

Appendix 15c - Drainage & Wastewater Management Plans

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The Need for Change

Our wastewater networks span over 52,000 km, including approximately 20,000 km that became public in 2011, when many small diameter sewers were transferred into public ownership. Service deficiencies arise in our systems for one or more of three primary reasons:

- Lack of available hydraulic capacity, including a transient loss of available capacity during storms
- Asset condition
- How that system is operated and maintained including misuse by the public and industry

Our existing systems experience significant challenges, and those are likely to increase in the future, due to increasing pressures from population growth and increasing urbanisation, climate change and even paving over our gardens. Alongside this, public expectations of our networks are increasing. Those expectations include:

- Improved visibility of current and future network performance
- Clear and robust long-term prioritised plans to address current and future shortfalls

Managing our Systems Differently through Strategic Drainage Management Plans

To meet these challenges and expectations successfully, requires us to do things differently. We already manage our systems in accordance with the national Drainage Strategy Framework and have produce Drainage Area Plans (DAPs) to guide us primarily on understanding hydraulically driven level of service failures, and the best means of solving them.

During the course of 2015-20, we have further developed and enhanced our ongoing DAPs to produce Strategic Drainage Management Plans (SDMPs). These are generally an aggregation of several DAPs which together align with a strategic area enabling opportunities for partnership engagement and co-creation of long term sustainable solutions. It is considered that the SDMPs form a good foundation upon which to build the Drainage and Waste Management Plan (DWMP) process.

At the time of writing this document, the company is delivering four 'pilot' SDMPs; Leeds, Sheffield, Hull and the Upper Aire Valley, each of which have been specifically chosen as opportunities to test and develop key parts of the SDMP process.

The SDMP process firstly develops an understanding of the risks and challenges through the collection of internal data and investment plans. This has been overlaid onto external stakeholder information (e.g. Environment Agency flood maps, water quality data, British Geological Society overlays, planning information). GIS routines were then used to identify solution opportunities, such as SuDS.

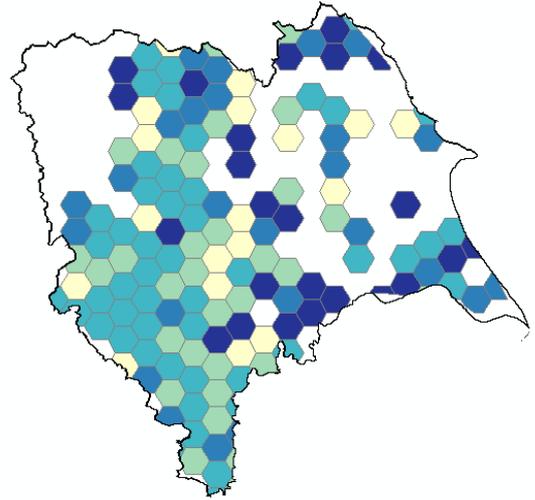


Figure 1 – Yorkshire Water Capacity Assessment Framework (included within the SDMP process)

Extensive network modelling has also been used to undertake a number of future scenarios to monitor the increasing stress on the drainage network over time. This helps us understand where short, medium and long-term investments are likely to be required for solutions to the risk of flooding, CSO performance and capacity. This in turn was followed by using the data and intelligence in discussions with representatives from the local Councils to determine areas of mutual concern and to establish a joint aspiration to form a robust strategic partnership.

Areas of shared responsibility, and potential barriers/constraints to partnership working, have been openly discussed at the outset and plans were developed for key areas of focus going forwards. Subsequent meetings took more of a 'workshop' format where key risk information was shared and opportunities for partnership work over different time frames documented. Each session focussed to allow the company to invite a targeted group to the sessions

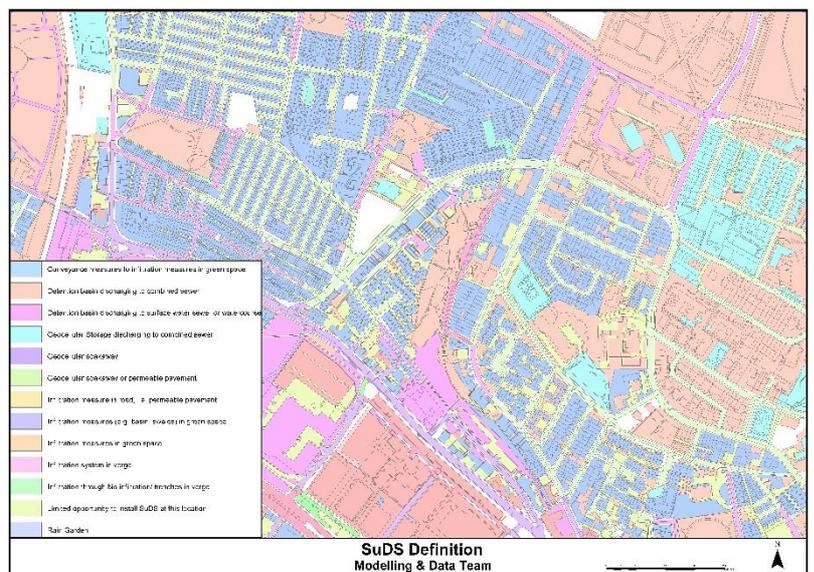


Figure 2 – Example of SDMP SuDS Routine Output

to maximise efficiency. For example, the ‘growth’ session was attended by a representative of the planning department to allow early visibility of ‘unpublished’ development plans.

Alignment to DWMP Framework

The overall strategic ambitions and plans for partnership working that Yorkshire Water have adopted are highly comparable to those proposed in the DWMP and it is considered that the SDMP pilots will be a good foundation upon which to build the DWMP process. The proposed Levels 1, 2 and 3 for the DWMP align well to the structure within which Yorkshire Water already undertakes its planning, particularly with the new SDMPs:

How does the SDMP align to the DWMP processes?

- **Level 1** – The regional view of the DWMP fits with the national summary overview as a way of providing a long-term overview context for the challenges of the region.
- **Level 2** – Equates to the SDMPs which build on the risks and notional solutions developed in the DAPs, by combining demand pressures and developing holistic catchment solutions. Future scenarios are modelled at this stage and uncertainty is quantified, however, sensitivity analysis is yet to be undertaken as part of the option development.
- **Level 3** – Equates to the DAPs which are built around the tried and tested Drainage Area Zones (DAZ). For some treatment works there would be several contributing DAZs, whilst for rural areas, there may be an individual DAZ covering several rural works. The DAP programme uses a risk-based approach against a combination of Performance Commitments and future catchment pressures and risks, similar to the DWMP risk-based screening process.

Note – for full explanation of the DWMP level hierarchy, refer to the following section “What is a DWMP?”

Overall our long-term planning processes have been based around the principles of the Drainage Strategy Framework, risk-based prioritisations, transparency, governance and developing holistic solutions. The partnership engagement and collaboration has allowed more confidence in long term planning and in identifying opportunities to work together and maximise funding streams.

Benefit and Results

As a result of the newly established relationship and workshops, Yorkshire Water has been able to openly discuss tactical and strategic issues and to build closer relationships with the Local Authorities. This has allowed the organisations to work together to present a shared approach to future strategic and tactical planning.

Consequently, a number of projects have been developed which Yorkshire Water can drive forward in collaboration with wider stakeholders. Some of these are at a tactical scale, but the real benefits have been the number of strategic partnership projects, likely to be delivered across multiple AMPs. A number of these have been included in our PR19 submission and demonstrate how we are able to use less traditional interventions to manage capacity and reduce flooding and pollution.

We have also benefited greatly from the experience local authorities, in particular Sheffield City Council, have in delivering and maintaining blue green solutions in an urban environment. Further information on our experiences with the Sheffield SDMP has been included as an exemplar case study with Appendix E – Case Studies of the DWMP Methodology (WaterUK, 2018).

What is a DWMP?

Drainage and Wastewater Management Plans (DWMPs) are a framework for the long term (25 year+) planning of drainage and wastewater treatment services. They set out, at three geographic levels, the long term risks and uncertainties for those services, the options that exist for resolving those risks, and how they are prioritised.

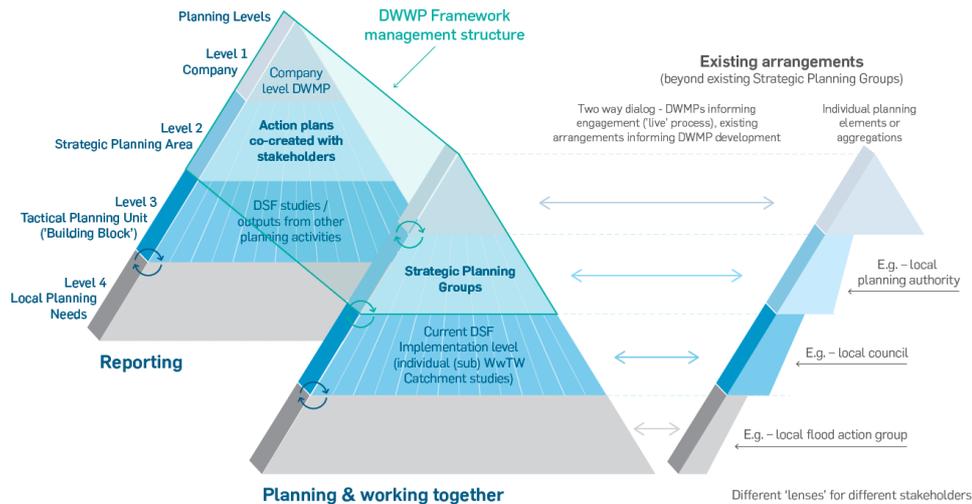


Figure 3 DWMP - Framework Management Structure (WaterUK, 2018)

Level 1 – The DWMP provides a regional/company overview of the current and future risks faced by our sewerage networks and treatment works, how we are going to address those risks, and in what order. This information will be visible at a national level, and is for providing the executive view of the state of this component of the nation’s infrastructure.

Level 2 – the Strategic Planning Area, is broadly equivalent geographically to the Strategic Drainage Management Plan areas we have established within Yorkshire Water. These have a broad alignment to natural river catchments, to facilitate engagement on wider flooding issues. Stakeholder engagement will take place at this level.

Level 3 – the Tactical Planning Unit, represents the wastewater treatment catchment, or aggregations of WwTW catchments for rural areas. Large urban areas may comprise more than one tactical planning unit. Our existing DAP work is generally at a geographically similar or finer scale, so a level 3 plan may comprise one or several DAPs.

We have been actively involved with the various workstreams in 21st Century Drainage Programme and have been working on the development of the DWMP Methodology as part of the Project Steering Group. We have worked through the draft methodology as these have been released, for the Risk Based Catchment Screening, in particular to become familiar with the approaches.

What does the DWMP Require us to do?

- Carry out defined sets of risk assessments at Level 3 scale.
- Agree prioritisation of options appraisal at Level 2 boundary, in conjunction with other responsible bodies.
- Carry out options appraisal at Level 3 for the prioritised catchments.
- Develop Level 2 Action Plans and a Level 1 DWMP.

External Visibility of DWMPs

- An intention of the framework is to provide a common view across the UK of both how assessments are carried out and how they are communicated.
- There will be a requirement to publish the Level 1 DWMP on a cycle that is aligned with the periodic review process.
- In addition, there is a requirement to carry out annual reviews of the DWMP Risk Based Catchment Screening and report on progress and any key changes.
- There will be external visibility of Level 2 Strategic Planning Area information via the associated Strategic Planning Group. By definition, this will be comprised from the Level 3 Tactical Planning Unit information.

Timetable of Activities

The following gantt charts detail, how we are aligning our internal DWMP notional timeline, with the wider industry.

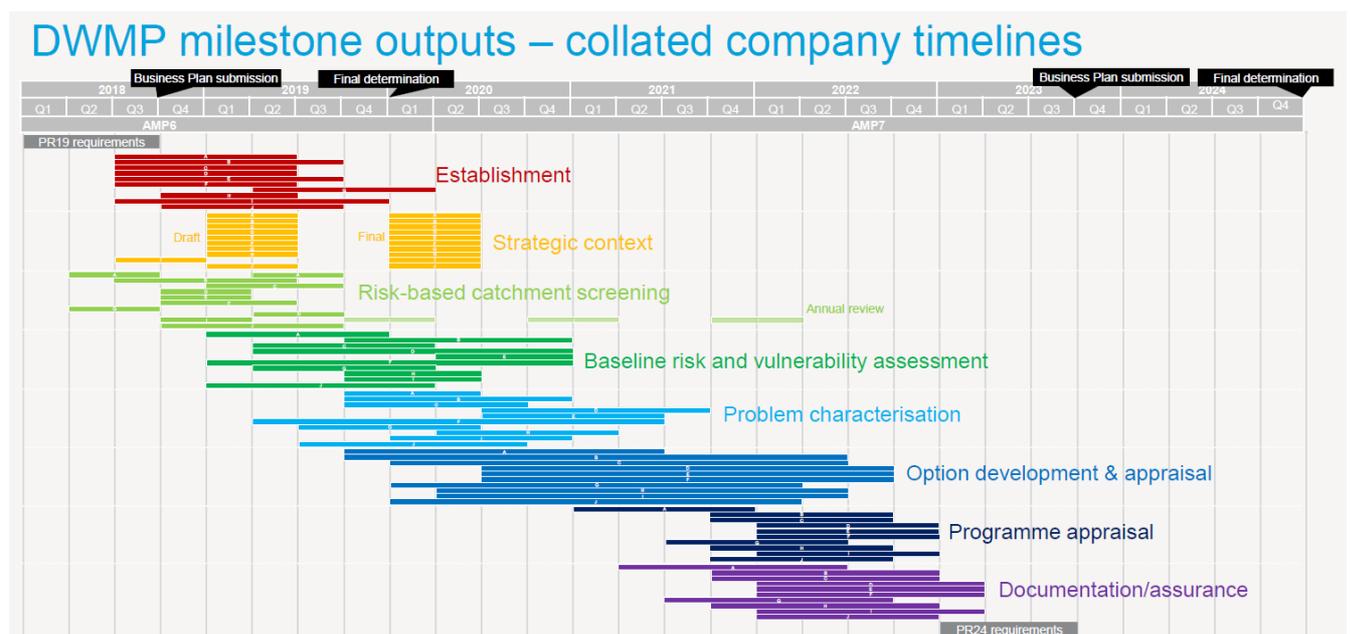


Figure 4 - DWMP Industry Milestone Outputs (WaterUK, 2018)

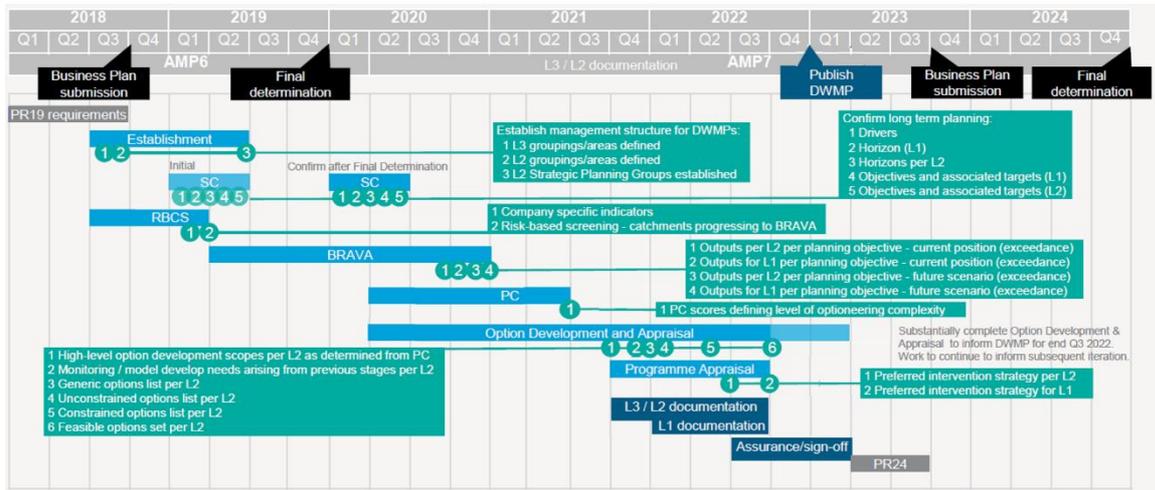


Figure 5 – Yorkshire Water Preliminary DWMP delivery timeline

Key Yorkshire Water Target Dates

Table 1 – Preliminary DWMP Activity Schedule

Activity	Start	Complete
Establish Management Structure for DWMPs	End of Q3 2018	End of Q2 2019
Define Strategic Context	End of Q4 2018	End of Q2 2019
Risk based Catchment Screening	End of Q2 2018	End of Q1 2019
Publish initial BRAVA risk assessment	End of Q1 2019	End of Q4 2020
Problem Characterisation	End of Q1 2020	End of Q2 2021
Option development & appraisal	End of Q1 2020	End of Q3 2022
Programme appraisal	End of Q3 2021	End of Q3 2022
Document & assure DWMP	End of Q3 2021	End of Q3 2023
Publish 1st DWMP		End of Q4 2022

Note: Dates based on draft DWMP Methodology

DWMP Progress to Date

We have undertaken the initial phase of implementing the DWMP through defining the Level 2 and Level 3 Tactical Planning Units (TPUs) within our company area. These tasks have been carried out simultaneously with the risk based catchment screening process (Q2 of 2018, ahead of target). The process defined 17 Level 2 areas containing just over 600 Level 3 (WwTW catchments) areas. Following the DWMP guidance, the Level 2 boundaries are broadly aligned with river basin district catchments, taking into consideration of the relevant Drainage Area Zones (DAZs). This alignment between DWMPs and SDMPs in turn aids the discussion of strategic issues. Significant urban areas were assigned their own separate Level 2 Area. Please see Figure 6 showing the

latest version of our Level 2 Areas.

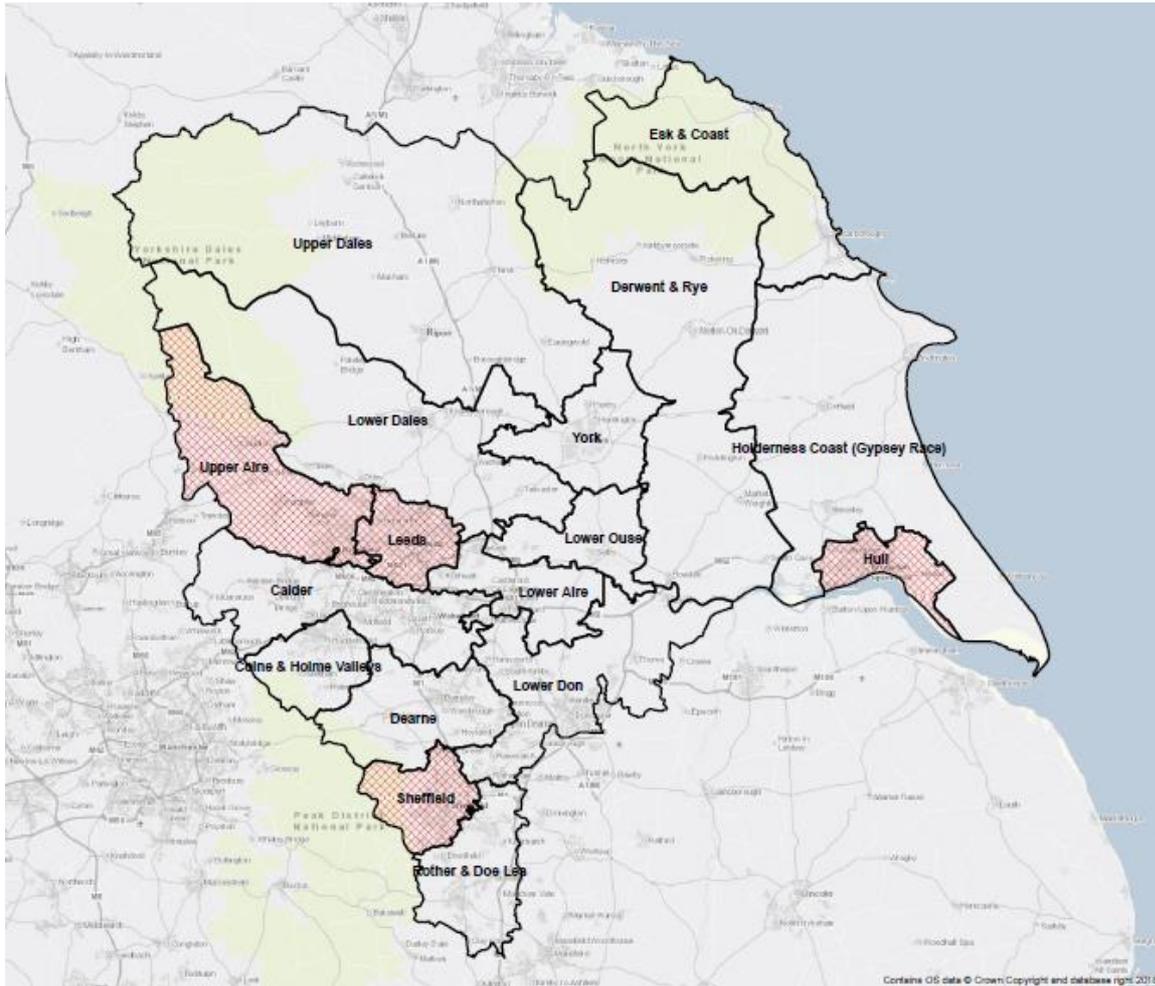


Figure 6 - Yorkshire Water – Level 2 Strategic Planning Areas (Hatched Areas represent pilot SDMP studies)

We have implemented the risk-based catchment screening process, primarily using GIS routines and spatial analytics, to produce a preliminary set of results, following the draft DWMP methodology. The draft results, produced at the end of Q2 2018 will be updated and finalised following the final dissemination of DWMP guidance in Q3 2018. The process of developing the screening criteria relied upon feedback and correspondence between the WaterUK consultants, water companies and other stakeholders, which we have been actively involved in and shaping, through the WaterUK DWMP Project Steering Group. The results are currently in the process of being drafted into outputs that will be used for stakeholder engagement, in the format of Level 2 and Level 3 portfolios.

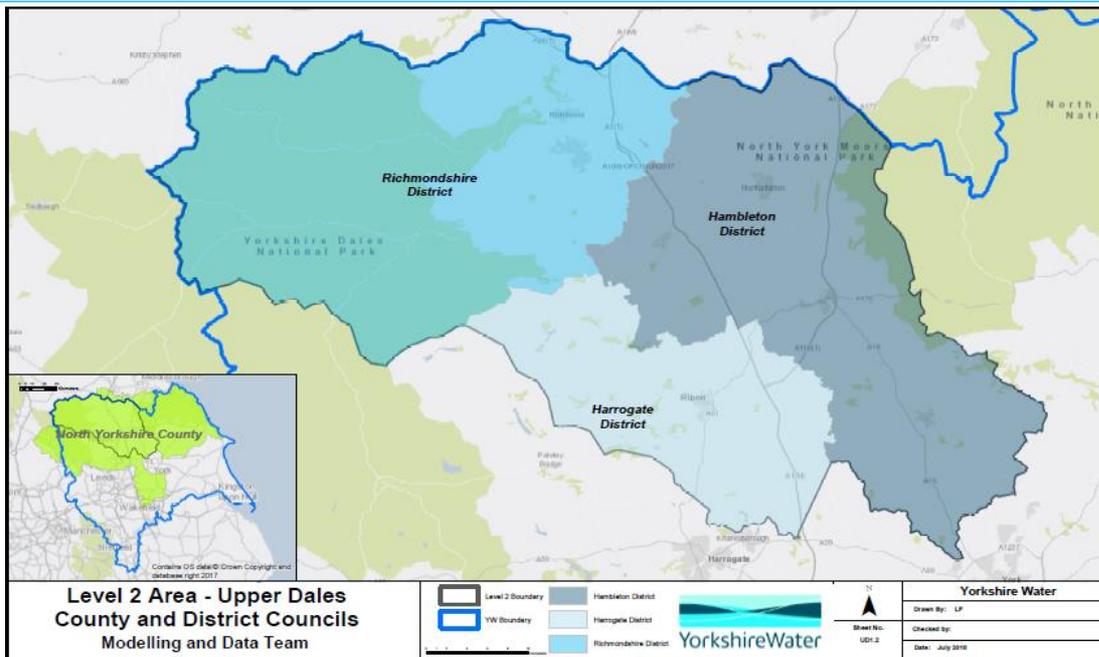


Figure 7 - Example of Level 2 Stakeholder Portfolio (data obtained through open government license)

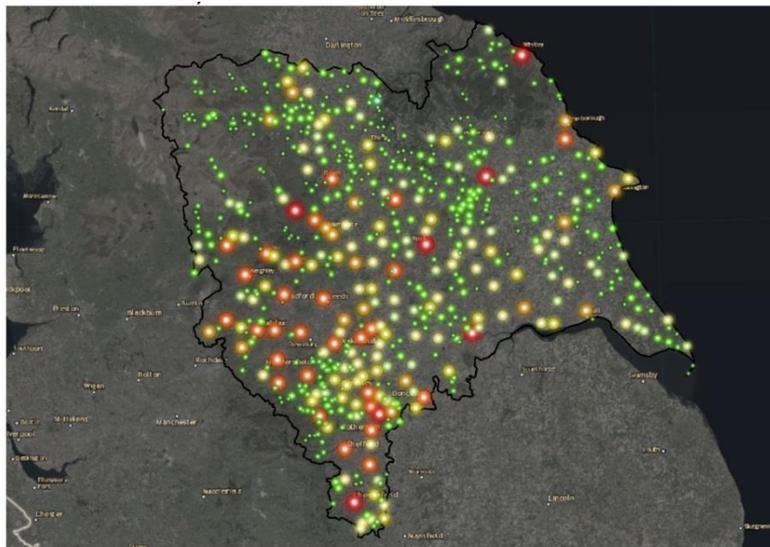


Figure 8 - Preliminary DWMP Risk Based Catchment Screening Outputs

Pending the final DWMP Dissemination event (5th September 2018), we intend to progress catchments through to the Baseline Risk And Vulnerability Assessment (BRAVA) on a risk-based priority approach based on population and indicator scores from the initial screening process. This is in line with current industry practice from the Drainage Strategy Framework and Sewer Risk Management, as indicated in Figure 9.

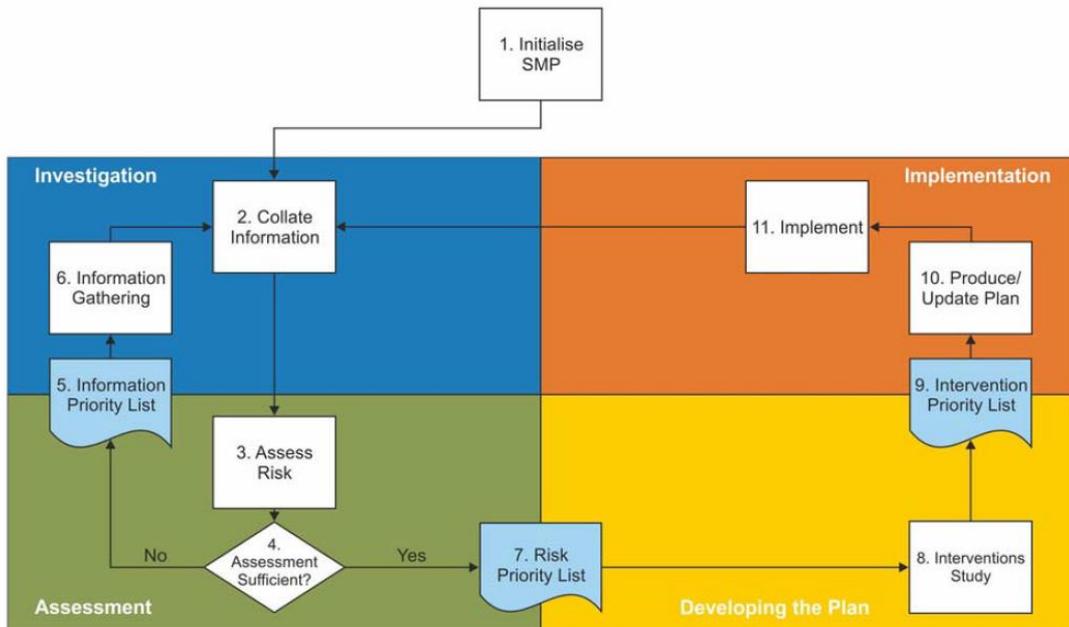


Figure 9 -Sewer Risk Management Approach (WRc, 2013)

Technical Extent and Detail of BRAVA Analysis Required

The Characterisation Baseline Risk and Vulnerability Assessment (BRAVA) is required for level 3 catchments that breach screening criteria. It comprises of the following key components:

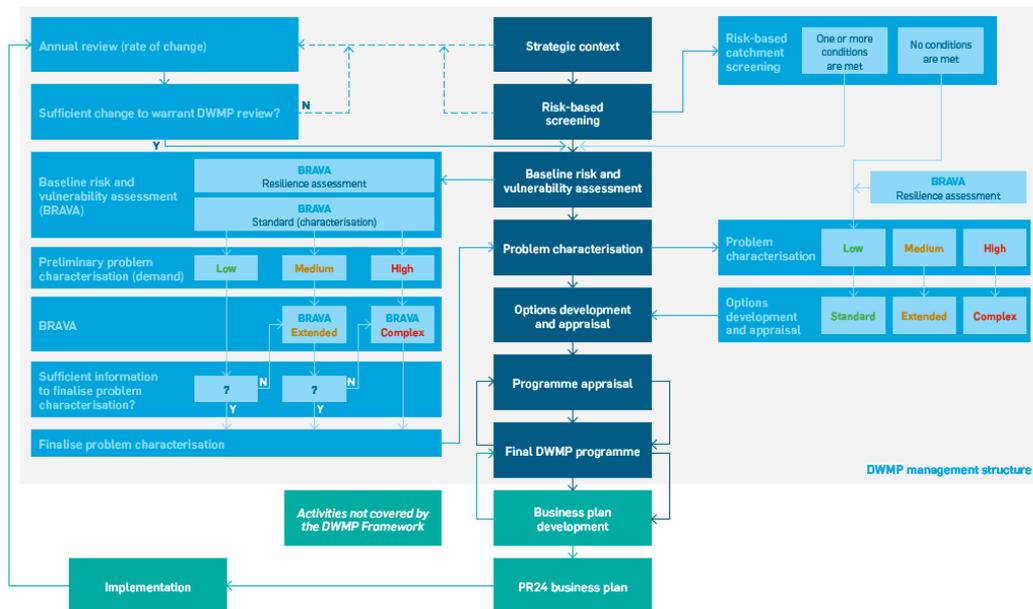


Figure 10 - Schematic of the DWMP process steps (WaterUK, 2018)

Depending on the problem characterisation, varying degrees of assesment are required, as shown in Figure 11.

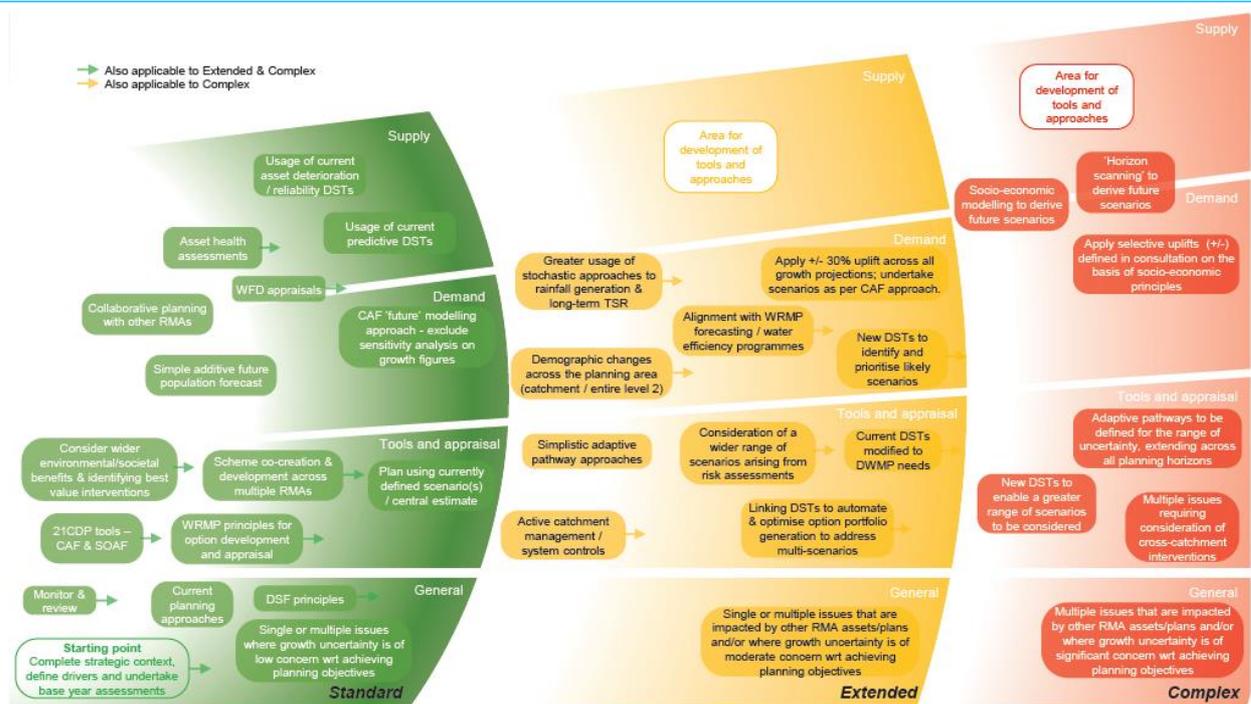


Figure 11 - Example of Decision Making Approaches for BRAVA (WaterUK, 2018)

The Benefits of our Plans

Resilience

- The plans identify the level of resilience of our wastewater systems, both now and in the future and how to maintain and improve it.
- Similarly, the plans also consider the impacts of our assets on other key infrastructure, including transport and energy, and vice versa.

Sustainability

- Solutions are identified that will work equally well in the long term, as well as current conditions.
- The plans are based on long term success, not short-term gain.
- Solutions are identified that develop and enhance the underlying capabilities of the drainage systems.

Affordability

- Solutions are optimised for long term, best value, so we are solving problems and ensuring their longevity.
- Using our 6 capitals approach, the costs and the impacts on our customers are managed effectively into the future.



Clear and Visible Plans

We want to make our plans clear and visible to customers, communities and stakeholders to have sight of the current and future challenges we face, how we intend to solve them, the order we will do this in, and the associated costs. This will facilitate the following:

- Our understanding of our strategic management plans for the future and their associated costs. These will detail what we are planning to do, and how well we are progressing against them.
- As part of making strategic plans visible, customers can see current and future risks, and can inform priorities for networks.
- We also monitor the performance of key assets, such as CSOs, and publish the performance data into the public domain.

At the heart of making our activities and risks visible will be a tiered set of plans which, at increasing levels of detail, make clear the challenges we face, the options we have considered to resolve those challenges, including the preferred solution, and in what order we are proposing to resolve them. They will also detail the partners who we are working with, and will make clear the resilience, sustainability and affordability of the solutions being identified. To create the ideal long-term, best value solution will sometimes require us to take forward options, which may not be the cheapest in the short term, but we will be clear why the adopted solution is best overall.

The Wider Benefits

- Where appropriate, solutions will be developed in partnership with other stakeholders and organisations.
- The impact of urban development will be evaluated, by clearly identifying in advance those drainage systems that have available capacity, and areas where enhancements will be required before accepting further flows.

Key Messages

The DWMP process will influence the way we co-create solutions with our customers, optioneer and then convey them to our delivery partners for implementation. Greater emphasis will be placed on sustainable blue green solutions enhancing natural and social capital. We will work collaboratively with our wider stakeholders to deliver the best options for the people of Yorkshire.

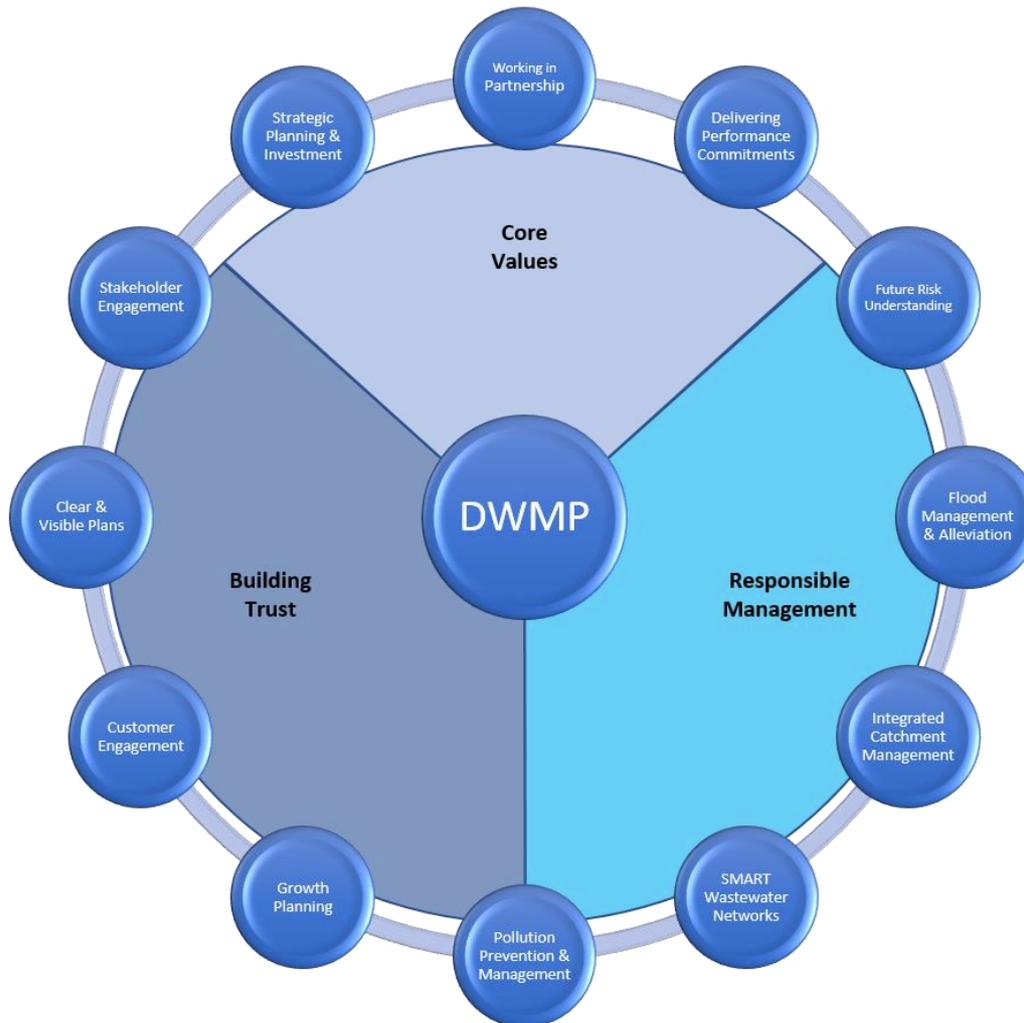


Figure 12 - DWMP - Links to Wastewater Networks Plus Price Control

As it can be seen from Figure 12, we consider that the DWMPs will form a central part of our PR24 submission. Linking together our Core Values, demonstrating our Responsible Management of our assets and the environment and Building Trust with our customers and wider stakeholders, we consider that the DWMPs tie together the elements discussed in Chapter 15 of our Business Plan, Wastewater Networks Plus Price Control.

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