

Northumbrian Water Drainage and Wastewater Management Plans - BRAVA and Problem Characterisation - Defining the Needs of the Catchment

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Introduction

Northumbrian Water commenced the BRAVA stage of their Drainage and Wastewater Management Plan (DWMP) programme in 2018, engaging a joint team comprising framework partners Esh-Stantec and Mott MacDonald-Bentley. The anticipated benefits of bringing both teams together to deliver the programme are as below:

- A collaborative, one-team approach using pre-existing and proven relationships;
- Assembly of a functioning Technical Steering Group to inform and agree processes;
- Create an active risk prioritisation process;
- Use of wider industry experts to collect other learning and processes, further driving consistency;
- The completion of targeted pilot studies to inform and agree robust process guidance;
- The development of commonly available tools to drive efficiency and consistency;
- Establishment of data collection groups to improve delivery for the programme;
- The development of outputs which are user-friendly, consistent, tailored to individual organisations, contain personalised analytics and are cloud based and visible to all.

The delivery of the overall DWMP programme is expected to require a significant investment from each of the Water and Sewerage Companies in England and Wales. To ensure timely delivery of the DWMPs for inclusion of outputs in the PR24 submissions, it has been key to make an early start in AMP6, with the bulk of the delivery occurring in AMP7. For this reason, pilot studies have been completed to help to inform methodologies.

Pilot Studies

The pilot studies will be delivered on catchments with recent study investment, with the main aim being to develop and refine the required methodologies. The pilot studies will draw on existing knowledge and previous work in drainage area and strategic studies, resulting in efficiencies in the delivery of subsequent phases. Efficient management of existing data and model outputs is anticipated to streamline the processes.

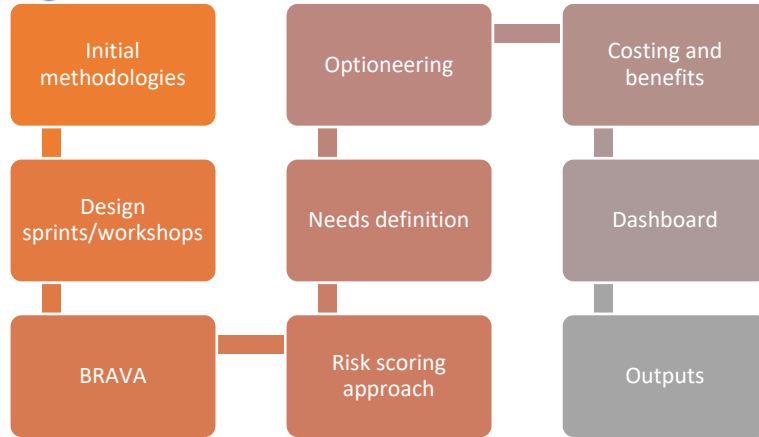


Figure 1 - Summary of Pilot Study Process

Validating the Issue

The results of the Risk Based Catchment Screening (RBCS) were collected and used to define which Northumbrian Water catchments would require a Baseline Risk and Vulnerability Assessment (BRAVA). A key stakeholder gateway was built into the process in order to validate that the RBCS determination was correct, and to start the BRAVA process with key catchment knowledge.

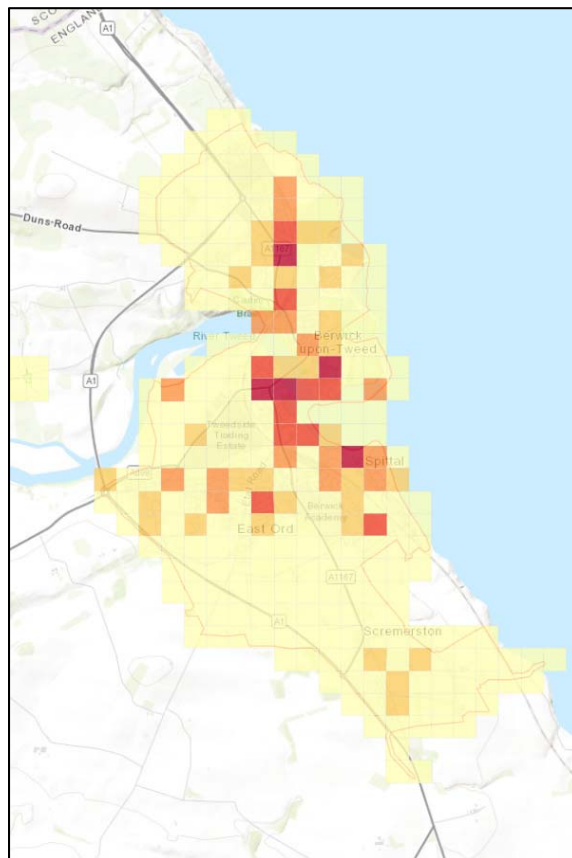


Figure 2 - Plan Showing Aggregated Catchment Indicators

The validated RBCS outputs were mapped spatially, based upon a grid approach – this process has been carried out through different stages of the DWMP. Figure 2 shows how the historic issues have been collected – key areas of collective pressure can be identified.

Baseline Risk and Vulnerability Assessment Process

The Water UK framework was used as a basis for the development of the methodologies and during the pilot studies. The first step was to define the Planning Objectives which would be used to assess the performance of the catchments. These planning objectives are defined below:

- Internal property flood risk;
- External property flood risk;
- Bathing water;
- River Water;
- Pollution;
- Asset health resilience;
- Compliance.

RBCS indicators were aligned to the defined planning objectives, and appropriate assessment methodologies were developed to quantify the existing and project performance of the catchment in the 2025, 2030, 2045 and 2060 time horizons.

Risk Based Approach and Problem Definition

A risk-based approach was developed for the DWMP process, which aligns with the existing business prioritisation process used by Northumbrian Water to assess schemes and prioritise investment. The risk-based process, which monetises risk, based upon a consequence cost data set, is calculated as the product of consequence, “likelihood” of consequence being realised, and probability – this ensures that areas with historic issues are promoted to high priority. The process aims to prioritise and deliver the benefits which have a direct contribution to achieving Northumbrian Water performance targets.

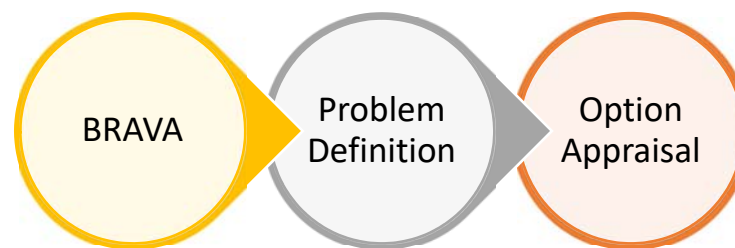


Figure 3 - The Problem Definition will allow BRAVA to transition into Optioneering Phase

The risk profile for the performance of the catchment for each planning objective can be plotted. Triggers can then be applied using a bespoke scoring tool to plot the key interventions points.

Opportunities Versus Needs

Using the defined grid approach, the results of the BRAVA can be viewed spatially through different time horizons, to demonstrate the performance of the catchment. At this stage of the process, key opportunity and strategic options start to emerge and can enable key stakeholder engagement and co-creation of solutions.



Figure 4 - Using a graphical output to show changing risk in the catchment through time

Summary

In summary, the approach adopted by Northumbrian Water has provided a platform for the delivery of DWMP programme, and provided the following benefits:

- Defined processes and methodologies in line with the framework;
- Efficient and streamlined approaches reducing the amount of effort required;
- Spatial outputs to provide evidence for key parts of the process;
- Develop a risk-based approach, in line with existing processes, to understand the future performance of the catchment for each of the defined planning objectives;
- Define triggers of performance exceedance and move in to the optioneering phase with an understanding of the location, scale and nature of feasible options.
- Optioneering – using scorecard and embedding capitals.