The Wessex area Drainage and wastewater management plan (DWMP) - Appendix G

DWMP Data Tables Commentary

Wessex Water

31st May 2023 – Final DWMP

Wessex Water
YTL GROUP

1. Introduction

This commentary provides explanation around how we have completed the final Drainage and Wastewater Management Plan (DWMP) data tables. The DWMP data tables are in Appendix F of our DWMP documentation and can be downloaded from our website (here).

Stakeholder feedback to our draft DWMP (dDWMP) has been invaluable in the completion of our final DWMP (fDWMP).

Our dDWMP data tables contained four sets of tables covering the four scenarios submitted in the draft DWMP: Core, Full, Unconstrained and Sound Science. We consulted with customers and stakeholders on their preferred scenario given the varying potential and indicative bill increases. The support for the 4 scenarios in the responses were:

- 50% support for the core scenario (minimum investment to achieve requirement)
- 25% support for the full scenario (core plus eliminate storm overflows)
- 25% support for the unconstrained scenario (core, plus eliminate storm overflow, plus significant hydraulic flooding reduction and a major step change in asset heath)
- 0% support for the sound science scenario (to defer investment until we had evidence of harm).

Following consultation on our dDWMP, and as described in our fDWMP documents, we are presenting a single core plan and apply adaptive planning to that plan as required. We have listened to our customer and stakeholders and our core plan is generally the same as the core scenario in the dDWMP, with more focus on storm overflows to achieve the minimum government storm overflow discharge reduction plan requirements and additional expenditure at WRCs to achieve new obligations.

A lot has changed since the submission of the dDWMP in June 2022. The biggest change is the Nutrient Neutrality requirement which has significantly increased the need for more investment at WRCs. This has increased our investment in WRCs from £500m to £1,400m in the period 2025 to 2030.

A significant proportion of the DWMP is dependent on and subject to the Water Industry National Environment Programme (WINEP). Whilst there is a lot more clarity on the WINEP since our dDWMP submission, there still remains a number of areas subject to change, with the potential for many of the options to be superseded/advanced/deferred accordingly.

Whilst the DWMP has been used to support the development of our wider PR24 business plan, further stakeholder and customer engagement is required, particularly when taking into account any affordability and deliverability considerations noting the significant increase in WINEP and other requirements since our dDWMP consultation.

It should be expected, thus, that our fDWMP and associated tables will not align with our PR24 business plan and data tables. As a further caution, it should be noted that the DWMP covers a major, but not complete, picture of our wastewater activities, with areas such as base maintenance, bioresources and related investigations to inform future WINEP iterations not included. These will be covered in our PR24 business plan submission in October 2023.

The overall costs for the core scenario have been included, with some adaptive pathway planning for other interventions at company level in the expenditure analysis in table 3.

General comments:

- The majority of the capex, opex and totex costs are as per the draft DWMP submission. All costs are at a 2022/23 price base. No allowance has been made for any potential above-inflation cost increases.
- We only have one scenario in our fDWMP, the core scenario, which is our best value plan. Table 3 shows adaptive pathways for other alternative levels of ambition (e.g. eliminate untreated discharges) and uncertainties (both current and future, e.g. climate change and further wastewater treatment requirements).
- A significant proportion of the DWMP is dependent on and subject to the WINEP. Even for this fDWMP there remains a great deal of uncertainty and lack of clarity regarding both the scope and timing of delivery of the WINEP, with the potential for many of the options to be superseded/advanced/deferred accordingly. This includes continuous discharges (e.g., nutrient improvements requiring WRC enhancement), intermittent discharges that cause harm (storm overflow reduction programme) and continuous water quality monitoring (we are awaiting the government's response to their consultation).

Due to the level of uncertainty, especially with the WINEP and DEFRA policy regarding storm overflows and monitoring water quality, the confidence grade we would give to the data in each table is B5.

2. Table 1 – Outcomes Summary

Our DWMP data tables are reporting against the six common planning objectives, which were agreed to be investigated by all water companies, and are as follows:

- internal sewer flood risk
- pollution risk
- sewer collapse risk
- risk of sewer flooding in a 1 in 50-year storm
- storm overflow performance
- risk of water recycling centre quality compliance

Wessex Water involved key stakeholders in the selection of six additional bespoke planning objectives at our Wessex Water DWMP workshop held in March 2020. The six planning objectives bespoke to Wessex Water are as follows:

- risk of water recycling centre flow compliance failure
- blockage risk
- waterbodies (river water quality) improved
- groundwater infiltration reduction
- partnership working opportunities
- sustainable drainage

Our six bespoke planning objectives are intertwined with the delivery of the common planning objectives, so to avoid double counting these are not all individually listed in the data tables. The bespoke planning objectives that we have added into the data tables are:

- risk of water recycling centre flow compliance failure
- groundwater infiltration reduction

Explanation of why some bespoke planning objectives are not listed is:

- blockage risk is included in the flooding expenditure and performance, so would be double counting
- waterbodies (river water quality) improved is included in the WRC expenditure, so would be double counting
- partnership working opportunities are provided in the Expenditure data table
- sustainable drainage is included in both our flooding reduction and storm overflow planning objectives, so would be double counting.

Within Table 1 there are three levels of outcomes against these planning objectives, depending on differing spend scenarios:

a) Baseline – Current baseline (2020) level of spending
   Base expenditure is routine, year-on-year expenditure, which we incur to provide a base level of service to customers. It includes expenditure to maintain the long-term capability of assets, as well as expenditure to improve efficiency. Where appropriate, it also includes the ‘betterment’ costs of replacing life-expired assets with modern equivalent assets which comply with legally required minimum standards which are higher than those they replace.

Expenditure is re-based every AMP to take account of the new base level of service which we provide as a consequence of the enhancement expenditure in the prior AMP. This baseline spending scenario assumes a continuation of our base spend as of 2020. It takes no consideration of any new base cost arising from AMP7 enhancement schemes or any future AMPs.

b) Base – Expected base spending, as of 2025
   As described above, expenditure is re-based every AMP. This base scenario assumes ongoing Opex and capital maintenance costs arising from AMP7 enhancement schemes is reflected in a change to base spend allowances.

c) Post Enhancement – Forecast
   Enhancement expenditure is for DWMP-related / identified needs where there is a permanent increase or step change in the current level of service to a new 'base' level and/or the provision to new customers of the current service. Enhancement funding can be for environmental improvements required to meet new statutory obligations, improving service quality and resilience.

For all tables we have assumed a continuation of enhancement Opex beyond AMP8 (2030), rather than a re-baselining at the end of every AMP period. In this way, the full ongoing costs of operating and maintaining to sustain any new level of service is clear.

2.1 Pollution Incidents

This metric is calculated as per Ofwat's PR24 definition to report the total number of pollution incidents (categories 1 to 3) in a calendar year emanating from a discharge or escape of a contaminant from a water company sewerage asset affecting the water environment, per 10,000km of sewer length from wastewater assets for which the company is responsible.

The total length of sewerage used to provide the normalised (per 10,000km) entries was 34,511km as per EPA methodology (version 9).

The definition and related methodology are the same as PR19 and used in APR23.

The calculated totals have been left as calculated, however, for the columns Total AMP10, Total AMP11 and Total AMP12 these show the performance position at the end of the relevant AMP period for lines 1a, 1b and 1c.

The totals for those columns and rows if completed as titled, would be as follows:

Line	Total AMP10 (2035-40)	Total AMP11 (2040-45)	Total AMP12 (2045-50)
1a	129.00	133.37	137.89
1b	75.34	56.50	37.67
1c	64.04	45.20	26.37

The AMP7 expenditure on the Pollution Incident Reduction Plan (PIRP) is £15.53m totex (£9.05m capex, £6.48m opex).

Line	Outcome	Description	Unit	Comment
1a	Pollution incidents - baseline	Number of category 1-3 pollution incidents per 10,000km of wastewater network	nr	Performance based of 2020 expenditure – so deterioration in performance from the end of AMP6. Deterioration rate based on average growth in total connected properties
1b	Pollution incidents - base	Number of category 1-3 pollution incidents per 10,000km of wastewater network (excluding impact of AMP8 onwards enhancements)	nr	AMP8 base performance based on five-year average. Future AMPs base performance is based on previous AMP enhancement providing an incident reduction of 16 incidents to trend to zero by 2050, includes secondary benefit of Flooding Blockages and Serious Pollution programmes
1c	Pollution incidents – post enhancement	Number of category 1-3 pollution incidents per 10,000km of wastewater network (including impact of AMP8 onwards enhancements)	nr	AMP7 no enhancement expenditure in final determination, however, expenditure diverted from hydraulic flooding programme to support sewerage pollution reduction programme; £9.1m capex and £6.5m opex. AMP9 base performance and future AMP periods based on assumed incident reduction rate of 16 incidents if AMP8 core plan

Line	Outcome	Description	Unit	Comment
				or similar implemented An assumption of an increase in AMP8 costs for future AMPs has been made due to increased difficulty of reducing performance further: AMP9 10%, AMP10 20%, AMP11 40%, AMP12 80%
1ci	Pollution incidents - enhancement cost	capex	£m	An assumption of an increase in AMP8 costs for future AMPs has been made due to increased difficulty of reducing performance further: AMP9 10%, AMP10 20%, AMP11 40% and AMP12 80%
1cii	Pollution incidents - enhancement cost	Opex	£m	
1ciii	Pollution incidents - enhancement cost	totex	£m	Sum of 1ci and 1cii

2.2 Compliance at WwTWs/WRCs

Compliance at Wastewater Treatment Works (WwTWs), or what Wessex Water call Water Recycling Centres (WRCs), is assumed to mean compliance with sanitary or nutrient limits. We have a bespoke metric for dry weather flow (DWF) compliance, although the two are closely linked. For WRCs requiring an increase to their DWF permit there is an associated tightening of sanitary and nutrient limits.

Compliance is assessed based upon the number of WRCs not meeting discharge permit compliance divided by total number of WRCs. For the purposes of this DWMP assessment, we have taken this to be all of our customer-serving WRCs, of which we have 398, even if they do not have numerical sanitary or nutrient limits. For sites with descriptive permits, we have assumed that the level of treatment is compliant with the Environment Agency's General Binding Rules for small sewage discharges.

This assessment differs from the Environment Agency's 'Discharge Compliance' metric within their Environmental Performance Assessment, which covers all wastewater discharges with numerical limits, including those arising from water treatment centres. For the calendar year 2022, the wastewater discharges from 297 WRCs and 18 water treatment centres contributed to our score, compared to 398 WRCs in total. Ofwat are proposing a PR24 Performance Commitment on 'Discharge permit compliance', and state in their final methodology that they propose to use the EA's discharge compliance metric definition. We support this alignment of definitions for the PR24 business plan, although have taken a different approach for the DWMP to ensure the forecast deterioration in performance at descriptive sites is appropriately captured.

We consider both quality and growth spending at WRCs to be classed as enhancement. We have factored in both our current AMP7 and the latest view on our PR24 enhancement plans, with quality elements aligning with the Water Industry National Environmental Programme (WINEP).

Changes in performance are required as and when new permits come into force, which we have profiled according to the WINEP profiling guidance. For all cases where the WINEP has (for AMP7) or will (for PR24 and beyond) require more than a marginal tightening of existing permit limits – which potentially could be achieve through tolerate / operational enhancements – then each identified WRC would be non-compliant without enhancement funding. Particularly for the baseline spend scenario, this shows a significant deterioration in WRC discharge compliance in the absence of an increase to base expenditure arising from meeting new AMP7 permits. We do not believe this is the intention of this scenario, but believe it is important to show the importance of an appropriately set level of base spend level.

Line	Outcome	Description	Unit	Comment
2a	Compliance at WwTWs – baseline	WwTW compliance with permit conditions from base expenditure	%	Discharge compliance assessed based on AMP7 WINEP obligations, impact of future growth, and latest view on PR24 WINEP obligations, with base spend as at 2020.
2b	Compliance at WwTWs – base	WwTW compliance with permit conditions from base expenditure (excluding impact of AMP8 onwards enhancements)	%	Discharge compliance assessed based on AMP7 WINEP obligations, impact of future growth, and latest view on PR24 WINEP obligations, with expected base spend as of 2025.
2c	Compliance at WwTWs – post enhancement	WwTW compliance with permit conditions following enhancement expenditure (including impact of AMP8 onwards enhancements)	%	Discharge compliance assessed based on AMP7 WINEP obligations, impact of future growth, and latest view on PR24 WINEP obligations, with forecast enhancement spend.
2ci	Compliance at WwTWs – enhancement cost	capex	£m	Capex estimates derived from high level capex costing tool, informed/calibrated through representative bottom-up estimates, alongside estimates developed for PR24. Scheme completions profiled to mitigate performance deterioration and to meet PR24 WINEP regulatory dates. Scheme durations and associated spend profile related to scheme values. 2024/25 enhancement capex spend is from latest AMP7 scheme forecasts. Any spend for PR24 WINEP is captured against 2025/26 (AMP8 Yr1), whereas transition spend will be occurring in 2023/24 and 2024/25 to meet early regulatory completion dates.
2cii	Compliance at WwTWs – enhancement cost	Opex	£m	Opex estimates derived from high level Opex costing tool, informed/calibrated through representative bottom-up estimates and actual site-based opex costs, alongside estimates developed for PR24 which includes engagement with suppliers for new process units. 2024/25 enhancement opex spend from latest AMP7 scheme forecasts, which has then been set as 0 in subsequent years (such that future opex only relates to new enhancements included in this DWMP). Any spend for PR24 WINEP is captured against 2025/26 (AMP8 Yr1), whereas transition spend will be occurring in 2023/24 and 2024/25

Line	Outcome	Description	Unit	Comment
				to meet early regulatory completion dates.
2ciii	Compliance at WwTWs – enhancement cost	totex	£m	Sum of 2ci and 2cii

2.3 Risk of Sewer Flooding

This metric is calculated as per Ofwat's PR19 definition to indicate the percent of the population at risk of sewer flooding in a storm. It is the predicted percentage of properties at risk of hydraulic sewer flooding in a 1 in 50 year storm (which is a really big storm event, bigger than our sewers were designed for). The definition only reflects hydraulic flooding (i.e. rainfall related storm response. It excludes blockages and other reasons why flooding may occur). We are using the same approach as the APR23 performance commitment of the same name.

Our modelling stock has been updated under the DWMP programme and we now have verified models of our catchments' foul and combined sewers. Some small catchments (less than 300 houses may not have been modelled) which are allowed in the exclusion.

Where we have a fit for purpose model results using FEH13[1] rainfall, we have applied the definitions Option 1b methodology. This uses a buffer circle radius around manholes that are predicted to flood during a 1 in 50 year storm – the maximum volume at each manhole is reported using various duration events and summer/winter rainfall profiles. The size of the buffer circles are larger the bigger predicted flood volume, as stated in the definition:

- 15m radius for small volumes of predicted flooding,
- 30m radius for volumes between 25m^3 and 100m^3 and
- 50m radius circles for flooding greater than 100m^3.

We included all address point within those buffer zones.

Our APR23 reported population at risk of flooding in 50 year storm was 7.98%. This is our baseline and base level of risk.

The 'Totals' column for the lines containing numbers (not costs) have been changed to reflect the end of AMP position.

Line	Outcome	Description	Unit	Comment
3a	Risk of Sewer flooding in a 1 in 50 storm - baseline	Percentage of properties at risk of sewer flooding in a 1 in 50 storm	%	The ARP23 value of 7.98% has been used for 24/25 and AMP8. The 2050 value of 11.21% is predicted by the hydraulic computer models when applying 20% climate change to the 2050 design horizon models. We profiled the increase over time with a slower rate for 10 years.
3b	Risk of Sewer flooding in a 1 in 50 storm - base	Percentage of properties at risk of sewer flooding in a 1 in 50 storm (excluding impact from AMP8 onwards enhancement)	%	Same as 3a.
3c	Risk of Sewer flooding in a 1 in 50	Percentage of properties at risk of sewer flooding in a 1	%	Proposed hydraulic flooding investment reduces the value only slightly in the core scenario.

[1] Flood estimations handbook 2013 (FEH13) is the latest 'design' rainfall available

	storm - post enhancement	in 50 storm (including impact from AMP8 onwards enhancement)		We have not included any multiple benefits that the storm overflow programme could deliver (as overflows prevent flooding already and should not be in the same locations as the hydraulic flooding schemes). This would be different for the 'eliminate storm overflows scenario, as there will be opportunities to separate surface water from the entire catchment which could reduce the risk of flooding too in areas in the catchment that are upstream of overflows.
3ci	Risk of Sewer flooding in a 1 in 50 storm - enhancement cost	capex	£m	This is the proposed AMP8 level of investment for the hydraulic flooding programme
3cii	Risk of Sewer flooding in a 1 in 50 storm - enhancement cost	opex	£m	This is the proposed AMP8 level of investment for the hydraulic flooding programme
3ciii	Risk of Sewer flooding in a 1 in 50 storm - enhancement cost	totex	£m	Sum of 3ci and 3cii

2.4 Storm Overflows

Storm overflows are an important part of our drainage system. There are 1300 storm overflows in the Wessex area (at WRCs and on the sewer network) and many of these will need improvements to comply with the government's new storm overflow discharge reduction plan (SODRP). Since the draft DWMP, the SODRP has been published and there is more certainty in the Water Industry Environment Programme (WINEP) for 2025 to 2030 requirements.

We will be hydraulically improving all of our storm overflows that currently discharge more than 10 times per year on average by 2050.

Our event duration monitoring (EDM) programme is almost complete. We have a good understanding of how the overflows perform, although about 100 are still to be installed and last year was 'a dry year' so those results may be low. We have used the EA's 12/24 hour spill count method to count discharges.

Our hydraulic computer models (see Section 2.3 for description) were used to predict performance in a Stormpac 10 year time series rainfall. The models were then used to predict how much attenuation (e.g. underground storage tanks) or separation (e.g. 10%, 20% or 50% of separation needed to bring spills down to 10). Often separation of 50% was not achieving the required standard so an attenuation tanks was also required. These are hybrid separation schemes.

We have prioritised our storm overflow improvements to achieve the targets set out in the SODRP and the EA WINEP guidance.

Overflows discharging to environmentally sensitive and high impact waterbodies (e.g. bathing water, shellfish waters, chalk streams, designated environmental sites) need improving by 2045 and may require a higher standard than 10 discharges per year so that the overflow has no local ecological harm. There is still some uncertainty with this aspect of 'harm' until we undertake detailed investigations (due by April 2027) and the Storm Overflow Assessment Framework is updated so we know how many detailed investigations are required.

There are currently no designated inland bathing waters within the Wessex Water region, with the exception of Henleaze Lake, a private member's swimming club in a former quarry unconnected to our assets or the river system. Our plan assumes no new inland bathing waters will become designated, although within the WINEP we include monitoring proposals for a number of potential candidate locations. If some are designated, then it is likely that they will be de-designated after a few years, not only due to inputs from our assets but also agriculture pollution, wildlife, private septic tanks and other discrete inputs.

Each overflow that is known to need improvement has been allocated to one of the three categories in the data table:

- Bathing waters – all were added to the WINEP24 as a bathing water driver
- Frequency – we have included frequency only overflows where spilling greater than 10 times a year

- High priority ecological harm – any overflow classified as a sensitive environment (these may not be causing harm) discharging more than 10 times a year

Most of the high priority sensitive areas storm overflows that we have listed will not be causing ecological harm. But they are at sensitive locations, so we will be undertaking the Storm Overflow Assessment Framework (version 2 when released) on these to find which ones do cause harm. The remainder will be moved to the 'Frequency' category, for cycle 2 of the DWMP.

The 'All ecological harm' category is the same as the 'High priority ecological harm', so these are duplicated. All other overflows are only listed once.

The costs in the data table for storm overflows, exclude:

- Continuous water quality monitoring (detail to be announced from the government on the scale of these)
- Monitoring of storm overflows (all will have EDM)
- Monitoring of emergency overflow (EO)
- Inland bathing waters.

The total expenditure on storm overflow improvements adds up to £550m in AMP8. This includes the £28m allowance for investigations (some UPM studies required).

The 'Totals' column for the lines containing numbers (not costs) have been changed to reflect the end of AMP position.

Line	Outcome	Description	Unit	Comment
4a	Storm overflows - more than 10 spills per year - baseline	Number of storm overflows with more than 10 spills per year.	nr	The 2024/25 value is the number of SO that have EDM data (from our annual returns) that on average more than 10 discharges per year with a Frequency only driver. These are at WRC and in the network. The numbers exclude storm overflows improvements at bathing water and sensitive environments. Some more may be identified from new installations of EDM last year. These have not been included.
4b	Storm overflows - more than 10 spills per year - base	Number of storm overflows with more than 10 spills per year (excluding impact of AMP8 onwards enhancement).	nr	Same as 4a
4c	Storm overflows - more than 10 spills per year - post enhancement	Number of storm overflows with more than 10 spills per year (including impact of AMP8	nr	The proposed storm overflow enhancement programme brings this to zero by the end of AMP12.

Line	Outcome	Description	Unit	Comment
		onwards enhancement).		The number in AMP8 is lower than future AMPs because we have prioritised improvement at Bathing water and sensitive areas.
4ci	Storm overflows - more than 10 spills per year - enhancement cost	capex	£m	2024/25 spend is zero, as the small AMP7 programme does not deliver the SODRP level of ambition. The data table costs exclude the £100m costs associate with the continuous water quality monitoring (CWQM) programme. The spend in AMP8 is lower than future AMPs because we have prioritised improvement at Bathing Water and Sensitive areas.
4cii	Storm overflows - more than 10 spills per year - enhancement cost	opex	£m	These costs exclude the huge opex costs associate with the CWQM programme.
4ciii	Storm overflows - more than 10 spills per year - enhancement cost	totex	£m	Sum of 4ci and 4cii
5a	Storm overflows (high priority) - ecological harm - baseline	Number of high priority overflows causing ecological harm a year	nr	The 2024/25 value is the number of SO that have EDM data (from our annual returns) of on average more than 10 discharges per year discharging to a sensitive environment. These are at WRCs and in the network. The numbers exclude storm overflows improvements at bathing waters.
5b	Storm overflows (high priority) - ecological harm - base	Number of high priority overflows causing ecological harm a year (excluding impact of AMP8 onwards enhancement)	nr	Same as 5a.
5c	Storm overflows (high priority) - ecological harm - post enhancement	Number of high priority overflows causing ecological harm a year (including impact of AMP8 onwards enhancement)	nr	The proposed storm overflow enhancement programme prioritises more than the required 38% of sensitive sites. Most of these will not be causing ecological harm. But they are at sensitive locations, so we will be undertaking the Storm Overflow Assessment Framework (v2 when released) on these to find which ones do cause harm.
5ci	Storm overflows (high priority) -	capex	£m	2024/25 spend is zero, as the small AMP7 programme does not deliver the SODRP level of ambition.

Line	Outcome	Description	Unit	Comment
	ecological harm - enhancement cost			These data table costs exclude the £100m costs associate with the continuous water quality monitoring (CWQM) programme.
5cii	Storm overflows (high priority) - ecological harm - enhancement cost	opex	£m	Opex costs associated with the capex investment.
5ciii	Storm overflows (high priority) - ecological harm - enhancement cost	totex	£m	Sum of 5ci and 5cii
6a	Storm overflows (all) - ecological harm - baseline	Number of all overflows causing ecological harm a year	nr	Same as 5a.
6b	Storm overflows (all) - ecological harm - base	Number of all overflows causing ecological harm a year (excluding impact of AMP8 onwards enhancement)	nr	Same as 5b
6c	Storm overflows (all) - ecological harm - post enhancement	Number of all overflows causing ecological harm a year (including impact of AMP8 onwards enhancement)	nr	Same as 5c
6ci	Storm overflows (all) - ecological harm - enhancement cost	capex	£m	Same as 5ci
6cii	Storm overflows (all) - ecological harm - enhancement cost	opex	£m	Same as 5cii
6ciii	Storm overflows (all) - ecological harm - enhancement cost	totex	£m	Sum of 6ci and 6cii
7a	Storm overflows - designated bathing waters (coastal and inland) - baseline	Number of overflows in designated bathing waters spilling more than 3 times per bathing season	nr	There are 33 storm overflow improvements on the WINEP.
7b	Storm overflows - designated bathing waters (coastal and inland) - base	Number of overflows in designated bathing waters spilling more than 3 times per bathing season	nr	Same as 7a
7c	Storm overflows - designated bathing waters (coastal and inland) - post enhancement	Number of overflows in designated bathing waters spilling more than 3 times per bathing season	nr	We will be improving all bathing water overflow by 2030, ahead of the EA guidance profile.

Line	Outcome	Description	Unit	Comment
7cii	Storm overflows - designated bathing waters - enhancement cost	capex	£m	2024/25 spend is zero, as we are not delivering any bathing water improvements in AMP7. These data table costs exclude the £100m costs associate with the continuous water quality monitoring (CWQM) programme.
7cii	Storm overflows - designated bathing waters - enhancement cost	opex	£m	Opex costs associated with the capex investment.
7ciii	Storm overflows - designated bathing waters - enhancement cost	totex	£m	Sum of 7ci and 7cii

2.5 Sewer Collapses

The end of AMP7 forecast is based on the average of the performance in AMP7 to date (2020-21 to 2022-23) using the new PR19 reporting guidance.

The profile for the baseline and base performance protections are based on two separate models, one for sewer collapses and the other for rising main bursts.

For sewer collapses, our sewer deterioration modelling predicts the overall structural condition grades moving towards the worst grades from our current asset condition profile. It's using probability matrices derived from sewer CCTV observations over time. This model has been reliable over the last decade to establish of the quantum of sewer network that deteriorates, verified and also by simulating the deterioration of the entire network by age cohorts from construction to present time.

To produce the sewer collapse profiles we have included the respective length correction to the matrices due to the proposed spend of each profile. This allows to linear project the number of sewer collapses that we could expect for each future spend profile.

The profiles have been developed using our current asset data, The model uses pipe material and pipe age, unfortunately the quality of this data is poor as it is made up of historical asset data generated since the mid 1990's. The profile of the pipe has also been used. Where there are gaps, these have been backfilled with approximate age and pipe material. The model then uses statistical functions that mimic the lifecycle of a pipeline, and then estimates the remaining life and the likelihood of a burst on the main. It is then run with the different investment proposals to develop an estimate of the effects of investment.

If base expenditure was to remain at similar levels to AMP7, the performance

		AMP8	AMP9	AMP10	AMP11	AMP12
Sewer collapses - base	nr per 1000km	263	331	389	457	536
Sewer collapses - base costs - totex	£m	33.95	33.95	33.95	33.95	33.95

Line	Outcome	Description	Unit	Comment
8a	Sewer collapses - baseline	Number of sewer collapses	nr per 1000km	Combined collapse rates for rising main burst and sewer collapses with no additional base expenditure from 2020
8b	Sewer collapses - base	Number of sewer collapses	nr per 1000km	Combined collapse rates for rising main burst and sewer collapses with doubled base expenditure from AMP8
8ci	Sewer collapses - base costs	capex	£m	Proposed future expenditure is double base expenditure in AMP7
8cii	Sewer collapses - base costs	opex	£m	No associated opex expenditure to rehabilitation works

8ciii	Sewer collapses - base costs	totex	£m	Sum of 8ci and 8cii

2.6 Internal sewer flooding

This metric is calculated as per Ofwat's PR19 reporting guidance to report the total number of internal flooding incidents (including the impact of severe weather) from a water company sewerage asset affecting customers properties, per 10,000 connected properties.

The inclusion of severe weather (since AMP7) in the number of incidents reported makes forecasting more difficult as weather is beyond our control.

The total number of connected properties used to provide the normalised (per 10,000 connected properties) entries was 1,284,980.

The definition and related methodology are the same as PR19 and used in APR23.

The calculated totals have been left as calculated, however, for the columns Total AMP10, Total AMP11 and Total AMP12 these show the performance position at the end of the relevant AMP period for lines 1a, 1b and 1c.

The totals for those columns and rows if completed as titled, would be as follows:

Line	Total AMP10 (2035-40)	Total AMP11 (2040-45)	Total AMP12 (2045-50)
1a	7.27	7.54	7.82
1b	5.72	5.25	4.79
1c	5.04	4.41	3.79

There are two main categories of incidents: other causes (e.g. blockages) and inadequate hydraulic capacity. For enhancement there are two programmes of works: Flooding – blockages and Flooding – capacity to reduce hydraulic flooding.

The AMP7 expenditure on the Flooding - capacity to reduce hydraulic flooding is £17.9m totex (£17.55m capex, £0.35m opex).

The proposed flooding programme will have significant impact on the number of external flooding incidents with the proposed activities reducing external flooding incidents in AMP8 by at least 20%.

Line	Outcome	Description	Unit	Comment
9a	Internal sewer flooding - baseline	Total number of internal sewer flooding incidents / escapes per 10,000 sewer connections	nr	We allow for an increase in incidents due to climate change, urban creep (impacting inadequate capacity incidents) and development (impacting other causes incidents). In AMP7 we are currently running an Escape of Sewage programme, which is primarily focused on reducing pollution incidents. However, any positive interventions on the network will have an impact on other performance indicators. We

Line	Outcome	Description	Unit	Comment
				don't consider this programme of expenditure to be part of base expenditure and anticipate a 10% increase in incidents over an AMP period.
9b	Internal sewer flooding - base	Total number of internal sewer flooding incidents / escapes per 10,000 sewer connections (excluding AMP8 onwards enhancements)	nr	AMP8 base performance based on AMP7 target. Future AMPs base performance is based on previous AMP enhancement providing an incident reduction of 16 incidents if AMP8 core plan or similar implemented.
9c	Internal sewer flooding - post enhancement	Total number of internal sewer flooding incidents / escapes per 10,000 sewer connections (including AMP8 onwards enhancement expenditure) (see note 9 on Line definitions tab)	nr	End of AMP7 forecast based on five-year average, 2018-19 to 2022-23. AMP9 base performance and future AMP periods based on assumed incident reduction rate of 16 incidents if AMP8 core plan or similar implemented.
9ci	Internal sewer flooding - enhancement cost	capex	£m	An assumption of an increase in AMP8 costs for future AMPs has been made due to increased difficulty of reducing performance further: AMP9 10%, AMP10 20%, AMP11 40% and AMP12 80%
9cii	Internal sewer flooding - enhancement cost	opex	£m	
9ciii	Internal sewer flooding - enhancement cost	totex	£m	Sum of 9ci and 9cii

2.7 Screening storm overflows

The screening of storm overflows isn't a planning objective or a common performance commitment. The screening data in the Outcomes tab is to capture the requirements to meet the storm overflow discharge reduction (SODRP) plan target and identify which will be delivered through base or enhancement.

Where an existing screen exists and does not meet its current permitted screening requirement, the provision of the screen is expected to be delivered through base funding. If a screen does not exist and is required because of the SODRP, then this would be funded through enhancement expenditure.

The total number of storm overflows is assumed for this return that the number doesn't change between AMP7 to AMP12; the total number of storm overflows is 1312.

At the end of AMP7, 534 storm sites will have a minimum of 6mm mechanical screening, meaning there will be 778 storm overflow sites without screening.

The SODRP equates to 699 storm overflows of which 355 sites already have a screen and 344 are without a screen.

Of the 778 storm overflow sites without screening, 344 will have screening provided because of the SODRP, meaning the 434 sites will require a hand raked screen only, these will be delivered in AMP11 and AMP12.

The SODRP requires all storm overflows will have screening by the end of AMP12, 2050.

For lines 10a, 10b and 10c, the values shown for AMP10, AMP11 and AMP12 are the number of screens at the end of the AMP period.

The enhancement profile is based on the following screening requirements:

- SODRP programme requiring screens plus sites requiring screening only
- AMP8 SODRP enhancement programme – 52 SO sites without screens
- AMP9 SODRP enhancement programme – 76 SO sites without screens
- AMP10 – 53 SODRP sites, no screen
- AMP11 – 66 SODRP sites, no screen plus 217 screening only
- AMP12 – 97 SODRP sites, no screen plus 217 screening only

Line	Outcome	Description	Unit	Comment
10a	Screening storm overflows - baseline	Total number of storm overflows requiring screening	nr	Total number of storm overflows requiring screening at end of AMP7
10b	Screening storm overflows - base	Total number of storm overflows requiring screening	nr	Total number of storm overflows requiring screening after previous AMPs enhancement expenditure because of the SODRP programme

Line	Outcome	Description	Unit	Comment
		(excluding impact of AMP8 onwards enhancements)		
10c	Screening storm overflows - post enhancement	Number of storm overflows requiring screening (including impact of AMP8 onwards enhancements)	nr	Total number of storm overflows requiring screening after enhancement expenditure annually for AMP8 and AMP9, and over the AMP forAMP10, AMP11 and AMP12. Delivery profile in line with SODRP and assumed flat during each AMP
10ci	Screening - enhancement cost	capex	£m	Average cost per new screen £250k
10cii	Screening - enhancement cost	opex	£m	Opex based on 2% capex cost
10ciii	Screening - enhancement cost	totex	£m	Sum of 10ci and 10cii

2.8 Flow Compliance at WwTWs/WRCs

This bespoke planning objective defines the risk of WRC flow compliance failure. It is based on dry weather flow (DWF) compliance, for WRCs that have a DWF permit.

The EA sets limits on the quality and quantity of treated effluent from WRCs to ensure discharges from WRCs do not cause an unacceptable impact on the environment. The flow that may be discharged in dry weather is one of these limits. DWF is the average daily flow to a WRC during a period without rain, and the permitted DWF limit is set as the planned annual 80% exceed daily volume discharged. For compliance purposes an exceedance is recorded for a calendar year only when the limit at the end of that year is exceeded by 90% or more of the recorded total daily volumes in that year (excluding spurious/missing flow readings). From 01/01/2026, the EA are changing their DWF compliance assessment. The DWF limits will have been complied with in an assessment calendar year unless the limit was exceeded in the compliance assessment year, and two or more exceedances have occurred in the preceding 4 years, summarised as '3-in-5 year' compliance.

A DWF permit increase is associated with a pro-rata tightening of sanitary/nutrient permit limits, alongside additional storm storage requirements (typically to meet 68l/hd, based on a residential population equivalent) and potential increase to the flow passed forward (FPF) rate.

We typically use a 20-yr planning horizon when forecasting new DWF permit limits, although in some cases adopt a shorter design horizon, for example to reduce the enhancement spend needed to achieve other permit limits (which could include tolerating a tightening of limits), or if there is uncertainty in the forecast growth, or to align with other expected future changes on site (either linked with a WINEP quality driver or capital maintenance needs promoting wholesale changes to a site's operation).

Line	Outcome	Description	Unit	Comment
11a	Dry Weather Flow Compliance at WwTWs – baseline	WwTW compliance with dry weather flow permit from base expenditure	%	Compliance against DWF 3-in-5 year assessment methodology, based on impact of future growth, with base spend as at 2020.
11b	Dry Weather Flow Compliance at WwTWs – base	WwTW compliance with dry weather flow permit from base expenditure (excluding impact of AMP8 onwards enhancements)	%	Compliance against DWF 3-in-5 year assessment methodology, based on impact of future growth, with expected base spend as of 2025.
11c	Dry Weather Flow Compliance at WwTWs – post enhancement	WwTW compliance with dry weather flow permit following enhancement expenditure (including impact of AMP8 onwards enhancements)	%	Compliance against DWF 3-in-5 year assessment methodology, based on impact of future growth, with forecast enhancement spend.
11ci	Dry Weather Flow Compliance at	capex	£m	Capex estimates derived from high level capex costing tool, informed/calibrated through

Line	Outcome	Description	Unit	Comment
	WwTWs – enhancement cost			representative bottom-up estimates, alongside estimates developed for PR24. Scheme completions profiled to ensure enhancements made to meet increased DWF permit ahead of / in time to mitigate 3-in-5 year risk. Scheme durations and associated spend profile related to scheme values, along with alignment to PR24 WINEP scheme dates to benefit from cost-efficiencies with multi-driver schemes. 2024/25 enhancement capex spend from latest AMP7 scheme forecasts.
11cii	Dry Weather Flow Compliance at WwTWs – enhancement cost	opex	£m	Opex estimates derived from high level opex costing tool, informed/calibrated through representative bottom-up estimates and actual site-based opex costs, alongside estimates developed for PR24 which includes engagement with suppliers for new process units. 2024/25 enhancement opex spend from latest AMP7 scheme forecasts, which has then been set as 0 in subsequent years (such that future opex only relates to new enhancements included in this DWMP).
11ciii	Dry Weather Flow Compliance at WwTWs – enhancement cost	totex	£m	Sum of 11ci and 11cii

2.9 Groundwater Inundation

This bespoke planning objective defines the weighted length of sewers inspected and made watertight in catchments vulnerable to groundwater inundation. The sealing (e.g. linings) carries a 100% weighting, whereas the inspection carries a 10% weighting.

Crack or holes in sewers (public and private) can allow groundwater to enter the sewers when the groundwater table is high, such as during wet winters or prolonged times of rainfall. Groundwater inundation of foul sewers in the Wessex region is problematic because we have chalk geology in the southeast half of our region and mudstone geology in the north west of our region and the Somerset levels and Moors fluvial flood risk. Our video (here) explains the chalk geology phenomenon that causes some our customers being not able to flush their downstairs toilet for several weeks during wet winters.

To see more details about our Infiltration reduction plans please see our Regional annual report (here).

This bespoke planning objective reflects Wessex Water's programme of infiltration reduction programme (IRP) work to prevent groundwater inundation. The IRP work is proposed to be extended to sewers upstream of storm overflows that are vulnerable to groundwater inundation.

The definition has changed since the draft DWMP, because the percentage number was too small, so zero. The definition is now the length of sewers made watertight (km) + 10% the length of sewers surveyed (km) for groundwater reduction purposes in the report period.

Line	Outcome	Description	Unit	Comment
12a	Groundwater inundation - baseline	Weighted length of sewer inspection and sealing in vulnerable catchments	Score (km)	Historical weighted score for inspection and sealing.
12b	Groundwater inundation - post enhancement	Weighted length of sewer inspection and sealing in vulnerable catchments	Score (km)	Proposed weighted score for inspection and sealing.
12ci	Groundwater inundation - enhancement cost	capex	£m	Total capex to achieve the inspection and sealing that is in the core plan.
12cii	Groundwater inundation - enhancement cost	opex	£m	Zero, as these sewers were already assigned Opex.
12ciii	Groundwater inundation - enhancement cost	totex	£m	Sum of 12ci and 12cii

3. Table 2 – Expenditure Analysis

For this final DWMP data table, we have distinguished the WRC and sewerage network improvements into the relevant lines (whereas in the draft DWMP they were all reported in the Network lines).

Since the draft DWMP, we have also undertaken more wider benefits analysis of green solutions (nature based, sustainable or separation schemes) and grey solutions (attenuation / storage tanks, making sewers and pumping stations have larger capacity), so have clearer proposals for AMP8 and some of the future schemes. For those schemes proposed for delivery beyond 2030 we have not appraised to the same details as those identified for AMP8, and have used the cost of the grey solution (which is typically the lowest cost solution), to improve any cost-benefit valuations. The solution types are all subject to change during outline design where a more cost beneficial scheme may be identified.

3.1 Network

We presumed this was all 'network only' storge to address flooding and storm overflows and that 'Network only' excludes any improvements within a WRC boundary, effluent main or sludge main.

1A	Additional network storage / conveyance / containment **TRADITIONAL GREY INTERVENTIONS**	Description	Units	Comment
	Interventions to reduce the risk of sewer flooding in a storm including storage, or other containment, and to reduce spill frequency at storm overflows (network only)	Additional grey storage / containment volume to be delivered in the network (enhancement)	1000m^3	Additional storage to be provided in the network.
		Number of individual schemes	nr	Delivery profiled to meet WINEP and SORP dates, and stated level of ambition.
		Projected spend on grey network storage - capex	£m	Capex estimates derived from high level capex costing tool, informed/calibrated through representative bottom-up estimates, alongside estimates developed for PR24.
		Projected spend on grey network storage - opex	£m	Opex estimates based on an assumed pumped return.
		Projected spend on grey network storage - totex	£m	Sum of capex and opex

1B	Upstream surface water separation / removal or other network storage BLUE / GREEN SEPARATION & STORAGE	Description	Units	Comment
	Additional blue/green interventions (including associated enabling works) to remove impermeable area inflow from entering the storm/foul/combined network.	Impermeable area inflow removed from entering the network or stored in environment (enhancement)	Hectares	Impermeable area, such as hardstanding, road surfaces, roofs etc., disconnected from network and/or attenuated through green storage.
		Number of individual schemes	nr	Delivery profiled to meet WINEP and SORP dates, and stated level of ambition.
		Projected spend on green network schemes - capex	£m	Capex estimates derived from high level capex costing tool, informed/calibrated through representative bottom-up estimates, alongside estimates developed for PR24.
		Projected spend on green network schemes - opex	£m	Assumed level of routine grounds maintenance (e.g. mowing banks).
		Projected spend on green network schemes - totex	£m	Sum of capex and opex

	Description	Units	Comment
Planning Objectives delivered by Tables 1A and 1B	Reduced number of category 1-3 pollution incidents	nr	Number of pollutions reduced by the pollution programme in Outcomes 1c
	Improvement in WwTW compliance	%	n/a
	Percentage of properties at risk of sewer flooding in a 1 in 50 storm	%	Negligible change from improvements outlined in 1a and 1b
	Storm overflow average spill reduction	nr	Improvement performance in proposed PR24 storm overflow PC
	Reduced number of overflows spilling 10 or more per year	nr	
	Reduction in high priority overflows causing ecological harm per year	nr	
	Reduction in overflows causing ecological harm per year	nr	
	Reduction in sewer collapses	nr	No change from improvements outlined in 1a and 1b
	Reduction in households with internal sewer flooding	nr	
	Dry Weather Flow Compliance at WwTWs	%	n/a
	Groundwater Inundation		n/a

3.2 WwTW

In this table we capture all enhancements identified at our WwTWs/WRCs for growth and quality needs, where additional treatment capacity is identified. Not included are investigations, flow monitoring or any sludge-related activities (e.g. where upgrades are required at Bioresource Centres for additional sludge handling, either through growth or nutrient removal requirements).

2A	**Additional WwTW storage** TRADITIONAL GREY INTERVENTIONS	Description	Unit	Comment
	Additional grey storage at WwTW	Additional grey storage volume required at WwTW (enhancement)	1000m3	This volume is that to reduce/remove spills to stated level of ambition, alongside volume required by new DWF permits, being that WRCs are typically required to have 68l/hd for residential population equivalent linked with the permitted DWF.
		Number of individual schemes	nr	Delivery profiled to meet stated level of ambition.
		Projected spend on grey WwTW storage - capex	£m	Capex estimates derived from high level capex costing tool, informed/calibrated through representative bottom-up estimates, alongside estimates developed for PR24.
		Projected spend on grey WwTW storage - opex	£m	Opex estimates based on an assumed pumped discharge or pumped return. A cost comparison has been done between buried and above ground tanks in the determination of solutions.
		Projected spend on grey WwTW storage - totex	£m	Sum of capex and opex

2B	BLUE/GREEN **Interventions at WwTWs**	**Description**	**Units**	Comment
	Additional blue/green interventions at WwTW	Number of individual blue/green interventions (schemes) required at WwTW to increase storm storage/reduce need for storm tanks on site	nr	This is the number of stormwater treatment solutions at WRCs, removing/reducing the need for storm storage on site. The number of schemes excludes any blue/green interventions at WRCs where they are providing additional treatment capacity for discharge compliance.
		Projected spend on green WwTW interventions - capex	£m	Capex estimates derived from recent scheme costs alongside estimates developed for PR24.

2B	BLUE/GREEN Interventions at WwTWs	Description	Units	Comment
		Projected spend on green WwTW interventions- opex	£m	Assumed level of routine grounds maintenance (e.g. mowing banks).
		Projected spend on green WwTW interventions - totex	£m	Sum of capex and opex

	Description	Units	Comment
Planning Objectives delivered by Tables 2A and 2B	Reduced number of category 1-3 pollution incidents	nr	Covered by network equivalent table for Section 1a and 1b
	Improvement in WwTW compliance	%	Improvement in WRC compliance in Outcomes 2c (where providing additional treatment capacity, rather than storm storage).
	Percentage of properties at risk of sewer flooding in a 1 in 50 storm	%	n/a
	Storm overflow average spill reduction	nr	Covered by network equivalent table for Section 1a and 1b. Some of the storm storage relates to DWF permit changes. Whilst there will be an improvement in the short/medium term, the additional storage volume is effectively netted off as the population grows and takes up this storage.
	Reduced number of overflows spilling 10 or more per year	nr	
	Reduction in high priority overflows causing ecological harm per year	nr	
	Reduction in overflows causing ecological harm per year	nr	
	Reduction in sewer collapses	nr	n/a
	Reduction in households with internal sewer flooding	nr	n/a
	Dry Weather Flow Compliance at WwTWs	%	Whilst additional storm storage is required for an increase in permit DWF, in and of itself it does not ensure DWF compliance, as treatment capacity upgrades may also be required. Covered by equivalent table for Section 3
	Groundwater Inundation		n/a

The majority of our proposed treatment capacity upgrades at our WRCs are to meet changes to numerical (sanitary/nutrient) permit limits, without a change to flow permit conditions. Flow to Full Treatment (FFT) – which has been re-defined by the EA as Flow Passed Forward (FPF) – is related to an instantaneous flow rate with permits set to treat a multiple of Dry Weather Flow. It is not directly comparable with total daily volume/flow calculations used for DWF assessments. For WRCs with headroom in their DWF permit to the design horizon there is no change to FPF. Additional treatment capacity, however, is required to maintain consent compliance with water quality discharge permits.

3	**Interventions at WwTWs - additional treatment capacity**	Description	Unit	Comment
	Schemes at sewage treatment works to increase flow to full treatment capacity.	Additional FFT treatment capacity required at WwTWs	ML/day	The FFT values provided for AMP7 relate to our AMP7 U_IMP5 (FFT increase schemes). The estimated FFT values provided for AMP8 include for Avonmouth and Saltford, being AMP7 schemes for which the EA have agreed completion date extensions into AMP8. Others for AMP8 and beyond relate to WRCs where we have identified the need for a change in their DWF permit, with an associated change to their FFT permit, if required. Some permit changes will require treatment changes with no associated additional treatment capacity, such as the addition of chemical dosing for phosphorus removal. Some WRCs also do not have an FFT permit and are required to treat all flows.
		Number of individual schemes	nr	We include here the number of individual schemes related to the above FFT increase schemes.
		Projected spend on additional WwTW capacity - capex	£m	Our spend lines capture all enhancement spend at WRC, not just that related to increasing FFT capacity. Capex estimates derived from high level capex costing tool, informed/calibrated through representative bottom-up estimates, alongside estimates developed for PR24. Scheme completions profiled to mitigate performance deterioration and to meet PR24 WINEP regulatory dates. Scheme durations and associated spend profile related to scheme values. 2024/25 enhancement capex spend is from latest AMP7 scheme forecasts. Any spend for PR24 WINEP is captured against 2025/26 (AMP8 Yr1), whereas transition spend will be occurring in 2023/24 and 2024/25 to meet early regulatory completion dates.
		Projected spend on additional WwTW capacity - opex	£m	Opex estimates derived from high level opex costing tool, informed/calibrated through representative bottom-up estimates and actual site-based opex costs, alongside estimates

3	**Interventions at WwTWs - additional treatment capacity**	Description	Unit	Comment
				developed for PR24 which includes engagement with suppliers for new process units. 2024/25 enhancement opex spend from latest AMP7 scheme forecasts, which has then been set as 0 in subsequent years (such that future opex only relates to new enhancements included in this DWMP).
		Projected spend on additional WwTW capacity - totex	£m	Sum of capex and opex

	Description	**Units**	Comment
Planning Objectives delivered by Table 3	Reduced number of category 1-3 pollution incidents	nr	Covered by network equivalent table for Section 1a and 1b
	Improvement in WwTW compliance	%	Discharge compliance assessed based on AMP7 WINEP obligations, impact of future growth, and latest view on PR24 WINEP obligations, with forecast enhancement spend.
	Percentage of properties at risk of sewer flooding in a 1 in 50 storm	%	n/a
	Storm overflow average spill reduction	nr	n/a
	Reduced number of overflows spilling 10 or more per year	nr	n/a
	Reduction in high priority overflows causing ecological harm per year	nr	n/a
	Reduction in overflows causing ecological harm per year	nr	n/a
	Reduction in sewer collapses	nr	n/a
	Reduction in households with internal sewer flooding	nr	n/a
	Dry Weather Flow Compliance at WwTWs	%	Compliance against DWF 3-in-5 year assessment methodology, based on impact of future growth, with forecast enhancement spend. This also assumes DWF permit related storm storage capacity is also provided.
	Groundwater Inundation		n/a

3.3 Storm overflows screening interventions

This table captures the split between base and enhancement activities for storm overflow screens between 2025 and 2050.

The following assumptions have been made:

- The total number of storm overflows (SO) will not change, 1312
- All SO sites, 534, that have screens will need replacement between AMP8 and AMP12
- There are 778 SO sites that require a screen between 2025 and 2050, end of AMP12

4	**Interventions at storm overflows - screening**	Description	Unit	Comment
	Interventions at storm overflows to provide screening required to meet the SODRP	Total number of storm overflows	nr	No change in total number of SOs
		Number of new screens required on overflows where the overflow has an existing screen (i.e. replacement screens)	nr	Flat profile assumed in replacing existing screens: 107 per AMP period
		Number of new screens required on overflows where the overflow has not had a screen installed previously.	nr	Profile for AMP8 to AMP10 aligns with SODRP AMP11 and AMP12 include for sites where consent doesn't require a screen
		Projected spend on storm discharge screening for SODRP - capex	£m	Assume unit rate of new or replacement screen, £250k
		Projected spend on storm discharge screening for SODRP- opex	£m	Assumed opex cost is 2% of capex cost
		Projected spend on storm discharge screening for SODRP - totex	£m	Sum of capex and opex

3.4 Reduction in GHG emissions

Carbon valuations have been provided by external consultancies using industry standard data and assumptions. Valuations have been derived from a high level carbon valuation tool, informed/calibrated through representative bottom-up estimates, alongside estimates developed for PR24.

An in-depth assessment has been undertaken to review carbon emissions over the DWMP period. With the National Grid increasingly being supplied by renewable energy sources this will reduce our operational carbon emissions in the future. Using the Department for Business, Energy & Industrial Strategy's (BEIS) modelling based on the Intergovernmental Panel on Climate Change (IPCC) (2021), an agreed the power emission factor number used for the CO_2e value is an average of the central figures from 2022-2050.

We appreciate the tables are titled "reduction in operational/greenhouse GHG emissions", and have stated negative values as the DWMP interventions proposed will contribute to a significant increase in greenhouse gas emissions.

5	Reduction in OPERATIONAL GHG emissions	Description	Units	Comment
		Total operational GHG emissions	tCO2/e	Cumulative total operational GHG emissions arising from the enhancements identified. To meet ever-more stringent permit limits our WRC treatment processes are becoming increasingly energy-intensive, as well as requiring chemical dosing to achieve the nutrient reduction levels required.

6	Reduction in EMBODIED GHG emissions	Description	Units	Comment
		Total embodied GHG emissions	tCO2	In-period embodied GHG emissions arising from the enhancements identified. As described in our fDWMP, a significant proportion of the Wessex Water region falls within sensitive areas. Despite our continued promotion of catchment and nature-based solutions, to meet the requirements of the WINEP (especially nutrient reduction) and early delivery dates for the storm overflow reduction plan related to these areas, we have often found that 'grey' solutions are the only viable ones.

3.5 Significant DWMP and PR24 schemes

In this table we record details of any significant cost / scale schemes that will be required to meet long term planning objectives, in particular significant schemes likely to be required in PR24. We have considered materiality to be anything greater than £50m.

	Comment
Individual Scheme title	
Scheme description	We describe the key investment needs and proposed solution.
Benefits to be delivered (text)	We describe the salient benefits to be delivered.
Benefits to be delivered (£m)	We have developed an integrated and consistent approach to investment planning and processes, aligned to the principles of the UKWIR Framework for Expenditure Decision Making. This has involved the development of a decision-support approach which enables objective comparisons of investment options across business areas drawing on common valuation criteria to support investment decision making. The defined approach utilises a capitals-based Service Measure Framework (SMF) consistent with best practice across the industry. An SMF is a systematic service risk-and value-based investment framework formed using an agreed set of metrics. The metrics (i.e., service measures) cover the majority of the services we provide to meet our corporate objectives, including providing services to customers, to the environment and to stakeholders (including employees). Behind each service measure sits a monetised unit value representing the value of service failure to us and impacts on the broader environmental, social, and human & intellectual capitals. The SMF allows a user to articulate a pre-intervention and post-intervention risk position, with the change in risk deriving a monetary benefit of the intervention. The assessment of the metrics has been carried out over a 30-year design horizon which reviews the changing service risk over time. External influences such as meeting net-zero carbon targets have informed the assessment. We note that as the nutrient requirements at both Poole and Dorchester are Statutory drivers – as defined in the Water Industry Strategic Environmental Requirements (WISER) – they are not required to be cost-beneficial. We consider our promoted option to be best value within this statutory context.
Estimated totex expenditure (£m)	Estimated totex expenditure is expressed as a 30-yr NPV. The totex estimates for both Poole WRC and Dorchester WRC have been derived from bottom-up capex and opex estimates, with the former originating from an AMP7 WINEP options appraisal. Both schemes require substantive rebuilds of the WRC, whilst maintaining compliance with existing permit conditions.
Delivery date (YYYY)	The schemes at Poole WRC and Dorchester WRC are both included in the WINEP.
Primary Planning objective category	We relate the schemes to a primary planning objective.
Additional planning objective category	We relate the scheme to an additional planning objective, if applicable/appropriate and of more than a marginal benefit.
Further information	The WINEP schemes at Poole and Dorchester WRCs are subject to change whilst the WINEP remains in development.

3.6 Key partnership schemes

In this table we record details of individual key partnership schemes that are likely to be progressed to deliver against long-term planning objectives.

We make the following commentary on the partnership schemes listed:

- A flexible approach is needed to partnership schemes given the uncertainties that are inherent with collaborative working regarding stakeholders' financial contributions, resources and their capacity and skills to progress co-creation, design and delivery.
- Funding is allocated and confirmed on an annual basis for many partners. This presents challenges with securing certainty in delivery.
- Given the different positions of partnership schemes in the project life cycle, funding for partnership schemes is forecast to increase in AMP9 and beyond to deliver schemes designed and developed during AMP8.
- A block approach has been proposed for partnership funding to provide the flexibility required to work most effectively with our stakeholders.

A total of £36m of Wessex Water contributions has been identified towards schemes that have a total project cost of ~£330m. The distribution of schemes and potential partnerships across the Wessex Water area are shown in the table below

Area	Names / details of partner(s)
Bristol Avon Flood partnership projects	Potential partners: Environment Agency, Bristol City Council, Bath and North East Somerset Council, South Gloucestershire Council, Gloucestershire Council, Wiltshire Council, Network Rail, National Highways, Bristol Avon Catchment Partnership, River Frome Reconnected Catchment Partnership, Somerset Frome Catchment Partnership, North Somerset Levels and Moors partnership, communities within the Bristol Avon catchment
Hampshire Avon Flood Partnership projects	Potential partners: Environment Agency, Wiltshire Council, Hampshire County Council, BCP Council, Hampshire Avon Catchment Partnership. Stour Catchment Partnership, communities within the Hampshire Avon Catchment
Dorset Flood Partnership projects	Potential partners: Environment Agency, Dorset Council, BCP Council, Dorset Stour Catchment Initiative, Poole Harbour Catchment Initiative, West Dorset Rivers and Coastal Streams Initiative, Dorset communities
Somerset Flood Partnership projects	Environment Agency, Somerset Council, Somerset Rivers Authorities, Somerset Catchment Partnership, Somerset Communities
Wessex Area Flood Partnership projects	Environment Agency, Wessex Regional Flood and Coastal Committee, Infrastructure providers
WINEP partnership projects	As described in our WINEP submission: Chew Valley Partnership (Bristol Avon), Cam & Wellow Partnership (Bristol Avon), Stour Chalk Streams & Clay Vales (Dorset Stour) and Resilient Avon Programme (Hampshire Avon).

Potential partnership contributions have been identified for collaboration with 17 schemes that will either be led by Wessex Water or other Flood Risk Management Authorities that have medium to high confidence in deliverability that are listed on the Flood Defence Grant-in-Aid (FDGiA) Medium Term Plan. The proposed Wessex Water contribution towards these schemes' totals £13m. Although funding contributions have not been confirmed or secured, they have the with a potential to secure partnership contributions ranging between 1:1 to 1:20 of the initial investment. The projects aim to deliver integrated flood alleviation

measures that address all sources of flooding and will look to deliver an increased resilience to Wessex Water's sewerage assets and infrastructure Section 10.1.6 of the main DWMP report provides details.

Approximately 50 additional partnership projects have been proposed by stakeholders, however further investigation, and potentially modelling options assessment and detailed design will be required. Given the early stage of project development it is not possible to provide locations of the potential partnership projects. However, £8m of Wessex Water funding has been proposed with a potential to secure ~£8m or more of partnership funding. Although funding contributions have not been secured, it is assumed that match funding will be available. Further details will be developed between the final DWMP and the start of AMP8. It is envisaged that a number of projects will be developed, designed and delivered during the time period of cycle 1 of the DWMP. A number of outputs from this work will be detailed designs of schemes that will be used to inform Cycle 2 of the DWMP. A funding bid for jointly funded resources has been submitted for AMP7 to progress with accelerated partnership funded project development and design for partnership projects identified within DWMP Cycle 1. If successful, this approach will be extended into AMP8.

4. Table 3 – Adaptive Plans

Our core plan is our best value plan. It has our best estimate of what is required by 2030 and has a line of sight for delivery of the long term plans. However, there are current uncertainties (such as continuous water quality monitoring and investigations) and many future uncertainties (such as climate change and further wastewater treatment requirements).

Adaptive pathways will allow our DWMP and long term delivery strategies to adjust more efficiently to reflect new information, options and experiences to address the current and future uncertainties that may be realised going forward. Within our DWMP we describe each pathway, along with trigger and decision points.

	Comment
Core Pathway	Our core pathway aligns with the government's Storm Overflow Discharge Reduction Plan (SODRP) and latest view on the WINEP. Our plan improves storm overflow performance to discharge no more than 10 times per year on average by 2050, with a prioritised programme. Overflows discharging to environmentally sensitive waterbodies need improving by 2045 and may require a higher standard so that the overflow has no local ecological harm.
Preferred Plan	Our preferred plan is more ambitious with regards to storm overflows, whereby we are proposing to completely eliminate untreated discharges in line with our current strategic direction statement by 2050. This will require an additional £9billion to achieve and some of the previous schemes will need to be revisited by undertaking more surface water separation or proving additional storage or capacity.
AP1 – Alternative pathway 1	This pathway is for high climate change and core growth. The high climate change forecast would result in more intense rainfall leading to more flooding and more storm overflow discharges, requiring bigger solutions that will cost extra. Sensitivity of growth projections are much lower with only 1% variation and we consider immaterial (at regional scale) given the impact from climate change. Reduction in per capita consumption rates could also mitigate increases in growth numbers.
AP2 – Alternative pathway 2	This pathway is for an asset health step change (groundwater inundation and sewer rehabilitation). Our strategy for dealing with storm overflows that discharge groundwater back into the environment is to treat the flows using wetlands. If this strategy is not accepted by our regulators, and will not count towards spill reduction, then we will need to undertake significantly more investment in infiltration sealing. This will need a huge step change in investment on both public and private assets.
AP3 – Alternative pathway 3	This pathway assumes wet wipes are banned by 2030. If wet wipes were banned or made to be rapidly degradable, then the number of pollution and flooding incidents would reduce considerable. This is a cost saving adaptive pathway.
AP4 – Alternative pathway 4	This pathway is for additional treatment requirements at WRCs.

	Comment
	Enhancements identified at WRCs are related to growth provision and meeting quality requirements, the latter principally as identified for the DWMP as through the PR24 WINEP. Our core plan does not include for speculative or changing regulatory requirements that may arise in future WINEPs. This pathway includes for further nutrient removal (principally the non-exclusion of WRCs between 250 and 2.000pe for nutrient neutrality – phosphorus and/or nitrogen – requirements, plus further phosphorus removal at WRCs discharging to inland waterbodies) and upgrades at WRCs related to inland bathing waters. Excluded is any enhancement associated with reducing/removing levels of microplastics, pharmaceutics and other emerging contaminants.
AP5 – Alternative pathway 5	This pathway is for more investment to reduce hydraulic flooding risk. Our hydraulic computer models are predicting significant flood risks, that will need a step change in our hydraulic flooding programme to address. We have used the hydraulic computer models to give an indication of the scale of the solutions required to reduce the risk of flooding at manholes that are predicted to exceed: • $25m^3$ from the foul/combined manholes in a 1 in 1 year event • $100m^3$ from the foul/combined manholes in a 1 in 10 year event • $200m^3$ from surface water manholes in a 1 in 10 year event We costed attenuation storage solutions for these options which are usually the best value option. There could be synergies with the eliminating storm overflow pathway, should that occur.

For the above identified pathways we present a breakdown of components that contribute to any changes in values presented in the table, as described above. All other elements of the DWMP are assumed to be unchanged for any given alternative pathway, although in reality the pathways cannot be considered in isolation.

		Comment
AP0	Adaptive Plan – Whole DWMP Plan	Our whole DWMP plan
AP1	Adaptive Plan Component 1	Storm overflow improvements Contributes to Preferred plan (Eliminate storm overflow discharges)
AP2	Adaptive Plan Component 2	Reducing the risk of sewer flooding in 1-in-50 yr storm Contributes to Preferred plan (Eliminate storm overflow discharges)
AP3	Adaptive Plan Component 3	WRC enhancements Contributes to Alternative pathway 4 (Additional treatment requirements at WRCs)