y.20 As the DWMP matures we intend to increase the efficiency by which information is shared between the WRMP and DWMP, and also the speed which it can be incorporated and assessed within the models.

Climate change projections

What is our current approach?

Y.21 Climate change will impact water supplies (reduction in raw water availability, increased likelihood of droughts), water demand (increases with temperature), our waste network (increased rainfall intensity) and our waste treatment capability.

Y.22 Climate change is known to be a significant driver for change in water supply availability and sewer flooding.

Y.23 Details of how we include climate change in our WRMP will be provided the WRMP Main Report Sections 3 and 4.

Y.24 Details of how we include climate change in our DWMP are provided in the DWMP Baseline (BRAVA) Appendix.

How do we align?

Y.25 Key messages:

- We use climate change projections published by the Met Office in the UK Climate Projections (UKCP) as our base data source for all climate change assessment work
- UK Water Industry Research (UKWIR) and the Environment Agency then provide uniform methodologies to turn the climate variables into information suitable for use in our water and wastewater models
- Previous climate change impact assessments were based on UKCP09 projections. New projections were released by the UKCP in 2018
- We have worked with the industry and our regional partners to incorporate UKCP18-based updates into our plans as they have become available.
- A 2021 UKWIR report examines which water and wastewater tools should be updated in light of the new projections[4]
- A rapid review of impact of the UKCP18 projections on water supply has been undertaken in coordination with WRSE[5] and included in the regional plan and draft WRMP
- Pre-release UKCP18 information was able to be used in the UKWIR project for waste network (UKWIR, 2017[6]). We use uplifted rainfall profiles in our draft DWMP, based on this work
- A Drainage[7] project is underway with the UK Climate Resilience Programme, to re-examine the UKWIR 2017 report with UKCP18 published data, including the revised UKCP local level (2.2km) projections
- Impact of climate change on water demand remains based on UKCP09 projections[8]. Priority has been given to water supply as climate change impacts on water demand are relatively modest in comparison
- Excluding storm discharges, there is currently no industry method to allow for climate impacts on sewage treatment works.
- Differences between datasets and emission scenarios are not considered to be material at this stage, but we will update to the latest figures as soon as practicable.
- Uncertainty in the baseline climate change impact figures is handled within headroom analysis, adaptability assessment and what-if scenario testing

[4] UKWIR (2021) Integrating UKCP18 With UKWIR Tools and Guidance: Review of Existing Methods
[5] Atkins (2020) Regional climate datasets for regional Water Resources Planning
[6] UKWIR (2017) Rainfall Intensity for Sewer Design – Stage 2
[7] https://www.ukclimateresilience.org/projects/future-drainage-ensemble-climate-change-rainfall-estimates-for-sustainable-drainage/
[8] UKWIR (2013) Impact of Climate Change on Water Demand 13/CL/04/12

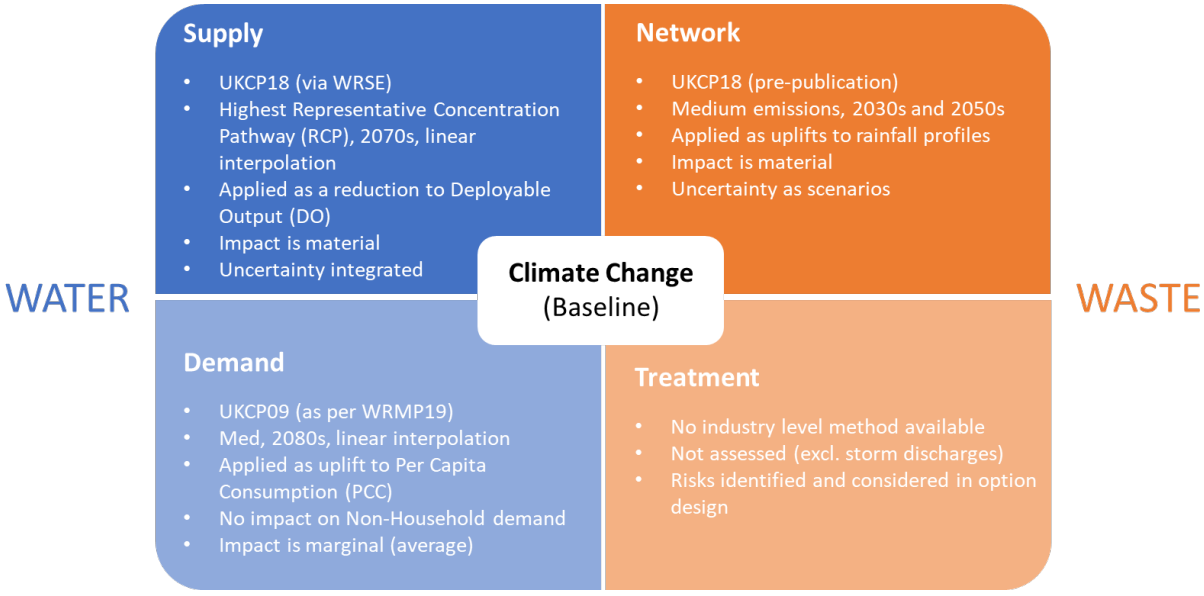

Figure Y-1: Climate Change in the WRMP and DWMP baseline projections

Y.26 A summary of how climate change is included in the baseline forecasts for water supply and demand and waste network and treatment works is provided in Figure Y-1.

Future development

Y.27 We will continue to update the climate change impacts in all of the areas, with the latest data as it becomes available.

Y.28 We have a programme to update the rainfall uplifts applied in the wastewater and drainage network models via the ongoing work of the UK Climate Resilience Programme.

Y.29 We will investigate updating the impacts on water demand, noting that the impact is not as material as in other areas of the baseline.

Y.30 We will work with the industry to develop ways to allow for climate change impact on sewage treatment works. We will also investigate developing our models to allow better integration with our water demand and waste network models.

Problem Characterisation

What is our current approach?

Y.31 The WRMP and DWMP methods both advocate a risk-based planning process, incorporating a stage called problem characterisation. This brings together the risks identified in the baselining phase, to examine overall severity of the problem (the extent of any deficit and how soon it manifests in the planning period) and complexity of the potential solution.

Y.32 WRZs and wastewater systems are assigned an overall risk level of High, Medium or Low.

Y.33 Details of the problem characterisation for the 6 WRZs are provided in the WRMP Main Report Section 10.

Y.34 Details of the problem characterisation for the 382 systems are provided in DWMP Baseline (BRAVA) Appendix.

Y.35 We have combined the outputs of the individual problem characterisations to look at the combined risk areas identified across water and wastewater (Table Y-2).

Risk Category	Strategic Plan	
	WRMP (n = 6)	DWMP (n = 382)
High	3	4
Medium	2	17
Low	1	361

Table Y-2: Problem characterisation risk levels

Y.36 The high-risk WRZs highlighted in the WRMP are London, Swindon and Oxfordshire (SWOX) and Slough, Wycombe and Aylesbury (SWA).

Y.37 The high-risk catchments highlighted in the DWMP are Beckton STW and Crossness STW (which drain part of the London WRZ), Mogden STW (which also drains part of the London WRZ and also parts of Affinity Water's Pinn WRZ) and Crawley STW (which drains part of Southern Water's Sussex North WRZ).

How do we align?

Y.38 Key messages: We have used the outputs of this comparison of strategic risk to influence options development and programme appraisal in the following ways:

- To target development of options in joint high-risk areas for dual benefit
- Highlight catchments of high interest for joint catchment management work
- Influence selection of options with joint benefits in programme appraisal

Future development

Y.39 In future rounds we intend to make the presentation of problem characterisation more visual using GIS. This will help us identify areas of joint risk, as well as highlighting the potential for joint solutions and targeted delivery.

Aligning preferred programmes

Y.40 Having established and understood the combined baseline risk, we then investigate potential options available (referred to as Options Appraisal in the WRMP and Options Development and Appraisal in the DWMP) to resolve the problems. No single option will be sufficient, so we must develop programmes of options to meet our objectives (Programme Appraisal). We then seek to identify a best overall value programme for each plan (the Preferred Programme / Plan) that balances the needs of our stakeholders and customers.

Y.41 In the following sub-sections, we look at each of these areas in turn.

Options Appraisal

What is our current approach?

Y.42 Options appraisal represents the biggest area of expenditure in the development of the plans, where hundreds of potential options are investigated, with the assistance of specialist consultants. Some options have a significant history of study, others are new solutions. Importantly, options brought to appraisal need to be technically deliverable.

Y.43 Details of the WRMP Options Appraisal are provided in the WRMP Main Report Sections 7-9.

Y.44 Details of the DWMP Options Appraisal are provided in the DWMP ODA Technical Appendix.

Y.45 The options appraisal processes in the WRMP and DWMP both follow a screening approach whereby we identify as many types of options and specific options as we can, with the help of our stakeholders, and then filter them to a manageable option set for programme appraisal using multiple phases of screening.

Y.46 We identify:

- Generic option types (such as re-use, SuDS, transfers, new treatment works etc...)
- Unconstrained options – Specific options within each option type
- Feasible options – Options which pass initial screening
- Constrained options – Options developed to a level suitable for programme appraisal

Y.47 Both plans maintain registers, which document the option types or individual options that are not considered suitable for inclusion in this round of plans, and why. All options will be reviewed in future planning cycles.

Y.48 Constrained options, which perform the best of their option types, are assessed in both plans:

- To a conceptual design level suitable for comparative assessment. In terms of:
  - Cost (Capital, Operational, Carbon)
  - Benefit (i.e. the impact of the scheme on the plan metrics)
  - Environmental performance (Benefits and dis-benefits)
  - Resilience factors
  - Customer and social factors

Y.49 Option dossiers are produced to explain the key elements of each scheme.

Y.50 The options appraisal stage serves to develop the best set of solutions by type, to address the risks and challenges identified in our plans. The attributes of each option are then used

in programme appraisal, where combinations of options are put together to form programmes, which in turn are compared to find the overall best value plan.

How do we align?

Y.51 Our approach to options appraisal is aligned, both in terms of screening processes and how options are appraised.

Y.52 We have used our experience gained in options appraisal for the WRMP to identify and develop options in conjunction with our stakeholders.

Y.53 The WRMP has a large library of existing options, we have sought to develop a similar library for the DWMP; a considerable task from a standing start.

Y.54 We have considered the output of the option appraisal process to identify where there are options that could potentially be beneficial from a water and wastewater perspective.

Future development

Y.55 Option appraisal is an ongoing process. We will continue to seek out new opportunities as they become available. The DWMP database in particular will mature over time.

Y.56 Currently we have separate options appraisal teams for the DWMP and WRMP, although we have investigated how joint option development could work in the future. We may look again at how we procure options appraisal work in future planning cycles.

Y.57 We will continue to review the summary characteristics of the options we use to assess their performance. In this planning cycle we have seen the emergence of natural capital as a way to assess options (and programmes). We have also seen the uncertainty and risk area expand including a wider understanding of resilience risks at the option, programme and system level.

Programme Appraisal

What is our current approach?

Y.58 Having established the baseline challenges and the options available to meet them, we then seek to identify the programme (i.e. a combination of options), that best makes up any shortfall in water supplies (WRMP) or reduces flooding, ensures discharges do not cause harm, and brings wider community benefits (DWMP) over the planning period.

Y.59 Details of the WRMP Programme Appraisal are provided in the WRMP Main Report Section 10.

Y.60 Details of the DWMP Programme Appraisal are provided in the DWMP Programme Appraisal Technical Appendix.

Y.61 Each programme must meet a number of legal and regulatory requirements and policy expectations, which include a range of environmental legislation and drinking water quality regulations.

Y.62 Then there are regional and company strategic objectives to consider. These are the specific goals that both plans must aim to deliver. We've used insight from customers and stakeholders to help us understand their priorities, so our objectives seek to achieve what matters most to them.

Y.63 We develop criteria (such as cost, environmental performance, resilience) and metrics to describe performance against each of the objectives and then use optimisation modelling to identify programmes of potential solutions which can meet the objectives with varying

emphasis on each of the criteria We compare the performance of the programmes and select an overall best value programme in consultation with the public and stakeholders.

How do we align?

Y.64 Our approach to programme appraisal is aligned, with both plans setting objectives, measuring them using criteria and metrics and then modelling to produce potential programmes.

Y.65 For both plans we have used a similar computational method to identify potential programmes of solutions. This method, known as multi-criteria optimisation, allows us to produce programmes that maximise or minimise a single criterion (such as cost or resilience), or consider two criteria at the same time (i.e. seeking to balance both cost and environmental performance).

Y.66 For both plans, we initially establish the combinations of options that meet objectives while keeping costs and bill impacts as low as possible. However, it is recognised that other potential programmes could deliver additional value to people and places and that this should be considered, alongside cost.

Y.67 This could result in a programme being chosen that isn't necessarily the cheapest but is one which delivers much wider benefits to society. This is what's known as a 'Best Value' plan.

Y.68 We recognise that 'Best Value' means different things to different people, and so we have used a range of criteria and metrics to assess the additional value delivered by the different programmes we identify.

Y.69 Several of these criteria are uniform across both plans, with themes of Cost, Environment and Resilience.

Y.70 In both plans we have used these criteria and metrics to help us identify where value is added so we can differentiate between the programmes. Once we have used these criteria to shortlist our 'Best Value' programmes, we compared them and used them to facilitate the informed conversations we had with stakeholders and customers, about their respective costs, benefits and outcomes. This helped us to identify and discuss 'trade-offs' that need to be made before we ultimately identified the preferred programmes that form the basis of our plans.

Y.71 Both plans include for customer and stakeholder involvement in priorities and decision making and include a formal public consultation stage.

Y.72 Both Plans use adaptive planning principles, and although a single preferred plan is identified for reporting purposes, several alternative futures, (both company-derived and reference scenarios suggested by our regulators) are considered in the development of both plans.

Y.73 In the WRMP, as a part of regional modelling, we are able to model across a wide range of futures at once, by building a 'tree' of future pathways. This means at certain branch points (e.g. key policy delivery dates) we recognise that the future may take a different path and our modelling can account for that in its selection of different programmes of options. By doing this we can be confident that early investments are best suited to the range of potential futures.

Y.74 In the DWMP the modelling is more localised and based on iterations of single futures, which are then examined to develop adaptive pathways.

Future development

Y.75 The WRMP is becoming increasingly regionally focused. The majority of the modelling and assessment is now done at regional level through the Regional Water Resources Plans, with the outcomes reflected in company WRMP's. However, the DWMPs, at least in the first iteration of the plans, are more locally focused (system/sub-system level), with limited expectation that a regional approach will follow in the near future.

Y.76 We will need to examine this difference of scale and look how best to bring the DWMP and WRMP together.

Y.77 Currently only the WRMP is a statutory plan. We will need to work with the regulators to establish the pros and cons of whether the Regional Plans should have a statutory basis. Although the first cycle of the DWMP is non-statutory, DWMPs will become a statutory duty for Water Companies from April 2023.

Y.78 The DWMP processes will mature in future cycles. We expect to see improvements in data processing, visualisation and modelling.

The preferred programmes

Y.79 WRMP Preferred Programme details are provided in the WRMP Main Report Section 11.

Y.80 DWMP Preferred Programme details are provided in the DWMP The Plan.

How do we align?

Y.81 The WRMP and DWMP preferred programmes align in these key areas:

- Demand management focus
- Re-use options
- Catchment management options

Y.82 Demand management is an essential component of both plans. The WRMP includes for substantial reduction in leakage and usage which in turn will impact flow to our STWs.

Y.83 The WRMP leads in terms of obtaining funding for this activity, but the DWMP will influence where the activity is delivered and when. Priority will be given to areas of joint benefit.

Y.84 The WRMP identifies re-use plants in its preferred programme. Our options development teams have ensured that the developments required at key potential STW / re-use sites in London are compatible.

Y.85 Environmental improvement is an important element of both plans. These opportunities range from large, formal schemes like those required to deliver the Water Industry Environment Programme (WINEP); to SuDS development and the 'greening' of the urban environment; down to smaller, local opportunities to improve particular river reaches for environmental gain.

Y.86 One way that improvement will be delivered will be through the inclusion of catchment management schemes and partnership opportunities. We have engaged with key stakeholders in developing both plans and have identified a large number of areas of common risk. We have highlighted partnership opportunities that if developed could improve the environmental status of catchments in the Thames Basin, as well as contributing to us meeting shared goals.

Y.87 We are committed to a 'Smarter Water Catchments[9] approach, building and delivering ten-year action plans in four river catchments (Chess, Evenlode, Kennet and Crane), so we will already be bringing together water and waste aspects.

Y.88 This approach will be expanded to further catchments.

Future development

Y.89 The preferred programme proposed in the WRMP is required to be option specific. That is to say that we need set out what options will be done when, which directly informs the company's overall Business Plan. The DWMP outputs are currently more directional and discuss types of options and combinations rather than specific outputs. The detail of the first five years of our DWMP's investment plan will be proposed as part of our medium-term Business Plan. We can see the DWMP becoming more option specific in future iterations, especially as the plan becomes statutory.

[9] https://www.thameswater.co.uk/media-library/home/about-us/responsibility/smarter-water-catchments/smarter-water-catchments.pdf

Case Studies

Comparing baseline risks – problem characterisation

Y.90 As both the WRMP and DWMP planning processes are risk-based, both include a step called problem characterisation, which seeks to assess the level of risk in each planning area.

Y.91 Problem characterisation provides an ideal point in the planning process to spatially compare the levels of risks (High, Medium, Low) between plans and identify areas of joint risk for the operating system as a whole.

Y.92 Table Y-2 sets out the number of planning areas in each risk category in the WRMP (6 WRZs) and DWMP (382 catchments). In Table Y-3 below we extract the 21 DWMP catchments that are High (red) and Medium (yellow) risk and provide the risk identified in the WRMP for the WRZ each catchment drains.

Y.93 For the avoidance of doubt, no areas of joint medium or high risk are identified for the Guildford or Henley WRZs.

DWMP		WRMP	
STW Catchment	Risk	Water Resource Zone	Risk
Beckton STW	High	London	High
Crossness STW	High	London	High
Mogden STW	High	London; Z4 Pinn – Affinity Water	High
Crawley STW	High	North Sussex – Southern Water	High
Bicester STW	Medium	SWOX	High
Blunsdon STW	Medium	SWOX	High
Bourton-on-the-Water STW	Medium	SWOX	High
Chalgrove STW	Medium	SWOX	High
Cholsey STW	Medium	SWOX	High
Didcot STW	Medium	SWOX	High
Kingston Bagpuize STW	Medium	SWOX	High
Moreton-in-Marsh STW	Medium	SWOX	High
Oxford STW	Medium	SWOX	High
Swindon STW	Medium	SWOX	High
Wantage STW	Medium	SWOX	High
Maple Lodge STW	Medium	Z2 Colne – Affinity Water	High
Ashford Hill STW	Medium	Kingsclere – Southern Water	High
Arborfield STW	Medium	WRZ4: Bracknell – South East Water	Medium
Bracknell STW	Medium	WRZ4: Bracknell – South East Water	Medium
Little Marlow STW	Medium	Slough Wycombe Aylesbury	Medium
Reading STW	Medium	Kennet Valley	Medium

Table Y-3: Comparing planning area risks (DWMP/WRMP)

Y.94 Observations:

- We can see that all four high-risk areas in the DWMP are also identified as high risk in the WRMPs.
- The DWMP catchments at high or medium risk are also at high or medium risk in the relevant WRMP WRZ.
- There are a number of medium risk areas in the DWMP that are high risk in the WRMP, particularly in the SWOX WRZ

Y.95 These observations suggest that there are certain areas where joint investigation and option development could be beneficial to both plans.

Y.96 Before doing so, we need to examine the precise nature of the risks in both zones. Whilst we know the WRMP issue will be regarding the supply demand balance, we need to identify which of the DWMP metrics are at risk (network or treatment, or both) and when the risks occur.

Y.97 This determines the scope for joint option development, five of which are shown in the case studies below.

Joint option development

Y.98 An outcome of the problem characterisation work is that it helps us to target where it is most important to identify options that can solve multiple planning problems.

Y.99 We have identified five mini case studies that demonstrate how our WRMP and DWMP option appraisal processes and those of our neighbours Affinity Water, have led to the identification and investigation of joint options.

Y.100 Whilst at this stage, these investigations have not resulted in options selected in a preferred plan, they demonstrate the potential advantages of bringing strategic water and wastewater plans together.

Case Study 1 – Mogden South Sewer

Beneficiaries	Thames Water WRMP – increased flow to abstract from Lower Thames. Thames Water DWMP – increased headroom at Mogden STW.
Concept	Interception of sewage flows upstream of Mogden STW. New sewage treatment works, incorporating enhanced treatment discharging into the Lower Thames, upstream of existing water intakes.
System Status	WRMP – London WRZ (High risk). DWMP – Mogden STW (High risk).
Size	Up to 50 Ml/d.
Description	Mogden STW in West London is our third largest STW, serving around 2 million people. The works and its sewer network are located for the most part within the catchment of the River Crane. In the WRMP19, we identified several potential options that could use final treated effluent leaving Mogden STW, for supply enhancement. However, if we intercepted sewage flows within the Mogden sewerage catchment upstream of the works rather than using final effluent, then this could benefit both systems. The Mogden South Sewer option would intercept and treat raw sewage at Kempton WTW, which is upstream of Mogden STW and closer to our water storage and treatment assets. The treated effluent would then be discharged above the intakes at Walton WTW. This would also reduce the sewage flowing to Mogden STW, which could delay the need for capacity increases and reduce the risk of spills and pollution incidents. Investigations have shown the option to be technically feasible at up to around 50Ml/d and the option has been developed for inclusion within the options appraisal processes for both plans. The option is included as a part of the wider Strategic Regional Option (SRO) investigations on effluent reuse in London.
Liaison	Regular meetings between options appraisal teams, supported by DWMP/WRMP liaison group. Included within DWMP stakeholder engagement for the Mogden system.
Status within plans	WRMP – Option rejected for WRMP24 because other options at Mogden STW exist, with greater supply-side benefits. However, option development work is being planned for over the longer term, to consider the wider benefits of the scheme for future plans. DWMP – Option remains viable and will continue to be investigated.

Case Study 2 – Iver South Sludge Treatment Centre

Beneficiaries	Thames Water DWMP – increased headroom at Mogden STW. Environmental improvement – increased flow in the River Colne and River Crane.
Concept	New sludge treatment centre at Iver South to reduce ammonia load to Mogden STW. Treated effluent could be used to increase river flows.
System Status	DWMP – Mogden STW (High risk). River Crane – A Smarter Water Catchment.
Size	To be defined.
Description	Mogden STW in West London is our third largest STW, serving around 2 million people. The works and its sewer network are located for the most part within the catchment of the River Crane. The proposal is to construct a liquor treatment plant at Iver South sludge treatment centre, to reduce the ammonia load from sludge liquors returned to Mogden STW. Sludge produced at Mogden is currently subjected to digestion at Mogden and the digested sludge transferred to Iver South for dewatering. The liquors from the dewatering process are currently returned to the Mogden STW inlet and contain a significant ammonia load. Additional treatment assets could be added at Iver South to allow the further treated effluent to discharge into the River Colne and support the River Crane (one of our Smarter Water Catchments) that takes flow from the Colne. Investigations have shown the option to be technically viable, but water quality has been identified as a key concern.
Liaison	Regular meetings between options appraisal teams, supported by the DWMP/WRMP liaison group. Included within DWMP stakeholder engagement for the Mogden system.
Status within plans	DWMP – Option will continue to be investigated but is not expected to deliver a resource benefit for WRMP purposes.

Case Study 3 – Sewage transfer to Blackbirds STW

Beneficiaries	Thames Water DWMP – increased headroom at Maple Lodge STW. Affinity Water WRMP – Increased flow in the River Colne to support further abstraction (or mitigate sustainability reductions).
Concept	Sewage transfer to provide headroom at Maple Lodge STW, enabling enhanced discharge into the River Colne for use as a resource by Affinity Water.
System Status	DWMP – Maple Lodge STW (Medium risk). Affinity Water WRMP – WRZ2 Colne (High risk).
Size	Up to 10 Ml/d.
Description	Maple Lodge and Blackbirds STWs serve over 600 thousand people in West Hertfordshire. The option involves refurbishment and upgrade of Blackbirds STW so that it can treat to maximum design capacity (increase of 10 Ml/d to total 20 Ml/d), thus increasing headroom at Maple Lodge. The option would increase discharge further upstream in the River Colne for potential resource benefit for Affinity Water or as mitigation for potential sustainability reductions. Investigations have focused on: Improving reliability and operating regimes to maintain the increased discharge from Blackbirds STW (Thames Water). Options for Affinity to capture the increased discharge via groundwater infiltration or alternatives (Affinity Water). Potential downstream licence derogation (Affinity Water).
Liaison	Regular liaison between TW DWMP and Affinity Water WRMP teams.
Status within plans	Thames Water DWMP – Option included in preferred plans to reduce risks at Maple Lodge. Affinity Water WRMP – Options for re-use at Maple Lodge and Blackbirds are identified in Affinity's options appraisal but both are rejected because of concerns of licence derogation downstream.

Case Study 4 – Long Reach system – new STW

Beneficiaries	Thames Water DWMP – Increased Headroom at Long Reach STW. Environmental Improvement – River Darent.
Concept	Construction of a new STW which would discharge into the River Darent, potentially improving known low flow issues.
System Status	DWMP – Long Reach STW (High risk). River Darent – a chalk stream with low flow concerns.
Size	To be defined.
Description	This is an early proposal to build a new STW north of Sevenoaks, in order to reduce the pressure on Long Reach STW by taking flow from the Darent Valley Trunk Sewer, treating and discharging it locally. The scheme has potential for multiple benefits, environmental net gain, and partnership working. The increase in flows in the River Darent could potentially offset the need for some licence reductions at our existing groundwater abstractions on the River Darent, however it is recognised that discharging to a chalk stream would require very low/no spills and a high-quality effluent.
Liaison	Regular meetings between options appraisal teams, supported by the DWMP/WRMP liaison group.
Status within plans	Thames Water DWMP – Option remains under consideration. Thames Water WRMP – Currently considered as a catchment management option for potential environmental benefit rather than resource benefit.

Case Study 5 – Hoddesden sewage transfer

Beneficiaries	Thames Water WRMP – resource benefit. Thames Water DWMP – increased headroom at Deephams STW.
Concept	Sewerage catchment transfers from Deephams STW system to Rye Meads STW. The subsequent increase in water volumes in the River Lee may then allow increased raw water abstraction during low flow periods.
System Status	WRMP – London WRZ (High risk). DWMP – Deephams STW (High risk).
Size	Up to 25 Ml/d.
Description	The Hoddesden Transfer Main (existing) is designed to pump sewage from the Deephams STW system to Rye Meads STW. The Rye Meads STW final effluent discharge point is above our abstraction points on the River Lee (whereas the Deephams STW discharge point is below our River Lee abstractions). The transfer main is a drought asset that is not in regular use. Headroom is reserved at Rye Meads to treat this flow. If we were to operate the asset permanently, it would provide a headroom increase at Deephams STW and increase water availability. There are water quality and flow concerns with the River Lee and potentially considerable abstraction reductions being investigated in conjunction with the Environment Agency.
Liaison	Regular meetings between options appraisal teams, supported by the DWMP/WRMP liaison group.
Status within plans	Rejected in both plans.

Working with customers and stakeholders

Y.101 There is wide interest in long-term water and wastewater planning, from organisations who are interested in the strategic objectives, to individuals and organisations who are focused on a specific river or catchment.

Y.102 Thames Water has sought to proactively engage with customers and stakeholders in the development of the WRMP and DWMP. Strategic planning provides the opportunity to work in partnership with customers and stakeholders to fully understand the issues and challenges, and identify and co-create potential solutions.

Y.103 It is important to note that the WRMP and DWMP are not isolated plans. There is a backdrop of strategic management plans and policies within the water industry and across other sectors that are relevant and need to be considered, as illustrated in Figure Y-2. These provide important context in our engagement with stakeholders.

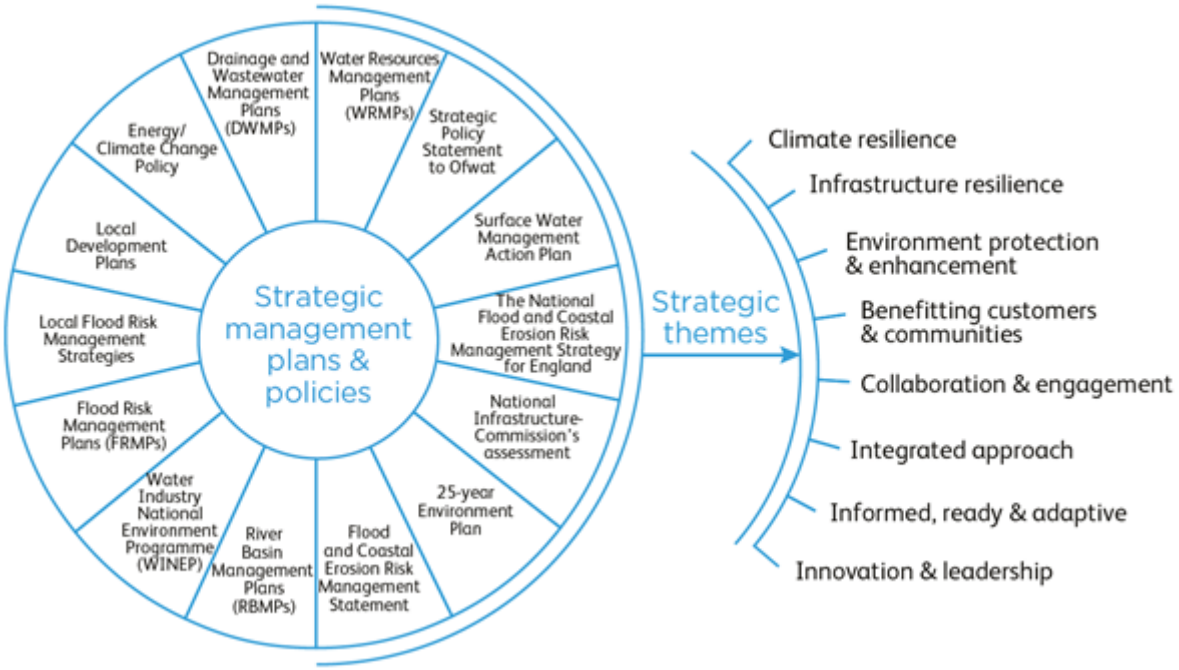

Figure Y-2: Climate change in the WRMP and DWMP baseline projections

Y.104 Recognising the complex landscape and interactions between the various policies and plans, and the range of stakeholders who have an interest in, and contribute to, the development of both the WRMP and DWMP, we have worked to coordinate our engagement. This has helped to make efficient and effective use of stakeholders' time, as well as ensuring that contributions are considered in both plans, where relevant.

Y.105 The WRMP is well established, in its sixth industry cycle. As this is the first time UK water companies have produced a long-term plan for their wastewater businesses, we've worked closely to design the engagement approaches, structure forward plans and ensure signposting of relevant WRMP and DWMP information with stakeholders. This has helped to provide clarity for stakeholders, coordinate activity and enable timely sharing of relevant technical information.

Y.106 An example of this coordination has been the sharing of information on issues, risks and opportunities in individual catchments. Water Resources South East hosted a series of workshops in early 2020 to engage with stakeholders and catchment partnerships to identify and understand issues and risks in the catchments across the South East, as well as to seek suggestions and ideas for catchment-led projects. The solutions proposed covered a range of issues including drainage, water quality and water availability. These workshops were followed up with 13 deep dive workshops to inform Catchment Strategy plans. The outputs from the workshops were discussed collectively to ensure coordinated activity to achieve wider benefits and meet multiple objectives.

Y.107 In addition to engagement with external stakeholders, there has also been a focus on better collaboration within the business. Previously water and wastewater strategic planning were largely managed as discrete activities but the introduction of the DWMP has initiated fuller engagement between the water and wastewater planning teams. This is reflected in the shared work on growth forecasts, climate change scenarios, the methodological approach to option identification appraisal and shared learning on adaptive planning. This will continue, though we recognise that there are important differences between the plans. For example, the DWMP primarily focuses on system-level solutions to the impacts of local planning, rather than large scale, regional solutions.

Y.108 The views of customers also play a vital role in shaping the plans. We worked closely on our engagement with customers to ensure a common, approach to capture customer preferences and priorities for long-term planning objectives, weightings, and types of interventions. This coordinated approach will be essential as we consider the future challenges facing the business, and the decisions that will need to be made on the scale and pace of activities within business planning, whilst recognising the need to consider the affordability of future investment and smoothing bill impacts.


Thames
Water