

A9: Drainage and Wastewater Management Plan 2018

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1.0 INTRODUCTION

We are developing our first Drainage and Wastewater Management Plan

Every day we drain over 2.7 billion litres of wastewater from our customers' properties. We then treat this water at our wastewater treatment work before returning the cleaned water back to the environment.

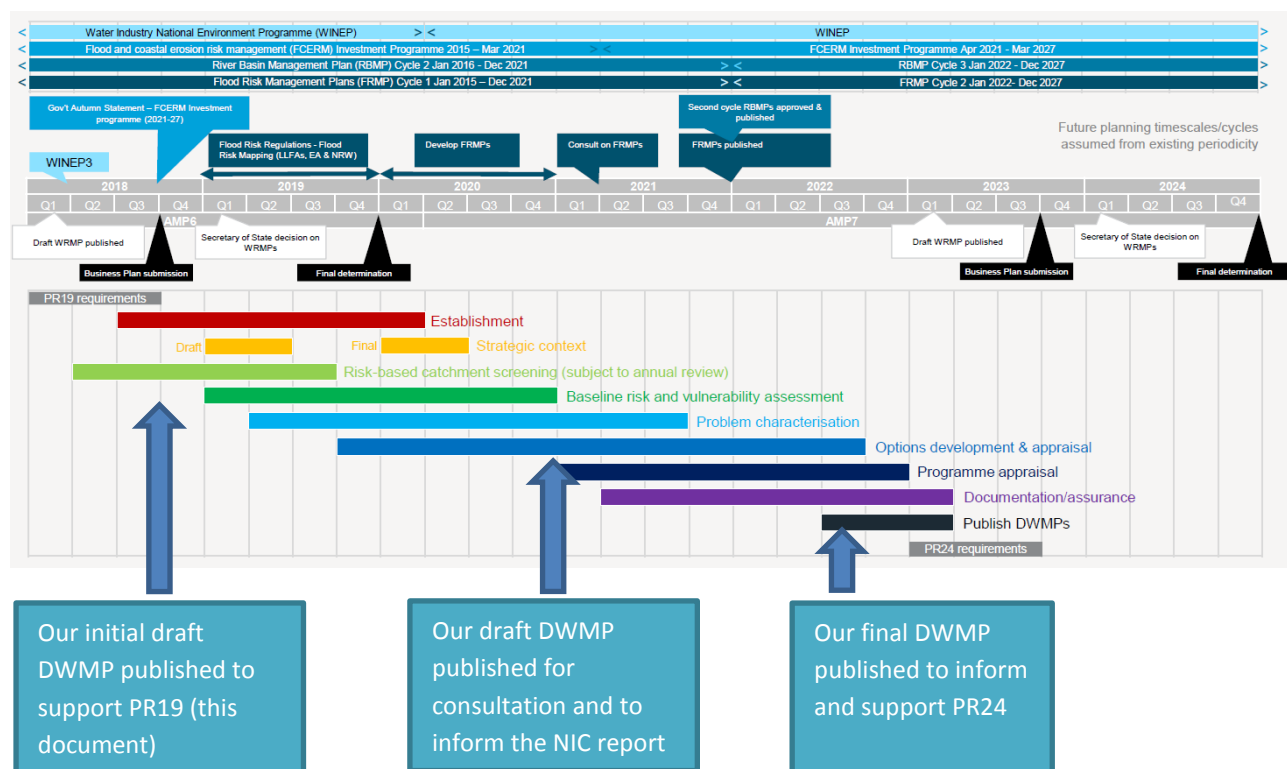
Our wastewater system consists of over 94,000km of sewers and drains, 4400 pumping stations and 1010 treatment works. This system has to continue to operate effectively day in day out but also needs to be able to cope with future pressures and this is where our Drainage and Wastewater Management Plan comes in.

Our Drainage and Wastewater Management Plan will cover the investments we plan to make over the next 5 year period, 2020 to 2025, as well setting out a long term (25 year) strategy for how we are going to deliver a reliable and sustainable wastewater service.

The first full publication of Drainage and Wastewater Management Plans (DWMPs) is not scheduled until 2022/23. We have chosen to provide a draft of our initial findings to:

- support the strategic investments we are proposing for AMP7;
- demonstrate our commitment to long term, sustainable, wastewater planning; and,
- provide an early benchmark to support and encourage the sector in development of DWMPs - in keeping with our position as a sector leader and innovator.

We intend to produce another update on our DWMP in 2020/21 to aid early customer and stakeholder consultation and inform the next 'State of the Nation' report by the National Infrastructure Commission (NIC). We will then further refine our plans with latest data and with further consultation before producing a full DWMP in 2022/23 to inform our PR24 business plan submission.



2.0 FUTURE PRESSURES

The wastewater system will need to be resilient in the face of future pressures

Our 5 year plan and 25 year strategy takes account of some of the key pressures that are going to impact our wastewater system. These pressures are summarised below:

Climate change: In May 2018 we experienced thunderstorms where, in some areas of Birmingham and West Midlands, over a month's worth of rainfall fell in one hour. The rainfall data collected indicated that a storm of this intensity had a probability of occurring less than once in 1000 years. However this wasn't an isolated event. We also experienced exceptionally heavy rainfall in June 2016 and February 2014. There is no denying that these extreme events are becoming more frequent and more intense and our sewer systems will need to adapt to cope with this. A recent study into the impact of climate change on sewer design has concluded that we will need to accommodate an increase of 20% on peak flows just to maintain current levels of performance.

Population Growth: We are expecting over 180,000 new properties to be built in our region in the next 5 years. We will have to accommodate the extra waste water these additional properties produce as well as dealing with the surface water run-off from the new infrastructure created to serve them (for example, roads, schools, shopping centres etc).

Water Quality: The Water Framework Directive sets ambitious targets for the standard of water quality our rivers need to achieve. This will mean that we need to allow less wastewater to be discharged through our Combined Sewer Overflows and treat wastewater to a higher standard. In 2015 only 7% of the waterbodies in our area were at Good Ecological Status (the standard set by the Water Framework Directive). The aim is to have 100% at Good Ecological Status by 2027. It is not just our discharges that impact water quality, solving this problem will require a catchment approach.

Operational Performance: Our customers and stakeholders continue to expect improvement in the level of service we are able to provide. For our wastewater system this is predominantly measured through the number of incidents of flooding that affects people's homes and gardens, the number of times we pollute a watercourse and percentage of time our treatment works are compliant with the standards set by the Environment Agency. We have been very successful at driving improvement in these areas and our performance is amongst the best in the industry:

- The number of internal and external sewer flooding incidents has been reduced by 41% and 58% respectively since 2015.
- The number of pollution incidents is down by 26%
- Our treatment works have achieved over 99% compliance for each of the last 6 years
- Overall we have been rated an 'industry leading company' in the Environment Agency's Environmental Performance Assessment in 3 out of the last 5 years.

We want to build on this great performance and continue to improve but this becomes gradually more and more challenging as the issues we are trying to fix get more complicated and more isolated.

3.0 APPROACH - PLANNING FOR THE FUTURE

Our approach to planning for the future builds on the best practice guidance set out in the Drainage Strategy Framework (Environment Agency and Ofwat 2013). The Drainage Strategy Framework sets out six guiding principles for drainage planning. Our approach aligns with these guiding principles and seeks to set a new best practice standard through innovative planning tools and techniques:

Guiding principle	Our approach to planning for the future
Partnership	<ul style="list-style-type: none"> We are taking a lead on integrating drainage planning and have developed tools to aid sharing of information between different organisations. We are facilitating catchment-based partnerships that can deliver multiple outcomes (e.g. flood risk, environmental, economic growth)
Uncertainty	<ul style="list-style-type: none"> All of our modelled outputs use multiple scenarios to test the sensitivity to uncertainty. Our models are assessed against a confidence grading standard based on the level of verification achieved.
Risk Based	<ul style="list-style-type: none"> We have developed 'driver trees' (a hierarchy of sub-measures) for all our key performance metrics that ensures we focus on the leading measures of performance, as well as the traditional lag measures, to help us prioritise our highest risk catchments. All of our risks are visualised on catchment plans to make it easy to compare risks and identify 'hotspot' areas.
Whole life costs and benefits	<ul style="list-style-type: none"> As well as considering whole life costs and benefits of specific schemes in isolation we are also assessing the costs and benefits of catchment level options and identifying opportunities for efficiency through co-delivery of work (e.g. refurbishing sewers and water mains at the same time or aligning sewer reinforcement work with highway re-surfacing). We are directly incentivising ourselves to consider the benefits associated with Natural and Social Capital through our Green Communities Performance Commitment.
Live process	<ul style="list-style-type: none"> We already maintain all of our models in a 'live' state which means that any changes in the catchment are immediately incorporated into the models and the risk assessments are reviewed. We are installing 'live' monitoring into our sewers, pumping stations and treatment works to give us a much more granular view of operation and provide advance warning of indicators of failure.
Innovative and sustainable	<ul style="list-style-type: none"> Our 'Open Innovation' approach is helping us stay at the forefront of emerging technology. We have an implementation process that helps us roll out the best innovations quickly into business as usual. Sustainability has been incorporated into our decision making and our performance commitments. We have pre-assessed opportunities for surface water removal and SuDS to support prioritisation of interventions.

Read more: We've provided some examples of how we are shifting best practice in Appendix D.

4.0 OUR PLANNING TOOLS

We have a range of comprehensive planning tools that we use to help us develop a detailed understanding of system risk. We are using the very latest software and modelling techniques to test multiple future scenarios and identify optimal and timely interventions.

It is the level of detail and the coverage of our planning tools that sets us apart from the rest of the sector. For example all companies will have hydraulic models of their sewer network, but few have 100% coverage with all models maintained in a 'live' state. Similarly, all companies will have some form of asset deterioration model to predict failures and inform operational investment. Few however will have factored in input characteristics such as local population demographics and proximity to food outlets - and even less will be considered true consequence by mapping the path and depth of flood water.

Our suite of planning tools give us a much clearer view of risk and therefore allows us to prioritise really effectively where we intervene, which in turn makes us more efficient. An example is the difference in that we made on sewer flooding by introducing a new risk register approach. We have calculated that we will have delivered a 42% increase in risk reduction for a like for like investment, all through prioritising the highest risk schemes.

We can also use the models to identify where there are synergies between programmes of work that can be exploited to make sure that when we do invest at a site, we resolve all potential drivers at the same time or build in a modular way that allows for future expansion. An example of this is how we have used the water quality models (SAGIS), our non-infrastructure deterioration model and our flow and load model to align the timing of our WFD improvements with capital maintenance needs or with capacity increases needed to accommodate additional flows. Aligning drivers of investment at a site or catchment level delivers significant efficiency over a non-aligned investment programme.

We have summarised our key planning tools and the function that they serve:

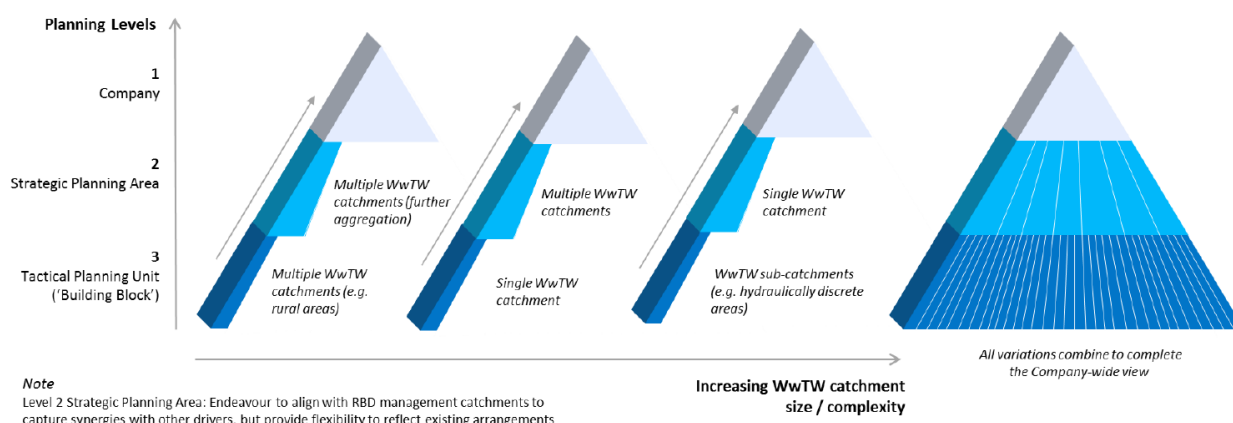
Tool	Planning function
Sewerage Management Plan Models (using Integrated Catchment Modelling (ICM))	<ul style="list-style-type: none">• Our Sewerage Management Plan (SMP) models deliver all of our understanding on how our system operates hydraulically.• The models are developed using the latest version of the Integrated Catchment Management (ICM) software from Innovyse.• By 2020 we will have full coverage of our system and all models will be maintained in a 'live' state (regularly updated for any catchment changes and re-verified)
Sewer Consequence Model (using Infonet)	<ul style="list-style-type: none">• We have developed bespoke Sewer Consequence Models using the software Infonet. These models simulate a failure of every one of our pipes and assess the likely consequence using a range of datasets such as LiDAR, GIS mapping and 2D Flood Modelling.• Knowing the likely consequence (flooding or pollution) of a failure and being able to predict its severity (i.e. would it have affected a property internally or polluted a sensitive watercourse) enables better prioritisation.
2D Flood Routing (using Flood Risk Mapper and PondSIM)	<ul style="list-style-type: none">• As an input to our SMP and Sewer Consequence Models we use 2D flood routing/mapping software to consider the risk from hydraulic overload, blockage or collapse of the sewer.
Hydraulic Flooding Risk Register	<ul style="list-style-type: none">• In preparation for AMP6 we introduced our own hydraulic flooding risk register to replace the DG5 methodology. Our risk register calculates true risk by calculating a likelihood, based on an annual probability of flooding, and a consequence, based on area impacted by flooding and the depth.

	<ul style="list-style-type: none"> This risk calculation has allowed us to convert all potential flooding schemes into a common denominator (known as the Equivalent Flooding Index) and therefore rank schemes based on the true risk.
Water Quality Models (inc. SIMPOL, SIMCAT and SAGIS)	<ul style="list-style-type: none"> Our water quality models assess the impact of our discharges (both continuous and intermittent) on river and estuarine water quality. We use these models to calculate the standards our treatment works or CSO discharges need to achieve to meet the objectives of the Water Framework Directive. We can also use these models to take a catchment based approach to improving water quality or consider options for alternatives to treatment enhancement (e.g. diffuse pollution management).
Flow and Load Tool	<ul style="list-style-type: none"> We have a 'ready reckoner' tool for considering the impact of additional flows or loads on our Wastewater Treatment Works (WwTW) performance. The Flow and Load Tool uses current performance versus design flow and load to calculate available headroom in WwTW capacity. When a risk threshold is breached this will trigger on site investigation and potential investment.
Sewer Infrastructure Model	<ul style="list-style-type: none"> The Sewer Infrastructure Model (SiM) is our asset deterioration and operational whole life costs and benefits optimiser. It uses sewer condition assessments, asset data and performance data to calculate a rate of deterioration and the levels of investment needed to offset this deterioration or meet a defined set of targets. The model is built in the Enterprise Decision Analytics software supplied by SEAMS Ltd and represents over 10 years of ongoing model development.
Non-Infrastructure Model	<ul style="list-style-type: none"> The Non-Infrastructure model works in a similar way to SiM but considers the deterioration of above ground assets including both civil structures and mechanical and electrical equipment.
Portfolio Optimiser	<ul style="list-style-type: none"> The Portfolio Optimiser is another tool from the Enterprise Decision Analytics package. We enter all the costs and benefits (using both willingness to pay and private costs of failure) of our schemes into the Portfolio Optimiser and it supports us in choosing the optimum overall balance of investment.

5.0 DEFINING OUR PLANNING BOUNDARIES

In line with the DWMP Framework we will be developing our DWMP at three different planning levels (this is shown in the figure below) .

- **Level 1 - Company:** This section brings together planning at level 2 and 3 to provide a high level overview to summarise the overarching DWMP to provide a strategic, long-term plan for drainage and wastewater resilience and associated investment over the plan period.
- **Level 2 - Strategic Planning Areas (SPA):** These areas provide an aggregation of Level 3 units into larger level 2 strategic planning areas (SPAs). The Level 2 SPAs are proposed to describe the local drivers for change as well as facilitating a more strategic and collaborative level of planning above the detailed catchment assessments.
- **Level 3 – Local Tactical Planning Unit (TPU):** These local planning areas as based on wastewater treatment works (WwTW) catchments. For small catchments these may be aggregated together but for our larger treatment works, or discrete sub-catchments for larger wastewater treatment works (WwTW) catchments).



At the Company Planning Level we will be producing two separate DWMPs - one for Severn Trent Water and one for Hafren Dyfrdwy. There will be cross references in both as the River Basin Management Plan boundaries that we have used to inform our Strategic Planning Area boundary crosses the border between the two companies.

Our Strategic Planning Areas are primarily based on the River Basin District boundaries as this offers the good alignment with other drivers (such as water quality and flood risk) and enables us to make use of the existing catchment based partnerships that are running in these areas. In some cases we have had to amend the boundaries slightly to ensure that the entirety of a sewage treatment catchment boundary falls within a single Strategic Planning Area. By doing this we maintain line of sight from Tactical Planning Unit through into Strategic planning Area.

In total we have 14 Strategic Planning Areas that wholly or partially cover Severn Trent Water and 3 Strategic Planning Areas that intersect with Hafren Dyfrdwy.



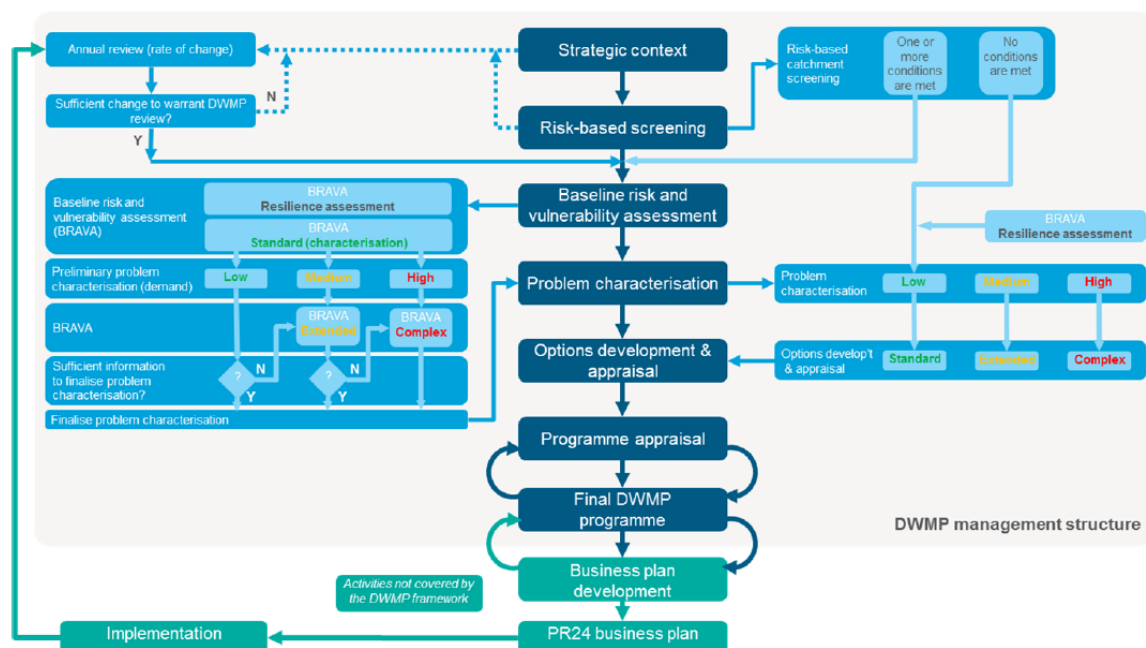
For the purposes of our initial risk-based catchment screening assessment we have defined our Tactical Planning Units as the Wastewater Treatment Works catchment boundary. We have 1010 WwTW catchments. Going forwards we may refine this to group some small rural catchments together into a single Tactical Planning Unit and break out our very large catchments (such as Birmingham) into a number of smaller sub catchments.

Read more: We've shown how our proposed Strategic Planning Area boundaries align to other administrative boundaries in Appendix C – Catchment Plans

6.0 RISK-BASED CATCHMENT SCREENING

The first assessment stage of a DWMP is to complete a risk-based catchment screening. The screening exercise is intended to identify those catchments that require further, more detailed, investigation.

In order to complete the risk-based catchment screening we have measured each of our 1010 Level 3 Tactical Planning Units against the 16 screening metrics (a combination of both performance measures and risk assessment measures) set out in the DWMP Framework.



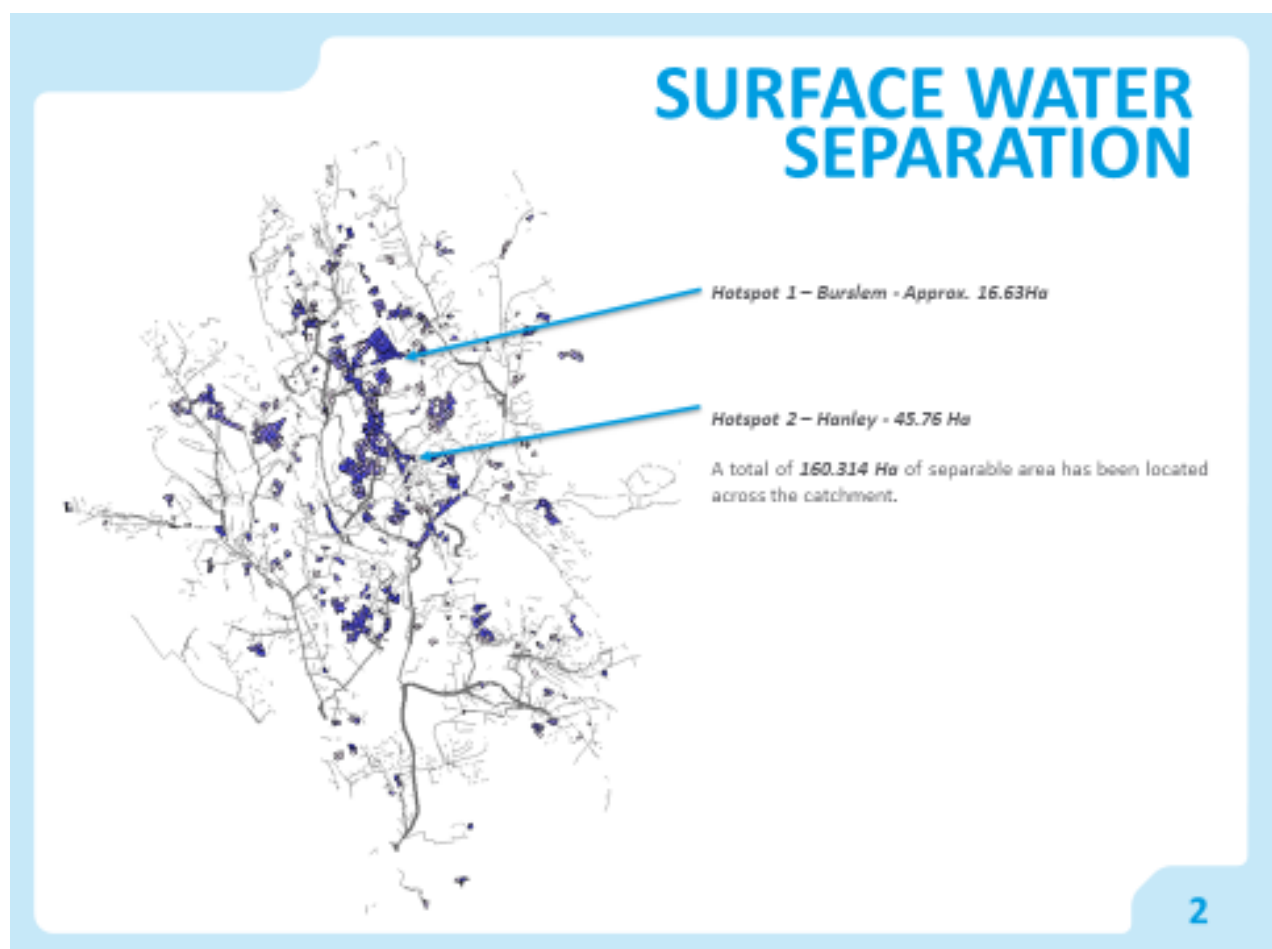
In total 65% of our Tactical Planning Units have been identified by the risk-based catchment screening as needing to progress to the baseline risk and vulnerability assessment (BRAVA) stage of the DWMP. Of these, seven of our larger catchments are included in our PR19 Business Plan for significant investment that will help address the needs identified through the risk-based screening:

Tactical Planning Unit: Strongford (serving Stoke-on-Trent)

Drivers: CSO operation, sewer capacity and development

PR19 Problem Characterisation: The sewerage system serving Stoke-on-Trent is a large and complex system that came about as a result of 6 towns merging in 1910 to form Stoke-on-Trent City and the subsequent closures of a number of historic treatment sites within the catchment. The combined trunk sewer network drains a high proportion of impermeable area within the City and some areas see high levels of infiltration, partly linked to historic mining activities. This all contributes to the trunk sewers filling quickly in response to a storm resulting in more frequent operation of the CSOs. Stoke-on-Trent is situated close to the source of the River Trent and its tributaries which means that the watercourses in the area are generally smaller and more sensitive than you would normally find in a large urban conurbation. In AMP6 we have been completing an investigation into the impact of CSO operation on achieving WFD river water quality standards which has shown that work is required to reduce the spill frequency and volume from a selection of CSOs. This situation will be further exacerbated by planned development in the catchment and this will need to be accounted for.

Options development & appraisal: We have considered a range of potential solutions to reduce CSO discharges and accommodate development. There are some local capacity upgrades needed but the majority of the CSOs are influenced by the trunk sewer systems and therefore a catchment wide strategic approach is needed. Outline options for separating surface water, removing infiltration, upsizing/duplicating trunk sewers or installing a new treatment works have all been assessed. Some upsizing is likely to be required but the majority of our solution will be achieved through sealing sewers against infiltration and removing surface water from the combined network. Through our analysis of the catchment we have identified 160 hectares of developed land that is drained separately via a foul and a surface water sewer but with both then entering the combined trunk sewer system. This 160 hectares contributes a flow of around 9 cumecs (9000 litres per second) to the combined sewer system which if removed would have an extremely beneficial impact on the operation of CSOs. Our investment will therefore focus on connecting these separately drained areas to a new surface water only sewer network and then into SuDS or watercourses. Because we are very early in the development stage of this option we have planned to phase investment across AMP7 and AMP8 to remove the impact of cost uncertainty on our customers whilst still delivering the output in by the 2027 WFD deadline. This phasing has been agreed with the Environment Agency as part of our WINEP submission.

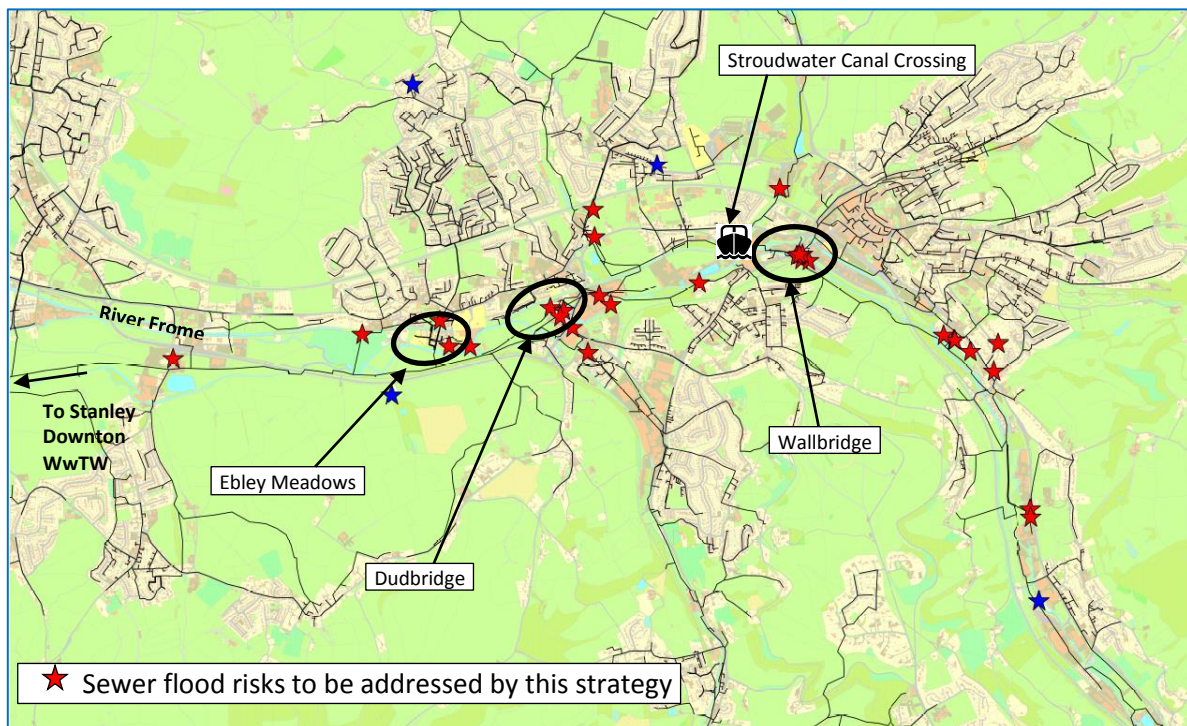


Tactical Planning Unit: Stanley Downton (serving Stroud)

Drivers: Sewer Flooding, Pollution

PR19 Problem Characterisation: The town centre of Stroud is built in a valley with outlying areas stretching up into the hills. This means that the combined sewers react very quickly to rainfall and the main valley trunk sewer that runs adjacent to the River Frome quickly fills up and eventually floods open spaces and spills via a CSO and overland flows into the River Frome causing pollution. Locally there are proposals to reopen the Stroudwater Navigation Canal which can only be accomplished if a section of trunk sewer that runs across the base of the canal is removed.

Options development & appraisal: Multiple options have been appraised to address the issues with the main trunk sewer. This includes looking at addressing higher than anticipated groundwater infiltration and opportunities to undertake surface water separation, both of which are aimed at removing flows from the sewer network. However due to the high volumes of flows that need to be managed these solutions alone will not address the capacity deficiencies. Our preferred option is to provide a new trunk sewer to allow excess flows to be conveyed further downstream along the River Frome where a new overflow is to be constructed. This would allow existing poorly performing overflows to be abandoned and will address the flooding issues that are currently causing overland pollution to the river. The location of this new overflow will benefit from increased dilution in the river and overall the solution will deliver improved water quality. The solution will also allow the abandonment of the trunk sewer passing through the Stroudwater Navigation Canal as flows upstream will be diverted into the new trunk sewer. Options have been considered to phase the construction over a longer planning period but this would result in increased overall scheme cost with no additional benefit for customers. Therefore commissioning of this solution is included in our AMP7 Plan for delivery by 2025.



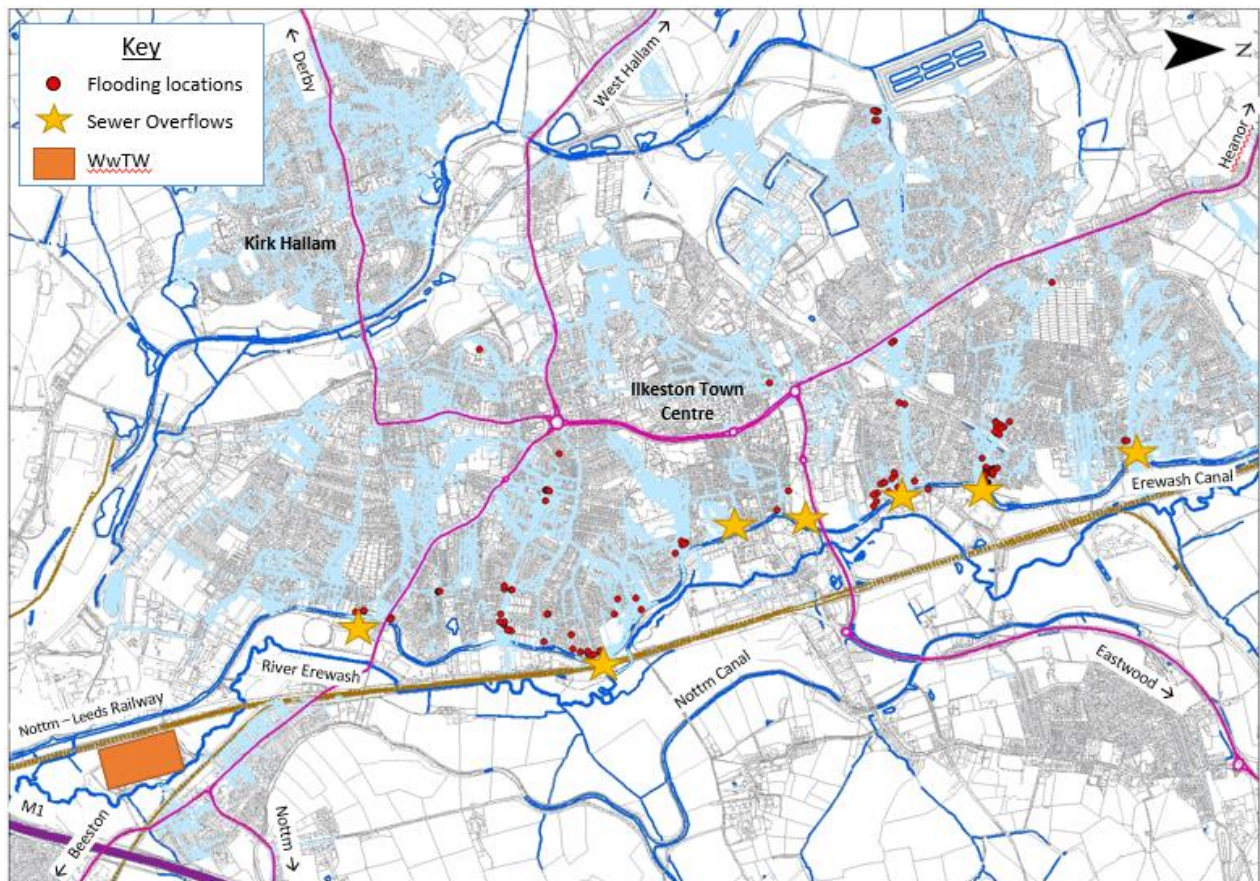
Tactical Planning Unit: Hallam Fields (serving Ilkeston)

Drivers: Sewer Flooding, 1 in 50 year storm risk, Pollution

PR19 Problem Characterisation: The combined sewerage system in Ilkeston drains a high proportion of the town's surface water run-off which regularly fills to capacity the Eastern Valley Trunk Sewer that runs parallel to the River Erewash and transports flows to the Hallam Fields WwTW for treatment. Investigations during AMP6 have identified a large number of previously unreported sewer flooding incidents which have been factored into our option development. We have also considered the wider issues in the catchment that could benefit from system wide solution such as surface water flood risks being considered by Nottinghamshire County Council and high frequency spilling CSOs that are affecting the water quality of the River Erewash.

Options development & appraisal: We have considered an option to construct a large 2.85m diameter tunnel (4.3km long) to intercept the excess flows on the eastern valley trunk sewer. However as part of our investigations we have identified five locations where the provision of new surface water sewer systems will allow sufficient highway drainage to be removed from the overloaded trunk sewer to negate the need for a new tunnel. This will involve the construction of around 8.3km of new surface water sewer to facilitate the removal of around 20.4 hectares of existing roads and hardstanding. Our engineering teams are already engaging with the local council about opportunities to deliver wider

surface water flood risk benefits through the use of sustainable drainage systems (SuDS). Our modelling work still indicates some localised capacity upgrades will still be required but overall the surface water separation solution offers a 24% cost saving compare to the tunnel option and provides a more resilient sustainable solution.



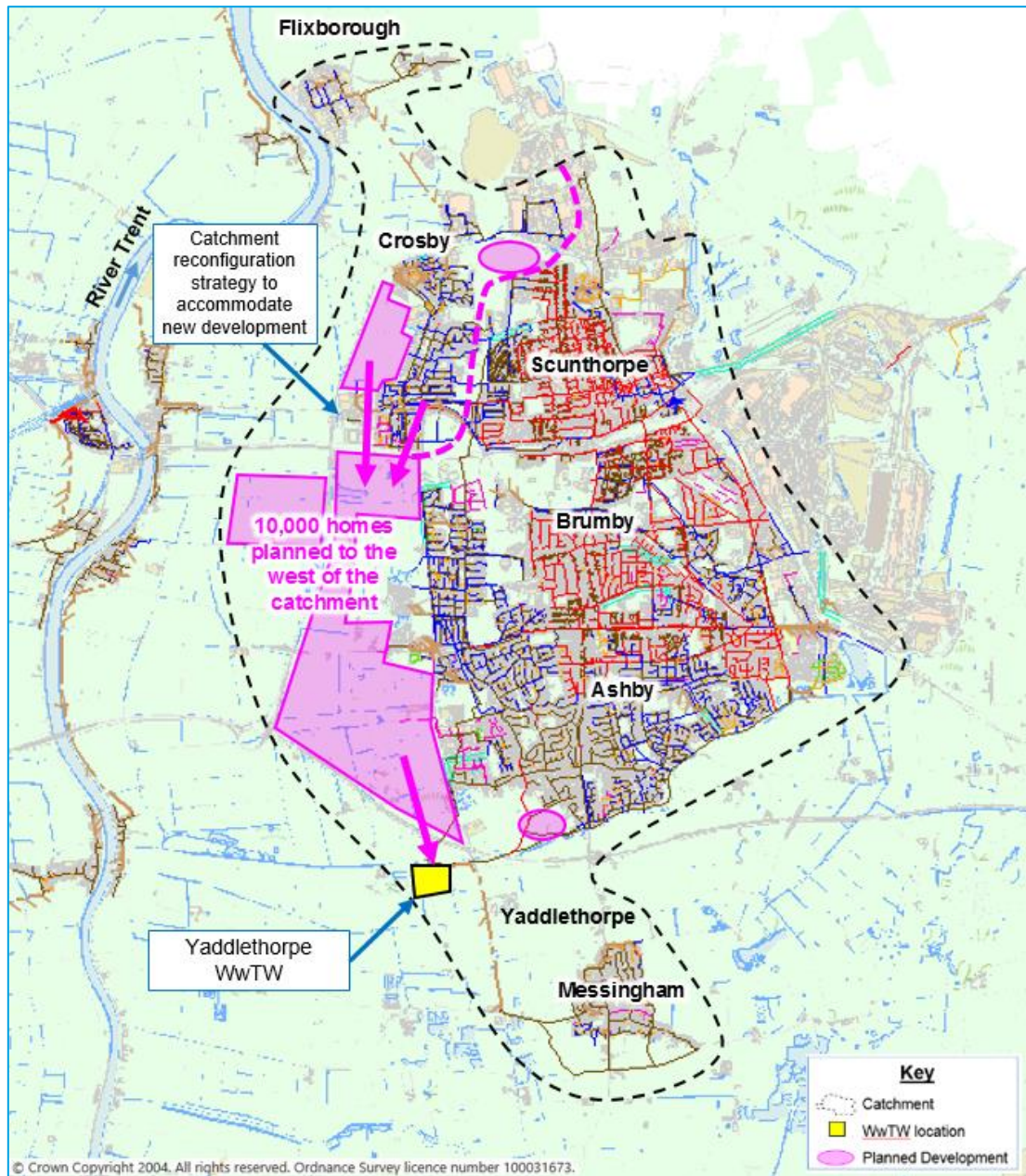
Overview of the Ilkeston catchment indicating the location of sewer flooding and CSOs.

Tactical Planning Unit: Yaddlethorpe (serving Scunthorpe)

Drivers: Development, CSO Operation, Sewer Flooding

PR19 Problem Characterisation: Proposals to build over 10,000 dwellings to the west of Scunthorpe will put an unacceptable pressure on the existing sewerage network where there are existing known sewer flooding issues and issues with CSO operation.

Options development & appraisal: The location of the development in relation to the existing sewerage layout provides an opportunity to work closely with the developers to reconfigure the proposed new on-site development drainage into an integrated capacity solution. Early engagement with the developers has allowed a system design to be developed which allows for existing flows to be reconfigured and diverted into the drainage network for the new development which will be increased in size to accommodate. The flows will then being pumped directly to our Yaddlethorpe WwTW to by-pass the existing sewerage system, resolve existing flooding issues and reduce CSO spills. This approach is more cost effective than upsizing the existing local sewerage network and provides a solution that address other risks within the catchment and frees up network headroom to allow for future development. Works is also being proposed at Yaddlethorpe WwTW to improve WFD compliance in the Bottesford Beck by extending the treated effluent outfall to discharge directly into the River Trent.



Overview of the Scunthorpe (Yaddlethorpe) WwTW catchment

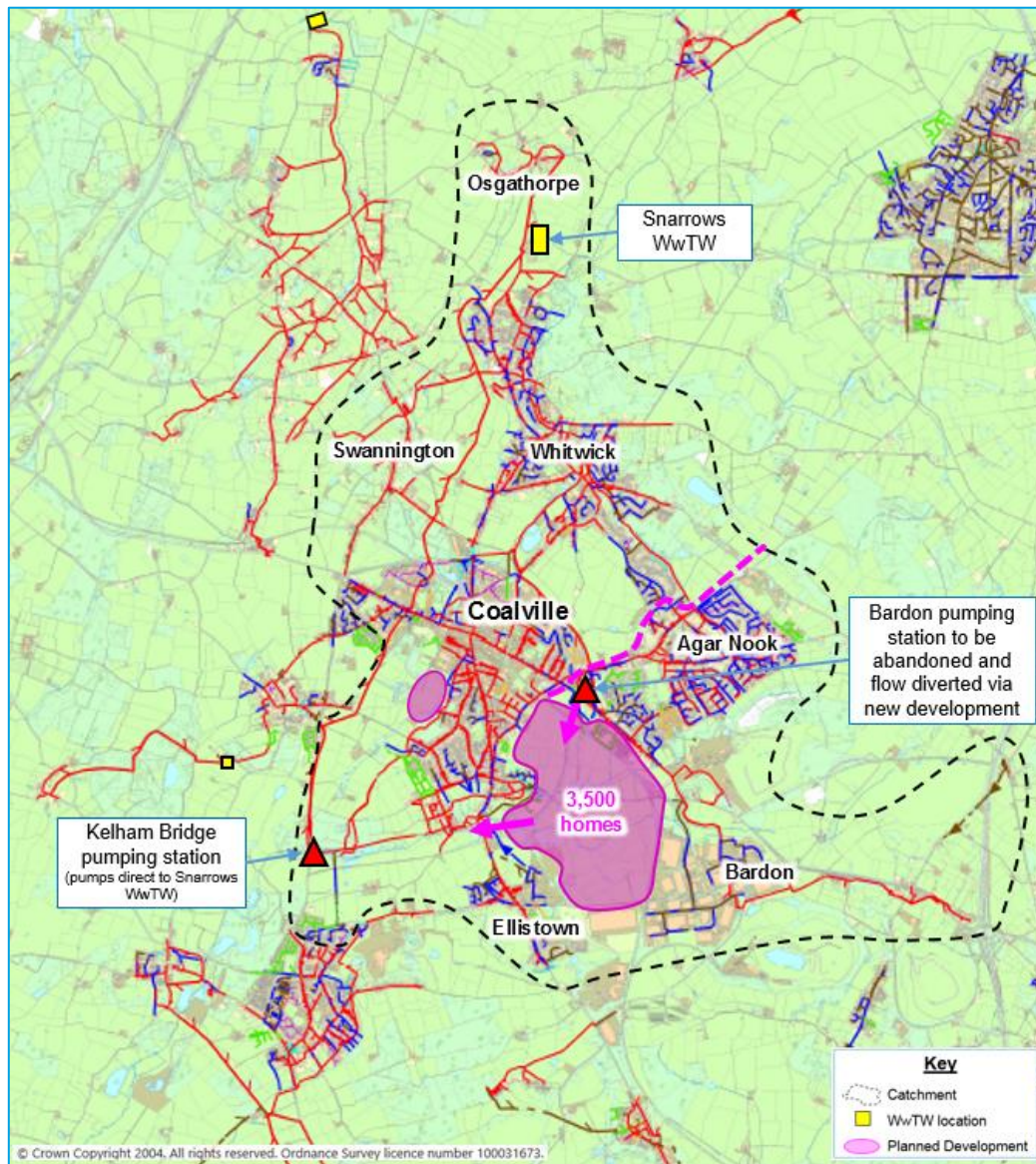
Tactical Planning Unit: Snarrows (serving Coalville & Whitwick)

Drivers: Development, CSO Operation, Flooding

PR19 Problem Characterisation: The sewerage network serving the Coalville and Whitwick urban areas in North West Leicestershire comprises of three main sub-catchment areas which are then pumped to our Snarrows WwTW located to the north west of the network. The allocation of 3,200 dwellings to the south-east of the catchment is on the opposite side of the catchment in relation to the Snarrows WwTW and, without capacity upgrades, it will have a detrimental impact on existing flood risk and increase CSO spills.

Options development & appraisal: The location of the development, whilst problematic if dealt with locally, does provide wider catchment benefits to reconfigure the existing sewerage network and utilise oversized on-site development drainage provide benefit to existing customers at risk of flooding. By working with developers the first phase of this long term

strategy has already been completed in AMP6 whereby we requested realignment of developer's drainage proposals to allow for future abandonment of some existing pumping stations. By transferring flows into a new gravity sewer this will alleviate existing flooding issues, whilst the next phase of the strategy will reinforce existing trunk sewer capacity to pass flows onwards to Snarrows WwTW. This approach provides a more cost effective solution compared to just providing capacity to accommodate the development and address then flooding issues independently.



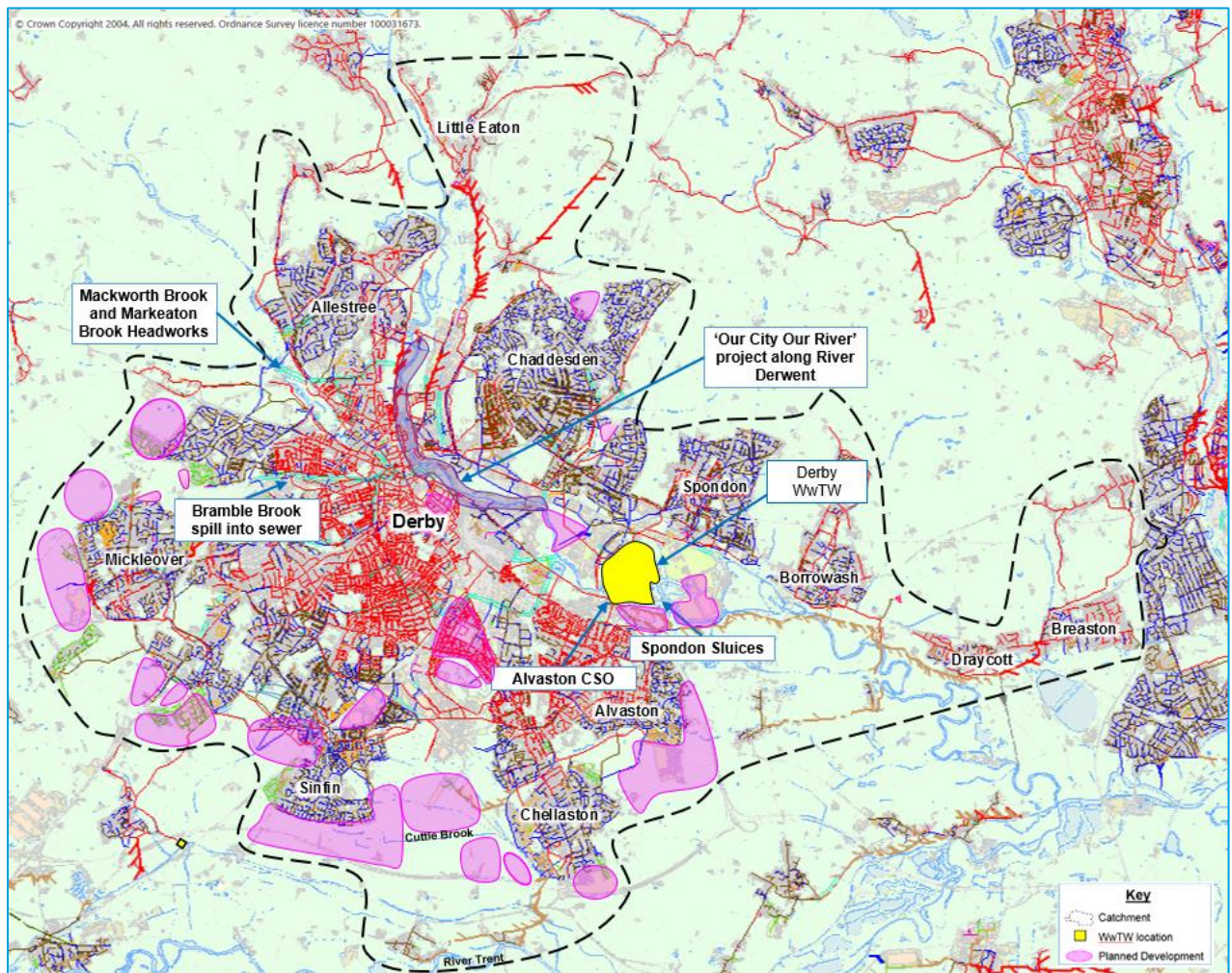
Overview of the Snarrows WwTW catchment

Tactical Planning Unit: Derby (serving Derby)

Drivers: Development, CSO Operation

PR19 Problem Characterisation: Local planning proposals have allocated significant amounts of new development along the south and south-west of Derby. Collectively these developments would result in an increased risk of sewer flooding and affect the performance of our CSOs.

Options development & appraisal: Early engagement with local planners has allowed development needs to be assessed at a catchment scale with capacity upgrades being timed to align with development and reduce impact on the existing network. A key part of our strategy has been to optimise the performance of the sewer network to be able to store more flows in reconfigured existing attenuation tanks. This has allowed us to reduce the overall cost of capacity works and accommodate the first phases of development whilst developing the most efficient option for handling future flows. Local developers have been involved in this strategy from the outset to ensure that their on-site proposals align with our catchment solution.



Overview of the Derby WwTW catchment

Tactical Planning Unit: Minworth (serving Birmingham)

Drivers: Flooding, 1:50 year storm risk

PR19 Problem Characterisation: The Bourn Brook catchment is particularly vulnerable to flooding during extreme rainfall (greater than a 1 in 50 year storm event) with multiple sources of flooding from surface water, local watercourses and the sewers. Flooding has occurred in at least 3 times in the last 10 years in 2012, 2016 and most recently in May 2018. Because of the multiple flooding mechanisms and the extreme nature of the flood events it has been difficult for any single authority to justify investment.

Options development & appraisal: A jointly funded Integrated Drainage Plan (IDP) is currently underway in the catchment to understand the wider impact of surface water run off which is resulting in significant sewer flooding as well as flooding from the Bourn Brook. In the past sewer flooding solutions have been discounted on cost benefit ground but development of an integrated surface water management solution is expected to deliver a more cost beneficial outcome.



Integrated model flood risk outputs for the Bourn Brook catchment

Read more: We've included an overview description of each of our Strategic Planning Areas in Appendix A and the detailed outputs of our risk-based catchment screening in Appendix B.

7.0 CONCLUSION AND NEXT STEPS

We have all the necessary data, tools and techniques to progress quickly with the development of our first Drainage and Wastewater Management Plan (DWMP). Throughout the development of the Framework for DWMPs we have supported the sector by testing out the proposed methodologies and the metrics and provided critical feedback that has helped shape the end output.

We have shown through this document and its appendices that we understand both the current and future risks across our planning areas and we are ready to move to the next stage of the process to consider the baseline risk and vulnerability position and start engaging with customers and stakeholders on option development and appraisal.

The key strategic investments that we are planning to make in AMP7 are supported by the findings of our risk-based catchment screening exercise. They include many examples of how we are applying best practice, such as:

- co-creating and co-delivering solutions with developers and local authorities to align designs and reduce overall cost;
- taking a holistic, catchment based approach to deliver multiple benefits through a single investment; and,
- ensuring that we consider long term sustainability within our solutions and look for opportunities to phase investments where appropriate to manage uncertainty and/or bill impact for customers.

This document is just starting point and we recognise that we have a long journey ahead to develop our final DWMP – but it's a journey we are fully committed to making. There are some near term next steps that we are going to be taking in advance of AMP7 so we can continue to lead and inform the rest of the sector:

Next step	What we are going to do
Setting up Strategic Planning Groups (SPGs)	<ul style="list-style-type: none">• The SPGs will have a key role to play in informing and shaping our DWMP and therefore setting these up is going to be one of the first things we do following publication of the framework.• In late 2018 we intend to hold some stakeholder workshops to help us set co-create the terms of reference for our SPGs and raise awareness of the DWMP process.• We understand the pressures that both we and many of our stakeholders have around resourcing the SPGs and therefore we are going to look at ways in which we can integrate DWMPs into existing forums such as RFCCs and CaBA groups to reduce the burden and make the most of everyone's time.
Formalising our Strategic Catchment Planning Team	<ul style="list-style-type: none">• We have insourced some of the work that used to be completed by our specialist hydraulic modelling consultants. This has allowed us appoint four new Strategic Catchment Planner roles. It will be the responsibility of these Catchment Planners to be the expert on everything that is happening within their catchments and to liaise closely with stakeholders such as developers, local authorities and the Environment Agency to ensure that we take advantage of potential opportunities for collaboration.• We have appointed employees into these roles earlier this year and with the publication of the DWMP framework we will be formalising their role within the process.
Updating our assessments to take account of UKCIP18 data	<ul style="list-style-type: none">• In November 2018 the latest UK climate change impact predictions are set to be published by UKCIP.• Climate change is one of the largest areas of uncertainty in our future predictions and therefore we will need to assimilate the latest information published by UKCIP and update our climate change factors where required.
Undertaking the BRAVA stage of DWMP	<ul style="list-style-type: none">• The next stage of producing our DWMP is to undertake the baseline risk and vulnerability assessment (BRAVA) which will help us refine the outputs of our risk based catchment screening into a much more granular level of detail to dictate which catchments (or parts of catchments) should move forward to problem characterisation and options development and appraisal.• We intend to complete this assessment in 2019, a year ahead of the sector timeline.

ACRONYMS

21CDP	21st Century Drainage Programme
AMP	Asset Management Period or Plan
CaBA	Catchment Based Approach Groups
CAF	Capacity Assessment Framework
DAP	Drainage Area Plan
DEFRA	Department for Environment, Food and Rural Affairs
DSF	Drainage Strategy Framework
DWMP	Drainage and Wastewater Management Plan
LA	Local Authority
LDP	Local Development Plan
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
WINEP	Water Industry National Environment Programme
Ofwat	Water Services Regulation Authority
PR	Periodic/Price Review
PSG	Project Steering Group
RBD	River Basin District
RBMP	River Basin Management Plan
RFCC	Regional Flood and Coastal Committee
RMA	Risk Management Authorities
SOAF	Storm Overflow Assessment Framework
SPA	Strategic Planning Area
SuDS	Sustainable Drainage System
UKCIP09	UK Climate Projections 2009
UKCIP18	UK Climate Projections 2018
UKWIR	UK Water Industry Research Ltd
WRMP	Water Resources Management Plan
WFD	Water Framework Directive
WwTW	Wastewater Treatment Works

APPENDIX A: DETAILED LEVEL 2 ASSESSMENT

The objective of this appendix is to provide high level catchment summaries for each of the Level 2 Strategic Planning Areas. They also provide an overview of the Level 3 Tactical Planning Units which have been identified through the Risk Based Screening assessment as requiring a Baseline Risk and Vulnerability Assessment (BRAVA) in line with the DWMP Framework.

The DWMP Framework requires full BRAVA assessments to be undertaken on any catchment where the Risk Based Catchment Screening triggers a detailed assessment and option development. This process will involve close liaison with DWMP partners through the setting up of Project Steering Groups (PSG) to collectively understand the wider issues across catchments that fall within the scope of a DWMP to allow 25 year strategic options to be developed and appraised.

As set out in this DWMP our Sewerage Management Planning (SMP) programme has developed the tools and procedures necessary to inform the next stage of the DWMP programme for delivery by 2023 to inform PR24 business planning. Clearly the development of DWMP strategies for all catchments triggering BRAVA is not possible to meet PR19 submission milestones and collate existing SMP intelligence in a suitable format to align fully with the DWMP Framework, particularly with respect to valued input from Strategic Planning Groups (SPG). This DWMP 'Lite' appendix therefore provides an overview of issues within on our larger Level 3 Tactical Planning Units, which for most Strategic Planning Areas (SPA) this has focused on our principle WwTW catchment with an equivalent population over 50,000, with a lower threshold of 20,000PE for some of our smaller SPAs.

Each part of this appendix is aimed at providing background to each SPA and an initial indication of partners expected to input into SPGs. This is non-exhaustive and it is expected that membership of each will evolve once groups are established to begin the collation and scope of each SPA needs DWMP. Whilst the organisational structure and meeting forum of SPGs is yet to be determined we are envisaging SPGs will be established early in 2019 to ensure early engagement can start to deliver collaborative outcomes and strategies for collation into our PR24 DWMP.

Appendix Structure

Ref	SPA Name
A.1	Upper Severn
A.2	Tern
A.3	Teme
A.4	Upper Trent
A.5	Dove
A.6	Derwent
A.7	North Notts
A.8	Lower Trent
A.9	Soar
A.10	Trent Confluence
A.11	Central
A.12	Avon
A.13	Middle Severn
A.14	Lower Severn



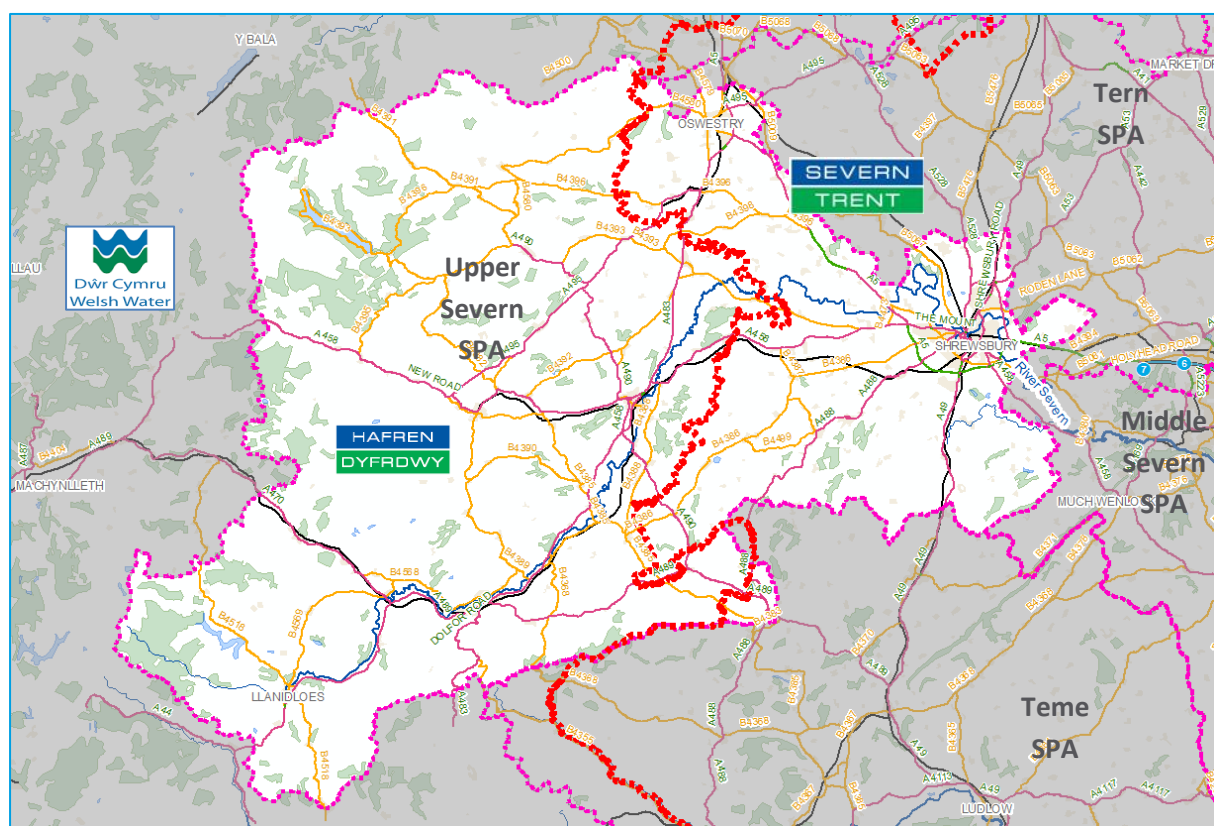
Appendix A1:

Upper Severn Strategic Planning Area

1: Background

The L2 area covers the Severn Upland River Basin Management Catchment (RBMCM) area which includes the upper section of the River Severn and the River Perry. The catchment covers both Severn Trent and Hafren Dyfrdwy with the principle urban conurbations being Shrewsbury, Oswestry, Newtown and Welshpool.

This area serves a population of approximately 177,000 people, around 1.7% of the Severn Trent total. NOTE: The Hafren Dyfrdwy boundary is shown in red on the map below.



Overview of the Upper Severn Strategic Planning Area

There are 79 WwTW across the Upper Severn SPA of which one serving a population of over 50,000 people; Monkmoor (Shrewsbury). However the catchment is very rural in nature with 91% of the area's population draining to small WwTW serving less than 2000 people (See Appendix B.1 for details).

The catchment covers four principle local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Shrewsbury and Atcham	71%
Oswestry	64%
Powys	34%
South Shropshire	12%

In terms of Environment Agency regions the Upper Severn SPA falls within their West region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (West Area)
- English Severn and Wye RFCC
- Shropshire LLFA
- Shrewsbury and Atcham, Oswestry, Powys and South Shropshire authorities.
- Severn Uplands CaBA Group (Catchment Based Approach)

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs from the RBCS for catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
MONKMOOR	89,719																	

RBCS outputs for Upper Severn SPA for catchments over 50,000PE

3: TPU assessment overview

Monkmoor WwTW

The catchment principally drains Shrewsbury with some of the outlying villages pumped into the catchment before drain to the Monkmoor WwTW, which is located to the east of the town centre. Monkmoor WwTW is the largest treatment works in the Upper Severn SPA and the 23rd largest across Severn Trent.

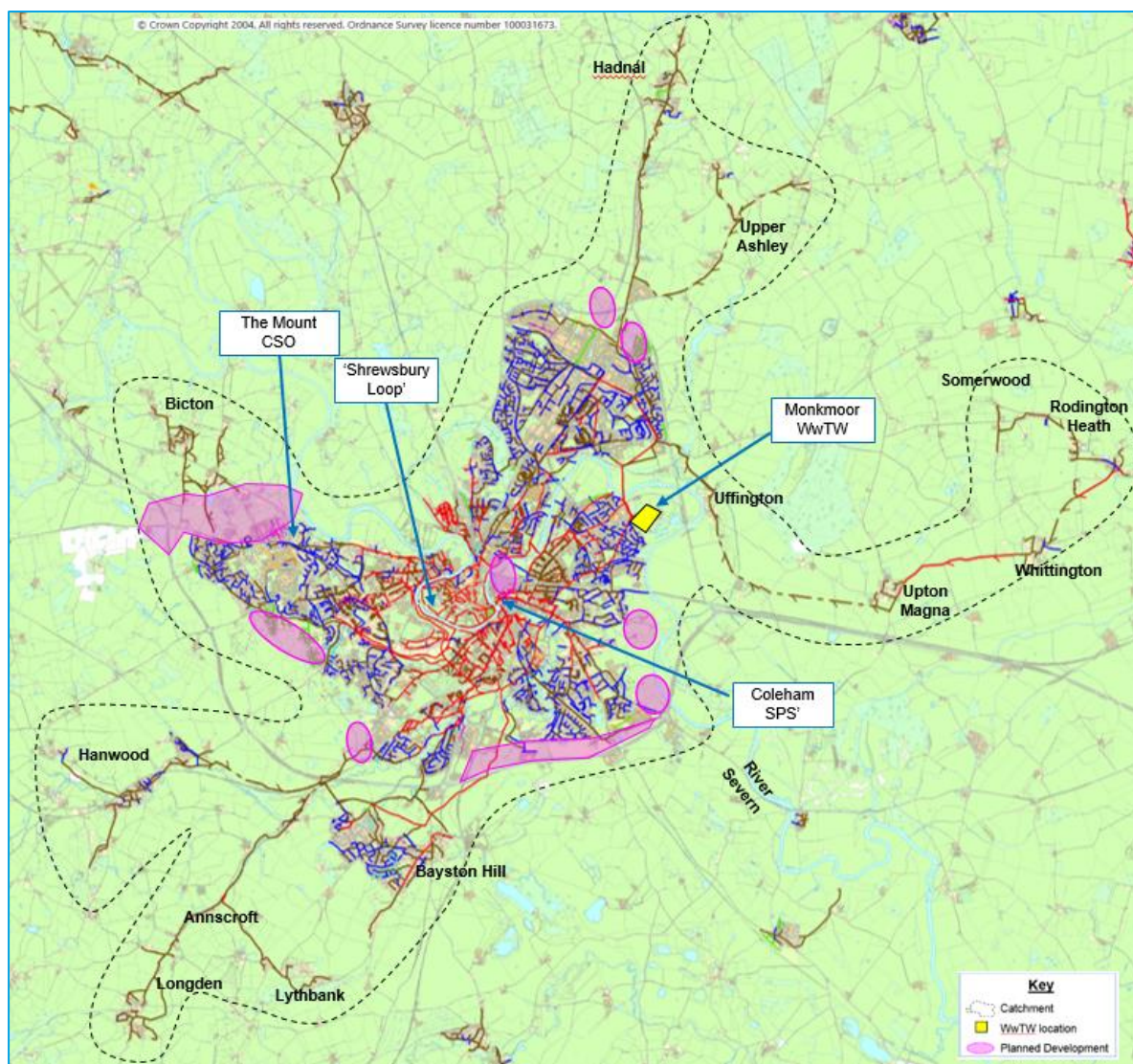
The majority of this catchment lies within the Severn Uplands RBMC area however as parts of the wastewater network to the north-east of the town centre fall within the Severn Middle Shropshire RBMC the Upper Severn SPA boundary has been realigned to ensure the whole of the Monkmoor WwTW catchment is covered under a single DWMP area.

Our discussions through the development of the Shropshire Local Plan (2006-2026) has identified proposals to build an additional 6,500 dwellings and 90ha of employment area across the catchment, principally located to the south east of the catchment. Our capacity assessment process has indicated that localised sewer upgrade improvement work will be required to accommodate this level of new development and funding to provide these upgrades have been included in our PR19 Plan.

There are several flooding risks across the catchment, however, these are relatively isolated and have been attributed to local capacity issues. A study to consider the impact of this is currently being undertaken. With regard to interaction with other risk management authority assets there are known interactions between the sewerage network and the River Severn within the “Shrewsbury Loop”. During times of high river water levels the River Severn can inundate our assets through combined sewer outfalls (CSOs) which can limit capacity during storm conditions. Particular issues are currently being investigated with regard to a CSO located at ‘The Mount’ CSO and a pumping station known as ‘Bicton Shepherd’s Lane SPS’.

A catchment strategy has been developed and includes various strategic concept solutions, including rationalisation of the ‘Shrewsbury Loop’ CSO river interactions and accommodation of sustainable urban extension development allocations to the south and north of the catchment.

As part of the PR19 WINEP works are being proposed to improve phosphate effluent performance to 1 mg/l. This work being planned for completion by December 2024.



Overview of the Monkmoor WwTW catchment

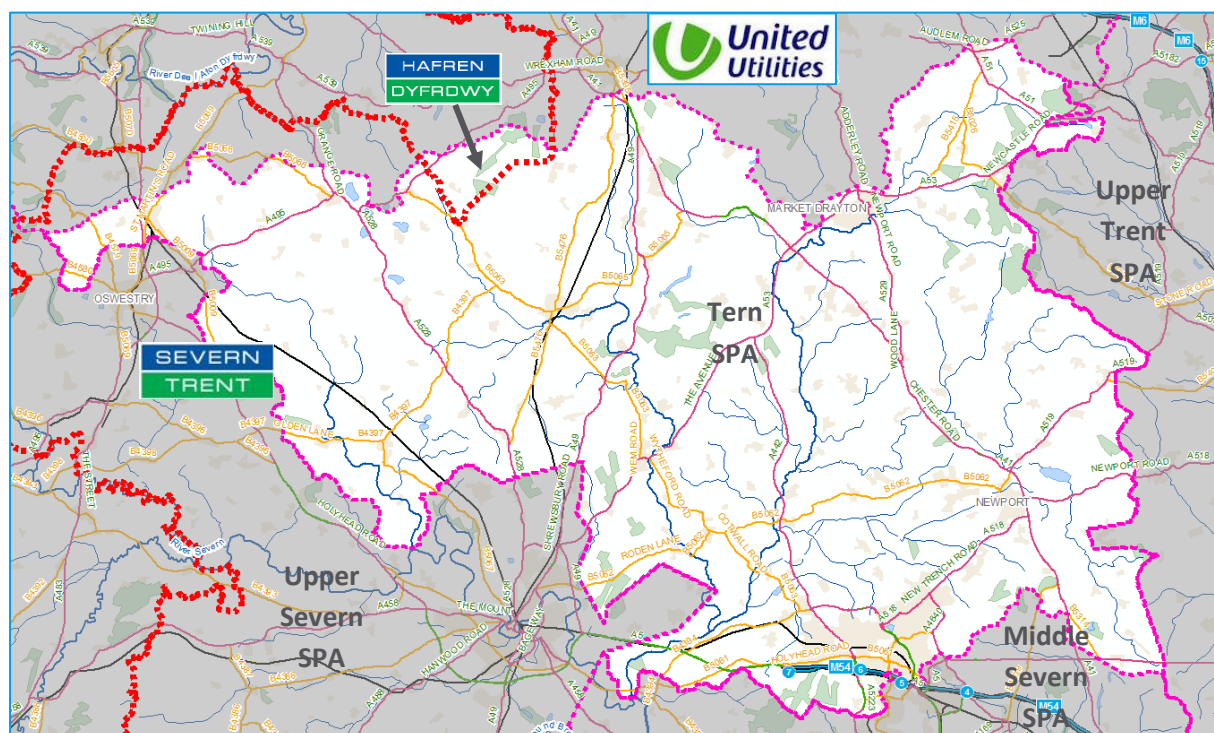
Appendix A2:

Tern Strategic Planning Area

1: Background

The L2 area principally covers the Severn Middle Shropshire River Basin Management area including the River Tern and River Roden. The catchment covers both Severn Trent and Hafren Dyfrdwy (albeit there are no sewers in the Hafren Dyfrdwy area) with the principle urban conurbations being Telford North (note Telford is served by two WwTW), Newport and Market Drayton.

This areas serves a population of approximately 206,000 people, around 2.0% of the Severn Trent total.



Overview of the Tern Strategic Planning Area

There are 91 WwTW across the Tern SPA of which only one serves a population of over 50,000 people; Rushmoor (North Telford). However the catchment is very rural in nature with 91% of the area's population draining to 82 small WwTW serving less than 2000 people (See Appendix B.2 for details).

The catchment covers four principle local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
The Wrekin	81%
North Shropshire	80%
Newcastle-under-Lyme	26%
Oswestry	26%
Stafford	14%
Shrewsbury and Atcham	7.2%
South Staffordshire	4.6%

In terms of Environment Agency regions the Tern SPA falls within their West region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (West Area)
- English Severn and Wye RFCC
- Shropshire LLFA & The Wrekin LLFA
- The Wrekin, North Shropshire, Newcastle-under-Lyme, Oswestry, Stafford, Shrewsbury and Atcham & South Shropshire authorities.
- Severn Middle Shropshire CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs from the RBCS for catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
RUSHMOOR	139,148																	

RBCS outputs for Tern SPA for catchments over 50,000PE

3: TPU assessment overview

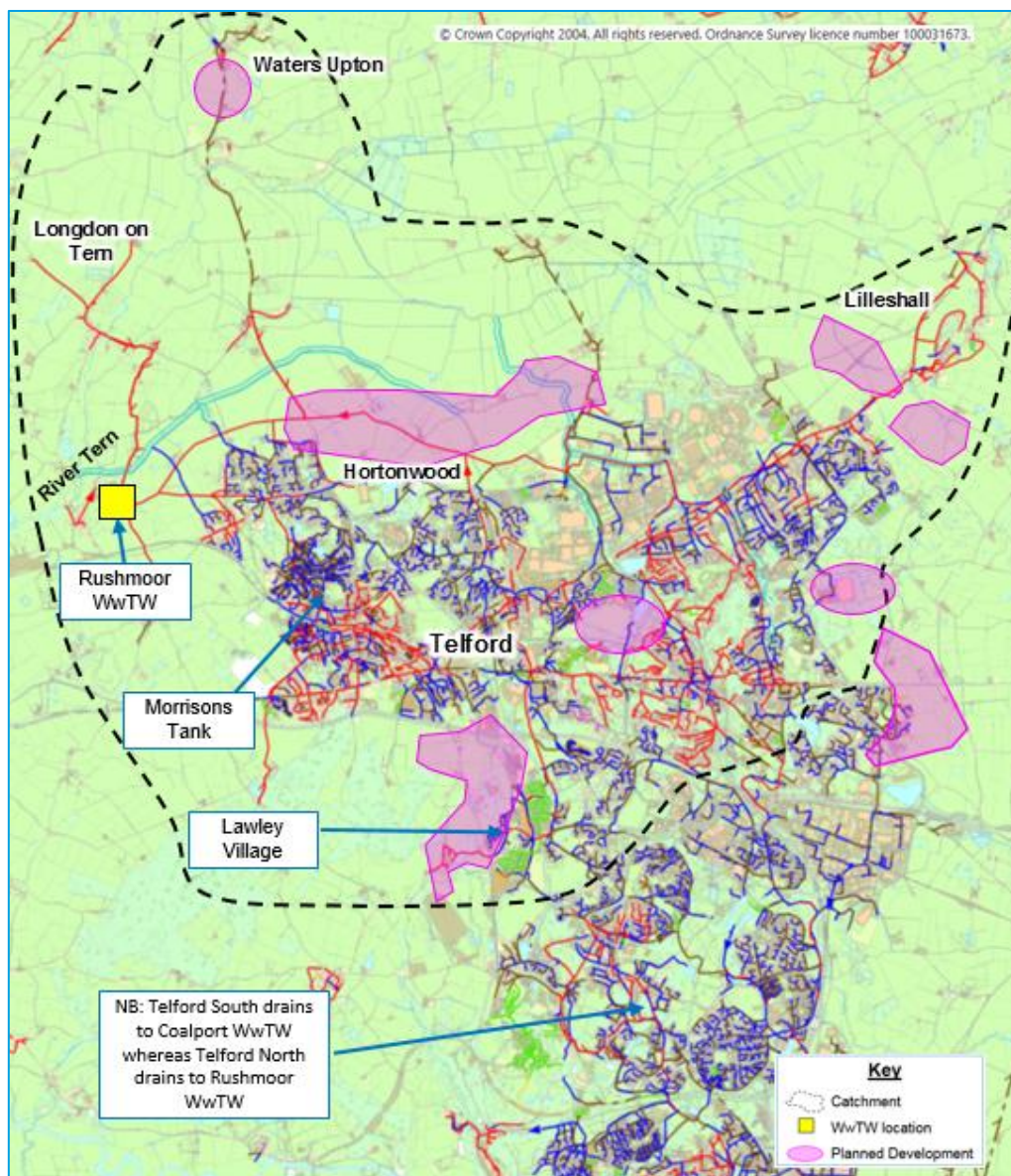
Rushmoor WwTW

Our Rushmoor WwTW is located to the north west of Telford and serves the around 2/3rds of the town's population. The treatment works is the 12th largest facility across Severn Trent.

The main ongoing issue in the catchment relates to the 'Morrison's Tank' and associated flooding. Closer investigations have identified a number of issues with this tank, and it is now understood that some of the flooding in this area is not linked to the problems with the tank. Successful trials have been recently undertaken to dose specialist enzymes to reduce FOG issues in the tank, and further investigations into the problems are ongoing. This will include consideration of the potential for surface water separation upstream of the storage tank to help alleviate ongoing issues.

Population growth presents a risk, with a large development being built in multiple phases at Lawley Village. There are concerns that flows from this region will be restricted where it crosses beneath the M54. Telford is the primary focus for growth in the Telford & Wrekin Local Plan 2011-2031. It is outlined that 14,950 new dwellings will be constructed across Telford prior to 2031, with significant increases in employment areas. This development will be likely be split between Rushmoor WwTW and Coalport WwTW (which serves the southern part of Telford and is located within the Middle Severn SPA), and consideration could be given to balancing flows between the two catchments where appropriate. The Telford & Wrekin Local Plan does not detail the specific sites of proposed growth. A broad strategy has been developed which

includes promotion of a solution for Morrison's Tank, the growth impact on the trunk sewer and mitigation of localised growth, flooding and pollution risks.



Overview of the Rushmoor WwTW catchment

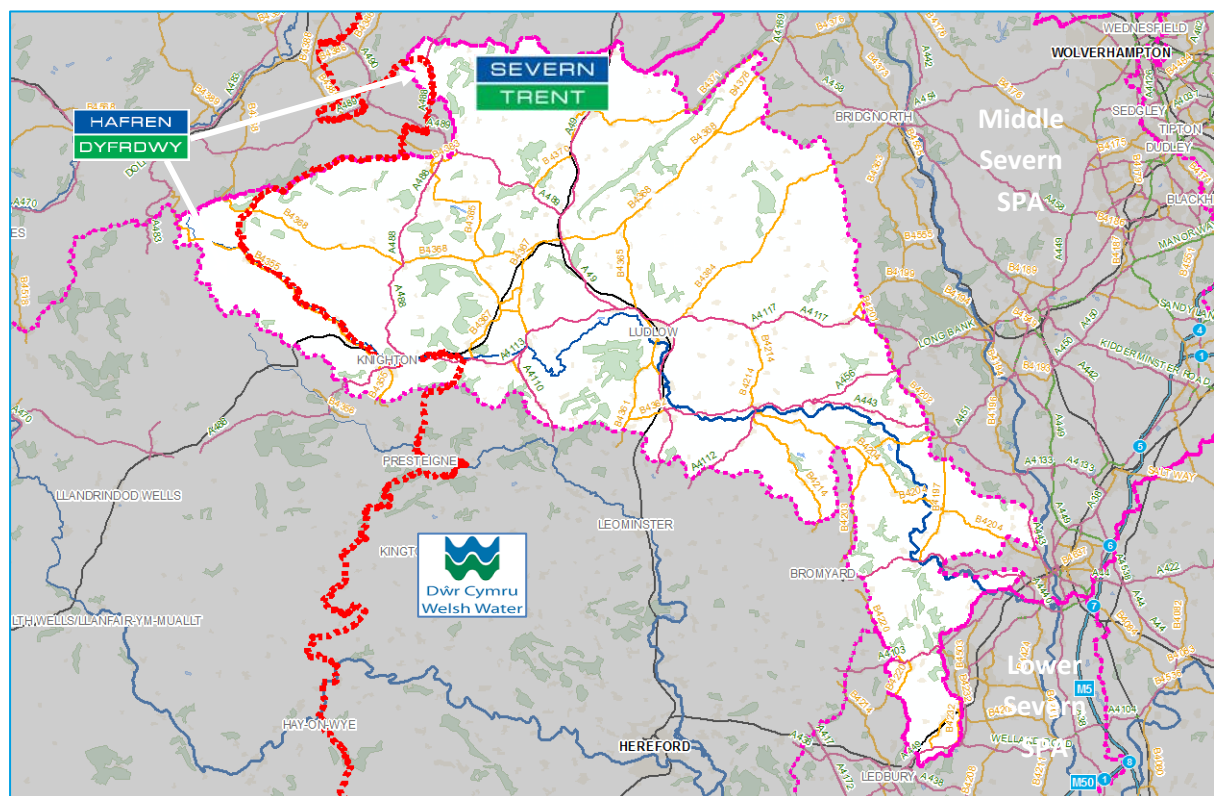
Appendix A3:

Teme Strategic Planning Area

1: Background

The L2 area principally covers the Teme RBMC area including the River Teme. The catchment covers both Severn Trent and Hafren Dyfrdwy with the principle urban conurbations being Tenbury and Ludlow.

This areas serves a population of approximately 70,000 people which is less than 1% of the Severn Trent total.



Overview of the Teme Strategic Planning Area

There are 71 WWTW across the Teme SPA of which two serve a population of over 10,000 people; Tenbury and Ludlow. However the catchment is very rural in nature with 90% of the area's population draining to 64 small WWTW serving less than 2000 people (See Appendix B.3 for details).

The catchment covers two principle and four secondary local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
South Shropshire	87%
Malvern Hills	42%
Bridgnorth	19%
Hereford	12%
Shrewsbury and Atcham	4.3%
Powys	2.2%

In terms of Environment Agency regions the Teme SPA falls within their West region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (West Area)
- English Severn and Wye RFCC
- Shropshire LLFA
- Planning authorities in the table above.
- Teme CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 10,000 population (No catchments over 50,000PE).

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
TENBURY	25,048																	
LUDLOW	12,392																	

RBCS outputs for Teme SPA for catchments over 10,000PE

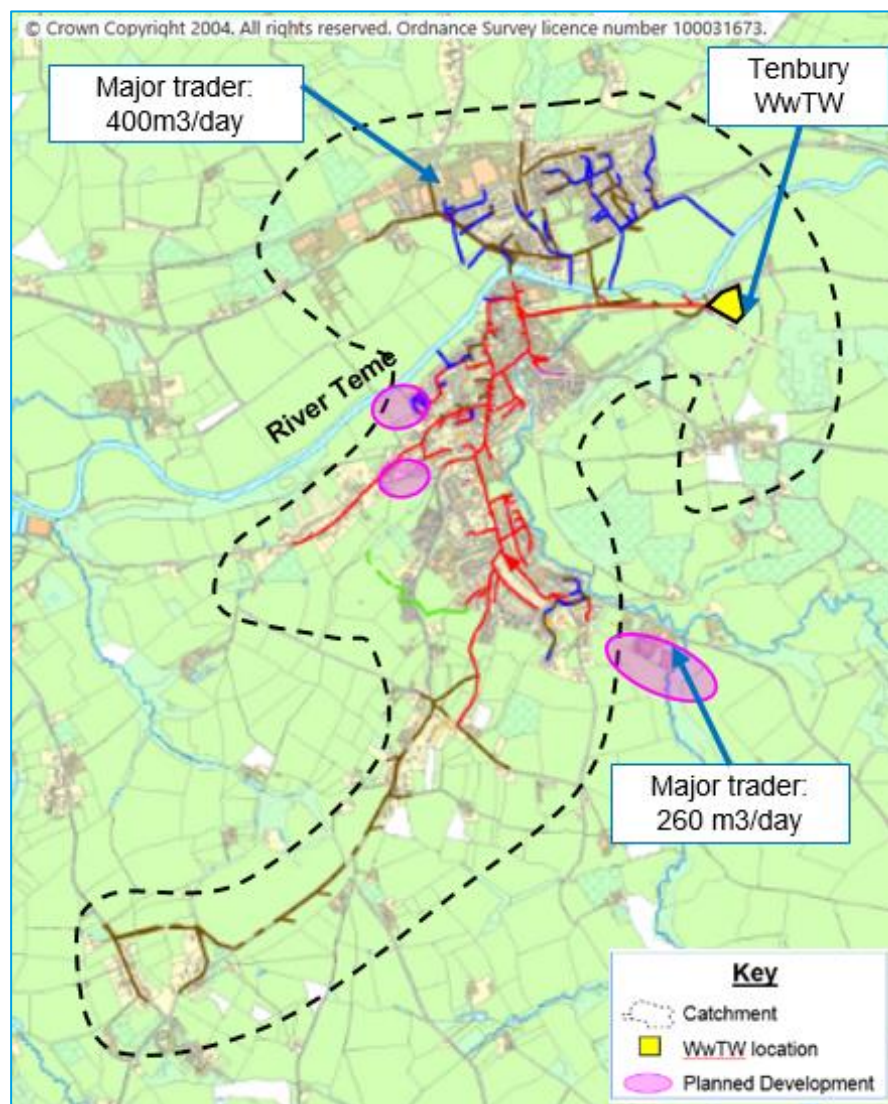
3: TPU assessment overview

Tenbury WwTW

Whilst Tenbury is the largest WwTW within the Teme SPA it only serves a population of around 25,000PE with all flows being pumped to the treatment facility located to the east of the town centre. It is our 67th largest treatment works.

The catchment generally performs well with no reported hydraulic flooding issues, albeit the RBCS indicates higher than expected external flood risk in the catchment due linked to blockage issues. There have also been some issues associated with incidents which occurred as a result of rising main bursts but new pumps have been installed to help remedy these issues.

The Local Plan proposes site allocations for 162 dwellings within the Tenbury Wells catchment and whilst local capacity upgrades may be required these will be assessed as part of our normal developer enquiry processes. In addition, there are allocations for Tenbury Business Park and Town Centre Regeneration. A strategy for the impact of these development will be investigated when the catchment is made “Live” by 2020.



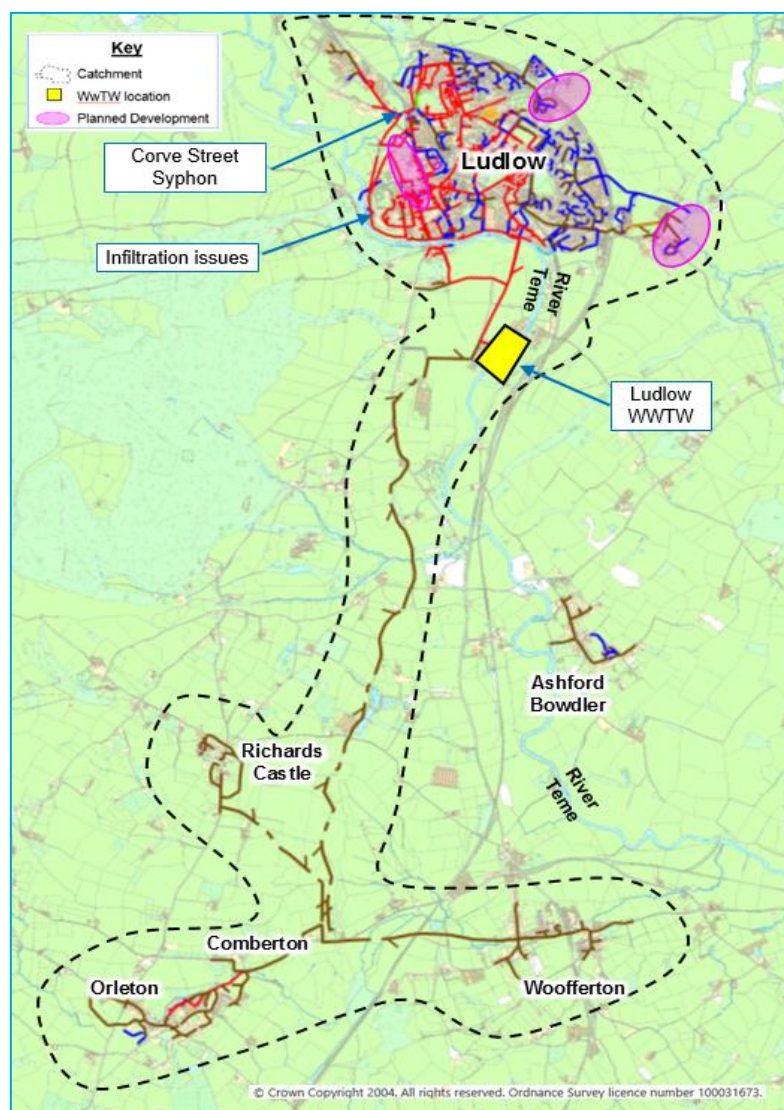
Overview of the Tenbury WwTW catchment

Ludlow WWTW

The town of Ludlow is situated adjacent to the River Teme with its treatment works being located to the south of the catchment.

Several flooding issues are spread across the Ludlow catchment. These are generally localised problems and are being investigated. The main flooding issue in the catchment relates to the Corve Street syphon, which has been identified as a contributing factor to moderate flooding and pollution risks in the area. The two areas of flooding associated with this syphon have been promoted, and flood alleviation schemes are currently in development. Infiltration is an issue in the catchment, especially on the trunk sewer. A small scheme was previously implemented to seal some of the major points, but proximity to the river means this is likely to be an ongoing issue due to the high-groundwater table. Odour complaints have been reported in the Squirrel Lane area, in the same vicinity of flooding and growth drivers. A route cause analysis of the main drivers within the catchment has been undertaken and a strategy is currently being considered.

In terms of development, Ludlow is expected to see significant population growth. The Shropshire Local Plan (SAMDev) specifies a total of 875 new dwellings and at least 6ha of employment land between 2006 and 2026. Development is planned for Sheet Road may prove problematic due to ongoing flooding issues in the area and so capacity upgrades are envisaged. The addition of development flow will increase flood risk if the flooding issues are not resolved prior to the development being connected. As part of our ongoing sewerage management planning process options are currently being assessed to develop mitigation options ahead of a capacity project being promoted.



Overview of the Ludlow WwTW catchment

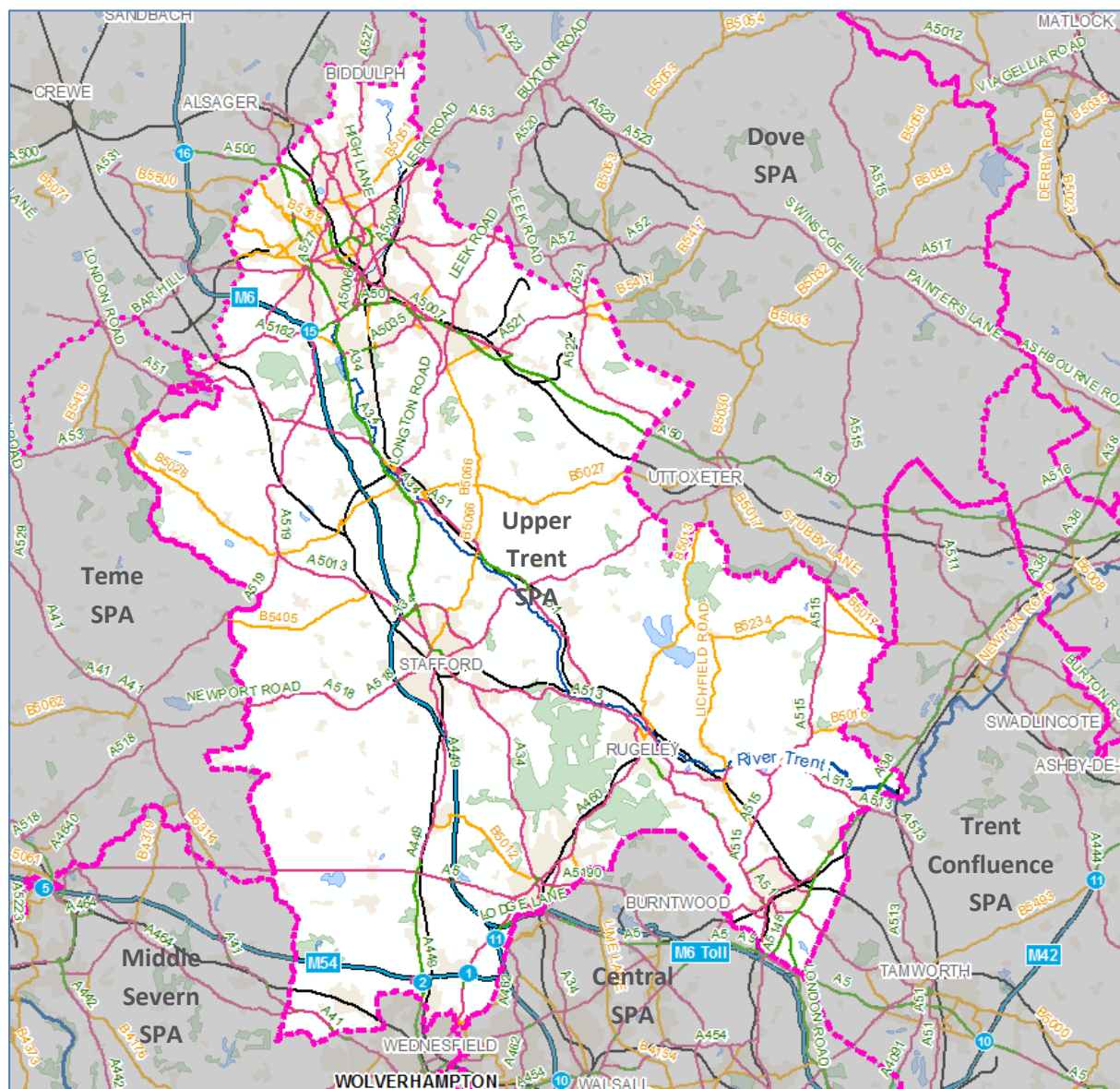
Appendix A4:

Upper Trent Strategic Planning Area

1: Background

The L2 area principally covers the Trent Valley Staffordshire RBMC area principally based on the upper reaches of the River Trent and its tributaries. The principle urban conurbations being Stoke-on-Trent, Stafford, Cannock, Rugeley and Lichfield.

This areas serves a population of approximately 715,000 people which represents around 7% of the Severn Trent total.



Overview of the Upper Trent Strategic Planning Area

There are 59 WwTW across the Upper Trent SPA of which three serve a population of over 50,000 people; Strongford (serving Stoke-on-Trent and Newcastle-under-Lyme), Brancote (serving Stafford), and Cannock. Parts of the catchment are rural in nature with 73% of the area's population draining to 34 small WwTW serving less than 2000 people (See Appendix B.4 for details).

The catchment covers nine local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Stoke-on-Trent	100%
Stafford	86%
Cannock Chase	72%
South Staffordshire	51%
Lichfield	42%
East Staffordshire	39%
Newcastle-under-Lyme	35%
Staffordshire Moorlands	17%
Wolverhampton	7.3%

In terms of Environment Agency regions the Upper Trent SPA falls within their Central region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (Central Area)
- English Severn and Wye RFCC
- Staffordshire LLFA
- Planning authorities in the table above.
- Trent Valley Staffordshire CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
STRONGFORD	355,993																	
BRANCOTE	72,954																	
CANNOCK	62,737																	

RBCS outputs for Upper Trent SPA for catchments over 50,000PE

3: TPU assessment overview

Strongford WwTW

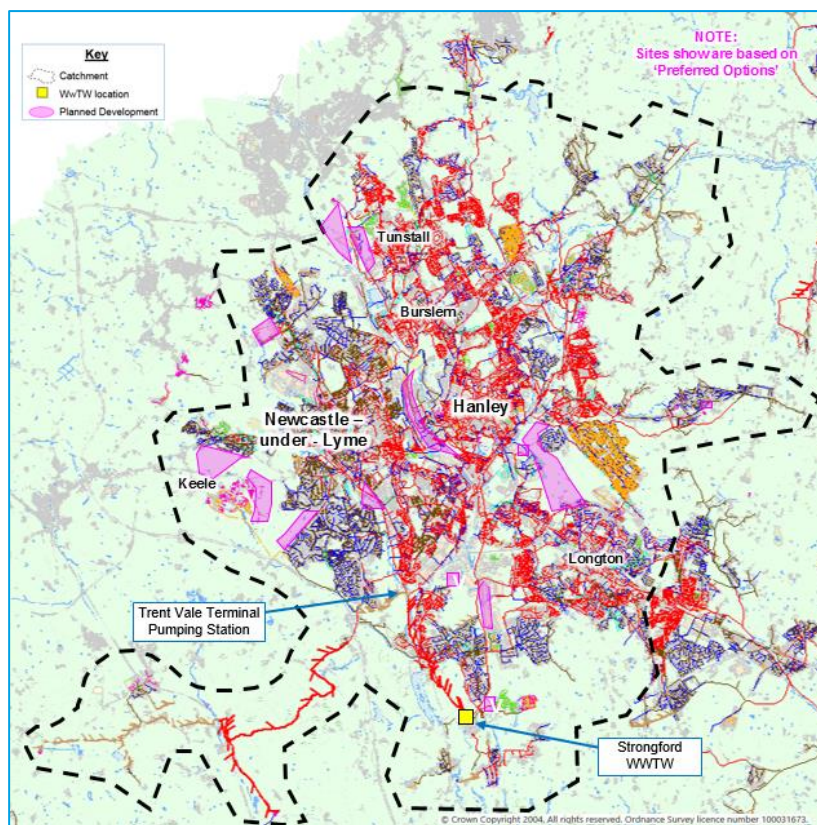
Strongford is our 6th largest WwTW and serves the conurbations of Stoke-on-Trent and Newcastle-under-Lyme. The facility is located to the south of the city to the west of Barlaston village and adjacent to the River Trent.

Stoke-on-Trent are in the process of producing a joint local plan with neighbouring planning authority Newcastle-under-Lyme Borough Council. Currently they are preparing a full draft joint local plan which will take into account representations received as part of Preferred Option(s) and will set out fully the spatial proposals along with supporting planning policies. Consultation on the Full Draft Plan will be held during November/December 2018. Large residential developments are being considered at Keele Golf course (1800 dwellings), Berryhill (1300 dwellings), College Road (800 dwellings), Whitmore road (500 dwellings), with large employment developments at Chatterley Valley (27.5 Ha), Etruria Valley (20 Ha), Keele Science Park & New Dev (24.5 Ha) and former Tunstall WWTW (10 Ha).

There are 315 known flood risk locations across the catchment, of which 62 of which are currently being addressed with capital investment. As part of long term strategy to alleviate capacity issues in the catchment there is a focus on surface water separation. Investigations to date have identified 160 hectares of contributing area from surface water sources which drain to the foul/combined network with major clusters in Burslem (totalling 16.6Ha) and also around Hanley (totalling around 45Ha). As part of a partnership with Environment Agency and Stoke City Council we are looking to target surface water management pilots across the catchment. This will benefit both sewer capacity plus alleviate surface water flood risk. As part of our PR19 plan we are intending to target surface water inundation and infiltration issues.

We are aware of historic issues with CSO operation, particularly with a frequent large spilling CSO located at Birches Head to the north east of the catchment, a CSO on the site of a former WwTW at Burslem and a major CSO at Etruria Vale. Ongoing water quality modelling is being used to understand interactions with the sewerage capacity and water quality to inform planned improvement strategy in AMP7 to alleviate WFD drivers:

There are eight sites identified across the catchment for SOAF assessments.



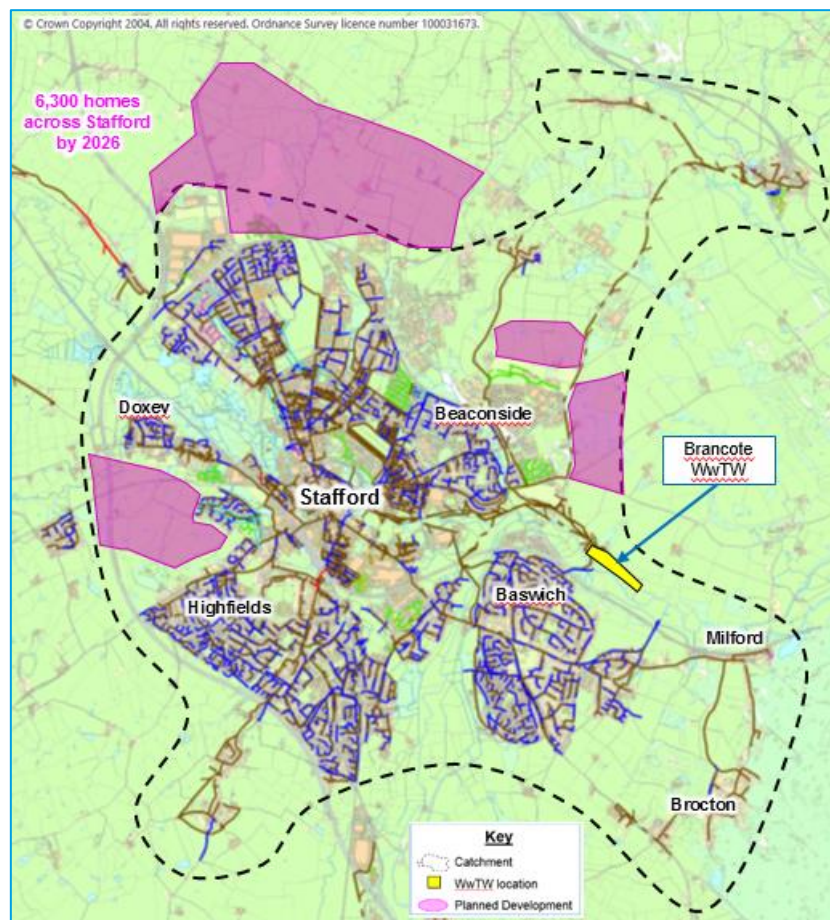
Overview of the Strongford WwTW catchment

Brancote WwTW

Brancote sewage treatment works is located to the east of Stafford with the majority of incoming flows being pumped.

There has been good levels of liaison with Stafford Borough Council with upgrades already in place to accommodate their adopted 'Plan for Stafford Borough 2011-2031' (adopted June 2014) and 'Plan for Stafford Borough Part 2' (adopted January 2017) comprising 6,300 new dwellings and 75ha of commercial developments across Stafford by 2026. Significant investment has resulted in the completion of a strategic solution involving the transfer for the northern part of the catchment direct to Brancote WwTW. This has released capacity within the existing system to accommodate planned allocations to the west of the town centre. Ongoing discussions are taking place regarding their Local Plan Review in July 2017 to setting out the long-term spatial vision and strategy for the Borough.

Of the 101 known flood risk locations across Stafford, 37 are currently being addressed with capital investment.



Overview of the Brancote WwTW catchment

Cannock WwTW

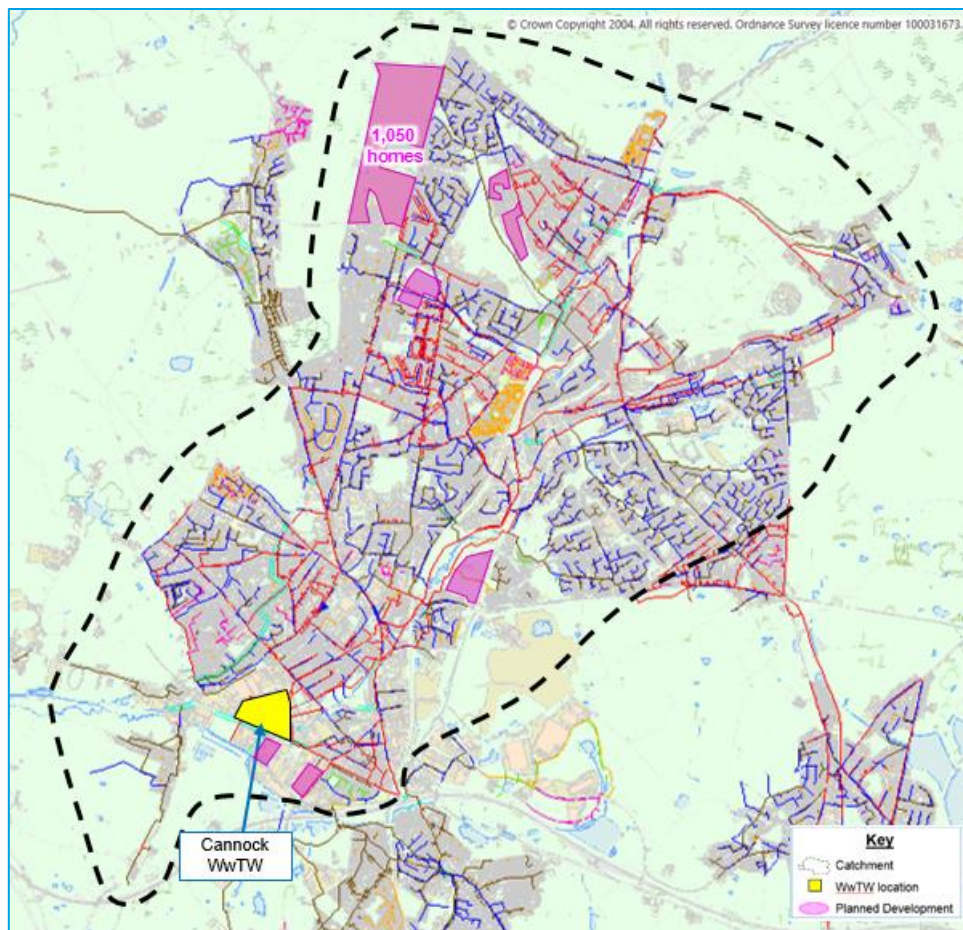
Our Cannock WwTW principally serves Cannock and Hednesford and is located to the south of the catchment.

Cannock Chase District Council are starting the production of a new Local Plan which will utilise the work to be carried out to date on Local Plan Parts 1 and 2 and incorporate any areas which need reviewing and updating. Sewer capacity improvement works are ongoing to accommodate 1050 dwellings at Pye Green.

There are 100 known flood risk locations, 24 of which are currently being addressed with capital investment.

Cannock WWTW discharges into Saredon Brook from Source to River Penk which is WFD status "moderate" due to organic pollution and phosphate as a result of continuous sewage discharge. Improvement works are planned within the AMP7 WINEP programme to address these issues.

Across the catchment there could be up to 12.6Ha of contributing area from the highway connected into the foul/combined network which could be separated. This option is due to be considered ahead of the PR24 DWMP.



Overview of the Cannock WwTW catchment

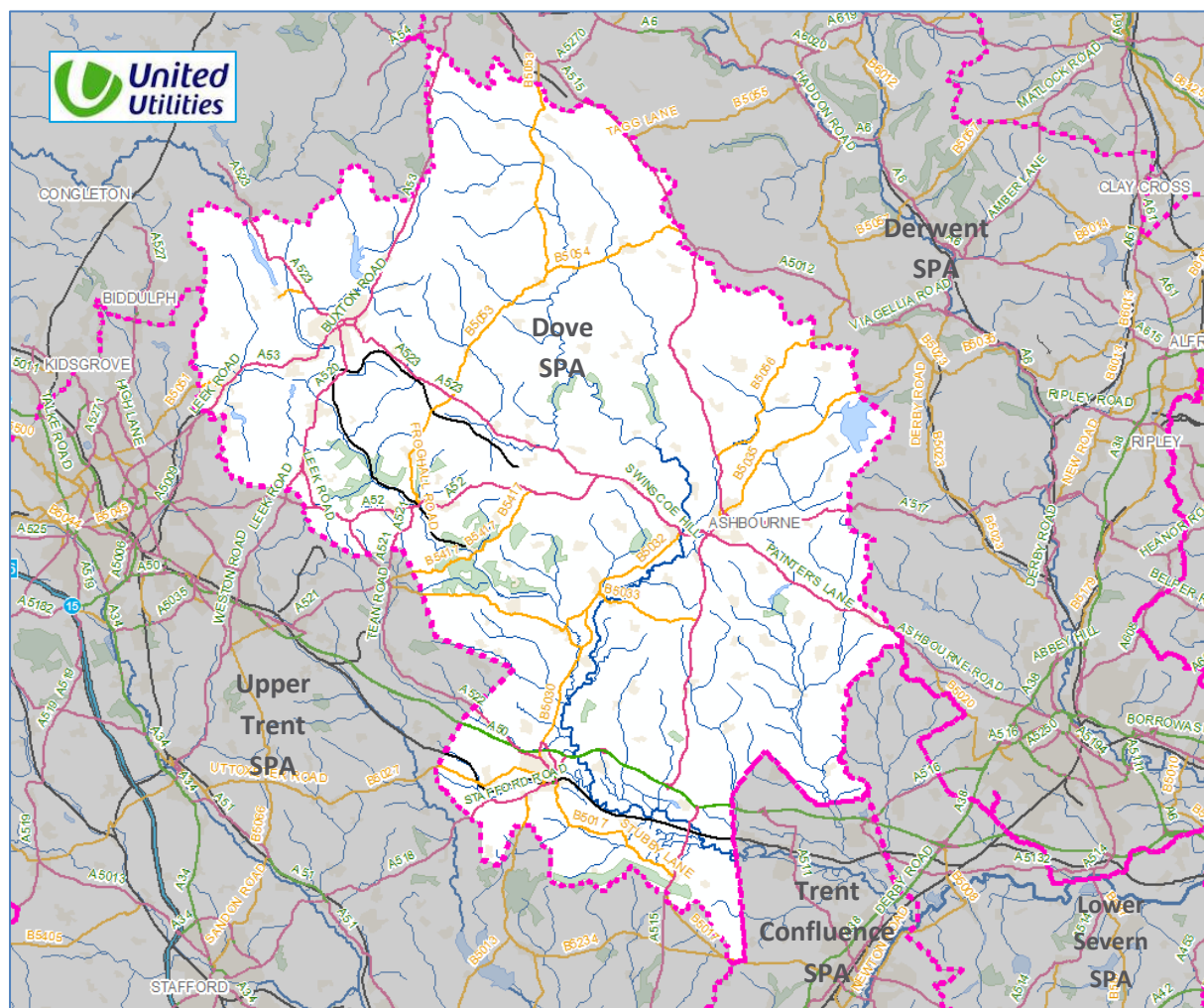
Appendix A5:

Dove Strategic Planning Area

1: Background

The L2 area principally covers the Dove RBMC area principally based on the River Dove and its tributaries. The principle urban conurbations being Leek, Uttoxeter and Ashbourne.

This areas serves a population of approximately 122,000 people which represents just over 1% of the Severn Trent total.



Overview of the Dove Strategic Planning Area

There are 38 WwTW across the Dove SPA of which three serve a population of over 10,000 people; Leek, Uttoxeter and Ashbourne (there are no catchment in excess of 50,000PE). Parts of the catchment are rural in nature with 84% of the area's population draining to 32 small WwTW serving less than 2000 people (See Appendix B.5 for details).

The catchment covers five local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Staffordshire Moorlands	73%
Derbyshire Dales	40%
East Staffordshire	38%
South Derbyshire	6.6%
High Peak	1.6%

In terms of Environment Agency regions the Dove SPA falls within their Central region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (Central Area)
- River Trent RFCC
- Staffordshire LLFA and Derbyshire LLFA
- Planning authorities in the table above.
- Dove CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 20,000 population (No catchments over 50,000PE).

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
LEEK	44,589	Green	Green	Green	Red	Green	Red	Red	Green	Green	Green	Red	Green	Red	Red	Green	Red	Red
UTTOXETER	34,660	Green	Green	Green	Green	Red	Green	Green	Red	Green	Red	Green	Green	Red	Red	Green	Red	Red
ASHBOURNE	20,090	Green	Green	Green	Green	Red	Red	Red	Red	Green	Green	Green	Green	Red	Red	Green	Green	Red

RBCS outputs for Dove SPA for catchments over 20,000PE

3: TPU assessment overview

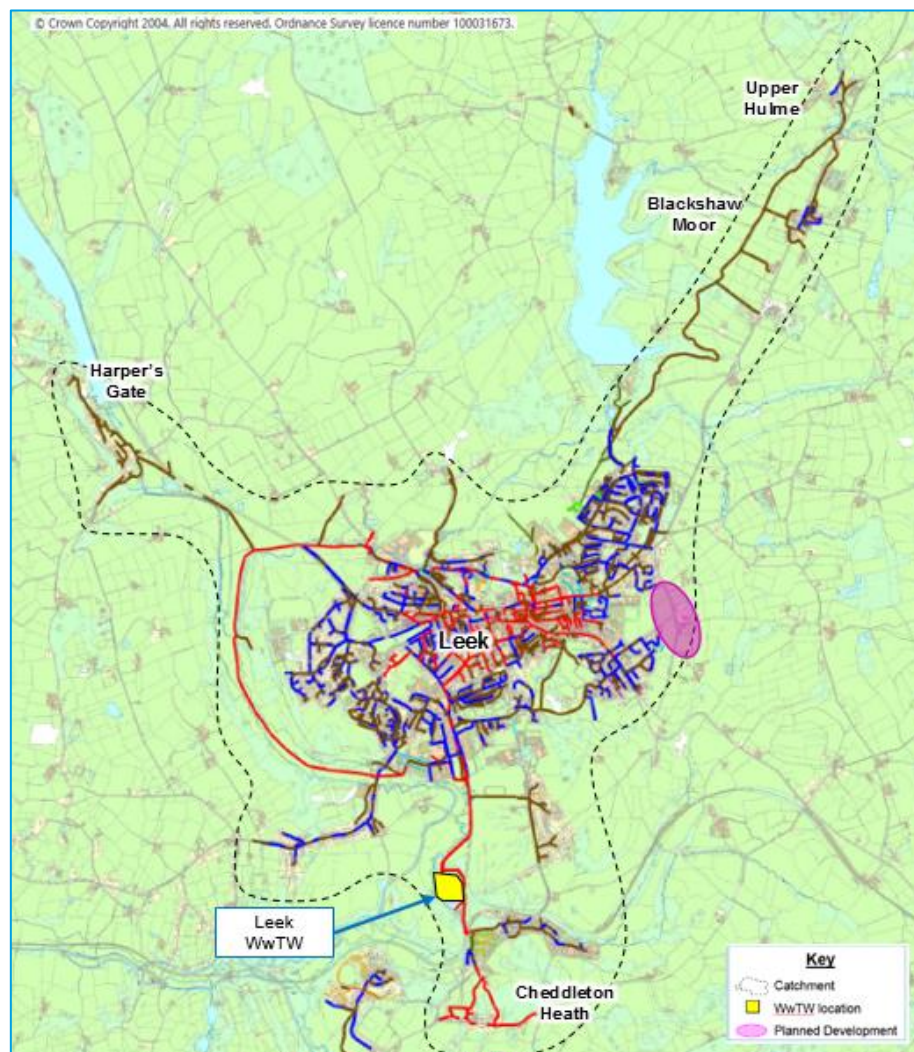
Leek WwTW

Leek is the largest WwTW in the Dove SPA and is located to the south of the catchment immediately adjacent to the River Churnet.

Staffordshire Moorlands Council are currently working on a new Local Plan with consultations on a submission version finishing in April 2018.

Leek WwTW and the majority of catchment overflows discharge to Churnet from Meerbrook to Leekbrook which is WFD status "moderate" due to impoundment from water storage. There are also some catchment overflows which discharge to basin Churnet from Endon Brook to Consall which is also "moderate" but due to either groundwater abstraction or continuous rather than intermittent discharge. Three CSOs are subject to ongoing Sewer Overflow Assessment Framework assessments.

Across the catchment there could be up to 22Ha of contributing area from the highway connected into the foul/combined network which could be separated. There is 4.14Ha of separated area which then discharges into the foul/combined network around Broad Street, 2.2Ha at Stockwell Street and some other smaller areas. As part of our PR24 DWMP further work is planned to identify potential opportunities for catchment separation.



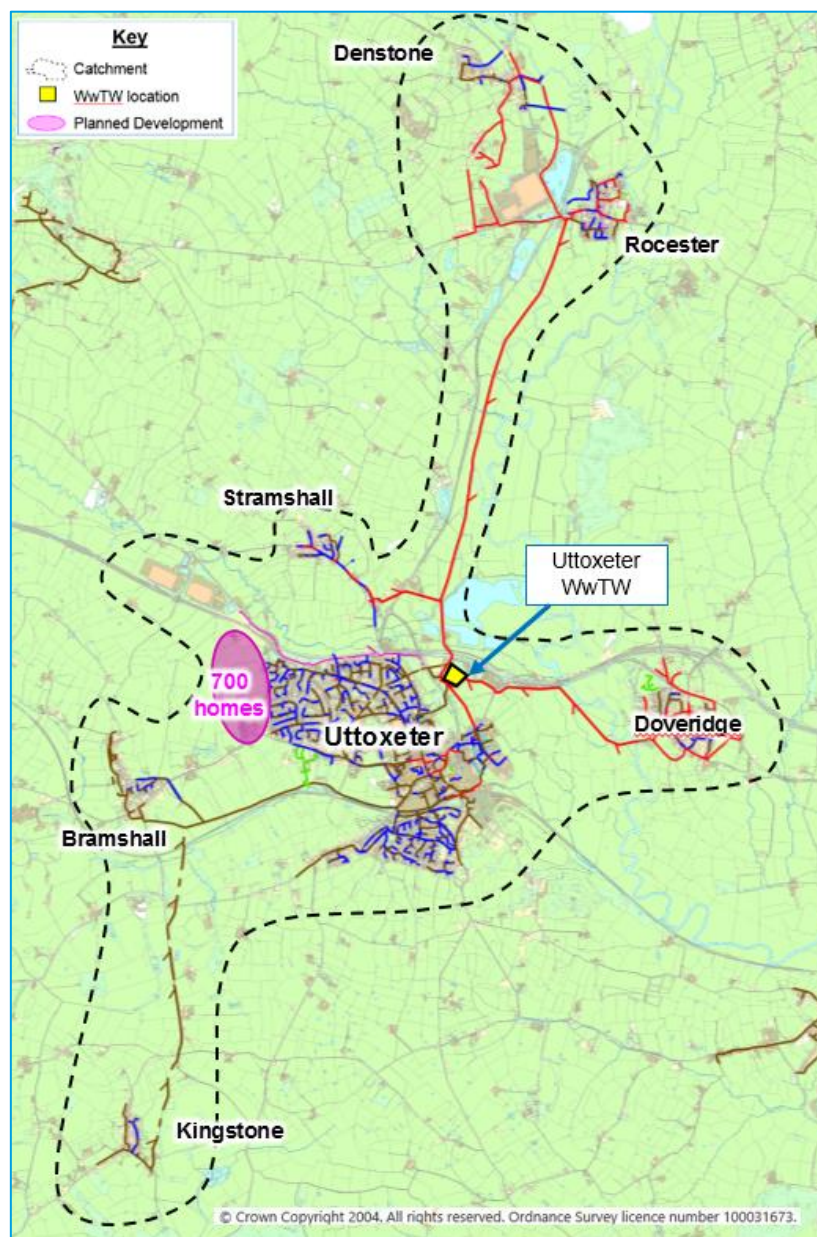
Overview of the Leek WwTW catchment

Uttoxeter WwTW

Uttoxeter WwTW is located to the east of the catchment. It serves the town of Uttoxeter plus the JCB factory/distribution centre.

East Staffordshire Borough Council has now adopted the Local Plan which has a plan period of 2012 to 2031. An ongoing sewer capacity project is underway to accommodate 700 dwellings plus school to the west of Uttoxeter. By working closely with the developer a connection strategy has been developed to enable all 700 dwellings to connect via a pumped system into Byrd's Lane, with Severn Trent contributing towards the extension of the rising main and any pump upsizing to avoid connecting to a smaller pumped catchment. This option also potentially offers the future potential to integrate this smaller pumped into the new development.

Uttoxeter WTW discharges into Tean from Cheadle Catchment to River Dove which has a WFD status "poor" due to phosphate pressure from continuous discharges. Planned WINEP upgrades at Uttoxeter WwTW are planned to alleviate this issue.



Overview of the Uttoxeter WwTW catchment

Ashbourne WwTW

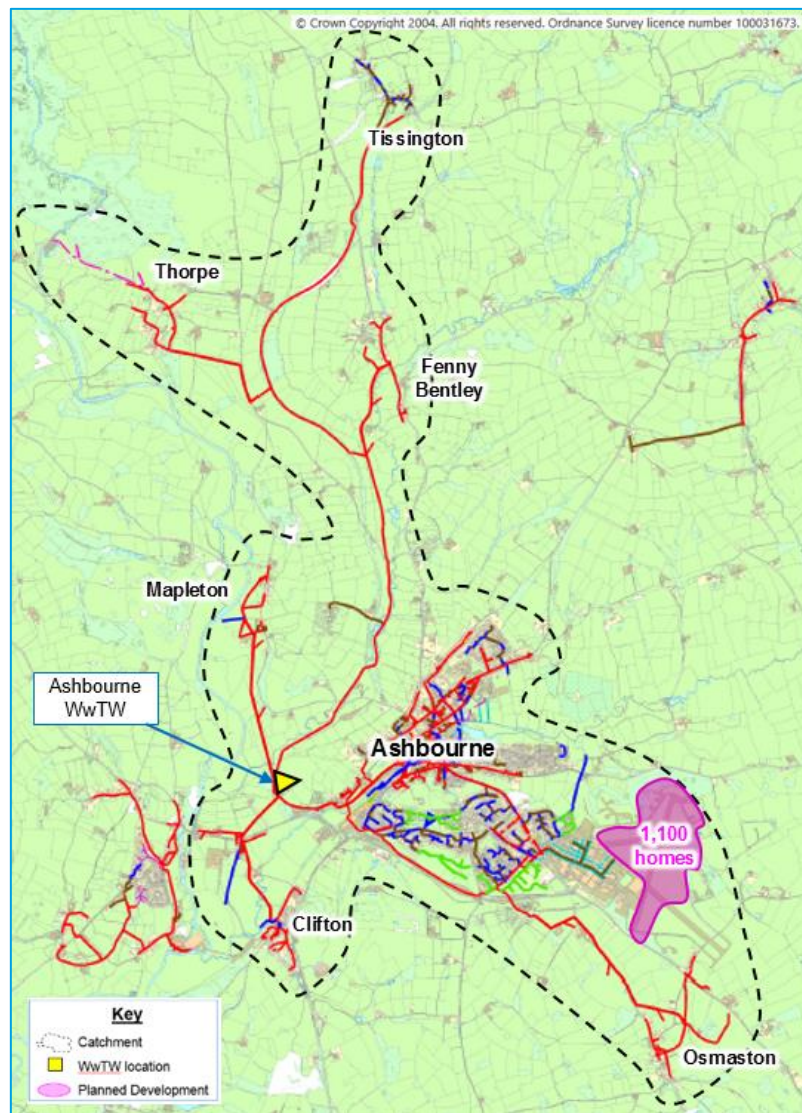
Located to the south west of the town centre, Ashbourne WwTW also accepts flows from outlying villages as well as the town of Ashbourne.

Derbyshire Dales' local plan was formally adopted in December 2017 and lays out a framework for development up to 2033. An ongoing project to accommodate 2,045 dwellings has recently been proposed. It is estimated that approximately 325 dwellings will connect in AMP6, 590 dwellings will connect in AMP7, and 1,130 dwellings will connect in AMP8. In addition to the dwellings, the developments also consists of 16 hectares of employment land.

Bentley Brook (trib of Dove) where Ashbourne WwTW discharges to currently has a "poor" WFD status due to phosphate from continuous sewage discharges. Proposals to address this issue are included on our AMP7 WINEP programme.

Across the catchment there could be up to 88Ha of highway area contributing to flows in the foul/combined system. There are no major opportunities to transfer partially separated areas from the foul/combined system.

Catchment constantly suffers from H₂S (hydrogen sulphide) issues in the area of Airfield Industrial Estate causing constant public complaints and damage to downstream sewers. Our operational teams and trade effluent department are continuing to investigate and develop improvements to resolve issue.



Overview of the Ashbourne WwTW catchment

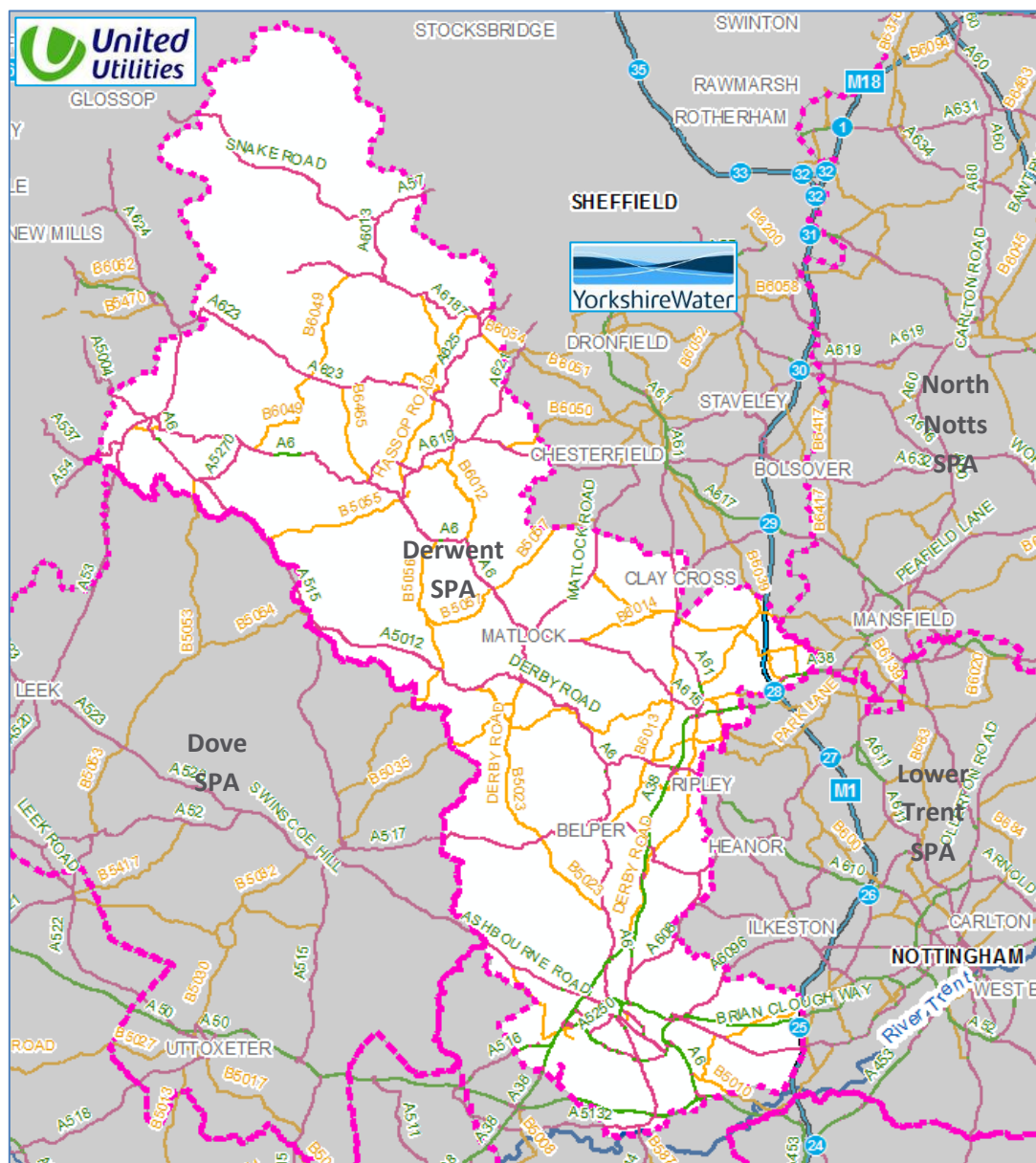
Appendix A6:

Derwent Strategic Planning Area

1: Background

The L2 area principally covers the Derwent Derbyshire RBMC area principally based on the River Derwent and its tributaries. The principle urban conurbations being Derby, Alfreton, Buxton, Belper and Matlock.

This areas serves a population of approximately 540,000 people which represents 5.2% of the Severn Trent total.



Overview of the Derwent Strategic Planning Area

There are 67 WwTW across the Derwent SPA of which only one serves a population of over 50,000 people; Derby. Parts of the catchment are rural in nature with 70% of the area's population draining to 48 small WwTW serving less than 2000 people (See Appendix B.6 for details).

The catchment covers ten local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Derby City	100%
Amber Valley	82%
Derbyshire Dales	60%
High Peak	48%
Erewash	48%
North East Derbyshire	33%
Bolsover	15%
South Derbyshire	10%
Sheffield	7.4%
Ashfield	4.4%

In terms of Environment Agency regions the Derwent SPA falls within their East region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (East Area)
- River Trent RFCC
- Derby LLFA and Derbyshire LLFA
- Planning authorities in the table above.
- Derwent Derbyshire CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
DERBY	318,997																	

RBCS outputs for Derwent SPA for catchments over 50,000PE

3: TPU assessment overview

Derby WwTW

Our Derby WwTW is located to the west of the city centre and is the 7th largest facility across the Severn Trent region.

The 'Derby City Local Plan - Part 1 Core Strategy' was adopted by the Council in January 2017. It is the key planning document for the City, setting out a long-term strategy for the spatial development of Derby to 2028. This catchment also covers parts of South Derbyshire and Amber Valley Councils with development being planned to the west and south of the existing city boundary.

There is a current issue with the pumped inlet at Derby WwTW due to a restriction with the rising main diameter. This has a knock on impact to the upstream network as the Chellaston trunk sewer surcharges and is affecting upstream overflow performance. Ongoing investigations are looking to develop the best solution.

There's a PR19 CSO improvement plan (WINEP list) for Alvaston CSO where the discharge is made to an area of slack flow, it therefore does not disperse. After a storm event the area is left full of storm sewage. This then turns anaerobic causing a foul odour and rising sludge. In terms of other AMP7 WFD drivers the Cuttle Brook WFD study, which also has links to the Derby South Growth scheme, is currently being investigated.

There are two Environment Agency projects for the River Derwent which will change the interaction of the River Derwent with the sewer network. 'Our City Our River' is an on-going flood defence project which is proposed to change the location and height of flood defences along the River Derwent. Two surface water pumping stations are proposed at key outfalls for the surface water network. Severn Trent have been in consultation with the Environment Agency with regards to the impact on the sewer network.

The 'Spondon Sluices' Environment Agency scheme was part undertaken in 2012 in which the sluices were fixed in place. This is predicted to result in the increased Q1 river levels to above the Alvaston Raynesway Park Drive CSO which takes ¾ of the flow from Derby SMP catchment. It has been observed since the scheme was undertaken in 2012 that the River has entered the CSO chamber and left the outfall drowned out for several months. The long-term phase for the Spondon Sluices scheme is to remove the sluices which requires further study on the watercourse impact by the Environment Agency and the removal of an act of parliament for a water abstraction license.

As part of the AMP2 Derby Sewerage Improvement strategy one of the main surface water culverts through the city was adopted as a combined sewer by Severn Trent. This culvert receives spill flows from the Bramble Brook. The majority of the current and future surface water flow from developments to the west of the catchment will discharge to this brook course and therefore more spill flows will occur in future into the combined system. Separation, reduction or limiting further increases in flows into this system form part of the desired future surface water management strategy for the catchment. This is currently at the concept solution stage and is to be appraised further as part of the PR24 DWMP.

A project is currently underway to accommodate 2,500 homes in the South West of Derby and valued at £1.4 million. This project will provide a new trunk sewer and associated storage to gravitate development to Derby STW whilst mitigating CSO spills and flooding. Additional tank sewer storage and improved utilisation of existing tank sewer storage, is provided upstream of Wilmore Road CSO in order to meet current consent to discharge.

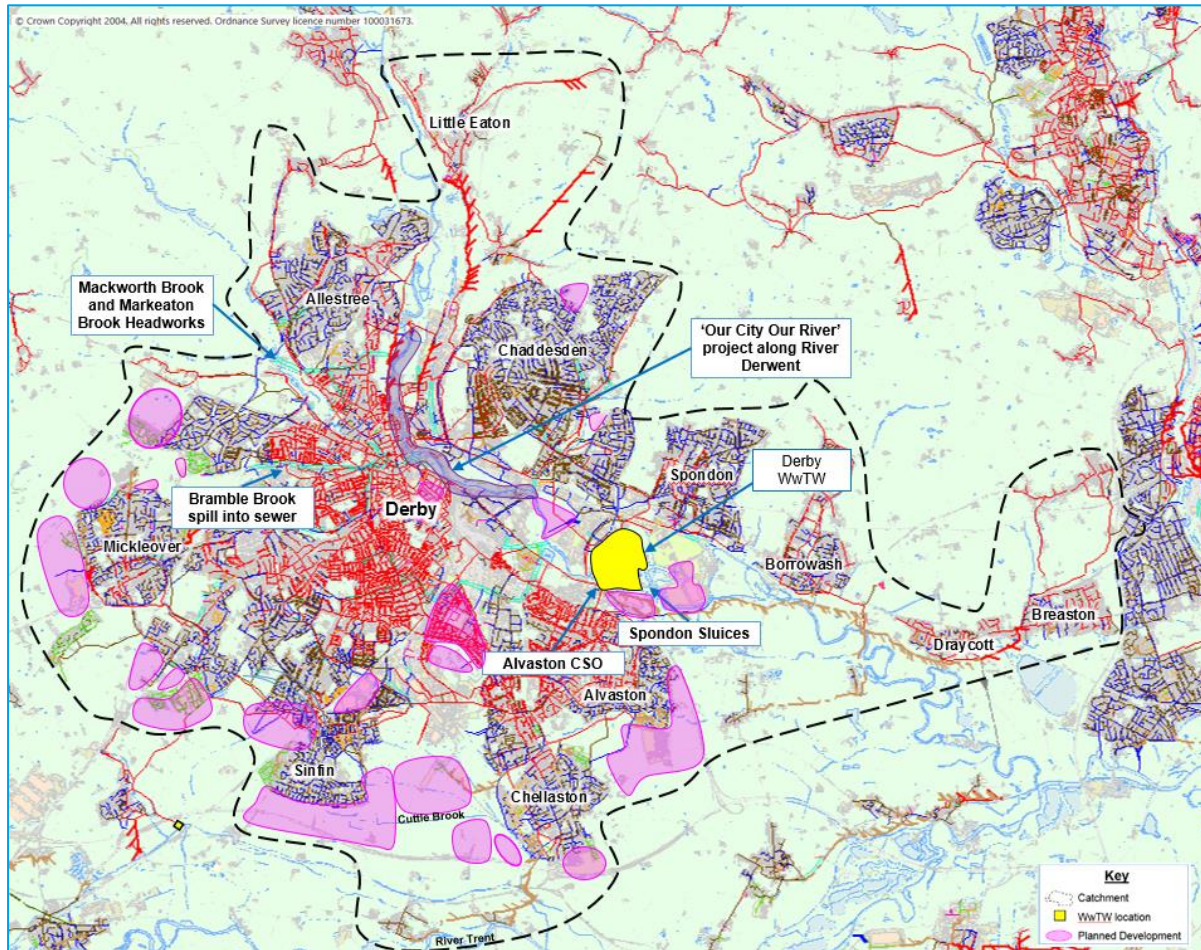
A further project is also looking at accommodating 4,700 dwellings in the Chellaston area which is expected to have a detrimental impact on the performance of the Chellaston Trunk Sewer, leading to increased spills at Station Road CSO valued at £1.12 million. This project is linked to ongoing option appraisal associated with the inlet works restriction at Derby WwTW.

Derby WwTW discharges in Derwent from Bottle Brook to Trent which is WFD status "moderate" due to phosphate pressures as a result of continuous sewage discharge. There is a project planned in our AMP7 WINEP programme to improve this.

Four SOAF investigations are underway to understand the impact of CSO spills on the above WFD river reaches.

There were pockets of infiltration noted as part of a previous sewer flow survey. Further investigation was undertaken to understand the source of these but it could not be located. There is an on-going programme of CCTV and sewer rehabilitation on-going in the catchment.

With regard to surface water separation opportunities there could be up to 105 Ha of contributing area from the highway connected into the foul/combined network which could be separated. Further investigation work is being planned to prioritise this risk to inform PR24 DWMP discussions.



Overview of the Derby WwTW catchment

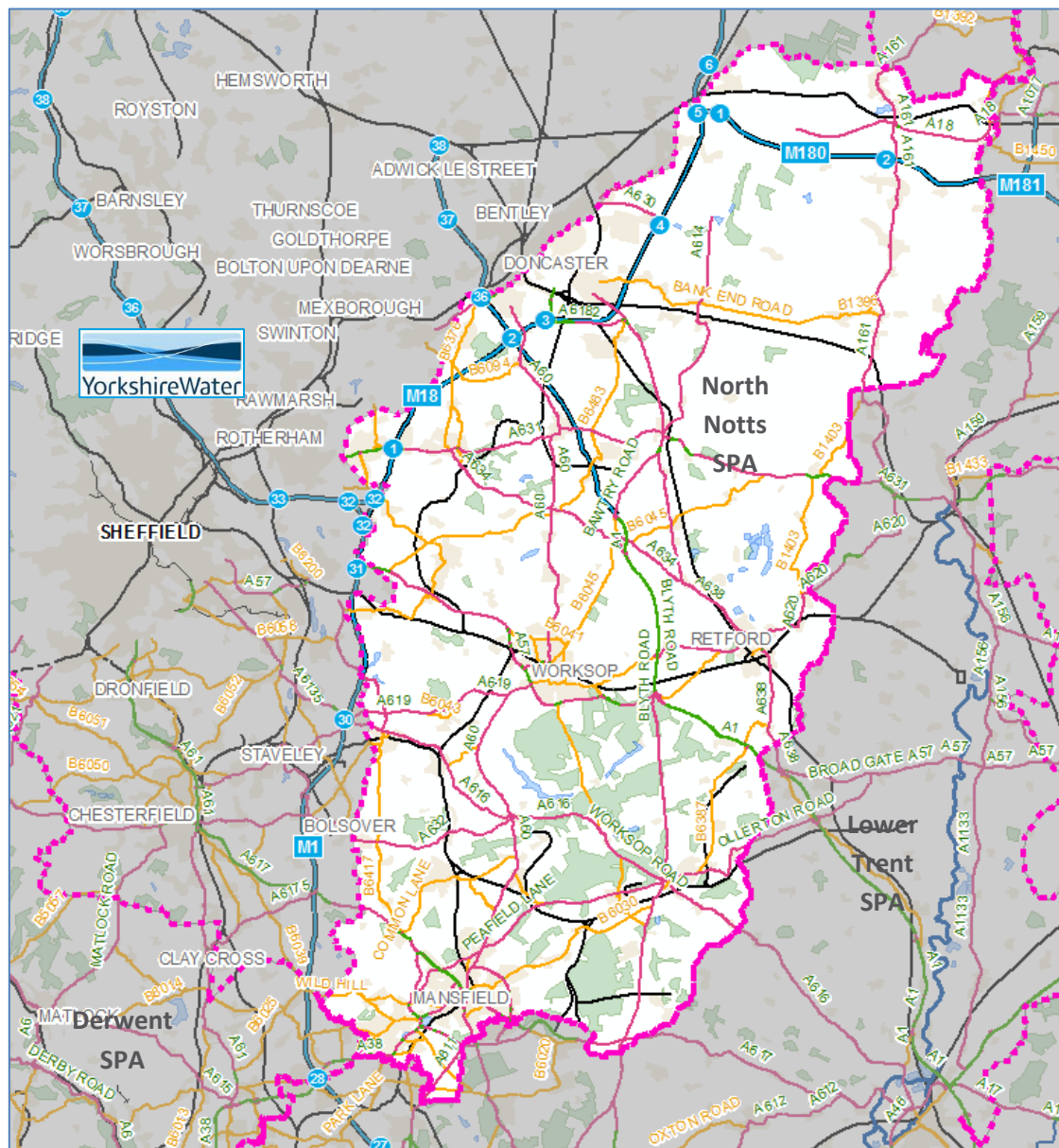
Appendix A7:

North Notts Strategic Planning Area

1: Background

The L2 area principally covers the Idle and Thorne RBCM area principally based on the River Idle and River Thorne and their tributaries. The principle urban conurbations being Mansfield, Workshop, Maltby, Sutton-in-Ashfield and Dinnington.

This areas serves a population of approximately 480,000 people which represents 4.6% of the Severn Trent total.



Overview of the North Notts Strategic Planning Area

There are 51 WwTW across the North Notts SPA of which two serve a population of over 50,000 people; Mansfield and Workshop. Parts of the catchment are rural in nature with 47% of the area's population draining to 24 small WwTW serving less than 2000 people (See Appendix B.7 for details).

The catchment covers eight local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Mansfield	92%
Bassetlaw	67%
Bolsover	55%
Doncaster	47%
Rotherham	44%
Ashfield	30%
Newark and Sherwood	20%
North Lincolnshire	19%

In terms of Environment Agency regions the North Notts SPA falls within their East region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (East Area)
- River Trent RFCC
- Doncaster LLFA, Rotherham LLFA, Nottinghamshire LLFA and Lincolnshire LLFA
- Planning authorities in the table above.
- Idle and Thorne CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
MANSFIELD - BATH LANE	89,355																	
WORKSOP-MANTON	55,082																	

RBCS outputs for North Notts SPA for catchments over 50,000PE

3: TPU assessment overview

Mansfield WwTW

Our Mansfield WwTW located off Bath Lane to the north west of the town serves the settlements of Mansfield, Mansfield Woodhouse, New Houghton and Pleasley.

Mansfield Recently consulted on the preferred option for their Emerging Local Plan which will outline development from 2013 up to 2033, the consultation ended on the 10th November 2017. Ashfield District Council are currently consulting on the Main modification of their local plan the consultation period ends on the 10th August 2018. The local plan covers the period 2017 to 2032. Bolsover District Council recently published their Draft Local Plan as part of a consultation period, which ended on the 15th June 2018. The draft Local Plan identifies the potential areas for development up to 2033. Bolsover District Council are looking to adopt the new Local plan by November 2018. The Local plans indicate significant development between Mansfield and Pleasley, including:

- Pleasley Hill Farm a mixed development incorporating 925 residential dwellings and employment land.
- Penniment Farm a mixed development incorporating 430 residential dwellings and 12 hectares of employment land.

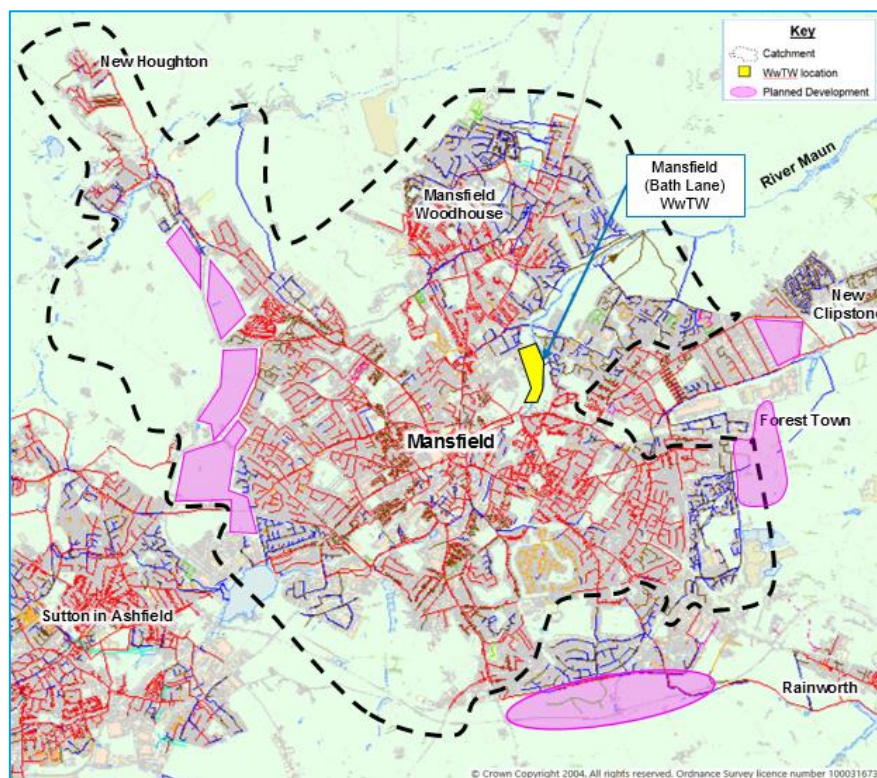
A recent high level assessment of these sites indicated that they were likely to have an adverse impact and that capacity improvements would be required. Further investigation is required to understand the full impact of these developments.

Further development is identified to the east of Mansfield including a mixed allocation off Jubilee Way for around 800 residential dwellings and some employment land.

The catchment does not contain any major flooding incidents.

Vicar Water for source until it's confluence with the River Maun has been defined as an AMP 7 Water Framework Directive (WFD) Assessment area. However there are no known issues within the catchment that are anticipated to impact on the delivery of the AMP 7 WFD programme. There are known issues with the Bath Lane WwTW, in particular the Newlands Road Balancing Lagoon, where the poor performance of the lagoon is possibly resulting in the occurrence flooding.

There are no known specific infiltration issues known within the catchment.



Overview of the Mansfield WwTW catchment

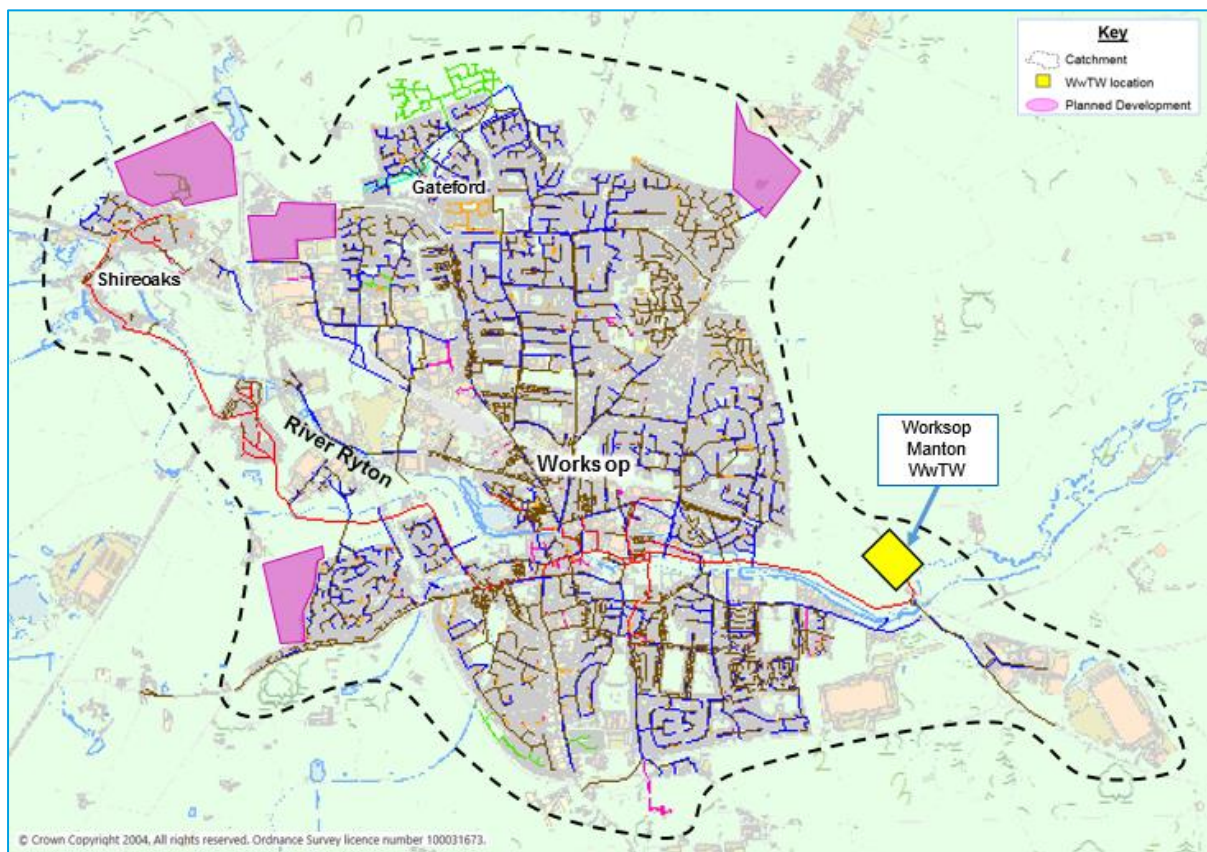
Workshop WwTW

Workshop WwTW is located to the east of Manton and treats flows from the settlements of Workshop, Shireoaks, Manton, Rhodesia and Darfoulds.

Bassetlaw District Council have undertaken and initial consulted on the preferred options for the Draft Local Plan. The new Local Plan will look to set out development within the authority's area until 2034. Bassetlaw District Council are looking to adopt the new plan by December 2020. The current version of the local plan does indicate significant growth within the catchment, predominantly to the north and west of the catchment in total the growth is approximately 67% of the existing catchment. The most notable developments being:

- Gateford Park, Workshop which proposes 650 new residential dwellings,
- Gateford Common, Workshop which proposes 330 new residential dwellings and 6.5 Hectares of employment land,
- Shireoaks Common, Workshop which proposed 175 new residential dwellings and 14.4 Hectares of employment land
- St Anne's Extension, Workshop which proposes 250 new residential dwellings.

There are no known specific infiltration issues known within the catchment.



Overview of the Workshop WwTW catchment

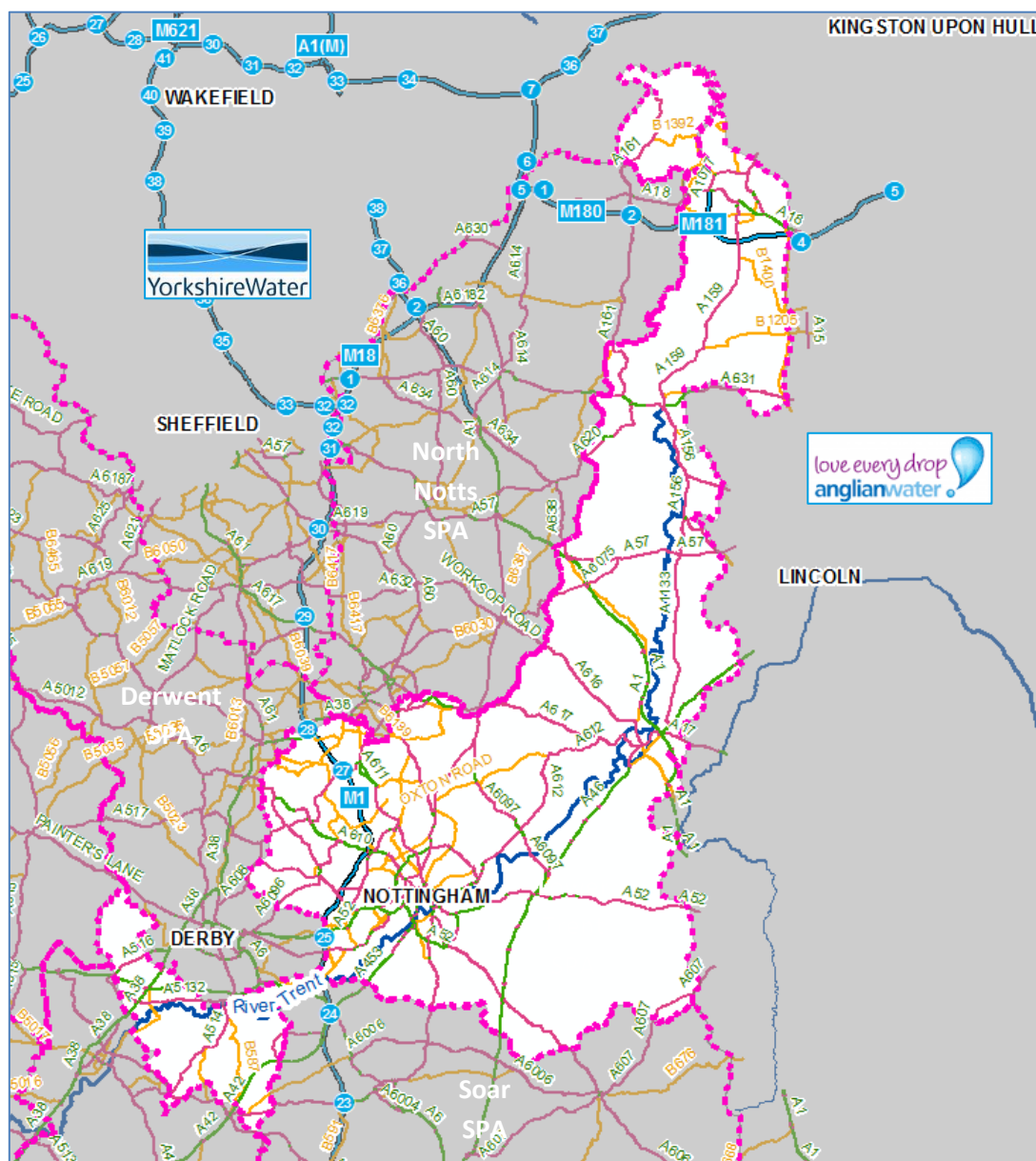
Appendix A8:

Lower Trent Strategic Planning Area

1: Background

The L2 area principally covers the Lower Trent and Erewash RBCM area principally based on the lower reaches of the River Trent and River Erewash and their tributaries. The principle urban conurbations being Nottingham, Scunthorpe, Newark, Ilkeston and Gainsborough.

This areas serves a population of approximately 1.3 million people which represents 12.7% of the Severn Trent total.



Overview of the Lower Trent Strategic Planning Area

There are 108 WwTW across the Lower Trent SPA of which four serve a population of over 50,000 people; the principle work being Stoke Bardolph (serving Nottingham), Yaddethorpe (serving Scunthorpe), Toton (serving west Nottingham) and Crankley Point (serving Newark). Parts of the catchment are rural in nature with 62% of the area's population draining to 67 small WwTW serving less than 2000 people (See Appendix B.8 for details).

The catchment covers 19 local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Nottingham	100%
Broxtowe	100%
Gedling	100%
Rushcliffe	81%
Newark and Sherwood	76%
Ashfield	62%
Erewash	52%
South Derbyshire	47%
Bassetlaw	33%
Melton	30%
North Lincolnshire	24%
West Lindsey	18%
Amber Valley	18%
North West Leicestershire	17%
Mansfield	7.9%
Bolsover	3.4%
North Kesteven	2.9%
South Kesteven	1.3%
East Riding	1.2%

In terms of Environment Agency regions the Lower Trent SPA falls within their East region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (East Area)
- River Trent RFCC
- Nottingham LLFA, Nottinghamshire LLFA and Lincolnshire LLFA
- Planning authorities in the table above.
- Lower Trent and Erewash CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population plus Ilkeston.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
STOKE BARDOLPH	597,473																	
SCUNTHORPE	116,736																	
TOTON	68,327																	
CRANKLEY POINT	54,039																	
ILKESTON	48,686																	

RBCS outputs for Lower Trent SPA for catchments over 50,000PE (inc Ilkeston)

3: TPU assessment overview

Stoke Bardolph WwTW

Stoke Bardolph WwTW is our 3rd largest treatment works facility, serving Nottingham, West Bridgeford,, Carlton, Arnold, Bulwell, Nuthall, Bilborough, Bramcote Burton Joyce, Hucknall, Papplewick Annesley and Annesley Woodhouse, Stoke Bardolph, Clifton, and part of Beeston.

The catchment is situated within the local authority areas of Gedling Borough Council, Nottingham City Council, Newark and Sherwood District Council, Rushcliffe Borough Council, Ashfield Borough Council and Broxtowe Borough Council

Gedling Borough Council have recently received the inspectors report supporting the delivery of their Draft Local Plan (26 June 2018). Gedling are planning to adopt the new local Plan in July 2018. The Nottingham City Council Draft Local Plan was submitted to the Secretary of state on the 23rd April 2018. The Newark and Sherwood Core Strategy was adopted in March 2011, and the associated allocations and development Management DPD was adopted in the 16th July 2013. These two documents set out the housing and employment needs up to 2026. Rushcliffe District Council recently consulted on their emerging local plan, the public consultation ended on the 28th June 2018, and the intention is to adopt the new Local Plan by December 2018. The draft local plan covers the period 2011 to 2028. Ashfield District Council are currently consulting on the Main modification of their local plan the consultation period ends on the 10th August 2018. The local plan covers the period 2017 to 2032. The Broxtowe Draft Local Plan part 2 which covers the period 2017 – 2028 was published in September 2017. This part of the local plan is anticipated to be adopted in the autumn 2018.

The Local Plans indicate significant growth across the catchment especially around the fringes of Nottingham, including:

- Land South of Clifton – this is a strategic development incorporating 3000 residential dwellings and 20 hectares of employment land. Discussion with the developer have been undertaken and a strategy has been developed to accommodate the additional flows form this site.
 - The development is anticipated to have a negative impact on the Clifton sewerage pumping station (SPS) and the associated flooding in the downstream catchment. To alleviate this risk the Clifton Sewerage Growth project has been promoted to combine with the flooding scheme to provide a joint solution. Based on the development

timescales it is anticipated that the capacity improvements are not required initially and that they can therefore be planned in for the AMP 7 period. The notional solution is to increase the storage at the SPS and increase the pump rate, thereby providing sufficient capacity for the new development.

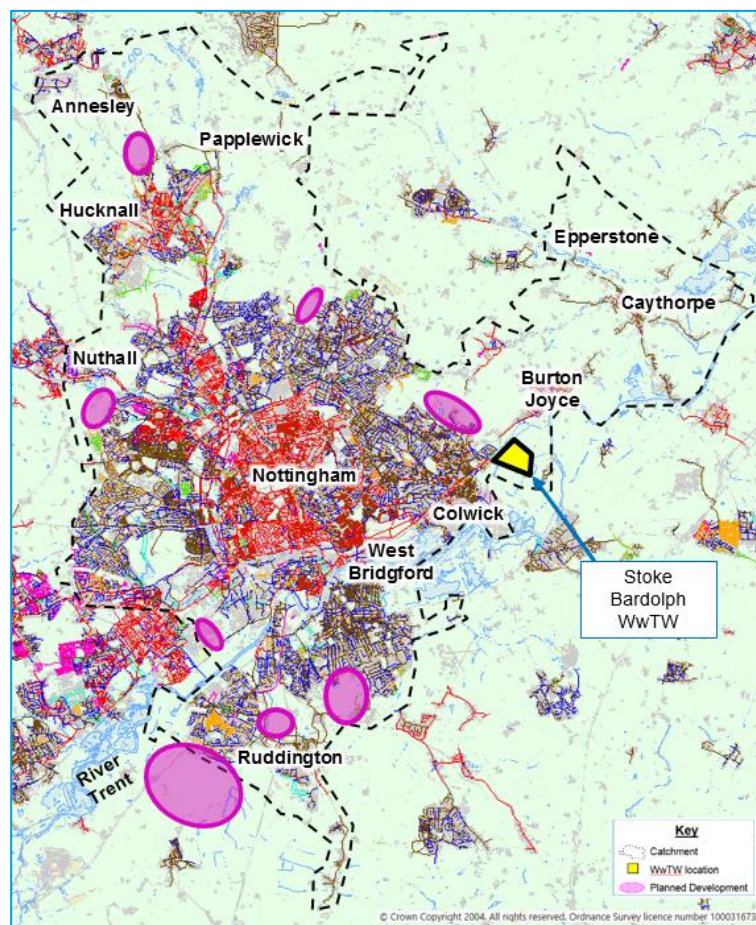
- East of Gamston / North Tollerton – This is a strategic development incorporating 4000 residential dwellings and 20 hectares of employment land.
- Melton Road, Edwalton – this is a strategic development incorporating 1500 residential dwellings and 4 hectares of employment land.
- Gedling Colliery / Chase Farm Carlton – This is a strategic development incorporating 1050 residential dwellings and 6 hectares of employment land.
- Boots Nottingham strategic development of 84.5 hectares on the edge of Beeston, there is also an associated development area within the Lilac Grove Catchment as such it may be appropriate to consider both of these development together.
- Rolls Royce, Watnall Road, Hucknall – development of approximately 900 residential dwellings.

The Polser Brook has been identified as an AMP 7 Water Framework Directive (WFD) assessment area. The area defined is between the confluence with the Cotgrave Brook and the confluence with the River Trent. There is only a small amount of the Stoke Bardolph Sewerage catchment within the Polser Brook WFD assessment area.

Outside of the Polser Brook WFD assessment area there are 2 notable pollution issues that are being investigated to identify the root cause, these are:

- the dual Manholes at Beeston and Beestwood which has records of repeat pollution incidents
- And the overflow at Carlton in relation to current performance and arrangement of the overflow.

There are no known specific infiltration issues known within the catchment.

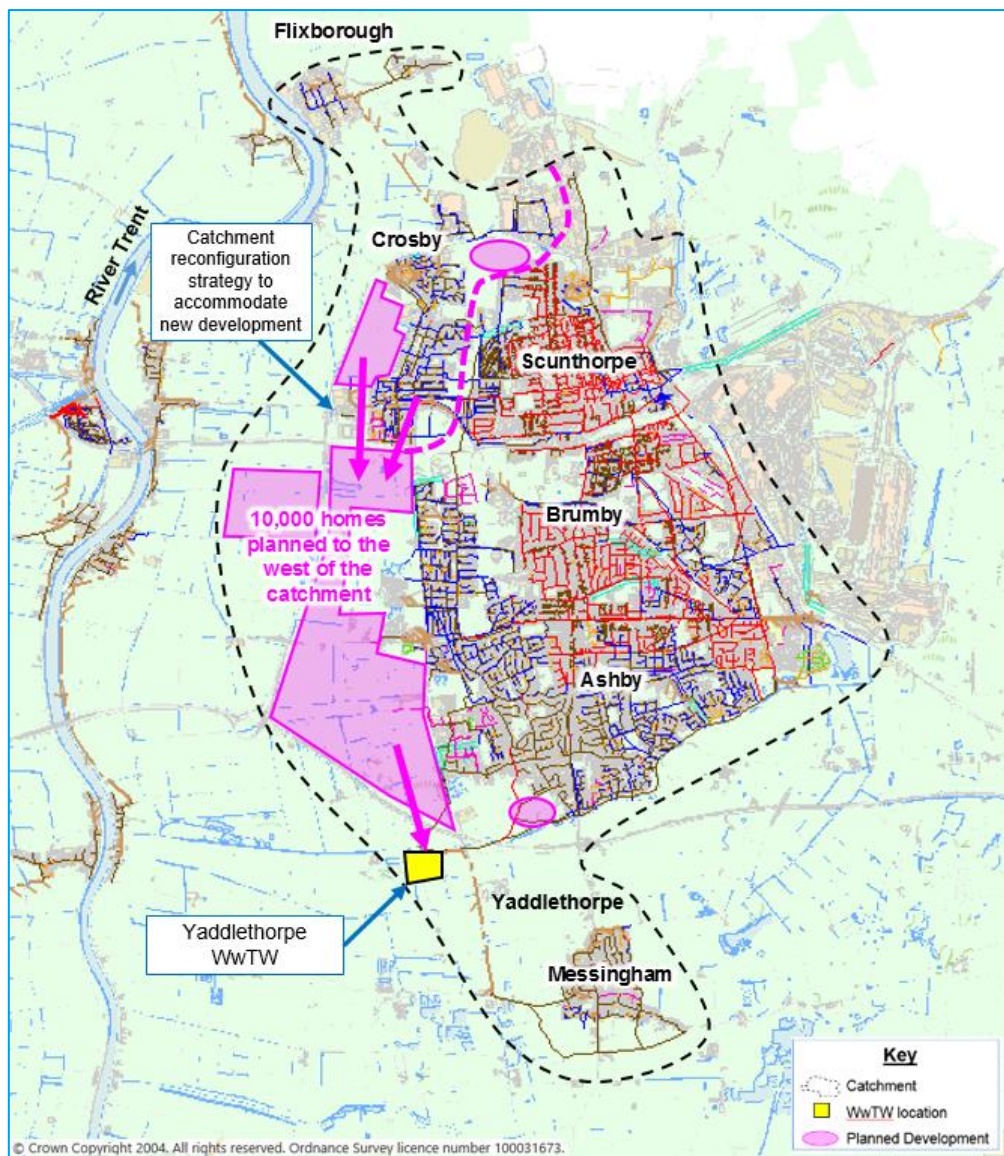


Overview of the Stoke Bardolph WwTW catchment

Scunthorpe (Yaddlethorpe) WwTW

Yaddlethorpe WwTW is located to the south west of Scunthorpe and treats the flows from settlements of Scunthorpe and the villages of Messingham, Flixborough and Flixborough Stather.

The main driver for this catchment is the allocation by North Lincolnshire Council of 10,000 new dwellings to the west of the catchment by 2035. The additional flows generated by this development will put an unacceptable pressure on the existing sewerage network where there are existing known sewer flooding issues and problems with CSO operation. As part of our options development & appraisal the location of the development in relation to the existing sewerage layout provide an opportunity to work closely with the developers to reconfigure the proposed on-site development drainage into an integrated solution. Early engagement with the developers has allowed a solution to be developed whereby existing flows can be reconfigured and diverted into the new development drainage with contributions from Severn Trent to fund the cost of oversizing. The flows are then being pumped directly to our Yaddlethorpe WwTW to by-pass the existing sewerage system. This approach will alleviate existing flood risk in the catchment and address CSO operation issues. This approach is more cost effective than upsizing the existing local sewerage network and provides a catchment solution. Works is also being proposed at Yaddlethorpe WwTW to improve WFD compliance in the Bottesford Beck by extending the treated effluent outfall to discharge directly into the River Trent.



Overview of the Scunthorpe (Yaddlethorpe) WwTW catchment

Long Eaton – Toton WwTW

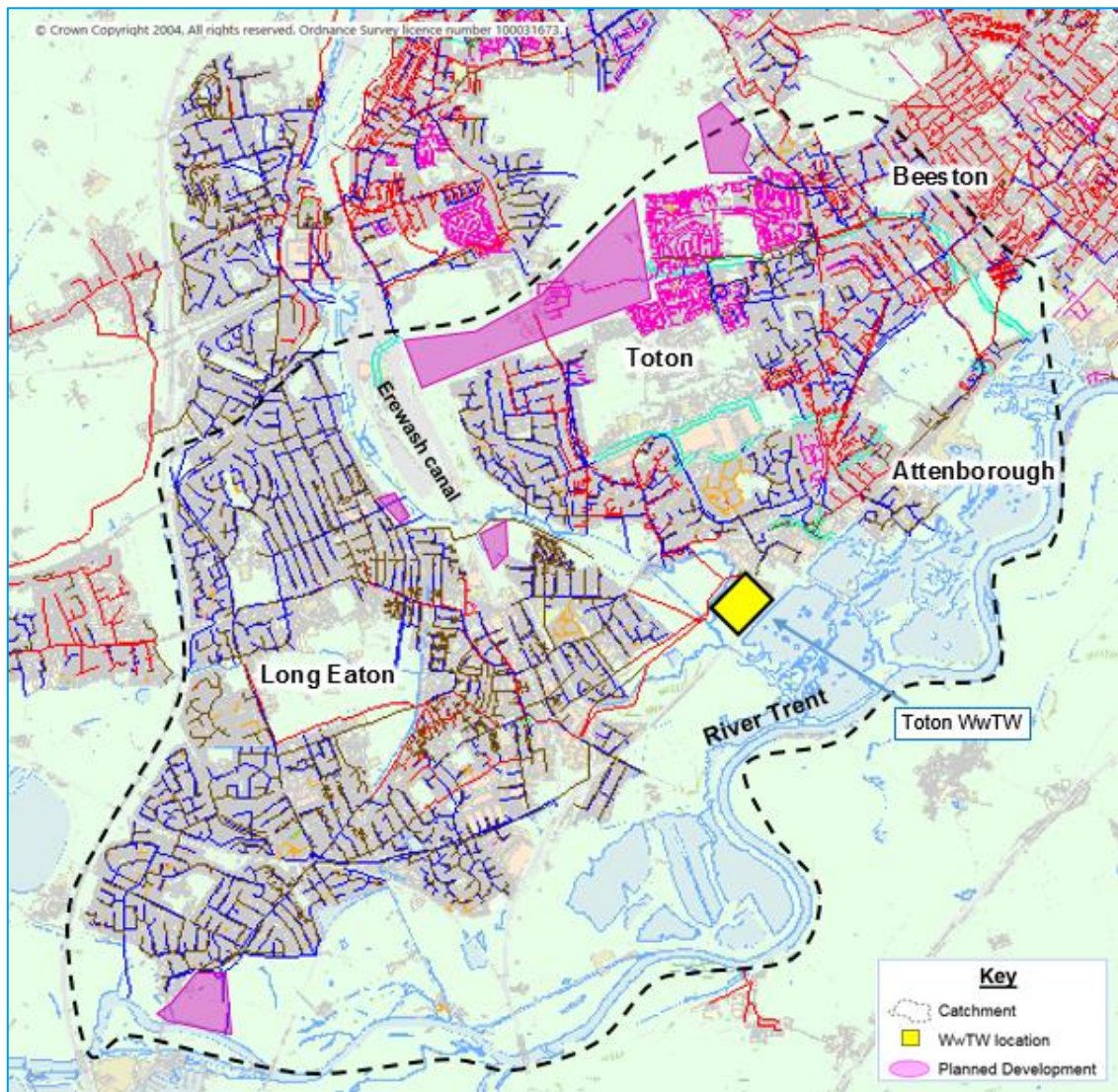
Our Long Eaton (Toton) WwTW is located to the south west of Nottingham and serves the settlements of Beeston, Long Eaton and a part of Stapleford.

The catchment is situated within the local authority areas of Erewash Borough Council and Broxtowe Borough Council. The Erewash Core Strategy was adopted by the Borough Council on March 6 2014. There are two major development sites located within the catchment:

- Toton Strategic Growth Location, a mixed allocation to the north east of Long Eaton and west of Beeston. The site is indicated for approximately 500 residential dwellings and employment land.
- Chetwynd Barracks is a housing allocation between Toton and Chilwell for approximately 500 dwellings proposed within the plan period.

There are no known specific infiltration issues known within the catchment.

Severn Trent are considering options to rationalise the Sewer Pumping Station (SPS) arrange within the catchment to resolve existing issues within the network due to the use of a shared rising main.



Overview of the Long Eaton (Toton) WwTW catchment

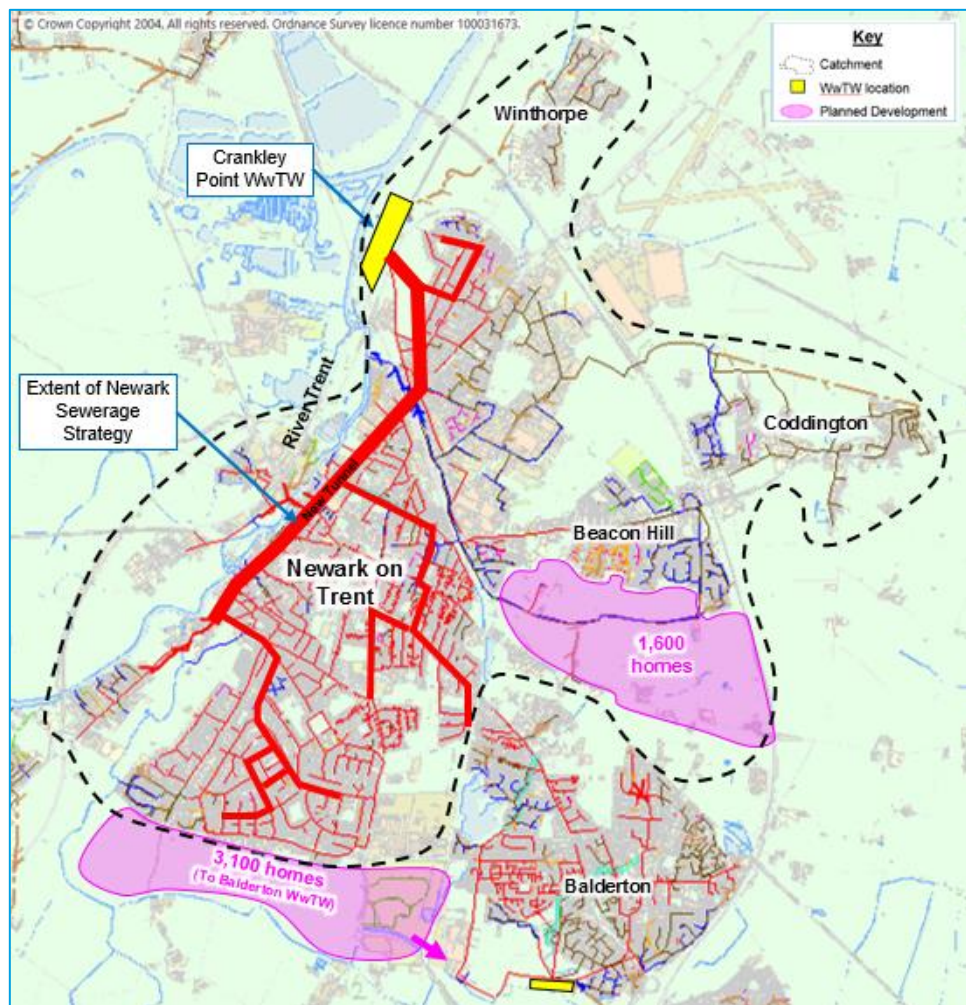
Crankley Point WwTW

Crankley Point WwTW is located to the north west of Newark town centre on the edge of the River Trent flood plain.

The Newark and Sherwood Core Strategy was adopted in March 2011, and the associated allocations and development Management DPD was adopted in the 16th July 2013. These two documents set out the housing and employment needs up to 2026. The Newark and Sherwood Local Development Framework and core strategy indicates that there are number of development proposed within the Crankley Point catchment totalling approximately 55% of the catchment including the developments at:

- The Land East of Newark (local Plan Ref NAP 2B) this development contain the remaining proportion of the Newark strategic growth, which is indicated to total approximately 4745 Residential Dwellings and 52 Hectares of employment land.
- NSK Factory on Northern Road, Newark (150 residential Dwelling + 4000m² retail and employment floor space)
- Land north of Beacon Hill Road, Newark (200 Residential Dwellings)
- Commercial and Industrial development West of the A1 (12.24+ HA of Employment Land)

A significant £56 million sewerage strategy is currently underway to address catchment wide sewer flooding problems which will benefit 377 properties/areas and provide capacity to accommodate planned growth within the catchment. This project will also rationalise six sewer overflows which are affected by high river levels and the construction of a new inlet pumping station into the WwTW. This is planned for completion in 2019.



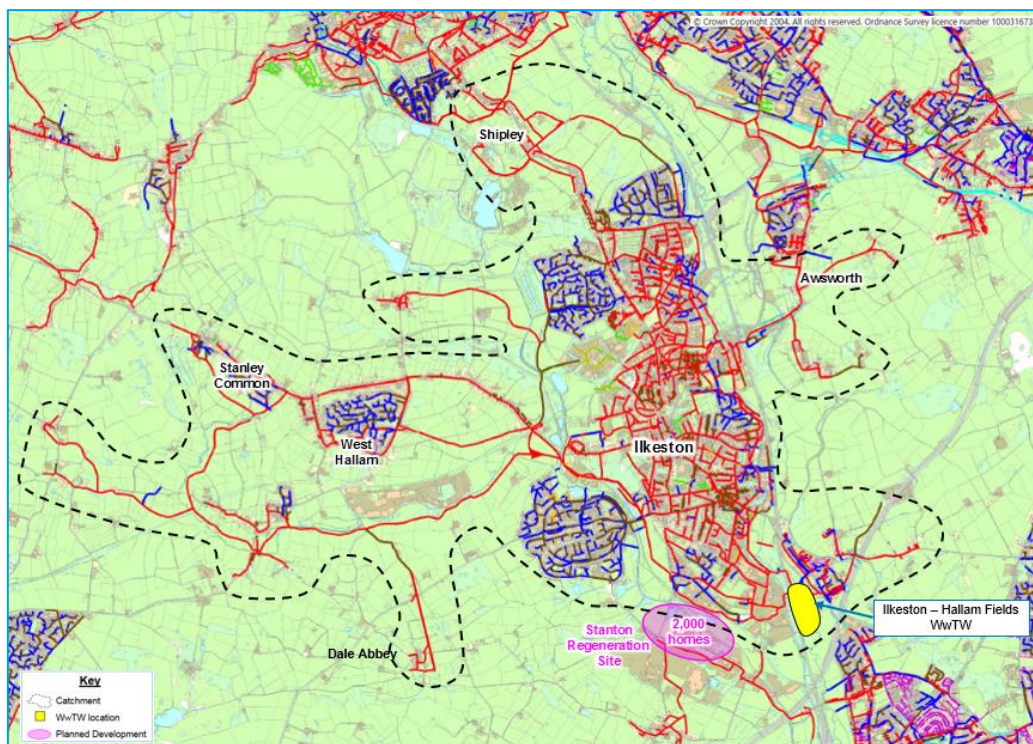
Overview of the Crankley Point WwTW catchment

Ilkeston – Hallam Fields WwTW

Whilst the Ilkeston (Hallam Fields) catchment is just below 50,000PE it is a catchment where significant investment is being planned in AMP7 to alleviate hydraulic sewer flooding risks and address issues with high frequency spilling sewer overflows which are impacting on River Erewash WFD compliance.

The Erewash Core Strategy was adopted by the Borough Council in March 2014. The Local Development Scheme sets out a timeline of document production for the Erewash Core Strategy and the future Local Plan and will be updated in 2018. The main development proposals is Stanton Regeneration comprising 2000 dwellings and 10Ha of employment land. This is located to the south of Ilkeston and could drain to either to Hallam Fields or Stapleford WwTW depending on the development layout.

Previous performance issues with the inlet screw pumps at Hallam Fields WwTW are known to lead to increased spills in the upstream sewerage network. This WwTW discharges to Erewash from Gilt Brook to Trent which is WFD status "poor" partially due to phosphate and ammonia from continuous sewage discharge. There is also an overflow in basin Erewash from Nethergreen Brook to Gilt Brook which is "poor" partially due to ammonia from intermittent discharges. Works are planned in our AMP7 WINEP programme to address these issues.



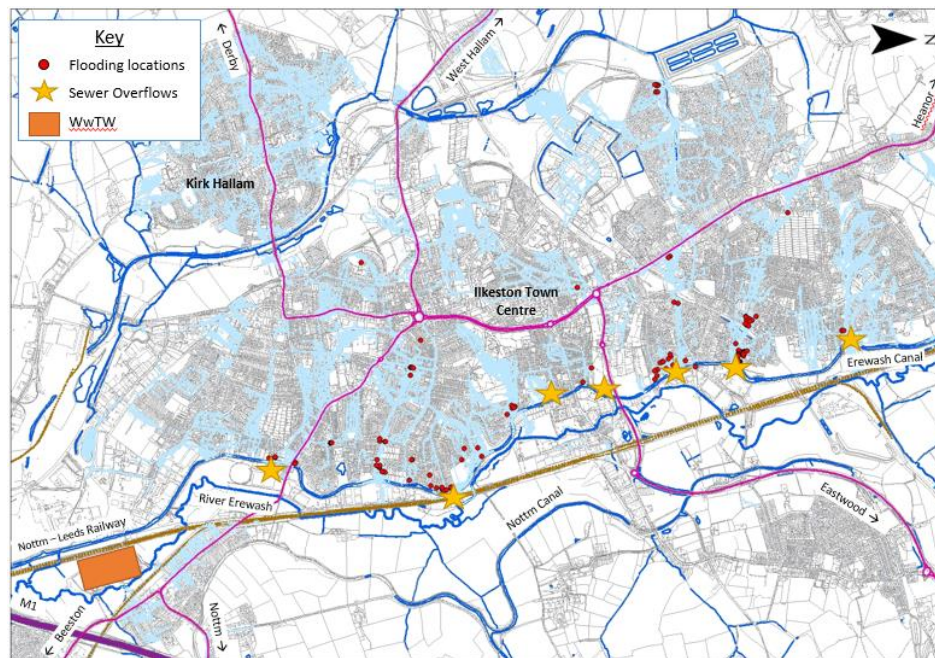
Overview of the Ilkeston (Hallam Fields) WwTW catchment

PR19 Ilkeston Strategy

Within the sewerage network there are significant capacity issues associated with the eastern valley trunk sewer. During AMP6 our investigations involving detailed hydraulic model verification and subsequent customer consultation has confirmed the sewer flood risk across Ilkeston to be far more extensive than originally envisaged due to previously unreported flooding incidents.

At the start of our investigations there were 119 known locations, largely located along the alignment of the eastern trunk which runs parallel to the River Erewash. Verification of sewer flood risk using Severn Trent's flood risk mapping techniques highlighted exceedance flood paths from upstream in the catchment which would end up at those eastern trunk locations. Subsequent investigations confirmed previously unreported incidents, and following customer confirmation increased the number of locations actually at sewer risk to 212.

In addition to the flood risk in the catchment, the River Erewash has been identified as requiring a WFD study with four of the seven combined sewer overflows (CSOs) highlighted as having a high spill frequently. As stated earlier Hallam Fields WwTW inlet is also known to be affected by excessive surface water flows.



Overview of the Ilkeston catchment indicating the location of sewer flooding and CSOs.

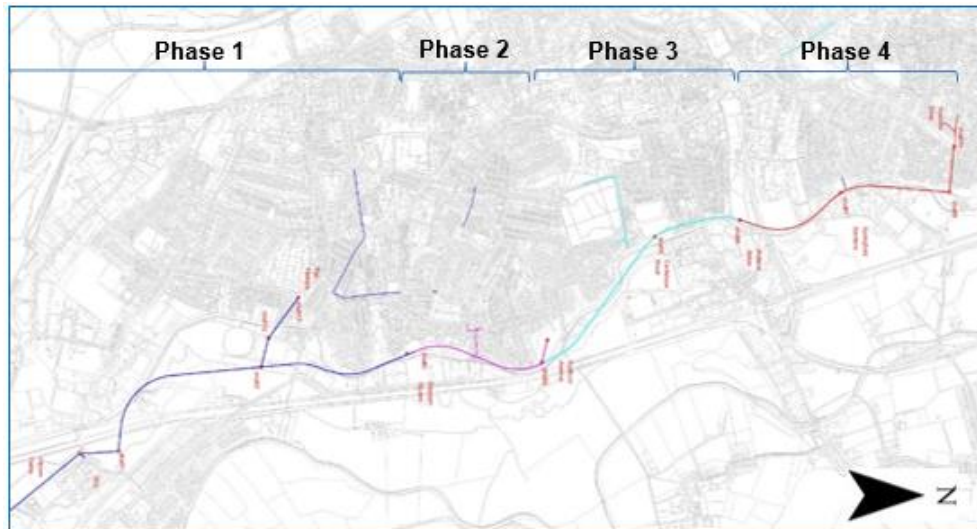
Two main option preferences have been appraised, a) looking at a conventional conveyance solutions and b) opportunities to undertake a catchment wide surface water management approach. These are outlined below:

Option 1 - New Trunk Sewer (including AMP7/AMP8 phasing options)

This option proposes the construction of a new interceptor trunk sewer by constructing a 4.3km segmental tunnel (2.85m diameter) which would take flows off the existing eastern trunk sewer at several locations along its length. This would be complemented by localised upsizing and capital maintenance work to alleviate local capacity issues.

The route of the tunnel lends itself to being split into four sections and whilst all flooding and CSO benefits would not be achieved until all sections were complete it does offer the option to phase construction across AMP7 and AMP8. Phase 1 would involve the construction of a new terminal pumping station to lift flows into Hallam Fields WwTW plus the 1.6km downstream section of the tunnel. The phased approach was to construct Phase 1 in AMP7 with the remaining 2.7km phases (2, 3 & 4) of the tunnel and associated localised capacity upgrades being completed by 2030 (end of AMP8). However by phasing works across AMP7/AMP8 this would spread the cost over a longer period but would incur additional costs of around £3 million compared to the estimated cost of constructing all work in AMP7. This phased approach would also not meet the 2027 WFD requirements and so the option to phase this solution was not optimal.

The cost of completing this tunnelled trunk sewer in AMP7 is estimated in the region of £48 million with the option to phase construction work into AMP8 increasing to £51 million.

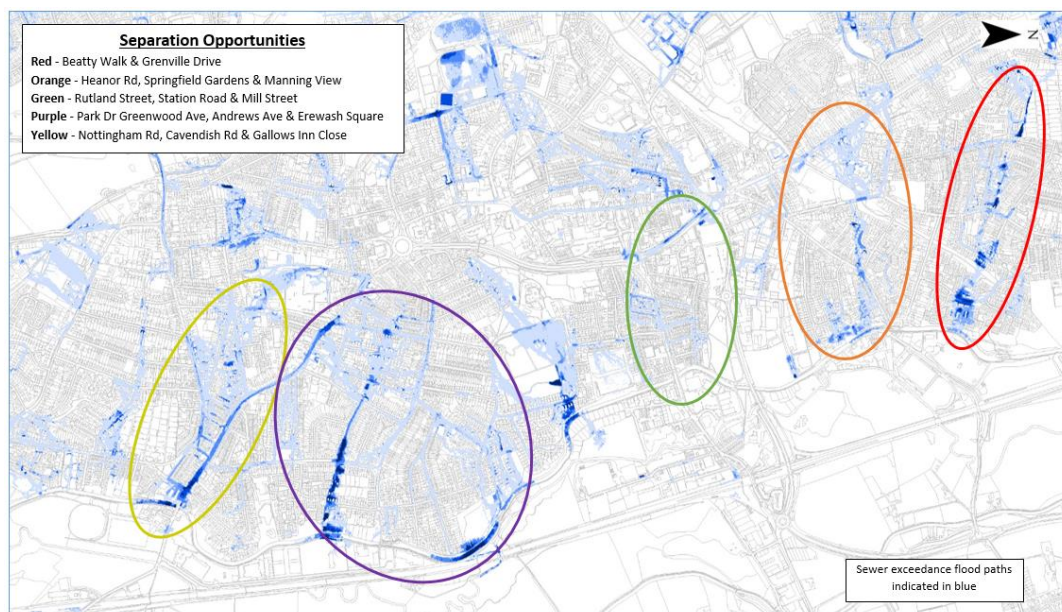


Indicative route of 4.3km tunnel, showing potential options to phase construction across AMP7/AMP8.

Option 2 – Surface water management focused approach

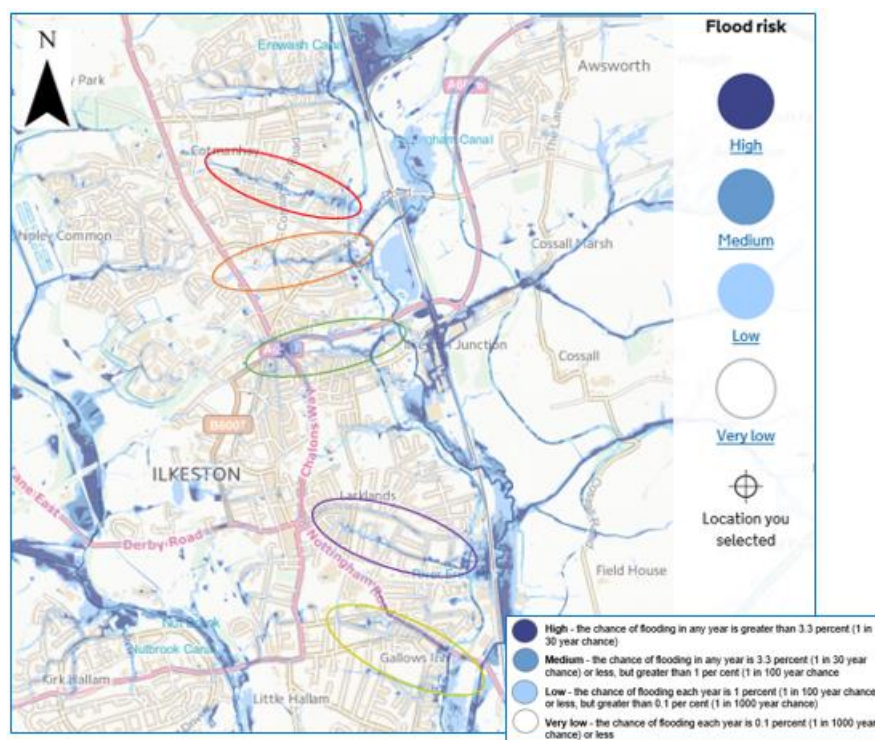
This catchment is known to have a high connectivity of impermeable areas being connected to the combined sewerage network and so assessments were undertaken to identify potential areas where targeted surface water separation could be undertaken. Removal of excess surface water would then reduce flows entering the existing eastern trunk sewer, thus alleviating sewer flooding and CSO pressures and benefit Hallam Fields WwTW.

In many parts of the sewerage network there are only combined sewers which, in addition to collecting foul flows, also collect run-off from highways as well as roofs and associated areas. Our analysis has identified five areas where there are opportunities to construct new surface water sewers to allow highway run-off into the combined sewer to be significantly reduced and together with the use of sustainable drainage systems (SuDS) this will reduce flows resulting in sewer flood risks and CSO spill. These areas are concentrated in areas where our flood risk mapping indicates overland flooding during times of heavy rainfall.



Extract from Severn Trent Flood Risk Mapper model indicating overland exceedance flood paths in a 1 in 20 year return period design storm.

As part of the work we undertook to understand sewer flood risk we have also identified potential opportunities to work with other flood risk stakeholder to alleviate wider surface water flood risks. The extract below is from the Environment Agency's long term surface water flood risk map (<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>).



Extract from Environment Agency Flood Risk Mapping system.

The Environment Agency mapping, which shows areas likely to be at risk from surface water flooding (i.e. surface water flood risk from rainfall before entering drainage systems), has a close correlation with sewer exceedance risk and so suggested the wider opportunities of working with Derbyshire County Council highways and LLFA teams to work together to manage surface water. Discussions are already underway between Severn Trent and other flood risk management stakeholders to develop these partnership opportunities to support external flooding opportunities ahead of the AMP7 sewer separation implementation.

Our investigations have identified opportunities to separate and remove 20.4 hectares of surface water from the combined sewers, by constructing a comprehensive network of 8.3km of new surface water sewers. It is intended that these separation opportunities will be complemented through the construction of SuDS features to attenuate flows to mitigate increase flood risk on the River Erewash. These are expected to form a mix of larger SuDS features complemented where possible with local community initiatives such as retrofit green infrastructure designs. Over the next years ongoing feasibility will develop these proposals further ahead of construction commencing for completion by 2025.

To complement the separation work our modelling indicates there will still be the need to make localised improvements to the combined sewerage network and CSOs in the catchment. However the scope of this work is significantly reduced and negates the need to provide a new trunk sewer and the replacement of the terminal pumping station. By sustainably removing excess surface water from the combined sewer this option will also benefit performance at Hallam Fields WwTW.

The estimated cost of the separation focused option is £37 million.

The option we have selected within our PR19 Plan is too focus heavily on surface water separation opportunities. This is 24% more cost effective than the equivalent tunnelled trunk sewer option and also offers the potential opportunities to deliver wider flood risk benefits through partnership working and performance benefits to Hallam Fields WwTW. This is expected to be a challenge in AMP7 due to the need to lay new 8.3km surface water sewer network across the town. This is expected to require intensive traffic management and liaison with our stakeholders but the long term outcome will be an outcome will be a more sustainable solution.

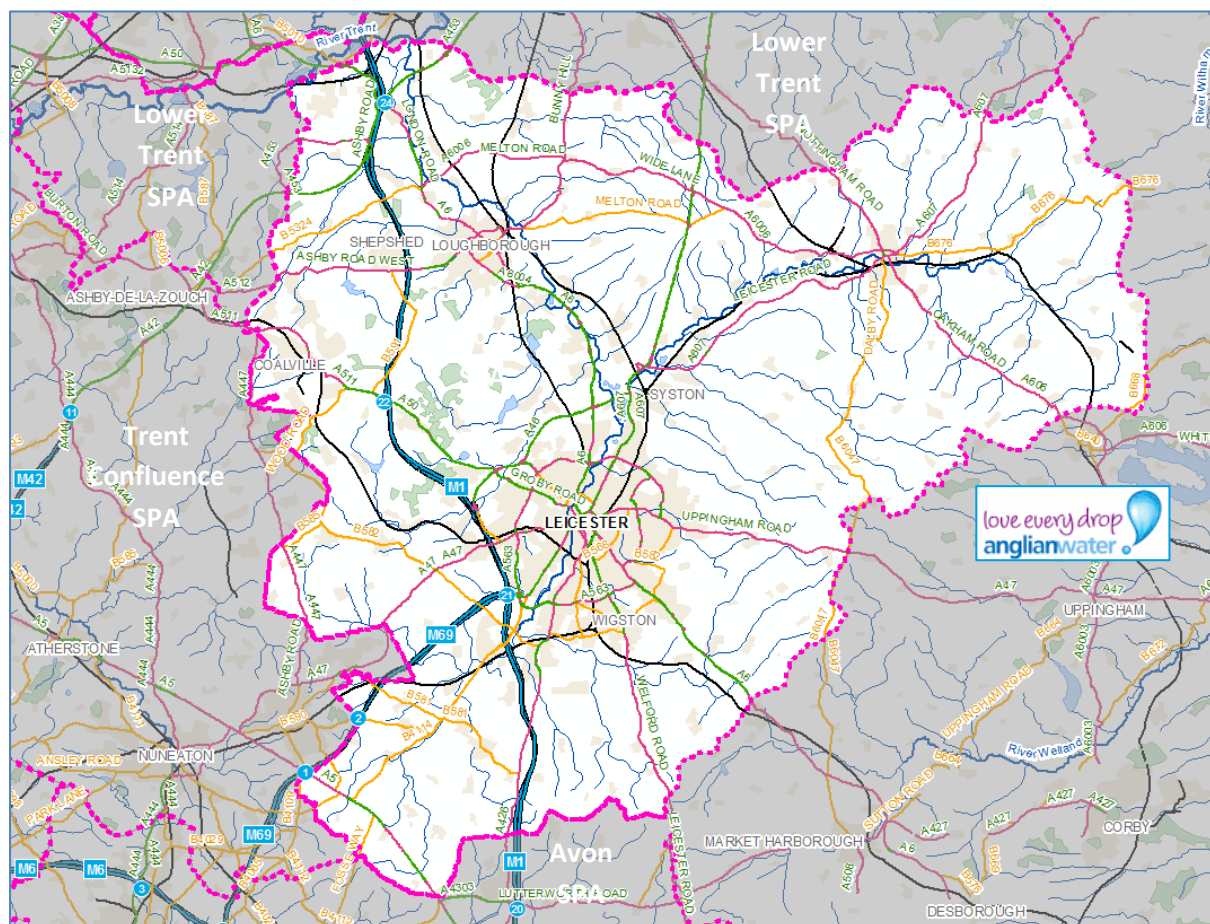
Appendix A9:

Soar Strategic Planning Area

1: Background

The L2 area principally covers the Soar RBCM area principally based on the River Soar, River Sence and their tributaries. The principle urban conurbations being Leicester, Loughborough, Melton Mowbray and Coalville.

This areas serves a population of approximately one million people which represents 9.8% of the Severn Trent total.



Overview of the Soar Strategic Planning Area

There are 57 WwTW across the Soar SPA of which three serve a population of over 50,000 people; Wanlip (serving Leicester), Loughborough and Melton. Parts of the catchment are rural in nature with 61% of the area's population draining to 35 small WwTW serving less than 2000 people (See Appendix B.9 for details).

The catchment covers 11 local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Oadby and Wigston	100%
Charnwood	100%
Leicester City	100%

Local Planning Authority	% of administrative boundary covered by this SPA
Blaby	97%
Melton	64%
North West Leicestershire	43%
Harborough	39%
Hinckley and Bosworth	35%
Rushcliffe	19%
Rutland	14%
Rugby	4.2%

In terms of Environment Agency regions the Soar SPA falls within their East region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (East Area)
- River Trent RFCC
- Leicester LLFA and Leicestershire LLFA
- Planning authorities in the table above.
- Soar CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
WANLIP	644,583	Green	Green	Red	Red	Red	Red	Green	Green	Green	Green	Red	Red	Red	Red	Green	Green	Red
LOUGHBOROUGH	72,540	Green	Green	Green	Red	Green	Red	Green	Red	Green	Green	Red	Green	Red	Green	Green	Red	Red
MELTON	60,088	Green	Green	Green	Green	Red	Red	Red	Red	Green	Red	Green	Green	Red	Red	Green	Red	Red
SNARROWS	45,824	Green	Green	Green	Green	Red	Red	Red	Green	Green	Green	Green	Green	Red	Red	Red	Green	Red

RBCS outputs for Soar SPA for catchments over 50,000PE

3: TPU assessment overview

Wanlip WwTW

Wanlip WwTW is located to the north of Leicester and treats the flows from Leicester and a large number of settlements around Leicester. This is our 2nd largest treatment works.

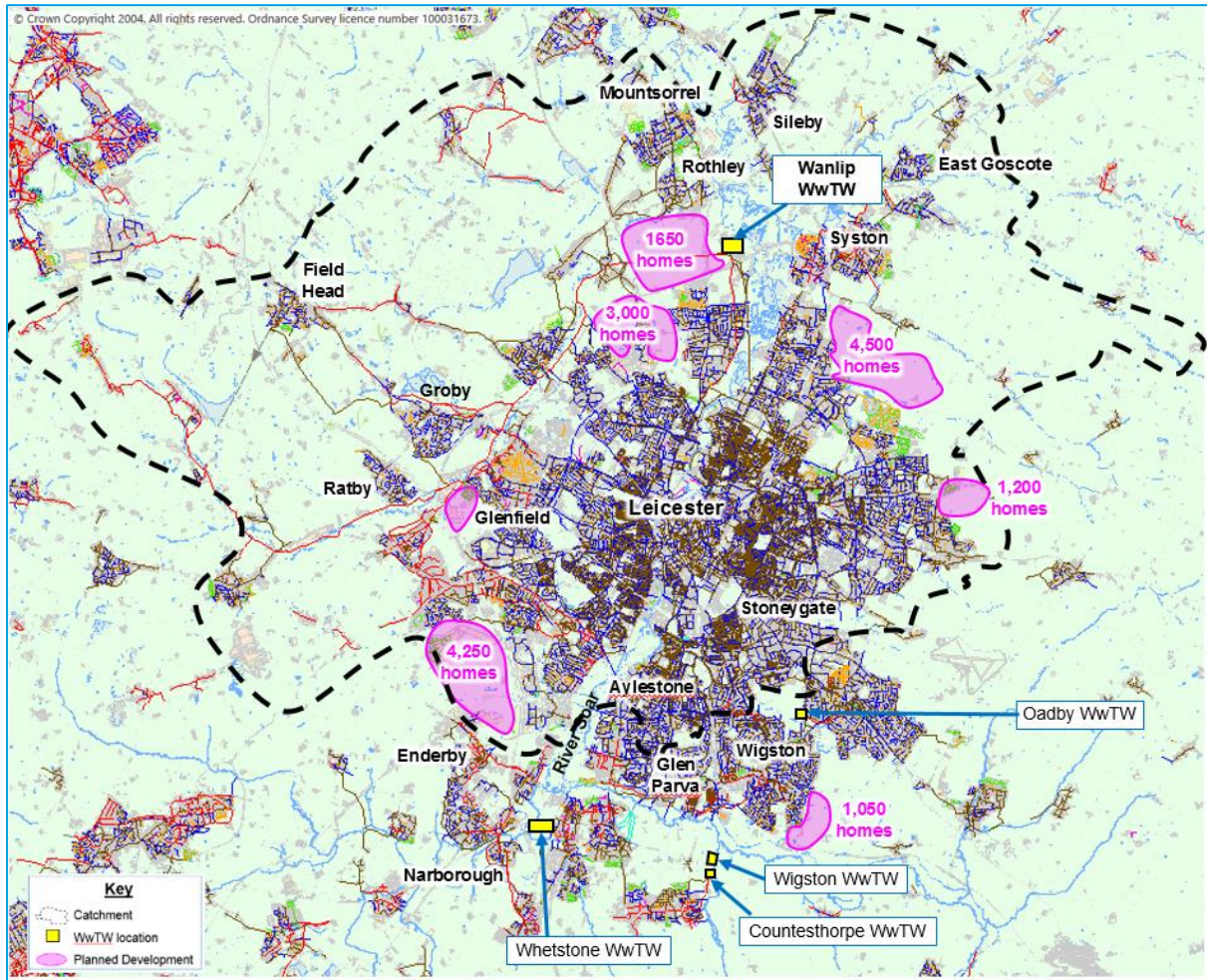
The catchment for Wanlip WwTW is covered by the local authority areas of Leicester City Council, Blaby District Council, Charnwood Borough Council, Oadby and Wigston Borough Council, Harborough District Council and Hinckley and Bosworth Borough Council. Blaby District Council have recently consulted on the Preferred Options for their emerging Local Plan. The new plan will outline development until 2028. Charnwood Borough Council have recently consulted on the scope, options and issues phase of their Local Plan. The new local plan will outline development within Charnwood until 2036. Leicester City Council recently consulted on the emerging options and development Management Policies, they are anticipating that the new local Plan will be adopted in December 2018. The local plan will outline development until 2031. Oadby and Wigston Borough Council recently submitted their draft local plan to the secretary of state for approval (29th January 2018). The Local Plan covers the period up to 2031. Harborough District Council recently submitted their draft Local Plan to the Secretary of State for approval (16 March 2018), the intention is to adopt the new Local Plan by December 2018. The local plan covers the period from 2011 to 2031. Hinckley and Bosworth Borough Council recently consulted on the Scope, Issues and Options stage for their local Plan with the consultation ending in February 2018. There is significant growth proposed within Leicester and the greater Leicester Area in particular the developments of:

- Lubbethorpe Sustainable Urban Extension approximately 4250 new residential dwellings local facilities, commercial and retail space.
- Thurmaston Sustainable Urban Extension approximately 5000 new residential dwellings.
- Waterside development approximately 500 new residential dwellings + offices (5500 m²) and retail (1000 m²)
- Thurnby development of around 658 new residential dwellings + retail (500 m²)
- Ashton Green development of 3,000 new residential dwellings + 10 Hectares of commercial land and a village centre.

Severn Trent are working with Leicester City Council, the Environment Agency and Leicestershire County Council in relation to flooding on the Holt brook which has resulted in flooding at Meadow Court Road and Carisbrooke Road.

The Evington Brook has been defined as a Water Framework Directive (WFD) AMP 7 assessment area for the River Reach from the source to the confluence with the Willow Brook. There is a large section of the Wanlip WwTW catchment within the Evington brook river reach and is subject to ongoing SOAF assessments.

There are known infiltration issues through the city centre and the current SMP strategy is to undertake catchment separation as brownfield redevelopment occurs.



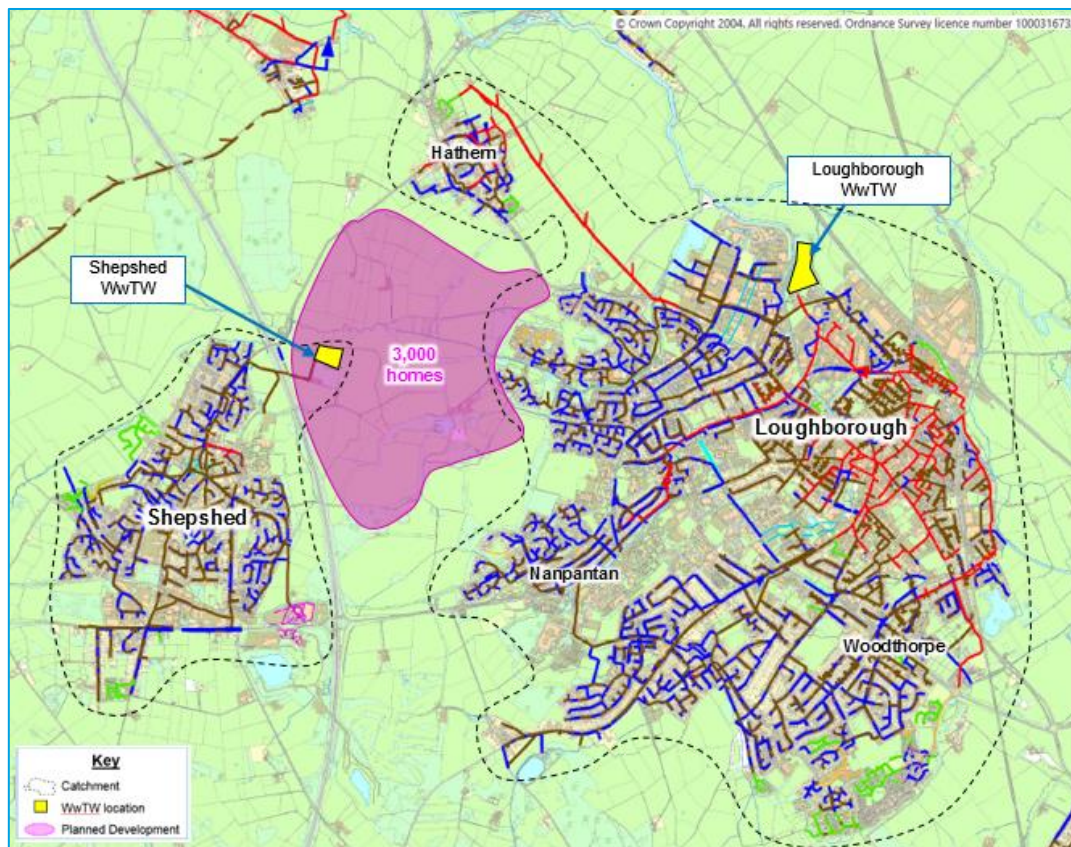
Overview of the Wanlip WwTW catchment

Loughborough WwTW

Loughborough WwTW is located to the north east of the town centre and serves Loughborough plus the settlements of Nanpantan, Woodthorpe and Hathern.

Charnwood Borough Council have recently consulted on the scope, options and issues phase of their Local Plan. The new local plan will outline development within Charnwood until 2036. The Scope, options and issues consultation document indicates a significant growth around within the Loughborough Catchment. The largest development is the Loughborough West Strategic Urban Extension (SUE) for 3200 residential dwellings, local facilities and employment land however this is anticipated to could drain to the Shepshed WwTW depending on on-site development drainage proposals.

There are no known specific infiltration issues known within the catchment.



Overview of the Loughborough WwTW catchment

Melton WwTW

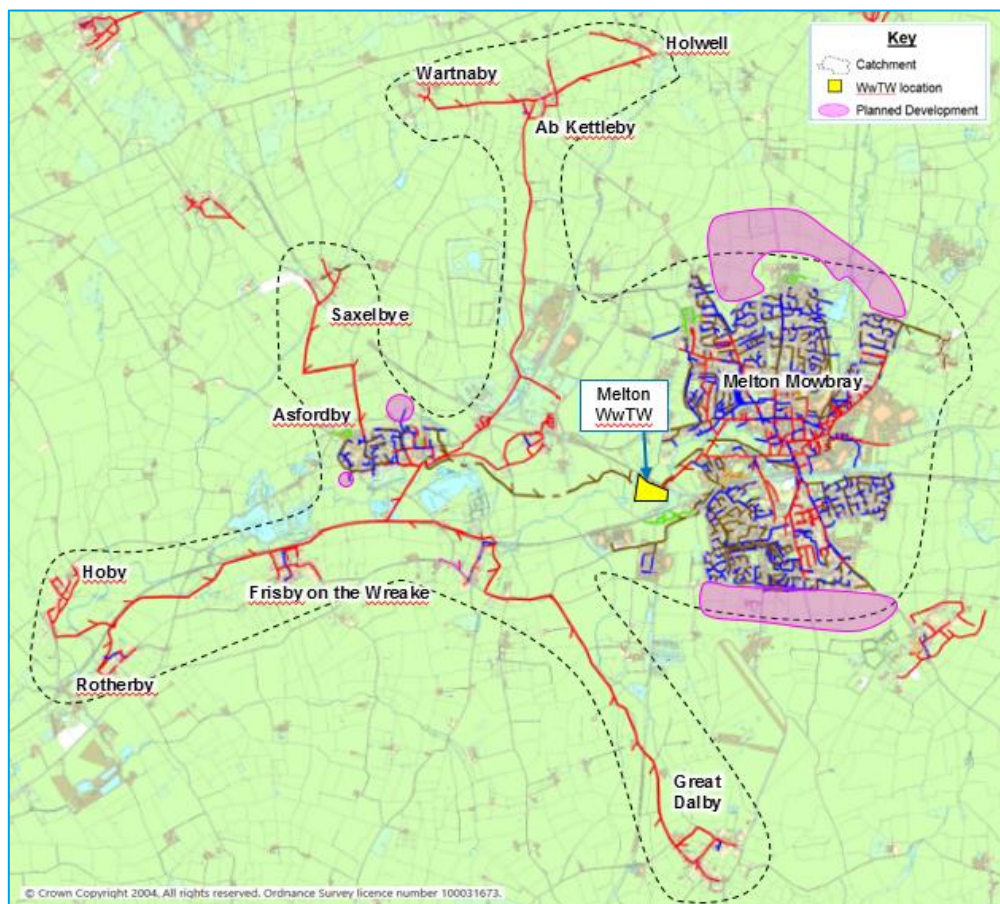
Melton WwTW is located to the south east of the town serves Melton plus the settlements of Kirkby Bellars, Great Dalby, Ab Kettleby, Holwell, Wartnaby, Saxelbye, Grimston, Hoby, Rotherby, Asfordby Hill and Asfordby.

The catchment is situated within the Melton Borough Council local authority area who are currently consulting on the Main Modifications the Consultation period end on the 2nd August 2018. The intention is to adopt the new Local Plan by summer 2018 with the local plan covers the period up to 2036. The Melton Local Plan indicates significant growth within Melton Mowbray located primarily along the northern and southern edges of Melton Mowbray. There is also potential for a new settlement to be developed at Six Hills, this site has not made it into the Melton Local Plan, but is identified as a reserve site. The proposed drainage solution for the 3000 residential dwellings and associated local facilities is to direct the foul flows into to Melton WwTW. We are also aware of proposals to construct a new rural village, known as Six Hills (2250 houses) located approximately 10km to the east of Melton Mowbray and are currently in discussions with the developer to confirm the best way to drain the site.

There are known issues in relation to the Melton WwTW terminal pumping station at Lake Terrace and it is anticipated that the growth planned in the Melton Local Plan will have an adverse impact on the issues caused by the pumping station. We are currently looking at developing a catchment strategy to accommodate growth in Melton Mowbray and resolve issues caused by the pumping station to ensure planned development can be accommodated.

Capacity upgrades are being planned at Melton WwTW to address WFD drivers and to accommodate additional development in the catchment.

There are known issues with Hydrogen Sulphide (H₂S) within the Kirkby Bellars section of the catchment. Infiltration has been identified as an issues within the Melton and is currently under assessment as part of AMP6 and will help inform PR24 DWMP intervention options.



Overview of the Melton WwTW catchment

Snarrows WwTW

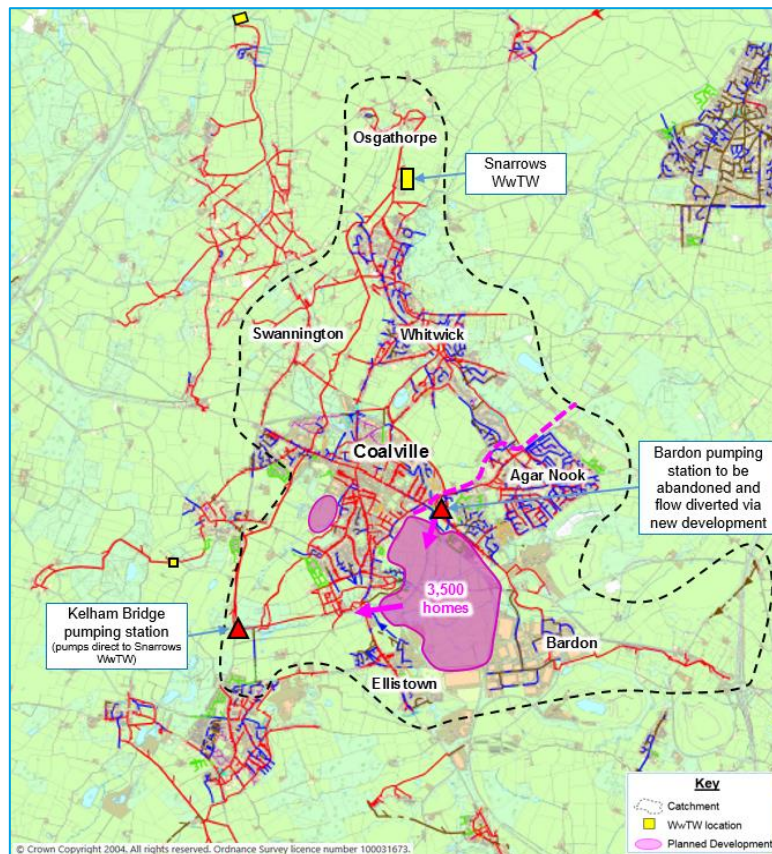
Snarrows WwTW is located to the north west of the catchment discharging treated effluent into the River Sence. The facility serves the settlements of Coalville, Osgathorpe, Thringstone, Swannington, Whitwick, Bardon, Hugglescote, Donnington Le Heath, Ellistown and parts of Ibstock and Ravenstone.

The catchment is located within the North West Leicestershire District Council local authority area. Their new local plan was adopted in November 2017 outlining new development up to 2031. The Local Plan indicates significant development around 100% of the current catchment size. A significant proportion of this is located between Coalville and Hugglescote (3500 new residential dwellings).

There are capacity constraints with balancing catchment flows between Kelham Bridge Terminal Pumping Station (TPS) which pumps the southern part of the catchment direct to Snarrows WwTW, whilst the northern sub-catchment has issues associated with Parsonwood Hill Tank to prevent flooding at the works and upstream in Whitwick.

To address the capacity constraints across the catchment a long term strategy has been developed. The location of the main 3,500 dwelling development allocation, whilst problematic if dealt with locally, does provide wider catchment benefits to reconfigure the existing sewerage network and utilise oversized on-site development drainage provide benefit to existing customers at risk of flooding. By working with developers the first phase of this long term strategy is already complete where Severn Trent requested realignment of developer's drainage proposals to allow for future abandonment of existing pumping stations. By transferring form into a new gravity sewer this will alleviate existing flooding issues whilst the next phase of the strategy will reinforce existing trunk sewer capacity to pass flows onwards to Snarrows WwTW. This approach provides a more cost effective solution compared to just providing capacity to accommodate the development and address flooding issues independently.

High levels of infiltration have been previously identified within the catchment and phase one of the infiltration removal scheme has been undertaken this has been utilised to provide some of the required capacity for growth within the catchment. Further work to separate surface water upstream of the Kelham Bridge TPS has also been identified to add additional capacity.



Overview of the Snarrows WwTW catchment

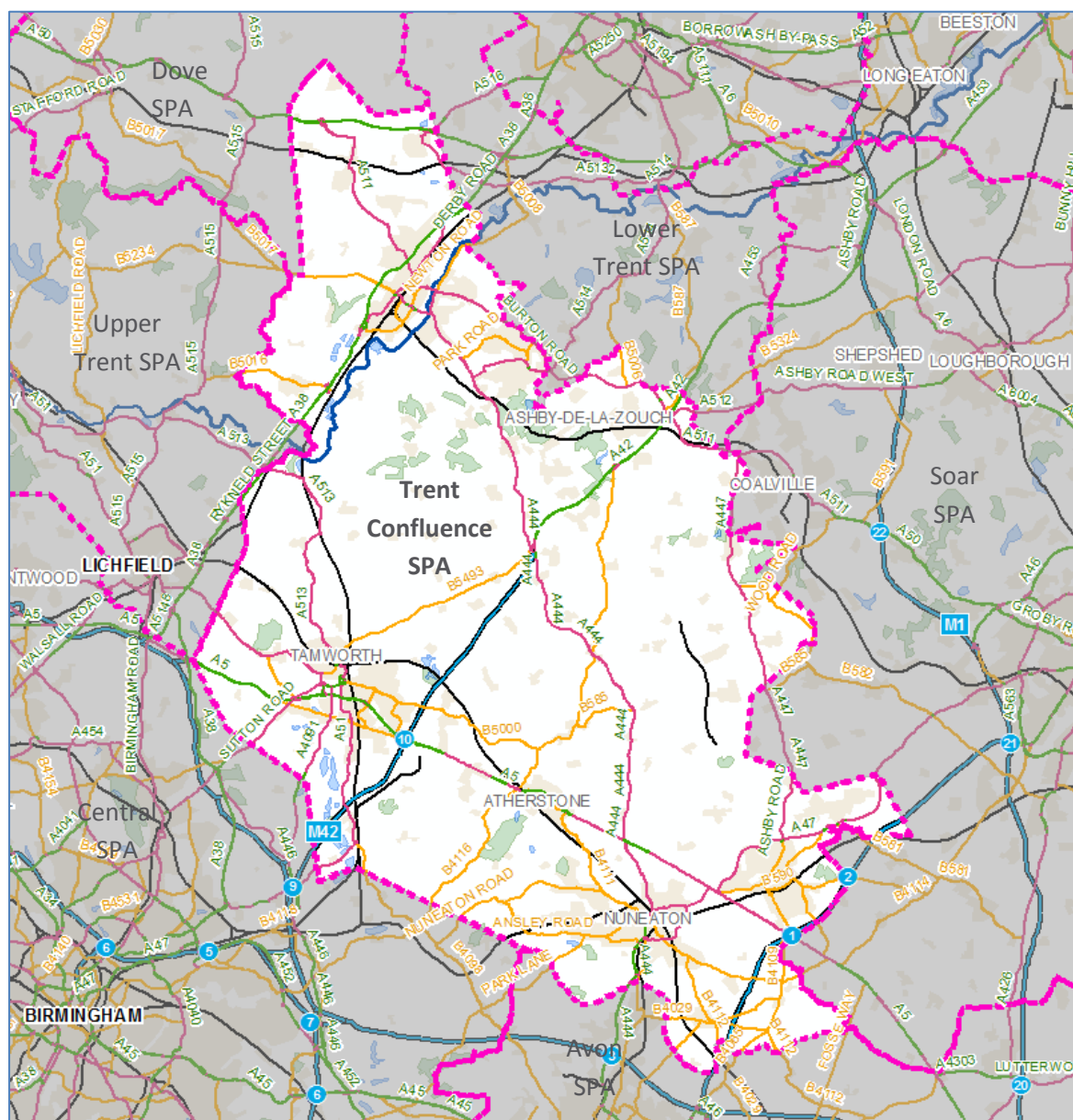
Appendix A10:

Trent Confluence Strategic Planning Area

1: Background

The L2 area principally covers the western area on the Tame Anker and Mease RBCM area principally based on the confluence of the River Trent with the River Tame, River Anker and River Mease and their upstream tributaries. The principle urban conurbations being Burton on Trent, Tamworth and Nuneaton.

This areas serves a population of approximately 780,000 people which represents 7.5% of the Severn Trent total.



Overview of the Trent Confluence Strategic Planning Area

There are 42 WwTW across the Trent Confluence SPA of which three serve a population of over 50,000 people; Clay Mills (serving Burton on Trent), Tamworth and Nuneaton. Parts of the catchment are rural in nature with 50% of the area's population draining to 21 small WwTW serving less than 2000 people (See Appendix B.9 for details).

The catchment covers 11 local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Tamworth	100%
Nuneaton and Bedworth	75%
Hinckley and Bosworth	65%
North Warwickshire	52%
North West Leicestershire	40%
South Derbyshire	36%
Lichfield	34%
East Staffordshire	23%
Rugby	8.5%
Blaby	3.2%

In terms of Environment Agency regions the Trent Confluence SPA falls within their Central region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (Central Area)
- River Trent RFCC
- Staffordshire LLFA, Leicestershire LLFA, Warwickshire LLFA and Derbyshire LLFA.
- Planning authorities in the table above.
- Tame Anker and Mease CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
CLAYMILLS	356,269	Green	Green	Green	Red	Red	Green	Green	Green	Green	Green	Red	Red	Red	Green	Green	Red	Red
TAMWORTH	99,433	Green	Green	Green	Red	Red	Green	Green	Red	Green	Green	Red	Green	Red	Red	Green	Red	Red
NUNEATON	95,362	Green	Green	Green	Red	Red	Red	Green	Green	Green	Green	Red	Red	Red	Red	Green	Green	Red

RBCS outputs for Trent Confluence SPA for catchments over 50,000PE

3: TPU assessment overview

Claymills WwTW

Located to the north west of Burton-on-Trent our Claymills WwTW is the largest in this SPA and overall our 5th largest facility. This works received significant amounts of flows from trade discharges in the catchment, associated with brewing and coffee making, which accounts for around three quarters of the total load arriving at the treatment works.

This catchment is split across two council districts; East Staffordshire and South Derbyshire, separated by the River Trent. East Staffordshire Borough Council has now adopted the Local Plan which has a plan period of 2012 to 2031. The Local Plan for South Derbyshire has been prepared in two parts. Part 1 was adopted by Full Council in June 2016, whilst The Local Plan Part 2 was adopted by Full Council in November 2017. The Adopted Local Plan Part 1 covers the period 2011 to 2028 and is the strategic element of the Local Plan.

Large volume of growth forecast along the north and west sides of the town; Branston Locks (2,500 dwellings), Henhurst Hill/Postern Park (1150 dwellings), Beamhill / Outwoods (1550 dwellings), Tutburry Rd/ Harehedge Ln (500 props).

Growth projects are ongoing to accommodate development to the Outwood Farm development and 500 dwellings proposed at Harehedge Lane and the Branston Locks development. The second project at Branston Locks involves increasing downstream capacity at Wellington Park SPS as well as diverting the rising main for Tatenhill SPS which has a history of bursts and sits within land owned by an active quarry who wish to utilise it.

Drakelow Park to the south of Burton and sitting in South Derbyshire District Council area is a local plan proposal to redevelop former Drakelow Power Stations. This development has been sized as up to 2,239 dwellings. Options have been assessed to upgrade the sewerage network through the Burton west sub-catchment but an alternative is being pursued to pump flows to the nearby Stanton WwTW where there is sufficient capacity.

Claymills WwTW is subject to planned WINEP improvements whilst there is also a SOAF underway on a CSO in the Horninglow area of the catchment.

Across the catchment there could be up to 12Ha of contributing area from the highway connected into the foul/combined network which could be separated. There is also an opportunity to separate approx. 5Ha of contributing area from partially separated drainage into the foul/combined system around Sydney St, Burton. These surface water separation opportunities are to be pursued in more detail as part of our PR24 DWMP assessments.

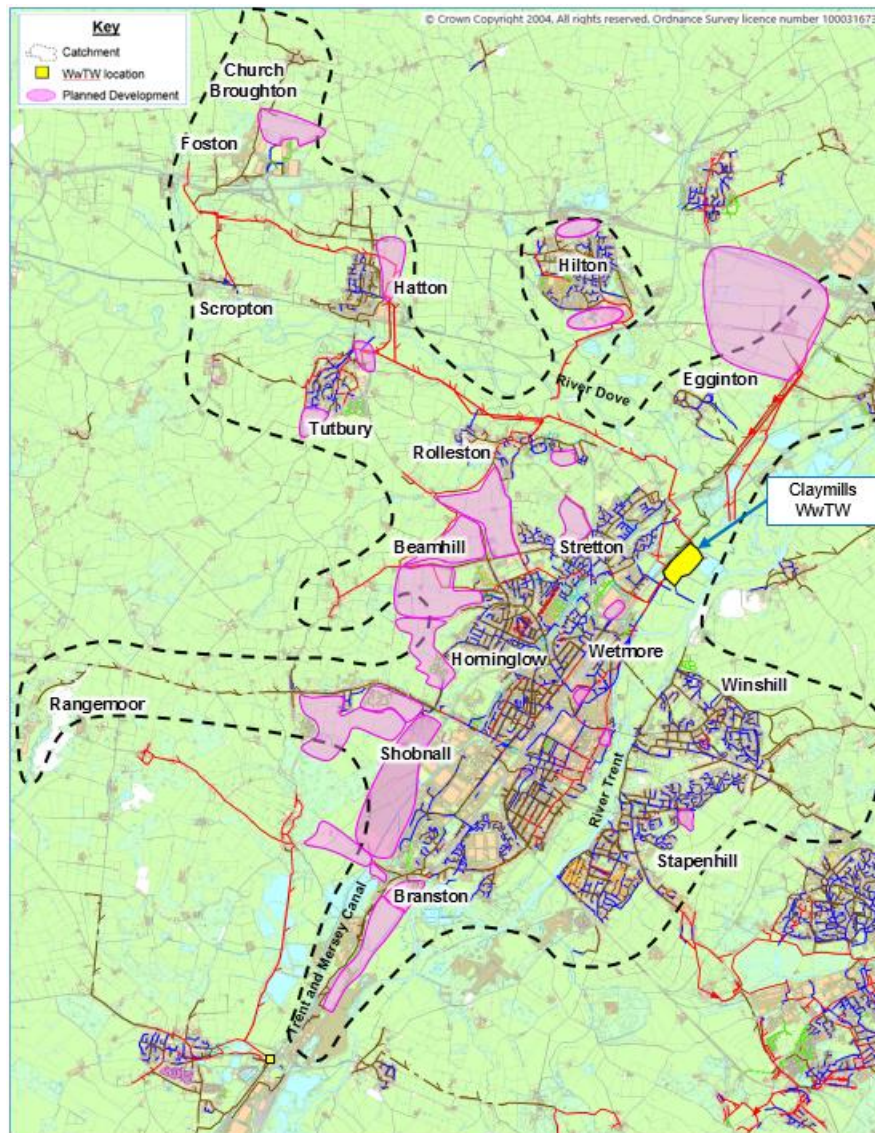
Poor serviceability (blockages) in areas of Burton West due to shallow/flat sewers & also high discharges of fats, oils and grease (FOG) and wet wipes are being addressed through customer education. The Proactive Work Program (PWP) has been active in small zones within the catchment in areas with especially dense reported issues during 2016-17 and 2018-19. Previous Blockage Reduction Strategies in Burton West in 2011 and 2014 suggest that regular intervention will be required in Burton West to maintain good performance and prevent blockage/FOG issues building up to resulting in flooding.

Flooding issues in Rolleston being considered through a pre-promotion study show although there is incapacity within the sewer system in Rolleston, much of the actual flooding is caused during storm conditions from Rolleston Brook or overland flow from surrounding fields.

The pressurised gravity main taking flows from the north of the catchment (western villages) from Rolleston Tanks to Claymills STW has an unknown structural and serviceability condition, and surveys have not been possible due to high levels of flow. Failure of this asset would be significant due to the high level of flows. This risk is being assessed as part of a wider catchment strategy to review options to mitigate the risk.

An upcoming EA scheme to rebuild life-expired defences to the south of the Burton will raise the height of the defences and possibly raise the river levels downstream in times of flood. Modelling using current River Level data provided by the EA for Tim Smith suggests few areas of risk in Burton West with outfalls close to the existing river levels and those outfalls

either confirmed or suspected to be already protected by flap valves. Flooding caused by surface water flows not able to be released due to high river levels preventing the flap valves opening may be likely, but has not been modelled to date.



Overview of the Claymills WwTW catchment

Tamworth WwTW

The catchment for Tamworth WwTW is split across several council districts; Tamworth (80%), Lichfield (14%) and North Warwickshire (6%). It is our 20th largest treatment works with most inflow being pumped.

The Tamworth Local Plan 2006-2031 outlines the spatial vision for sustainable development in the Borough up to 2031. Lichfield District Council is reviewing its Local Plan with the aim to create a new Local Plan that will provide direction on the future growth of the area. The North Warwickshire Local Plan has little development in the catchment.

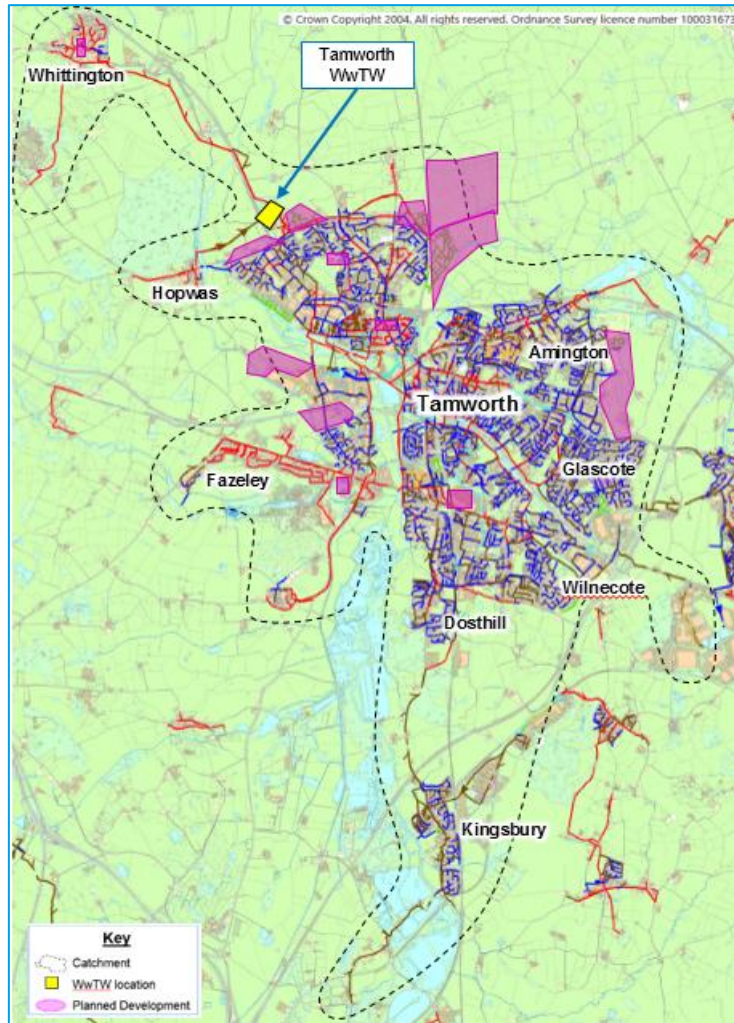
The main development proposals are located in the Anker Valley, Arkell Farm, Dunstall Lane, Tamworth Golf course, Browns Lane and Coton Lane. The Anker Valley, Browns Lane and Arkell Farm developments (1500 dwellings) are being dealt with as part of a project known as Tamworth (North) A sewerage growth project to negate the risk of flooding from a 225mm dia sewer in the immediate vicinity of the proposed development connection points, which could result in future flooding to new properties on one of the developments.

A new scheme promotion is planned to accommodate Dunstall Lane and provide a solution to Lichfield Road terminal pumping station (TPS) rising main which is a high profile risk. The rising main is one of the most vulnerable assets in Severn Trent, currently there are loggers on the rising main monitoring the issue. The retention time is 4 hours before the tanks will start to spill to the watercourse should the asset fail.

Infiltration issues have been identified via flow monitoring in the east of the catchment and this is to be pursued further.

Tamworth WwTW discharges to the basin Tame from River Anker to River Trent which is WFD status "poor" which has pressures from phosphate and organic pollution due to continuous sewage discharge. Improvements are being planned as part of our AMP7 WINEP programme. There are also SOAF assessments underway.

Across the catchment there could be up to 22Ha of contributing area from the highway connected into the foul/combined network which could be separated. However this is compounded by new development at Southwick Drive, Tamworth has resulted in 1.4Ha of contributing area from separated drainage being discharged into the foul/combined network. There's another 1.82Ha around Thomas St and 2.6Ha at Gorsy Bank Road. These connections are due to the automatic right to connect to the foul sewer in the absence of a suitable surface water outfall being available.



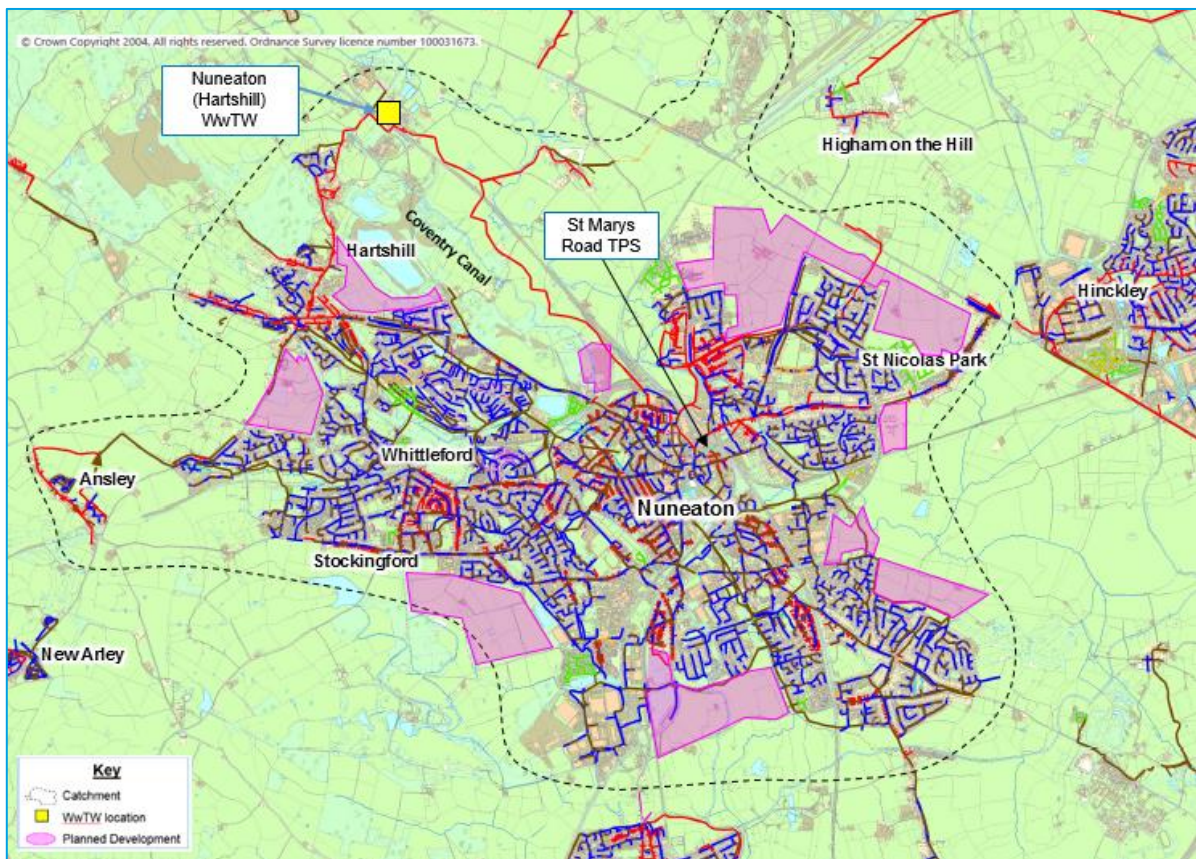
Overview of the Tamworth WwTW catchment

Nuneaton - Hartshill WwTW

Our Hartshill WwTW is located 3.2km to the west of Nuneaton town centre and treats flows from Nuneaton, Mancetter, Hartshill, Galley Common, Stockingford, Whitestone and Weddington.

The catchment is situated within Nuneaton and Bedworth Borough Council who are currently at examination stage of their local plan for the period 2011 to 2031 this is due to be adopted in August 2018. A strategic growth scheme has been raised to address the high cumulative impact of growth across multiple development sites within Nuneaton on both the sewerage network and STW, accounting for 5485 dwellings.

There is one CSO that has high frequently spilling CSOs listed in the NEP for Storm Overflow Assessment Framework (SOAF) investigations in AMP7, this is located at Weddington – Church Lane (CSO).



Overview of the Nuneaton (Hartshill) WwTW catchment

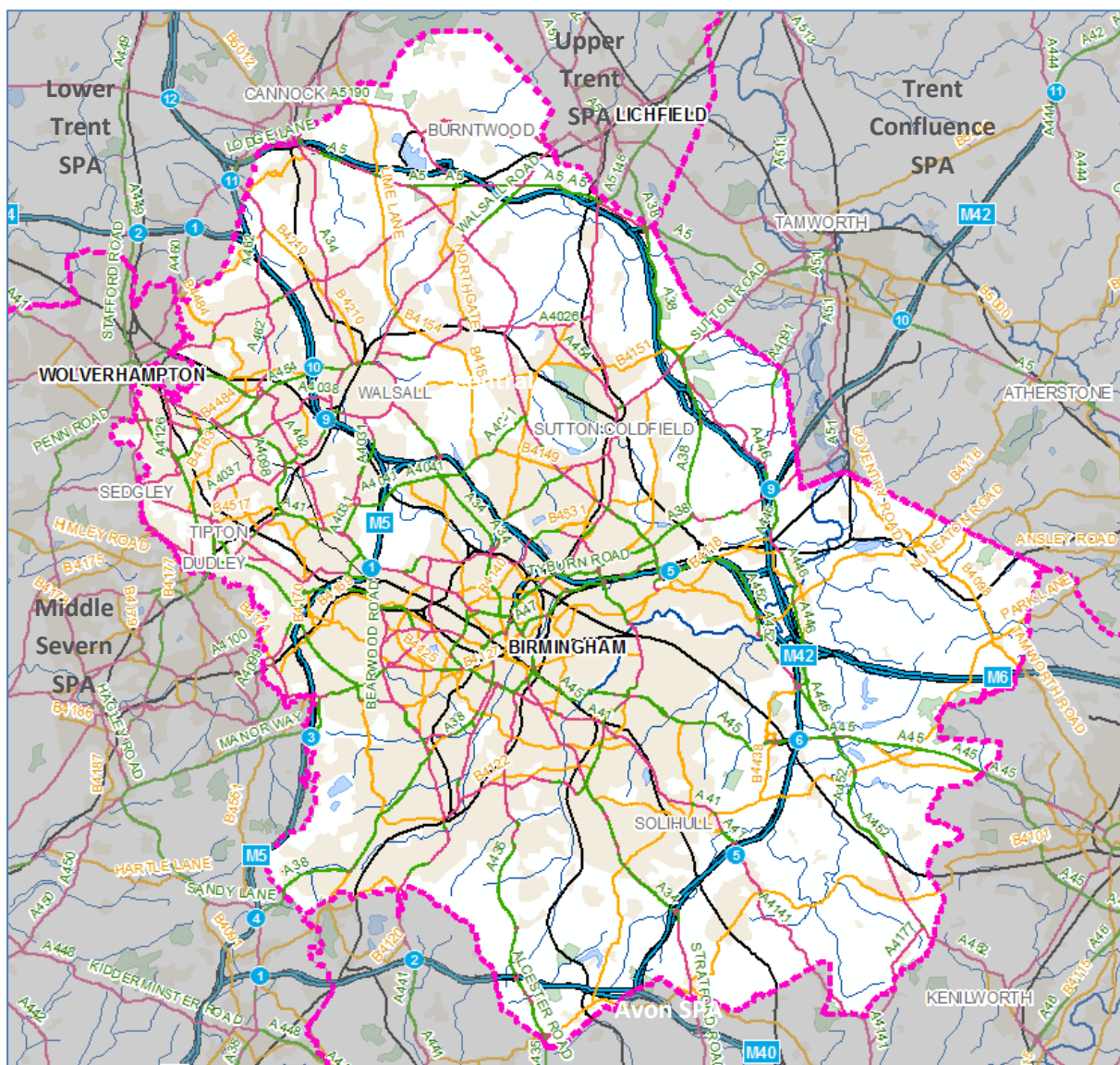
Appendix A11:

Central Strategic Planning Area

1: Background

The L2 area principally covers the eastern area of the Tame Anker and Mease RBCM area principally based on the River Tame and its upstream tributaries. The principle urban conurbations being the Birmingham and the Black Country.

This areas serves a population of approximately 2.4 million people which represents 23% of the Severn Trent total.



Overview of the Central Strategic Planning Area

There are 26 WwTW across the Central SPA of which five serve a population of over 50,000 people; the principle works being Minworth which serves 1.7 million people across Birmingham and the Black Country. Whilst more built up that other SPU 50% of the area's population draining to 13 small WwTW serving less than 2000 people (See Appendix B.10 for details).

The catchment covers 14 local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Walsall	100%
Birmingham	100%
Solihull	94%
Sandwell	89%
North Warwickshire	43%
Wolverhampton	37%
Cannock Chase	28%
Lichfield	24%
Dudley	16%
Bromsgrove	14%
South Staffordshire	5.4%
Warwick	4.8%
Coventry	2.0%
Stratford-on-Avon	1.7%

In terms of Environment Agency regions the Central SPA falls within their Central region.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (Central Area)
- River Trent RFCC & English Severn and Wye RFCC
- Birmingham LLFA, Walsall LLFA, Solihull LLFA, Sandwell LLFA, Wolverhampton LLFA, Warwickshire LLFA and Staffordshire LLFA.
- Planning authorities in the table above.
- Tame Anker and Mease CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
MINWORTH	1,695,010																	
COLESHILL	248,467																	
RAY HALL	136,015																	
GOSCOTE	109,758																	
BARSTON	60,652																	

RBCS outputs for Central SPA for catchments over 50,000PE

3: TPU assessment overview

Minworth WwTW & Rayhall WwTW

Minworth is our largest WwTW serving an equivalent population of around 1.7 million across Birmingham and The Black Country conurbations. Our Rayhall WwTW is located at the top end of the Black Country Trunk Sewer (BCTS) which drains through the catchment to Minworth and is designed to treat the base flow from West Bromwich, Wednesbury and Tipton areas with excess flows continuing along the BCTS to Minworth.

As expected there is a history of both internal and external flooding incidents in the Minworth catchment to which 817 location are attributable to hydraulic constraints in the network.

Given the scale and complexity of this catchment many flooding related issues require a collaborative approach between multiple stakeholders. Some of the partnership work we are currently involved in include:

- We are assisting Birmingham City Council (BCC) with Section 19 flooding investigations as a result of catchment wide flooding incidents in June 2016;
- We are liaising with both BCC and the Environment Agency regarding the flooding incidents in Birmingham over the May Bank Holiday weekend in 2018;
- We are an active partner of the Rea Catchment Partnership whose main aim is to reduce flood risk to communities located in the River Rea catchment. One project we are involved in as part of this is the Bourne Brook integrated flooding investigation which assesses flooding issues around the Reservoir Road/Osmaston Drive area of Birmingham which has a history of flooding from river, sewers and overland flows;

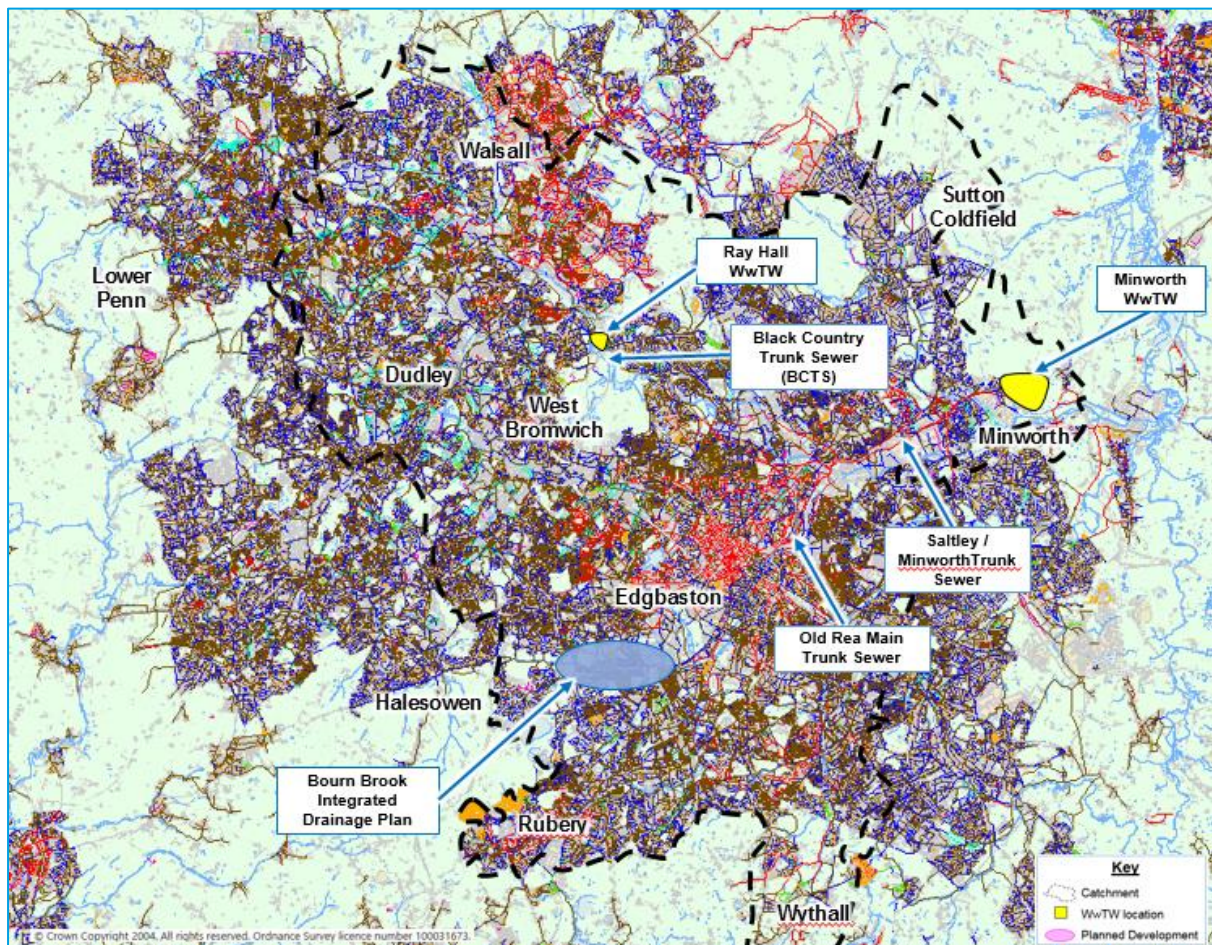
With regards to river water quality, the impact of CSO discharges on the WFD status of four receiving waterbodies in the catchment are being investigated in AMP6. These assessments will identify any performance deficiencies at the 124 CSOs being investigated and inform any future improvement needs. Five CSOs are listed in the draft National Environment Programme for improvements in AMP7 to enable the receiving waterbodies to reach good status.

Growth is a significant risk to the Minworth catchment which is covered by multiple councils; Walsall Metropolitan Borough and Sandwell Metropolitan Borough Councils published their joint local plan with other surrounding Black Country councils in 2011 and Birmingham City Council published its local plan in January 2017. Assessment of various sources of

growth data, including the Solihull Metropolitan Borough Council covering up to 2030, has identified developments equating to approximately 274,000 additional population which equates to an approximate 17 % growth.

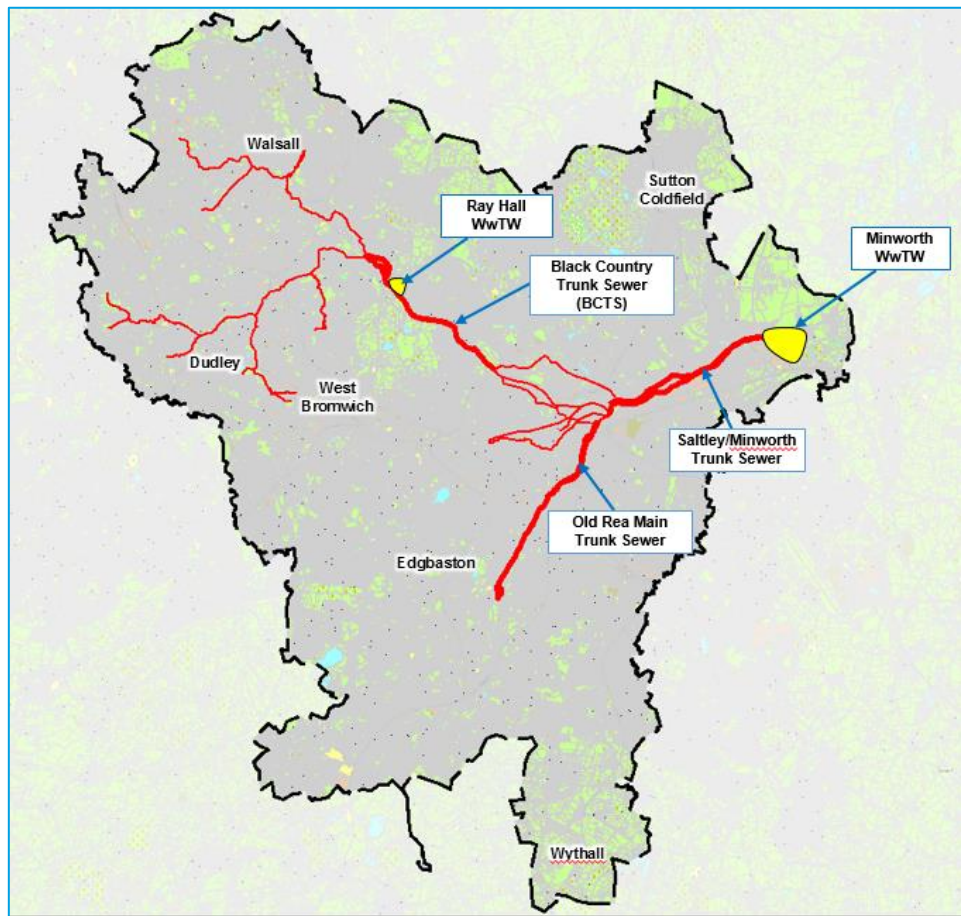
This proposed growth is generally spread across the whole of the Minworth catchment with some focus around city centre. Due to the combined nature of the drainage system in this area, there is a potential for surface water separation to be included within development proposals and installed in the existing system. This approach would reduce inflow and therefore increase capacity within the combined system.

Investigations are currently ongoing into the benefit of controlling the inflows into Minworth treatment works through the use of automated penstocks installed within the upstream catchment. This approach aims to balance flows using existing storage features in the network during dry weather flow periods. This proposal aims to reduce energy costs at the sewage treatment works and also flood risk within the upstream catchment during spatially varying storm events.



Overview of the Minworth and Rayhall WwTW catchments

Below is a map showing the Black Country Trunk Sewer (BCTS) and the principle trunk sewers serving the catchment.

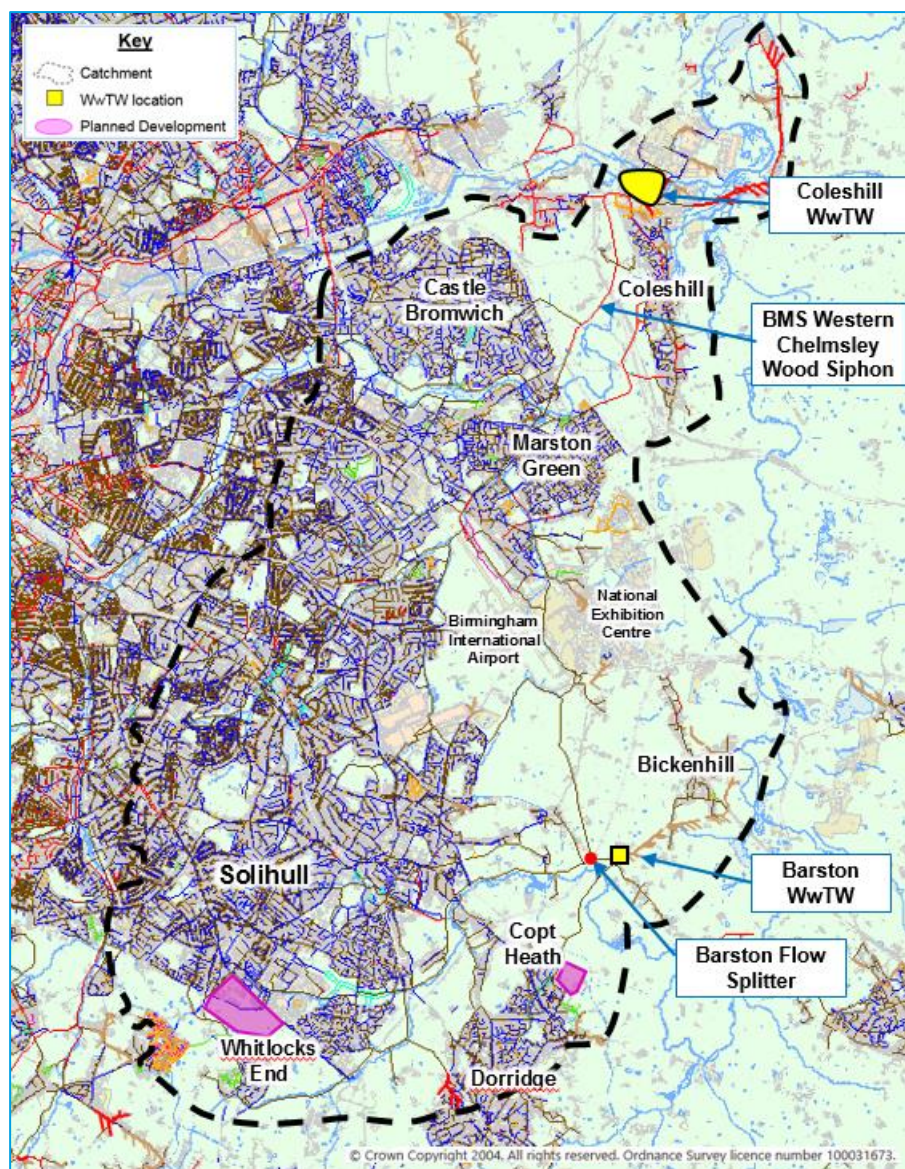


Black Country Trunk Sewer and principle trunk sewers across the Minworth and Rayhall WwTW catchments

Coleshill & Barston WwTW

Our Coleshill and Barston WwTW are inherently linked due to the design of the catchment. Under normal dry weather conditions accommodates its base flows but in storm conditions exceedance flows are diverted to Coleshill WwTW for treatment.

Growth is a significant risk to the Coleshill & Barston catchment. Assessment of various sources of growth data, including the Solihull Metropolitan Borough Council covering up to 2026, has identified developments equating to approximately 19,000 additional population which equates to an approximate 6% growth. Investigations are currently ongoing to understand the risk of this proposed growth in terms of flooding and pollution detriment. Although not confirmed it is anticipated that the Coleshill trunk sewer may require a proportion of upsizing to ensure no detriment to the catchment from the increased flows discharging into the system. The requirement for this sewer upsizing will be investigated once the catchment impact has been determined.



Overview of the Coleshill & Barston WwTW catchments

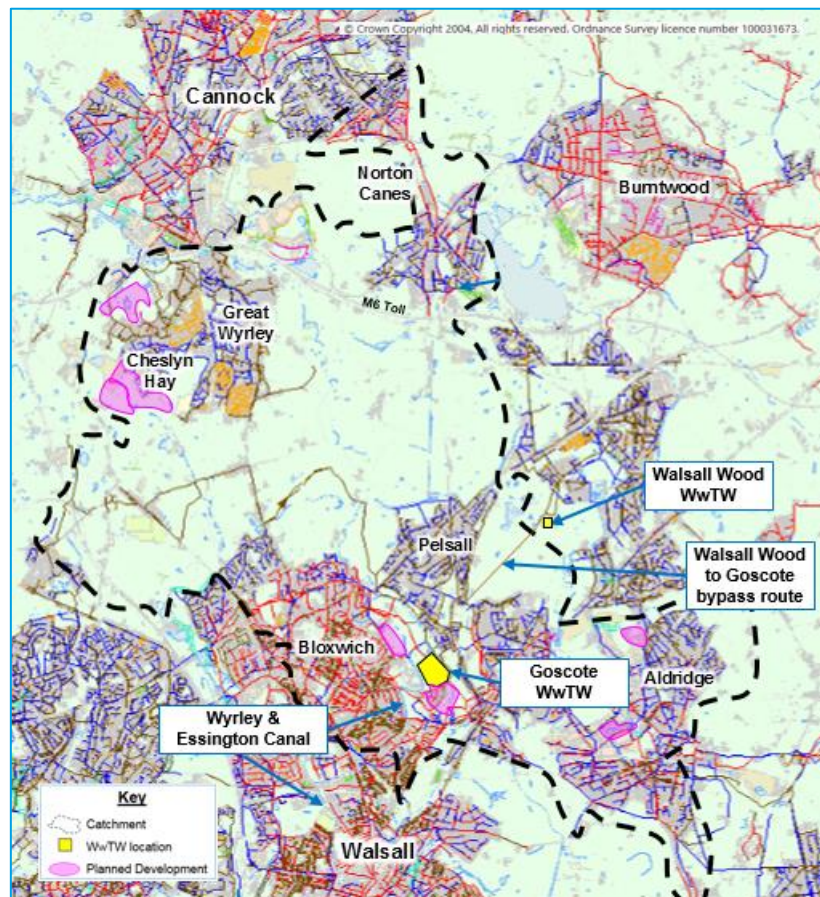
Goscote WwTW

The Goscote WwTW catchment is located to the north west of Walsall town centre with the treatment works being located in the centre of the catchment.

The Goscote catchment is spread across 3 council authorities Cannock Chase Council, South Staffordshire Council and Walsall Council. Cannock Chase and South Staffordshire Council have adopted their local plans and Walsall Council published its draft report in May 2016. There is a proposed increase of approximately 3,000 dwellings by 2035 across the Goscote catchment. The majority of the development (approximately 1,000 properties) are to the north in the Norton Canes, Great Wyrley and Cheslyn Hay areas.

In terms of river water quality, the impact of CSO discharges on the WFD status of the Ford Brook, is currently being investigated. This assessment will identify any performance deficiencies at the CSOs being investigated and inform any future improvement needs.

A capital project at Goscote WwTW also aims to improve the water quality of its outputs. The performance of the WwTW inlet works has a significant impact on the performance of the trunk sewers and associated sewer assets. Results from the ongoing WFD investigations and flood alleviation feasibility work will enable the performance of the Goscote WwTW to be better understood and allow option development to be appraised for the PR24 DWMP.



Overview of the Goscote WwTW catchment

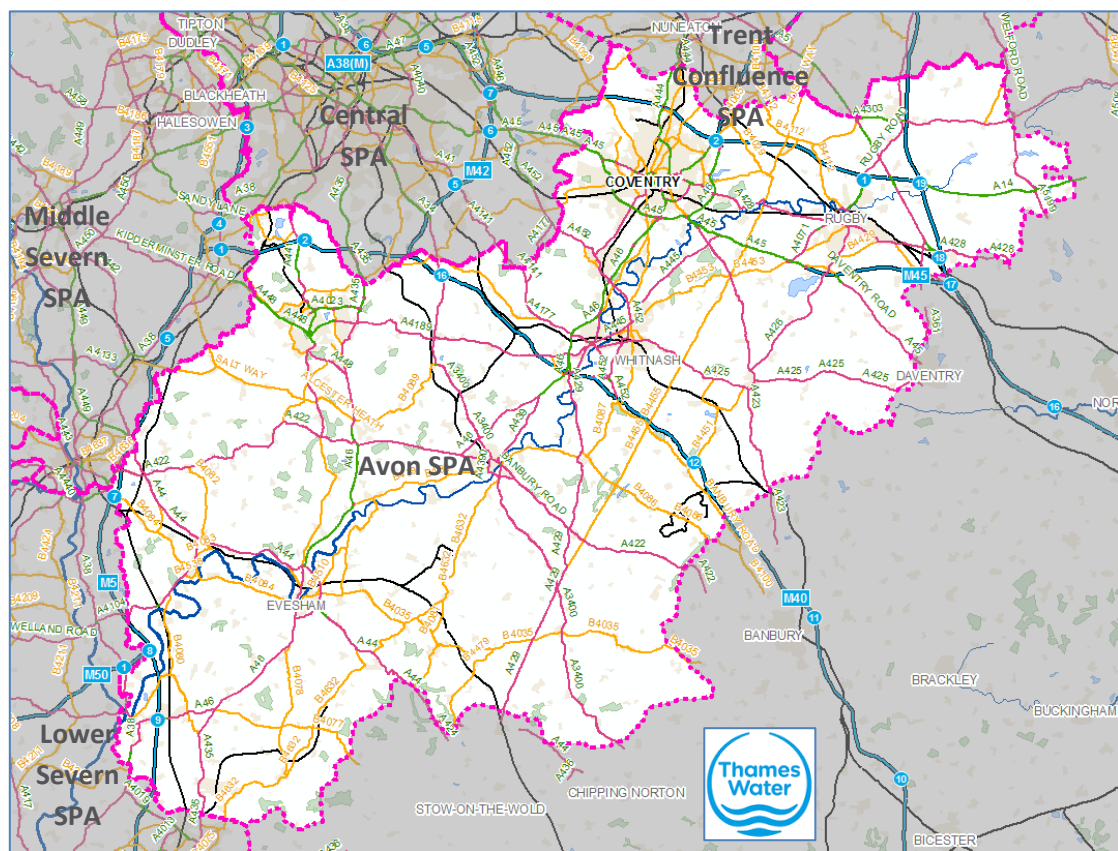
Appendix A12:

Avon Strategic Planning Area

1: Background

The L2 area principally covers the eastern area of the Avon RBCM area principally based on the River Avon and its upstream tributaries. The principle urban conurbations being the Coventry, Warwick, Leamington Spa and the Black Country.

This areas serves a population of approximately 1 million people which represents 10.3% of the Severn Trent total.



Overview of the Avon Strategic Planning Area

There are 155 WwTW across the Avon SPA of which four serve a population of over 50,000 people; Finham (serving Coventry), Warwick Longbridge (serving Warwick and Leamington Spa), Rugby Newbold (serving Rugby) and Spernal (serving Redditch). This fairly rural SPU 77% of the area's population draining to 119 small WwTW serving less than 2000 people (See Appendix B.11 for details).

The catchment covers 16 local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Redditch	100%
Coventry	98%
Warwick	95%
Stratford-on-Avon	93%
Rugby	87%

Local Planning Authority	% of administrative boundary covered by this SPA
Wychavon	77%
Tewkesbury	49%
Bromsgrove	31%
Nuneaton and Bedworth	25%
Daventry	23%
Harborough	18%
Cotswold	10%
Solihull	6.1%
Cheltenham	5.7%
North Warwickshire	5.4%
Cherwell	3.3%

In terms of Environment Agency regions the Avon SPA falls principally within their Central area but the west of the SPA being covered by the West area.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (Central and West Areas)
- English Severn and Wye RFCC
- Coventry LLFA, Warwickshire LLFA, and Worcestershire LLFA.
- Planning authorities in the table above.
- Avon Warwickshire CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
COVENTRY - FINHAM	435,448																	
WARWICK - LONGBRIDGE	122,721																	
RUGBY NEWBOLD	97,764																	
REDDITCH - SPERNAL	77,011																	

RBCS outputs for Avon SPA for catchments over 50,000PE

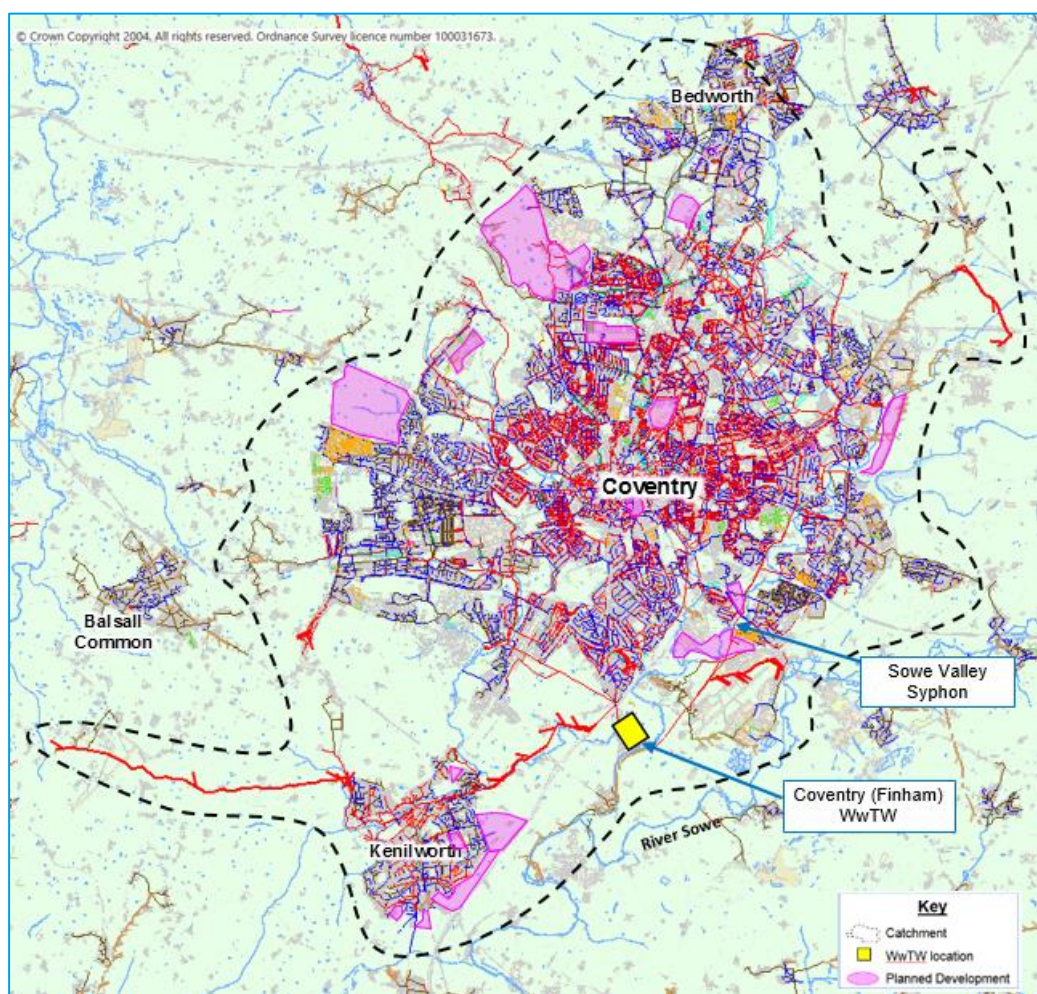
3: TPU assessment overview

Coventry (Finham) WwTW

Finham WwTW is our 4th largest treatment works and treats flows Coventry, Bedworth and Kenilworth. The works is located to the south east of Coventry with flows from Kenilworth being pumped.

The catchment is situated within three local authority areas. It is predominantly within Coventry City Council which has a Local plan covering the period 2017 to 2031 which was adopted December 2017. Kenilworth falls within Warwick District Council area covering the plan period 2011 to 2029 which was adopted September 2017. Bedworth falls within the Nuneaton and Bedworth Borough Council Local Plan 2011 to 2031 which is currently at Examination stage. Within the catchment there is a large amount of expected growth with the provision of 24,848 dwellings and 161 Ha employment across the three planning areas. A total of 1548 dwellings across multiple sites is allocated for the area of Bedworth located within the catchment. 3800 dwellings have been allocated for Warwick District Council areas including 2000 dwellings in Kenilworth for which a scheme is being investigated to provide capacity at Dalehouse Lane pumping station and 1800 at King's Hill near Finham. Within Coventry City Council two large sustainable urban extensions have been allocated, located at Keresley for 3,100 dwellings and Eastern Green for 2250 dwellings which has a strategic growth scheme to address capacity risks.

There is one CSO that has high frequently spilling listed in the NEP for Storm Overflow Assessment Framework (SOAF) investigations in AMP7, this is located at Hermes Crescent, Coventry.



Overview of the Coventry (Finham) WwTW catchment

Warwick - Longbridge (WwTW)

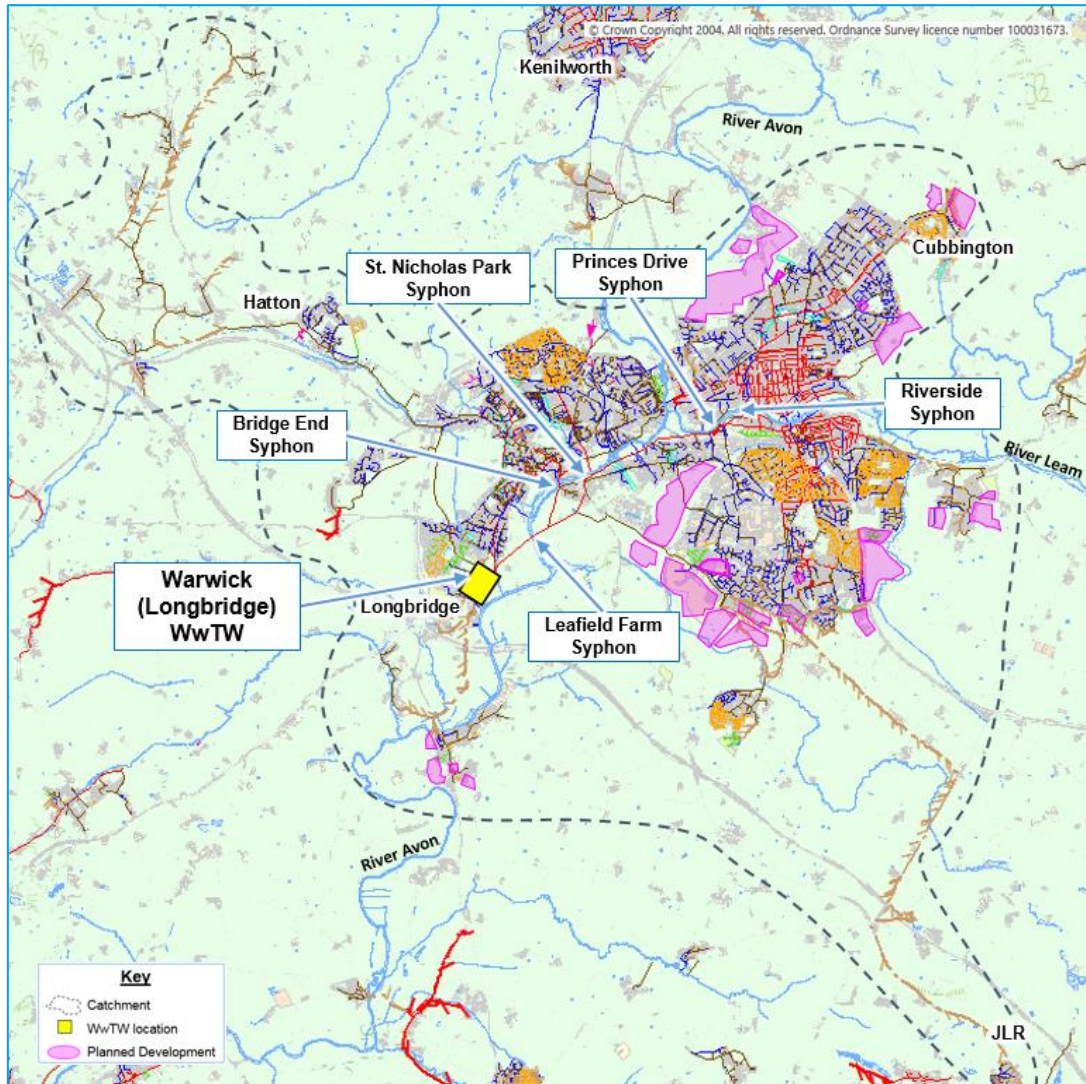
Our Warwick WwTW is located at Longbridge to the south west of the town centre. It treats flows from Warwick, Leamington Spa, Lighthorne Heath, Bishops Tachbrook, Radford Semele, Cubbington, Hatton Park, Hampton Magna and Barford.

The catchment is situated within the local authority area of Warwick District Council which has a Local Plan for the planning period 2011 to 2029 which was adopted September 2017. A cumulative total of approximately 12,000 dwellings are expected between 2016 and 2029 in Leamington Spa, Warwick, Lighthorne Heath, Bishops Tachbrook, Radford Semele, Cubbington, Hatton Park, Hampton Magna and Barford. A strategic growth scheme is at feasibility stage to address this growth. Key strategic sites in Warwick and Leamington Spa include Land West of Europa Way (1210 dwellings), Former Harbury Sewage Works (1820 dwellings), Land East of Whitnash (500 dwellings), Gallows Hill (630 dwellings) and The Asps (900 dwellings).

There is known infiltration risk to the North of the River Leam, Jephson Gardens and Victoria Park. Alongside this there are high risk resilience issues with high river levels along the River Avon and River Leam, with medium risk at the A429 at Wasperton, Junction 15 of the M40 and at Warwick Golf Centre. Other specific catchment issues include a Hydrogen Sulphide attack on a branch of the network serving the north west of the catchment between Hampton and Hatton.

There is potential that negative impacts to the WwTW inlet could be addressed by investigating capacity and consent issues at Princes Drive storm tanks on the network.

There is one CSO that has high frequently spilling CSOs listed in the NEP for Storm Overflow Assessment Framework (SOAF) investigations in AMP7.

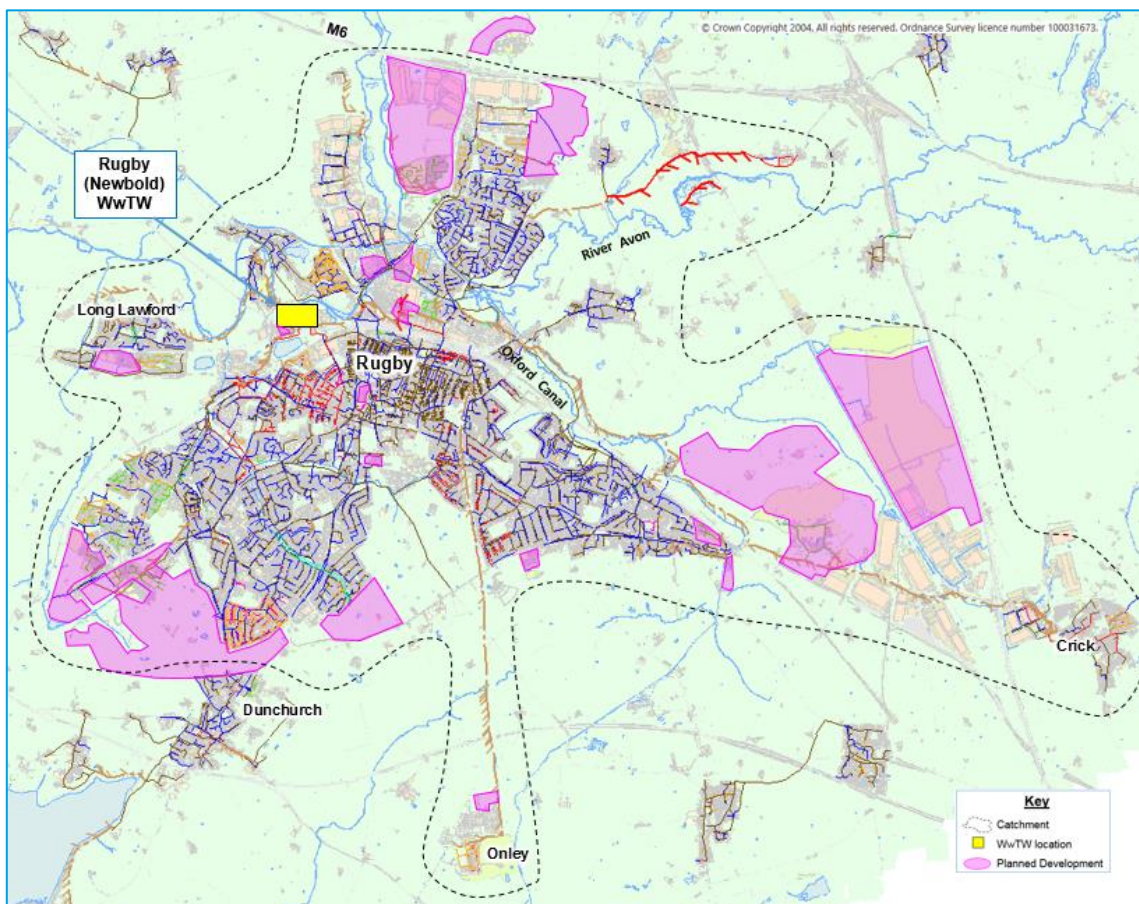


Overview of the Warwick (Longbridge) WwTW catchment

Rugby (Newbold) WwTW

The Rugby catchment (including the village of Crick to the east) drains to our WwTW located to the north west of the town centre at Newbold.

The catchment is situated within two local authority areas. Rugby Borough Council which has a Local Plan for the period 2011 to 2031 which is currently under examination and the Daventry District Council Part 2 Regulation 18 Draft local plan 2011 to 2029 for the area of Crick. There is limited development in Crick. Based on the Rugby District Council Publication Draft Local Plan from September 2016, the Local Plan expects to deliver a total of 13,664 dwellings between 2011 and 2031. There are three large growth areas within Rugby, these include Rugby Gateway and Coton Park (2200 dwellings and 34Ha employment), Rugby Radio Station (6200 dwellings and 16Ha employment) and South West Rugby (5000 dwellings and 35Ha employment). A strategic growth scheme is addressing growth from Rugby Gateway, Coton Park and Rugby Radio Station developments. A further scheme is being investigated to deliver capacity improvements for the growth in South West Rugby.



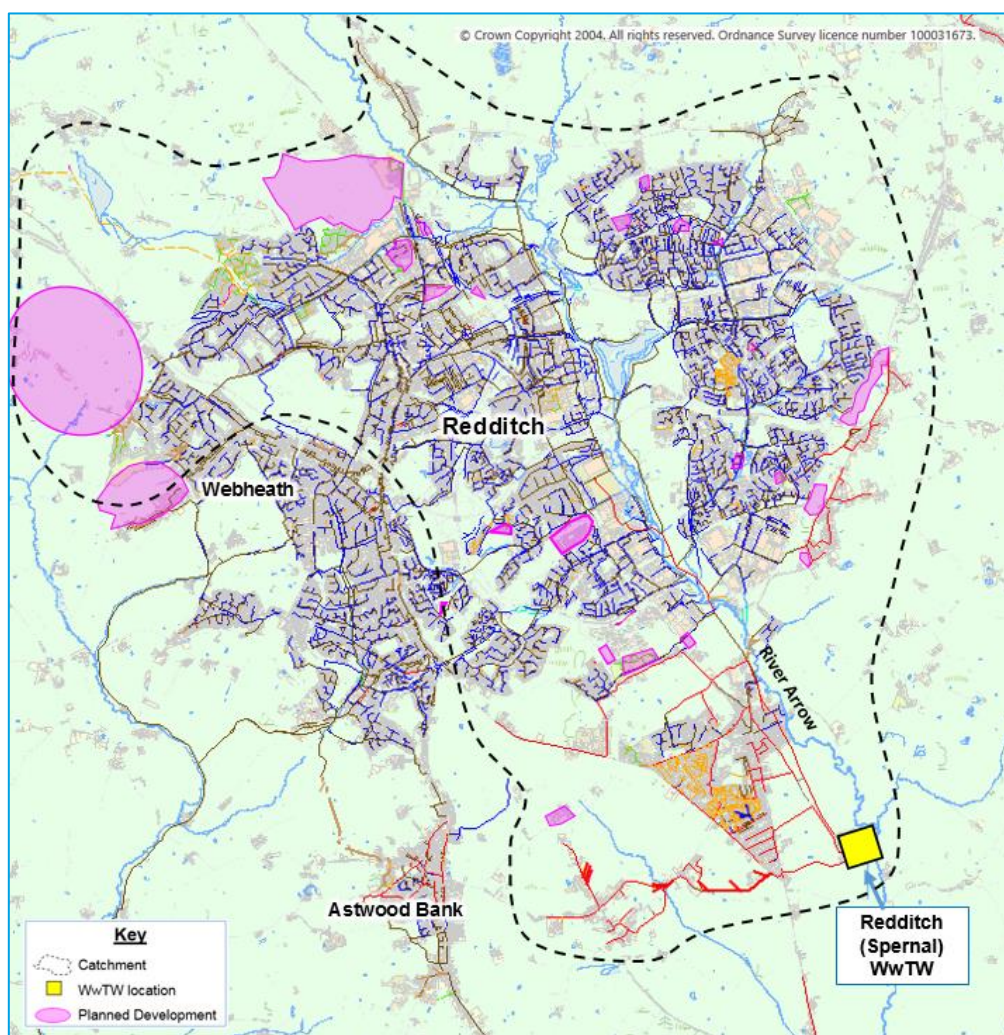
Overview of the Rugby Newbold WwTW catchment

Redditch (Spernal) WwTW

Our Spernal WwTW is located to the south east of Redditch at Spernal and treats flows from Redditch and Studley.

The catchment is situated across three local authority planning areas. Redditch Borough Council and Bromsgrove District Council which have linked Local Plans for the period 2011 to 2030, both adopted January 2017 and Stratford upon Avon Core Strategy for the plan period 2011 to 2031 which was adopted in July 2016. There is a total of 5450 dwellings and 8.45Ha employment allocated in the catchment with 2 large strategic sites at Brockhill East totalling 1950 dwellings the potential for a strategic scheme is being investigated due to potential capacity risk into the connecting system and at Webheath and Foxlydiates for 3400 dwellings. There is a high risk to flooding with this development therefore a scheme will be promoted for this site. In the Stratford upon Avon area there are 19 Ha employment land at the A435 corridor which will drain to Spernal.

Other specific catchment risks include the occurrence of pitch fibre pipes at Lodge Park.



Overview of the Redditch WwTW catchment

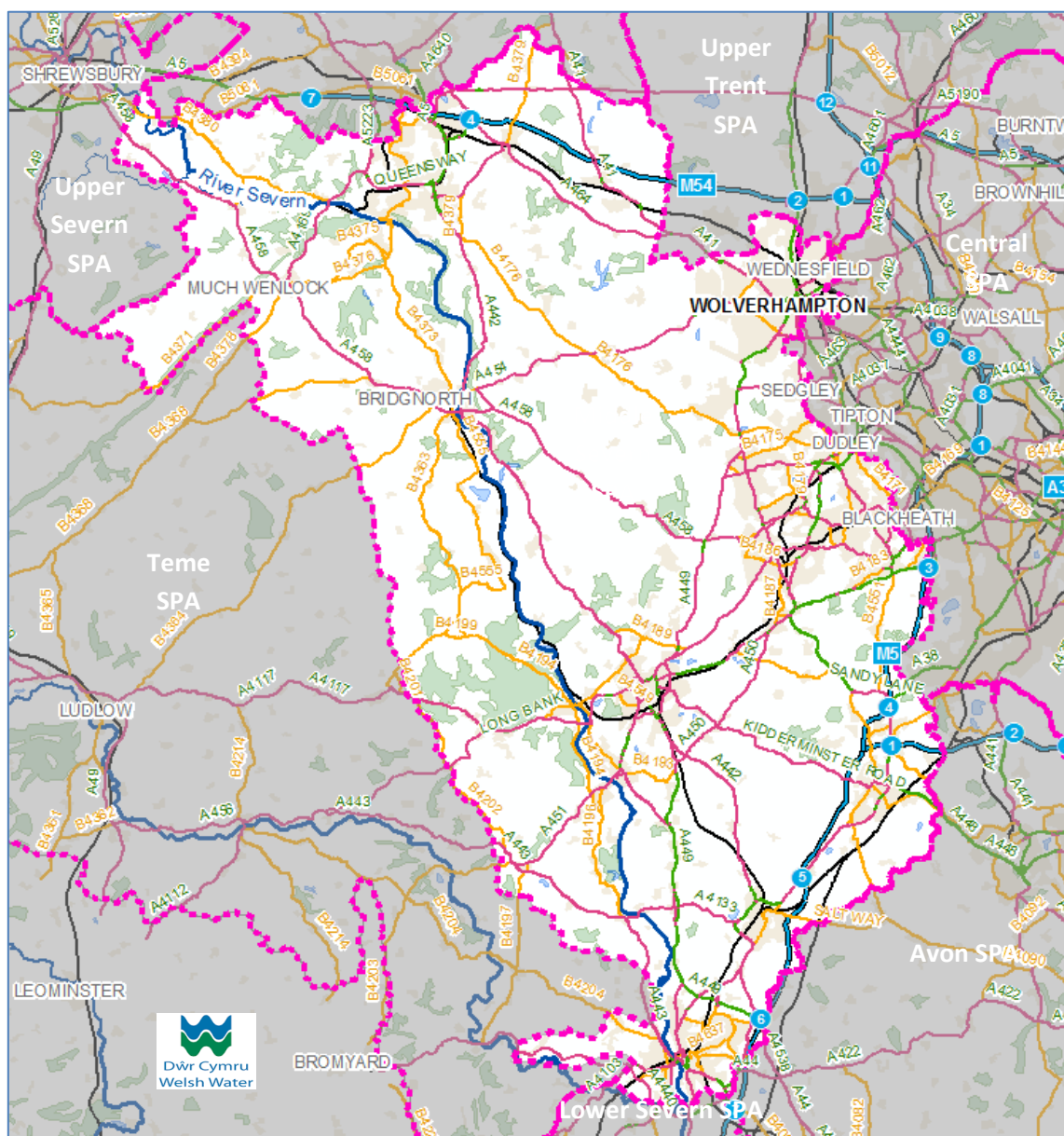
Appendix A13:

Middle Severn Strategic Planning Area

1: Background

The L2 area principally covers the eastern area of the Severn Middle Worcestershire RBCM area principally based on the middle reaches of the River Severn and its upstream tributaries. The principle urban conurbations being the Wolverhampton, south west Black Country, Worcester, Kidderminster and Bromsgrove.

This areas serves a population of approximately 930,000 people which represents 9% of the Severn Trent total.



Overview of the Middle Severn Strategic Planning Area

There are 64 WwTW across the Middle Severn SPA of which six serve a population of over 50,000 people; the principle works being Barhurst (serving Wolverhampton), Roundhill, Worcester and Kidderminster. This fairly rural SPU 72% of the area's population draining to 46 small WwTW serving less than 2000 people (See Appendix B.13 for details).

The catchment covers 12 local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Wyre Forest	99%
Worcester	93%
Dudley	84%
Bridgnorth	80%
Wolverhampton	55%
Bromsgrove	55%
South Staffordshire	39%
Wychavon	21%
The Wrekin	18%
Shrewsbury and Atcham	17%
Malvern Hills	14%
Sandwell	11%

In terms of Environment Agency regions the Middle Severn SPA falls within principally within their Central area but with parts covered by their Central area.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (West and Central Areas)
- English Severn and Wye RFCC
- Mets LLFA, Staffordshire LLFA, and Worcestershire LLFA.
- Planning authorities in the table above.
- Severn Middle Worcestershire CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
ROUNDHILL	276,251																	
BARNHURST	142,451																	
WORCESTER - BROMWICH ROAD	110,973																	
KIDDERMINSTER OLDINGTON	105,570																	
COALPORT	72,400																	
BROMSGROVE	60,827																	

RBCS outputs for Middle Severn SPA for catchments over 50,000PE

3: TPU assessment overview

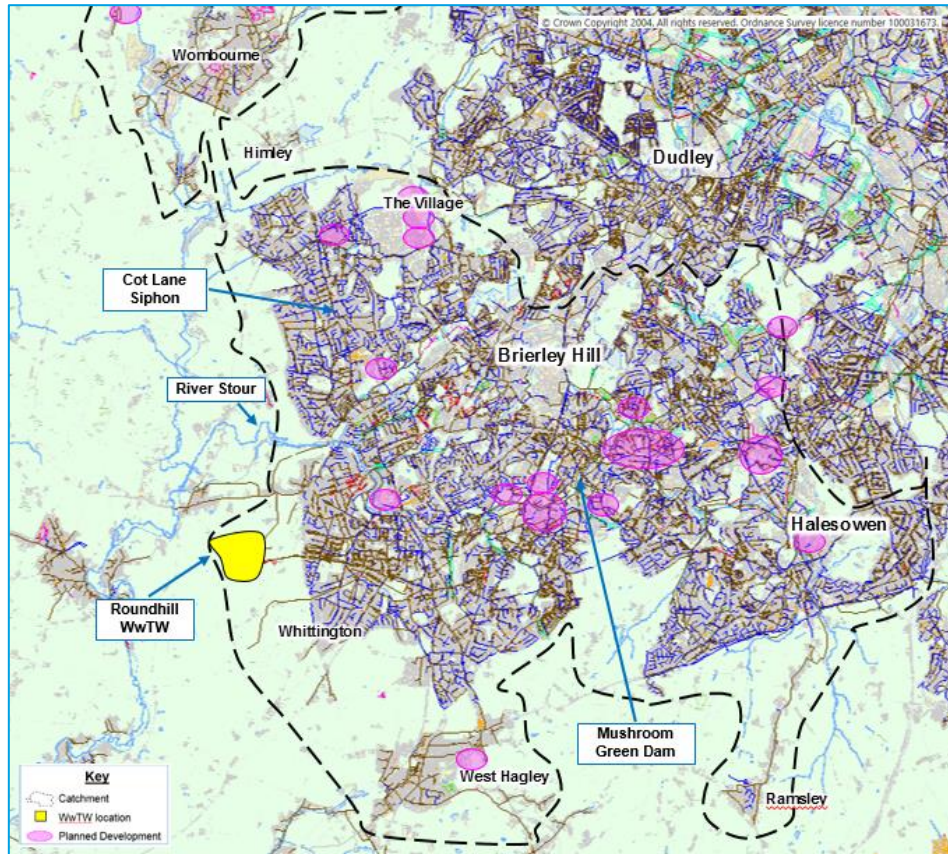
Roundhill WwTW

Roundhill WwTW is our 8th largest treatment works and serves the urban conurbations comprising Kingswinford, Brierley Hill, Cradley Heath and Stourbridge.

There is a history of both internal and external flooding incidents in the Roundhill catchment to which 204 are attributable to hydraulic constraints in the network. Of these 61 have been mitigated and/or have had a previous capital project and 9 will be addressed by the Mushroom Green Dam strategy and April Cottage Woodland Avenue Flood Alleviation Scheme. In terms of river water quality, the impact of CSO discharges on the WFD status of a receiving waterbody is currently being investigated. This assessment will identify any performance deficiencies at the CSOs being investigated and inform any future improvement needs.

The Roundhill catchment sits within Dudley Council area. The local plan for this area was adopted in March 2017. The Black Country core strategy was adopted in 2011 but is now under review. There are currently no details of any large developments planned within the catchment.

Due to the complexity of this catchment it is envisaged that the BRAVA assessment will be prioritised as early as possible to ensure long term strategies can be assessed ahead of the PR24 DWMP.



Overview of the Roundhill WwTW catchment

Barnhurst WwTW

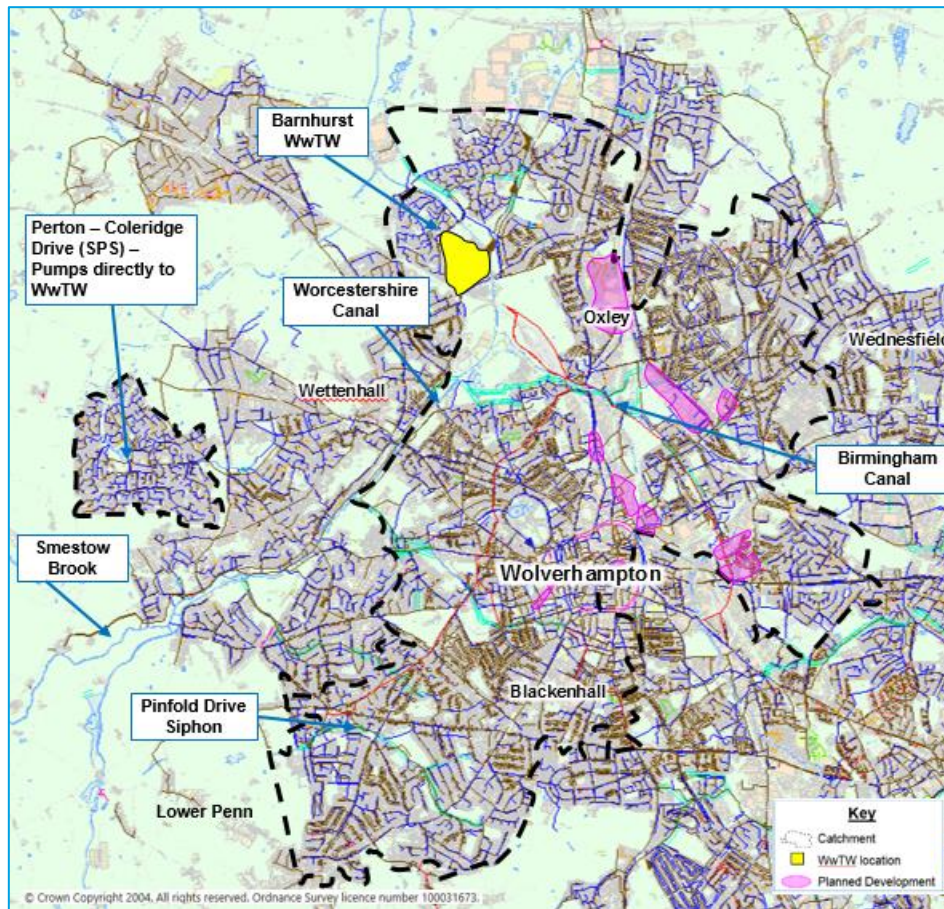
Barnhurst WwTW predominantly serves the central, eastern and northern areas of Wolverhampton with the treatment works being located to the north west of the town centre.

The Barnhurst area sits within the Wolverhampton Council area. The Black Country core strategy was adopted in 2011 but is now under review. The SHLAA in the city was reviewed and adopted in April 2018. The largest apparent development within the catchment is a 380 unit housing scheme along Wednesfield Road. There is potential for 4 or 5 similar sized developments to go ahead on the periphery of the Wolverhampton ring road which have been allocated as part of SHLAA.

There is a history of both internal and external flooding incidents in the Barnhurst catchment to which 113 are attributable to hydraulic constraints in the network. These flooding issues are being prioritised as part of our hydraulic sewer flooding programme. With regards to river water quality, the impact of CSO discharges on the WFD status of two receiving waterbodies are planned for investigation in AMP7. These assessments will identify any performance deficiencies at the CSOs being investigated and inform any future improvement needs.

There is a current integrated drainage partnership at Field Head Place (Trescott) and the Penk Brook in the Perton area of the Barnhurst catchment.

Due to the complexity of this catchment it is envisaged that the BRAVA assessment will be prioritised as early as possible to ensure long term strategies can be assessed ahead of the PR24 DWMP.



Overview of the Barnhurst WwTW catchment

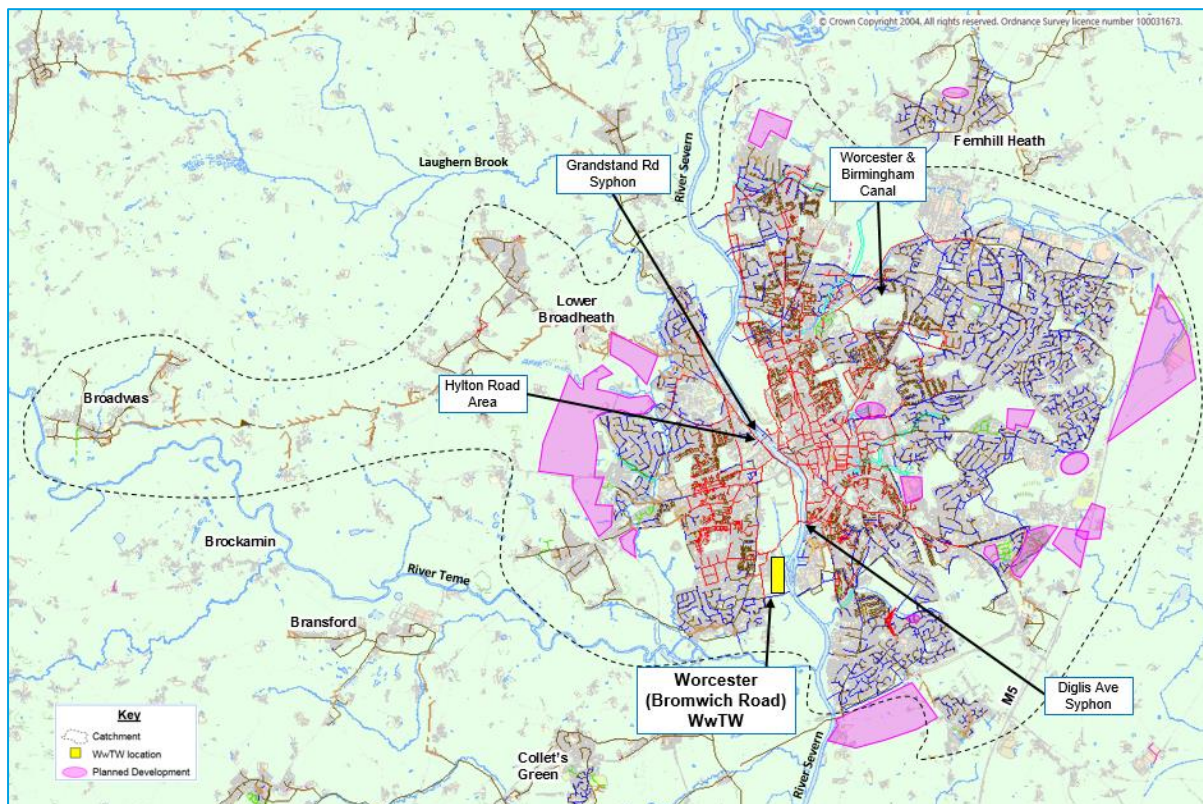
Worcester (Bromwich Road) WwTW

Worcester WwTW is located to the centre of the city centre located adjacent to the River Sever which runs through the centre of the catchment.

The catchment is situated within the local authority area of Worcester City Council which has joined with Malvern District Council and Wychavon District Council to produce the South Worcestershire Development Plan (SWDP) covering a plan period of 2016 to 2030. The plan was adopted in February 2016 and is currently under review which commenced in 2017. A total of 4923 dwellings and 80Ha employment are allocated for this catchment. A strategic growth feasibility scheme is in place to determine capacity improvements required to address high flooding, CSO and SPS risks in the west of the catchment.

Due to the proximity to the River Sever there are known high infiltration risks, especially when the river is at high levels, this causes increased flows to the works. There are also fluvial interactions during very high river levels which have an adverse interaction with the sewerage in the Hylton Road area and Diglis. Resilience works are currently being evaluated with potential for partnership working with River Sever flooding groups.

There are two CSOs that have high frequently spilling CSOs listed in the NEP for Storm Overflow Assessment Framework (SOAF) investigation.



Overview of the Worcester (Bromwich Road) WwTW catchment

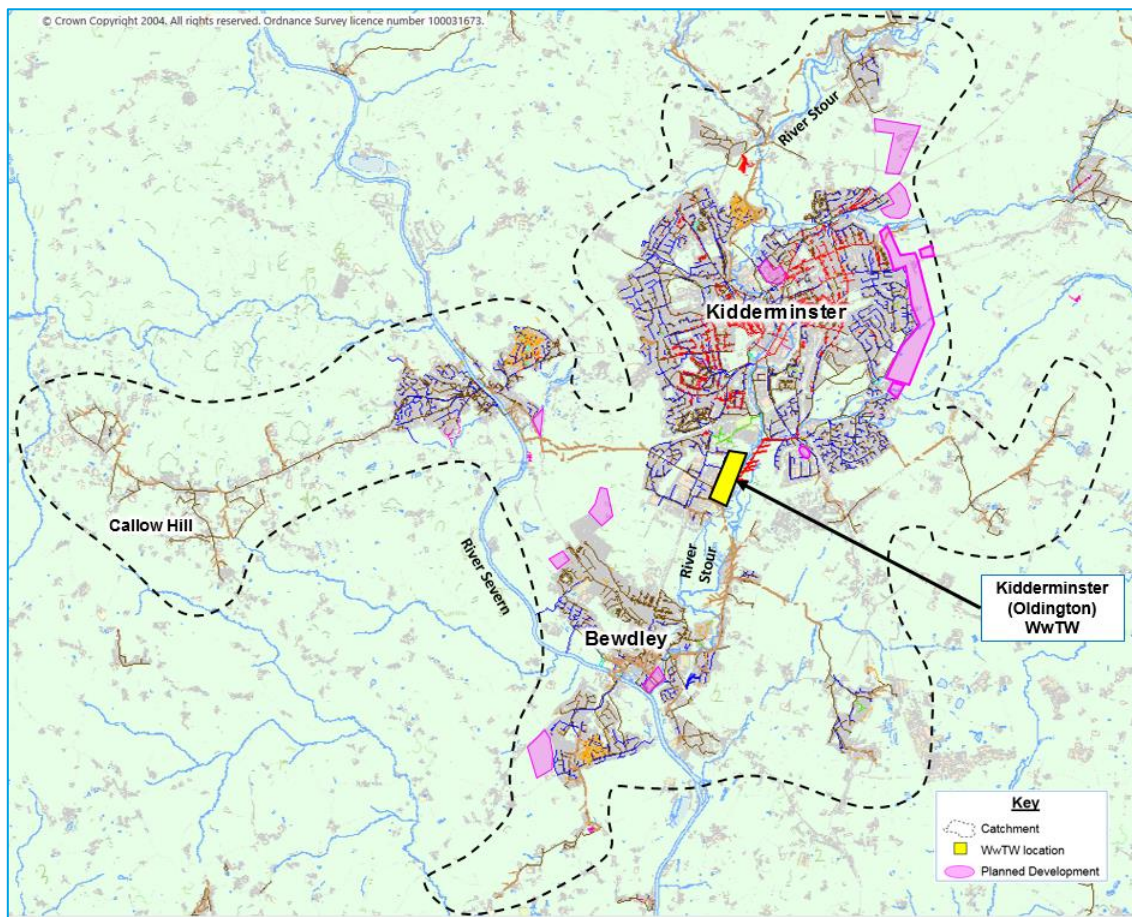
Kidderminster (Oldington) WwTW

Our Oldington WWTW is located to the south of Kidderminster adjacent to the River Stour. These facility treats flows from Kidderminster, Bewdley, Stourport-On-Severn, Hartlebury, Callow Hill, Wribbenhall and Wolverley.

The catchment is situated within the Wyre Forest District Council local authority area have a Core Strategy for the planning period 2006 to 2026. A Local Plan Review is currently at underway, this was at Preferred Options Stage in August 2017 and as a result of this there are a number of preferred strategic development options currently being investigated. There is a requirement to provide 6000 dwellings in this catchment. Core sites include 1735 dwellings and 9.6 Ha in the East of Kidderminster and 800 dwellings and 2 Ha Employment North of Kidderminster.

With the river Sever passing through the catchment there are several locations where high river levels have a detrimental impact on the operation of the sewerage network, in particular Beales Corner, Bewdley. Flood resilience assessment work is currently being discussed with the Environment Agency. There is potential for an integrated drainage partnership at Astley Cross.

There are a number of CSOs subject to ongoing SOAF assessments ahead of potential investment in AMP7.

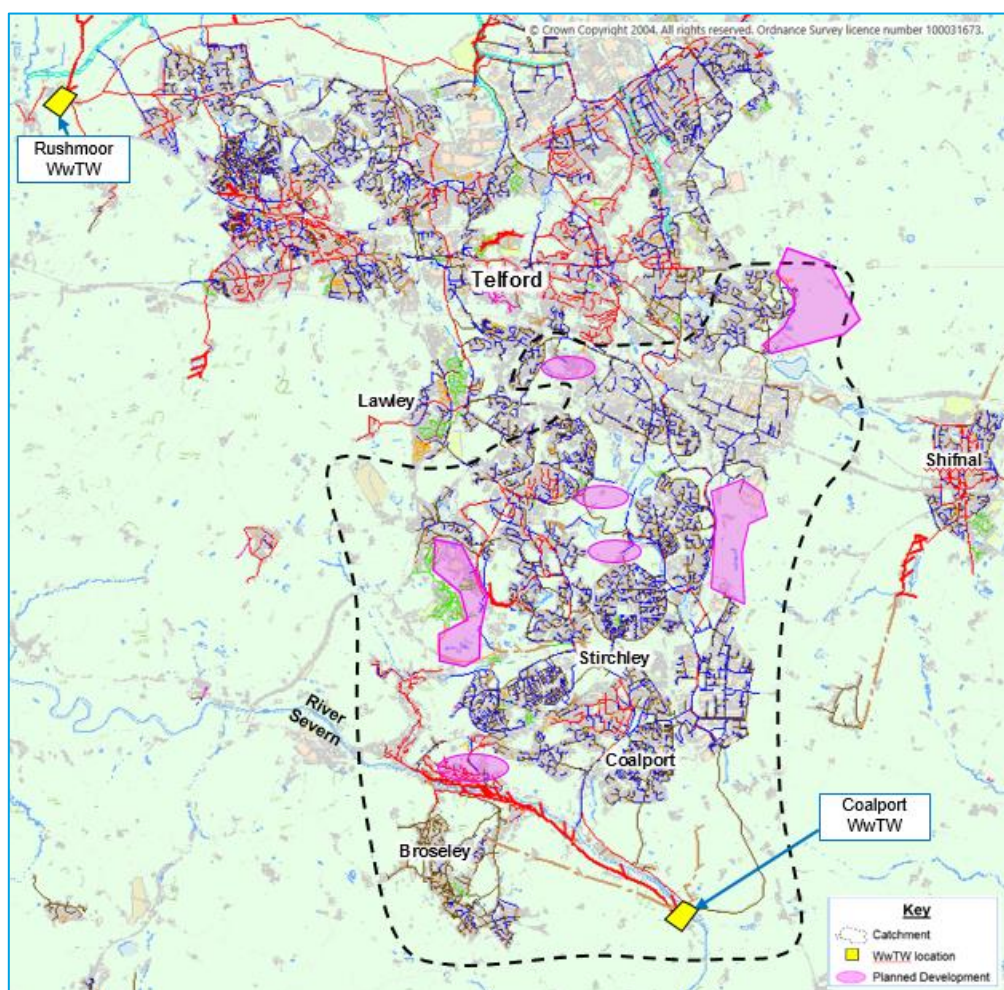


Overview of the Kidderminster (Oldington) WwTW catchment

Coalport WwTW

Telford is served by two WwTW catchments whereby the north drains to Rushmore WwTW (located within the Upper Severn SPA) and the south drains to Coalport WwTW (located within the Middle Severn SPA). This split is due to topography.

The catchment is largely covered by the Telford & Wrekin Local Plan 2011-2036, which proposes high levels of growth across the region. A total of 17,280 dwellings are expected to be built prior to 2031 (4,500 already built by 2016) as part of the Local Plan, with a significant proportion of those likely to drain to Coalport STW. In addition, significant areas of employment land are expected across the catchment. The most significant housing site is a large development of at least 1,100 dwellings plus commercial area, planned in the East Priorslee area. The impact of this has been considered and determined to be low risk. A small part of the catchment is covered by the Shropshire Local Plan (SAMDev), which identifies 200 dwellings and 2ha of commercial area for the town of Broseley, to which a strategy is in place. Due to the localised nature of catchment risks, the strategy focusses on promotion of three localised solutions (Dark Lane CSO, Fish House CSO and Ironbridge PS).

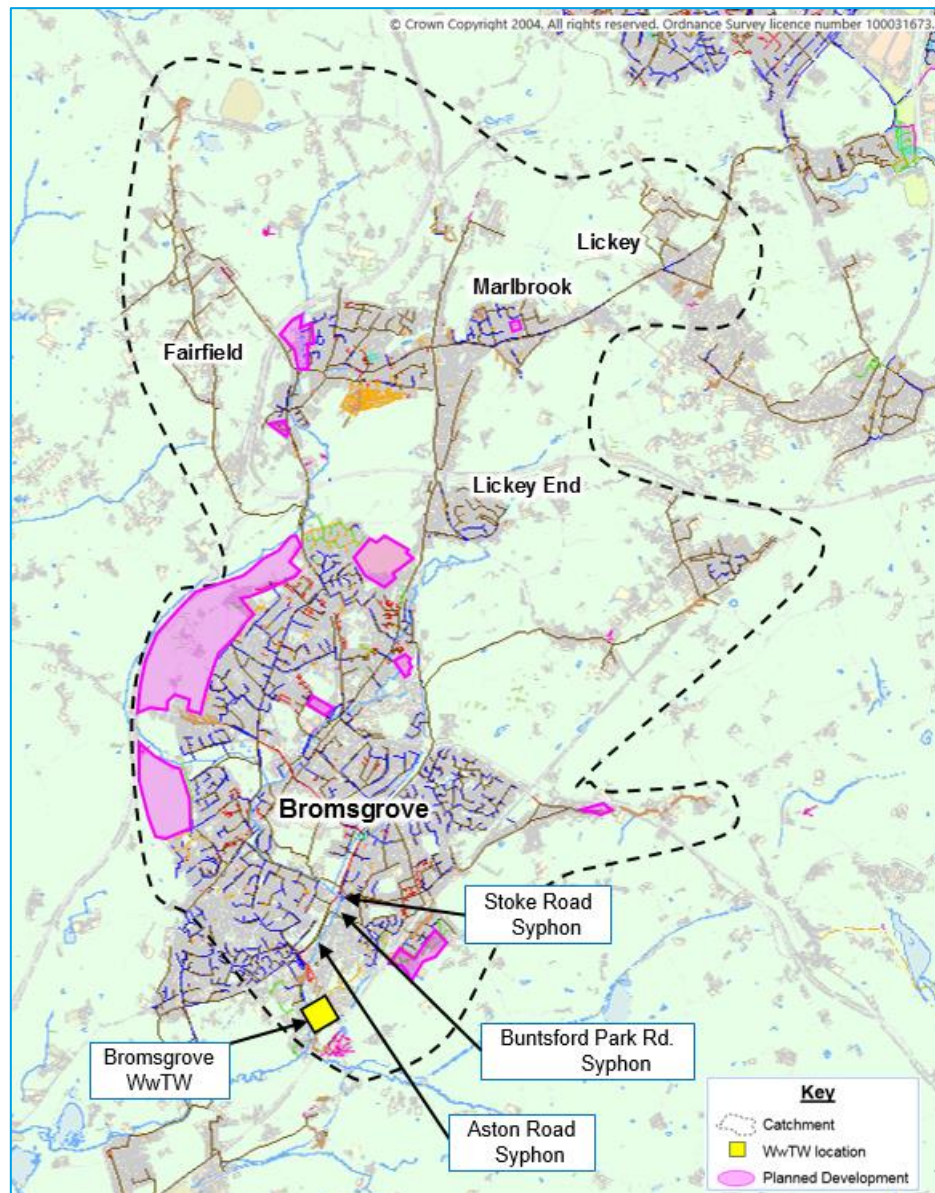


Overview of the Coalport WwTW catchment

Bromsgrove WwTW

The Bromsgrove WwTW is located to the south of the town centre and treats flows from Bromsgrove, Catshill, Marlbrook, Lickey End and Blackwell.

The catchment is situated within the Bromsgrove District Council local authority areas of which has a Local Plan for the period 2011 to 2030 adopted in January 2017. The plan allocates 2106 dwellings and 5Ha employment in Bromsgrove town. The site at Perryfields Road for 1300 dwellings plus 5 Ha employment has had reported flooding downstream and a scheme will be investigated to provide necessary sewerage capacity upgrades.



Overview of the Bromsgrove WwTW catchment

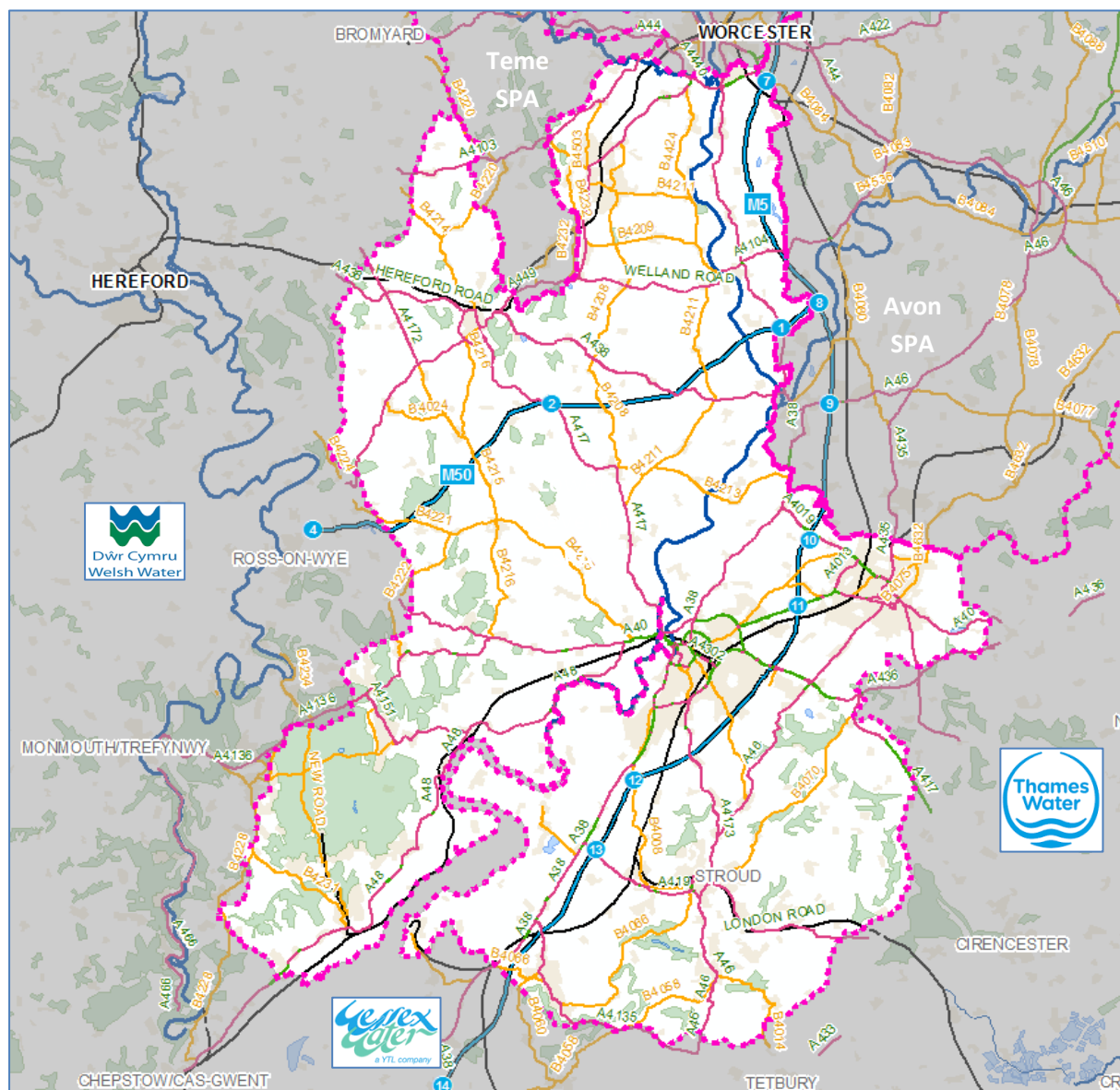
Appendix A14:

Lower Severn Strategic Planning Area

1: Background

The L2 area principally covers the eastern area of the Severn Vale RBCM area principally based on the lower reaches of the River Severn its upstream tributaries. The principle urban conurbations being the Gloucester, Cheltenham and Stroud.

This areas serves a population of approximately 550,000 people which represents 5.2% of the Severn Trent total.



Overview of the Lower Severn Strategic Planning Area

There are 98 WwTW across the Lower Severn SPA of which three serve a population of over 50,000 people; Netheridge (serving Gloucester), Hayden (serving Cheltenham) and Stanley Downton (serving Stroud). This fairly rural SPU 84% of the area's population draining to 82 small WwTW serving less than 2000 people (See Appendix B.14 for details).

The catchment covers 10 local authority planning administrative areas, namely:

Local Planning Authority	% of administrative boundary covered by this SPA
Gloucester	99%
Cheltenham	94%
Stroud	74%
Forest of Dean	73%
Tewkesbury	43%
Malvern Hills	42%
Hereford	7.3%
Worcester	5.9%
Cotswold	5.1%
Wychavon	1.5%

In terms of Environment Agency regions the Lower Severn SPA falls within their West area.

The Strategic Planning Group of stakeholders for this SPA is expected to consist of the following stakeholders:

- Environment Agency (West Area)
- English Severn and Wye RFCC
- Gloucester LLFA, Gloucestershire LLFA, Worcester LLFA, and Worcestershire LLFA.
- Planning authorities in the table above.
- Severn Vale CaBA Group

Consultation through preparation for our PR19 Plan has been used to inform this PR19 DWMP but a detailed action plan is to be developed to ensure a SPG forum is established to support the development of our PR24 DWMP.

2: Risk-based catchment screening outputs

The risk-based catchment screening process undertaken in accordance with proposed guidelines and assessment undertaken against the levels of service and risk indicators as outlined in the DWMP Framework.

The table below summarises the outputs for the sever L3: TPU catchments serving more than 50,000 population.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
NETHERIDGE	173,175																	
HAYDEN	130,562																	
STANLEY DOWNTON	75,654																	

RBCS outputs for Lower Severn SPA for catchments over 50,000PE

3: TPU assessment overview

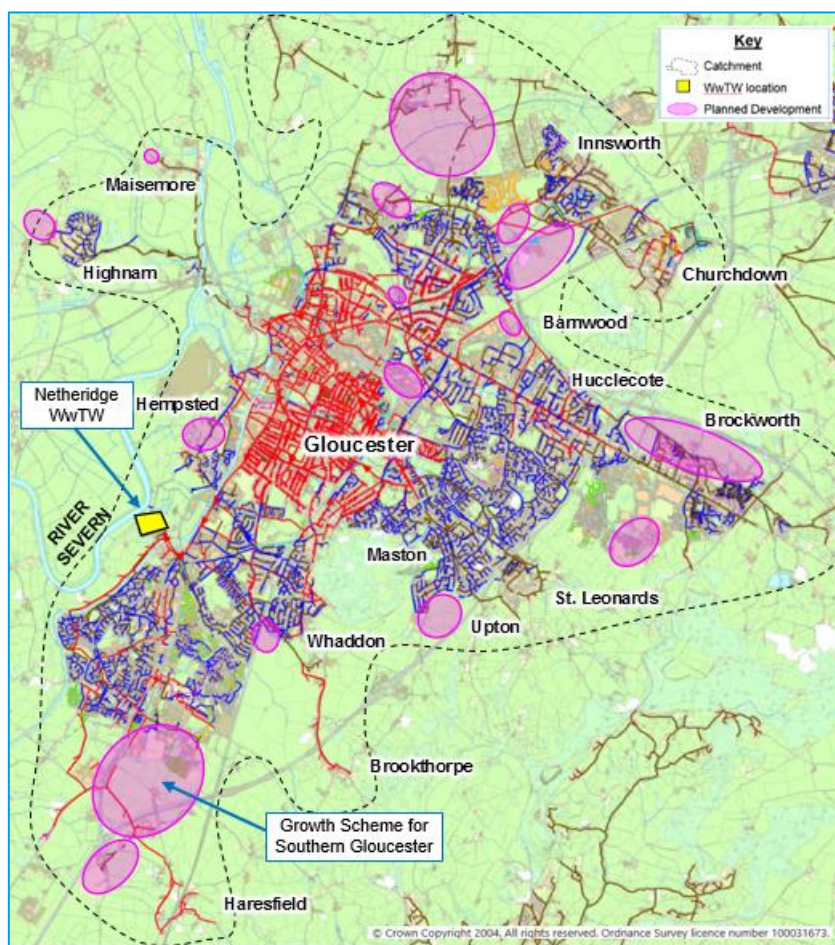
Netheridge WwTW

The Netheridge WwTW is located to the west of the city centre adjacent to the River Sever and treats flow from Gloucester and Quedegley.

The catchment is situated within the local authority area of Gloucester City Council which has produced a Joint Core Strategy between Gloucester, Cheltenham and Tewkesbury covering a plan period of 2011 to 2031 which was adopted in December 2017. A total of 10,325 dwellings is allocated within the catchment between 2016-2031, a number of large strategic developments are planned including Innsworth and Twigworth 2295 dwellings and 9.1Ha employment, South Churchdown 1100 dwellings and 17.4Ha employment, North Brockworth 1500 dwellings and 3Ha employment and Winneycroft 620 dwellings. A strategic scheme for Gloucester South has been raised A6S/11764 and additional schemes to account for growth at Innsworth & Twigworth and Quedegley are being investigated.

Gloucester was subject to major strategic sewer upgrade in AMP5 to provide additional trunk sewer capacity. Localised upgrades to remaining isolated flooding locations are currently ongoing as part of our sewer flooding alleviation programme.

Wet weather infiltration is generally a problem across the catchment particularly in Brockworth and Tuffley areas which have knock on effects downstream. No infiltration reduction schemes are currently being considered. There is river related flooding in low lying areas of the catchment which affects the sewerage network. There is potential for surface water separation within the catchment particularly in the northern part of central Gloucester where there is significant surface water runoff connecting into the combined system, no schemes are currently in place to address this.



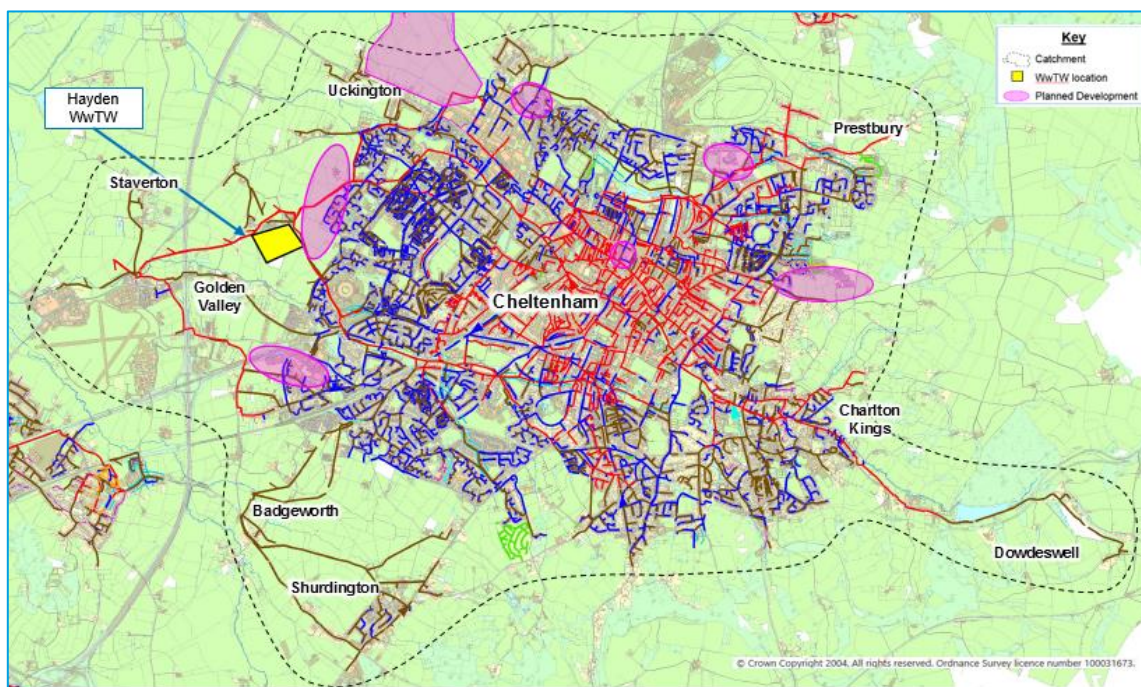
Overview of the Netheridge WwTW catchment

Hayden WwTW

Our Hayden WwTW is located to the west of Cheltenham and treats flows Cheltenham.

The catchment is situated within the Cheltenham Borough Council local authority area who have produced a Joint Core Strategy between Gloucester, Cheltenham and Tewkesbury covering a plan period of 2011 to 2031 which was adopted in December 2017. A total of 9,193 dwellings is allocated within the catchment between 2016 and 2031. Two large strategic sites include North West Cheltenham for 4285 dwellings and 23Ha employment, and Land West of Cheltenham for 1100 dwellings and 45Ha employment. A strategic growth scheme A6S/11944 is planned for North West Cheltenham.

There is some high infiltration risk across the catchment relating to wet weather but no schemes are currently in progress to address this. Additionally there are resilience issues relating to high river levels when small watercourses running through Cheltenham back up during wet weather causing issues to the surface water sewers that outfall to the watercourses.

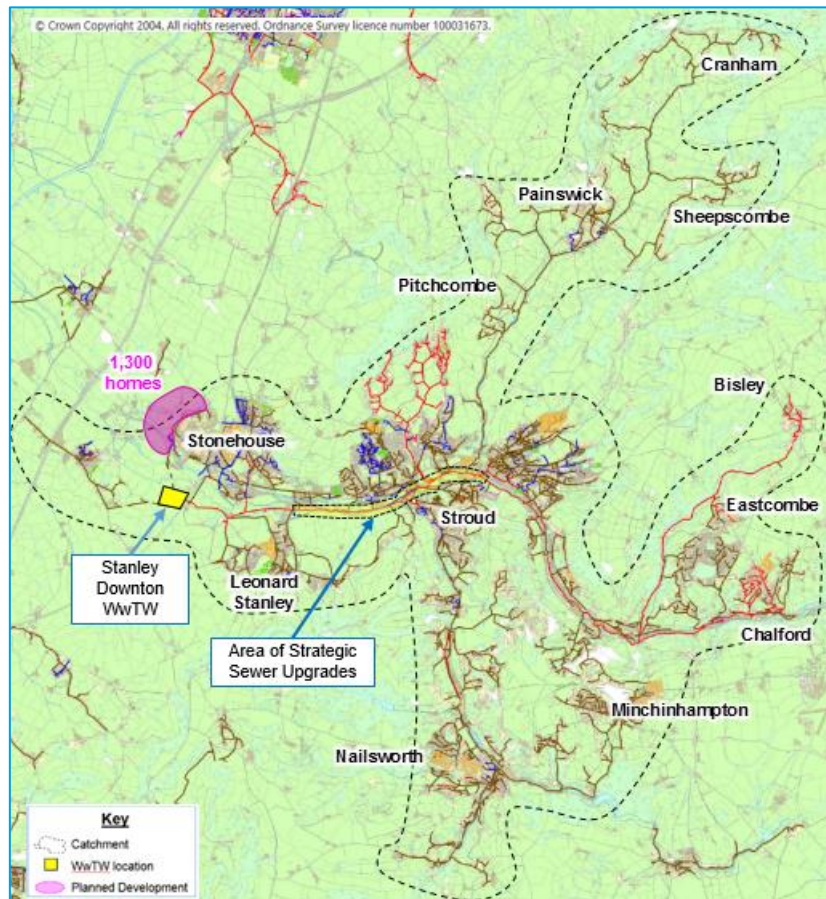


Overview of the Hayden WwTW catchment

Stanley Downton WwTW

Stanley Downton WwTW is located to the south of Stonehouse and treats flows from Stroud, Stonehouse and Leonard Stanley.

The catchment is situated within Stroud District Council local authority area who have a local plan covering the plan period 2011 to 2031 which was adopted in November 2015. There are two strategic allocations in this catchment, Stroud Valleys for 450 dwellings and Land West of Stonehouse for 1350 dwellings and 10Ha employment. A scheme to provide additional capacity upgrades to accommodate the development allocations at Stonehouse is currently in liaison with the developer regarding phasing of improvements.

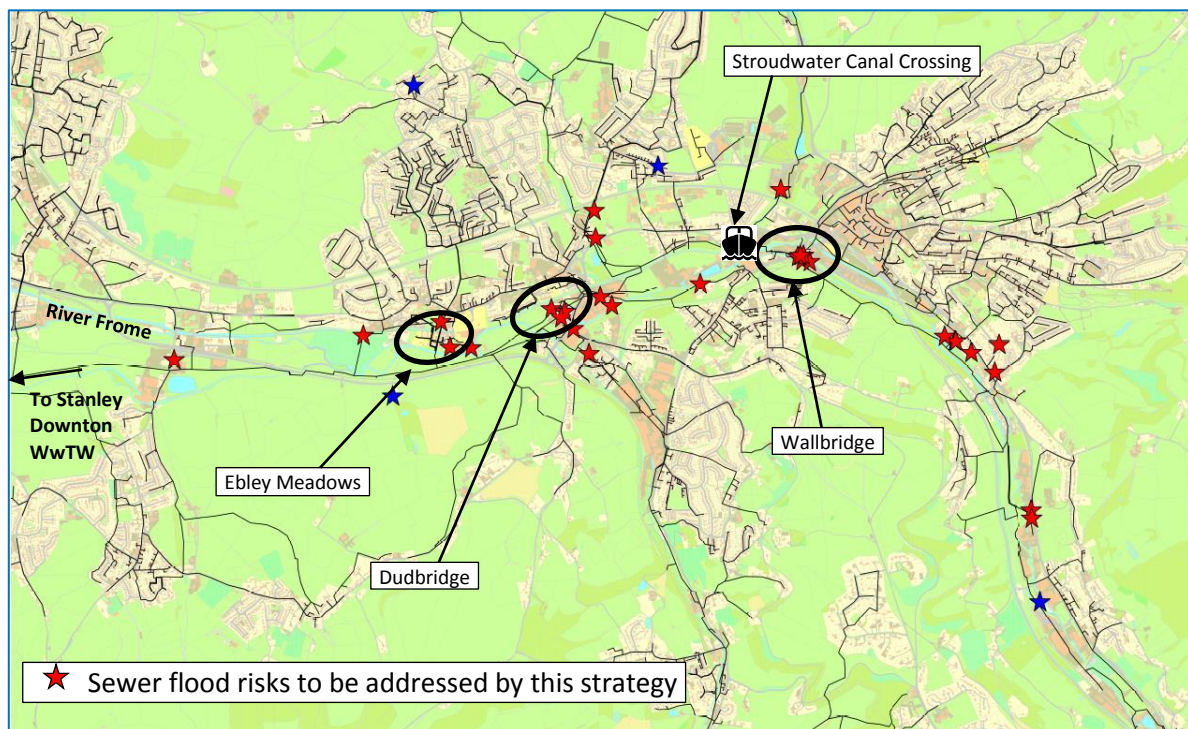


Overview of the Stanley Downton WwTW catchment

PR19 Stroud Strategy

The Stroud catchment covers 1,104Ha of contributing area spread over five valleys with Stroud's urban centre situated at the confluence of the valleys. The main trunk sewer follows the River Frome and Stroudwater Navigation canal down to Stanley Downton WwTW approximately 5.9km downstream. From a sewerage perspective the steep valley gradients result in fast run off from the upstream catchment into the main valley sewer where the gradient starts to reduce and the Frome valley widens as it approaches the River Severn. Over time this has resulted in significant capacity deficiencies in the main valley trunk sewer which our PR19 strategy intends to address.

The capacity deficiencies across the catchment are principally associated with the Stroud Valley Trunk Sewer resulting in sewer flooding in three main areas: Dudbridge, Ebley Meadows and Wallbridge. There is also a driver associated with the reopening of the Stroudwater Navigation Canal through which a 750mm dia trunk sewer was laid in the 1960s after the canal became disused. Reopening of this joint public & lottery funded project affected by the limited cover above the sewer.



Overview of the Stroud catchment

Further details of the capacity issues are summarised below:

Dudbridge Flooding and Overland Pollution Risk

Capacity issues in this area are associated with the 900mm dia Nailsworth Valley Trunk sewer where it meets with the main 750mm diameter Stroud Valley trunk sewer. Predicted flood volumes during a worst case 1 in 20 year return period event are in excess of 10,000m³. High return period events affect bowls club, playing fields, play area and overland flooding into the River Frome and whilst incidents are not always reported it does have a high profile of customer & council complaints.



Photographs showing extensive flooding in the Dudbridge area

Ebley Meadows Flooding and Overland Pollution Risk

This area floods regularly, but as the flooded area is in a secluded area not all incidents get reported. Flooding occurs in a low spot where the 600mm diameter Ebley Trunk Sewer connects to the 750mm diameter Stroud Valley Trunk Sewer. Flood water also finds its way into the River Frome as well as affecting public footpath, open space and grazing land. Predicted flood volume on worst case 1 in 20 year return period storm is around 8,000m³.



Photographs showing extensive flooding in the Ebley Meadows area

Wallbridge

Wallbridge is located at a low point where three principle sewers combine resulting in internal flooding and high frequency of spills from Wallbridge pumped CSO. There are regular complaints of pollution from local businesses with a water abstraction point for textile mill immediately downstream of the CSO discharge. Property level protection has been installed to reduce the risk of internal flooding but this is only seem as a temporary solution until the underlying capacity issues can be resolved.



Photograph showing extensive flooding in the Wallbridge area

A general schematic demonstrating the connectivity of lateral trunk sewers into the Stroud Valley trunk sewer is shown below. This demonstrates the inherent lack of capacity within the trunk sewer, resulting in the flooding issues outlined above.

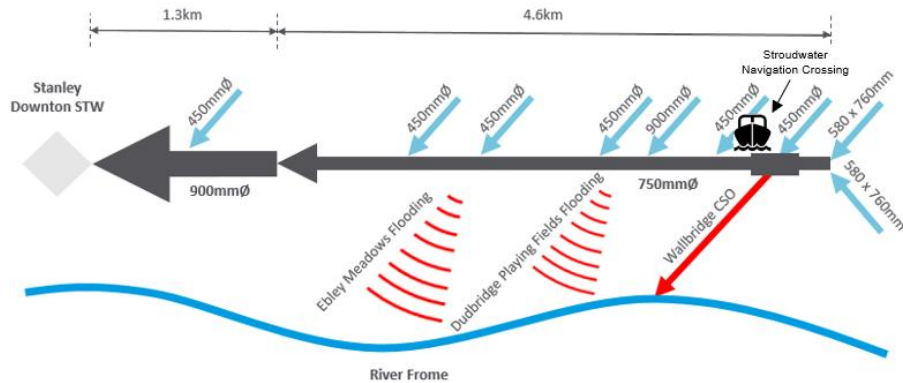


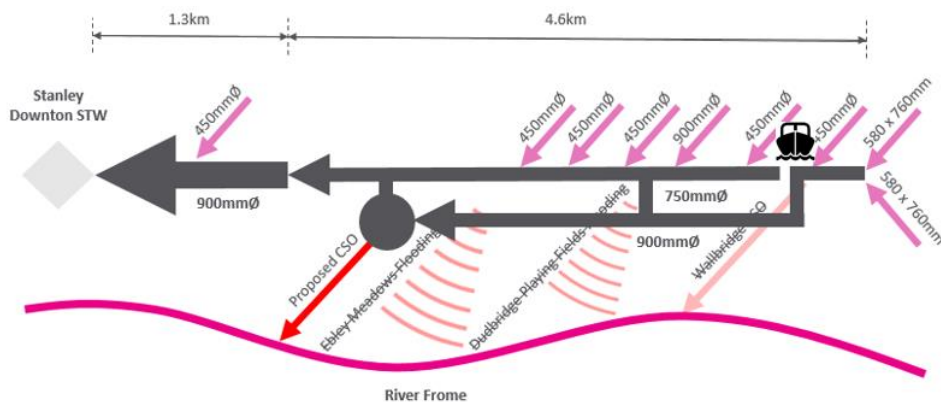
Figure 1: Schematic showing connectivity to Stroud Valley Trunk Sewer

Options Appraisal

Five principle options have been appraised to address the inherent capacity issues within the Stroud Valley Trunk Sewer. These are summarised below:

Option 1 – Strategic Trunk Sewer (with abandonment of Wallbridge CSO)

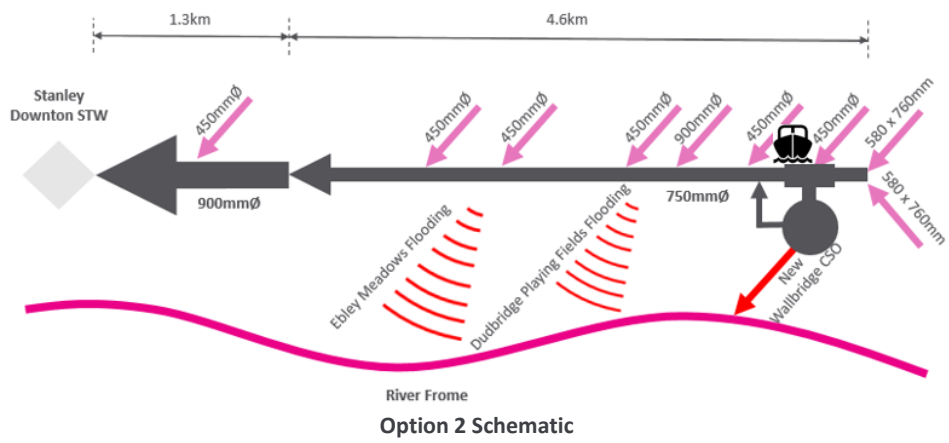
This option proposes a new Strategic Trunk Sewer which will facilitate the abandonment of Wallbridge CSO with a new modern CSO being built further downstream at Ryeford, including adequate storage and treatment. This will reduce sewer flooding risk, provide improved spill performance compared to Wallbridge theoretical performance. It also enables the 750mm diameter trunk sewer crossing through the Stroudwater Navigation Canal to be abandoned. Without its removal there will be insufficient depth of water to allow canal boats to pass.



Option 1 Schematic

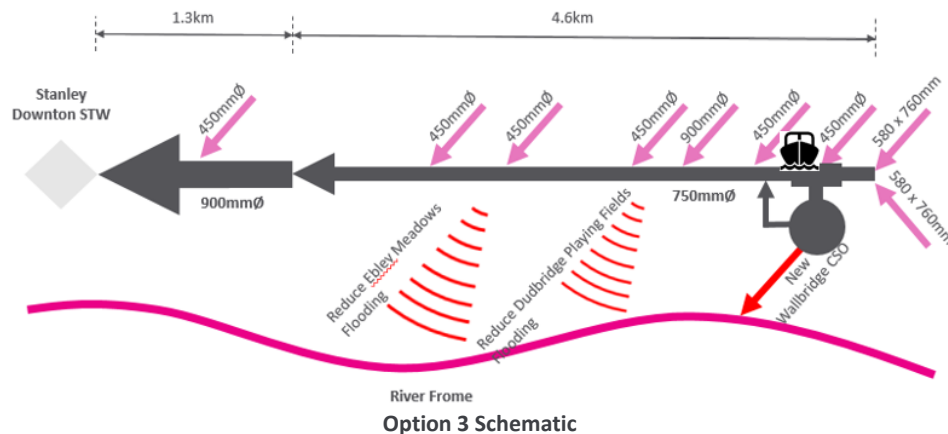
Option 2 – Replace Wallbridge CSO

This option only addresses risks associated with Wallbridge CSO by replacing it with a new CSO with enlarged storage volume. Whilst this proposal will provide improved spill performance and address the flooding risk at Wallbridge, it does not address downstream flooding at Dudbridge or Ebbley Meadows. Neither does it address the issue with the 750mm diameter trunk sewer crossing through the Stroudwater Navigation.



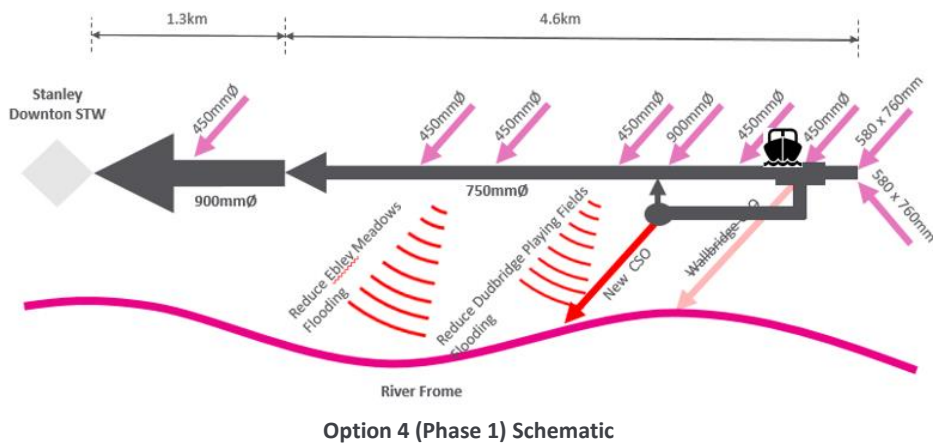
Option 3 – Replace Wallbridge CSO, surface water separation and infiltration reduction.

Similar to Option 2 but additional works to undertake surface water separation and address groundwater infiltration reduction. In addition to Option 2 this reduces downstream flood risk but does not resolve it to an acceptable level. This option does however show that whilst separation and infiltration removal is not sufficient to address the immediate short term needs of the catchment it does show that these can be part of a long term enhancement once the initial capacity issues have been addressed.

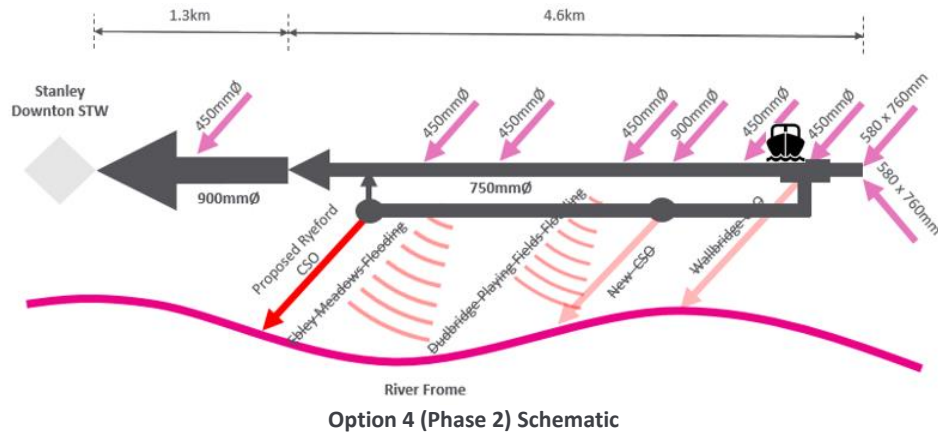


Option 4 – Phased approach to Trunk Sewer Strategy.

This option looked at phasing Option 1, whereby the upstream section of the new trunk sewer would be constructed to allow the abandon of Wallbridge CSO with a replacement CSO at intermediate location. This approach provides improved spill performance compared to Wallbridge and also includes surface water separation & infiltration reduction to reduce (but not fully alleviate) flood risk. It also does not meet the needs of the Stroudwater Navigation Canal re-opening.

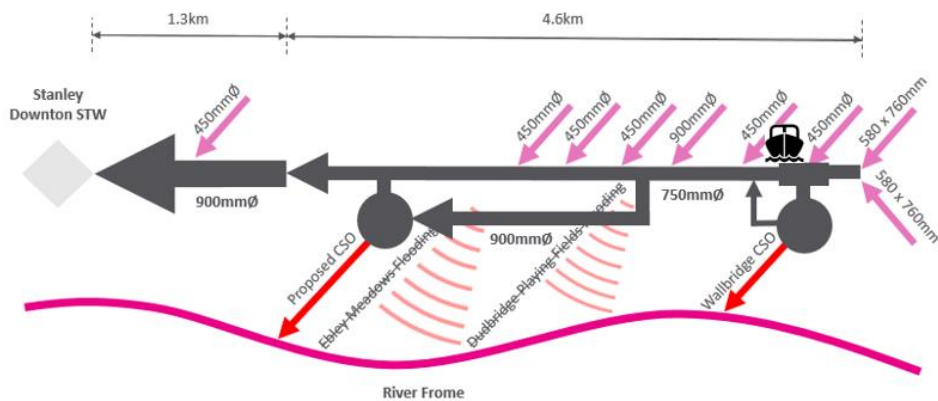


The subsequent phase would be the extension of Phase 1 of the trunk sewer to Ryeford, abandon intermediate CSO, replacement CSO at Ryeford. This would then address the downstream flood risk. However the Stroudwater Navigation crossing would not be resolved and there would be abortive costs associated with construction and short term abandonment of the intermediate CSO.



Option 5 - Two CSO proposal

This option proposes the replace of Wallbridge CSO with a new CSO with additional storage to address pollution risks, plus construction a new trunk sewer from Dudbridge to Ryeford with a new CSO at Ryeford to alleviate flood risk.



Summary

Out of the options appraised only Option 4 meets the need of the catchment and importantly is the only viable option which addresses the clash with the 750mm diameter sewer crossing the Stroudwater Navigation Canal. Without this critical sewer being abandoned it will not be possible to reopen the canal. Whilst feasibility work has identified opportunities to undertake surface water separation and infiltration reduction these are not sufficient to reduce flood risk to an acceptable level. It is therefore proposed that such interventions be considered as part of the long term plan for the catchment but in the short term the only viable solution to address the immediate capacity issues is to provide a new trunk sewer with a new overflow further downstream. This overflow would be designed to comply with Environment Agency requirements but in the long term there is the option to extend the trunk sewer down to Stanley Downton, however this would only be done when all viable separation/infiltration opportunities have been exhausted.

The estimated AMP7 cost of the Stroud strategy is £25 million. Options have been considered to phase this work across AMP7/AMP8 along similar lines to Option 4 but with the initial section of the new trunk sewer providing temporary storage capacity for Wallbridge CSO. However the cost of this work is estimated to increase to £28 million due to the abortive costs associated with intermediate works.

PR19 Proposal

The option we have selected within our PR19 Plan is Option 1, to construct a new 900mm diameter trunk to collect all flows to a new CSO located at Ryeford. This will allow the abandonment of Wallbridge CSO, rationalisation and abandonment of other smaller CSOs, alleviate sewer flood risk and overland pollution at Dudbridge and Ebley Meadows. Whilst there will be a new CSO at Ryeford it is expected that the reduced spills will have a positive impact on water quality on the River Frome as the discharge point will be further downstream where there is greater river dilution and the CSO will have adequate storage to mitigate future pollution risks.

APPENDIX B: RISK CATCHMENT BASED SCREENING (RBCS) ASSESSMENTS

B1 - Introduction

This appendix supplements the information provided within the main framework document for drainage and wastewater management plans (DWMPs).

The objective of the screening is to identify key risks within each L3 TPU to prioritise which catchments should be assessed as part of the detailed DWMP assessment, known as Baseline Risk and Vulnerability Assessment (BRAVA).

The indicators outlined in the DWMP Framework have been applied to the L3 TPUs across all 14 Strategic Planning Areas across Severn Trent and the finding summarised in this appendix.

NOTE: The final DWMP Framework is due to be published until September 2018 and so in order to complete the RBCS analysis to inform this document we have used final draft indicator criteria as of 19th July 2018. To allow the reader to understand the indicator assessment the following extracts have been taken the latest DWMP Framework Appendix B.

Table B-1 – Risk-based catchment screening indicators and process

Screening approach to be applied at L3 (or lower, to individual catchments, where tactical planning units have been created by grouping small catchments), as the objective is to highlight those catchments that require further detailed assessment.

Companies will need to state within DWMP documentation the base year against which all assessments are made.

Indicator	Measure	Description	Proceed to DWMP Baseline Risk and Vulnerability Assessment?		
			Calculation/statement	Yes	No
Catchment characterisation (stage 2 of the wastewater resilience metric methodology). (Tier 2 indicator) ²	Catchment characterisation score from the PR19 common performance commitment.	Provides a mechanism to understand the vulnerability of the catchment/sub-catchments to sewer flooding as a result of an extreme wet weather event.	Condition is based on the catchment vulnerability score (i.e. score from 1-5 based on catchment characteristics). Metric has a size exclusion principle for PR19 but it is anticipated that all catchments irrespective of size will be considered at PR24. As such it is considered that this indicator can be applied to all catchments in AMP7 (2020-2025).	Catchment vulnerability score = 4 or 5 (out of 5).	Catchment vulnerability score <4 (out of 5).
Intermittent discharge impacts upon bathing or shellfish waters.		Mechanism to understand the significant of any impact of water company operations on environmental receptors (bathing or shellfish waters).	Any of the intermittent discharges within the catchment.	For intermittent discharges with existing quantitative spill frequency trigger permit conditions, event duration monitoring (EDM) results indicate that investigations are likely to be triggered: <ul style="list-style-type: none"> For intermittent discharges impacting upon designated bathing waters, EDM spill frequency records 5 spills per bathing season for any bathing season in the previous 5 years. Or model predictions (if available) indicate that these are likely to be crossed within the next 5 years. For intermittent discharges impacting upon designated shellfish waters, EDM spill frequency records 14 spills per annum for any year in the previous 5 years. Or model predictions (if available) indicate that these are likely to be crossed within the next 5 years. (The above spill frequencies are defaults relating to standard permit conditions (3 spills per bathing season for bathing waters, 10 spills per annum for shellfish waters), where different values are in the permit then they are to be amended accordingly).	
Continuous or intermittent discharge impacts upon other sensitive receiving waters (part A).		Mechanism to understand the significant of any impact of water company operations on environmental receptors.	Any of the continuous or intermittent discharges within the catchment has a relevant water company:	<ul style="list-style-type: none"> Action identified as 'agreed' or 'planned' with the associated regulator on the Natural Resources Wales Actions Database. Or: <ul style="list-style-type: none"> 'Remedy' on Natural England's Designated Sites system (associated with freshwater pollution discharges or freshwater drainage). Relating to improving or maintaining the condition of a SSSI, Nature 2000 or Ramsar site (where measures have not been completed / are not underway to address the issue). And/or: <ul style="list-style-type: none"> Are included within a Nutrient Management Plan and/or a Diffuse Water Pollution Plan, requiring water company action to improve the discharge. 	
Continuous or intermittent		Mechanism to understand the	Any of the continuous or intermittent discharges within the	<ul style="list-style-type: none"> Action identified as 'required' on the Natural Resources Wales Actions Database. 	

² The treatment of tier 2 indicators is described in section B.2.2.

Indicator	Measure	Description	Proceed to DWMP Baseline Risk and Vulnerability Assessment?		
			Calculation/statement	Yes	No
discharge impacts upon other sensitive receiving waters (part B). (Tier 2 indicator) ²		significant of any impact of water company operations on environmental receptors.	catchment has a relevant water company:	Or: • 'Threat' on Natural England's Designated Sites system (associated with water pollution). Relating to improving or maintaining the condition of a SSSI, Natura 2000 or Ramsar site (where measures have not been completed / are not underway to address the issue).	
Storm Overflow Assessment Framework (SOAF).		SOAF procedures: • Current activity instigated • Potential for future activity	Are any SOAF investigations ongoing in the catchment, or planned (i.e. EDM data has crossed the SOAF spill frequency investigation triggers), or are likely to be triggered?)	Yes, or, model predictions (if available) indicate that SOAF spill frequency investigation triggers are likely to be crossed within next 5 years.	No
Capacity assessment framework (CAF).	The focus is on the outputs from either the Initial or Enhanced approaches for the 'present day' case. There are accepted issues around the confidence in outputs from the Initial model which does not include for surface water inputs; in this case some engineering judgement may be required to supplement the outputs.	Provides an indication of capacity constraints in the network as a leading indicator to service failure.	Assessment focuses on the 'present day' case. Any 10km hexagon covering the catchment that is:	Categorised as 4 or 5 (due to performance, in full or part, within the catchment being assessed). However, in making this overall assessment, Companies can exclude hexagons on the peripheral of the catchment categorised as 4 or 5, where these do not represent a significant catchment constraint (potential for growth in the peripheral area needs to be considered). Companies have discretion to take through those that may be categorised as 3, dependent on confidence in the model or where catchments contain individual 1km hexagons representing a major constraint.	
Internal sewer flooding ³ .	PR19 common performance commitment (internal sewer flooding) ⁴ .	Historical measure that records the number of internal flooding incidents per year (sewerage companies only) indicative of capacity constraints. Note that this is a variation from the PR19 common	For small catchments <2,000pe.	<ul style="list-style-type: none"> Number of incidents is > 1 in total over the last 3 years And, if the incidents have been caused by hydraulic overload only: Measures have not been put in place to address sewer flooding risk (e.g. permanent solutions for hydraulic overload) for all properties that have experienced flooding incidents in the last 3 years. 	
			For catchments >=2,000pe, and 3-year average performance at a company level (based on number	<ul style="list-style-type: none"> Annual flooding incidents (number per 10,000 connected properties) in any of the preceding 3 years is greater than the company average. And: The number of incidents is > 1 in total over the last 3 years And, if the incidents have been caused by hydraulic overload only: 	

³ Connected property numbers used for normalising both internal and external sewer flooding performance are to be consistent with the overall number included as part of the Annual Performance Report (being reported in accordance with Regulatory Accounting Guideline 4, specifically pro-forma 4u, item 4u.10)

⁴ A detailed definition can be accessed via the Ofwat webpage: <https://www.ofwat.gov.uk/outcomes-definitions-pr19/>

Indicator	Measure	Description	Proceed to DWMP Baseline Risk and Vulnerability Assessment?		
			Calculation/statement	Yes	No
External sewer flooding ³ .	PR19 asset health performance commitment (external sewer flooding) ⁴ .	performance commitment so the numbers considered in this assessment, as they exclude extreme events, will differ from figures reported for the performance commitment.	per 10,000 connections ⁵) is upper quartile.	<ul style="list-style-type: none"> Measures have not been put in place to address sewer flooding risk (e.g. permanent interventions for hydraulic overload) for all properties that have experienced flooding incidents in the last 3 years. 	
			For catchments $\geq 2,000$ pe, and 3-year average performance at a company level (based on number per 10,000 connections ⁵) is not upper quartile.	Annual flooding incidents (number per 10,000 connected properties) in any of the preceding 3 years is greater than the baseline value for upper quartile performance ⁷ . And: <ul style="list-style-type: none"> The number of incidents is > 1 in total over the last 3 years And, if the incidents have been caused by hydraulic overload only: <ul style="list-style-type: none"> Measures have not been put in place to address sewer flooding risk (e.g. permanent interventions for hydraulic overload) for all properties that have experienced flooding incidents in the last 3 years. 	
			For small catchments $< 2,000$ pe.	<ul style="list-style-type: none"> Number of incidents is > 10 in total over the last 3 years And, if the incidents have been caused by hydraulic overload only: <ul style="list-style-type: none"> Measures have not been put in place to address sewer flooding risk (e.g. permanent solutions for hydraulic overload) for all properties that have experienced flooding incidents in the last 3 years. 	
External sewer flooding ³ .	PR19 asset health performance commitment (external sewer flooding) ⁴ .	Historical measure that records the number of external flooding incidents per year (sewerage companies only) indicative of capacity constraints.	For catchments $\geq 2,000$ pe, and 3-year average performance at a company level (based on number per 10,000 connections) is upper quartile.	<ul style="list-style-type: none"> Annual flooding incidents (number per 10,000 connected properties) in any of the preceding 3 years is greater than the company average. And: <ul style="list-style-type: none"> The number of incidents is > 10 in total over the last 3 years And, if the incidents have been caused by hydraulic overload only: <ul style="list-style-type: none"> Measures have not been put in place to address sewer flooding risk (e.g. permanent interventions for hydraulic overload) for all properties that have experienced flooding incidents in the last 3 years. 	
			For catchments $\geq 2,000$ pe, and 3-year average performance at a company level (based on number per 10,000 connections) is not upper quartile.	Annual flooding incidents (number per 10,000 connected properties) in any of the preceding 3 years is greater than the baseline value for upper quartile performance. And: <ul style="list-style-type: none"> The number of incidents is > 10 in total over the last 3 years And, if the incidents have been caused by hydraulic overload only: <ul style="list-style-type: none"> Measures have not been put in place to address sewer flooding risk (e.g. permanent interventions for hydraulic overload) for all properties that have experienced flooding incidents in the last 3 years. 	

⁵ As presented on the Discover Water website

⁶ As presented on the Discover Water website

⁷ From analysis of data for 2014, 2015 and 2016 on Discover Water, the three-year average for each company was calculated and the upper quartile boundary assessed; this gave a value of 1.44 per 10,000 connections. For this condition, if a company is not upper quartile and the catchment under consideration has, in any of the preceding three years, an annual flooding incident rate of > 1.44 per 10,000 connections then 'yes' a detailed DWMP methodology assessment will be required; if ≤ 1.44 per 10,000 connections then 'no'. Companies will need to update this assessment to reflect the DWMP base year and latest available data.

Extract from Table B-1 of 'DWMP Framework – Appendix B' (as of 19th July 2018)

Indicator	Measure	Description	Proceed to DWMP Baseline Risk and Vulnerability Assessment?		
			Calculation/statement	Yes	No
Pollution incidents (Category 1, 2 and 3) ⁸ .	As per the 2017 definition of the Environmental Performance Assessment (EPA).	Historical measure that identifies incidents of unexpected release of contaminants that have resulted in environmental damage.	Based on EPA data and thresholds.	<ul style="list-style-type: none"> For any of the previous three years data, a category 1 or 2 incident has occurred. Or: <ul style="list-style-type: none"> For any of the previous 3 years data the average annual performance for the catchment is classed as 'Amber' or 'Red' (for 2017, this being greater than 25 incidents per 10,000km of sewer). And, where only one category 3 incident has been recorded in the last 3 years: <ul style="list-style-type: none"> Measures have not been put in place to address pollution risk, i.e. there is a significant risk of re-occurrence of a pollution incident. For clarity, if for any two of the previous 3 years data the average annual performance for the catchment is classed as 'Amber' or 'Red', then the indicator is breached.	
WwTW quality compliance.	As per the 2017 definition of the Environmental Performance Assessment (EPA).	Historical measure relating to the performance of the treatment works (discharge permit compliance (numeric)).	Based on EPA criteria.	<p>In any of the previous 3 years, the WwTW discharge has been confirmed as failing and was included as such in the calculation of overall permit compliance.</p> <p>And:</p> <p>Measures have not been put in place, or are not required (subject to Natural Resource Wales / Environment Agency agreement), to address the cause(s) of compliance failure.</p>	
WwTW dry weather flow compliance.	Based on measured flow volumes where available and calculated flows where measured flows are not available.	Historical measure of compliance with flow permits.	Where flow measurement is undertaken, using all available flow data has the Q90 of the measured yearly flows exceeded the dry weather flow permit condition on two consecutive years in the last 5 years?	<ul style="list-style-type: none"> Yes, with no measures in place to address compliance risk (or required by the Environment Agency / Natural Resources Wales). Yes - measures have been put in place that address compliance risk but are considered temporary/short-term solutions. 	<ul style="list-style-type: none"> No Or: <ul style="list-style-type: none"> Yes - measures have been put in place that address compliance risk and are considered permanent long-term solutions
			Where no flow measurement is in place, or in respect of maximum flows, do headroom calculations indicate the works is at risk of exceeding its flow permit conditions?	Yes	No
Storm overflows.	The focus is on using available data to examine permit risks that have not been captured by other	Examines issues associated with all storm overflows not captured by other indicators (e.g. issues	Is there evidence to indicate that over the last 3 years any overflow is not operating in accordance with permit conditions?	Yes	No

⁸ This requires that all public sewer lengths are used in the normalisation calculation, as advised in the Environment Agency Environmental Performance Assessment (EPA) Methodology (version 3) (https://www.ofwat.gov.uk/wp-content/uploads/2017/12/WatCoPerfEPAMethodology_v3-Nov-2017-Final.pdf)

Indicator	Measure	Description	Proceed to DWMP Baseline Risk and Vulnerability Assessment?		
			Calculation/statement	Yes	No
	indicators. Where monitoring is not in place consideration will need to be given to reported concerns.	to be considered include non-compliance with pass forward flow conditions, storm storage conditions (where relevant) and screening requirements).			
Risks from interdependencies between RMA systems.		A mechanism to understand risk posed by other RMA assets in the catchment.	Risk to be based on developing an understanding of whether there have been historical issues in the catchment through engagement with relevant stakeholders. Fluvial, coastal and surface water flooding potentially impacting on sewer networks (e.g. locking of outfalls) may be assessed through use of Environment Agency flood risk maps overlaid on the catchment area.	Yes, where it is considered that significant risks arise from interaction with other RMA drainage systems / receiving waterbodies.	No
Planned residential new development.		Uses predicted residential population growth forecasts to target catchments requiring investigations for potential future capacity constraints.	Company specific existing long-term forecasts.	Planned residential new development (including committed and infill (e.g. latter based on historical growth patterns)) predicted to be greater than the thresholds shown in Figure B-1 and Table B-3.	
WINEP.	WINEP sets out the actions that companies will need to complete to meet their environmental obligations.	Details the specific drivers for mitigating measures.	Known WINEP drivers for specific drainage and wastewater catchments. Investigations, option appraisals and scheme drivers to be included. 'Monitor only' drivers are to be excluded from the indicator, but recorded in the narrative (to ensure recognition for funding. Only drivers related to wastewater activities to be included. Clean water activities are to be considered on a case by case basis for those that impact / have potential to impact on wastewater activities.	There are known WINEP drivers impacting the specific Level 3 catchment (it is noted that the DWMP methodology will outline approaches to delivery of WINEP outcomes (e.g. river catchment based permitting) which could include assessment of specific Level 3 catchments which may not have been progressed to detailed DWMP methodology assessments).	

Extract from Table B-1 of 'DWMP Framework – Appendix B' (as of 19th July 2018)

Table B-2 – Sewer collapses and blockages – catchment prioritisation criteria

Indicator	Measure	Description	Catchment prioritisation criteria	
			Calculation/statement	
Sewer collapses.	PR19 common / asset health performance commitment (sewer collapses) ⁴ .	Historical measure that identifies risks to the integrity of the sewer system.	For catchments <2,000 pe.	Higher priority: <ul style="list-style-type: none"> Sewer collapses are > 2 per year in any of the preceding 3 years and measures have been put in place designed to reduce sewer collapse risk, but they are considered temporary/short-term solutions Lower priority: <ul style="list-style-type: none"> Sewer collapses are > 2 per year in any of the preceding 3 years and measures have been put in place designed to resolve sewer collapse risk, and they are considered long-term (permanent) solutions Or: <ul style="list-style-type: none"> Sewer collapses are ≤ 2 per year in any of the preceding 3 years
			For catchments >2,000 pe.	If the number of collapses (normalised by sewer length) in any of the preceding 3 years is greater than the average for the company over the last year.
Sewer blockages.	PR19 asset health performance commitment (sewer blockages) ⁴ .	Historical measure that records obstructions in a sewer (that require clearing) which causes a reportable problem (not caused by hydraulic overload), such as flooding or discharge to a watercourse, unusable sanitation, surcharged sewers or odour.	For all catchments.	If the number of blockages (normalised by sewer length) in any of the preceding 3 years is greater than the company average.

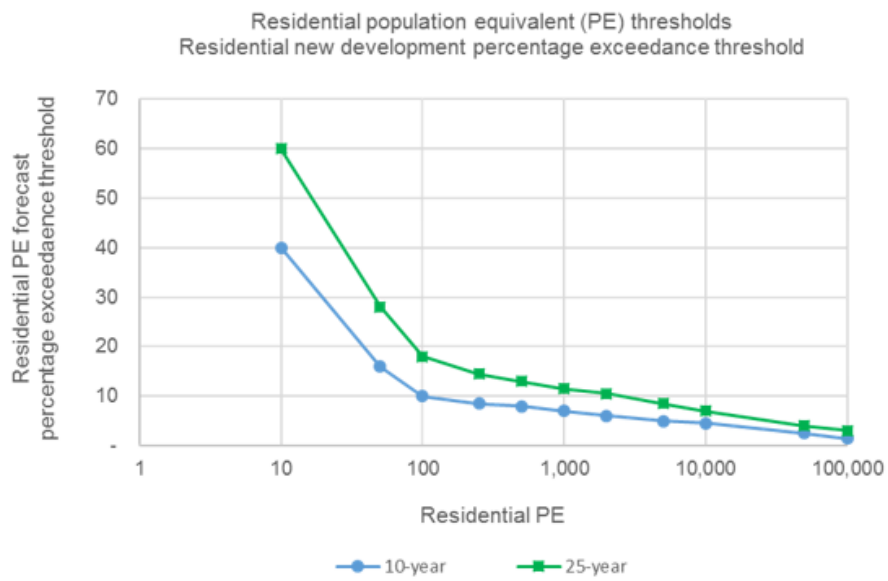
As detailed in Section B.2.2, if **only** the sewer collapses and/or blockages indicators are breached then at present this is to be treated as if **no** indicators are breached, i.e. there is no requirement to undertake the DWMP baseline risk and vulnerability assessment (BRAVA) and problem characterisation process steps, and current planning approaches to risk assessment and option development and appraisal are to be continued.

It is expected that catchments will be assessed, using current practices, with reference to the priority order arising from the risk-based catchment screening assessment.

Extract from Table B-2 of 'DWMP Framework –Appendix B' (as of 19th July 2018)

Indicator 13 relating to planned development has been assessed using the following thresholds extracted from the draft DWMP k

Figure B-1 – Planned residential new development thresholds



Values are tabulated below.

Table B-3 - Planned residential new development thresholds

Residential PE (nr)	Residential PE forecast percentage exceedance threshold	
	10-year (%)	25-year (%)
10	40.0	60.0
50	16.0	28.0
100	10.0	18.0
250	8.5	14.5
500	8.0	13.0
1,000	7.0	11.5
2,000	6.0	10.5
5,000	5.0	8.5
10,000	4.5	7.0
50,000	2.5	4.0
100,000	1.5	3.0

Extract from 'DWMP Framework – Appendix B' (as of 19th July 2018)

Assessment of whether a L3 TPU catchment would trigger BRAVA is based on the following extract taken from section B2.2. of 'DWMP Framework – Appendix B'. Where 'second tier' indicators have been triggered but do not meet the conditions set out below to proceed to BRAVA these have been highlighted in the RBCS tables in yellow. Catchments below 50 population equivalents are excluded from RBCS due to their sensitivity to data assessment but will be assessed on a case by case basis

Indicators have been classified into two tiers, providing a mechanism to differentiate between the priority of each indicator tier when considering whether further assessment is justified. The following two indicators have been classified as 'second tier' (with all other indicators being 'first tier'):

- Catchment characterisation (stage 2 of the wastewater resilience metric methodology).
- Continuous or intermittent discharges impact upon sensitive receiving waters (part B).

When summing the total number of indicator breaches (of screening criteria as defined in Table B-1) across both indicator tiers:

- If **two or more** indicators are breached (excluding sewer collapses and blockages – see third bullet) then a BRAVA is required to identify whether and to what extent changes in future inputs impact on planning objectives.
- If **one** indicator is breached (again, excluding sewer collapses and blockages – see next bullet) then a BRAVA is required, **if the indicator causing the single breach is included within the first tier.**
- If **only** the sewer collapses and/or blockages indicators are breached then at present this is to be treated as if **no** indicators are breached, i.e. there is no requirement to undertake the DWMP BRAVA and problem characterisation process steps, and current planning approaches to risk assessment and option development and appraisal are to be continued. Further development of the DWMP process is required to define a specific and consistent extended and complex planning approach for these supply-side risks; however, companies have the flexibility where current planning processes allow to define their own extended and complex approaches to asset deterioration assessments.
- If **no** conditions are met this implies that there is no current evidence to suggest that the L3 catchment is likely to be vulnerable to changes in future inputs. Companies will be expected to apply existing approaches for long-term planning against asset deterioration but no detailed baseline risk assessment is required. Companies will still need to undertake the wider resilience assessment for the catchment.

The inclusion of only two indicators in a second tier means that for these to influence the decision to proceed to BRAVA, they must both be breached (independently of others). However, the introduction of this mechanism also provides water companies with the opportunity to include bespoke indicators in the second tier, where considered more suitable than assigning first tier priority.

Extract from section B2.2. of 'DWMP Framework – Appendix B' (as of 19th July 2018)

B1 – Upper Severn SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
MONKMOOR	89,719																	
MILE OAK	21,147																	
WELSHPOOL	13,307																	
NEWTOWN	11,599																	
DRENEWYDD - OSWESTRY	5,259																	
LLANIDLOES	3,535																	
MINSTERLEY	2,873																	
PANT-PLAS CERRIG	1,987																	
FORD	1,630																	
PONTESBURY	1,623																	
BOMERE HEATH	1,241																	
LLANFYLLIN	1,184																	
GUILSFIELD	1,142																	
MONTGOMERY	1,090																	
FOUR CROSSES	1,089																	
CAERSWS	1,083																	
LLANFAIR CAEREINION	1,081																	
WEST FELTON	1,026																	
TREWERN	821																	
WORTHEN	805																	
KERRY	790																	
LLANSANTFFRAID	775																	
CHURCH STOKE	657																	
CONDOVER	612																	
TREGYNON	583																	
LLANRHAeadr	537																	
DORRINGTON	527																	
CARNO	519																	
FORDEN	468																	
LLANGADFAN	444																	
BAUSLEY	438																	
ARDDLEEN	407																	
MEIFOD	397																	
NESSCLIFFE - WILCOT	370																	
LLANDINAM	344																	
BERRIEW	310																	
CASTLE CAEREINION	297																	
LLANFECHAIN	279																	
TREFEGLWYS	260																	
PEN-Y-BONT-FAWR	250																	
BETTWS CEDEWAIN	245																	
LLANSILIN	240																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
YOCKLETON	232																	
KINNERLEY	230																	
CHIRBURY	225																	
SNAILBEACH	212																	
LLANDYSSIL	191																	
LLANGYNOG	188																	
MONTFORD BRIDGE	184																	
LLANWYDDYN	183																	
ACTON BURNELL	169																	
KNOCKIN	151																	
PONTROBERT	151																	
VAN	150																	
SARN	140																	
STIPERSTONES	134																	
ADFA	121																	
CAERHOWEL	116																	
LONGDON COMMON	112																	
CASTLE PULVERBATCH	95																	
CLATTER	87																	
BWLCH-Y-FRIDD	85																	
LLYNCLYS	75																	
LLANGEDWYN	70																	
LLYS RHYS RHYSNANT	58																	
LONGNOR- VINEYARD COTTAGES	54																	
MANAFON	50																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
PENYBONT-LLANERCH EMRYS	45																	
LEA CROSS	41																	
SNAILBEACH - PROSPECT COTTAGES (STW)	41																	
LOWER COMMON - STAPLETON	37																	
PENTREFELIN	30																	
VENNINGTON DITCH	29																	
DOLANOG	28																	
COUNDMOOR	21																	
DEYTHEUR	15																	
HENIARTH	15																	
PICKLESCOTT	13																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments

B2 – Tern SPA

The outputs of the Risk Based Catchment Assessment

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
RUSHMOOR	139,148																	
MARKET DRAYTON	17,808																	
NEWPORT	13,093																	
WEM - ASTON ROAD	5,775																	
BASCHURCH	4,019																	
ELLESMERE - WHARF MEADOW	3,672																	
EDGMOND	2,487																	
SHAWBURY	2,184																	
HIGHER HEATH-PREES	2,037																	
STOKE HEATH	1,677																	
LOGGERHEADS VILLAGE	1,434																	
LOGGERHEADS SANATORIUM	1,239																	
WOORE	1,083																	
RUYTON XI TOWNS	1,076																	
HINSTOCK	828																	
PREES - GOLFHOUSE LANE	784																	
HIGH ERCALL	690																	
BLYMILL	661																	
CLIVE	661																	
WOODSEAVES	637																	
CHESWARDINE	633																	
HODNET	546																	
CHILDS ERCALL	523																	
NORTON-IN-HALES	371																	
LOPPINGTON	225																	
IGHTFIELD	213																	
SAMBROOK	206																	
RODEN	167																	
DUDLESTON HEATH	151																	
ADBASTON	148																	
NORBURY	141																	
HOLLINWOOD	114																	
FORTON	97																	
ELLERDINE	93																	
STOKE-ON-TERN/LANGLEYDAL	89																	
PULESTON	83																	
NEWTOWN SPRINGFIELD	82																	
MARCHAMLEY - EASTLANDS	81																	
HORDLEY - SYCAMORE VIEW	65																	
LYNEAL	65																	
GRAFTON	62																	
PRESTON BROCKHURST	57																	
OSBASTON	54																	
WALCOT	50																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
WHIXALL-WINDMILL GARDENS	46																	
EDSTASTON - PEPPER ST	45																	
GREAT BOLAS	40																	
WOLLERTON - BEAN BANK	37																	
WOODSEAVES - HILLSIDE	37																	
WATERS UPTON - SYTCH LANE	31																	
ERCALL HEATH	30																	
CRUDGINGTON	27																	
ASTON NEAR WEM	26																	
WESTON - GUINEA LANE	25																	
PREES - HILLSIDE	24																	
ENGLISH FRANKTON	23																	
ROCKHALL VILLAS	22																	
SUGDON	22																	
WESTON-HAWKESTONE COURT	21																	
WISTANWICK EASTLEA	21																	
CHESWARDINE WINDSMOOR	20																	
CRICKMERRY BK- WISTANSWICK	20																	
WELSHAMPTON - BALMER CRESCENT	19																	
CHILDS ERCALL - LEAFIELDS	18																	
COTON - WEST VIEW	17																	
MORETON SAYE-THE DRUMBLES	16																	
STOKE ON TERN - MAYFIELDS	16																	
OXMOOR	15																	
WESTON - THE ELMS	15																	
HIGH OFFLEY - TUNSTALL LANE	14																	
HINSTOCK - MILL GREEN	14																	
PERTHY - WINDY RIDGE	14																	
ADBASTON - MAIN ROAD	13																	
EDSTASTON PARKFIELDS	13																	
WHIXHALL - RACK LANE	13																	

Catchments below 50 equivalent population are excluded from RBCS.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
ADBASTON - LERRIDGE LANE	12																	
KENWICK PARK	12																	
WEM - SOULTON VILLAS	12																	
MORETONWOOD-BLETCHLEY RD	11																	
WHIXALL - SANDY BANK	11																	
NORTHWOOD - WEM ROAD	10																	
RUEWOOD	10																	
WOODSEAVES - THE NOOK	10																	
COTON - PARK VILLAS	9																	
GRINSHILL OAKDENE	9																	
HIGH HATTON	9																	
PELOW	9																	
WHIXALL - MOSSLEIGH	9																	
BETTON BYEWAYS	6																	
GOLDSTONE - SPRINGFIELD	4																	
ALKINGTON RD - CHAIN HOUSE																		

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments

B3 – Teme SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
TENBURY	25,048																	
LUDLOW	12,392																	
CHURCH STRETTON	4,936																	
CRAVEN ARMS	3,669																	
KNIGHTON	2,899																	
CLEOBURY MORTIMER	2,754																	
COLWALL	2,178																	
BISHOPS CASTLE	1,754																	
HALLOW	1,448																	
CRADLEY	1,073																	
CORELEY - CLEE HILL	1,037																	
MARTLEY-DUCTONS COPP	835																	
CLUN	746																	
BUCKNELL	735																	
WIGMORE	708																	
LEINTWARDINE	694																	
CLIFTON-UPON-TEME	516																	
DITTON PRIORS	482																	
EARDISTON	355																	
LYDBURY NORTH	302																	
ALFRICK - CLAY GREEN	298																	
KNUCKLAS	287																	
WHITBOURNE WORKS	287																	
RUSHBURY	274																	
KNOWBURY	260																	
ASHFORD CARBONELL	251																	
STOTTESDON	230																	
ASTON ON CLUN	213																	
UPPER SAPEY	185																	
NEWCASTLE-ON-CLUN	161																	
CARDINGTON	139																	
DIDDLEBURY - THE MOORS	135																	
CAYNHAM COURT RBC	127																	
BITTERLEY-ORCHARD LEE	107																	
SUCKLEY	85																	
CLUNBURY	83																	
ONIBURY - CHURCH CLOSE	76																	
BRAMPTON BRYAN	75																	
HOPTON WAFERS	75																	
MIDDLETON	70																	
BEDLAM	68																	
MAMBLE NORTH	65																	
LONGVILLE IN THE DALE	63																	
SHELSLEY BEAUCHAMP	57																	
COLES GREEN	56																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
SHELSLEY-STNFRD BUNGALOW	31																	
TICKLERTON	25																	
MUNSLow	23																	
STOKE SAINT MILBOROUGH	23																	
MATHON	22																	
LOWER SAPEY	21																	
CULMINGTON - CORVE VIEW	20																	
STANTON LACY	19																	
KNIGHTWICK-HIGHFIELDS	18																	
LEIGH - WINSGRAVE BUNGALOWS	18																	
CLEE ST MARGARET	17																	
SEIFTON	17																	
MARTLEY-PRICKLEY LANE	15																	
DARBYS GREEN	14																	
MONKWOOD GREEN	14																	
COTHERIDGE-OTHERTON LANE	12																	
SUCKLEY - RECTORY LANE	11																	
ALFRICK - STOCKS LANE	10																	
SHELSLEY-WILDERNESS COT	10																	
TEDSTONE WAFRE	10																	
RUSHWICK GREEN (CROWN EAST)	9																	
KNIGHTWICK ALMSHOUSES	8																	
LULSLEY GRESWOLD	8																	
WICHENFORD - BOXLEY COTTAGES	6																	
ONIBURY - WOODYARD	6																	
LUSLEY RBC - COUNCIL HOUSES	5																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

B4 – Upper Trent SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
STRONGFORD	355,993																	
BRANCOTE	72,954																	
CANNOCK	62,737																	
CHECKLEY	48,587																	
LICHFIELD	38,293																	
COVEN HEATH	27,048																	
RUGELEY	23,250																	
PIREHILL	17,449																	
PENKRIDGE	13,845																	
CODSALL	13,251																	
ARMITAGE	6,737																	
HIXON	6,243																	
ECCLESHALL AND STURBRIDGE	5,181																	
WOOD EATON	4,532																	
ALREWAS	3,968																	
WHEATON ASTON	2,574																	
YOXALL	1,745																	
ABBOTS BROMLEY	1,316																	
BALDWINS GATE	1,078																	
GREAT BRIDGEFORD	962																	
HAUGHTON	737																	
ASHLEY	657																	
DERRINGTON	655																	
BISHOPSWOOD	592																	
COLTON	479																	
LADFORDFIELDS	441																	
NEWBOROUGH	329																	
BRADLEY	291																	
HAMSTALL RIDWARE	192																	
NORTON BRIDGE	185																	
MILWICH	144																	
SANDON	109																	
CRATEFORD LANE	94																	
ELMHURST	90																	
BOUNDARY	83																	
ADMASTON	78																	
PENKRIDGE BANK	62																	
CROXTON - THE HIGHFIELDS	54																	
COPMERE	51																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
LEA HEATH - HILLCREST	40																	
MODDERSHALL - HILL END	38																	
CANNOCK - FOUR CROSSES	37																	
FRADSWELL - THE DUTTONS	36																	
HILCOTE - THE LEAS	35																	
WETWOOD	34																	
ELLENHALL - GRANGE CLOSE	31																	
WALTON ON THE HILL	24																	
FAIROAK - COPSLEY DALE	23																	
SLINDON - BROWNS BRIDGE	20																	
STANDON - MILL LANE	20																	
LYSWAYS LANE	17																	
STOWE BY CHARTLEY - MILL COTTAGES (17																	
CHEBSEY - THE GREEN	15																	
GAYTON - CHERRY LANE	15																	
KNIGHTLEY EAVES	15																	
HILDERSTONE - SPOT LANE	14																	
GAILEY	12																	
RANTON - BROOK LANE	8																	
KNIGHTLY EAVES - GNOSALL ROAD	-																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

B5 – Dove SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
LEEK	44,589																	
UTTOXETER	34,660																	
ASHBOURNE	20,090																	
CHEDDLTON	5,239																	
ENDON	3,490																	
FROGHALL	2,787																	
ALTON	1,399																	
MAYFIELD	1,387																	
MARCHINGTON	1,360																	
WATERHOUSES	1,028																	
BRAILSFORD	773																	
BRASSINGTON	540																	
PARWICH	446																	
LONGNOR SOUTH	334																	
HARTINGTON	317																	
KNIVETON	300																	
BIGGIN	256																	
MARSTON MONTGOMERY	221																	
YEAVELEY	218																	
HOGNASTON	204																	
WARSLOW	185																	
SHIRLEY	181																	
EARL STERNDAL	177																	
ALSTONFIELD	153																	
HANBURY (STAFFORDSHIRE)	153																	
BUTTERTON	115																	
WETTON	113																	
SUDBURY	106																	
SUTTON ON THE HILL	84																	
WYASTON	82																	
CUBLEY	62																	
ELLASTONE	56																	
COTTON	28																	
THURVASTON	25																	
CROWDECOTE	15																	
HANBURY WOODEND	13																	
MILLDALE	12																	
MEERBROOK	-																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

B6 – Derwent SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
DERBY	318,97																	
ALFRETON	38,975																	
BUXTON	23,486																	
BELPER	23,007																	
MATLOCK LEA	21,690																	
KILBURN	11,777																	
BAKEWELL - PICKORY CORNER	10,836																	
WESTWOOD BROOK	9,261																	
RIPLEY	8,649																	
SOUTH NORMANTON	7,197																	
SWANWICK	6,964																	
HUTHWAITE	6,261																	
MAREHAY	5,901																	
WIRKSWORTH	5,687																	
DUFFIELD	5,437																	
BASLOW	5,000																	
BRADWELL	4,505																	
CLAY CROSS	4,051																	
HEAGE	2,585																	
TIDESWELL	2,204																	
FRITCHLEY	2,110																	
HATHERSAGE	1,860																	
AMBERGATE	1,651																	
SOUTH WINGFIELD	1,542																	
DOVEHOLES	1,039																	
HULLAND WARD	848																	
PEAKDALE	808																	
ASHOVER	760																	
KIRK LANGLEY	517																	
KIRK IRETON	441																	
TURNDITCH	373																	
TADDINGTON	361																	
WHATSTANDWELL	342																	
CHELMORTON	312																	
WESTON	231																	
UNDERWOOD	192																	
WHESTON	163																	
KELSTEDGE	147																	
EDALE	147																	
FOOLOW	135																	
IDRIDGEHAY	120																	
GREAT HUCKLOW	94																	
CRESSBROOK - BOTTOMHILL RD	81																	
SHELDON	73																	
EDALE MILL COTTAGE	64																	
ROWLAND	60																	
LITTLE HUCKLOW	51																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
STANTON LEES	48																	
FLAGG	45																	
HASSOP	42																	
BARBER BOOTH	36																	
ASHOVER - OVERTON HALL	29																	
UPPER BOOTH FARM	12																	
JUBILEE COTTAGES	7																	
ASHOPTON COTTAGE	6																	
EDALE - DALE HEAD FARM	5																	
FAIRHOLMES	5																	
LADYBOWER TAILBAY	5																	
EDALE - SPRINGHILL FARM	5																	
EDALE - LADYBOOTH FARM	3																	
EDALE - ORCHARD FARM	3																	
DERWENT - GAMEKEEPERS COTTAGE	2																	
DERWENT - OLD HOUSE FARM	2																	
EDALE - COTEFIELD FARM	2																	
FISHERIES - PRIDDOCK HOUSE	2																	
GINNETT HOUSE	2																	
HARDEN CLOUGH FARM	2																	
SHOOTING LODGE	2																	
ST HENRYS COMMUNITY CENTRE	2																	
CROOKHILL FARM	-																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

B7 – North Notts SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
MANSFIELD - BATH LANE	89,35																	
WORKSOP-MANTON	55,82																	
ABBAY LATHE - MALTBY	33,66																	
SUTTON IN ASHFIELD	32,35																	
DINNINGTON	29,267																	
RETFORD	26,134																	
BRANTON	19,651																	
EDWINSTOWE	15,443																	
ARMTHORPE	14,451																	
SHIREBROOK	14,367																	
BOUGHTON	12,831																	
CHURCH WARSOP	11,836																	
HODSOCK	11,231																	
SKEGBY	11,207																	
WARMSWORTH	10,930																	
HARWORTH	8,596																	
CLOWNE	7,418																	
EPWORTH	6,786																	
SLADE HOOTON	6,229																	
MATTERSEY THORPE	6,082																	
CRESWELL	5,888																	
TICKHILL	5,170																	
HAXEY - GRAIZELOUND	5,169																	
CROWLE - SCUNTHORPE	4,532																	
WHITWELL	4,145																	
BILSTHORPE	3,593																	
NETHER LANGWITH	2,957																	
ALTHORPE	1,926																	
WOODSETTS	1,698																	
RANSKILL	1,534																	
FINNINGLEY	1,461																	
WADWORTH	1,348																	
SCARCLIFFE	1,329																	
LOUND	1,326																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
GRINGLEY-ON-THE-HILL	1,041																	
BRAITHWELL	992																	
ELKESLEY	976																	
WEST BUTTERWICK	757																	
HODTHORPE	601																	
MISSON	589																	
WROOT	408																	
NORTON	305																	
THORPE SALVIN	280																	
GAMSTON	195																	
LETWELL	94																	
BUDBY	59																	
ELMTON	58																	
PERLETHORPE	55																	
ROWTHORNE	42																	
WHALEY VILLAGE	27																	
CARR	26																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

B8 – Lower Trent SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
STOKE BARDOLPH	597,473																	
SCUNTHORPE-YADDLETHORPE	116,736																	
TOTON	68,327																	
CRANKLEY POINT	54,039																	
ILKESTON - HALLAM FIELDS	48,686																	
NEWTHORPE	46,476																	
HEANOR-MILNHAY	34,023																	
STAPLEFORD-BESSEL LANE	29,778																	
KIRKBY IN ASHFIELD	29,082																	
GAINSBOROUGH - LEA ROAD	26,291																	
BEESTON -LILAC GROVE	26,137																	
RAINWORTH	22,946																	
MILTON	16,455																	
BALDERTON	12,709																	
ASLOCKTON	12,366																	
COTGRAVE	10,687																	
HARBY	10,336																	
SOUTHWELL	9,563																	
PYE BRIDGE	9,445																	
RADCLIFFE-ON-TRENT	9,401																	
PINXTON	9,005																	
CALVERTON	8,880																	
KEYWORTH	7,753																	
MELBOURNE	5,405																	
WALKERINGHAM	4,495																	
SUTTON ON TRENT - CROMWELL	4,403																	
SHARDLOW	4,276																	
EAST MARKHAM	4,136																	
COLLINGHAM	3,959																	
CROPWELL BISHOP	3,908																	
BOTTESFORD	3,869																	
SCOTTER	3,224																	
FARNSFIELD	3,200																	
KIRTON-IN-LINDSEY	2,898																	
ETWALL	2,755																	
FARNDON	2,599																	
WORTHINGTON	2,548																	
KINOULTON	2,264																	
BURTON STATHER	2,180																	
EAST BRIDGFORD	2,096																	
WEST BURTON	2,002																	
FINDERN	1,840																	
RAMPTON	1,778																	
GOTHAM	1,632																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
NETHER BROUGHTON	1,421																	
BLYTON	1,328																	
LUDDINGTON	1,325																	
GUNNESS	1,198																	
TORKSEY	1,104																	
LAUGHTERTON	1,010																	
REDMILE	914																	
EAST BUTTERWICK	886																	
ELSTON	878																	
BREEDON	854																	
WILLOUGHTON	752																	
MARTON	739																	
FLINTHAM	591																	
CROXTON KERRIAL	571																	
TICKNALL	565																	
BRANSTON	564																	
NORTH WHEATLEY	555																	
CLIFTON EAST MIDS	462																	
EAKRING	455																	
WOOLSTHORPE	416																	
LANGAR LIMES FARM	376																	
KIRKCLINTON SEWAGE WORKS	371																	
HEADON CUM UPTON & ASKHA	305																	
GRANBY VILLAGE DRAIN	263																	
EAST STOCKWITH	253																	
BARNSTONE - MAIN ROAD	250																	
LAXTON	225																	
AISBY	224																	
ALKBOROUGH	208																	
KNEESALL	197																	
DALBURY LEES	187																	
BARNSTONE - PARK ROAD	166																	
THORNEY	148																	
WILSON	125																	
SCREVETON	114																	
THRUMPTON	109																	
GROVE	108																	
HAWKSWORTH	107																	
NORTHORPE	102																	
COTTAM	97																	
EAST FERRY	95																	
HIGH SANTON	84																	
ELTON	77																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
PILHAM	77																	
THOROTON	67																	
SIBTHORPE	64																	
TRUSLEY	60																	
COTHAM	56																	
ALVERTON	54																	
SHELTON - NOTTS	46																	
OWTHORPE	43																	
KNEETON	40																	
ETWALL - GRAVEL PIT COTTAGES	35																	
STAUNTON	34																	
TITHBY	31																	
ADLINGFLEET	81																	
LOW MARNHAM	25																	
HALAM	21																	
MARKHAM CLINTON	13																	
ETWALL - BROOMHILL COTTAGES	11																	
LANGAR	8																	
LOW SANTON	8																	
SALTERFORD	6																	
SUTTON CUM GRANBY	-																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

B9 – Soar SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
WANLIP	644,583																	
LOUGHBOROUGH	72,540																	
MELTON	60,088																	
SNARROWS	45,824																	
WIGSTON	28,015																	
WHETSTONE	26,026																	
OADBY	21,752																	
SHEPSHED	14,926																	
STONEY STANTON	12,391																	
BARROW & QUORN	12,219																	
BROUGHTON ASTLEY	10,636																	
EAST LEAKE	9,166																	
CASTLE DONINGTON	7,132																	
COUNTRESTHORPE	6,792																	
FLECKNEY	5,064																	
KEGWORTH	3,610																	
GREAT GLEN	3,597																	
NEWBOLD VERDON	3,423																	
BURTON ON THE WOLDS	2,924																	
LONG WHATTON	2,533																	
WALTHAM	2,190																	
SUTTON BONNINGTON	2,022																	
CLAYBROOKE MAGNA	1,602																	
HOUGHTON ON THE HILL	1,561																	
ARNESBY	1,385																	
WHISSENDINE	1,303																	
LANGHAM	1,085																	
BILLESDON	885																	
ASHBY FOLVILLE	679																	
WYMONDHAM	600																	
THORPE SATCHVILLE	548																	
KIRKBY MALLORY	532																	
MARKET OVERTON	525																	
BURTON LAZARS	479																	
SOMERBY	446																	
GAULBY	337																	
WISTOW	278																	
HOTON	274																	
ASHWELL	257																	
FROLESWORTH	239																	
HUNGARTON	165																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
PICKWELL	135																	
BURROUGH ON THE HILL	117																	
KEYHAM	117																	
WILLEY	85																	
RAGDALE	74																	
LITTLE STRETTON	66																	
OWSTON	63																	
COLD OVERTON	62																	
GARTHORPE	56																	
Beeby STW	-																	
SAXBY	36																	
LOWESBY	29																	
FREEBY	26																	
WIGSTON PARVA	21																	
COLD NEWTON	13																	
BLACKBROOK	10																	

Catchments below 50 equivalent population
are excluded from RRCS

Please refer to Appendix A for comments relating to catchments.

B10 – Trent Confluence SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
CLAYMILLS	356,269																	
TAMWORTH	99,433																	
NUNEATON-HARTSHILL	95,362																	
HINCKLEY	48,023																	
STANTON - DERBYSHIRE	39,112																	
EARL SHILTON	26,346																	
PACKINGTON	17,979																	
ATHERSTONE	16,616																	
POLESWORTH	9,629																	
BARTON	7,833																	
IBSTOCK	7,473																	
MEASHAM	6,142																	
BULKINGTON	5,798																	
GRENDON	5,635																	
COTON PARK	4,675																	
HURLEY	3,179																	
DONISTHORPE	3,047																	
BARLESTONE	2,857																	
MARKET BOSWORTH	2,599																	
OVERSEAL	2,507																	
RAVENSTONE	2,227																	
BRAMCOTE	1,921																	
SNARESTONE	1,789																	
WARTON	1,369																	
EDINGALE	898																	
NETHERSEAL	744																	
CLIFTON CAMPVILLE	625																	
BILSTONE	572																	
RIDGE LANE-MANCETTER	549																	
ELFORD	523																	
SIBSON	386																	
TWYXCROSS	323																	
NORTON JUXTA	237																	
SMISBY	179																	
HINTS	178																	
BIRCHLEY HEATH	155																	
CHILCOTE RBC	129																	
ORTON ON THE HILL	93																	
DRAKELOW (DERBYS)	82																	
COMBERFORD	45																	
FREASLEY	45																	
BARTON IN THE BEANS	-																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments

B11 – Central SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
MINWORTH	1,695,010																	
COLESHILL	248,467																	
RAY HALL	136,015																	
GOSCOTE	109,758																	
BARSTON	60,652																	
BURNTWOOD	42,560																	
LITTLE ASTON	22,863																	
WALSALL WOOD	21,931																	
NORTON GREEN	10,226																	
BALSALL COMMON	6,925																	
SHENSTONE	3,840																	
ARLEY	3,415																	
MERIDEN	2,647																	
EARLSWOOD																		
SPRINGBROOK	1,797																	
WHITACRE HEATH	651																	
SHUSTOKE	398																	
BASSETTS POLE	233																	
BERKSWELL	215																	
MIDDLETON VILLAGE	213																	
LEA MARSTON	161																	
SPINNEY	144																	
FURNACE END	142																	
TEMPLE BALSALL	83																	
NETHER WHITACRE - DOG LANE	58																	
MAXSTOKE	32																	
WISHAW	32																	

Please refer to Appendix A for comments relating to catchments.

B12 – Avon SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
COVENTRY - FINHAM	435,448																	
WARWICK - LONGBRIDGE	122,721																	
RUGBY NEWBOLD	97,764																	
REDDITCH - SPERNAL	77,011																	
STRATFORD-MILCOTE	32,897																	
TEWKESBURY	28,296																	
EVESHAM	25,532																	
BLACKMINSTER	16,969																	
BROCKHAMPTON	15,935																	
ITCHEN BANK	15,597																	
PRIEST BRIDGE	13,557																	
PERSHORE	11,497																	
LUTTERWORTH	10,782																	
MARSTON LANE	9,950																	
BEDWORTH	9,223																	
ALVECHURCH	8,637																	
ALCESTER	8,637																	
SHIPSTON FELL MILL	7,958																	
BIDFORD-ON-AVON	7,760																	
WELLESBOURNE	6,323																	
WOLSTON	5,865																	
WINCHCOMBE	4,695																	
HONEYBOURNE	4,543																	
BROADWAY	4,306																	
WOOTTON WAWEN	4,111																	
BREDON-FLEET LANE	3,395																	
DUNCHURCH	2,762																	
CROPTHORNE HEATH	2,686																	
HARVINGTON	2,466																	
ASTWOOD BANK	2,319																	
CHIPPING CAMPDEN	2,286																	
KINETON	2,244																	
KILSBY	2,225																	
FRANKTON	2,219																	
LONG MARSTON	2,213																	
BLOCKLEY	2,211																	
ROWINGTON	2,020																	
BRAUNSTON	1,875																	
KIMCOTE	1,710																	
INKBERROW	1,584																	
CHERINGTON	1,458																	
WOOLSTONE	1,441																	
TWYNING	1,362																	
ALDERTON	1,273																	
SOUTH KILWORTH	1,262																	
ECKINGTON	1,221																	
MONKS KIRBY	1,131																	
SNITTERFIELD	1,077																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
ETTINGTON WORKS	1,058																	
CROWLE - WORCESTER	1,056																	
BRINKLOW	1,045																	
WELFORD	1,043																	
TYSOE	1,020																	
NAPTON	989																	
RIDGEWAY	977																	
LEEK WOOTTON	932																	
CLAVERDON	908																	
LIGHTHORNE HEATH	857																	
WESTON-UNDER-WETHERLEY	852																	
LONG COMPTON	842																	
SIBFORD FERRIS	837																	
SEDGEBERROW	834																	
CORLEY	832																	
FENNY COMPTON	797																	
YELVERTOFT	790																	
ILMINGTON	715																	
BISHAMPTON	699																	
ASHTON UNDER HILL	697																	
BEARLEY	688																	
LOWER MOOR	661																	
NASEBY WRW	641																	
BUTLERS MARSTON	640																	
BUBBENHALL	624																	
STOKE ORCHARD	613																	
NETHERCOTE	592																	
HARBOROUGH MAGNA	591																	
PEBWORTH VILLAGE	586																	
SWINFORD	548																	
NORTON LINDSEY	533																	
PRESTON-ON-STOUR	533																	
BECKFORD	515																	
PEOPLETON RBC	510																	
STAVERTON	494																	
CHURCH LENCH	481																	
MORETON MORRELL	480																	
OXHILL	446																	
STRETTON-ON-FOSSE	410																	
DEFFORD VILLAGE	407																	
NORTHEND	407																	
ULLENHALL	392																	
GAYDON	390																	
LILBOURNE	384																	
WILLOUGHBY	370																	
DUMBLETON	368																	
LIGHTHORNE	345																	
TODDINGTON	329																	
WHICHFORD	329																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
HANBURY (WORCESTERSHIRE)	320																	
TANWORTH-IN-ARDEN	320																	
UPTON SNODSBURY	308																	
CHURCH LAWFORD	300																	
LITTLE COMBERTON	286																	
RADWAY	286																	
BIRLINGHAM	221																	
STANTON - GLOUCESTERSHIRE	212																	
ASTON SOMERVILLE	207																	
LOWER STRENSHAM	207																	
CHURCHOVER	204																	
FLYFORD FLAVELL STW	204																	
HINTON-ON-THE-GREEN	193																	
STOULTON - HAWBRIDGE	184																	
LAVERTON	181																	
FLECKNOE	179																	
KNIGHTCOTE	179																	
KINGTON	172																	
BROUGHTON HACKETT	158																	
COMBROOK	158																	
LAWFORD HEATH	158																	
MORETON PADDOX	158																	
PRIORS HARDWICK	154																	
ASHORNE	146																	
ROUS LENCH	136																	
SHAWELL	125																	
SALE GREEN	123																	
WORMINGTON	110																	
BRETFORD	101																	
WADBOROUGH	101																	
THROCKMORTON	100																	
ABBOTTS MORTON	94																	
DUNNINGTON	91																	
WORMLEIGHTON	89																	
ADMINGTON	88																	
WHITTINGTON NR MOTORWAY	88																	
EARLS COMMON	87																	
BASCOTE	81																	
SNEACHILL	81																	
TILESFORD PARK	76																	
ASTON MAGNA	71																	
LOWER SHUCKBURGH	65																	
DORSINGTON	62																	
GT WASHBOURNE	62																	
NAUNTON BEAUCHAMP	61																	
OLD MILVERTON	58																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
DEFFORD LODGE HILL	45																	
WHITTINGTON EAST	42																	
WINWICK	36																	
CHURCHOVER - COTON ROAD	35																	
PEBWORTH MIDDLESEX	33																	
STOULTON - WINDMILL HILL	32																	
TEWKESBURY - LINCOLN GREEN LANE (ST	21																	
BAUGHTON LANE	17																	
STRENSHAM INTAKE	17																	
SNOWDON LODGE	5																	
GLEBE FARM	4																	
BROCKHILL	2																	
GRANGE FARM	2																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

B13 – Middle Severn SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
ROUNDHILL	276,251																	
BARNHURST	142,451																	
WORCESTER - BROMWICH ROAD	110,973																	
KIDDERMINSTER OLDINGTON	105,570																	
COALPORT	72,400																	
BROMSGROVE	60,827																	
LOWER GORNAL	36,085																	
TRESCOTT	33,552																	
DROITWICH-LADYWOOD	24,858																	
BRIDGNORTH-SLADS	13,423																	
GOSPEL END	8,129																	
SHIFNAL	7,086																	
KINVER	4,547																	
ALBRIGHTON	4,473																	
STOKE PRIOR	3,702																	
HIGHLEY	3,452																	
MUCH WENLOCK	2,062																	
BELBROUGHTON WORKS	2,020																	
BLAKEDOWN	1,700																	
PATTINGHAM	1,624																	
ALVELEY	1,541																	
WYCHBOLD	1,267																	
OMBERSLEY	1,083																	
BROMPTON-CROSS HOUSES	827																	
CLAVERLEY	708																	
CRESSAGE	698																	
CHADDESLEY CORBETT	555																	
ACKLETON/STABLEF ORD	452																	
HIMLEY	428																	
HOLT HEATH	390																	
BECKBURY	379																	
LOWER PENN	363																	
LITTLE WENLOCK	322																	
GREAT WITLEY	309																	
HOMER	269																	
BOBBINGTON	267																	
UPPER ARLEY	256																	
ENVILLE	244																	
ROCK - RECTORY LANE	231																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
ABBERLEY - THE COMMON	215																	
HILTON STRATFORD LANE	211																	
WORFIELD	193																	
ASTLEY HAMPSTALL	160																	
GARMSTON	142																	
BUILDWAS - PARK VIEW	134																	
WHITTINGTON MEB	126																	
GRIMLEY	120																	
BILLINGSLEY	116																	
CHORLEY	113																	
ATCHAM - THE GLEBE	107																	
MORVILLE	104																	
LITTLE WITLEY	101																	
BURNHILL GREEN	99																	
ABBERLEY SUFFOLK LANE	39																	
SHRAWLEY NEW INN LANE	29																	
WALTON COTTAGES	22																	
CHURCH PREEN	20																	
SHRAWLEY RECTORY LANE	12																	
WILDMOOR	11																	
ABBERLEY - SEPTIC TANK	7																	
UPPINGTON	6																	
COSFORD	2																	
HIMLEY HALL	2																	
HILLHAMPTON - YEW TREE COTTAGES	-																	

Please refer to Appendix A for comments relating to catchments.

B14 – Lower Severn SPA

The outputs of the Risk Based Catchment Assessment:

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
NETHERIDGE	173,175																	
HAYDEN	130,562																	
STANLEY DOWNTON	75,654																	
MALVERN	36,132																	
LYDNEY	22,754																	
COALEY	19,727																	
BLAKENEY	14,154																	
LEDBURY	13,963																	
POWICK	11,337																	
NEWENT	8,215																	
LONGHOPE	3,680																	
KEMPSEY WORKS	3,313																	
CINDERFORD - CRUMPMEADOW	3,172																	
UPTON-ON-SEVERN WKS	2,912																	
PITTS MILL	2,565																	
FRAMPTON	2,306																	
HOLLY GREEN WORKS	1,258																	
WELLAND	1,136																	
QUAY LANE	1,085																	
HUNTLEY	1,061																	
AVENING	1,056																	
WEST MALVERN	1,028																	
BROADOAK	1,020																	
WESTBURY-ON-SEVERN	708																	
APPERLEY	606																	
TIBBERTON	515																	
SEVERN STOKE WKS	467																	
RIPPLE WORKS	459																	
DYMOCK	424																	
CASTLEMORTON	370																	
LITTLEDEAN	349																	
BROMSBERROW	333																	
BOSBURY RBC	292																	
TIRLEY	292																	
ARLINGHAM	254																	
BIRDLIP	232																	
KEMPLEY	210																	
LONGDON WORKS	188																	
MUCH MARCLE	147																	
LONGNEY	124																	
GORSLEY - IVY HOUSE	120																	

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
CHURCHAM	107																	
PENDOCK	92																	
GUARLFORD	91																	
FROMES HILL	79																	
MADRESFIELD WATERLOO CLOS	78																	
BROTHERIDGE GREEN	69																	
PIRTON	68																	
GREEN STREET-KEMPSEY	66																	
NUPEND	64																	
PUTLEY GREEN	59																	
BROOMHALL	57																	
PARK LANE	55																	
POOLHAY CLOSE	54																	

Please refer to Appendix A for comments relating to catchments.

L3 : TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
HIGH GREEN	47																	
LANCASTER TERRACE	43																	
LYDNEY-THE BARRACKS	41																	
CLIFTON (NR KEMPSEY)	40																	
ASTON INGHAM	31																	
LITTLE MARCLE SCHOOL	29																	
ELDERSFIELD-BRIDGE END	25																	
MUCH MARCLE RUSHALL	24																	
EASTNOR	20																	
WOODEND	19																	
ACTON GREEN	17																	
PIXLEY	17																	
MUCH MARCLE KYNASTON	16																	
KERSWELL GREEN	15																	
CLIFFORDS MESNE	14																	
DEBLINS GREEN VILLAGE	14																	
DUCKSWICH	14																	
FALCON LANE	14																	
HOLDFAST YARDBRIDGE	14																	
MADRESFIELD NORTH END	14																	
AYLTON	13																	
BROMSBERROW BROWNS END	13																	
BUSHLEY GREEN	13																	
EVEBATCH	13																	
FOUR OAKS	13																	
MADRESFIELD RECTORY LANE	13																	
DEBLINS GREEN	12																	
HALLWOOD GREEN	12																	
LEDDINGTON	11																	
MUCH MARCLE WATERY LANE	11																	
MUCH MARCLE HAZERDINE	10																	
BOSBURY - THE PADDLES	9																	

Catchments below 50 equivalent population are excluded from RBCS.

L3: TPU (i.e. WwTW name)	WwTW Equivalent Population	1 - WW Resilience	2 - Bathing or shellfish waters	3 - Discharge to sensitive waters	4 - SOAF	5 - CAF	6 - Internal sewer flooding	7 - External sewer flooding	8 - Pollution incidents	9 - WwTW Q compliance	10 - WwTW Flow compliance	11 - Storm overflows	12 - Other RMA assets	13 - Residential development	14 - WINEP Programme	15 - Sewer collapses	16 - Sewer blockages	BRAVA Triggered
BUSHLEY CROFT FIELDS	9																	
MUCH MARCLE OLD PIKE	9																	
QUEEN HILL	9																	
CLEVELODE - WHITE ACRES	9																	
YATTON	9																	
BOSBURY - COLD GREEN	7																	
CAMERS GREEN NR CASTMTN	7																	
LONG GREEN	7																	
ASHPERTON	5																	
WALLERS GREEN	5																	
FORTHAMPTON	4																	
PUTLEY SCHOOL	3																	

Catchments below 50 equivalent population are excluded from RBCS.

Please refer to Appendix A for comments relating to catchments.

APPENDIX C: GENERAL PLANS

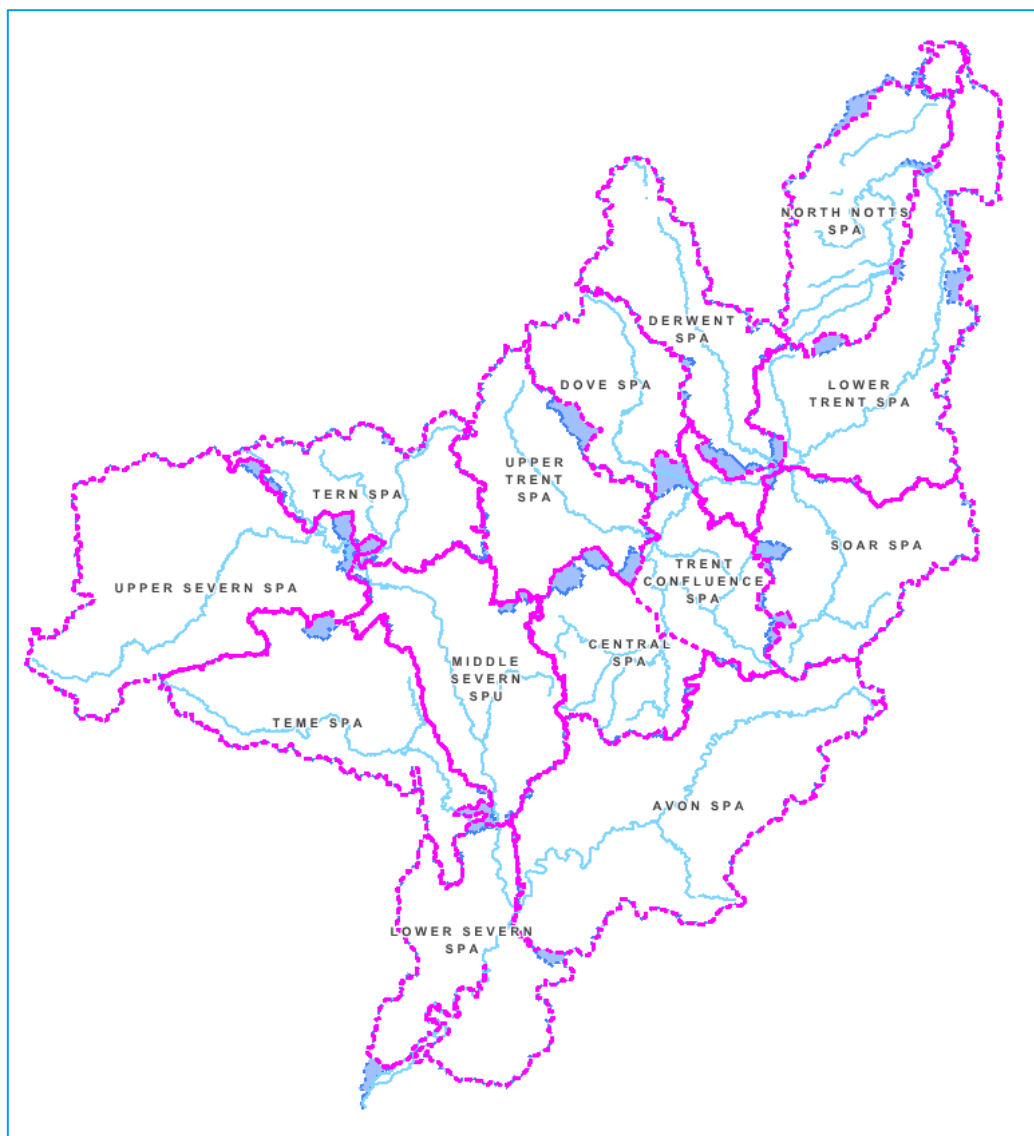
Alignment to River Basin Management Catchments

Where possible the Level 2 Strategic Planning Areas used for DWMP purposes have been aligned to the 13 River Basin Management Catchments (RBMC). However to ensure WwTW catchments are not split across two areas it has been necessary to tweak the RBMC in a few locations but in general we have tried to align the two boundaries.

L2 Strategic Planning Area	River Basin Management Catchments
1: Upper Severn	Severn Uplands
2: Tern	Severn Middle Shropshire
3: Teme	Teme
4: Upper Trent	Trent Valley Staffordshire
5: Dove	Dove
6: Derwent	Derwent Derbyshire
7: North Notts	Idle and Torne
8: Lower Trent	Lower Trent and Erewash
9: Soar	Soar
10: Trent Confluence	Tame Anker and Mease
11: Central	
12: Avon	Avon Warwickshire
13: Middle Severn	Severn Middle Worcestershire
14: Lower Severn	Sever Vale

Alignment of L2:SPUs to RBMCs

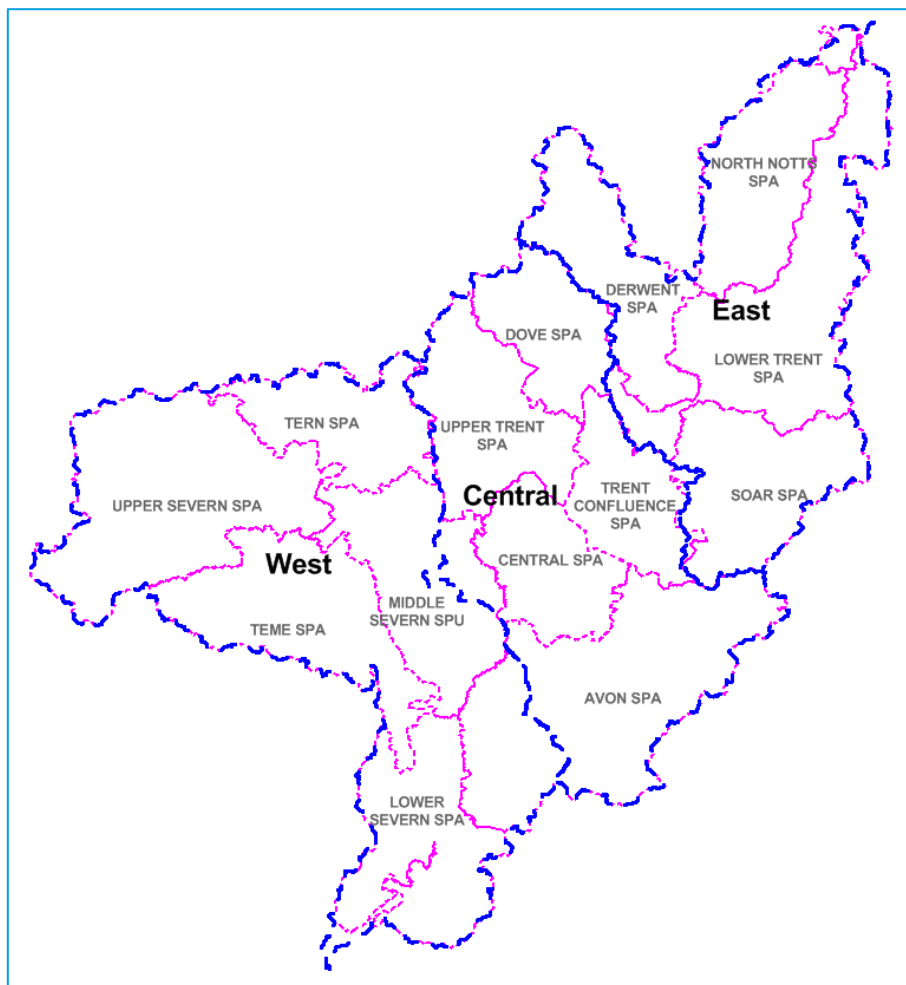
Whilst overall the two align there are some areas where the SPAs have been realigned to avoid WwTW catchment areas being split across more than one planning area but these have been kept to a minimum. The following plan shows how the DWMP Level 2 Strategic Planning Areas (shown in pink) align to River Basin Management Catchment areas (shown in blue) with variances between the two being hatched.



Plan showing alignment of DWMP SPAs to River Basin Management Catchments.

Environment Agency Regions

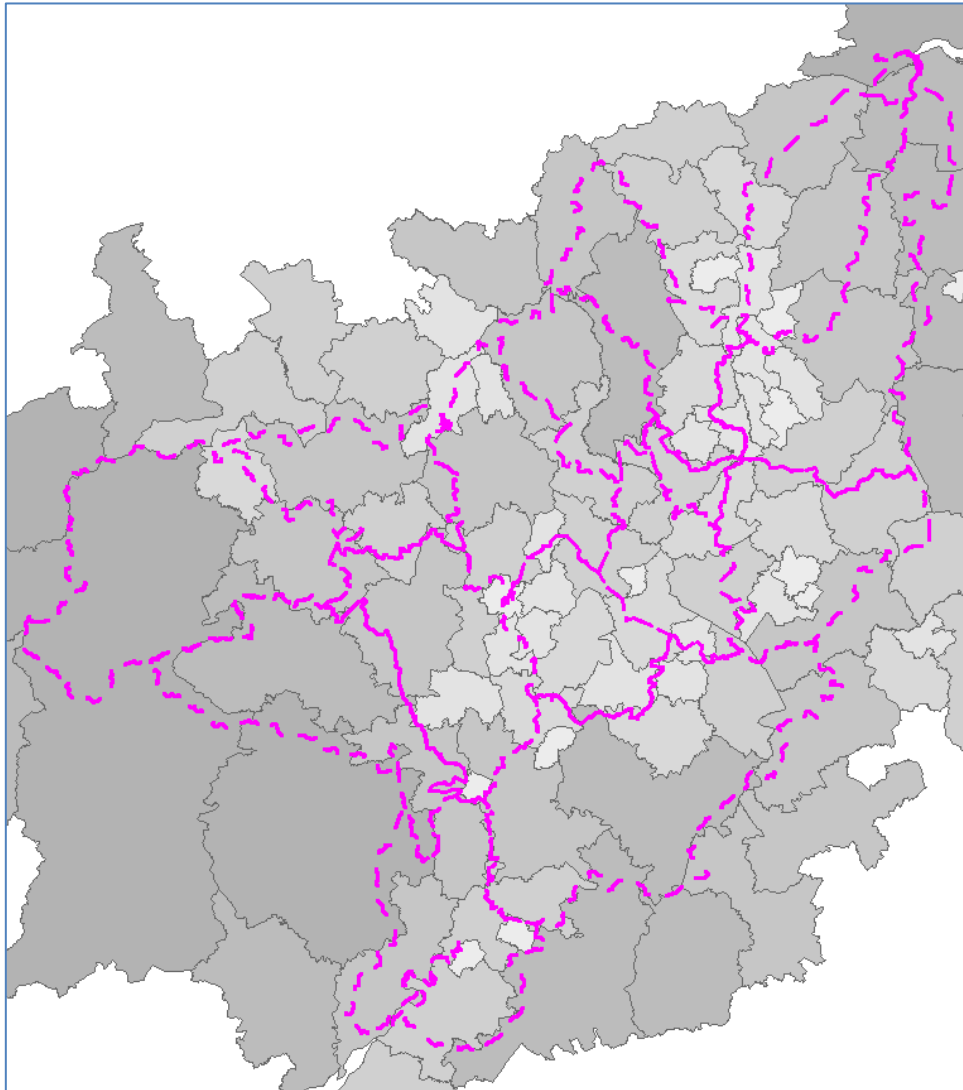
The plan below shows how the L2 Strategic Planning Areas align to Environment Agency regions:



Alignment of L2:SPUs to Environment Agency Regions

Local Authority Planning Areas

The Severn Trent/Hafren Dyfrdwy regions are covered by 80 local authority planning areas, some wholly within our region whilst others only have a small percentage of their area overlapping.



Plan showing alignment of DWMP SPAs to Local Planning Authority boundaries