Telford and Wrekin Council Water Cycle Study Phase 2

Final

25 February 2025

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Telford & Wrekin COUNCIL

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This report describes work commissioned by Telford and Wrekin Council, by an instruction dated October 2024. The Client's representative for the contract was Harriet Broster of Telford and Wrekin Council. Jessica Creber, James Fitton and Richard Pardoe of JBA Consulting carried out this work.

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Abbreviations

ALS	Abstraction Licencing Strategy
AMP	Asset Management Plan
AMP7	Seventh Asset Management Plan period (runs 2020-2025)
AMP8	Eighth Asset Management Plan period (runs 2025 to 2030)
BNG	Biodiversity Net Gain
BOD	Biological Oxygen Demand
BRE	Building Research Establishment
CAMS	Catchment Abstraction Management Strategy
CAPEX	Capital Expenditure
CIRIA	Company providing research and training in the construction industry
CSO	Combined Sewer Overflow (also referred to as Storm Overflows)
DEFRA	Department of the Environment, Food and Rural Affairs
DrWPA	Drinking Water Protected Areas
DWMP	Drainage and Wastewater Management Plan
EA	Environment Agency
EC	European Community
FWMA	Flood and Water Management Act
GES	Good Ecological Status
GIS	Geographical Information System
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HOF	Hands-off flow: river flow below which an abstractor may be required to stop or reduce abstraction
ID	Identifier
JNCC	Joint Nature Conservation Committee
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LNRS	Local Nature Recovery Strategy
LPA	Local Planning Authority
l/p/d	Litres per person per day
NBS	Nature Based Solutions
NE	Natural England
NFM	Natural Flood Management
NPPF	National Planning Policy Framework
OEP	Office for Environmental Protection

OfWAT	Water Services Regulation Authority
PPG	Planning Policy Guidance
Ramsar	The intergovernmental Convention on Wetlands, signed in Ramsar, Iran, in 1971
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Area of Conservation, protected under the EU Habitats Directive
SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Area for birds, protected under the EU Habitats Directive
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
STW	Severn Trent Water
TBC	To be confirmed
TWC	Telford and Wrekin Council
UKWIR	UK Water Industry Research Ltd
UWWTD	Urban Wastewater Treatment Directive
WaSC	Water and Sewerage Company
WCS	Water Cycle Study
WFD	Water Framework Directive
WINEP	Water Industry National Environment Programme
WRMP	Water Resources Management Plan
WRZ	Water Resources Zone
WwTW	Wastewater Treatment Works

Definitions

Term	Description
Abstraction Point	The location where water is either taken or extracted from either a surface or groundwater waterbody.
Agricultural Management	The farming techniques and practices used to produce food and manage livestock.
Abstraction Licencing Strategy	The Abstraction Licencing Strategy sets out the Environment Agency's approach to managing new and existing abstraction and impoundments within their river

Term	Description
	management catchments.
Asset Management Plan (AMP) Period	Price limit periods in the water sector are sometimes known as Asset Management Plan (AMP) periods. The current period (2020-25) is commonly known as AMP 7 because it is the seventh price review period since privatisation of the water industry in 1989. AMP periods are five years in duration and begin on 1 April in the years ending in 0 or 5. Every five years the industry submits a Business Plan to OfWAT for a Price Review (PR). These plans set out the companies' operational expenditure (OPEX) and capital expenditure (CAPEX) required to maintain service standards, enhance service (for example where sewer flooding occurs), to accommodate growth and to meet environmental objectives defined by the Environment Agency. OfWAT assesses and compares the plans with the objective of ensuring what are effectively supply monopolies and operating efficiently.
Aquifer	An aquifer is a rock and/or sediment body that holds groundwater.
Dry Weather Flow	Dry weather flow is the average daily flow of wastewater to a waste water treatment works during a period without rain.
Effluent	Effluent discharge is the liquid waste produced from residential, commercial and industrial processes.
Environmental Flow Indicator	The Environmental Flow Indicator (EFI) is the proportion of natural flows that are required to support the environment of a waterbody.
Groundwater Body	A Groundwater Body is the management unit under the Water Framework Directive which represents a distinct body of groundwater with its own hydrogeological characteristics.

Term	Description
Lead Local Flood Authority	A county council or unitary authority which leads in managing local flood risks (i.e., risks of flooding from surface water, ground water and ordinary (smaller) watercourses). Their duties are outlined in the Flood and Water Management Act.
Natural Flood Management	Natural flood management is the use of natural processes to reduce the risk of flooding and coastal erosion.
Per Capita Consumption	The per capita consumption is the average volume of water used by one person in a day. It is defined as the sum of the measured household consumption of clean water and unmeasured household consumption of clean water divided by the total household population. This is often expressed in litres per person per day (l/p/d).
Permitted Headroom	The difference between the volume of treated wastewater a treatment works is allowed to discharge under its environmental permit, and volume it currently discharges. It can be used to estimate the number of properties that could be connected to a WwTW catchment before a flow permit is exceeded.
Sustainable Drainage Systems (SuDS)	Sustainable drainage systems are drainage solutions that provide a natural alternative to the direct channelling of surface water through an artificial networks of pipes and sewers to nearby watercourses.
Waterbodies	Water bodies constitute areas of water – both salt and fresh, large and small – which are distinct from one another in various ways. All surface waters (including rivers, lakes, estuaries and stretches of coastal water) and groundwaters have been divided up into discrete units called water bodies. Water bodies are the basic unit that are used to assess the quality of the water environment and to set targets for environmental improvements.

Term	Description
Water Framework Directive (WFD)	The Water Framework Directive is a river basin management planning system which was implemented to help protect and improve the ecological health of the UK's rivers, lakes, estuaries and coastal and groundwaters.
Water Framework Directive Classification Status	Rivers, lakes, estuaries and coastal waters can be awarded one of five WFD statuses: High, Good, Moderate, Poor or Bad Groundwater can be awarded one of two statuses: Good or Poor.
Water Framework Directive – Reasons for not achieving good (RNAG)	Where a WFD element is classified as being at less than good status, a reason for the failure to meet the good status is attributed, including the sector deemed responsible or a pressure affecting a biological element.
Water Framework Directive objectives	The Water Framework Directive objectives are set out in Regulation 12 and Regulation 8 of the Water Environment Regulations 2017.
Water Industry National Environment Programme	The Water Industry National Environment Programme is the programme of work in which water companies in England must meet their obligations from environmental legislation and UK government policy.
Water Resource Management Plan (WRMP)	Water Resource Management Plans are statutory documents that all water companies must produce at least every five years. They set out how the water company intends to achieve a secure water supply for their customers while protecting and enhancing the environment.
Water Resource Zone (WRZ)	A Water Resource Zone is an area in which the abstraction and distribution of water is self-contained and is used to meet demand within that area.
Wastewater Treatment Works (WwTW)	A wastewater treatment works receives flows from the sewerage system and treats it so it can be discharged back into a river. They may also be called Sewage Treatment Works (STWs) or Water Recycling Centres (WRCs).

Executive Summary

JBA Consulting were commissioned by Telford Wrekin Council (TWC) to undertake a Phase 2 Water Cycle Study (WCS) as part of the evidence base for their Local Plan. This builds on the Phase 1 study completed in 2023, updating the assessments where appropriate, and assessing the impact of proposed developments on water infrastructure. Phase 2 also addresses water quality and environmental impacts not investigated in Phase 1.

Unmitigated future development and climate change can adversely affect the environment and water infrastructure capability. A WCS will provide the required evidence, together with an agreed strategy to ensure that planned growth occurs within environmental constraints, with the appropriate infrastructure in place in a timely manner so that planned allocations are deliverable.

New homes require the provision of clean water, safe disposal of wastewater and protection from flooding. The allocation of large numbers of new homes in certain locations may result in the capacity of existing available infrastructure being exceeded, a situation that could potentially cause service failures to water and wastewater customers, adverse impacts to the environment, or high costs for the upgrade of water and wastewater assets being passed on to the bill payers.

In addition to increased housing demand, future climate change presents further challenges to the existing water infrastructure network, including increased intensive rainfall events and a higher frequency of drought events. Sustainable planning for water must now take this into account.

A forecast of growth during the Local Plan period was collated based on information provided by TWC. This included:

- Preferred allocations
- Commitments (sites already within the planning system)
- Recent completions
- Windfall

Information on growth in neighbouring authorities that share infrastructure with Telford and Wrekin was also included. From this an estimate of water and wastewater demand at the site and Local Authority level was created for use within the WCS assessments.

The focus in the report is on the 58 potential allocations. These were shared with Severn Trent Water (STW) in their role as water supplier and sewerage undertaker for the region, for them to assess the impact of the sites on their networks and wastewater treatment works (WwTW).

Water resources

Water resources in the UK are under considerable pressure. The Environment Agency have stated that "the scale of the challenge we face increases with time**,** and, by 2050, we are looking at a shortfall of nearly 5 billion litres of water per day between the sustainable

water supplied available and the expected demand.". The National Water Resources Framework sets the objective to reduce the average per capita consumption in the UK to 110l/p/d by 2050. This is now part of the Environmental Improvement Plan (EIP) and water companies Water Resource Management Plans (WRMPs). Within Defra's Plan for Water is the commitment to review Building Regulations and a target of 100l/p/d in water stressed areas is suggested.

The Future Homes Hub, who are supporting Defra to produce a roadmap to greater water efficiency propose a staged reduction in PCC, with a target of 100l/p/d in water stressed areas in place from 2025, and a reduced target of 90l/p/d in place by 2030 (depending on market conditions and customer acceptance).

This study recommends that as a minimum the proposed new Building Regulations target of 100l/p/d outlined in Defra's Plan for Water be adopted across Telford and Wrekin. This should be achieved using a fittings-based approach. This should be supported by the requirement for non-household development to achieve three credits in the assessment category WAT01 of the BREEAM UK New Construction Standard. The Local Plan should allow for a future reduction in the Building Regulations target to 90l/p/d in 2030. Developers should be encouraged to achieve 90l/p/d or lower, especially on larger strategic sites**.**

Water supply

It is likely that upgrades to the water supply network will be required in order to serve the potential allocations without a detriment to existing customers. Modelling by STW may be required to define the extent of these upgrades. Early engagement between developers TWC and STW is needed to ensure that these upgrades are in place prior to occupation of the developments.

Wastewater network

STW provided an assessment of the preferred allocations. This was split into foul network and surface water network. In the foul network assessment, 17 sites were given a "green" assessment confirming there was sufficient capacity within the network to incorporate these sites and no further infrastructure was likely to be required. 4 sites (references: 301, 412, 422, and 449) were given an "amber" assessment, reflecting the need for some additional infrastructure. No particular constraints were identified by STW.

In the surface water assessment, 26 sites were given a "green" assessment confirming there was sufficient capacity within the network to incorporate these sites and no further infrastructure was likely to be required. 5 sites were given an "amber" assessment reflecting the limited surface water network in some areas, and some local flood risk.

Early engagement is required with STW to ensure that the required infrastructure is in place prior to occupation, and a wastewater solution defined where one does not currently exist.

The Environment Act now requires water companies to report and monitor storm overflows as well as reduce the harm caused to the rivers they discharge to. There are 60 storm overflows in Telford and Wrekin, 47 on the network, and 13 at WwTWs. The Storm Overflow Assessment Framework (SOAF) set a threshold of 60 operations in a year (based

on 1 years' data, 50 if based on 2 years data, and 40 if based on 3 years), above which a storm overflow should be investigated. Six of the network and two of the WwTW storm overflows were operating above this threshold between 2021 and 2023.

The Storm Overflow Reduction Plan which was published in 2022 sets an objective that "storm overflows will not be permitted to discharge above an average of ten rainfall events per year by 2050". 37 of the 60 monitored storm overflows are operating on average above ten times per year so may require action to meet the long-term target.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems, and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Wastewater treatment

A capacity assessment was undertaken by JBA comparing the future flow from each WwTW (the current actual flow and the forecast additional flow from growth), with the permit limit. Two of the WwTWs (Edgmond and Newport) in the study area are expected to be close to or exceeding their permit during the Local Plan period. An increase in the permit limit, and / or upgrades to treatment capacity may be required at these WwTWs in order to accommodate planned growth.

It is important that when planning upgrades at WwTW that the full quantum of growth, including from neighbouring LPAs is taken into account.

Coalport WwTW has a storm tank overflow that is currently operating above the threshold for investigation. Growth within this catchment could result in an increase in the operation of this overflow contributing to a worsening of water quality in the area.

Action should be taken by the water companies to address this overflows prior to an increase in wastewater demand being generated by new development.

Water quality

Water quality modelling was performed using the Environment Agency's SIMCAT modelling tool. A baseline scenario was run, updating the existing EA model to the latest flow from WwTW to account for growth since the model was created. A future scenario was then run using the growth forecast for the end of the Local Plan period and the results compared to check for deterioration in water quality. A further test then investigated whether deterioration could be prevented by improvements in upstream treatment. The modelling indicates the growth during the Local Plan period could result in a significant deterioration (10% or over or deterioration in class) in water quality at 1 WwTWs (Newport). This deterioration in class could not be prevented by improvements in treatment as Newport is currently operating below TAL.

The modelling also looks at whether growth during the Local Plan period could prevent good ecological status being achieved in the future. The results showed that growth alone

will not prevent good ecological status being prevented in the future should improvements in upstream water quality be made.

Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with STW is essential to ensure that infrastructure is in place prior to development to prevent a breach of the environmental permit.

Environmental impact

The potential impact of development on a protected sites within and downstream of Telford and Wrekin should be considered in future plan making. This applies to both the impact of abstraction and of additional wastewater discharge as well as the impact of surface water runoff.

Water quality modelling has predicted no significant deterioration in the river adjacent to SSSIs within and downstream of Telford and Wrekin.

Further investigation may be required on these sites, in consultation with NE to ensure that the status of these sites is not affected (in line with the requirements of the Wildlife and Countryside Act).

22 potential allocations are located within groundwater Source Protection Zones. The EA has published management advice for development within these zones (outlined in 10.7.1).

Development sites within the study area could be sources of diffuse pollution from surface runoff. SuDS are required on all development sites. Their design should consider both water quantity and water quality and site-level investigations should be undertaken to define the most appropriate SuDs types for each specific development. Opportunities exist for SuDS to offer multiple benefits of flood risk reduction, amenity value and biodiversity. Consideration should be given to infiltration and deep borehole SuDS within chalk stream catchments to aid replenishment of the chalk aquifer. Telford and Wrekin Council should be consulted at an early stage of development to ensure that SuDS are implemented and designed in response to site characteristics and policy factors.

In the wider area, opportunities exist to implement natural flood management techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

1 Introduction

1.1 Terms of reference

JBA Consulting were commissioned by Telford Wrekin Council (TWC) to undertake a Phase 2 Water Cycle Study (WCS) as part of the evidence base for their Local Plan. This builds on the Phase 1 study completed in 2023, updating the assessments where appropriate, and assessing the impact of proposed developments on water infrastructure. Phase 2 also addresses water quality and environmental impacts not investigated in Phase 1.

Unmitigated future development and climate change can adversely affect the environment and water infrastructure capability. A WCS will provide the required evidence, together with an agreed strategy to ensure that planned growth occurs within environmental constraints, with the appropriate infrastructure in place in a timely manner so that planned allocations are deliverable.

1.2 The impact of development on the water cycle

Figure 1-1 below shows the main elements that compromise the Water Cycle and shows how the natural and artificial processes and systems interact to collect, store or transport water in the environment.

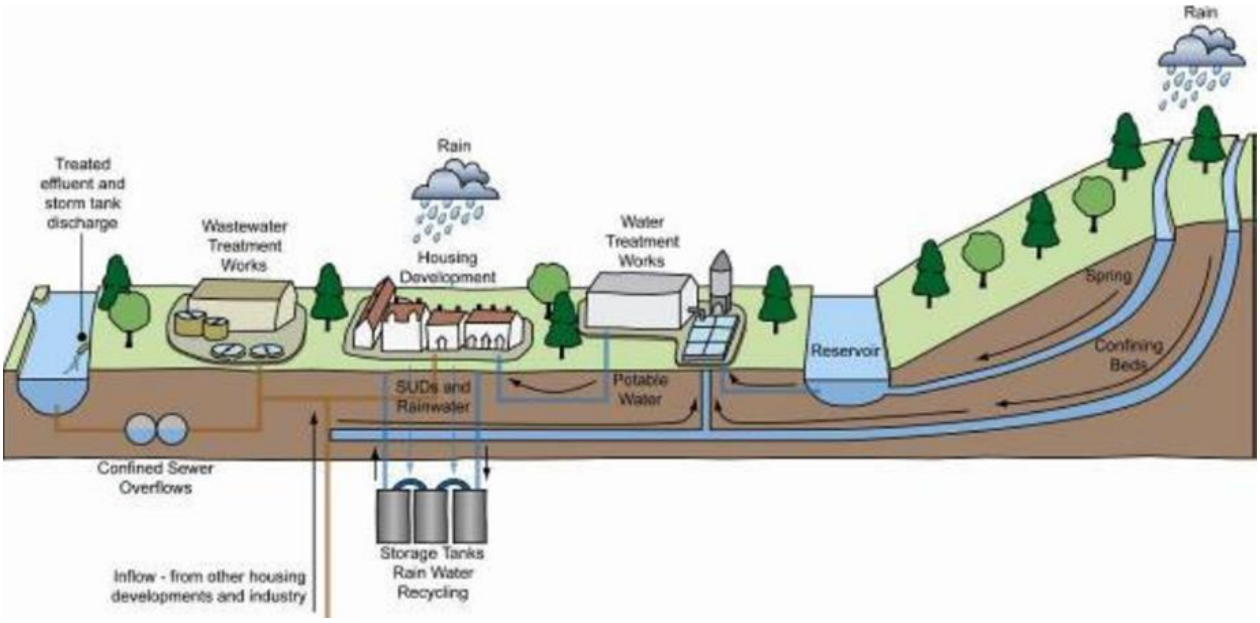


Figure 1-1: The Water Cycle

New homes require the provision of clean water, safe disposal of wastewater and protection from flooding. It is possible that allocating large numbers of new homes at some locations may result in the capacity of the existing available infrastructure being exceeded, in the absence of further investment from water companies. This situation could potentially lead to service failures to water and wastewater customers, have adverse impacts on the

environment or cause the high cost of upgrading water and wastewater assets being passed on to bill payers. Climate change presents further challenges such as increased intensity and frequency of rainfall and a higher frequency of drought events that can be expected to put greater pressure on the existing infrastructure.

As statutory undertakers water companies, including Severn Trent Water are legally obliged to plan for and accommodate new residential development. The water companies do this by, for example, taking forward projection of growth and incorporating them into their asset management plan cycles and their long-term plans including their Water Resource Management Plan and Drainage and Wastewater Management Plan.

1.3 Study area

Telford & Wrekin Council covers an area of approximately 290km^2 of which 72km^2 is made up of the Telford urban area. The Local Authority area has a population of 191,915 (based on 2023 data[1]). Over 80% of residents live in the Telford urban area, a collection of several centres which were brought together as a New Town making a single urban area. The town has a rich industrial past and continues to provide the largest and most extensive employment areas in the borough. Over 60% of the area is rural and this includes several named settlements which range from a small cluster of buildings to larger villages with a range of facilities.

Several Environment Agency designated main rivers flow through Telford & Wrekin. The borough contains the River Severn, Meese, Rode, Strine, Strine Brooks, Tern, Commission Drain, Hurley Brook, and Coalbrook.

Water supply and wastewater services are provided by Severn Trent Water (STW). See Figure 1-2 for the study area.

1 Telford and Wrekin Joint Strategic Needs Assessment (JSNA) Population Headlines (July 2024)

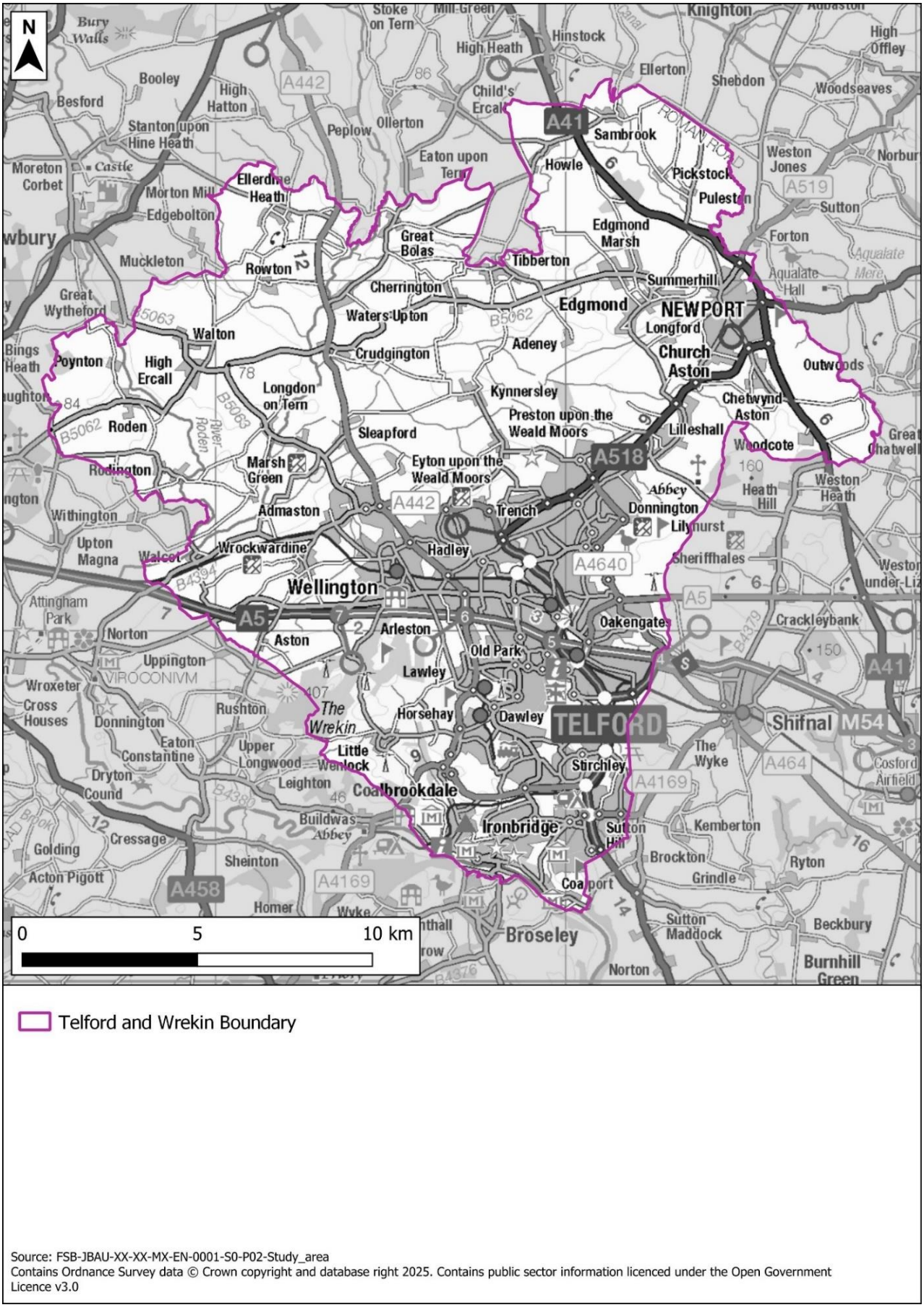


Figure 1-2: Telford and Wrekin study area.

1.4 Record of Engagement

1.4.1 Introduction

Preparation of a WCS requires significant engagement with stakeholders within the Local Planning Authority area, with water and wastewater utilities, with the Environment Agency and Natural England, and where there may be cross-boundary issues, with neighbouring local authorities. This section forms a record of engagement for the WCS.

1.4.2 Detailed study engagement

An inception meeting was held with TWC to discuss the scope and data collection requirements. This was also attended Severn Trent Water (STW) and the Environment Agency (EA). Further discussions were held with both STW and the EA as the project progressed, and results emerged. The EA were consulted on the methodology for assessing water quality and provided their water quality model for the area.

Neighbouring authorities that shared wastewater infrastructure with TWC were contacted to obtain an estimate of growth in areas that would be served by those wastewater treatment works (WwTW). This allowed the full quantum of growth to be understood. Neighbouring authorities include:

- Shropshire County Council
- South Staffordshire Council
- Stafford Borough Council

2 Future growth in Telford and Wrekin

2.1 Overview

The Telford & Wrekin Local Plan (TWLP) was adopted in January 2018 and allocates 148 ha of employment land alongside the housing requirement of 17,280 dwellings (864 dwellings per year) for the Plan period 2011-2031 (based on 2018 data) (TWC, 2018). A significant proportion of this employment and housing growth has already been delivered through allocations and commitments. There has been a consultation period on the TWC Draft Local Plan from the 25th of October 2023 to the 31st of January 2024.

In order to meet future housing and employment land requirements as well as recent revisions to national planning policy and guidance, and the obligation to review Local Plans within a five-year period from adoption, the Council is proposing to review the current Local Plan. The Council formally commenced the Review in January 2020. Telford & Wrekin Council are proposing to extend the local plan period to 2040.

Analysis for this study is based on the figures below, the housing numbers are the middle population led scenario consulted on at the Issues & Options stage of the plan process. It must be noted that at this point the Council has not yet determined a final housing requirement and regular monitoring carried out by the Council means that the figures (as well as the windfall allowances) may change after this report is published.

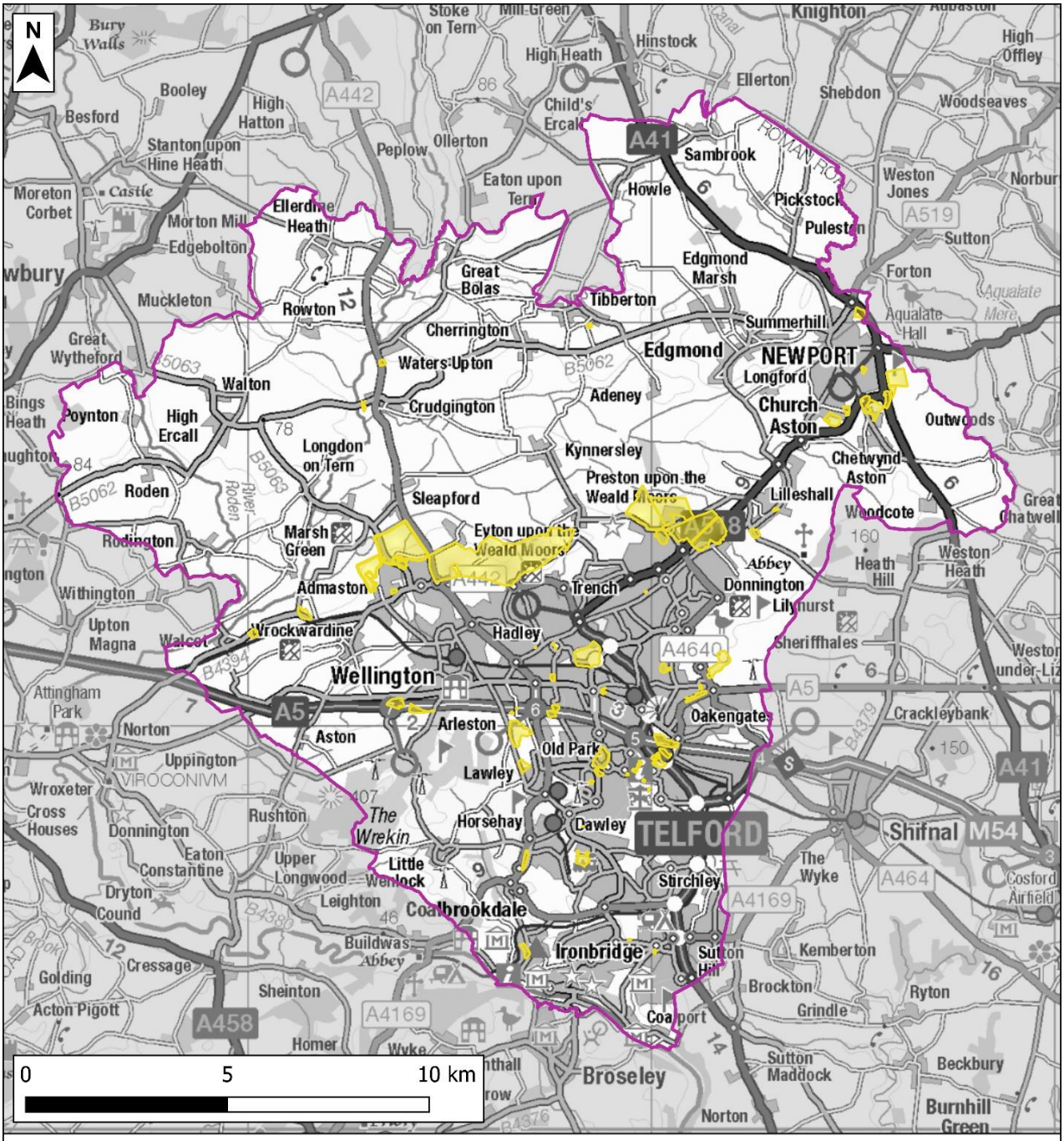


Figure 2-1: Proposed allocations in Telford and Wrekin Council

Table 2-1: Overall growth in Telford and Wrekin Council (2018 to 2031)

Type of Growth	Number of Houses	Employment floorspace (m^2)
Commitments	9,018	100,544
Completions	707	0
Allocations	9,314	490,515
Windfall	960	N/A
Neighbouring	9,313	12,780

*Employment floorspace figures may be subject to change because of new employment allocations emerging.

2.2 Growth Outside Telford and Wrekin Council

2.2.1 Shropshire Council

JBA has completed the WCS for the Shropshire County Council. Three WwTWs serve both Shropshire and TWC – Coalport, Monkmoor, and Walcot.

Table 2-2: Summary of growth in the Shropshire County served by infrastructure shared with Telford & Wrekin

WwTW	Proposed number of dwellings	Proposed employment floorspace (m^2)
Coalport	1,176	457
Monkmoor	8,131	12,323
Walcot	6	0

3 Policy and legislation

3.1 Introduction

The following sections introduce several national, regional, and local policies that must be considered by the Local Planning Authority (LPA), water companies and developers during the planning stage. Key extracts from these policies are presented as well as links to the full text. Whilst care has been taken to ensure that the information presented in this report was up to date at the time of writing, policy and guidance can change rapidly and the reader should ensure that the most up to date information is sought.

3.2 Plan-making

The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, 2024) was originally published in 2012, as part of reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

Local Plans are the primary mechanism by which plan-led spatial planning is implemented in England. Local Plans must be prepared by Local Planning Authorities (LPAs) and include:

- Strategic policies which set out the "overall strategy for the pattern, scale and design duality of places", including for the provision of infrastructure, transportation and community facilities.
- Non-strategic policies, which "set out more detailed policies for specific areas, neighbourhoods or types of development. This can include allocating sites, the provision of infrastructure and community facilities at a local level."

Under the Localism Act (HM Government, 2011) new rights were provided to allow local communities to come together and shape the development and growth of their area by preparing Neighbourhood Development Plans, or Neighbourhood Development Orders, where the ambition of the neighbourhood is aligned with strategic needs and priorities for the area. Neighbourhood Plans can make non-strategic policies, aligned to the strategic policies of the Local Plan. As neighbourhoods draw up their proposals, Local Planning Authorities are required to provide technical advice and support to communities.

3.3 Water and the Planning System

3.3.1 National Planning Policy Framework and water

The NPPF provides guidance to planning authorities to take account of flood risk and water and wastewater infrastructure delivery in their Local Plans. Key paragraphs include:

- Paragraph 35: “Plans should set out the contributions expected from development. This should include setting out the levels and types of affordable housing provision required, along with other infrastructure (such as that needed

for education, health, transport, flood and water management, green and digital infrastructure). Such policies should not undermine the deliverability of the plan."

- Paragraph 162: "Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply..."
- Paragraph 187e: "…preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans".

3.3.2 Planning Practice Guidance overview

Planning Practice Guidance (PPG) was originally issued in 2014 by the Department for Communities and Local Government, with the intention of providing guidance on the application of the NPPF. The individual guidance documents are updated periodically. The following guidance documents are particularly relevant to a WCS:

- Water Supply, Wastewater and Water Quality (HM Government, 2019)
- Housing - Optional Technical Standards (HM Government, 2015a)

3.3.3 PPG - Water Supply, Wastewater and Water Quality

Two key passages from the PPG (Para 002) provide an overview of what needs to be considered plan-making authorities, and provide a basis for the work contained in a WCS or IWMS:

"Early discussions between strategic policy-making authorities and water and sewerage companies can help to ensure that proposed growth and environmental objectives are reflected in company business plans. Growth that requires new water supply should also be reflected in companies' long-term water resources management plans. This will ensure that the necessary infrastructure is funded through the water industry's price review."

"Strategic policy-making authorities will also need to consider the objectives in the government's 25 Year Environment Plan to reduce the damaging abstraction of water from rivers and groundwater, and to reach or exceed objectives for rivers, lakes, coastal and ground waters that are specially protected."

A summary of the advice for plan-makers and for planning applications is contained below but it is recommended that the full text is reviewed.

Plan-making considerations - Infrastructure (Para 005)

- Identification of suitable sites for new or enhanced infrastructure, including the location of existing and proposed development.
- Consider whether new development is appropriate near to water and wastewater infrastructure (for example due to odour concerns).

- Phasing new development so that water and wastewater infrastructure will be in place when needed. Infrastructure should also be in place before any environmental effects occur on designated sites of importance for biodiversity.

Plan-making considerations - Water quality (Para 006)

- How to help protect and enhance local surface water and groundwater in ways that allow new development to proceed and avoids costly assessment at the planning application stage.
- The type or location of new development where an assessment of the potential impacts on water bodies may be required.
- Whether measures to improve water quality, (e.g., SuDS schemes) can be used to address water quality in addition to flood risk.

Plan-making considerations - Wastewater (Para 007)

- The sufficiency and capacity of wastewater infrastructure.
- The circumstances where wastewater from new development would not be expected to drain to a public sewer (such as via a package treatment sewage treatment works or septic tank).
- The capacity of the environment to receive effluent from development without preventing statutory objectives being met.

Early engagement with the LPA, the EA, and relevant water and sewerage companies can help establish whether any particular water and wastewater issues need to be considered.

Considerations for planning applications - Water supply (Para 016)

Water supply planning would normally be addressed through the LPA's strategic policies and reflected in the water companies WRMPs. Water supply is therefore unlikely to be a consideration for most planning applications. However, some exceptions might include:

- Large developments not identified in plans that are likely to require a large volume of water; and/or
- significant works required to connect the water supply; and/or
- where a plan requires enhanced water efficiency in new development as part of a strategy to manage water demand locally.

Considerations for planning applications - Water quality (Para 016)

Water quality is only likely to be a significant planning concern where a proposal would:

- Involve physical modifications to a water body such as flood storage areas, channel diversions and dredging, removing natural barriers, construction of new locks, new culverts, major bridges, new barrages or dams, new weirs, and removal of existing weirs; and/or
- indirectly affect water bodies, for example:
    - As a result of new development such as the redevelopment of land that may be affected by contamination, mineral workings, water and wastewater treatment, waste management facilities and transport scheme including culverts and bridges.

- Result in runoff into surface water sewers that drain directly, or via a combined sewer, into sensitive waterbodies e.g., waterbodies with a local, national or international habitat designation.
- Through a lack of adequate infrastructure to deal with wastewater.
- Through a local of adequate infrastructure to deal with wastewater where development occurs in an area where there is strategic water quality plan e.g., a nutrient management plan, River Basin Management Plan, Water Cycle Study, Diffuse Water Pollution plan or sewerage undertakers' drainage strategy which set out strategies to manage water quality locally and help deliver new development.

3.3.4 PPG - Housing - Optional Technical Standards

This guidance advises planning authorities on how to gather evidence to set optional requirements, including for water efficiency. It states that “all new homes already must meet the mandatory national standard set out in the Building Regulations (of 125 litres /person /day). Where there is a clear local need, local planning authorities can set out Local Plan policies requiring new dwellings to meet the tighter Building Regulations optional requirement of 110 litres/person/day. Planning authorities are advised to consult with the EA and water companies to determine where there is a clear local need, and also to consider the impact of setting this optional standard on housing viability.

The evidence for adopting the optional requirements is outlined in section 4.8. Viability is reviewed in section 4.8.8.

3.4 Water and design

3.4.1 Building regulations

The Building Regulations (2010) Part G was amended in early 2015 to require that all new dwellings must ensure that the potential water consumption must not exceed 125 litres/person/day, or 110 litres/person/day where required under planning conditions (HM Government, 2015b) (see 3.3.4).

The Environmental Improvement Plan (discussed in 3.7.2) contains a commitment to consider a new standard for new homes in England of 105 litres per person per day (l/p/d) and 100 l/p/d where there is a clear local need, such as in areas of serious water stress. Whilst this new standard is only under consideration, it demonstrates the direction of travel for water efficiency standards, and it is highly likely that this or a similar standard will be adopted.

3.4.2 Building Research Establishment

The Building Research Establishment (BRE) publish an internationally recognised environmental assessment methodology for assessing, rating, and certifying the sustainability of a range of buildings.

New homes are most appropriately covered by the Home Quality Mark (BRE, BRE, 2023a), and commercial, leisure, educational facilities and mixed-use buildings by the Building Research Establishment Environmental Assessment Methodology (BREEAM) UK New Construction Standard (BRE, BREEAM, 2018b).

Using independent, licensed assessors, BREEAM/HQM assesses criteria covering a range of issues in categories that evaluate energy and water use, health and wellbeing, pollution, transport, materials, waste, ecology, and management processes.

In the Homes Quality Mark, 400 credits are available across 11 categories and lead to a star rating. 18 credits are available for water efficiency and water recycling. A greater number of credits are awarded for homes using water efficient fittings (with the highest score achieving 100l/p/d or less), and further credits are awarded for the percentage of water used in toilet flushing that is either sourced from rainwater or from grey water.

The BREEAM New Construction Standard awards credits across nine categories, four of which are related to water: water consumption, water monitoring, leak detection and water efficient equipment. This leads to a percentage score and a rating from “Pass” to “Outstanding”.

Through the Local Plan, the Council has the opportunity to seek BREEAM or HQM status for all new, residential, and non-residential buildings.

3.4.3 Energy and Water

17% of the UK’s domestic energy usage is for water heating (Eurostat 2017). If less water was being used within the home, for instance through more water efficient showers, less water would need to be heated, and overall domestic energy usage would be reduced.

The Government is currently analysing the results of a 2019 consultation on a Future Homes Standard that will involve changes to Part L (conservation of fuel and power) of the Building Regulations for new dwellings. Whilst there is no direct mention of water efficiency in this consultation, there is an important link between water use and energy use, and therefore between water use and the whole-life carbon cost of developments.

3.4.4 Viability

The evidence for the costs of meeting the optional 110l/p/d water efficiency target in new homes indicate that the costs are minimal:

- A 2014 study into the cost of implementing sustainability measures in housing found that meeting a standard of 110 litres per person per day would cost only £12 (at 2023 prices) for a four-bedroom house (EC Harris, 2014).
- The Committee on Climate Change report - UK Housing: Fit for the Future - stated that the cost of "requiring all homes in England to be built to 110 l/p/d is possible under Part G of regulations and would be no additional cost." (Committee on Climate Change, 2019)
- Heating water accounts for 18% of energy used in the home (Department for Energy Security and Net Zero, 2022) This would cost a 2-3 person, 3-bed

household an average of £352 per year in energy at 2023 costs (British Gas, 2023). Water efficiency is therefore not only viable but of positive economic benefit to both private homeowners and tenants.

There is less evidence available on the costs of going below 110l/p/d. The Sussex North Water Neutrality Strategy (JBA Consulting, 2022) found that the additional cost to meet 85l/p/d using water efficient fittings would be between £349 and £431 per dwelling, or £1,049 to £1,531 where white-goods appliances would not otherwise have been installed in the dwelling (2022 prices).

3.5 The Water Industry

3.5.1 The Water Industry in England

Water and sewerage services in England and Wales are provided by eleven Water and Sewerage Companies (WaSCs) and six 'water-only' companies. The central legislation relating to the industry is the Water Industry Act 1991. The companies operate as regulated monopolies within their supply regions, although very large water users and developments are able to obtain water and/or wastewater services from alternative suppliers - known as inset agreements.

The Water Act 2014 aims to reform the water industry to make it more innovative and to increase resilience to droughts and floods. Key measures could influence the future provision of water and wastewater services include:

- Non-domestic customers will be able to switch their water supplier and/or sewerage undertaker (from April 2017);
- new businesses will be able to enter the market to supply these services;
- measures to promote a national water supply network; and
- enabling developers to make connections to water and sewerage systems.

The water industry is primarily regulated by three regulatory bodies:

- **Economic regulation:** Office of Water Services (Ofwat) are the economic regulator. They have a statutory duty to protect the interests of consumers, ensuring water companies carry out their functions (customer service standards, environmental rules, drinking water standards etc) and can finance them. Part of this role is setting the limits on pricing of water and sewerage services.
- **Environmental regulation:** The Environment Agency are the environmental regulator. They are responsible for monitoring the impact of the water industry (as well as others) on the environment and issuing permits for abstraction of water and discharge of wastewater.
- **Drinking water regulation:** Finally, the Drinking Water Inspectorate (DWI) implement standards for drinking water and can take enforcement measures against water companies if those standards are not met.

3.5.2 Funding of the water industry

The water industry works on a five-year cycle called the Asset Management Plan period or AMP periods. Every five years a water company submits a Business Plan to Ofwat for a Price Review. These plans set out the companies' operational expenditure (OPEX) and capital expenditure (CAPEX) required to maintain service standards, enhance service (for example where sewer flooding occurs), to accommodate growth and to meet environmental objectives defined by the Environment Agency. Ofwat assesses and compares the plans with the objective of ensuring what are effectively supply monopolies are operating efficiently, and that the company is meeting its obligations. It then sets the allowable price increase for consumers based on the retail prices index, the business plan, and taking into consideration affordability for consumers. The current AMP period is AMP 7 (2020-2025), and the price of water for this period was set by Ofwat late in 2019 in a process referred to as Price Review 19 (PR19). The new price came into effect in April 2020. This system gives stability in pricing. Within this price review process there may also be incentives and penalties on the water company for exceeding or failing to meet targets.

When considering investment requirements to accommodate growing demand, water companies are required to ensure a high degree of certainty that additional assets will be required before funding them. Longer term growth is, however, considered by the companies in their internal asset planning processes and in their 25-year Strategic Direction Statements and WRMPs.

The Water Industry National Environment Programme (WINEP) is a set of actions that are defined by the EA and given to all water companies operating in England for completion during a particular AMP period. The aim of the programme is to support the objectives in the Water Framework regulations. Examples of typical actions could include investigations into the sustainability of an abstraction, a reduction in an abstraction to support river flows, or new permit limits at a wastewater treatment works.

3.5.3 Planning for Water

Water resource management plans

Water Resource Management Plans (WRMPs) are 25-year strategies that water companies are required to prepare, with updates every five years. In reality, water companies prepare internal updates more regularly. WRMPs are required to assess:

- Future demand (due to population and economic growth).
- Future water availability (including the impact of sustainability reductions).
- Demand management and supply-side measures (e.g., water efficiency and leakage reduction, water transfers and new resource development).
- How the company will address changes to abstraction licences.
- How the impacts of climate change will be mitigated.
- Where necessary, they set out the requirements for developing additional water resources to meet growing demand and describe how the balance between water supply and demand will be balanced over the period 2015 to 2040.

- Using cost-effective demand management, transfer, trading and resource development schemes to meet growth in demand from new development and to restore abstraction to sustainable levels.
- In the medium to long term, ensuring that sufficient water continues to be available for growth and that the supply systems are flexible enough to adapt to climate change.

Severn Trent Water's final WRMP is published here and is reviewed in detail for the study area in section 4.7.2.

Drought Plan

- Linked to the WRMP is a water company's drought plan. This is a requirement under the Water Industry Act 1991 (as amended by the water Act 2003). A water company must state how it will maintain a secure water supply and protect the environment during dry weather and drought. The plan will contain:
- Drought triggers - these are points where a water company will take action to manage supply and demand. They are based on monitoring of rainfall levels, river flows, groundwater levels and reservoir stocks.
- Demand management actions - how a water company will reduce demand for water during a drought. Actions that save water before taking more water from the environment must be prioritised. These could include:
  - reducing leakage;
  - carrying out water efficiency campaigns with customers;
  - reducing mains pressure; and
  - restricting water use, for example through temporary use bans which limit hosepipe and sprinkler use.
- Supply management actions - how a water company will maintain water supply during a drought. Actions that have the least effect on the environment must be prioritised. This could include:
  - carrying out engineering work to improve its supply;
  - transferring water in bulk from other water companies;
  - using drought permits and drought orders to abstract more water;
  - using desalination - permanent or temporary plants; and
  - using tankers to supply customers with water directly.
- Extreme drought management actions - the actions it could take in an extreme drought. These could delay the need to use emergency restrictions standpipes and rota cuts.
- Communicating during a drought - a water company must set out how it will communicate in a clear and timely way during a drought with customers, partners or other stakeholders.
- Environmental assessment, monitoring and mitigation. A drought plan must include:
  - an environmental assessment;
  - an environmental monitoring plan for each supply management action; and

- details of mitigation measures the company plans to take for each supply management action.

- End of a drought - a water company must explain how it will identify when a drought is over or ending and the actions it will take during this stage, communicate this information to customers, and review its performance.

Regional water resource planning

Water resource planning is taking an increasingly regional focus, recognising the need for collaboration between water companies and sectors in order to address the challenges of climate change, increasing demand for water and protecting the water environment. Five regional groupings having been formed, including the Water Resources West (WRW) group which covers Telford and Wrekin Council. An advisory group consisting of their regulators (Environment Agency and Ofwat) and Defra regularly attend meetings of WRE.

WRW are preparing a regional water resource plan for publication in autumn2023, which in turn will inform the next round of company WRMPs to be published in 2024. As part of this process, they have published an initial water resource position statement which sets out the water resources challenges and opportunities within the region.

3.5.4 Planning for Wastewater

21st Century Drainage

The UK Water Industry Research (UKWIR) “21st Century Drainage” programme has brought together water companies, governments, regulators, local authorities, academics, and environmental groups to consider how planning can help to address the challenges of managing drainage in the future. These challenges include climate change, population growth, urban creep and meeting the Water Framework Directive.

The group recognised that great progress has been made by the water industry in its drainage and wastewater planning over the last few decades, but that, in the future, there needs to be greater transparency and consistency of long-term planning. The Drainage and Wastewater Management Plan (DWMP) framework (Water UK, 2018) sets out how the industry intends to approach these goals. Companies were required to published finalised DWMPs in 2023 to inform their business plans for the 2024 Price Review.

Drainage and Wastewater Management Plans (DWMPs)

DWMPs are consistently structured plans delivered at three spatial scales; company-wide, regional groupings and individual wastewater catchments. The framework defines drainage to include all organisations and all assets which have a role to play in drainage, although, as the plans will be water company led, it does not seek to address broader surface water management within catchments.

LPAs and LLFAs are recognised as key stakeholders and are invited to join, alongside other stakeholders, the Strategic Planning Groups (SPGs) organised broadly along river basin district catchments.

DWMPs aim to provide more transparent and consistent information on sewer flooding risks and the capacity of sewerage networks and treatment works, and this should be taken into account in SFRAs, Water Cycle Studies, as well as in site-specific FRAs and Drainage Strategies.

Severn Trent Water's final DWMP, including interactive mapping, is published here and is reviewed in detail for the study area in section 6.3.

3.5.5 Developer Contributions and connection charges

A significant part of water company business is the interface with developers to facilitate connection to the public water supply and sewerage systems, through their developer services functions. Developments with planning permission have a right to connect to the public water and sewerage systems, however, there is no guarantee that the capacity exists to serve a development.

Developers may requisition a water supply connection or sewerage system or self-build the assets and offer these for adoption by the water company or sewerage undertaker. Self-build and adoption are usually practiced for assets within the site boundary, whereas requisitions are normally used where an extension of upgrading the infrastructure requires construction on third party land. The cost of requisitions is shared between the water company and developer as defined in the Water Industry Act 1991.

The above arrangements are third party transactions because the Town and Country Planning Act Section 106 agreements and Community Infrastructure Levy agreements may not be used to obtain funding for water or wastewater infrastructure.

OfWAT, the water industry's economic regulator, published revised rules covering how water and wastewater companies may charge customers for new connections (OfWAT, 2020). These rules have applied to all companies in England since April 2018. The key changes include:

- More charges will be fixed and published on water company websites. This will provide greater transparency to developers and will also allow alternative connection providers to offer competitive quotations more easily.
- There will be a fixed infrastructure charge for water and one for wastewater.
- The costs of network reinforcement will no longer be charged directly to the developer in their connection charges. Instead, the combined costs of all of the works required on a company's networks, over a five-year rolling period, will be covered by the infrastructure charges paid for all new connections.
- The definition of network reinforcement has changed and will now apply only to works required as a direct consequence of the increased demand due to a development. Where the water company has not been notified of a specific development, for example when developing long-term strategic growth schemes, the expenditure cannot be recovered through infrastructure charges.

Severn Trent Water publish their charging arrangements annually here . These include incentives to encourage good design by developers, including:

- Water Environmental Discount: To encourage developers to build new homes to a 100 l/p/d standard or less, a discount of up to £380.00 is available off the clean water infrastructure charge.
- Sewerage Environmental Discount: To encourage no surface water connection made to public sewers during the building of new homes. This can lead to a discount of £124.00.

3.5.6 Water companies and the planning system

Water companies are currently not statutory consultees to planning applications, although they do monitor planning applications and respond to potentially significant applications, or where requested to do so by the LPA. Defra are intending to consult on making water companies statutory consultees for some applications (Department for Environment, Food & Rural Affairs, 2023).

Where a water company is concerned that a new development may impact upon their service to customers or the environment (for example by causing foul sewer flooding or pollution) they may request the LPA to impose a Grampian condition, whereby the planning permission cannot be implemented until a third-party secures the necessary upgrading or contributions.

3.6 Flood Risk and Surface Water

3.6.1 Flood and Water Management Act 2010

The Flood and Water Management Act (FWMA) aims to improve both flood risk management and the way water resources are managed (HM Government, 2010).

The FWMA has created clearer roles and responsibilities and helped to define a more risk-based approach to dealing with flooding. This included the creation of a lead role for LAs, as LLFAs, designed to manage local flood risk (from surface water, ground water and ordinary watercourses) and to provide a strategic overview role of all flood risk for the EA.

The content and implications of the FWMA provide considerable opportunities for improved and integrated land use planning and flood risk management by LAs and other key partners. The integration and synergy of strategies and plans at national, regional, and local scales, is increasingly important to protect vulnerable communities and deliver sustainable regeneration and growth.

Schedule 3 of the Act has not been enacted in England, but this is expected to be implemented in 2024. The enactment of schedule 3 will have the following implications for the planning process:

- Designation of local authorities as SuDS Approval Bodies (SAB) which have a duty to adopt new drainage systems.
- The cessation of the automatic right for new developments to connect to the existing sewer system.

- Developers must ensure that drainage systems are built as per the approved drainage plan that complied with mandatory national standards as outlined in the NPPF and the PPG.

3.6.2 Strategic Flood Risk Assessment (SFRA)

All LPAs are required, under NPPF, to prepare a SFRA, which forms a key part of the evidence base for their Local Plan. The SFRA must consider flood risks from all sources, collating up-to-date flood risk data and in some cases developing new flood risk modelling. The SFRA is used to inform the Sequential Test, by which Local Plan allocations should be sequentially selected to direct development towards areas of lower flood risk, taking into consideration the vulnerability to flooding of the proposed land use. Telford and Wrekin Council's current SFRA stage 1 was published in 2023 and stage 2 in 2025 (TWC T. a., 2025).

3.6.3 Surface Water Management Plan

Surface Water Management Plans (SWMPs) outline the preferred surface water management strategy in a given location and establish a long-term action plan to manage surface water. SWMPs are undertaken, when required, by LLFAs in consultation with key local partners who are responsible for surface water management and drainage in their area. There are currently no surface water management plans for Telford & Wrekin, with the previous Plan superseded by the LLFA FRMS.

3.6.4 Sustainable Drainage Systems

From April 2015, Local Planning Authorities (LPA) have been given the responsibility for ensuring that sustainable drainage is implemented on developments of ten or more homes or other forms of major development through the planning system. Under the new arrangements, the key policy and standards relating to the application of SuDS to new developments are:

- The National Planning Policy Framework, which requires that development in areas already at risk of flooding should give priority to sustainable drainage systems.
- The House of Commons written statement (Pickles, 2014) setting out governments intentions that LPAs should “ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate” and “clear arrangements in place for ongoing maintenance over the lifetime of the development.” This requirement is also now incorporated in the 2019 update of the NPPF (paragraph 165). In practice, this has been implemented by making Lead Local Flood Authorities (LLFAs) statutory consultees on the drainage arrangements of major developments.
- The Defra non-statutory technical standards for sustainable drainage systems (HM Government, 2015c). These set out the government’s high-level requirements for managing peak flows and runoff volumes, flood risk from

drainage systems and the structural integrity and construction of SuDS. This very short document is not a design manual and makes no reference to the other benefits of SuDS, for example water quality, habitat, and amenity.

Telford and Wrekin Council are the LLFA and play a key role in ensuring that the proposed drainage schemes for all new developments comply with technical standards and policies in relation to SuDS. Further information on surface water drainage can be found here (LINK).

An updated version of the CIRIA SuDS Manual was published in 2015. The guidance covers the planning, design, construction and maintenance of SuDS for effective implementation within both new and existing developments. The guidance is relevant for a range of roles with the level of technical detail increasing throughout the manual. The guidance does not include detailed information on planning requirements, SuDS approval and adoption processes and standards, as these vary by region and should be checked early in the planning process. The manual itself can be found here.

CIRIA also publish “Guidance on the Construction of SuDS” (C768), which contains detailed guidance on all aspects of SuDS construction, with specific information on each SuDS component available as a downloadable chapter. The downloadable chapter is available here.

Severn Trent Water provides guidance on their website through their surface water drainage page, available here. Applications for projects should be made through their website.

3.6.5 Design and Construction Guidance

The Design and Construction Guidance (DCG), part of a new Codes for Adoption covering the adoption of new water and wastewater infrastructure by water companies, contains details of the water sector’s approach to the adoption of SuDS, which meet the legal definition of a sewer. This replaces the formerly voluntary Sewers for Adoption The new guidance came into force in April 2020 and compliance by water companies in England is mandatory.

The previous standards, up to and including Sewers for Adoption Version 7, included a narrow definition of sewers to mean below-ground systems comprising of gravity sewers and manholes, pumping stations and rising mains. This essentially excluded the adoption of SuDS by water companies, except for below-ground storage comprising of oversized pipes or chambers.

The new guidance provides a mechanism for water companies to secure the adoption of a wide range of SuDS components which are now compliant with the legal definition of a sewer. There are however several non- adoptable components such as green roofs, pervious pavements, and filter strips. These components may still form part of a drainage design so long as they remain upstream of the adoptable components.

The Design and Construction Guidance states that the drainage layout of a new development should be considered at the earliest stages of design. It is hoped that the new

guidance will lead to better managed and more integrated surface water systems which incorporate amenity, biodiversity, and water quality benefits.

3.7 Environmental Protection and Biodiversity

3.7.1 The Environment Act 2021

The Environment Act (HM Government, 2021) came into UK law in November 2021 with the aim of protecting and enhancing the environment. The Act has objectives to improve air and water quality, biodiversity, waste reduction and resource efficiency. The implementation of the policies within the Environment Act has begun and legally binding environmental targets are being developed. This will be enforced by the newly created Office for Environmental Protection (OEP, more information available here).

The Environment Act (Part 5) contains policies concerning improvements to the water environment. These policies have the following aims:

- Effective collaboration between water companies through statutory water management plans.
- Minimise the damage that water abstraction may cause on environment.
- Modernise the process for modifying water and sewerage company licence conditions.

Further to this, there is specific legislation regarding storm overflows aiming to reduce the discharge of untreated sewage into waterways. This plan includes requirements for water companies to:

- report on the discharges from storm overflows;
- monitor the quality of water potentially affected by discharges;
- progressively reduce the harm caused by storm overflows; and
- report on elimination of discharges from storm overflows.

3.7.2 25-year Environment Plan

The Environmental Improvement Plan (EIP) is the first revision of the 25-year environment plan (25YEP) published in 2018. It contains ten goals which are shown in Figure 3-1. The full text of the EIP can be found here. Government must review and revise the plan, if needed, every five years to ensure continued progress against the ten 25YEP goals.

Of particular importance to a WCS is Goal 3 - Clean and plentiful water.

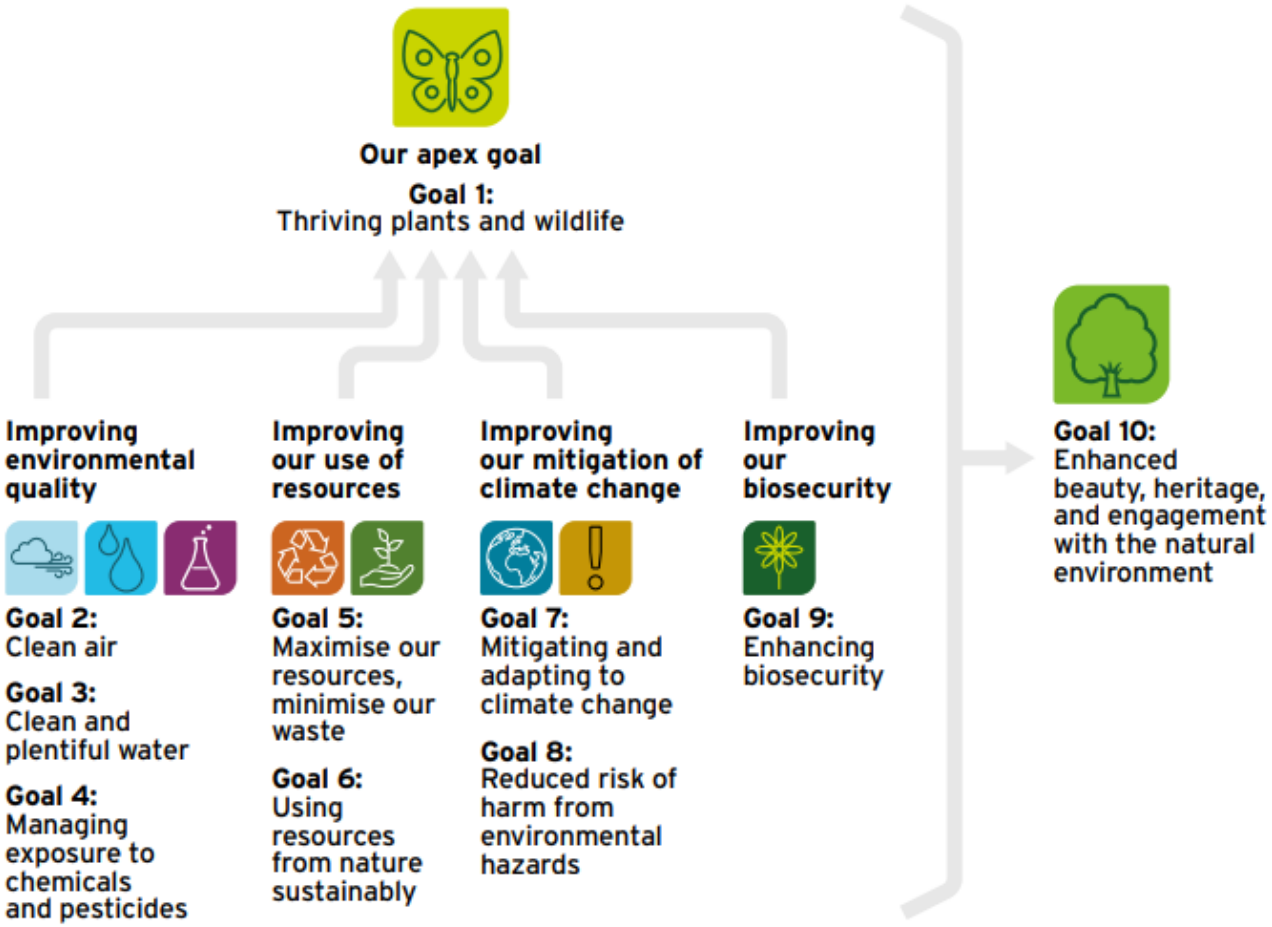


Figure 3-1: The 10 Environmental Improvement Plan goals

Under Goal 3 - Clean and plentiful water, there are eight sets of targets and commitments relating to different aspects of the water environment:

- Reduce nitrogen, phosphorus, and sediment pollution from agriculture into the water environment by at least 40% by 2038, compared to a 2018 baseline, with an interim target of 10% by 31 January 2028, and 15% in catchment containing protected sites in unfavourable condition due to nutrient pollution by 2028.
- Reduce phosphorus loadings from treated wastewater by 50% by 2028 and 80% by 2038 against a 2020 baseline.
- Halve the length of rivers polluted by harmful metals from abandoned mines by 2038, against a baseline of around 1,500km (approximately 930 miles.
- Reduce the use of public water supply in England per head of population by 20% from the 2019-20 baseline, 2038, with interim targets of 9% by 2027 and 14% by 2032, and to reduce leakage by 20% 2027 and 30% by 2032.
- Restore 75% of our water bodies to good ecological status.
- Require water companies to have eliminated all adverse ecological impact from sewage discharges at all sensitive sites by 2035, and at all overflows by 2050.
- Target a level of resilience to drought so that emergency measures are needed only once in 500-years.

To deliver these goals, the EIP outlines action across these areas:

- Improving wastewater infrastructure and water company environmental performance.
- Reducing pressures on the water environment from agriculture.
- Enabling the sustainable use of water for people, business and the environment
- Tackling pressures from chemicals and pollutants.
- Restoring natural function and iconic water landscapes.
- Joined-up management of the water system.

Progress towards delivering the EIP will be monitored annually**.**

3.7.3 Defra Plan for Water

Defra's Plan for Water (Department for Environment, Food & Rural Affairs, 2023) provides further detail on the actions towards achieving Goal 3 of the EIP23. It promotes an integrated approach to water management as the foundation of the plan. Whilst many of the actions contained within the Plan for Water are outside of the responsibilities of areas of influence of the LPAs, the following summarises those actions that LPAs should have regard to:

- Require standardised sustainable drainage systems (SuDS) in new housing developments in 2024, subject to final decisions on scope, threshold, and process following consultation in 2023.
- Designate all chalk catchments as water stressed and high priority under the sewer overflows reduction plan, driving action to improve water management.
- The plan reflects the predicted 4 billion litre per day (4,000 ml/d) gap between supply and demand across England and contains measures to both boost supply and reduce demand. Of interest to LPAs is the plan to reduce demand which will address half of the gap.

A key component in reducing demand for water is improving water efficiency and there is a target under the Environment Act to reduce the use of public water supply in England per head of population by 20% by 2038. A road map on water efficiency in new developments and retrofits has been developed with ten actions to improve water efficiency:

- **Action 1 -** Implement schedule 3 to the Flood and Water Management Act 2010. The 2024 consultation will consider rainwater harvesting in developing the statutory SuDS National Technical Standards.
- **Action 2 -** Review the Water Supply (Water Fittings) Regulations 1999, the Water Supply (Water Quality) Regulations 2016 and/or any other relevant legislation to address wasteful product issues with toilets and enable new water efficient technologies.
- **Action 3 –** Develop clear guidance on ‘water positive’ or ’net zero water’ developments and roles for developers and water companies.
- **Action 4 –** Review water efficiency options in planning, building regulations and through voluntary schemes for non-household buildings.

- **Action 5 –** Work with Ofwat to ensure the water industry can play a central role in retrofitting water efficient products in households, businesses, charities and the public sector.
- **Action 6 –** Work across government to integrate water efficiency into energy efficiency advice and retrofit programmes.
- **Action 7 -** Review the Building Regulations 2010, and the water efficiency, water reuse and drainage standards including considering a new standard for new homes in England of 105l/p/d and 100 l/p/d where there is a clear local need.
- **Action 8 –**Mandatory water efficiency labelling scheme.
- **Action 9 –** Investigate dual pipe systems (rainwater harvesting) and water reuse options for new housing development as part of the review of the planning framework.
- **Action 10 –** Enable innovative water efficiency approaches in buildings, including technologies and approaches to funding and maintenance.

3.7.4 Storm Overflow Reduction Plan

The Environment Act placed a legal duty on water companies to progressively reduce the adverse impacts of discharges from storm overflows. The storm overflow reduction plan (Department for Environment, Food & Rural Affairs, 2023) sets the following targets:

- By 2035, water companies will have: improved all overflows discharging into or near every designated bating water; and improved 75% of overflows discharging to high priority sites.
- By 2050, no storm overflows will be permitted to operate outside of unusually heavy rainfall or to cause any adverse ecological harm.

There is also an expectation that water companies ensure their infrastructure keeps pace with increasing external pressures, such as urban growth and climate change, without these pressures leading to greater numbers of discharges.

3.7.5 The Water Framework Directive (WFD) and Water Environment Regulations

Introduction

The European Union Water Framework Directive (WFD) 2000 is currently transposed into English and Welsh law by the Water Environment Regulations (HM Government, 2017). They apply to all waterbodies (watercourses, canals, lakes, estuaries and coastal waters), with the objective of meeting Good Ecological Status (GES) or, where heavily modified, Good Ecological Potential (GEP) To meet GES or GEP, a water body must achieve a good or high score for all elements - in the case of surface water, these are biological, physico-chemical, specific pollutants and hydromorphology (Figure 3-2). UK policy remains to meet GES or GEP for all waterbodies by 2027.

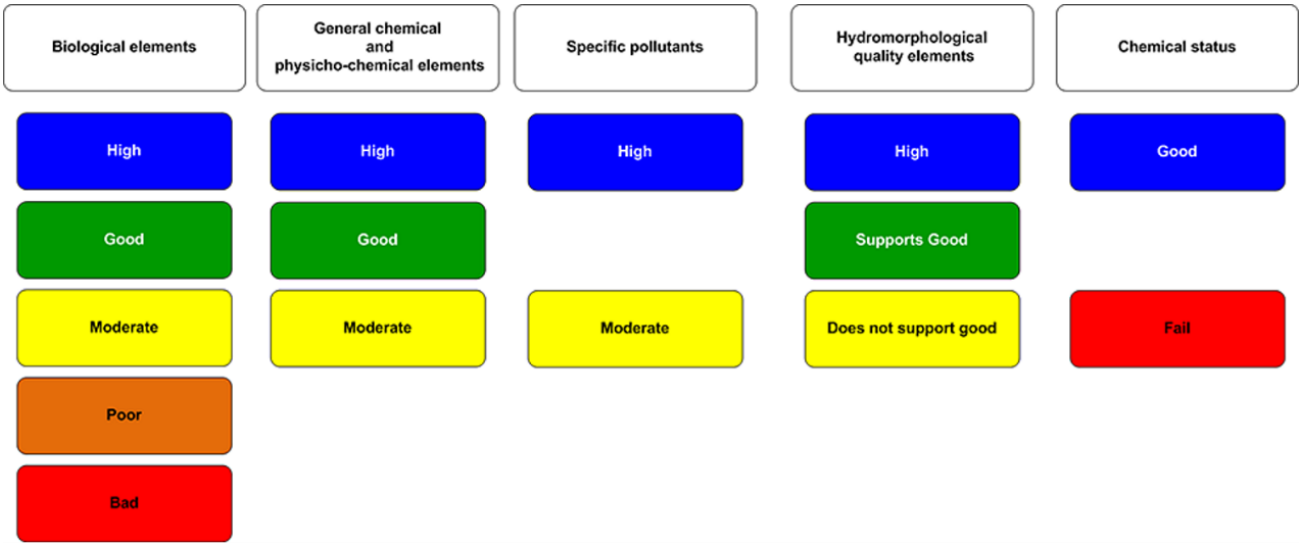


Figure 3-2: Status classification for surface water (Environment Agency, 2023a)

Chemical Status is separately assessed. The Water Framework Directive and the EA recognise a group of ubiquitous chemicals which are persistent, bioaccumulative or toxic (uPBT), and without which over 90% of England's waterbodies would achieve Good Chemical Status. Mercury, PFOS and PBDE are the most ubiquitous causes of failures. Due to the persistent nature of these chemicals, the date for getting all waterbodies to Good Chemical Status is set for 2063.

River Basin Management Plans

River Basin Management Plans (RBMP) are required under the WFD and document the baseline classification of each waterbody in the plan area, the objectives, and a programme of measures to achieve those objectives. Telford and Wrekin falls within the Severn RBD (Gov.UK, 2018). The third cycle RBMPs were published in 2022. A primary WFD objective is to ensure 'no deterioration' in environmental status, therefore all water bodies must meet the class limits for their status class as declared in the Severn River Basin Management Plan. Another equally important objective requires all water bodies to achieve good ecological status. Future development needs to be planned carefully so that it helps towards achieving the WFD and does not result in further pressure on the water environment and compromise WFD objectives. The WFD objectives as outlined in the updated RBMPs are summarised below:

- Preventing deterioration of the status of surface waters and groundwater.
- Achieving objectives and standards for protected areas.
- Aiming to achieve good status for all water bodies.
- Reversing any significant and sustained upward trends in pollutant concentrations in groundwater.
- Cessation of discharges, emissions and losses of priority hazardous substances into surface waters.
- Progressively reducing the pollution of groundwater and preventing or limiting the entry of pollutants.

- Local Planning Authorities (LPAs) must have regard to the Water Framework Directive as implemented in the RBMPs. It is of primary importance when assessing the impact of additional wastewater flows on local river quality.
- Alongside the RBMP documents, the data behind them can be explored further using the Catchment Data Explorer (Environment Agency, 2023a) and map viewer (Environment Agency, 2023b).

Protected Area Objectives

The Water Environment Regulations specify that areas requiring special protection under other EC Directives, and waters used for the abstraction of drinking water, are identified as protected areas. These areas have their own objectives and standards.

Some areas may require special protection under more than one piece of EU-derived legislation or may have additional (surface water and/or groundwater) objectives. In these cases, all the objectives and standards must be met.

The types of protected areas are:

- Areas designated for the abstraction of water for human consumption (Drinking Water Protected Areas);
- areas designated for the protection of economically significant aquatic species (Freshwater Fish and Shellfish);
- bodies of water designated as recreational waters, including Bathing Waters;
- nutrient-sensitive areas, including areas identified as Nitrate Vulnerable Zones under the Nitrates Directive or areas designated as sensitive under Urban Waste Water Treatment Regulations; and
- areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection including relevant Natura 2000 sites.

3.7.6 Conservation of Habitats Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2010 (commonly referred to as the Habitats Regulations) consolidated the Conservation (Natural Habitats, &c.) Regulations 1994, and transposed the EU Habitats Directive in England and Wales which was aimed at protecting plants, animals and habitats that make up the natural environment. The regulations were further amended in 2017.

The Habitats Regulations define the requirement for a Habitats Regulations Assessment (HRA) to be carried out. The purpose of this is to determine if a plan or project may affect the protected features of a “habitats site”. These include:

- A special area of conservation (SAC).
- A site of Community Importance.
- A site hosting a priority natural habitat type or priority species protected in accordance with Article 5(4) of the Habitats Directive.
- A Special Protection Area (SPA).

- A potential SPA.

All plans and projects (including planning applications) which are not directly connected with, or necessary for the conservation management of a habitat site require consideration of whether the plan or project is likely to have significant effects on that site.

This is referred to as the “Habitats Regulations Assessment screening” and should take into account the potential effects of both the plan/project itself and in combination with other plans or projects.

Part 6 of the conservation of Habitats and Species Regulations 2017 states that where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view of the site’s conservation objectives.

The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site.

If adverse effects cannot be rules out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured.

The “People over Wind” ECJ ruling (C-323/17) clarifies that when making screening decisions for the purposes of deciding whether an appropriate assessment is required, competent authorities cannot take into account any mitigation measures. This must be part of the appropriate assessment itself.

The implementation of the Conservation of Habitats Regulations have had particular significant implications in two areas related to water and planning:

- Nutrient Neutrality. Natural England (NE) has identified a number of catchment areas where Habitats Sites are in unfavourable condition due to eutrophication (an excess of the nutrients phosphorous and/or nitrogen in water). NE have advised that developments in these catchments must demonstrate that they do not cause harm, and that one way to do this is to introduce mitigation measures in the catchment area which offset the additional nutrients emitted as a result of the development, an approach known as nutrient neutrality.
- Water Neutrality. Natural England (NE) has issued a position statement that it cannot be concluded with sufficient certainty that groundwater abstractions in the Arun Valley, West Sussex are causing no adverse effect on Habitats Sites. NE have advised that developments in Sussex North Water Resource Zone must demonstrate that they do not cause harm, and that one way to do this is to introduce mitigation measures in the zone which offset the additional water consumed as a result of the development, an approach known as water neutrality.

Both nutrient and water neutrality designations have resulted in significant impacts on the granting of planning permission in the designated areas.

3.7.7 Wildlife and Countryside Act

Sites of Special Scientific Interest (SSSI) are designated and legally protected under the Wildlife and Countryside Act 1981, Section 28G places a duty to take reasonable steps, consistent with the proper exercise of the authority's functions, to "further to the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which the site is of special scientific interest." (HM Government, 1981).

The Government's 25-year Environment Plan has a target of "restoring 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term." In line with this, and the Wildlife and Countryside Act 1981, Local Authorities should look put forward options that contribute to conservation or restoration of favourable condition, and at the very least must not introduce policies that hinder the restoration of favourable condition by increasing existing issues.

A site is said to be in "favourable condition" when the designated feature(s) within a unit are being adequately conserved and the results from monitoring demonstrate that the feature(s) in the unit are meeting all the mandatory site-specific monitoring targets set out in the favourable condition targets (FCT).

3.7.8 Ramsar

The Convention on Wetlands of International Importance, more commonly known as the Ramsar convention, aims to protect important wetland sites. Member counties commit to:

- Wise use of all their wetlands.
- Designating sites for the Ramsar list of "Wetlands of International Importance" (Ramsar Sites) and their conservation.
- Cooperating on transboundary wetlands and other shared interests.
- "Wise use" of wetlands is defined under the convention as "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development". (Ramsar Convention Secretariat, 2010)
- In the UK, Ramsar Sites are designated by the Joint Nature Conservation Committee (JNCC).

In general, the designation of UK Ramsar sites is underpinned through prior notification of these areas as Sites of Special Scientific Interest (SSSIs). Additionally, the NPPF states that Ramsar sites should be given the same protection in the planning process as sites designated under the EU Habitats Directive.

3.7.9 Biodiversity Net Gain

Biodiversity net gain (BNG) is designed to contribute to the recovery of nature while developing land. The principle is that the natural environment is in measurably better state after development than it was before. The Environment Act 2021 requires all planning permissions granted in England (except for small sites) to achieve 10% BNG from January 2024. This will be required on small sites from April 2024.

3.7.10 Bathing Water Regulations

The Bathing Water Directive was first published in 2006 and are currently transposed into English and Welsh law through the Bathing Water Regulations 2013. The aims of the directive are the protection of public health whilst bathing, standardisation of publicly available water quality information and to improve management practices at bathing waters.

The UK has over 600 designated bathing waters defined as areas of inshore waters designated for public swimming, these areas are typically characterised by large numbers of swimmers and visitors per year. The Environment Agency are required to monitor water quality at these sites regularly (usually weekly) throughout the Bathing Water season, between 15th May and 30th September.

Water quality standards are based on the incidence of potentially harmful bacteria, E. coli and intestinal enterococci and are categorised as ‘excellent’, ‘good’, ‘sufficient’ or ‘poor’ on the basis of bacteria levels. Sites are rated annually and on a short-term basis in response to any temporary pollution incidents.

Achieving compliance with the Bathing Water Directive has driven some £2.5bn of investment by UK water companies since the early 1990s to reduce the impact of sewerage systems and treated wastewater discharges. Measures have included storage and surface water management to reduce storm overflow spills, moving or extending effluent outfalls and improving wastewater treatment, including ultra-violet (UV) treatment of final effluent.

In contrast to some other European nations, the UK has not previously designated stretches of river as bathing waters, however five new inland bathing waters have been designated since 2021, and across England there are numerous campaigns by NGOs and members of the public to designate other stretches of river. Defra has published guidance on applying for bathing water status, including a requirement for at least 100 bathers per day during the season (Department for the Environment, Food and Rural Affairs, 2023).

3.7.11 Environmental Permitting Regulations

Environmental permitting is a process used to manage and regulate activities which may cause harm to the environment. The Environmental Permitting Regulations (HM Government, 2016) were introduced in order to streamline a wide-ranging number of environmental permitting laws under one set of regulations. These include permits for emissions to air, water and land, and cover a range of industrial sectors and waste management streams.

Of particular relevance to this study are the regulations for permitting sewage effluent discharges to surface waters and groundwaters, known as water discharge activities (Environment Agency, 2022).

- The regulations are used to permit discharges from water company and private wastewater treatment works, and for sewer overflows.
- The Environment Agency will usually object to applications for a new private Package Treatment Plan (PTP) or septic tank where it is feasible to connect the development to a public sewerage system. A general rule of 30m per dwelling is

used to define a reasonable distance from the site boundary to a public sewer. Hence a development of 10 homes should connect to a public sewer within 300m of the boundary, unless there are significant barriers, such as a river or motorway.

- Where an existing or new development treats its own wastewater, a PTP must be installed if the discharge is directly to surface water. Where the discharge is to ground, a PTP or septic tank may be used, but must be connected to a suitably designed drainage field.

3.7.12 Groundwater protection

Under the regulations, the EA have published a set of position statements on protecting groundwater from various activities (Environment Agency, 2018). The position statements that are relevant to this study with regard to discharges to groundwaters, include surface water drainage and the use of SuDS, discharges from contaminated surfaces (e.g., lorry parks) and from treated sewage effluent.

The EA also maintain a set of maps of Source Protection Zones (SPZs) to help identify high risk areas within which pollution prevention measures should be implemented. The SPZs show the risk of contamination to public water supplies from activities that may cause pollution in the area, the closer the activity, the greater the risk:

- **Zone 1 (Inner protection zone)** This zone is designed to protect against the transmission of toxic chemicals and water-borne disease. It indicates the area in which pollution can travel to the borehole within 50 days from any point within the zone and applies at and below the water table. There is also a minimum 50 metre protection radius around the borehole.
- **Zone 2 (Outer protection zone)** This zone indicates the area in which pollution takes up to 400 days to travel to the borehole, or 25% of the total catchment area, whichever area is the largest. This is the minimum length of time the Environment Agency think pollutants need to become diluted or reduce in strength by the time they reach the borehole.
- **Zone 3 (Total catchment)** This is the total area needed to support removal of water from the borehole, and to support any discharge from the borehole.
- **Zone of special interest** This is defined on occasions, usually where local conditions mean that industrial sites and other polluters could affect the groundwater source even though they are outside the normal catchment.

3.8 Summary of key new and emerging policy and legislation

The policy and legislation covering the water environment, water and wastewater services and planning is wide and frequently changing. The new and emerging policy and legislation below have been identified as particularly important for consideration in the development of the Local Plan:

- Schedule 3 of the Flood and Water Management Act is expected to be enacted in England in 2024. This will designate Lead Local Flood Authorities as SuDS

Approval Bodies (SABs) with a duty to adopt new SuDS and removing the automatic right to connect to public sewers.

- Defra have signalled their intention, with the Plan for Water, to review the water efficiency standards for new homes, including consideration of a new national 105l/p/d standard and 100l/p/d where there is a clear local need.
- All development sites will be expected to demonstrate at least a 10% net-gain in biodiversity from 2024.
- The designation of specific catchments in England as requiring to demonstrate Nutrient Neutrality under the Conservation of Habitats Regulations has led to significant limitations to development in these areas, as well as the development of offsetting schemes to enable nutrient-neutral development. In 2023 the government unsuccessfully attempted to remove development restrictions in these areas, so further developments might be expected in the near future.
- Similarly, the availability of water resources, and the impact of new water demand on the environment, has led to restrictions on granting planning permission in Sussex North WRZ and a requirement to demonstrate water-neutral development in Cambridge Water WRZ. It is anticipated that LPAs will be increasingly required to demonstrate that there will be sufficient water resources to supply development without causing further harm to the environment through the life of their Local Plans.

4 Water Resources and Water Supply

4.1 Introduction

4.1.1 Objectives

The aim of the water resources assessment is to ensure there is sufficient water available to abstract in the region for the level of proposed growth without impacting the environment, over both the local plan time frame and the future. The assessment characterises the study area, identifying key surface and ground water bodies and the geology of the region studied, and highlights pressures on water resources, existing constraints on abstraction, and evidence for adopting tighter water efficiency targets.

4.1.2 Water resources in the UK

It is important to set water resources in the study area within the context of the overall national picture.

The Environment Agency (Environment Agency, 2024) have published a summary of the revised draft regional and Water Resources Management Plans which includes their view on the overall state of water resources in the UK and the challenges the country faces. They state that:

"In England, our climate is changing, our population is growing, and as a nation we want an improved environment along with a thriving economy, enabled by resilient water supplied. Action is required now to meet these objectives".

"The scale of the challenge we face increases with time, and, by 2050, we are looking at a shortfall of nearly 5 billion litres of water per day between the sustainable water supplied available and the expected demand."

"Demand reductions are crucial, particularly in the short term. The Environment Act 2021 sets a target to reduce the use of public water supply in England, per head of population, by 20% by 2037-38 from the 2019-20 baseline."

"Government will be looking to water companies to act quickly and take significant steps forward on installing smart meters and delivering on their wider water efficiency commitments and reducing leakage. This will happen alongside the introduction of a mandatory water label which will enable water efficient decisions across the country. The government has also committed to review water efficiency requirements of building regulations which will be a key action to ensure new homes are water efficient."

There have been several important documents published in recent years, all highlighting the growing awareness and concern about this issue. The National Water Resources Framework led to the creation of the regional water resources planning groups and defined the objective to achieve an average household water efficiency of 110l/p/d by 2050 (including existing housing).

The Government's Environmental Improvement Plan published in January 2023 contains a roadmap for improving water efficiency in new developments and retrofits. This contains an action to review Building Regulations (2010) and consider a new standard for new homes in England of 105 l/p/d and 100 l/p/d where there is a clear local need, such as in areas of serious water stress. Whilst this is not current policy, it is likely that a tighter standard than the 110 l/p/d will be adopted in Building Regulations early in the Local Plan period.

4.2 Characterisation of the study area

4.2.1 Surface Water

Within the study area, there are multiple main statutory watercourses and ordinary watercourses, with the main statutory rivers being: The Rivers Roden, River Severn and the River Tern, each with their own associated tributaries (Figure 4-1).

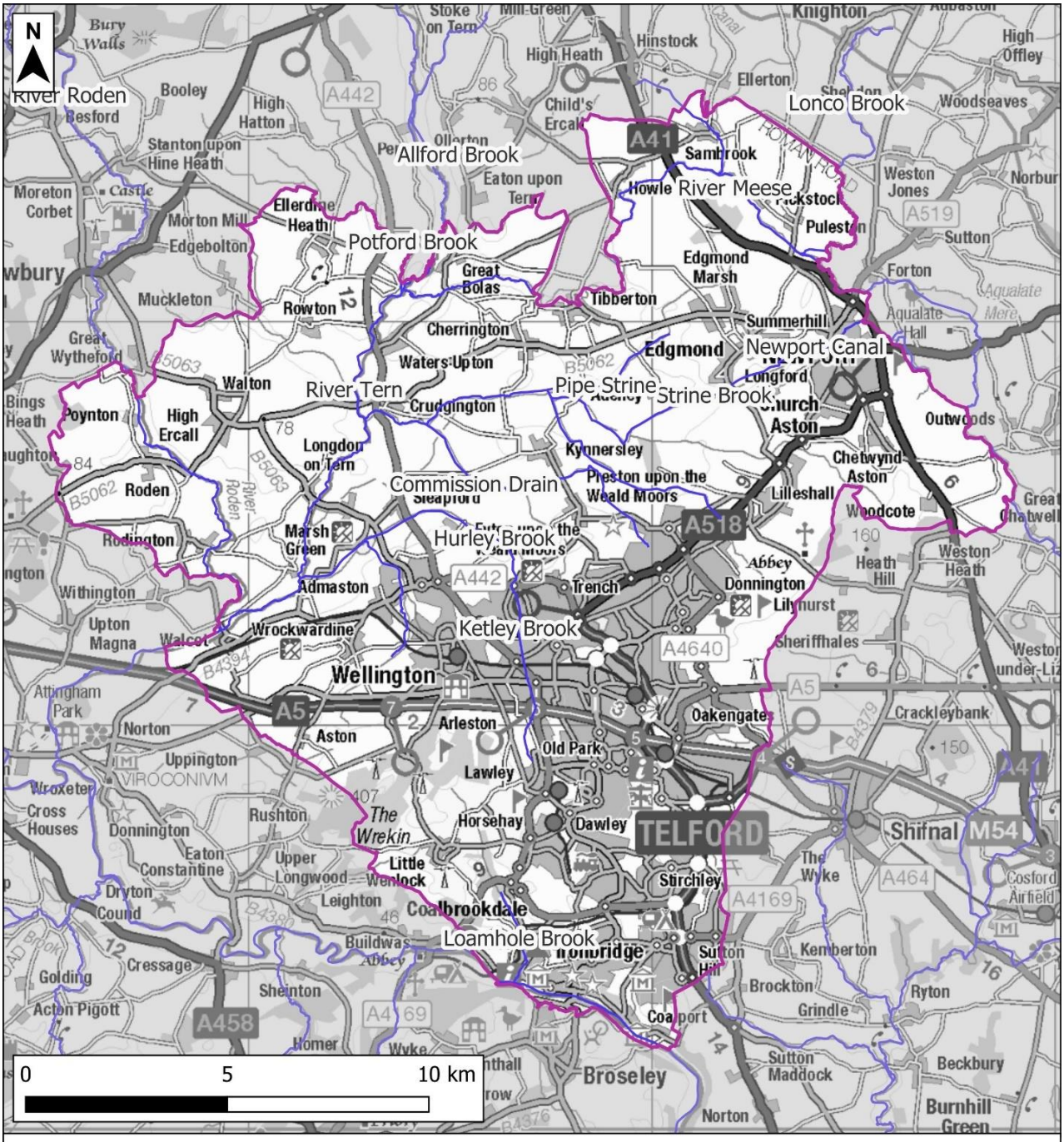


Figure 4-1: Surface waterbodies in Telford and Wrekin

4.3 Geology

4.3.1 Introduction

The geology of catchments is an influencing factor in water runoff from the ground surface, and how appropriate the type of SuDS is for a development due to the variations in the permeability of surface material and bedrock stratigraphy.

4.3.2 Bedrock Geology

Figure 4-2 shows the bedrock geology over the study area. Most of the north of the study area covering Newport, Walton and Hadley is Sandstone and Conglomerate, Interbedded. To the south of the study area over Telford the bedrock geology is siltstone and sandstone with subordinate mudstone. There are pockets of Limestone, mudstone and calcareous mudstone, lava and tuff and mudstone, siltstone and sandstone.

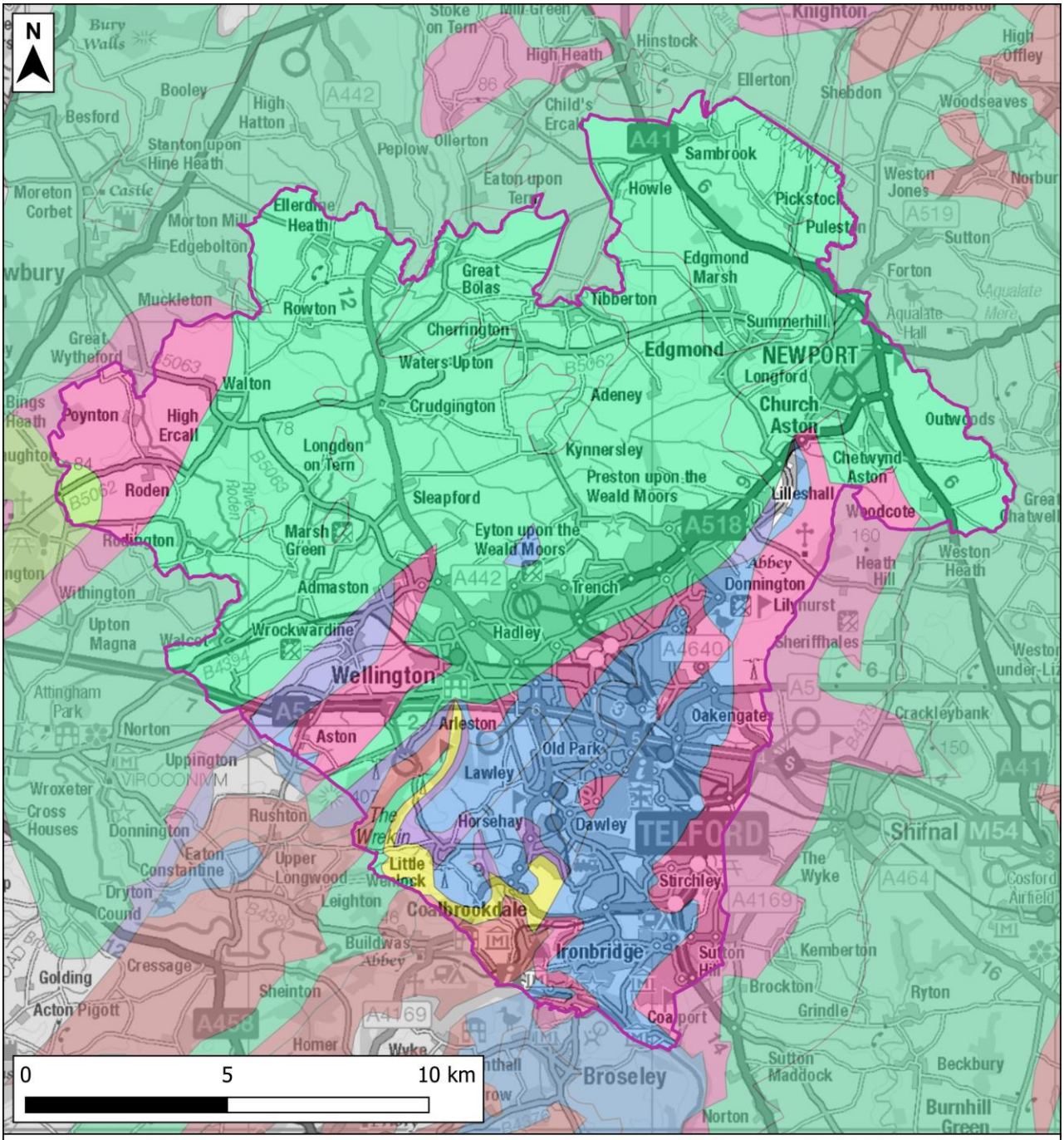


Figure 4-2: Bedrock geology of Telford and Wrekin

4.3.3 Superficial Geology

Figure 4-3 shows the superficial (surface) geology of the study area. Diamicton geology is prevalent over the study area with pockets of sand and gravel in the centre of the study area around Hadley, Marsh Green and over Newport. Peat is present over Steapford and Kynnersley, with clay covering a small area over Eytonupon the Weald Moors and Adnaston.

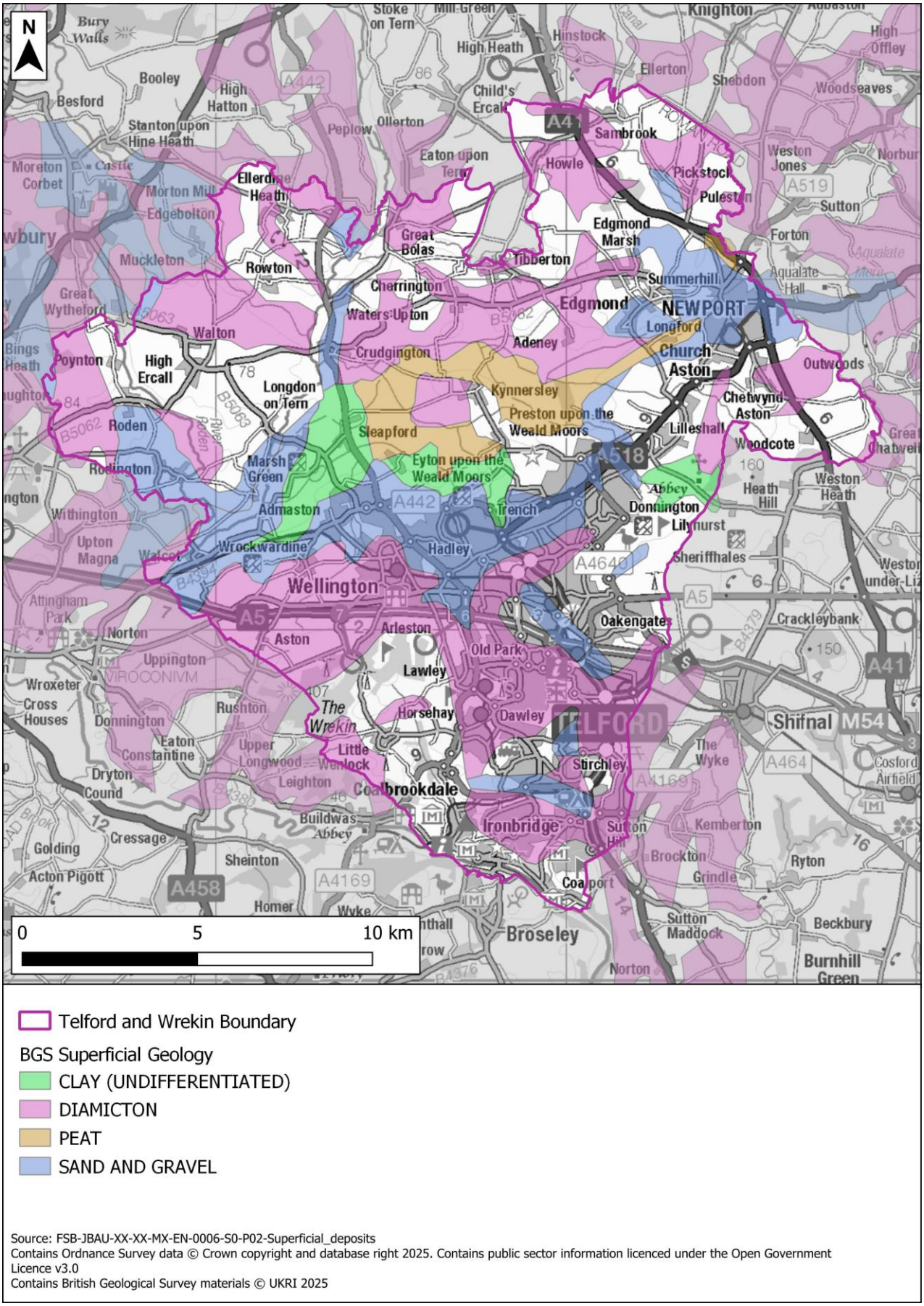


Figure 4-3: Superficial (at surface) geology of Telford and Wrekin

4.4 Groundwaters

A WFD groundwater body represents a distinct body of groundwater flow with a coherent flow unit including recharge and discharge areas with little flow across the boundaries. Groundwater bodies are shown in Figure 4-4 and their corresponding WFD classification is summarised in Table 4-1:.

Table 4-1: WFD Status of groundwater bodies

Groundwater Bodies	Waterbody ID	Quantitative Status	Chemical Status	Overall Status
Severn Uplands Carboniferous Shrewsbury*	GB40902G205500	Good	Poor	Poor
Shropshire Middle Severn-Secondary Mudrocks and Drift Wem	GB40902G991800	Good	Good	Good
Shropshire Middle Severn-PT Sandstone East Shropshire*	GB40901G300100	Poor	Poor	Poor
Shropshire Middle Severn-Secondary Combined*	GB40902G303300	Good	Good	Good
Staffordshire Trent Valley-Merica Mudstone West	GB40402G300400	Good	Good	Good
Staffordshire Trent Valley- PT Sandstone Bishops Wood	GB40401G300200	Good	Good	Good
Teme-Secondary Combined	GB40902G991000	Good	Good	Good
Worcestershire Middle Severn-PT Sandstone*	GB40901G300800	Poor	Poor	Poor

*Within the study area.

Quantitative status of poor means that the water bodies failed the quantitative groundwater balance test, indicating the total existing abstraction may not be sustainable in the long term. This failure is associated with abstraction for agricultural and rural land management,

as well as public water supply. Poor chemical status is associated with agriculture, rural and urban land management, point, and diffuse sources of pollution.

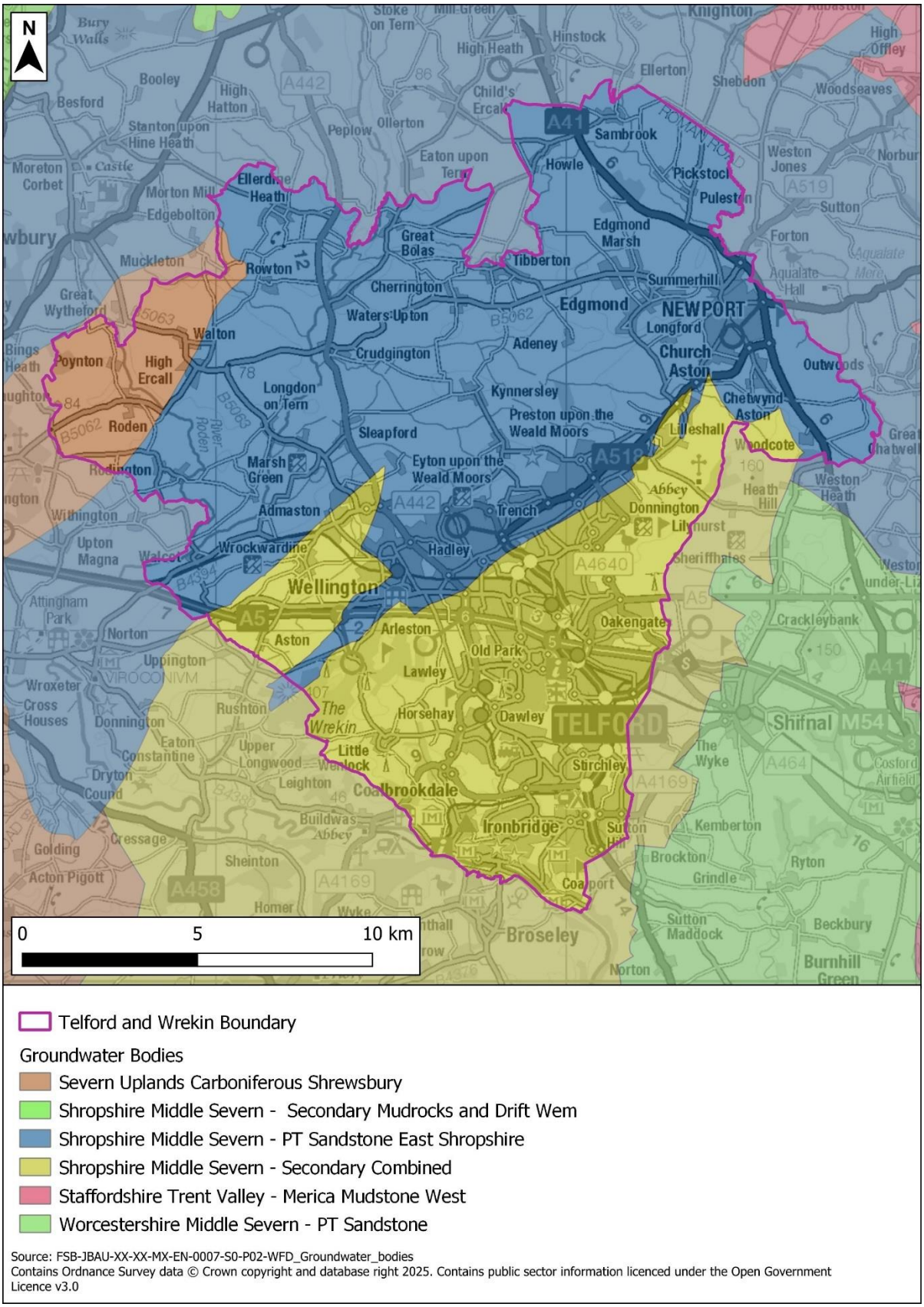


Figure 4-4: Groundwater bodies in Telford and Wrekin

4.5 Availability of Water Resources

4.5.1 Abstraction Licensing Strategy

The Environment Agency working through the Catchment Abstraction Management Strategy (CAMS) process, prepare an Abstraction Licensing Strategy (ALS) for each sub-catchment in a river basin. The strategy sets out how water resources are managed within England and contributes to the implementation of the WFD. The ALS report provides information on the resources available and what conditions might apply to new licences. The licences require abstractions to stop or reduce when a flow or water level falls below a specific threshold, as a restriction to protect the environment and manage the balance between supply and demand for water users.

All new licences, and some existing licences are time limited, allowing for periodic review of the area as circumstances may have changed since the licence was first issued. The duration is generally twelve years, but shorter licences may be granted if they are based on resource assessment and environmental sustainability grounds. In some cases, future plans or changes may mean that the EA will grant a shorter time limited licence, so it can be re-assessed following the change. If a licence is only required for a short time, it can be granted either as a temporary licence or with a short time limit. If a licence is considered to pose a risk to the environment it may be granted with a short time limit while monitoring is carried out. The licences are then replaced with a changed licence, revoked or renewed near to the expiry date.

The ALS are important in terms of the Water Resource Management Plan (WRMP) as this helps to determine the current and future pressures on water resources and how the supply and demand will be managed by the relevant water companies. An abstraction license is needed from Natural Resources Wales or the Environment Agency if abstraction is above 20m^3/ day (4,400 gallons) a day from:

- rivers or streams
- reservoirs, lake or pond
- canal
- spring or
- an underground source

Telford and Wrekin is covered predominantly by Shropshire Middle Severn with smaller areas to the south covered by the Severn Corridor and Worcestershire Middle Severn.

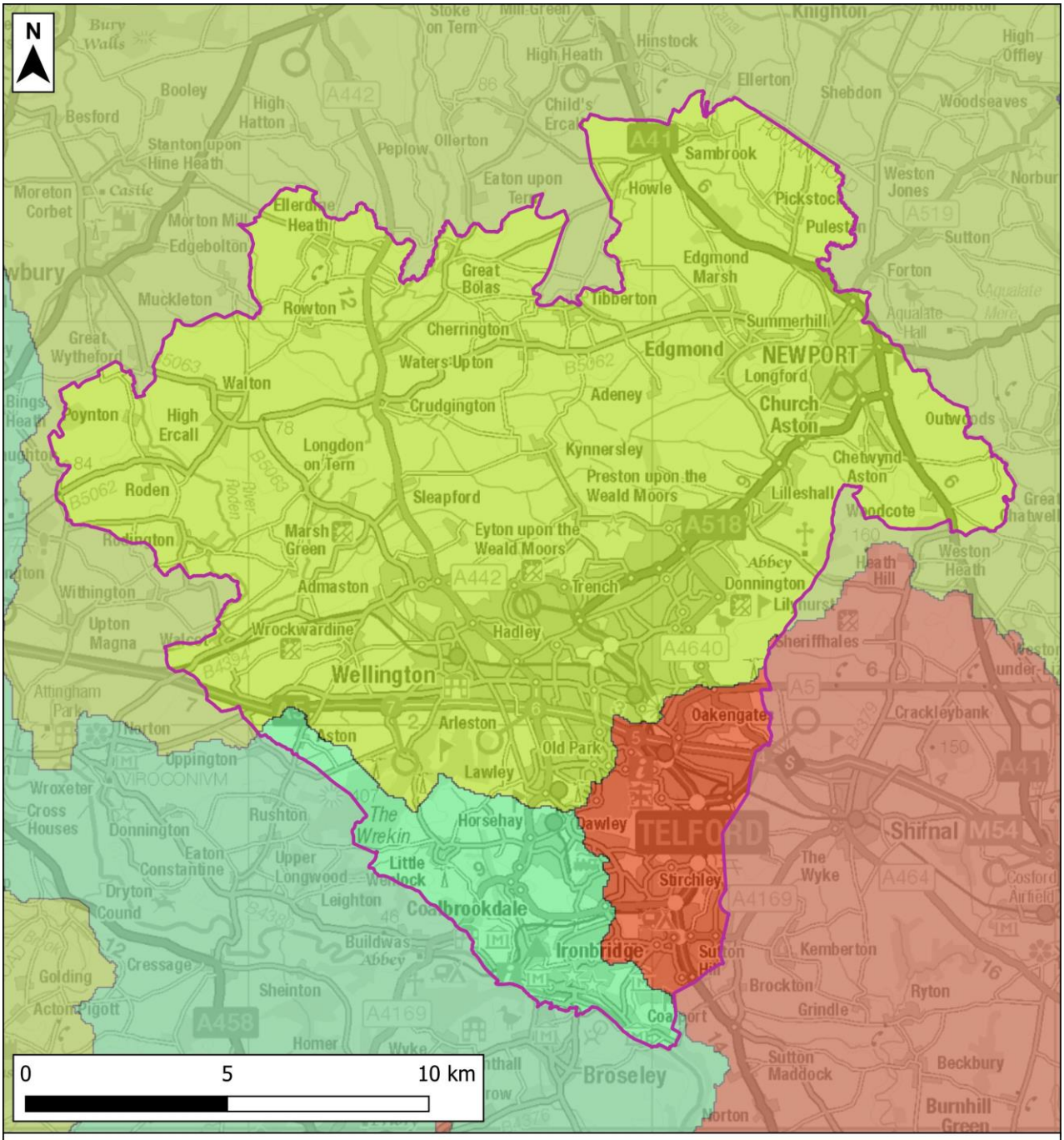


Figure 4-5: ALS (formally CAMS) boundaries covering Telford and Wrekin

4.5.2 Resource Availability Assessment

To abstract surface water, it is important to understand what water resources are available within a catchment and where abstraction for consumptive purposes will not pose a risk to resources or the environment. The Environment Agency has developed a classification system which shows:

- The relative balance between the environmental requirements for water and how much has been licensed for abstraction;
- Whether there is more water available for abstraction in the area; and
- Areas where abstraction may need to be reduced.

The availability of water for abstraction is determined by the relationship between the fully licensed (all abstraction licences being used to full capacity) and recent actual flows (amount of water abstracted in the last six years) in relation to the Environmental Flow Indicator (EFI). Results are displayed using different water resource availability colours, further explained in Table 4.2. In some cases, water may be scarce at low flows, but available for abstraction at higher flows. Licences can be granted that protect low flows, this usually takes the form of a "Hands-off Flow" (HOF) or Hands-off Level (HOL) condition on a licence.

The assessment is performed at Assessment Points (APs), which are usually significant points on a river such as a confluence or gauging station.

Groundwater availability as a water resource is assessed similarly, unless better information on principle aquifers is available or if there are local issues that need to be considered.

Table 4-2: Implications of surface water resource availability colours

Water Resource Availability Colour	Implications for Licensing
BLUE- High hydrological regime	There is more water than required to meet the needs of the environment. Due to the need to maintain the near pristine nature of the water body, further abstraction is severely restricted.
GREEN-Water available for licensing	There is more water than required to meet the needs of the environment. Licences can be considered depending on local/downstream impacts.
YELLOW-Restricted water available for licensing	Fully Licensed flows fall below the Environmental Flow Indicator (EFI). If all licensed water is abstracted there will not be enough water left for the needs of the environment. No new consumptive licences would be granted. It may also be appropriate to investigate the possibilities for reducing fully licensed risks. Water may be

Water Resource Availability Colour	Implications for Licensing
	available via licence trading.
RED- Water not available for licensing	Recent Actual flows are below the Environmental Flow Indicator (EFI). This scenario highlights water bodies where flows are below the indicative flow requirement to help support Good Ecological Status. No further licences will be granted. Water may be available via licence trading.
GREY-HMWBs (and /or discharge rich water bodies)	These water bodies have a modified flow that is influenced by reservoir compensation releases, or they have flows that are augmented. There may be water available for abstraction in discharge rich catchments.

Water resource availability is assessed under four different flow conditions:

- At Q95 conditions - very low flows which are exceeded 95% of the time
- At Q70 conditions - low flows which are exceeded 70% of the time
- At Q50 conditions - median flows which are exceeded 50% of the time
- At Q30 conditions - high flows which are exceeded 30% of the time

The resource availability for Shropshire Middle Severn, Severn Corridor, and Worcestershire Middle Severn ALSs are summarised below, and for completeness the Water resource ALSs within the study area are presented graphically in Figure 4-5. The resource availability for each flow condition is presented in Figure 4-6.

4.6 ALS overviews

4.6.1 Shropshire Middle Severn ALS

The Shropshire Middle Severn ALS (Environment Agency, 2013)[2] is largely rural in nature, predominantly covering the county of Shropshire but also incorporating parts of Staffordshire, Cheshire, Wrexham, Telford and Wrekin. It covers an area of 1422 km^2. The area contains only a few urban centres, namely the market towns of Shrewsbury, Newport, Market Drayton and parts of Telford.

There are 8 APs within the Telford & Wrekin Middle Severn ALS, two of which fall within Telford & Wrekin or are located on the border with Telford & Wrekin:

- AP5 covers the River Meese from its outflow at Aqualate Mere to its confluence with the River Tern. The majority of the catchment overlies the sandstone aquifer.
- AP7 Covers the River Tern from its confluence with the Bailey Brook to its confluence with the River Severn downstream of Shrewsbury. Tributaries include

the River Strine, Platt Brook, Wall Brook and Beanhill Brook. The majority of the catchment overlies the sandstone aquifer

The groundwater availability is guided by the surface water assessment unless specific information on principal aquifers exists or local issues that need protecting overrule it.

Consumptive groundwater licences which do not have a direct impact upon main river flows may be permitted but may be subject to restrictions such as prescribed groundwater levels. Restrictions will be determined on a case-by-case basis, dependent upon the nature and scale of any abstraction.

At AP5, water is restricted in Q30 and Q50 conditions, and is not available in Q70 and Q95 conditions. At AP7, water is available in Q30 conditions, but is restricted in Q50, Q70 and Q95 conditions.

4.6.2 Severn Corridor ALS

The Severn Corridor ALS (Environment Agency, 2013), covers the upper reaches of the River Severn catchment (including all of the upland tributaries) down to the point where it is joined by the River Perry to the northwest of Shrewsbury. From here, it focuses on the River Severn itself and a number of smaller tributaries down to the Severn Estuary. The main water demand pressure in the Severn Corridor ALS is from agriculture.

The entirety of the Severn Corridor has reliable water resources, with water being available for abstraction (by those with licenses to abstract water) at least 70% of the time.

There are 13 APs within the Severn Corridor ALS, one of which falls within Telford & Wrekin: AP9.There is restricted water available for licencing at this AP.

The groundwater availability in the Severn Corridor ALS region is guided by the surface water assessment unless specific information on principal aquifers exists or local issues that need protecting overrule it.

Consumptive groundwater licences which do not have a direct impact upon main river flows may be permitted but may be subject to restrictions such as prescribed groundwater levels. Restrictions will be determined on a case-by-case basis, dependent upon the nature and scale of any abstraction.

4.6.3 Worcestershire Middle Severn ALS

The Worcestershire Middle Severn ALS (Environment Agency b, 2013) encompasses just over 1,000 km^2 of central England. The area lies directly west of the West Midlands conurbation and covers parts of the counties of Shropshire, Staffordshire, Worcestershire, and the West Midlands. The towns of Kidderminster, Stourbridge and Telford and parts of Bridgnorth, Wolverhampton, Dudley and Bromsgrove lie within the CAMS area. The southern tip of the CAMS includes the outskirts of Worcester.

The main water resource issue in the Worcestershire Middle Severn ALS is the historic over-abstraction of groundwater for public supply and the associated environmental impact as well as the high demand for water to irrigate agricultural land.

There are 10 APs within the Worcestershire Middle Severn ALS, one of which falls within Telford & Wrekin: AP1. Currently there is restricted water available for licensing at this AP. This would limit new abstractions of water outside of public water supply.

The groundwater availability in the Worcestershire Middle Severn ALS region is guided by the surface water assessment unless specific information on principal aquifers exists or local issues that need protecting overrule it.

Consumptive groundwater licences which do not have a direct impact upon main river flows may be permitted but may be subject to restrictions such as prescribed groundwater levels. Restrictions will be determined on a case-by-case basis, dependent upon the nature and scale of any abstraction.

In the Q30 condition, water availability is restricted across AP1 River Worfe at Burcote. During the Q50, Q75 and Q95 flow conditions, water is not available.

4.6.4 Overview

Figure 4-6 shows the water resource availability across Telford and Wrekin under different flow conditions. This gives an indication of whether there are sufficient water resources to support a healthy ecology and sustainable abstraction, and how much water might be available for additional future licencing, and under what conditions. Existing abstraction licences held by STW for public supply are considered within this assessment, so a "red" rating does not indicate that water is not available for public supply, only that there is no additional water available for abstraction. STW's abstraction is evaluated as part the Water Resources Management Plan process.

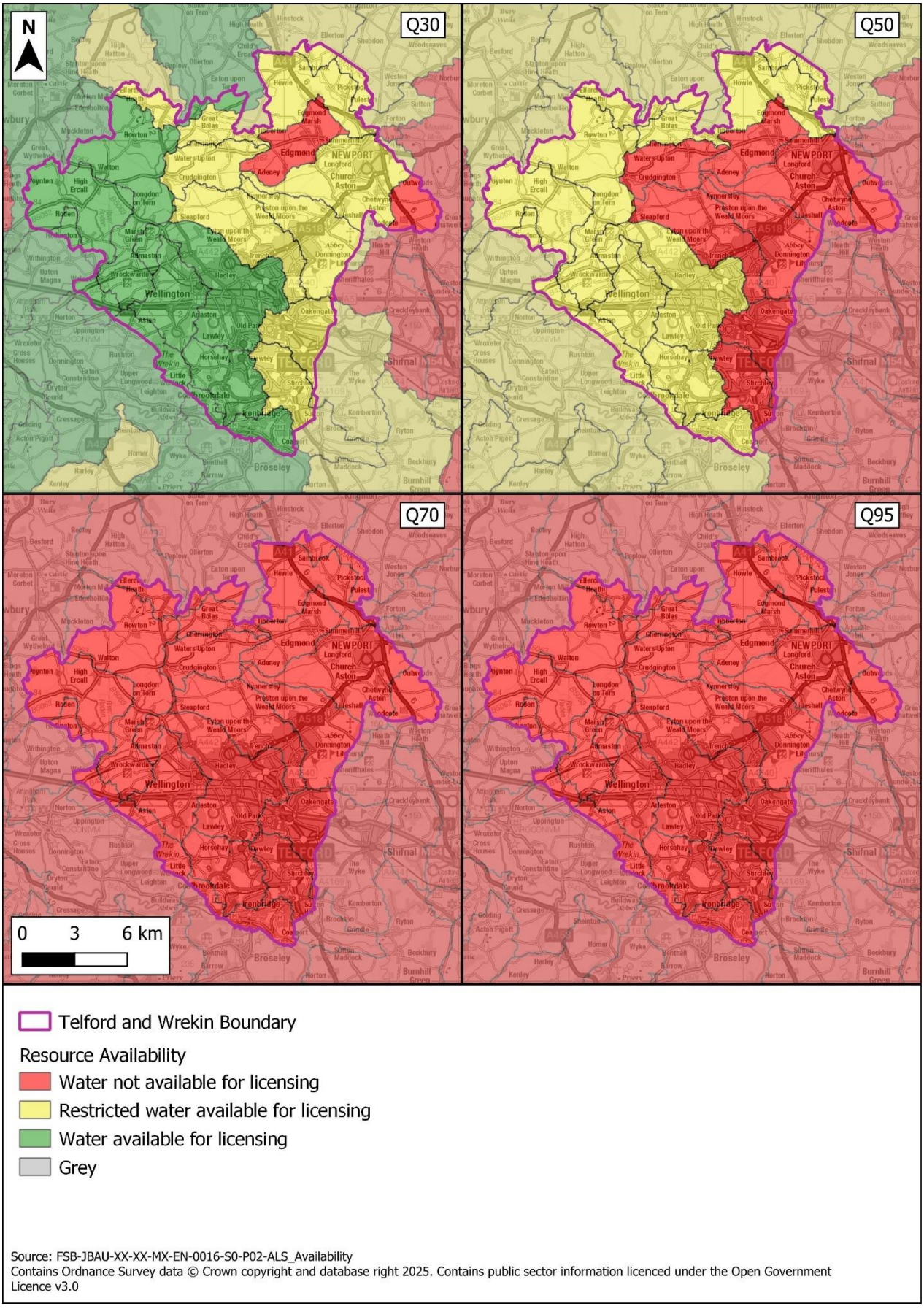


Figure 4-6: Resource availability across Telford and Wrekin

4.7 Water resource management plans

4.7.1 Introduction

Water Resource Management Plans (WRMPs) are 50-year strategies that water companies are required to prepare, with full updates every five years. WRMPs are required to assess:

- Future demand (due to population and economic growth).
- Future water availability (including the impact of sustainability reductions).
- Demand management and supply-side measures (e.g., water efficiency and leakage reduction, water transfers and new resource development).
- How the company will address changes to abstraction licences.
- How the impacts of climate change will be mitigated.
- Where necessary, they set out the requirements for developing additional water resources to meet growing demand and describe how the balance between water supply and demand will be balanced over the next 50 years.
- Using cost-effective demand management, transfer, trading, and resource development schemes to meet growth in demand from new development and to restore abstraction to sustainable levels.
- In the medium to long term, ensuring that sufficient water continues to be available for growth and that the supply systems are flexible enough to adapt to climate change.

When new development within a Local Planning Authority area is being planned, it is important to ensure that there are sufficient water resources in the area to cover the increase in demand without risk of shortages in the future or during periods of high demand, and without causing a negative impact on the waterbodies from which water is abstracted.

The aim of this assessment was to compare the future additional demand as a result of development proposed within the emerging Local Plan, with the demand accounted for by Severn Trent Water within their Water Resource Management Plan. Figure 4-7 shows the Water Resource Zone (WRZ) boundaries within Telford and Wrekin. Water Resource Zones are defined by the EA as areas in which the management of supply and demand is largely self-contained and where the supply infrastructure is linked such that customers within the zone experience the same risk of supply failure. Within a WRZ a customer may receive their water from anywhere within the zone, and not necessarily from the nearest source.

This assessment has been undertaken using the draft 2024 Water Resource Management Plan (dWRMP24), as such it may be subject to change as the WRMP is finalised.

The dWRMP used for this report can be found here:

dwrmp24 DRAFT documents | Water resources management plan | Our plans | About us | Severn Trent Plc

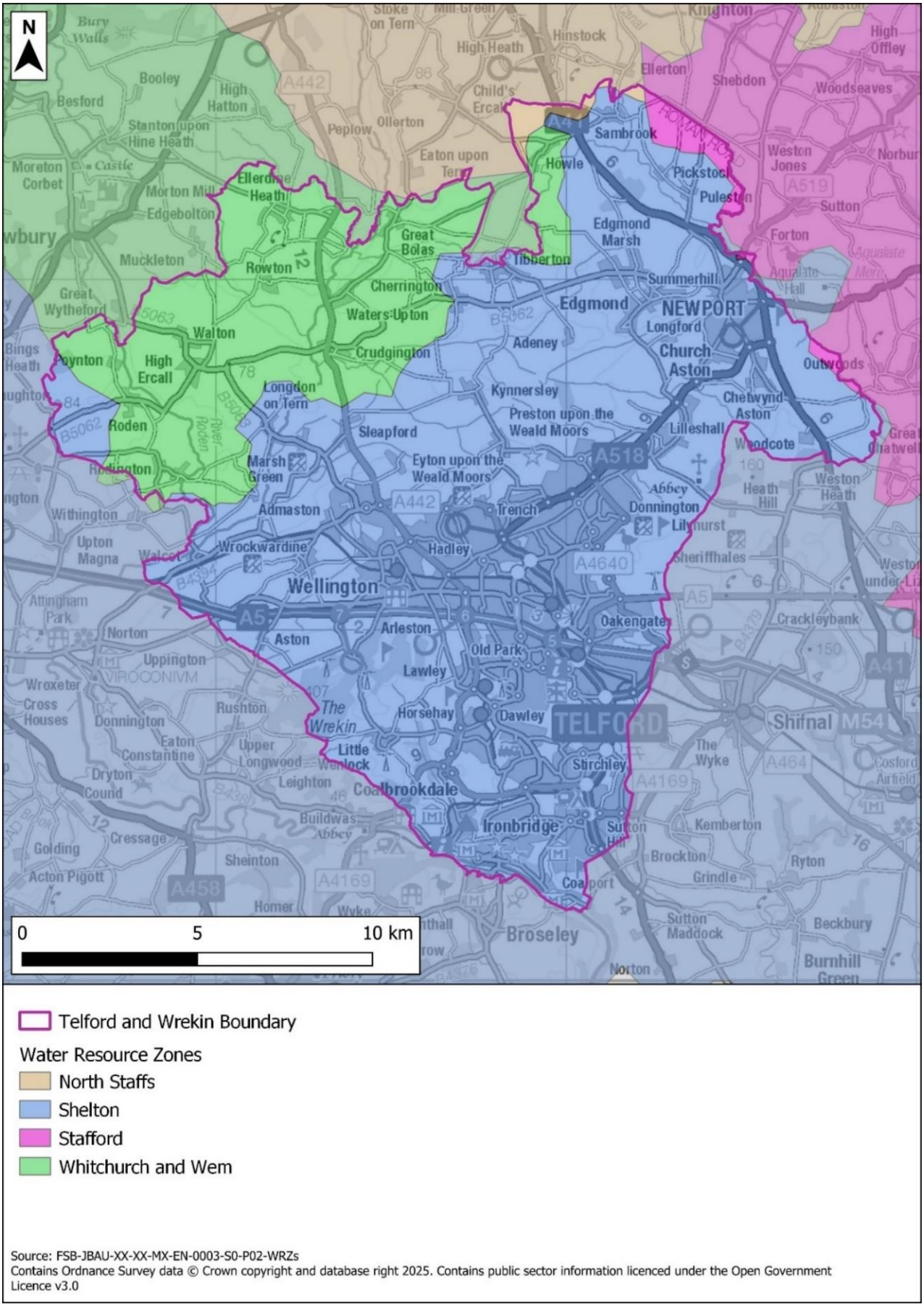


Figure 4-7: Water Resource Zones (WRZs) that cover Telford and Wrekin

4.7.2 Severn Trent Waters dWRMP24

Severn Trent's water comes from 40% reservoirs, 32% rivers and 28% groundwater. Challenges identified in the WRMP are:

- growing population
- leakages
- sustainable abstraction
- delivering the best value to customers

The draft for the Severn Trent 2024 WRMP (dWRMP24) was published in 2022 (Severn Trent, 2022).

In STW's 2024 draft, a focus on leak reduction, population, value for customers and climate change. This includes having home efficiency checks, school pop up sessions and a target of 110 l/p/d by 2050 as well as a leakage reduction goal of 15% from 2020-2025.

Water transfers were also mentioned in the 2024 draft which was not included in the 2019 WRMP. By transferring water between WRZs that need water it can help reduce pressure on reservoirs and abstraction sites.

From AMP8 (2025-2030) expansion of multiple Water Treatment Works (WTWs) are planned, with an aim to save between 5-15 million litres per day. An increase in outputs is also mentioned with an aim of saving 4-5 million litres per day. By working towards leakage reduction and water efficiency it is hoped that this will aid in reducing demand for future growth in STWs supply zone.

STW's 'Preferred Water Supply Options' consist of the expansion of Shelton WTW (AMP8, between 2025-30), which is thought to provide an increase of 12 million litres per day. During AMP9 (2030-35) and AMP10 (2035-40), a scheme named "Exploration of United Utilities import to Shelton" is listed as a best-value option for water supply. The potential benefits of this import on water resources will come into effect in AMP10 with an increase of 25 million litres a day.

Another best value option is a new WTW near Stafford in AMP11 (2040-45). This is expected to increase water resources by 23 million litres a day. Further options and their benefits can be found in Section 5 ("Our long-term water resources strategy") of the dWRMP found here.

As part of the dWRMP24 a baseline supply/demand balance was created. This shows that without further intervention by STW, the Shelton, Whitchurch and Wem, Stafford and North Staffs WRZs will have a supply demand deficit by 2034, and Shelton a deficit by 2039. The dWRMP goes on to show how supply demand balance will be achieved, including:

Leakage reduction, water metering programmes, water efficiency activities, imports and exports of water to and from other water companies, increased use of existing reservoirs and river water treatment works along with new infrastructure to distribute water.

4.8 Water efficiency and water neutrality

4.8.1 Introduction

It is widely recognised that the climate is changing and in response, Telford and Wrekin Council unanimously declared a climate emergency in July 2019. Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand deficit in the future, and making environmental damage from over abstraction of water resources more likely. Furthermore, the delivery of water and wastewater services and the heating of water in the home require high energy inputs and therefore contribute directly to emissions of greenhouse gases. Water efficiency therefore reduces energy use and carbon emissions. It is important therefore that new development does not result in an unsustainable increase in water abstraction. This can be done in several ways from reducing the water demand from new houses through to achieving “water neutrality” in a region by offsetting a new developments water demand by improving efficiency in existing buildings.

4.8.2 Required evidence.

It is for Local Authorities to establish a clear need to adopt the tighter water efficiency target through the building regulations. This should be based on existing sources of evidence such as:

- the Environment Agency classification of water stress;
- water resource management plans produced by water companies;

River Basin Management Plans which describe the river basin district and the pressure that the water environment faces. These include information on where water resources are contributing to a water body being classified as ‘at risk’ or ‘probably at risk’ of failing to achieve good ecological status, due to low flows or reduced water availability;

consultations with the local water and sewerage company, the Environment Agency and catchment partnerships; and consideration of the impact on viability and housing supply of such a requirement.

4.8.3 Water stress

Water stress is a measure of the level of demand for water (from domestic, business and agricultural users) compared to the available freshwater resources, whether surface or groundwater. Water stress causes deterioration of the water environment in both the quality and quantity of water and consequently restricts the ability of a waterbody to achieve a “Good” status under the WFD.

The Environment Agency has undertaken an assessment of water stress across the UK. This defines a water stressed area as where:

- “The current household demand for water is a high proportion of the current effective rainfall which is available to meet that demand; or
- the future household demand for water is likely to be a high proportion of the effective rainfall available to meet that demand.”

4.8.4 River Basin Management Plans

One of the challenges identified in the River Basin Management Plan (RBMP) for the River Severn Basin is “changes to natural flow and levels of water”. The management recommendations from the RBMP are listed below:

- **Government and agencies (Environment Agency)** grant licences under the Water Resources Act 1991 to regulate how much water is taken from rivers, lakes estuaries and groundwater. The Environment Agency reviews the sustainability of time-limited abstraction licences as they expire, and the licence holders seek replacement licences.
- **All sectors** take up or encourage water efficiency measures, including water industry work on metering, leakage, audits, providing water efficient products, promoting water efficiency and education.
- **Local Government** sets out local plan policies requiring new homes to meet the tighter water efficiency standard of 110 litres per person per day as described in Part G of Schedule 1 to the Building Regulations 2010.
- **Industry manufacturing** and other business implement tighter levels of water efficiency, as proposed by changes to the Building Regulations.
- **Agriculture and rural land management** manage demand for water and use water more efficiently to have a sustainable water supply for the future.
- **Local government** commissions water cycle studies to inform spatial planning decisions around local water resources.

The RBMP goes on to state that “dealing with unsustainable abstraction and implementing water efficiency measures is essential to prepare and be able to adapt to climate change and increased water demand in the future.”

4.8.5 National Water Resources Framework

A National Framework for Water Resources was published by the Government in March 2020. This outlines the water resources challenges facing England and sets out the strategic direction for the work being carried out by regional water resource groups.

A range of options were explored, and the most ambitious scenarios rely on policy change to introduce mandatory labelling of water using fittings and associated standards. The Government is currently reviewing policy on water efficiency following a recent consultation. The framework proposes that regional groups plan to help customers reduce their water use to around 110 l/p/d. This is achievable without policy interventions.

This aligns with the tighter standard of 110 l/p/d per day as described in building regulations. A water efficiency target for new build housing higher than 110 l/p/d would therefore make the overall target for the UK harder to achieve.

4.8.6 Regional Water Resources- Water Resources West (WRW).

Telford and Wrekin is within the Water Resources West (WRW) regional water resources planning group. WRW have published their Emerging Regional Plan for the West of England which covers 2025-2085 (Water Resources West a, 2022). WRW relies on several major rivers such as the Severn, Dee, Trent, and Wye to supply 18 million people as well as agriculture and businesses. WRW aim for a 50% reduction of leakage by 2050 and deliver net environmental and biodiversity gain.

Figure 4-8 has been taken from the WRW website to illustrate the future demand for water within the area.

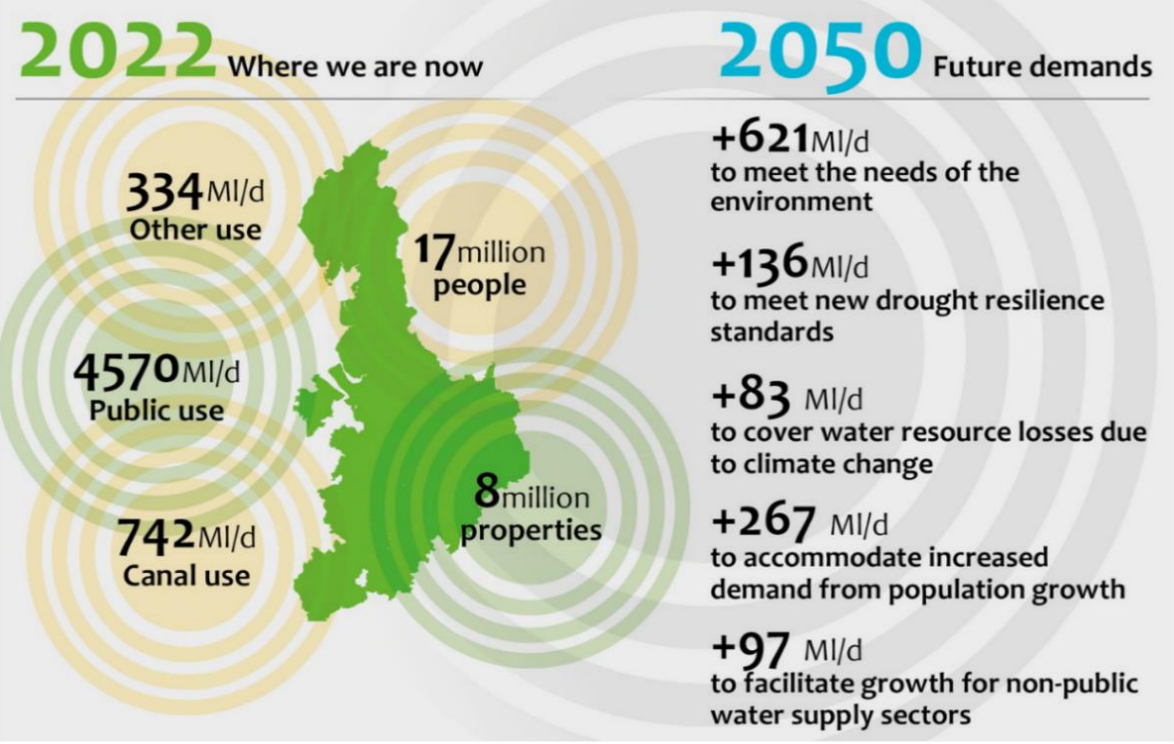


Figure 4-8: Future demands within the Water Resources West demand zone (Water Resource West b, 2022).

The report outlines their needs for the future, and a recent report published in April 2023 (Water Resources West c, 2023) further lay out their plans for managing drivers for change within the report. These drivers are:

- Growth and an increased need in services
- Climate change
- Environmental needs such as low flow and water quality (including drinking water quality).
- Flood (high flows)

Proposed actions are laid out within the report.

Within the emerging regional plan some of the biggest non-public uses in the area are chemicals, agriculture, and power. Issues such as over abstraction, pollution, and degradation of habitats make it difficult for some watercourses in the area to achieve 'good ecological status' under the WFD. WFD status is further spoken about in Section 9.

As it currently stands at the time of writing, the draft best value plan is:

- Reduce daily water demand, including water labelling to help raise consumers awareness of how much water they are using. Water labelling is where a label is put on certain products such as washing machines and dishwashers saying how much water is used per use.
- Diversification water supply options to offset abstraction reduction.
- Developing new water resources to support water transfers.
- Upgrading networks in South-East Wales.
- Improving water quality and the natural environment.

Factors that will increase pressure on the water supply and demand to 2050 in the WRW region are:

- Climate change
- Drought resilience
- Environmental needs
- Demand growth

The area that WRW covers experiences more extensive drought and severe drought. This creates more pressure on water resources. Baseline forecasts for the Strategic Grid WRZ show that in a 1 in 500-year drought scenario there will be a large deficit. All other WRZs under DCWW have a low risk of having a deficit in a 1 in a 500-year drought (Water Resources West d, 2021). WRW have a goal of 110 l/p/h/d by 2050 and a leakage reductio of 50% to try to manage the lack of water resources in the future. Drought measures, new supply and transfers between regions are also goals to help increase water resource availability in the future.

4.8.7 Water Company Advice

Severn Trent Water offers discounts on infrastructure charges where there is evidence that developments are designed to a standard of 100 l/p/d or less. Additionally, they ran a Water Efficiency trial Scheme for 4 months in 2021 including an incentive payment to retailers for reducing water demand and a customer incentive for reducing water demand at specific times and dates.

4.8.8 Impact on viability

As outlined in section 3.2.4 the cost of installing water-efficient fittings to target a per capita consumption of 110l/p/d has been estimated as a one-off cost of £9 for a four-bedroom house (compared with the cost of building to 125l/p/d). Research undertaken for the devolved Scottish and Welsh governments indicated potential annual savings on water and energy bills for householders of £24-£64 per year as a result of such water efficiency measures (Waterwise b, 2018). Water efficiency is therefore not only viable but of positive economic benefit to both private homeowners and tenants.

4.8.9 Summary of evidence for tighter efficiency standard

The strategic direction in the UK set out in the new National Water Resources Framework is to attain an average household water efficiency of 110 l/p/d by 2050. This also aligns with the recommendation in the River Basin Management Plan aimed at reducing the impact of abstraction. There would also be a positive economic impact for residents in terms of reduced energy and water bills.

Currently, Building Regulations provide for a water efficiency target of 125l/p/d or 110l/p/d in water stressed areas. Based on the EA classification of water stress and the information contained in the RBMPs alongside the national objective to achieve a water efficiency target of 110l/p/d across the UK by 2050, there is clear evidence to support the 110l/p/d as a minimum.

However, this figure is under review and is expected to change. In response to the Environmental Improvement Plan, the Future Homes Hub have proposed a roadmap to achieve the 110l/p/d national target that includes a target of 100l/p/d in water stressed areas from 2025. This figure reduces to 90l/p/d by 2030.

This WCS therefore recommends that the Council adopts a policy requiring a water efficiency target of 100l/p/d in their Local Plan and allow for a reduction in this target to 90l/p/d from 2030.

4.8.10 Water neutrality concept

Water neutrality is a relatively new concept for managing water resources, but one that is receiving increased interest as deficits in future water supply/demand are identified. The definition adopted by the Government and the Environment Agency (Environment Agency c, 2009) is:

"For every development, total water use in the wider area after the development must be equal to or less than total water use in the wider area before development"

It is useful to also refer to the refined definition developed by Ashton:

"For every new significant development, the predicted increase in total water demand in the region due to the development should be offset by reducing demand in the existing community, where practical to do so, and these water savings must be sustained over time" (Booth and Charlesworth, 2014).

This definition states the need to sustain water saving measures over time, and the wording "predicted increase in total water demand" reflects the need for water neutrality to be designed in at the planning stage.

Both definitions refer to water use in the region or "wider area", and the extent of this area should be appropriate to local authority boundaries, water resource zones, or water abstraction boundaries depending on what is appropriate for that particular location. For instance, if a development site is in an area of water stress relating to a particular abstraction source, offsetting water use in a neighbouring town that is served by a different water source will not help to achieve water neutrality.

In essence water neutrality is about accommodating growth in a region without increasing overall water demand.

Water neutrality can be achieved in several ways:

- Reducing leakage from the water supply networks.
- Making new developments more water-efficient.
- "Offsetting" new demand by retrofitting existing homes with water-efficient devices.
- Encouraging existing commercial premises to use less water.
- Implementing metering and tariffs to encourage the wise use of water.
- Education and awareness-raising amongst individuals.

Suggestions for water-efficiency measures are listed in Table 4-3: below.

Table 4-3: Consumer water efficiency measures

Topic	Measures
Educational and promotional campaigns	Encourage community establishments (e.g., schools, hospitals) to carry out self-audits on their water use. Deliver water conservation message to schools and provide visual materials for schools. Building awareness with homeowner/ tenants
Water-efficient measures for toilets	Cistern displacement devices to reduce volume of water in cistern. Retro-fit or replacement dual flush devices Retro-fit interruptible flush devices Replacement low-flush toilets
Water-efficient measures for	Tap insert, such as aerators. Low flow restrictors

Topic	Measures
taps	Push taps Infrared taps
Water-efficient measures for showers and baths	Low-flow shower heads Aerated shower heads Low-flow restrictors Shower timers Reduced volume baths (e.g., 60 litres) Bath measures
Rainwater harvesting and water reuse	Large-scale rainwater harvesting Small-scale rainwater harvesting for example with a water butt, or rainwater tank for toilet flushing. Grey water recycling
Water efficient measures addressing outdoor use	Hosepipe flow restrictions Hosepipe siphons Hose guns (trigger hoses) Drip irrigation systems Mulches and composting
Commercial properties	Commercial water audits Rainwater recycling Grey water recycling Optimising processes Provide water efficiency information to all newly metered businesses
Metering	Promote water companies' free meter option Compulsory metering (in water stressed areas) Smart metering (to engage customer with their consumption) Provide interactive websites that allow customers to estimate the savings associated with metering (environmental and financial) Innovative tariffs (seasonal, peak, rising block) Customer supply pipe leakages- supply pipe repair and replacement
Other	Household water audits, including DIY or with help of plumber. Seek and fix internal leaks and/ or dripping taps. Water efficient white goods, including washing machines and dishwashers. Ask customers to spot and report leaks

Source: Adapted from Booth and Charleswell 2014

Many interventions are designed to reduce water use if operated in a particular way, and so rely on the user being aware and engaged with their water use. The educational aspect is therefore important to ensure that homeowners, community establishments and businesses are aware of their role in improving water efficiency.

4.8.11 Rainwater Harvesting and Greywater Recycling

Rainwater harvesting

Rainwater recycling or rainwater harvesting (RwH) is the capture of water falling on buildings, roads or pathways that would normally be drained via a surface water sewer, infiltrate into the ground or evaporate. In the UK this water cannot currently be used as a drinking water supply as there are strict guidelines on potable water, but it can be used in other systems within domestic or commercial premises.

Systems for collection of rainwater can be simple water butts attached to a drainpipe on a house, or it could be a complex underground storage system, with pumps to supply water for use in toilet flushing and washing machines. By utilising rainwater in this way there is a reduced dependence on mains water supply for a large proportion of the water use in a domestic property.

Benefits of RwH

- RwH reduces the dependence on mains water supply – reducing bills for homeowners and businesses.
- Less water needs to be abstracted from river, lakes and groundwater.
- Stormwater is stored in a RwH system reducing the peak runoff leaving a site providing a flood risk benefit (for smaller storms).
- By reducing surface water flow, RwH can reduce the first flush effect whereby polluted materials adhering to pavement surfaces during dry periods are removed by the first flush of water from a storm and can cause pollution in receiving watercourses.

Challenges of RwH

- Dependency on rainfall can limit availability of harvested rainwater during drought and hot weather events.
- Increased capital (construction) costs to build rainwater harvesting infrastructure into new housing (£2,674 for a 3/4bed detached home).
- Payback periods are long as the cost of water is low so there is little incentive for homeowners to invest.

Greywater Recycling

Greywater refers to water that has been “used” in the home in appliances such as washing machines, showers and hand basins. Greywater recycling (GwR) is the treatment and re-use of this water in other systems such as for toilet flushing. By their nature, GwR systems require more treatment and are more complex than RwH systems, and there are limited examples of their use in the UK.

Greywater re-use refers to systems where wastewater is taken from source and used without further treatment. An example of this would be water from a bath or shower being used on plants in the garden. This sort of system is easy to install and maintain, however as mentioned above the lack of treatment to remove organic matter means the water cannot be stored for extended periods.

Greywater recycling refers to systems where wastewater undergoes some treatment before it is used again. These systems are complex and require a much higher level of maintenance than RwH or greywater re-use systems.

Domestic water demand can be significantly reduced by using GwR, and unlike with a RwH system where the availability of water is dependent on the weather, the source of water is usually constant (for instance if it is from bathing and showering). However, the payback period for a GwR system is usually long, as the initial outlay is large, and the cost of water relatively low. Viability of greywater systems for domestic applications is therefore currently limited. Communal systems may offer more opportunities where the cost can be shared between multiple households.

4.8.12 Energy and water use

According to EU statistics (Eurostat 2017), 17% of the UK's domestic energy usage is for water heating. If less water was being used within the home, for instance through more water efficient showers, less water would need to be heated, and overall domestic energy usage would be reduced.

After analysing the results of a 2019 consultation on a Future Homes Standard, the Government made the decision that new homes need to be built with energy efficiency and the production of lower carbon emissions in mind (June 2022). Whilst there is no direct mention of water efficiency in this consultation, there is an important link between water use and energy use, and therefore between water use and carbon footprint.

4.8.13 Funding for water neutrality

Water neutrality is unlikely to be achieved by just one type of measure, and likewise it is unlikely to be achieved by just one funding source. Funding mechanisms that may be available could be divided into the following categories:

- Infrastructure-related funding (generally from developer payments).
- Fiscal incentives at a national or local level to influence buying decisions of households and businesses.
- Water company activities, either directly funded by the five-year price review or because of competition and individual company strategies.
- Joint funding through energy efficiency schemes (and possibly to integrate with the heat and energy saving strategy).

Currently in the UK, the main funding resource for the delivery of water efficiency measures is the water companies, with some discretionary spending by property owners or landlords. For water neutrality to be achieved, policy shifts may be required in order to increase investment in water efficiency. Possible measures could include:

- Further incentivisation of water companies to reduce leakage and work with customers to reduce demand.
- Require water efficient design in new development.
- Developer funding to contribute towards encouraging water efficiency measures.

- Require water efficient design in refurbishments when a planning application is made.
- Tighter standards on water using fittings and appliances.

4.9 Conclusions

It is widely recognised that the climate is changing and in response Telford and Wrekin Council declared a climate emergency in July 2019. Climate change is predicted to increase pressure on water resources, increasing the potential for a supply-demand deficit in the future, and making environmental damage from over abstraction of water resources more likely. Furthermore, the delivery of water and wastewater services and the heating of water in the home require high energy inputs, and therefore contribute directly to emissions of greenhouse gases. Water efficiency therefore reduces energy use and carbon emissions.

It is important that new development in Telford and Wrekin does not result in an unsustainable increase in water abstraction. This can be undertaken in several ways from reducing the water demand from new houses through to achieving “water neutrality” in a region by offsetting a new developments water demand by improving efficiency in existing buildings.

Currently, Building Regulations provide for a water efficiency target of 125l/p/d or 110l/p/d in water stressed areas. Based on the EA classification of water stress and the information contained in the RBMPs alongside the national objective to achieve a water efficiency target of 110l/p/d across the UK by 2050, there is clear evidence to support the 110l/p/d as a minimum.

However, this figure is under review and is expected to change. The Future Homes Hub have proposed a roadmap to achieve the 110l/p/d national target that includes a target of 100l/p/d in water stressed areas from 2025. This figure reduces to 90l/p/d by 2030.

This WCS therefore recommends that the Council adopts a policy requiring a water efficiency target of 100l/p/d in their Local Plan and allow for a reduction in this target to 90l/p/d from 2030.

This residential target should be supported by an equivalent non-household target.

4.10 Recommendations

Table 4-4: Recommendations for water resources

Action	Responsibility	Timescale
Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with Local Planning Authorities.	STW	Ongoing

Action	Responsibility	Timescale
Provide yearly profiles of projected housing growth to water companies to inform the WRMP update.	TWC	Ongoing
The Council adopts a policy requiring a water efficiency target of 100l/p/d in their respective Local Plans and allow for a reduction in this target to 90l/p/d from 2030. This would be subject to viability testing.	TWC	In Telford and Wrekin LP
Use planning policy to require new build non-residential development to achieve at least 3 credits in the Wat01 Measure for water in the BREEAM New Construction standard.	TWC	In Telford and Wrekin LP
Larger residential developments (including new settlements), and commercial developments should consider incorporating greywater recycling and/or rainwater harvesting into development at the master planning stage in order to reduce water demand.	TWC and STW	In Telford and Wrekin LP
The concept of water neutrality or water positive development has the potential to provide a benefit in improving resilience to climate change and enabling all waterbodies to be brought up to "Good" status. Explore further with the water companies and the Environment Agency how the Council's planning and climate change policies can encourage this approach. This approach could have application in strategic sites and new settlements.	TWC, STW and EA	In Telford and Wrekin LP
Water companies should advise TWC of any strategic water resource infrastructure developments within the study, where these may require safeguarding of land to prevent other type of development occurring.	TWC and STW	Part of Telford and Wrekin LP process

5 Water Supply Infrastructure

5.1 Introduction

An increase in water demand due to growth can exceed the hydraulic capacity of the existing supply infrastructure. This is likely to manifest itself as low pressure at times of high demand. An assessment is required to identify whether the existing infrastructure is adequate or whether upgrades will be required. The time required to plan, obtain funding, and construct major pipeline works can be considerable and therefore water companies and planners need to work closely together to ensure that the infrastructure is able to meet growing demand.

Water supply companies make a distinction between supply infrastructure, the major pipelines, reservoirs, and pumps that transfer water around a WRZ, and distribution systems, smaller scale assets which convey water around settlements to customers. This outline study is focused on the supply infrastructure. It is expected that developers should fund water company impact assessments and modelling of the distribution systems to determine requirements for local capacity upgrades to the distribution systems.

In addition to the work undertaken by water companies, there are opportunities for the local authority and other stakeholders to relieve pressure on the existing water supply system by increasing water efficiency in existing properties. This can contribute to reducing water consumption targets and help to deliver wider aims of achieving water neutrality.

A cost-effective solution can be for local authorities to co-ordinate with water supply companies and “piggyback” on planned leakage or metering schemes, to survey and retrofit water efficient fittings into homes (Waterwise, 2009). This is particularly feasible within property owned or managed by the local authorities, such as social housing.

5.2 Conclusion from Phase 1

Severn Trent Water supply water and wastewater services for the whole of Telford & Wrekin.

STW have stated that having reviewed the potential allocations ***“…there are no immediate concerns***” and “***In regards to additional infrastructure to reach new development specifically (e.g. pipes) this would be decided and assessed when new developments come forward for new connections. Based on our current planning and processes we don’t anticipate the need for any specific land to be safeguarded***”.

5.3 Phase 2 Results

An update to the assessment provided in Phase 1 was sought from STW who were provided a list of the potential allocations and asked to assess each site based on the impact on the water supply network.

They advised JBA that they do not have a team resourced to carry out this assessment, and that each ***"site or settlement will be evaluated on a case-by-case basis"*** by

developer services as part of the planning process. STW were asked whether they had any concerns on the level of growth expected during the plan period (approximately 20,200 dwellings between 2020 and 2040) and they reiterated that: ***"We obviously have a duty to provide supply so our focus will be on ensuring we can provide the best possible service for new and existing customers".***

They were also asked if there are any known constraints to providing upgrades to the water supply network. They responded that there are ***"none that we are currently aware of."***

5.4 Conclusions

In line with other WCSs conducted in STW's supply area, a site-by-site assessment of the impact of potential allocations on the supply network was not available. Instead STW were asked if they had any concerns on the level of growth expected during the plan period and if there any known constraints to providing upgrades to water supply infrastructure. No concerns were raised.

5.5 Recommendations

Early developer engagement with STW is essential to ensure that, where necessary, network reinforcement is delivered prior to developments becoming occupied.

Table 5-1: Recommendations for water supply

Action	Responsibility	Timescale
STW should undertake network modelling on a site-by-site basis to ensure adequate provision of water supply is feasible. This should be done as part of their developer services process.	STW and developer	Through the STW developer services process
TWC and Developers should engage early with STW, once there is certainty on the scale and location of development, to ensure that any infrastructure required to support the site is in place prior to occupation.	STW, TWC and developers	In Local Plan

6 Wastewater collection

6.1 Sewerage undertaker for Telford and Wrekin

Severn Trent Water is the Sewerage Undertaker (SU) for Telford and Wrekin. The role of sewerage undertaker includes the collection and treatment of wastewater from domestic and commercial premises, and in some areas, it also includes the drainage of surface water from building curtilages to combined or surface water sewers. It excludes, unless adopted by the SU, systems that do not connect directly to the wastewater network, e.g., Sustainable Drainage Systems (SuDS) or highway drainage.

Increased wastewater flows into collection systems due to growth in populations or per-capita consumption can lead to an overloading of the infrastructure, increasing the risk of sewer flooding and, where present, increasing the frequency of discharges from storm overflows (also known as Combined Sewer Overflows or CSOs).

Likewise, headroom at Wastewater Treatment Works (WwTW) can be eroded by growth in population or per-capita consumption, requiring investment in additional treatment capacity. As the volumes of treated effluent rises, even if the effluent quality is maintained, the pollutant load discharged to the receiving watercourse will increase. In such circumstances the Environment Agency as the environmental regulator, may tighten consented effluent consents to achieve a "load standstill", i.e., ensuring that as effluent volume increases, the pollutant discharged does not increase. Again, this would require investment by the water company to improve the quality of the treated effluent.

In combined sewerage systems, or foul systems with surface water misconnections, there is potential to create headroom in the system, thus enabling additional growth, by the removal of surface water connections. This can most readily be achieved during the redevelopment of brownfield sites which have combined sewerage systems, where there is potential to discharge surface waters via sustainable drainage systems (SuDS) to groundwater, watercourses, or surface water sewers. In some areas of Telford and Wrekin, there are known issues of surface water causing localised flooding. Strategic schemes to provide improved local surface water drainage may be required in such areas, rather than solely relying upon on-site soakaways on brownfield or infill plots.

6.2 Sewerage System Capacity Assessment

New residential developments add pressure to the existing sewerage systems. An assessment is required to identify the available capacity within the existing wastewater network, and the potential to upgrade overloaded systems to accommodate future growth. The scale and cost of upgrading works may vary significantly depending upon the location of the development in relation to the network itself and the receiving WwTW.

It may be the case that an existing sewerage system is already working at its full capacity and further investigations must be carried out to define which solution is necessary to implement an increase in its capacity. New infrastructure may be required if, for example, a

site is not served by an existing system. Such new infrastructure will normally be secured through private third-party agreements between the developer and utility provider.

Sewerage Undertakers must consider the growth in demand for wastewater services when preparing their five-yearly Strategic Business Plans (SBPs) which set out investment for the next Asset Management Plan (AMP) period. Typically, investment is committed to provide new or upgraded sewerage capacity to support allocated growth with a high certainty of being delivered. Additional sewerage capacity to service windfall sites, smaller infill development or to connect a site to the sewerage network across third party land is normally funded via developer contributions, as third-party arrangements between the developer and utility provider.

6.3 Severn Trent Water Drainage and Wastewater Management Plan (DWMP)

Severn Trent Water's DWMP (Severn Trent c, 2023) lays out eight key ambitions:

- Guarantee future water supply.
- Ensure water is used wisely.
- Deliver a high quality, affordable service.
- Lower the risk of flooding and pollution.
- Protect and enhance our environment.
- Support a more circular economy.
- Make a positive social difference.
- Maintain a safe, inclusive, and fair workplace.

There are 2647 storm overflows in the Severn Trent Water region, and by 2050, 1097 of them are predicted to be classed as high priority activating higher than 10 times per year, which is above the national annual allowance. By 2030 STW aim to align to the Storm Overflow Discharge Reduction Plan by addressing 39% of high priority storm overflows causing harm and 26% of all overflows activating more than 10 times a year. Reducing storm overflow operation can be achieved by upgrading WwTWs or the sewer network ensuring that storm overflows only operate in unusually heavy rainfall.

An assessment has been carried out using a Baseline Risk and Vulnerability Assessment (BRAVA) for a 1 in 50-year storm with various climate change scenarios taken into consideration (no temperature change, 2°C increase and 4°C increase). The scenarios looked at how many properties would be at risk of internal sewer flooding. Currently there are 112,000 properties at risk of internal flooding which amounts to 2.58% of connected properties in the Severn Trent region. If no upgrades of WwTW occur, by 2050 this percentage is expected to rise to 39% (155,998 properties), assuming a 2°C increase in temperature.

As part of their option development and appraisal section, options such as maximising investment opportunities. Investment opportunities encompass internal sewer flooding in a storm and storm overflows. The investment would incorporate alleviating flood risk by undertaking surface water separation scenarios taking surface water out of combined

sewers. As for storm overflow investment, money towards improving site screening for pollutants and addressing high priority storm overflows are mentioned.

Maximising blue-green nature-based solutions was focussed on to work towards a more sustainable approach to reducing the inflow of surface water in the sewer network. The main solution for this was using SuDs.

Overall, there is a focus on reduction of storm overflow operations, upgrading WwTW and creating more sustainable water management options, such as SuDS.

6.4 Methodology

Severn Trent were provided with a list of the sites and forecast housing numbers. Using this information, they were asked to assess each site using the range of datasets they hold. 58 sites were sent to STW for assessment.

A RAG score was then applied to each development site based on the wastewater catchment they were in, and the size of the development.

Developments with less than 100 homes in an area of very low or low headroom concern were given a green rating. Sites larger than 100 homes, or developments in an area of moderate, high, or very high headroom concern were given an amber score on the basis that some network reinforcement would be required. TW did not advise their criteria for giving a red score to a site. The following red / amber / green traffic light definition was used to score each site:

LOW - GREEN	MEDIUM - AMBER	HIGH - RED
Capacity to serve the proposed growth	Infrastructure and/or treatment work upgrades are required to serve proposed growth, but no significant constraints to the provision of this infrastructure have been identified	Infrastructure and/or treatment upgrades will be required to serve proposed growth. Major constraints have been identified

A red assessment does not reflect a “showstopper” and it should be remembered that the water companies have a statutory duty to serve new development under the Water Industry Act 1991 – but there may be significant new infrastructure required.

An amber assessment indicates where further modelling may be required to understand local capacity in the network, and some network reinforcement to accommodate growth is likely to be required. A green assessment indicates that no constraints have been identified.

It should be noted that this assessment does not replace appropriate assessments or modelling as part of developer engagement with the sewerage undertaker, evidence of which should be demonstrated to the LPA as an application progresses through the planning process.

6.5 Results

6.5.1 Foul sewer network assessment

In the foul network assessment, 26 sites were given a "green" assessment confirming there was sufficient capacity within the network to incorporate these sites and no further infrastructure was likely to be required. 7 sites were given an "amber" assessment, and 16 sites were given a "red" assessment, reflecting the need for additional infrastructure.

The three sustainable urban extension sites were given a RAG score of Red. See Appendix H for full details of the RAG assessment.

10 sites were not assessed due to development size and employment development type.

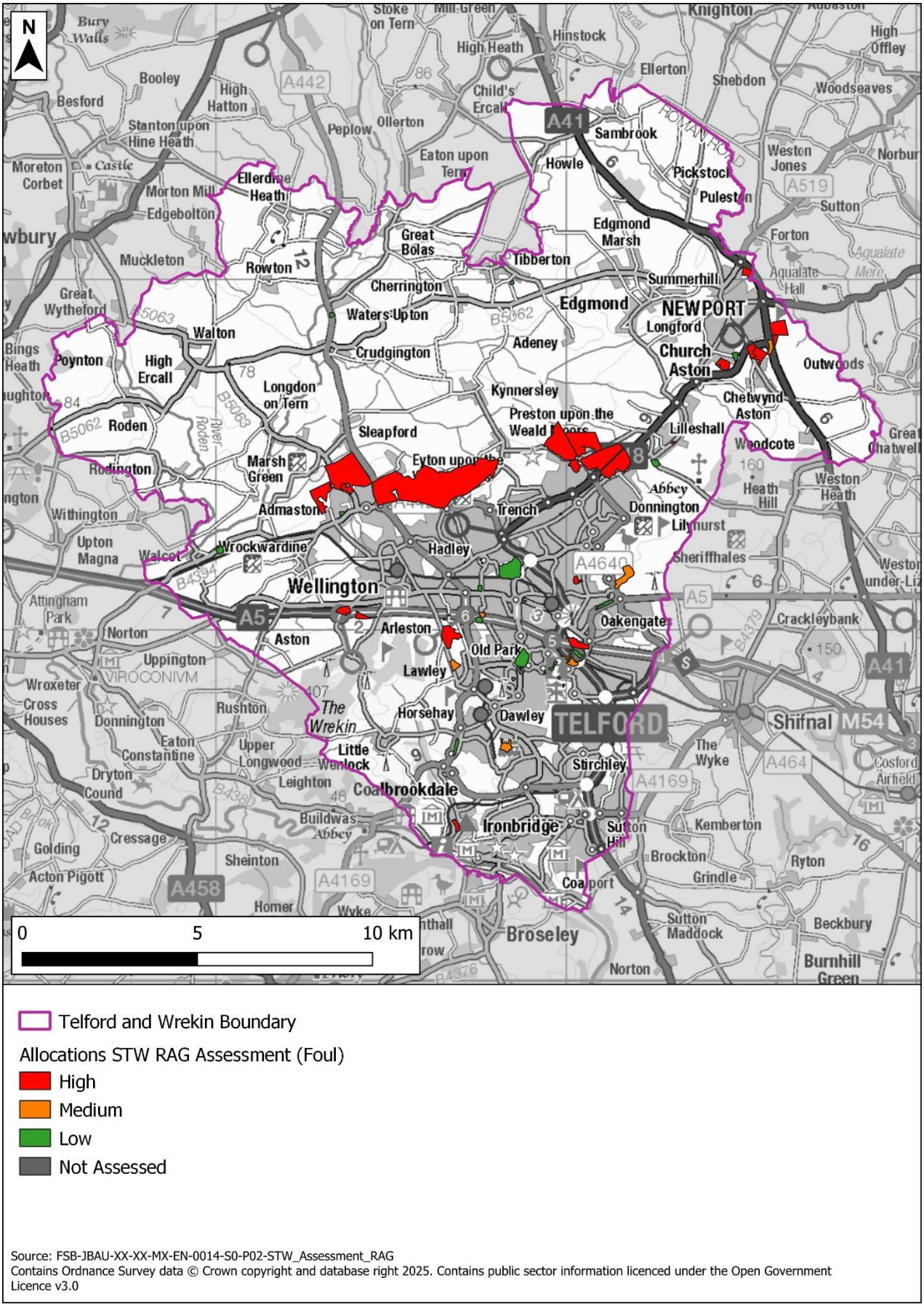


Figure 6-1: STW foul sewer network assessment

6.6 Storm overflows

6.6.1 Background

Storm overflows are an essential component in the sewer network – however when they operate frequently, they can cause environmental damage. They occur on combined sewer systems where the sewer takes both foul flow (sewage from homes and offices) and rainwater runoff. In normal conditions all of this flow passes through the sewer network and is treated at a wastewater treatment works.

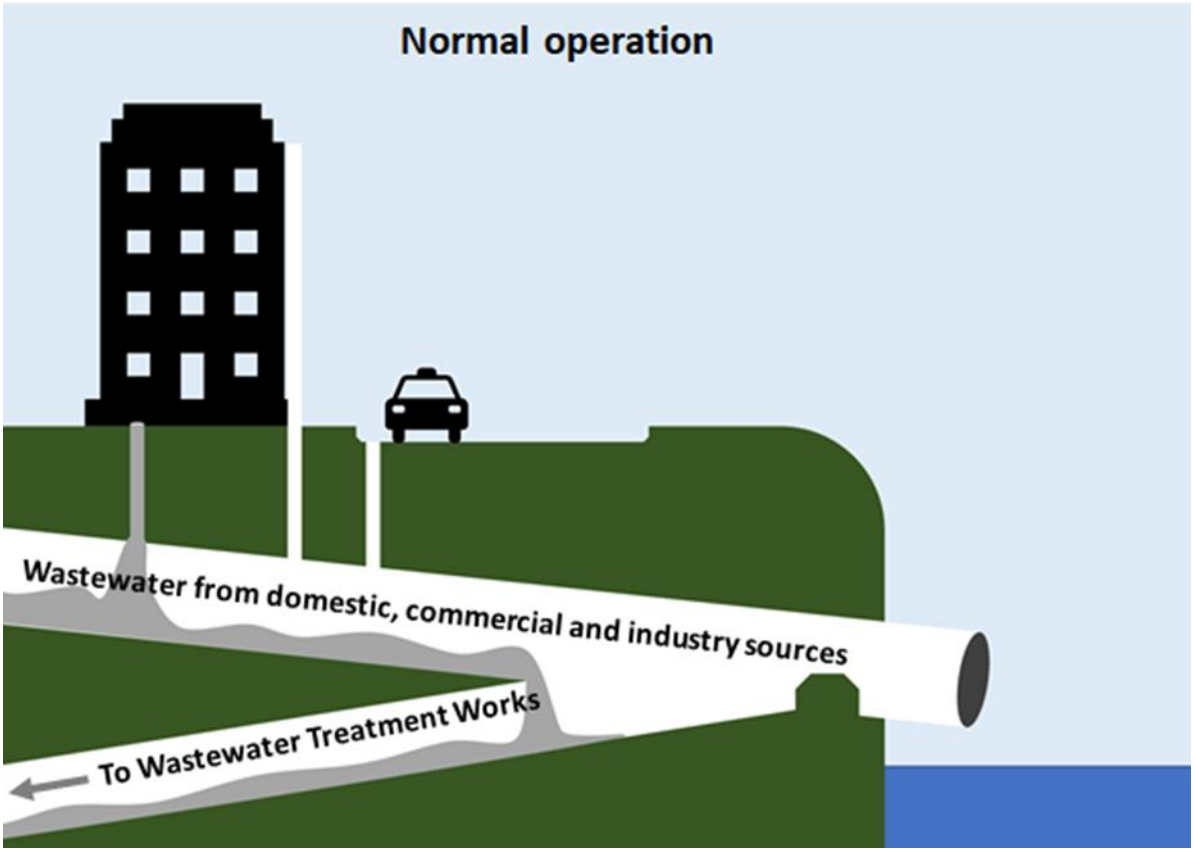


Figure 6-2: Storm overflow operation in normal conditions

In periods of exceptional rainfall, the capacity in a combined sewer may be used up by the additional flow from rooftops and storm drains. Once the capacity is exceeded, wastewater would back up into homes, businesses and on to roads. A storm overflow acts as a relief valve, preventing this from happening.

Storm overflows become problematic when they operate frequently in moderate or light rainfall, or for long periods as a result of groundwater infiltration in the sewerage system – possibly in breach of their permit.

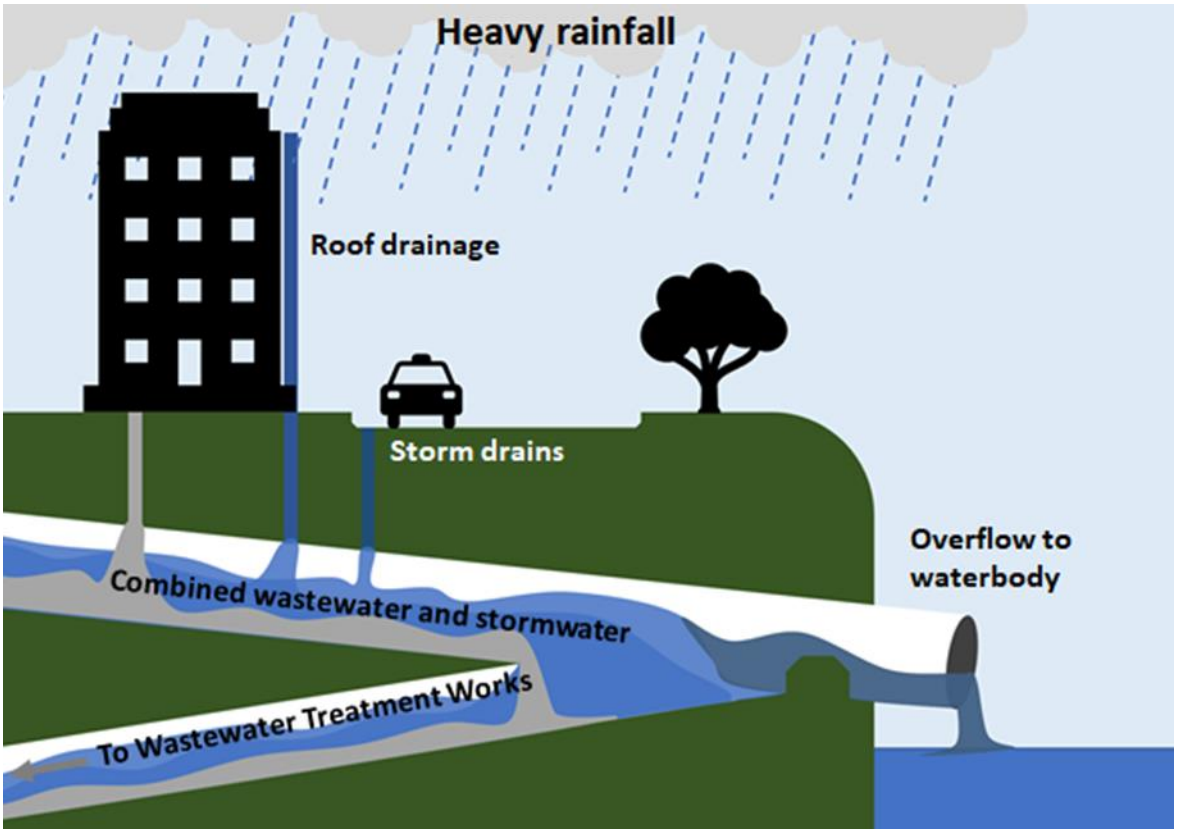
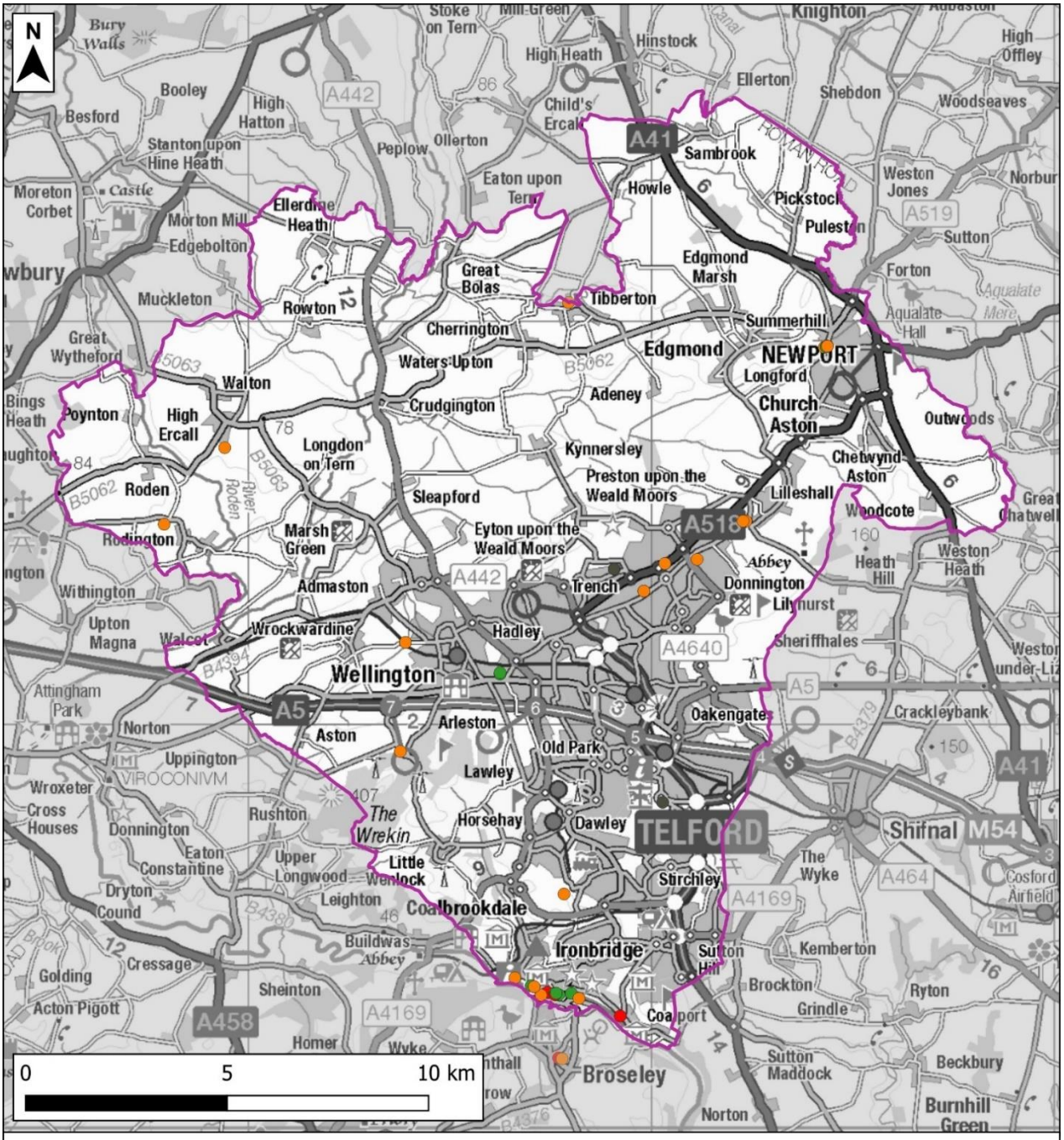


Figure 6-3: Storm overflow operations in exceptional rainfall event

6.6.2 Storm overflow assessment

The Environment Act now requires water companies to report and monitor storm overflows as well as reduce the harm caused to the rivers they discharge to.



Source: FSB-JBAU-XX-XX-MX-EN-0009-S0-P02-Network_EDM_RAG

Figure 6-4 below shows the location of the 47 storm overflows on the wastewater network. Further details can be found in Appendix A.

The Storm Overflow Taskforce, made up of Defra, the EA, Ofwat, Consumer Council for Water, Blueprint for Water and Water UK, has agreed a long-term goal to end the damaging pollution caused by the operation of storm overflows. An important component of this is the monitoring of overflows, and a target has been set to monitor the frequency and duration of operation at all storm overflows by 2023 (Environment Agency i, 2023). This is called Event Duration Monitoring (EDM). The EDM dataset (which contains performance data on the 16,639 storm overflows monitored in 2021) has been used to provide information on storm overflows in Telford and Wrekin. The EA have set a threshold of 60 operations per year above which a storm overflow should be investigated (if based on one year of data, the threshold is 50 for two years data and 40 for three years data).

Table 6-1: shows the RAG rating used for assessing EDM data from the Environment Agencies Storm Overflow Assessment Framework.

Table 6-1: Definition of RAG scoring applied.

Sewer Overflows RAG Score	Number of operations per year (average of available data)	Commentary
Green	0-10	Overflow is currently operating within the long-term (2050) target. Need to ensure that this is maintained in the long-term considering upstream development, climate change and urban creep.
Amber	11 - threshold for individual storm overflow	An investigation is not required at present, but improvements will need to be made in the network and/or catchment to meet the long-term target.
Red	Above threshold	The overflow may already be operating beyond the threshold which would trigger an investigation. Upstream development could further increase the discharge frequency, so mitigation should be required prior to significant development.

Six storm overflows are currently operating at a level exceeding the threshold for further investigation:

- Broseley- Cockshutt Lane (CSO)
- Broseley- Dark Lane (CSO)
- Doseley- Holywell Lane (SPS)
- Ironbridge- Severnside (SPS)
- Ironbridge (Shaft) SPS and Ladywood (Ironbridge Shaft (TPS))
- Madeley- Park Avenue (CSO)

The remaining 41 storm overflows are operating below the threshold for further investigation, however, it is important that development does not increase the frequency or duration of operation. Both Broseley storm overflows (Cockshut Lane and Dark Lane) are on the southside of the River Severn, and would only serve new development within Shropshire, not within Telford & Wrekin.

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems, and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Table 6-2: summarises the performance of the storm overflows on the network in Telford and Wrekin. All other storm tank overflow information can be found in Appendix A.

Table 6-2: Storm overflow operation in 2020 - 2023 that exceed the annual threshold.

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Number of operations average*
BROSELEY - COCKSHUTT LANE (CSO)	S/02/21005/O	92	180.33	23	29.62	52	80.22	55.67
BROSELEY - DARK LANE (CSO)	S/02/21268/O	0	0	0	0	108	225.37	108
DOSELEY - HOLYWELL LANE (SPS)	S/02/55806/O	213	1238.06	59	217.14	20	153.59	97.33
IRONBRIDGE - SEVERNSIDE (SPS)	TSC3863	109	168.55	Not assessed	Not assessed	Not assessed	Not assessed	109
IRONBRIDGE (SHAFT) SPS AND LADYWOOD (IRONBRIDGE SHAFT (TPS))	S/02/56046/O	0	0	0	0	60	446.03	60
MADELEY - PARK AVENUE (CSO)	S/02/55675/O	145	1438.06	0	0	0	0	145

*Averages from the annual data available

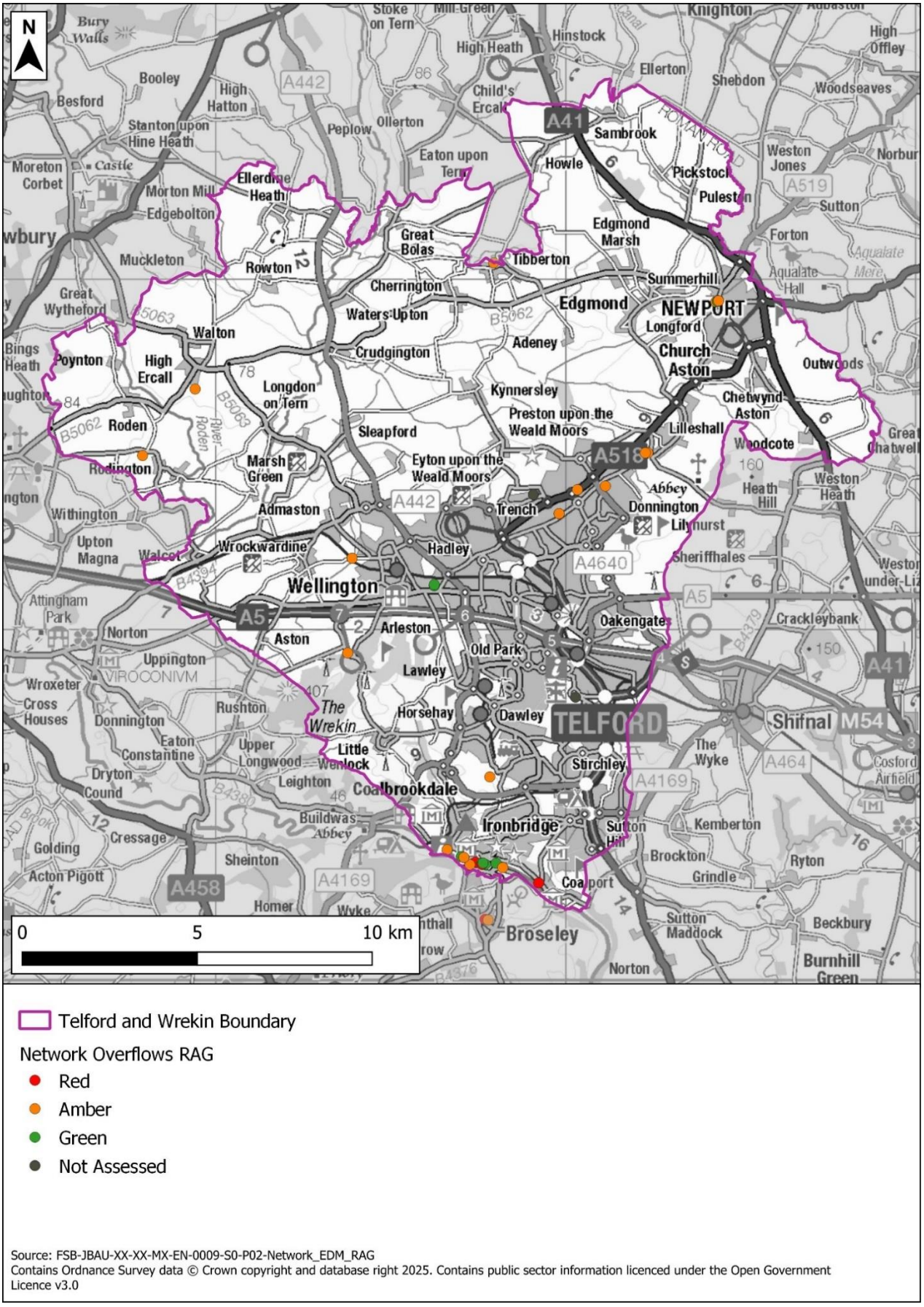


Figure 6-4: Location of network storm overflows around Telford and Wrekin.

6.7 Conclusions

Developments in the area where there is limited wastewater network capacity will increase pressure on the network. Subsequently, this will increase risk of a detrimental impact on existing customers and increasing likelihood of storm overflows (where present).

47 network overflows serve Telford and Wrekin. Six storm overflows are currently operating above the threshold for further investigation:

- Broseley- Cockshutt Lane (CSO)
- Broseley- Dark Lane (CSO)
- Doseley- Holywell Lane (SPS)
- Ironbridge- Severnside (SPS)
- Ironbridge (Shaft) SPS and Ladywood (Ironbridge Shaft (TPS))
- Madeley- Park Avenue (CSO)

There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems, and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

6.8 Recommendations

Table 6-3: Recommendations for wastewater network

Actions	Responsibility	Timescale
Early engagement between Developers, TWC and STW is required to ensure that where upgrades to infrastructure is required, it can be planned in by STW.	TWC Developers STW	Ongoing
Take into account wastewater infrastructure constraints in phasing development in partnership with the sewerage undertaker	TWC STW	Ongoing
Developers will be expected to work with the sewerage undertaker closely and early in the planning promotion process to develop an outline foul Drainage Strategy for sites to the satisfaction of the LPA that the development will not increase sewer flooding or the frequency or duration of storm overflow operation. The Outline Foul Drainage strategy should set out the following: What – What is required to serve the site Where – Where are the assets / upgrades to be located When – When are the assets to be delivered (phasing) Which – Which delivery route is the developer	Developers STW	Ongoing

Actions	Responsibility	Timescale
going to use s104 s98 s106 etc. The Outline Drainage Strategy should be submitted as part of the planning application submission, and where required, used as a basis for a drainage planning condition to be set.		
Developers will be expected to demonstrate to the Lead Local Flood Authority (LLFA) that surface water from a site will be disposed using a sustainable drainage system (SuDS) with connection to foul sewers seen as the last option. New connections for surface water to foul sewers will be resisted by the LLFA. Where a surface water connection is proposed to the public sewerage network, it should be demonstrated to Severn Trent Water that there is no other technically feasible option by selecting options as high as possible within the surface water hierarchy.	Developers LLFA STW	Ongoing

7 Wastewater treatment

7.1 Introduction

There are 27 WwTWs within Telford and Wrekin, all of which are operated by Severn Trent Water. Of these, 16 are expected to serve growth within the Local Plan period.

The location of these WwTWs is shown in Figure 7-1 below.

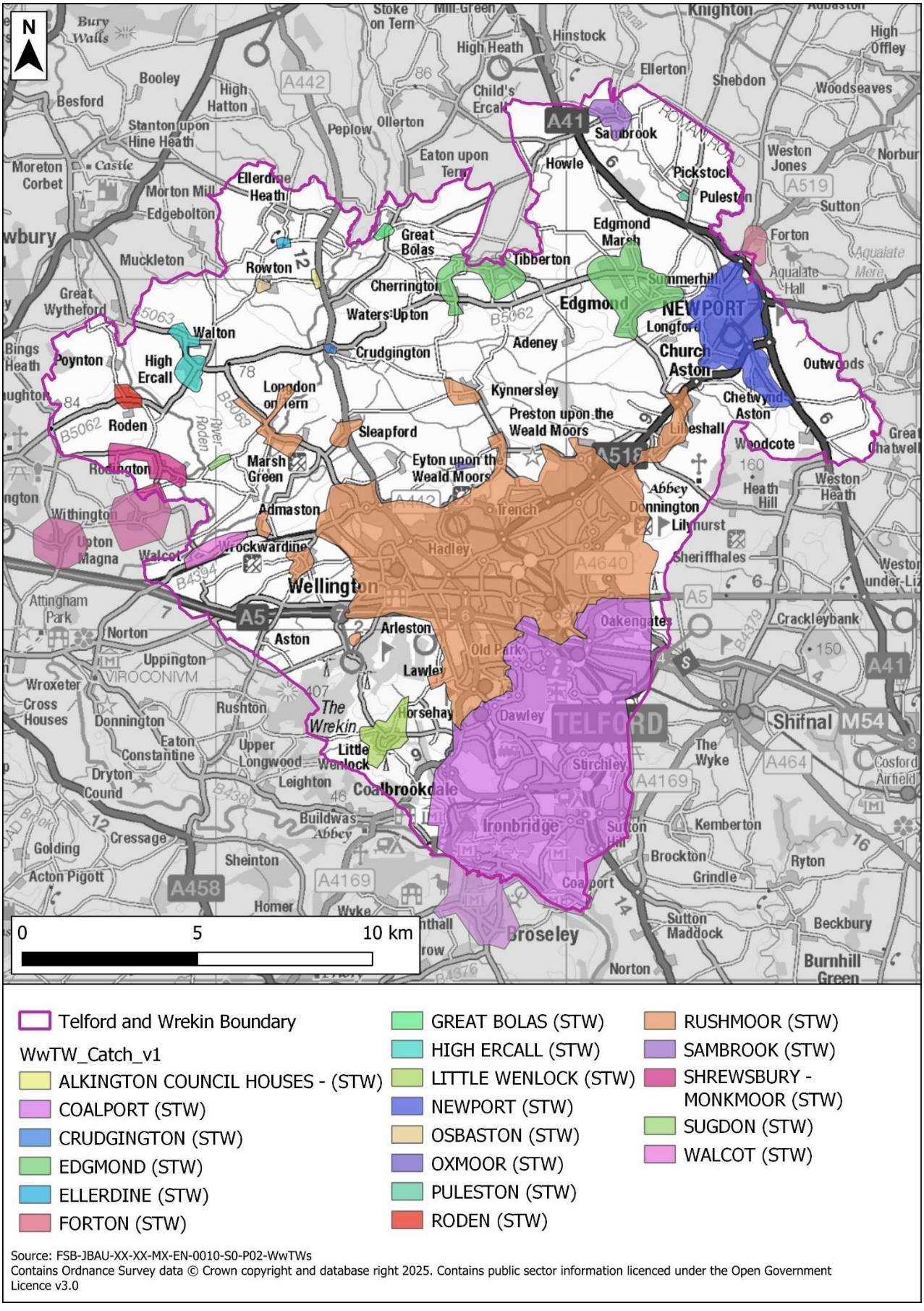


Figure 7-1: Location of WwTW catchments in Telford and Wrekin

7.2 Wastewater Treatment Works Flow Permit Assessment

7.2.1 Introduction

New residential developments and new employment land add pressure to the existing treatment works. An assessment is required to identify the available capacity within the existing WwTWs, and the potential to upgrade overloaded systems to accommodate future growth. The scale and cost of upgrading works may vary significantly depending upon the location of the development in relation to the network itself and the receiving WwTW.

The Environment Agency is responsible for regulating sewage discharge releases via a system of Environmental Permits (EPs). Monitoring for compliance with these permits is the responsibility of both the EA and the plant operators. Figure 7-2 summarises the different types of wastewater releases that might take place, although precise details vary from works to works depending on the design.

During dry weather, the final effluent from the Wastewater Treatment Works (WwTW) should be the only discharge (1). With rainfall, the storm tanks fill and eventually start discharging to the watercourse (2) and Combined Sewer Overflows (CSOs) upstream of the storm tanks start to operate (3). The discharge of storm sewage from treatment works is allowed only under conditions of heavy rain or snow melt, and therefore the flow capacity of treatment systems is required to be sufficient to treat all flows arising in dry weather and the increased flow from smaller rainfall events. After rainfall, storm tanks should be emptied back to full treatment, freeing their capacity for the next rainfall event.

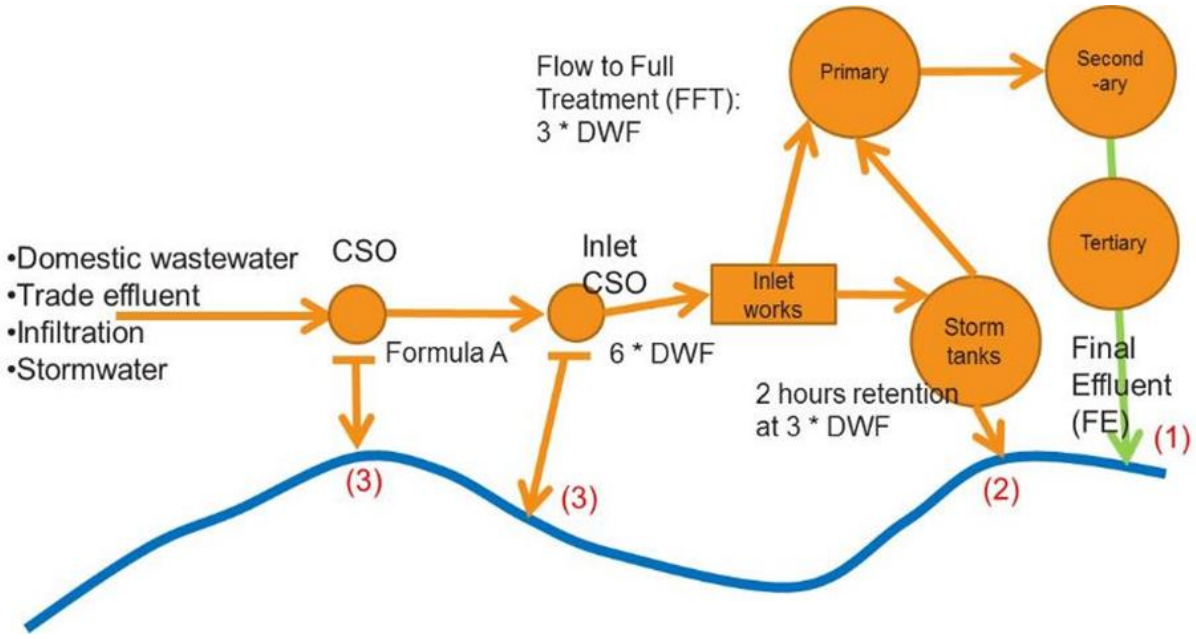


Figure 7-2: Overview of typical combined sewerage system and WwTW discharges

Environmental permits are used alongside water quality limits as a means of controlling the pollutant load discharged from a water recycling centre to a receiving watercourse. Sewage flow rates must be monitored for all WwTW where the permitted discharge rate is greater than 50 m^3/day in dry weather.

Permitted discharges are based on a statistic known as the Dry Weather Flow (DWF). As well as being used in the setting and enforcement of effluent discharge permits, the DWF is used for WwTW design, as a means of estimating the 'base flow' in sewerage modelling and for determining the flow at which discharges to storm tanks will be permitted by the permit (Flow to Full Treatment, FFT).

WwTW Environmental Permits also consent for maximum concentrations of pollutants, in most cases Suspended Solids (SS), Biochemical Oxygen Demand (BOD) and Ammonia (NH4). Some works (usually the larger works) also have permits for Phosphorous (P). These are determined by the Environment Agency with the objective of ensuring that the receiving watercourse is not prevented from meeting its environmental objectives, with specific regard to the Chemical Status element of the Water Framework Directive (WFD) classification.

Increased domestic population and/or employment activity can lead to increased wastewater flows arriving at a WwTW. Where there is insufficient headroom at the works to treat these flows, this could lead to failures in flow consents.

Areas not covered by catchments shown in Figure 7-1 may not have an existing public sewer system. Where this is the case, small developments in more rural areas may be suitable for on-site treatment and discharge, however the Environment Agency will not usually permit this where there is a public sewerage system within a distance calculated as 30m per dwelling from any part of the site boundary.

7.3 Methodology

Severn Trent Water were provided with the list of proposed development sites and the potential housing numbers for each site. STW were then invited to provide an assessment of the receiving WwTW and provide any additional comments about the impacts of the development. An assessment of receiving WwTW was not provided, but the impact on foul sewerage infrastructure was provided.

A parallel assessment of WwTW capacity was carried out using measured flow data supplied by the water companies. The process was as follows:

- STW provided their Dry Weather Flow (DWF) statistics, and from this the 20th percentile (80% exceedance flow) for 2021-2023 was calculated. The flow data was processed to remove zero values and low outlier values which would artificially reduce the measured DWF.
- Preferred allocations, windfall and existing commitments were assigned to a WwTW using the sewerage drainage area boundaries provided by STW.
- For each residential site, the future DWF was calculated using the occupancy rates and per-capita consumption values obtained from the Water Resource Management Plans, and the assumption that 95% of water used is returned to sewer. Permitted headroom was used as a substitute for actual designed hydraulic capacity for each WwTW being assessed.

- For employment sites, the net floorspace provided by TWC was used to estimate the number of employees using the employment use class, and standard densities from the Employment Density Guide 3rd Edition (Homes & Communities Agency, 2015). A standard figure of 0.1m^3/employee/day was then used to estimate water demand on each site.
- The current and estimated future flow was then compared to the permitted flow obtained from the Environment Agency "Consented Discharges to Controlled Waters with Conditions" database.
- Headroom (expressed the number of homes that could be accommodated before the permit is exceeded) was estimated by calculating the difference between the current and permitted flow and using the occupancy and per capita consumption for the WRZ the sewer catchment is in to provide an estimate for the number of houses.
- A red/amber/green score was then assigned to each WwTW based on whether it was likely to exceed its permitted flow.

For each site, the future DWF was calculated using the occupancy rates and per-capita consumption values obtained from the Water Resource Management Plans (Table 7-1:), and the assumption that 95% of water used is returned to sewer. Permitted headroom was used as a substitute for actual designed hydraulic capacity for each WwTW being assessed.

Table 7-1: Values used in water demand calculations.

Water Company	Water Resource Zone	Occupancy rate (persons per dwelling)	Per capita consumption (m^3/person/day)
Severn Trent Water	North Staffordshire	2.1	0.111
Severn Trent Water	Shelton	2.1	0.111
Severn Trent Water	Staffordshire	2.2	0.112
Severn Trent Water	Whitchurch and Wem	2.1	0.121

The demand forecast contains all the expected development served by WwTWs within or shared with TWC. This included allocations, sites already in the planning system, windfall, and neighbouring authority growth.

The following red / amber / green traffic light definition was used by STW to score each site:

LOW - GREEN Capacity to serve the proposed growth	MEDIUM - AMBER Infrastructure and/or treatment work upgrades are required to serve proposed growth, but no significant constraints to the provision of this infrastructure have been identified	HIGH - RED Infrastructure and/or treatment upgrades will be required to serve proposed growth. Major constraints have been identified

The preferred option sites were also provided to STW for them to assess the impact on their WwTWs using the RAG criteria with comments where appropriate.

7.4 Results

Table 7-2: WwTW capacity assessment

WwTW	JBA Assessment	Estimated spare hydraulic capacity following planned development (number of dwellings)
COALPORT (STW)	Green	27
CRUDGINGTON (STW)	N/A	N/A
EDGMOND (STW)	Amber	-5
ELLERDINE (STW)	N/A	N/A
HIGH ERCALL (STW)	Green	53
LITTLE WENLOCK (STW)	N/A	N/A
MONKMOOR (STW)	Green	1247
NEWPORT (STW)	Amber	-237
OSBASTON (STW)	Green	53
RODEN (STW)	Green	13
RUSHMOOR (STW)	Green	510
WALCOT (STW)	N/A	N/A
SUGDON (STW)	N/A	N/A
OXMOOR (WRW)	N/A	N/A
SAMBROOK (WRW)	N/A	N/A
WATERS UPTON SEWAGE TREATMENT WORKS	N/A	N/A

Edgmond and Newport WwTWs are expected to exceed their flow permit during the Local Plan period and may require an increase in their permit and / or upgrades to treatment

processes in order to serve growth. In addition to hydraulic capacity, it is important to consider water quality considerations which are discussed in Sections 9 and 11. For WwTWs that need upgrading, typically around 5 years is required for permit changes to be agreed, funding obtained for the next AMP and major works upgrades to be completed. It is therefore important for TWC to engage early with STW to ensure that any required infrastructure is in place prior to development being occupied.

7.5 Storm tank overflows

There are 13 storm tank overflows that serve the Telford and Wrekin council area. Table 7-3 and Figure 7-3 present the performance of storm tank overflows at WwTWs, also referred to as Sewage Treatment Works (STW), in Telford and Wrekin that exceed the annual threshold. A summary of all storm tank overflows is presented in Appendix B.

Coalport (STW) has an average of 49 operations over the three years of data available. Great Bolas (STW) is on the verge of exceeding the annual threshold with a three-year average of 39.67.

Where a storm tank overflow is operating in periods of moderate or light rainfall, or even in dry conditions it indicates either an infiltration problem within the network, or that the WwTW or its storm tanks are undersized for the population served. Further development within a catchment that has a poorly performing storm tank overflow is likely to exacerbate the issue.

Whilst the frequency of operation of overflows on storm tanks in the study area is below the threshold for investigation, it is important that development does not increase this frequency. The local plan can contribute to this by encouraging the use of SuDS to divert storm water away from the sewer network, reducing the volume that reaches the WwTW.

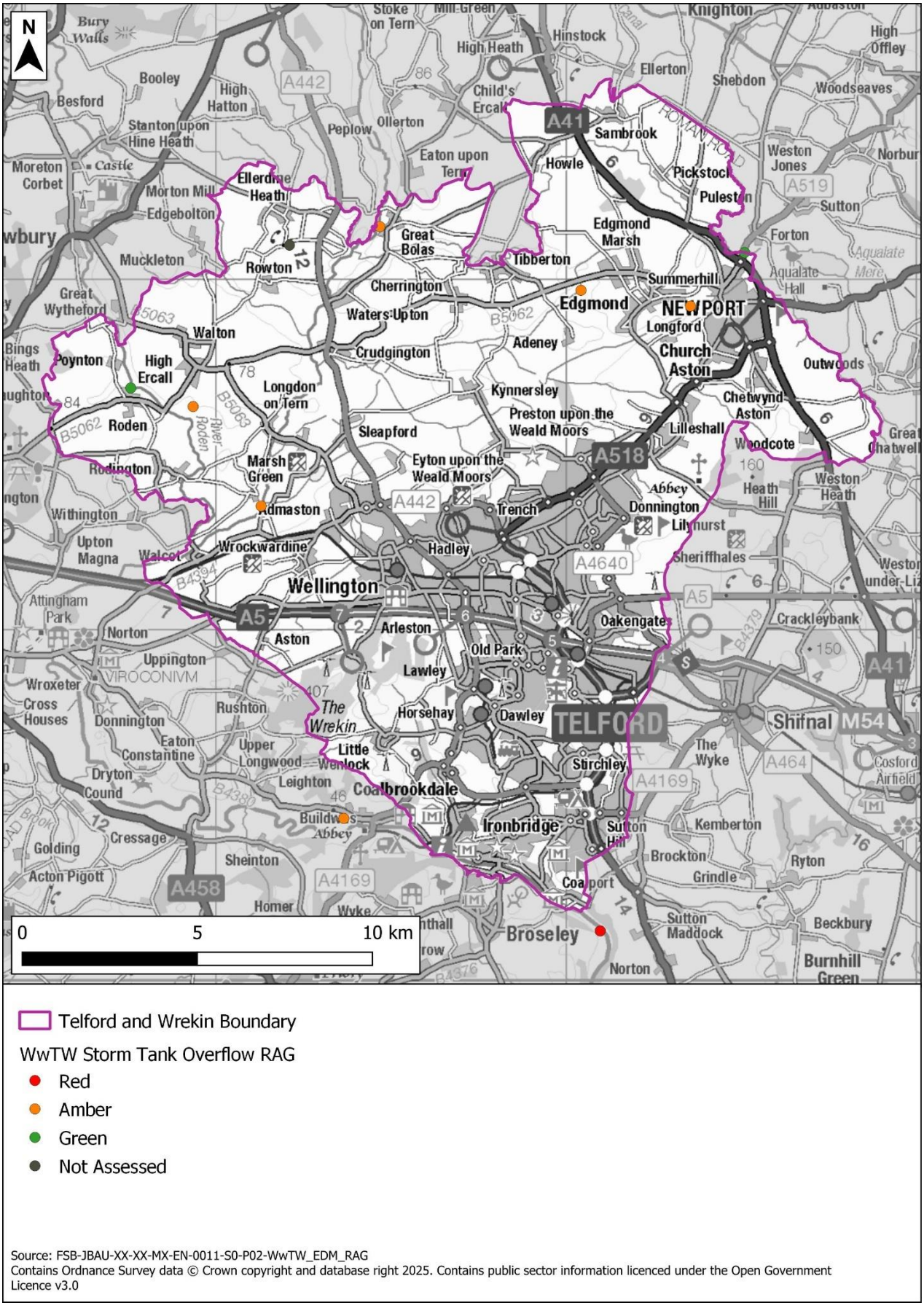


Figure 7-3: Location of storm tank overflows in Telford and Wrekin

Table 7-3 WwTW storm overflow operation in 2020-2023 that exceed the annual threshold.

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average*
COALPORT (STW)	S/02/56070/R	28	60.89	48	45.14	71	702.28	49

*Averages from the annual data available.

7.6 Conclusions

There are 16 WwTWs that may serve growth during the plan period in Telford and Wrekin. Two of these (Edgmond and Newport) are expected to exceed their flow permit during the Local Plan period (subject to final sites selected for the Local Plan) and will require an increase in their permit and / or upgrades to treatment processes in order to serve growth. TWC should engage early with STW to ensure that any required upgrades are in place prior to occupation of development. In addition to hydraulic capacity, it is important to consider water quality considerations which are discussed in section 8.1 and 10. The storm tank overflow at Coalport WwTW is currently operating at a level that exceeds the threshold for investigation by the EA.

7.7 Recommendations

Table 7-4: Recommendations for wastewater treatment

Action	Responsibility	Timescale
Consider the available WwTW capacity when phasing development going to the same WwTW.	TWC STW	Ongoing
Provide Annual Monitoring Reports to STW detailing projected housing growth.	TWC	Ongoing
STW to assess growth demands as part of their wastewater asset planning activities during the next AMP period to enable growth to come forward and feedback to the Council if concerns arise.	STW TWC	During AMP8 (2025-2030)

8 Odour Assessment

8.1 Introduction

Where new developments encroach upon an existing Wastewater Treatment Works (WwTW), odour from that site may become a cause for nuisance and complaints from residents. Managing odour at WwTWs can add considerable capital and operational costs, particularly when retro fitted to existing WwTWs. National Planning Policy Guidance recommends that plan-makers consider whether new development is appropriate near to sites used (or proposed) for water and wastewater infrastructure, due to the risk of odour nuisance. Sewerage undertakers recommend that an odour assessment may be required if the site of a proposed development is close to a WwTW and is encroaching closer to the WwTW than existing urban areas. The general principle is that allocated sites should not be located where a suitable standard of amenity cannot be achieved, or the continuous operation of an existing WwTW would be prejudiced.

Because of the change to sites from the Phase 1 WCS undertaken by JBA, this odour assessment section will act as an update.

8.2 Methodology

Sewerage undertakers recommend that an odour assessment may be required if the site of a proposed development is close to a WwTW and is encroaching closer to the WwTW than existing urban areas. The actual odour experienced is dependent on the size of the works, the type of treatment processes present, and the age and condition of the site. There is also significant variation due to current weather conditions.

Another important aspect is the location of the site in respect to the WwTW. Historic wind direction records for sites around Telford & Wrekin indicate that the prevailing wind is from west south-west (Shawbury) to west (Cosford Royal Air Force base) recorded at METAR weather stations (METAR, 2024).

A GIS assessment was carried out to identify areas that the sewerage undertaker considers may be at risk from odour nuisance due to encroachment on an existing WwTW. For Severn Trent Water, this is defined as development sites less than 800m from the WwTW and encroaching closer to the WwTW than existing urbanised areas. If there are no existing houses close to a WwTW it is more likely than an odour impact assessment is needed.

8.3 Results

There is one allocation within 800m of a WwTW. This is presented in Table 8-1 below. The location of this site is also shown in Figure 8-1. An odour assessment is recommended at this site as part of the planning process (to be funded by the developer). Consideration should also be given to the layout of this site where only part of the site boundary lies within the 800m buffer zone. In some cases, only part of a larger site may be at risk, in which case zoning of lower impact land uses (e.g., landscaping, amenity, parking) closer to sources of odour may be sufficient to address this risk.

Table 8-1: Sites at risk of nuisance odour from WwTWs

Site ID	Site name	WwTW
419	Land South of Plough Lane, Newport	Forton

Site 419, (Land South of Plough Lane, Newport), is located 550m south of Forton WwTW. The site is entirely located within the odour buffer.

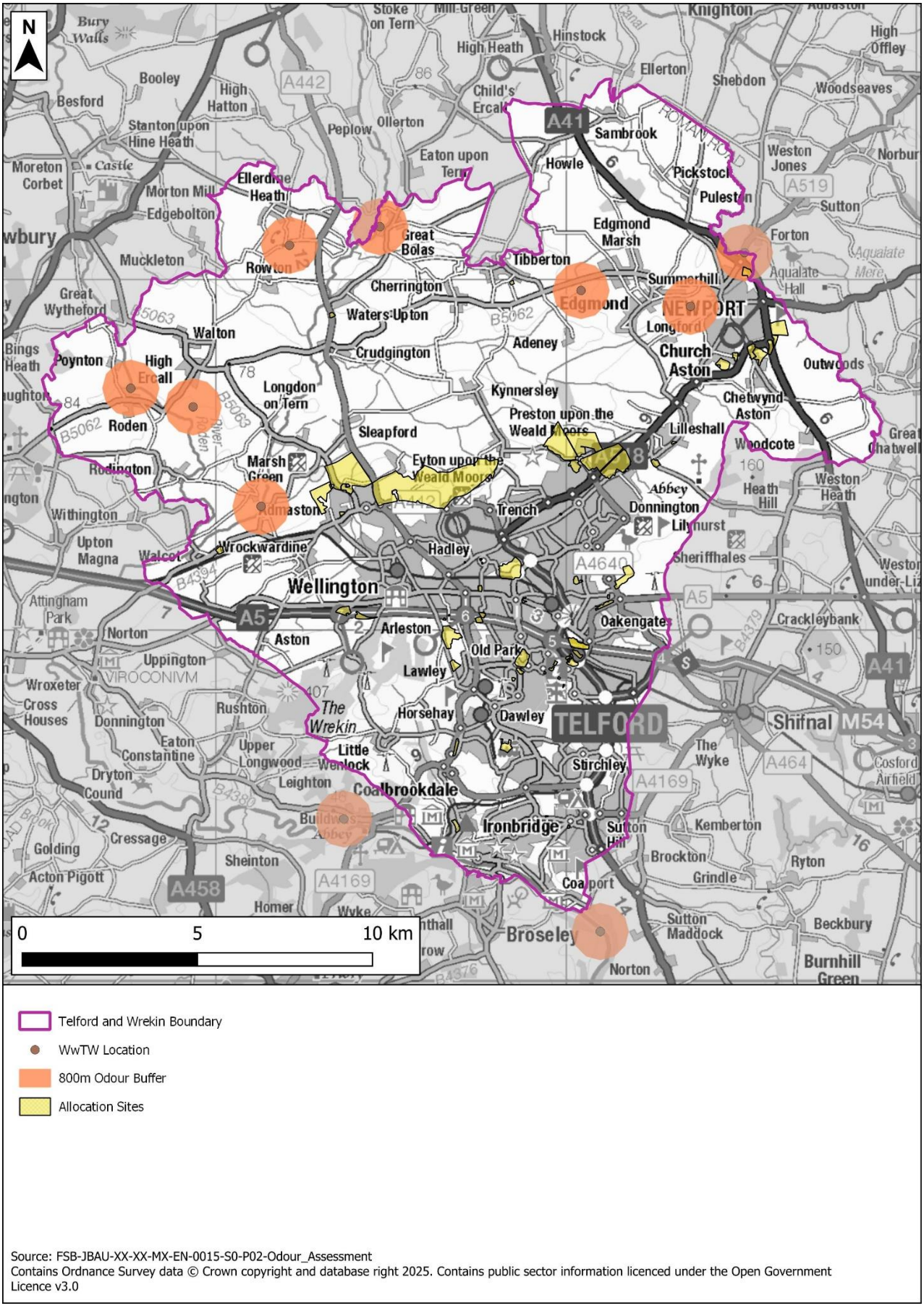


Figure 8-1: Odour assessment buffer zones

8.4 Conclusion

The odour screening assessment has identified one site, (Land South of Plough Lane, Newport), within 800m of a WwTW where an odour impact assessment would be recommended. This should be funded by the developer.

8.5 Recommendations

Table 8-2: Recommendations from the odour assessment

Actions	Responsibility	Timescale
Consider odour risk in the site identified to be potentially at risk from nuisance odour.	TWC	Ongoing
Carry out an odour assessment for site identified as being at risk of nuisance odour.	Developers	Ongoing

9 Water Quality

9.1 Introduction

An increase in the discharge of effluent from Wastewater Treatment Works (WwTW) because of development and growth in the area in which they serve can lead to a negative impact on the quality of the receiving watercourse. Under the Water Framework Directive (WFD), a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for individual elements assessed).

It is Environment Agency (EA) policy to model the impact of increasing effluent volumes on the receiving watercourses. Where the scale of development is such that a deterioration is predicted, a variation to the Environmental Permit (EP) may be required for the WwTW to improve the quality of the final effluent, so that the increased pollution load will not result in a deterioration in the water quality of the watercourse. This is known as "no deterioration" or "load standstill". The need to meet river quality targets is also taken into consideration when setting or varying a permit.

The Environment Agency operational instructions on water quality planning and no-deterioration are currently being reviewed. Previous operational instructions (Environment Agency d, 2012) (now withdrawn) set out a hierarchy for how the no-deterioration requirements of the WFD should be implemented on inland waters. The potential impact of development should be assessed in relation to the following objectives:

- Could the development cause a greater than 10% deterioration in water quality? This objective ensures that all the environmental capacity is not taken up by one stage of development and there is sufficient capacity for future growth.
- Could the development cause a deterioration in WFD class of any element assessed? This is a requirement of the Water Framework Directive to prevent a deterioration in class of individual contaminants. The "Weser Ruling" (European Court of Justice, 2015) by the European Court of Justice in 2015 specified that individual projects should not be permitted where they may cause a deterioration of the status of a water body. If a water body is already at the lowest status ("bad"), any impairment of a quality element was considered to be a deterioration. Emerging practice is that a 3% limit of deterioration is applied.
- Could the development alone prevent the receiving watercourse from reaching Good Ecological Status (GES) or Potential? Is GES possible with current technology or is GES technically possible after development with any potential WwTW upgrades.

The overall WFD classification of a water body is based on a wide range of ecological and chemical classifications. This assessment focuses on three physico-chemical quality elements; Biochemical Oxygen Demand (BOD), Ammonia, and Phosphate as set out in the EA guidance (Environment Agency e, 2014).

BOD – Biochemical Oxygen Demand

BOD is a measure of how much organic material – sewage, sewage effluent or industrial effluent – is present in a river. It is defined as the amount of oxygen taken up by micro-organisms (principally bacteria) in decomposing the organic material in a water sample stored in darkness for 5 days at 20°C. Water with a high BOD has a low level of dissolved oxygen. A low oxygen content can have an adverse impact on aquatic life.

Ammonia

Nitrogen is an essential nutrient required by all plants and animals for the formation of amino acids. In its molecular form nitrogen cannot be used by most aquatic plants, and so it is converted into other forms. One such form is ammonia (NH_3). This may then be oxidized by bacteria into nitrate (NO_3) or nitrite (NO2). Ammonia may be present in water in either the unionized form NH_3 or the ionized form NH_4. Taken together these forms care called Total Ammonia Nitrogen.

Although ammonia is a nutrient, in high concentrations it can be toxic to aquatic life, in particular fish, affecting hatching and growth rates.

The main sources in rivers include agricultural sources, (fertilizer and livestock waste), residential sources (ammonia containing cleaning products and septic tank leakages), industrial processes and WwTWs.

Phosphate

Phosphorus is a plant nutrient and elevated concentrations in rivers can lead to accelerated plant growth of algae and other plants. Its impact on the composition and abundance of plant species can have adverse implications for other aspects of water quality, such as oxygen levels. These changes can cause undesirable disturbances to other aquatic life such as invertebrates and fish.

Phosphorus (P) occurs in rivers mainly as Phosphate (PO_4), which are divided into Orthophosphates (reactive phosphates), and organic Phosphates.

Orthophosphates are the main constituent in fertilizers used in agriculture and domestic gardens and provide a good estimation of the amount of phosphorus available for algae and plant growth and is the form of phosphorus that is most readily utilized by plants.

Organic phosphates are formed primarily by biological processes and enter sewage via human waste and food residues. Organic phosphates can be formed from orthophosphates in biological treatment processes or by receiving water biota.

Although it is phosphorus in the form of phosphates that is measured as a pollutant, the term phosphorus is often used in water quality work to represent the total phosphorus containing pollutants.

9.2 Water quality modelling

SIMCAT is used by the Environment Agency to model water bodies and identify where permit changes are needed to prevent deterioration or improve water quality as well as

supporting decision making to guide development to locations where environmental deterioration will be reduced. SIMCAT is a 1D model which represents inputs from both point-source effluent discharges and diffuse sources, and the behaviour of solutes in the river.

SIMCAT can simulate inputs of discharge and water quality data and statistically distribute them from multiple effluent sources along the river reach. It uses the Monte Carlo method for distribution that randomly models up to 2,500 boundary conditions. The simulation calculates the resultant water quality as the calculations cascade further downstream.

Once the distribution results have been produced, an assessment can be undertaken on the predicted mean and ninetieth percentile concentrations or loads compared to the Environmental Quality Standards.

The study area is covered by the Severn SIMCAT model.

Within SIMCAT, the determinands modelled were Biochemical Oxygen Demand (BOD), Ammonia (NH4) and Phosphorus (P). In fresh waterbodies, phosphate is usually the limiting nutrient for algal growth. However, in marine environments, nitrogen is considered to be the limiting nutrient.

The methodology followed is summarised in Figure 9-1 below. In this flow chart, all of the questions in the top row must be answered.

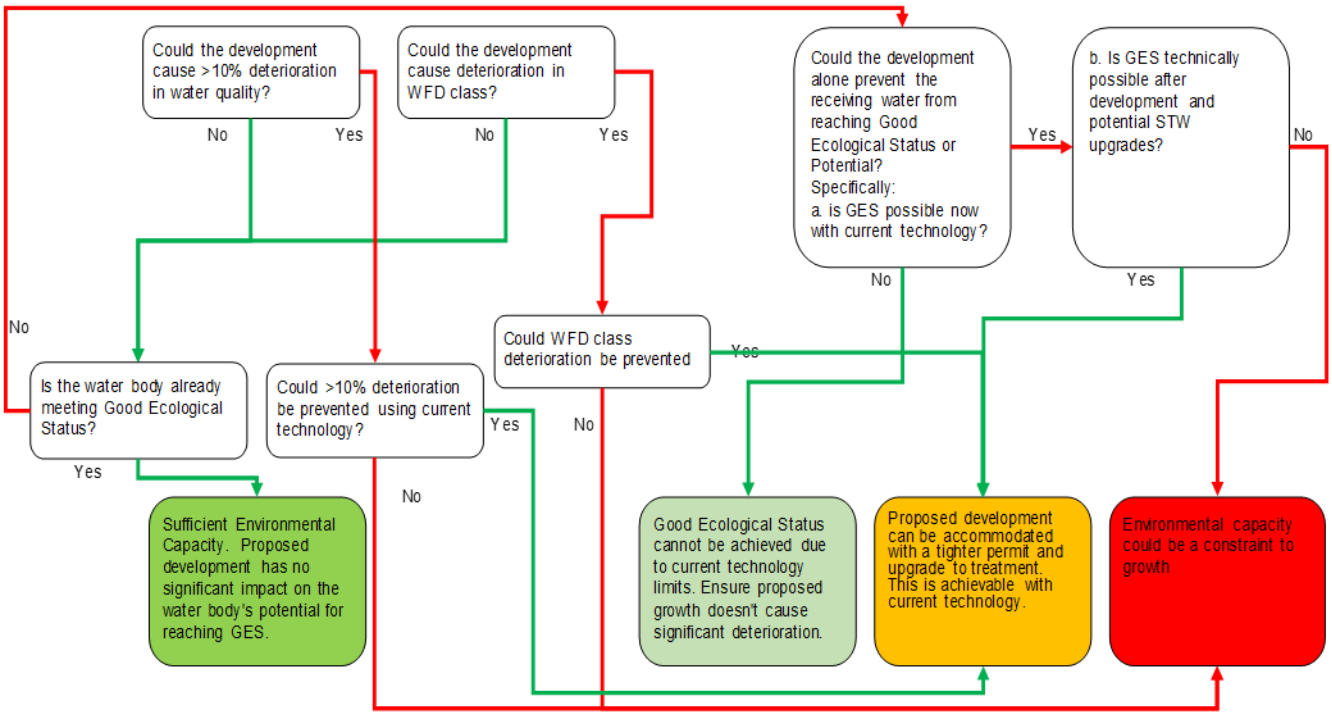


Figure 9-1: Water quality impact assessment following EA guidance

Where modelling indicated that growth may lead to a deterioration in the watercourse, or where the watercourse is not currently meeting at least a 'Good' class for each determinant, the models were used to test whether this could be addressed by applying stricter discharge limits. In such cases, a Technically Achievable Limit (TAL) was considered.

The EA advised that the following permit values are achievable using treatment at TAL, and that these values should be used for modelling all WwTW potential capacity irrespective of the existing treatment technology and size of the works:

- Ammonia (90%ile): 1 mg/l
- BOD (90%ile): 5 mg/l
- Phosphorus (mean): 0.25 mg/l

This assessment did not take into consideration whether it is feasible to upgrade each existing WwTW to TAL due to constraints of costs, timing, space, carbon costs etc.

9.2.1 General approach

The study area is covered by the Severn SIMCAT model developed by the Environment Agency. The models have been largely based on observed flow and quality data for the period 2014-2020. A widespread update of the models, and the resultant recalibration were not within scope of this project. It was therefore agreed with the EA to update just the effluent flow at WwTWs receiving growth in the study area. Consequently, the modelling work presented should be used to identify areas at risk of water quality deterioration, but not for permit setting.

Flow data from the last three years for each WwTW in the study area was supplied by Severn Trent Water (STW) and used to update the model. Several of the WwTWs in the study area already had upgrades completed in AMP6 or planned in AMP7, which would be expected to improve water quality at those locations. These were therefore factored into the model by applying the updated permit limit where it was less than the current discharge in the model. The model was then run in its updated form to set a 2024 baseline. It is expected that further upgrades to WwTWs will be planned in AMP8 (2025-30) which will be defined in the AMP8 WINEP and the business plans for STW. As these documents have not yet been published, AMP8 schemes have not been factored into the modelling.

Additional effluent flow from growth during the Local Plan Update period was added to current flow at WwTWs receiving growth and the model re-run as a future scenario.

Some smaller WwTWs within the model have "descriptive permits" which do not set specific numerical limits for DWF and effluent quality, and these WwTW do not have flow monitoring in place. The models are calibrated to observed water quality measurements and represent the overall water quality in the catchment well, however at a local scale some of these smaller WwTWs are not well represented and do not have discharge data or have pollutant discharges modelled as a load in kilograms rather than an effluent flow and concentration. Sugdon, Sambrook, Ellerdine, Oxmoor, Crudgington, and Walcot WwTWs have descriptive permits. Waters Upton also has a descriptive permit, however, does not discharge to a watercourse in the SIMCAT model. As such no results are available for this WwTW.

No deterioration test

The results from the baseline and future versions of the model were compared to assess the predicted percentage deterioration for each of the modelled determinands. WFD targets

for each river reach were provided by the EA and used to determine if there was a risk of a class deterioration.

Where a deterioration of 10% or greater was predicted or a change in class (considered to be a significant deterioration under WFD) a further test was conducted to see if this deterioration could be prevented by upgrades to treatment processes. This used another version of the model with each WwTW set to operate at their Technically Achievable Limit (TAL).

Good Ecological Status assessment

Where treatment at TAL and reductions in diffuse sources in the present day could improve water quality to achieve Good Ecological Status (GES), it is important to understand whether this could be compromised as a result of future growth within the catchment.

Guidance from the EA suggests breaking this down into two questions:

a) Is GES possible now with current technology?

b) Is GES technically possible after development and any potential WwTW upgrades?

If the answer to questions a) and b) are both ‘Yes’ or both ‘No’ then the development can be assessed as having no significant impact on the water bodies potential for reaching GES, i.e., the development alone is not preventing GES from being achieved. An "amber" score is given where GES could be achieved with improvements in treatment technology reflecting the need for an intervention at that WwTW, but growth is not preventing this. It is given a "yellow" score where a WwTW would need to be upgraded beyond the current technically achievable limit in order to achieve GES, but as for the amber rating it is not growth that is preventing this.

If the answer to a) is ‘Yes’ and the answer for b) is ‘No’ then development is having a significant impact, i.e., before development GES could be achieved with upstream improvements, and after growth the additional effluent from growth prevents GES being achieved - so it is growth that is preventing GES from being achieved leading to a "red" score.

The possible answers are summarised in

Table 9-1.

Run type 9 within SIMCAT was used which assumes that upstream flow at each treatment works is at good ecological status. This simulates improvements being made in upstream water quality. The water quality of the discharge from each WwTW in order to maintain GES is then calculated by the model.

Table 9-1 Possible GES assessment results

Predicted to achieve GES after growth	Could achieve GES today with improvements in upstream water quality? (a)	Could achieve GES in the future with improvements in upstream water quality? (b)	Assessment Result
YES	N/A	N/A	GREEN - Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.
NO	YES	YES	AMBER - Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology.
NO	NO	NO	YELLOW - Good ecological status cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration.
NO	YES	NO	RED - Environmental capacity could be a constraint to growth.

9.2.2 Results

The first test applied compares the future scenario to the baseline and assesses whether a significant deterioration in water quality occurs – either a 10% deterioration in water quality or a deterioration in WFD class. Where, a significant deterioration is predicted, the TAL scenario then assesses whether this deterioration could be prevented by improvements in treatment processes.

Table 9-2: below summarises the results of the water quality assessments. Where a "green" score is given, deterioration was less than 10% for each determinand, and no change in WFD class is predicted. Where an "amber assessment is given, a 10% deterioration or change in WFD class is predicted, but this could be prevented by improvements in treatment technology. In these cases, upgrades may therefore be required at that WwTW or at WwTW upstream.

A "red" assessment would be given where a significant deterioration in water quality is predicted, and it cannot be prevented by improvements in treatment processes.

None of the 15 WwTWs serving growth during the plan period are predicted to experience a significant deterioration. However, a class deterioration is predicted for BOD at Newport WwTW which may deteriorate from High to Good status. This WwTW is already operating below the TAL of 2.86mg/l and also deteriorates in class during the TAL scenario. The percentage deterioration for BOD at this treatment works is 1% and returns to High status just downstream of the treatment works.

In this assessment, improvements in treatment processes have been modelled by assuming the WwTW is operating at TAL. It has not investigated the feasibility of upgrading individual WwTWs. This should be performed by STW who have the detailed knowledge of their assets, and the Environment Agency who are responsible for setting permit limits at WwTW.

Appendix A maps the predicted deterioration in water quality visually for Ammonia, BOD and Phosphate in the future, and the predicted deterioration if WwTWs were performing at the technically achievable limit.

The first set of maps in Appendix E.1 shows the modelled results if wastewater discharges were increased by the volume predicted during the Local Plan period. They show the result at the point of mixing (i.e., where the WwTW discharges) and the results downstream in the river. These are colour coded based on whether deterioration is greater (red) or less than (amber) 10%. Areas where no deterioration is predicted are coloured green.

The second set of maps in Appendix E.2 shows the modelled results in the TAL scenario, where each WwTW has been upgraded to the technically achievable limit. This shows areas where deterioration could not be prevented. In each case this is less than 10%.

The growth stated in Table 9-2: includes recent completions and neighbouring authority growth as well as growth from within Telford and Wrekin.

Table 9-2: Water quality modelling results

WwTW	Housing growth over plan period (dwellings)	Employment growth over plan period (m^2)	Could the development cause a greater than 10% deterioration in water quality for one or more of BOD, Ammonia or Phosphate?	Could the development cause a deterioration in WFD class of any element?	Can a deterioration of >10% or in class be prevented by treatment at TAL?
SHREWSBURY MONKMOOR	277	0	No	No	Yes
RODEN STW	17	0	No	No	Yes
HIGH ERCALL STW	10	0	No	No	Yes
SUGDON (WRW)	2	0	No	No	Yes
SAMBROOK (WR	4	0	No	No	Yes
ELLERDINE (W	7	0	No	No	Yes
OSBASTON STW	1	0	No	No	Yes
OXMOOR (WRW)	16	0	No	No	Yes
EDGMOND STW	111	0	No	No	Yes

WwTW	Housing growth over plan period (dwellings)	Employment growth over plan period (m^2)	Could the development cause a greater than 10% deterioration in water quality for one or more of BOD, Ammonia or Phosphate?	Could the development cause a deterioration in WFD class of any element?	Can a deterioration of >10% or in class be prevented by treatment at TAL?
NEWPORT STW	1189	153,354	No	Yes - (BOD deteriorates from High to Good status)	No - (BOD deteriorates from High to Good with TAL as the discharge from this WwTW is currently better than TAL rating)
CRUDGINGTON	187	0	No	No	Yes
RUSHMOOR STW	12,030	367,466	No	No	Yes
WALCOT (WRW)	641	0	No	No	Yes
LITTLE WENLOCK STW	1	0	No	No	Yes
COALPORT STW	5415	70,240	No	No	Yes

Table 9-3: summarises the results of the GES assessment outlined in section 0. Four different assessments are possible which are shown in

Table 9-1 above.

- If good ecological status is predicted to be achieved within the receiving waterbody following growth during the plan period, a green assessment is given. In this case, it can be said that there is environmental capacity to accommodate growth.
- Where GES is not currently being achieved but could be achieved if upstream water quality were improved, then an amber score is given – growth could be accommodated without preventing a waterbody achieving GES in the future.
- Where GES cannot be achieved either today or in the future, despite upgrades in treatment processes, and improvements in upstream water quality, then a yellow assessment is given – and it can be said that GES cannot be achieved due to the limits of current technology. Growth alone is not predicted to prevent GES being achieved in the future.
- Should GES be achievable today, but not in the future due to growth, a red assessment would be given, and it can be said that environmental capacity could be a constraint to growth, i.e., growth alone could prevent good ecological status being achieved in the future.

Table 9-3: Good Ecological Assessment (GES) results

WwTW	Ammonia assessment	Biochemical Oxygen Demand (BOD) assessment	Phosphate assessment
SHREWSBURY MONKMOOR	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology
RODEN STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology
HIGH ERCALL STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with

WwTW	Ammonia assessment	Biochemical Oxygen Demand (BOD) assessment	Phosphate assessment
	water body's potential for meeting GES.	body's potential for meeting GES.	current technology
SUGDON (WRW)	GES Assessment cannot be undertaken as the effluent concentration is expressed as a load rather than a concentration		
SAMBROOK (WR	GES Assessment cannot be undertaken as the effluent concentration is expressed as a load rather than a concentration		
ELLERDINE (W	GES Assessment cannot be undertaken as the effluent concentration is expressed as a load rather than a concentration		
OSBASTON STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology
OXMOOR (WRW)	GES Assessment cannot be undertaken as the effluent concentration is expressed as a load rather than a concentration		
EDGMOND STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	YELLOW-Good ecological status cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration
NEWPORT STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	YELLOW-Good ecological status cannot be achieved due to current technology limits. Ensure proposed growth doesn't cause significant deterioration
CRUDGINGTON	GES Assessment cannot be undertaken as the effluent concentration is expressed as a load rather than a concentration		

WwTW	Ammonia assessment	Biochemical Oxygen Demand (BOD) assessment	Phosphate assessment
RUSHMOOR STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology
WALCOT (WRW)	GES Assessment cannot be undertaken as the effluent concentration is expressed as a load rather than a concentration		
LITTLE WENLOCK STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology
COALPORT STW	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	GREEN-Sufficient environmental capacity. Proposed development has no significant impact on the water body's potential for meeting GES.	AMBER-Proposed development can be accommodated with a tighter permit and upgrade to treatment. This is achievable with current technology

Results of the GES assessment show that proposed development will not prevent good ecological status being achieved. For the majority of treatment works, there is sufficient environmental capacity for ammonia and BOD. However, for phosphate, a tighter permit or upgrade would be required at most WwTWs. At Edgmond and Newport WwTW, GES can not be achieved for phosphate due to technological limits.

9.3 Summary of WFD status

Figure 9-2 shows the Cycle 2 Water Framework Directive overall status classifications for watercourses in the study area. There two waterbodies classified as 'Bad' (Red Strine - source to conf R Strine, and R Tern - conf R Meese to conf R Roden). There are 12 waterbodies classed as 'Moderate' and 5 classified as 'poor'.

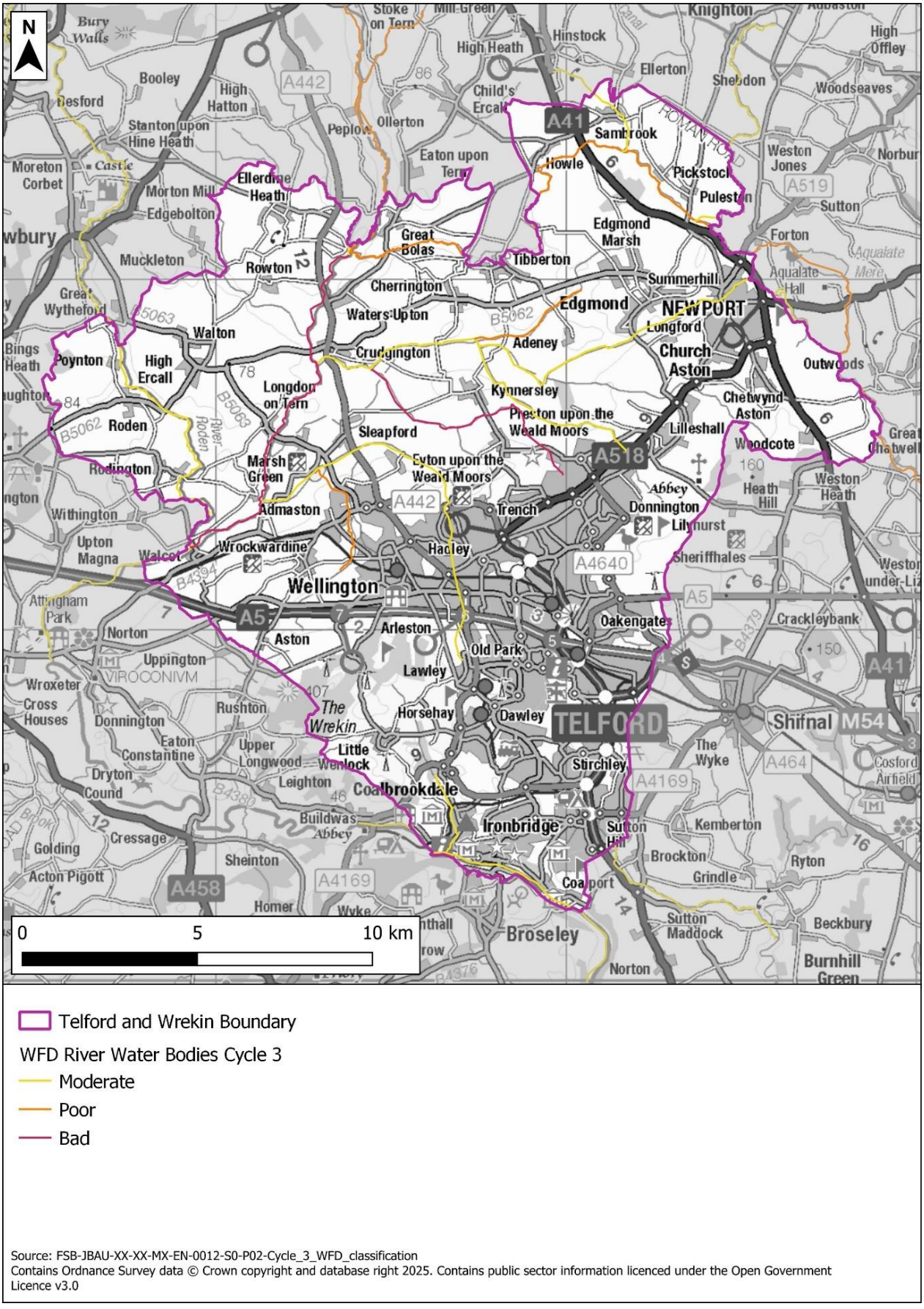


Figure 9-2: WFD overall status of waterbodies in Telford and Wrekin

9.4 Priority substances

As well as the physico-chemical water quality elements (BOD, Ammonia, Phosphate etc.) addressed above, a watercourse can fail to achieve Good Ecological Status due to exceeding permissible concentrations of hazardous substances. Currently 33 substances are defined as hazardous or priority hazardous substances, with others under review. Such substances may pose risks both to humans (when contained in drinking water) and to aquatic life and animals feeding in aquatic life. These substances are managed by a range of different approaches, including EU and international bans on manufacturing and use, targeted bans, selection of safer alternatives and end-of-pipe treatment solutions. There is considerable concern within the UK water industry that regulation of these substances by setting permit values which require their removal at wastewater treatment works will place a huge cost burden upon the industry and its customers, and that this approach would be out of keeping with the "polluter pays" principle.

We also consider how the planning system might be used to manage priority substances:

- Industrial sources – whilst this report covers potential employment sites, it doesn't consider the type of industry and therefore likely sources of priority substances are unknown. It is recommended that developers should discuss potential uses which may be sources of priority substances from planned industrial facilities at an early stage with the EA and, where they are seeking a trade effluent consent, with the sewerage undertaker.
- Agricultural sources - There is limited scope for the planning system to change or regulate agricultural practices. UK water companies are involved in a range of “Catchment-based Approach” schemes aimed at reducing diffuse sources of pollutants, including agricultural pesticides.
- Surface water runoff sources - some priority substances e.g., heavy metals, are present in urban surface water runoff. It is recommended that future developments would manage these sources by using SuDS that provide water quality treatment, designed following the CIRIA SuDS Manual. This is covered in more detail in sections 10.7.2 and 10.7.3.
- Domestic wastewater sources - some priority substances are found in domestic wastewater as a result of domestic cleaning chemicals, detergents, pharmaceuticals, pesticides or materials used within the home. Whilst an increase in the population due to housing growth could increase the total volumes of such substances being discharged to the environment, it would be more appropriate to manage these substances through regulation at source, rather than through restricting housing growth through the planning system.

No further analysis of priority substances will be undertaken as part of this study.

9.5 Conclusions and Recommendations

9.5.1 Conclusions

The modelling indicates that growth during the Local Plan period could result in a significant deterioration (change in class) at Newport WwTW which is currently operating below TAL. A class change in BOD from High to Good status is predicted. This effect disappears further downstream of the WwTW.

Growth alone will not prevent good ecological status being prevented in the future should improvements in upstream water quality be made.

Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with Severn Trent Water is essential to ensure that infrastructure is in place prior to development to prevent a breach of the environmental permit.

9.5.2 Recommendations

Table 9-4: Recommendations from the water quality section

Actions	Responsibility	Timescale
Provide annual monitoring reports to STW detailing projected housing growth in the Local Authority.	TWC	Ongoing
Take into account the full volume of growth (from TWC and neighbouring authorities) within the catchment.	TWC and STW	Ongoing

10 Environmental Impacts

10.1 Introduction

Development has the potential to cause an adverse impact on the environment through several routes such as worsening of air quality, pollution to the aquatic environment, or disturbance to wildlife. Of relevance in the context of a Water Cycle Study is the impact of development on the aquatic environment.

A source-pathway-receptor approach can be taken to investigate the risk and identify where further assessment or action is required.

10.2 Sources of pollution

Water pollution is usually categorised as either diffuse or point source. Point source sources come from a single well-defined point, an example being the discharge from a WwTW. Section 8.1 models the WwTWs serving growth within TWC as point sources of pollution and predicts the likely concentration of pollutants downstream.

Diffuse pollution is defined as “unplanned and unlicensed pollution from farming, old mine workings, homes and roads. It includes urban and rural activity and arises from industry, commerce, agriculture and civil functions and the way we live our lives.”

Examples of diffuse sources of water pollution include:

- Contaminated runoff from roads – this can include metals and chemicals.
- Drainage from housing estates
- Misconnected sewers (foul drains to surface water drains)
- Accidental chemical/oil spills from commercial sites
- Surplus nutrients, pesticides, and eroded soils from farmland
- Septic tanks and non-mains sewer systems

The most likely sources of diffuse pollution from new developments include drainage from housing estates, runoff from roads and discharges from commercial and industrial premises. The pollution risk posed by a site will depend on the sensitivity of the receiving environment, the pathway between the source of the runoff and the receiving waters, and the level of dilution available. After or during heavy rainfall, the first flush of water carrying accumulated dust and dirt is often highly polluting.

Whilst the threat posed by an individual site may be low, several sites together may pose a cumulative impact within the catchment.

Runoff from development sites should be managed by a suitably designed SuDS scheme, more information on SuDS can be found in section 10.7.2.1.

Potential impacts on receiving surface waters include the blanketing of riverbeds with sediment, a reduction in light penetration from suspended solids, and a reduction in natural oxygen levels, all of which can lead to a loss in biodiversity.

10.3 Impact of abstraction

Abstraction of water within a catchment, either from groundwater or surface water sources, is necessary to provide a public water supply, for industrial processes and for agriculture. When the volume of water being abstracted becomes too high, it can cause environmental damage by reducing river flow or lowering the water table.

Changes in river flow can impact sensitive ecosystems, for example trout require a clean gravel bed to lay their eggs. A reduction in river flow can cause sediment to build up, blocking the spaces the fish require to lay their eggs impacting their reproductive cycle. Changes in groundwater levels can also affect the flow regime in rivers and can cause drying of wetland sites.

The precise location of abstraction points for public water supply in England is not available for reasons of national security. Furthermore, water demand within a WRZ can be met by sources located anywhere within that WRZ, or from a neighbouring WRZ if the transfer between WRZs is used to provide some of the water available for use. It is therefore not possible, in all but the simplest of WRZs, to trace an impact of an individual development site back to a particular water abstraction and therefore to an environmental impact. The assessments in this report therefore rely on information in the public domain.

Groundwater Dependent Terrestrial Ecosystems

Figure 10-1 shows a schematic of how Groundwater Dependent Terrestrial Ecosystems (GWDTEs) were identified. The LPA boundary is within a WRZ. Water abstracted anywhere within that WRZ could be used to serve growth within the LPA. In the diagram below, there are two abstraction points. Abstraction 1 could impact an area outside of both the LPA boundary and the WRZ. However, there are no protected sites within that groundwater body. Abstraction 2 also impacts an area both within and outside of the LPA boundary. Protected site A is within the WRZ but may not be impacted directly by an abstraction. Protected site B is outside of the WRZ and outside of the groundwater body containing an abstraction and is therefore unlikely to be impacted by growth. Protected site C is within a groundwater body containing an abstraction, hence there is a risk that an increase in abstraction could impact this site.

The location of abstraction points within the study area is not known, and so the approach must be taken that GWDTE anywhere within the combined extent of the WRZ and groundwater bodies overlapping the WRZ could be impacted by an increase in abstraction.

A further check was done on whether abstraction may already be an issue in those GWDTEs. The Water Framework Directive (WFD) records "Significant Water Management Issues" (SWMIs) in each water body. These are the pressures on the water environment that put our ability to achieve the environmental objectives of the WFD most at risk.

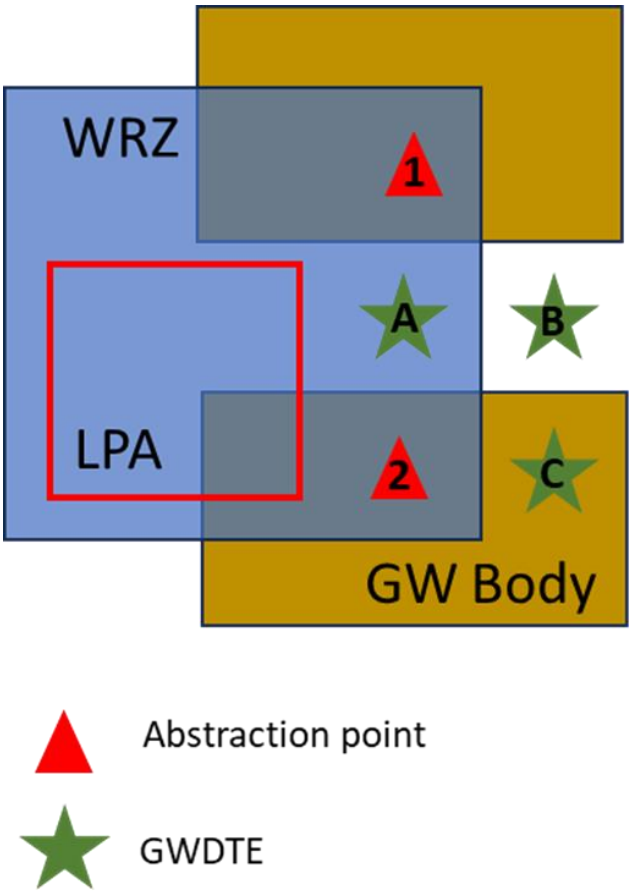


Figure 10-1: Definition of groundwater study area

The steps taken to identify GWDTEs that may be impacted by abstraction to serve Telford and Wrekin were as follows:

- Define study area for Telford and Wrekin - based on extent of WRZ and WFD Groundwater bodies that overlap with the WRZs.
- Identify Groundwater Dependent Terrestrial Ecosystems (GWDTE) within the study area using the EA's GWDTE dataset.
- Identify GWDTEs that are within groundwater bodies with flow identified as a Significant Water Management Issue (SWMI).

Surface water based ecosystems

Figure 10-2 shows a schematic of how protected sites on surface waterbodies were identified. As in the groundwater example, water could be abstracted from anywhere within the WRZ. Protected site A is downstream of an abstraction and so could be impacted by changes in river flow resulting from the abstraction. Protected site B whilst further downstream in the river basin, it is on a tributary not connected with the WRZ, so abstraction is unlikely to have an impact. Protected site C is upstream of the abstraction so would not be impacted.

As with the groundwater abstractions, the location of surface water abstractions was not available to inform this study. The approach was therefore taken that any protected site directly on a waterbody that flows through or is downstream of the WRZ could be impacted by abstraction. Protected sites upstream or on tributaries that have not flowed through the WRZ are ignored.

In order to identify protected sites that may be at risk, Flood Zone 2 from the Risk of Flooding from Rivers and the Sea mapping was used to define an area that was either adjacent to a river or could be reasonably expected to receive surface water from a river.

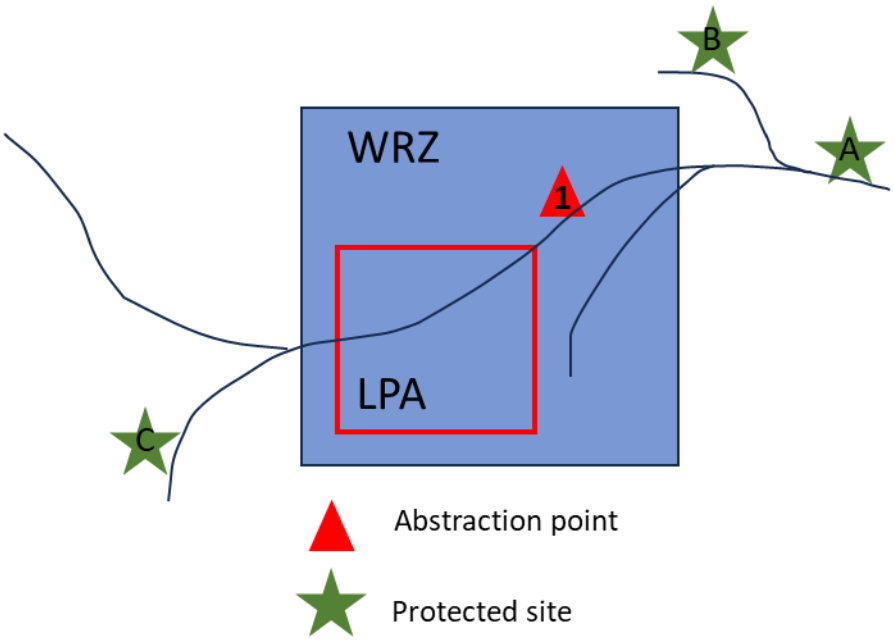


Figure 10-2: Definition of surface water study area.

10.3.1 Results

There are 190 Groundwater Dependent Terrestrial Ecosystems that are within a groundwater body that overlaps with water resource zones serving TWC. These are listed in Appendix C. 23 of these (across four groundwater bodies) are in groundwater bodies where flow is noted as a significant water management issue - either due to groundwater or surface water abstraction.

There are 133 SSSIs that are adjacent to waterbodies within the WRZs serving TWC (based on flood zone 2). These are listed in Appendix D. 25 of these have flow (either from groundwater or surface water abstraction) noted as a significant water management issue. Some of these SSSIs are also designated as Ramsar, SACs or SPAs.

10.3.2 Water quality impact

Sources of pollution

Water pollution is usually categorised as either diffuse or point source. Point source sources come from a single well-defined point, an example being the discharge from a WRC.

Diffuse pollution is defined as “unplanned and unlicensed pollution from farming, old mine workings, homes and roads. It includes urban and rural activity and arises from industry, commerce, agriculture and civil functions and the way we live our lives.”

Examples of diffuse sources of water pollution include:

- Contaminated runoff from roads – this can include metals, chemicals and microplastics.
- Drainage from housing estates
- Misconnected sewers (foul drains to surface water drains)
- Accidental chemical/oil spills from commercial sites
- Surplus nutrients, pesticides and eroded soils from farmland
- Septic tanks and non-mains sewer systems

The most likely sources of diffuse pollution from new developments include drainage from housing estates, runoff from roads and discharges from commercial and industrial premises. The pollution risk posed by a site will depend on the sensitivity of the receiving environment, the pathway between the source of the runoff and the receiving waters, and the level of dilution available. After or during heavy rainfall, the first flush of water carrying accumulated dust and dirt is often highly polluting. Interception of this polluted water can be carried out by SuDS such as swales or permeable paving.

Whilst the threat posed by an individual site may be low, several sites together may pose a cumulative impact within the catchment.

Runoff from development sites should be managed by a suitably designed SuDS scheme. Potential impacts on receiving surface waters include the blanketing of riverbeds with sediment, a reduction in light penetration from suspended solids, and a reduction in natural oxygen levels, all of which can lead to a loss in biodiversity.

10.4 Pathways

Pollutants can take several different pathways from their source to a "receptor" – a habitat or species that can be impacted. This could be overland via surface water flow paths, via the river system, or via groundwater or a combination of all three.

10.5 Receptors

A receptor in this case is a habitat or species that is adversely impacted by a pollutant. Both the rivers and groundwater as well as being pathways, can also be considered to be receptors, and the impact on the ecological status of rivers as defined within the Water Framework Directive is the subject of Section 8.1. Groundwater bodies are also given a status under the WFD which is reported in Section 4.4 for the groundwater bodies.

Within the study area and downstream are many sites with environmental designations such as:

- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Sites of Special Scientific Interest (SSSI)
- Ramsar sites (Wetlands of International Importance)
- Priority Habitats and Priority Headwaters

A description of these, and the relevant legislation that defines and protects them, can be found in Section 3.

10.6 Assessment of point source risk

10.6.1 Screening

To identify which of the protected sites may be at risk, Flood Zone 2 from the Risk of Flooding from Rivers and the Sea mapping was used to define an area that was either beside a river or could be reasonably expected to receive surface water from a river during times of flood. Where a WwTW serving growth in the plan period was present in the catchment upstream of the protected site, this site was taken forward for further assessment.

Where there was no WwTW serving growth upstream, these protected sites were discounted as no deterioration would be predicted in a water quality model, and the impact would be expected to be minimal. However, in these cases the overall catchment water quality should be considered where for example they are designated for migratory fish species that may spend part of their lifecycle elsewhere in the catchment.

Whilst deterioration in water quality may not always lead to a significant impact at a protected site such as a SSSI, modelled deterioration can be used to highlight areas of risk for further analysis in the Habitat Regulations Assessment.

Table 10-1 contains a list of protected sites (SSSIs, SACs, SPAs and Ramsar sites) that are within or downstream of Telford and Wrekin, and adjacent to a watercourse, and have a

WwTW serving growth during the plan period upstream. These protected sites are considered further in section 10.6.2.

Table 10-1: List of protected sites with WwTW upstream

Receptor Name	Reference	WwTW Upstream further assessment required? Y/N
Aileshurst Coppice SSSI	SO773502	N
Alderton Hill Quarry SSSI	SP006345	N
Allscott Settling Ponds SSSI	SJ601129	Y
Aqualate Mere SSSI	SJ773204	N
Areley Wood SSSI	SO787711	N
Ashleworth Ham SSSI	SO832262	N
Ashmoor Common SSSI	SO852466	N
Astridge Wood SSSI	SO546087	Y
Attingham Park SSSI	SJ551095	Y
Aust Cliff SSSI	ST568898	N
Brotheridge Green Disused Railway Line SSSI	SO814412	N
Buildwas River Section SSSI	SJ640045	Y
Burley Dene Meadows SSSI	SO813323	N
Chaceley Meadow SSSI	SO857305	N
Chermes Dingle SSSI	SJ614061	N
Coombe Hill Canal SSSI	SO867268	Y
Frampton Pools SSSI	SO753073	N
Garden Cliff SSSI	SO718127	N
Grange Meadow SSSI	SO805481	Y
Grimley Brick Pits SSSI	SO838616	Y
Hartlebury Common and Hillditch Coppice SSSI	SO823707	N
Hughley Brook SSSI	SJ591001	Y
Innsworth Meadow SSSI	SO850215	N
Lazy Meadow SSSI	SP016415	N
Lord's Wood Meadows SSSI	SO732552	Y
Lydebrook Dingle SSSI	SJ659062	Y
Lydney Cliff SSSI	SO653017	Y
Malthouse Farm Meadows SSSI	SO805389	N
Meezy Hurst SSSI	SO642086	N
Muxton Marsh SSSI	SJ715134	N

Receptor Name	Reference	WwTW Upstream further assessment required? Y/N
Nagshead SSSI	SO607092	Y
Newport Canal SSSI	SJ736193	N
Northwick Marsh SSSI	SO835579	N
Old River Severn, Upper Lode SSSI	SO880330	N
Osebury Rock SSSI	SO737555	N
Purton Passage SSSI	SO686044	Y
Ranters Bank Pastures SSSI	SO722749	N
Rectory Farm Meadows SSSI	SO921382	N
River Teme SSSI	SO507745	Y
River Wye SSSI	SO519384	Y
Severn Estuary SSSI	ST529870	Y
Severn Ham, Tewkesbury SSSI	SO885325	N
Sheinton Brook SSSI	SJ607038	N
Shrawley Wood SSSI	SO808659	Y
Soudley Ponds SSSI	SO662112	N
Teme Bank SSSI	SO507742	N
Temeside SSSI	SO518742	Y
Thatchers Wood and Westwood Covert SSSI	SO702904	Y
Tick Wood and Benthall Edge SSSI	SJ663033	Y
Tiddesley Wood SSSI	SO929452	N
Upham Meadow and Summer Leasow SSSI	SO915375	Y
Upper Severn Estuary SSSI	SO716063	Y
Upton Ham SSSI	SO859400	N
Wainlode Cliff SSSI	SO845257	N
Walmore Common SSSI	SO744151	N
Whitwell Coppice SSSI	SJ618021	N
Wyre Forest SSSI	SO745766	Y
Midland Meres & Mosses Phase 2 Ramsar	UK11080	N
Severn Estuary Ramsar	UK11081	Y
Walmore Common Ramsar	UK11076	N
River Wye SAC	UK0012642	Y

Receptor Name	Reference	WwTW Upstream further assessment required? Y/N
Severn Estuary SAC	UK0013030	Y
Wye Valley & Forest of Dean Bat Sites SAC	UK0014794	N
Wye Valley Woodlands SAC	UK0012727	N
Salisbury Plain SPA	UK9011102	N
Severn Estuary SPA	UK9015022	Y
Somerset Levels & Moors SPA	UK9010031	Y
Walmore Common SPA	UK9007051	N

10.6.2 Impact Assessment

The predicted deterioration in water quality in the river adjacent to the protected site is shown in Appendix G. In all cases deterioration could be prevented by an improvement in upstream treatment processes.

10.7 Protection and mitigation

10.7.1 Groundwater Protection

Groundwater is an important source of water in England and Wales.

The Environment Agency is responsible for the protection of “controlled waters” from pollution under the Water Resources Act 1991. These controlled waters include all watercourses and groundwater contained in underground strata.

The zones are based on an estimate of the time it would take for a pollutant which enters the saturated zone of an aquifer to reach the source of abstraction or discharge point (Zone 1 = 50 days, Zone 2 = 400 days, Zone 3 is the total catchment area). The Environment Agency will use SPZs (alongside other datasets such as the Drinking Water Protected Areas (DrWPAs) and aquifer designations as a screening tool to show:

- areas where it would object in principle to certain potentially polluting activities, or other activities that could damage groundwater;
- areas where additional controls or restrictions on activities may be needed to protect water intended for human consumption; and
- how it prioritises responses to incidents.

The EA have published a position paper (Environment Agency f, 2018) outlining its approach to groundwater protection which includes direct discharges to groundwater, discharges of effluents to ground and surface water runoff. This is of relevance to this water cycle study where a development may manage surface water through SuDS.

Sewage and trade effluent

Discharge of treated sewage of 2m^3 per day or less to ground are called small sewage discharges (SSDs). Most SSDs do not require an environmental permit if they comply with certain qualifying conditions. A permit will be required for all SSDs in source protection zone 1 (SPZ1).

For treated sewage effluent discharges, the EA encourages the use of shallow infiltration systems, which maximise the attenuation within the drainage blanket and the underlying unsaturated zone. Whilst some sewage effluent discharges may not pose a risk to groundwater quality individually, the cumulative risk of pollution from aggregations of discharges can be significant. Improvement or pre-operational conditions may be imposed before granting an environmental permit. The EA will only agree to developments where the addition of new sewage effluent discharges to ground in an area of existing discharges is unlikely to lead to an unacceptable cumulative impact.

Generally, the Environment Agency will only agree to developments involving release of sewage effluent, trade effluent or other contaminated discharges to ground if it is satisfied that it is not reasonable to make a connection to the public foul sewer. The EA would normally expect to only permit new private discharges where the distance to connect to the nearest public sewer exceeds the number of dwellings multiplied by 30m. So, for example, a development of 100 dwellings would need to be more than 3km from a public sewer. The developer would have to provide evidence of why the proposed development cannot connect to the foul sewer in the planning application. This position will not normally apply to surface water run-off via sustainable drainage systems and discharges from sewage treatment works operated by sewerage undertakers with appropriate treatment and discharge controls.

Deep infiltration systems (such as boreholes and shafts) are not generally accepted by the EA for discharge of sewage effluent as they bypass soil layers and reduce the opportunity for attenuation of pollutants.

Discharges of surface water run-off to ground at sites affected by land contamination, or from sites for the storage of potential pollutants are likely to require an environmental permit. This could include sites such as garage forecourts and coach and lorry parks. These sites would be subject to a risk assessment with acceptable effluent treatment provided.

Discharge of clean water

"Clean water" discharges such as runoff from roofs or from roads, may not require a permit. However, they are still a potential source of groundwater pollution if they are not appropriately designed and maintained.

Where infiltration SuDS schemes are proposed to manage surface runoff they should:

- be suitably designed,
- meet Government non-statutory technical standards (DEFRA, 2015) for sustainable drainage systems – these should be used in conjunction with the NPPF and PPG; and
- use a SuDS management treatment train

A hydrogeological risk assessment is required where infiltration SuDS is proposed for anything other than clean roof drainage in a SPZ1.

Deep infiltration systems (such as boreholes and shafts) could be accepted by the EA for discharge of clean roof water via sealed system. Separation of clean roof water and other runoff should be considered early stage of design in a project.

Source Protection Zones in Telford and Wrekin

Source Protection Zone (SPZ) 3 covers a large majority of the northeast of the study area. Parts of Newport, Longdon on Tern and Crudgington are in Zones 1 and 2. A small area in Wrockwardine is also covered by Zones 1 and 2.

A list of sites that overlap with the SPZs is shown in Table 10-2.

Table 10-2: Allocations within Source Protection Zones

Site name	SPZ
Land off Hay Street Tibberton	Zone 3
Land South of The Dale, Church Aston	Zone 3
South of Hutchinson Gate	Zone 2
Old Railway Line, Church Aston	Zone 3
Land South of Plough Lane, Newport	Zone 3
Land North and West of Allscott Meads (Smaller site)	Zone 3
Land at Aga Rangemaster, Waterloo Road	Zone 3
Land Opp the Shawbirch PH, Trench	Zone 3
Land South and West of Sommerfield Road, Telford	Zone 3
Former Bush Hotel, Hadley	Zone 3
Land at Arleston Manor Drive	Zone 3
Little Dessert Shop	Zone 3
Land at Badhan Factory, Waterloo Road	Zone 3
Former Cross Keys PH, Haybridge road	Zone 3
Land at Arleston Lane	Zone 3

Site name	SPZ
Land North East of Muxton	Zone 3
Land North of A442 Wheat Leasows (Wappenshall)	Zone 3
Land North of A518 Newport	Zone 3
Land South of A518, Newport	Zone 2
Land North of Middle Farm, Field Aston	Zone 3
Land Southeast of Newport Town Centre	Zone 3

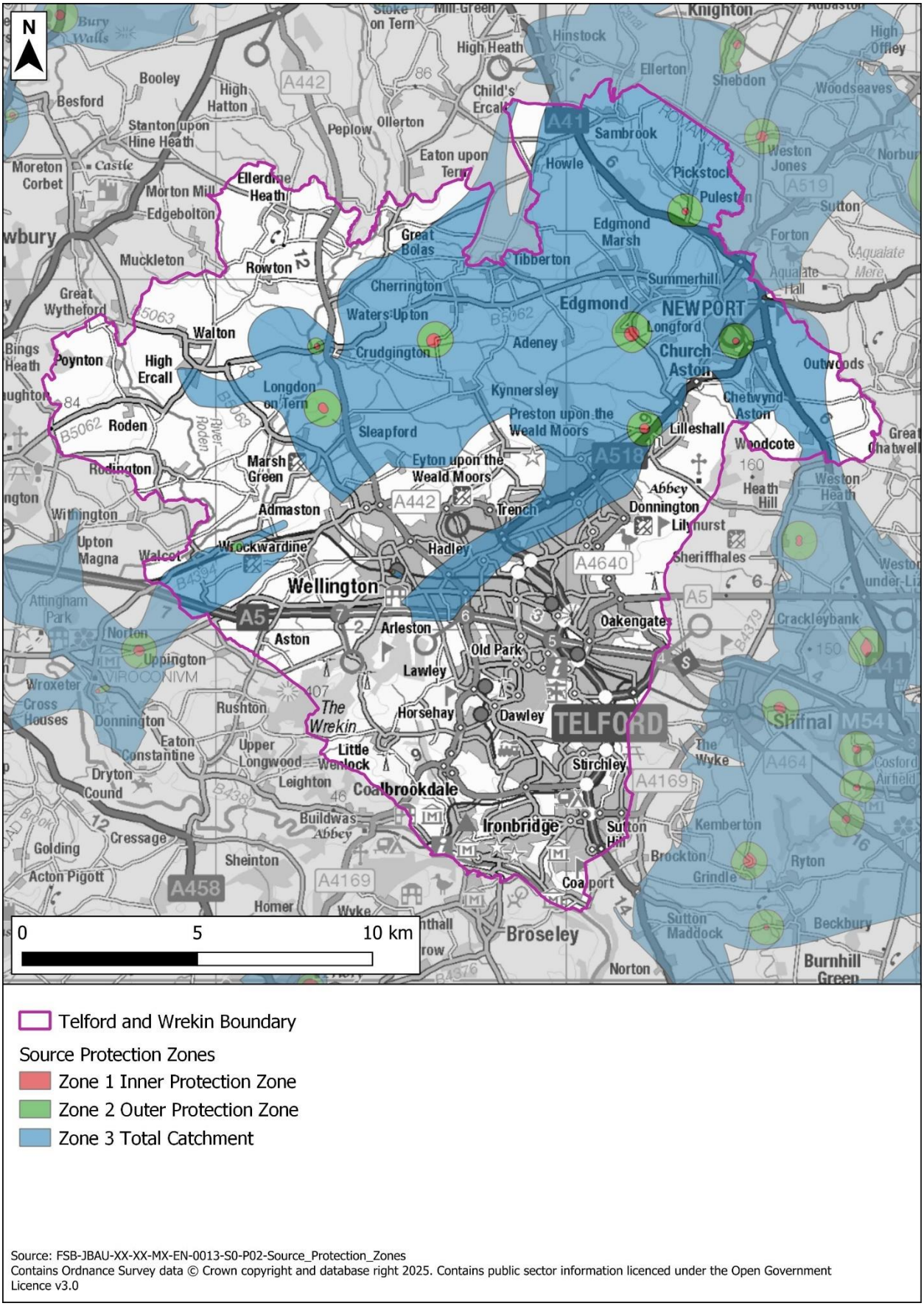


Figure 10-3: Source Protection zones (SPZs) in Telford and Wrekin

Table 10-3: SPZ development guidance

Source Protection Zone	Management advice / EA position statement
Zone 1 – Inner Protection Zone	G2 – Inside SPZ1 all sewage effluent discharges to ground must have an environmental permit. G4 – Inside SPZ1 the EA will object to any new trade effluent, storm overflow from sewage system or other significantly contaminated discharges to ground where the risk of groundwater pollution is high and cannot be adequately mitigated. G12 – Discharge of clean roof water to ground is acceptable both within and outside SPZ1, provided all roof water down-pipes are sealed against pollutants entering the system from surface runoff, effluent disposal or other forms of discharge. The method of discharge must not create new pathways for pollutants to groundwater or mobilise contaminant already in the ground. No permit is required if these criteria are met. G13 – Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, a hydrogeological risk assessment should be undertaken, to ensure that the system does not pose an unacceptable risk to the source of supply. SuDS schemes must be suitably designed.
Zone 2 – Outer Protection Zone	A hydrogeological risk assessment is not a requirement for SuDS schemes, however they should still be “suitably designed”, for instance following best practice guidance in the CIRIA SuDS Design Manual.
Zone 3 – Total Catchment	A hydrogeological risk assessment is not a requirement for SuDS schemes, however they should still be “suitably designed”, for instance following best practice guidance in the CIRIA SuDS Design Manual.

10.7.2 Sustainable Drainage Systems (SuDS)

Since April 2015 (HM Government, 2014), management of the rate and volume of surface water has been a requirement for all major development sites, using Sustainable Drainage Systems (SuDS).

Telford and Wrekin Council as Lead Local Flood Authority (LLFA), is a statutory consultee to the planning system for surface water management within major development, which covers the following development scenarios:

- 10 or more dwellings
- a site larger than 0.5 hectares, where the number of dwellings is unknown
- building greater than 1,000 square metres

- a site larger than 1 hectare

SuDS are drainage features which attempt to replicate natural drainage patterns, through capturing rainwater at source, and releasing it slowly into the ground or a water body. They can help to manage flooding through controlling the quantity of surface water generated by a development, improve water quality by treating urban runoff and provide a useful function in aquifer recharge. SuDS can also deliver multiple benefits, through creating habitats for wildlife and green spaces for the community. SuDS also have the advantage of providing effective Blue and Green infrastructure and ecological and public amenity benefits when designed and maintained properly.

The CIRIA C753 SuDS Manual (CIRIA c, 2015) and Guidance for the Construction of SuDS (CIRIA b, 2017) provide the industry best practice guidance for design and management of SuDS.

10.7.2.1 Use of SuDS in Water Quality Management

SuDS allow the management of diffuse pollution generated by urban areas through the sequential treatment of surface water reducing the pollutants entering lakes and rivers, resulting in lower levels of water supply and wastewater treatment being required. This treatment of diffuse pollution at source can contribute to meeting WFD water quality targets, as well as national objectives for sustainable development.

This is usually facilitated via a SuDS Management Train of several components in series that provide a range of treatment processes delivering gradual improvement in water quality and providing an environmental buffer for accidental spills or unexpected high pollutant loadings from the site. Considerations for SuDS design for water quality are summarised in Table 10-4: below.

Table 10-4: Considerations for SuDS design for water quality

Objective	Advice
Manage surface water close to source	Where practicable, treatment systems should be designed to be close to source of runoff. It is easier to design effective treatment when the flow rate and pollutant loadings are relatively low. Treatment provided can be proportionate to pollutant loadings and the sensitivity of receptors. Accidental spills or other pollution events can be isolated more easily without affecting the downstream drainage system. Encourages ownership of pollution. Poor treatment performance or component damage/ failure can be dealt with more effectively without impacting on the whole site.

Objective	Advice
Treat surface water runoff on the surface	Where practicable, treatment systems should be designed to be on the surface. Where sediments are exposed to UV light, photolysis and volatilisation processes can act to break down contaminants. If sediment is trapped in accessible parts of the SuDS, it can be removed more easily as part of maintenance. It enables use of evapotranspiration and some infiltration to the ground to reduce runoff volumes and associated total contamination loads (provided risk to groundwater is managed appropriately). It allows treatment to be delivered by vegetation. Sources of pollution can be easily identified. Accidental spills or misconnections are visible immediately and can be dealt with rapidly. Poor treatment performance can be easily identified during routine inspections, and remedial works can be planned efficiently.
Treat surface water runoff to remove a range of contaminants	SuDS design should consider the likely presence and significance of any contaminant that may pose a risk to the receiving environment. The SuDS component or combination of components selected should include treatment processes that, in combination, are likely to reduce this risk to acceptably low levels.
Minimise risk of sediment remobilisation	The SuDS design should consider and mitigate the risks of sediments (and other contaminants) being remobilised and washed into receiving surface waters during events greater than those which the component has been specifically designed for.
Minimise impacts from accidental spills	By using a number of components in series, SuDS can help ensure that accidental spills are trapped in/on upstream component surfaces, facilitating contamination management and removal. The selected SuDS components should deliver a robust treatment design that manages risks appropriately - taking into account the uncertainty and variability of pollution loadings, sensitivity of receptors and treatment processes.

10.7.3 Further benefits

Flood Risk

The Strategic Flood Risk Assessment contains recommendations for SuDS to manage surface water on development sites, with the primary aim of reducing flood risk.

SuDS are most effective at reducing flood risk for relatively high intensity, short and medium duration events, and are particularly important in mitigating potential increases in surface water flooding, sewer flooding and flooding from small and medium sized watercourses resulting from development.

Water Resources

A central principle of SuDS is the use of surface water as a resource. Traditionally, surface water drainage involved the rapid disposal of rainwater, by conveying it directly into a sewer or Water Recycling Centres.

SuDS techniques such as rainwater harvesting, allow rainwater to be collected and re-used as non-potable water supply within homes and gardens, reducing the demand on water resources and supply infrastructure.

Climate Resilience

Climate projections for the UK suggest that winters may become milder and wetter, and summers may become warmer, but with more frequent higher intensity rainfall events. This would be expected to increase the volume of runoff, and therefore the risk of flooding from surface water, and diffuse pollution, and reduce water availability.

SuDS offer a more adaptable way of draining surfaces, controlling the rate and volume of runoff leaving urban areas during high intensity rainfall, and reducing flood risk to downstream communities through storage and controlled release of rainwater from development sites.

Through allowing rainwater to soak into the ground, SuDS are effective at retaining soil moisture and groundwater levels, which allows the recharge of the watercourses and underlying aquifers. This is particularly important where water resource availability is limited, and likely to become increasingly scarce under future drier climates.

Biodiversity

The water within a SuDS component is an essential resource for the growth and development of plants and animals, and biodiversity benefits can be delivered even by very small, isolated schemes. The greatest value can be achieved where SuDS are planned as part of a wider green landscape, providing important habitat, and wildlife connectivity. With careful design, SuDS can provide shelter, food, foraging and breeding opportunities for a variety of species including plants, amphibians, invertebrates, birds, bats, and other animals.

Amenity

Designs using surface water management systems to help structure the urban landscape can enrich its aesthetic and recreational value, promoting health and well-being and supporting green infrastructure. Water managed on the surface rather than underground can help reduce summer temperatures, provide habitat for flora and fauna and act as a resource for local environmental education programmes and working groups and directly influence the sense of community in an area.

10.8 Nutrient reduction options

Natural Flood Management (NFM) is used to protect, restore, and re-naturalise the function of catchments and rivers to reduce flood risk. A wide range of techniques can be used that aim to reduce flooding by working with natural features and processes in order to store or slow down flood waters before they can damage flood risk receptors (e.g., people, property, infrastructure, etc.).

Techniques and measures, which could be applied in Telford and Wrekin include:

- Peatland and moorland restoration in upland catchments
- Offline storage areas
- Re-meandering streams
- Targeted woodland planting
- Reconnection and restoration of functional floodplains
- Restoration of rivers and removal of redundant structures
- Installation or retainment of large woody material in river channels
- Improvements in management of soil and land use
- Creation of rural and urban SuDS

In 2017, the Environment Agency published an online evidence base[3] to support the implementation of NFM and with JBA produced maps showing locations with the potential for NFM measures[4]. These maps are intended to be used alongside the evidence directory to help practitioners think about the types of measure that may work in a catchment and the best places in which to locate them. There are limitations with the maps; however, it is a useful tool to help start dialogue with key partners.

3 Working with natural processes to reduce flood risk, Environment Agency (2018). Accessed online at: https://www.gov.uk/government/publications/working-with-natural-processes-to-reduce-flood-risk on: 10/02/2023.

4 Mapping the potential for working with natural process, Environment Agency and JBA (2017). Accessed online at: https://www.arcgis.com/home/item.html?id=7315f943998847e2b3797a85665f5438 on: 10/02/2023.

10.8.1 Multiple Benefits of NFM

In addition to flood risk benefits, there are also significant benefits in other areas such as habitat provision, air quality, climate regulation and water quality.

Many NFM measures have the ability to reduce nutrient and sediment sources by reducing surface runoff flows from higher ground, reducing soil erosion, trapping sediment at the edge of agricultural land, or encouraging deposition of sediments behind natural dams upstream in watercourses.

Suitable techniques may include:

- Leaky dams
- Woodland planting
- Buffer strips
- Runoff retention ponds
- Land management techniques (soil aeration, cover crops etc.)

Case Study – Black Brook Slow the Flow

Four engineered log dams were installed on Black Brook at an estimated cost of £2,000, funded by Natural England and the Environment Agency to restore Stanley Bank SSSI. The scheme aimed to improve habitat and reduce the risk of flooding. However, the scheme also resulted in reduced levels of phosphate and nitrate in Black Brook, with phosphate concentrations falling by 3.6mg/l. By 2035, it is predicted that 792m^3 of sediment will be stored in three ponds retained by the jams.

Figure 10-4: Example of a leaky dam

Reproduced from Case study 17. Black Brook Slow the Flow, St Helens, Norbury, Rogers and Brown, EA WwNP Evidence Base 2017. Photograph taken on 8 May 2015; courtesy of Matthew Catherall.

10.8.2 Integrated Constructed Wetlands

An integrated constructed wetland (ICW) is an artificial wetland created for the purpose of treating polluted water, whether this is municipal wastewater, grey water from residential properties, or agricultural runoff.

They are usually unlined, free surface flow wetlands, designed to contain and treat influents within emergent vegetated areas.

Defra carried out a systematic review of the effectiveness of various wetland types, including ICWs for mitigating agricultural pollution such as phosphate and nitrate. The overall conclusion was that all wetland types are very effective at reducing major nutrients and suspended sediments, with the exception of nitrite in ICWs. Nitrate is only reduced when passing through overland buffer strips and through constructed wetlands with vegetation, where the systematic review showed a mean reduction of 29% across the evidence included in the study. The mean reduction in Total Phosphorus across the evidence base was 78%.

Case Study – Frogshall ICW

The Upper River Mun in Norfolk was experiencing chronic pollution, and a loss in biodiversity in the river. Investigation found that nutrients from a Sewage Treatment Works upstream were contributing to this issue.

A pilot ICW was created consisting of three shallow ponds, filled with 18,000 emergent aquatic plants, and the outfall from the treatment works was diverted to pass through the wetland.

Early monitoring has shown that 90% of the phosphate is being removed by the wetland, and a large increase in biodiversity downstream observed.

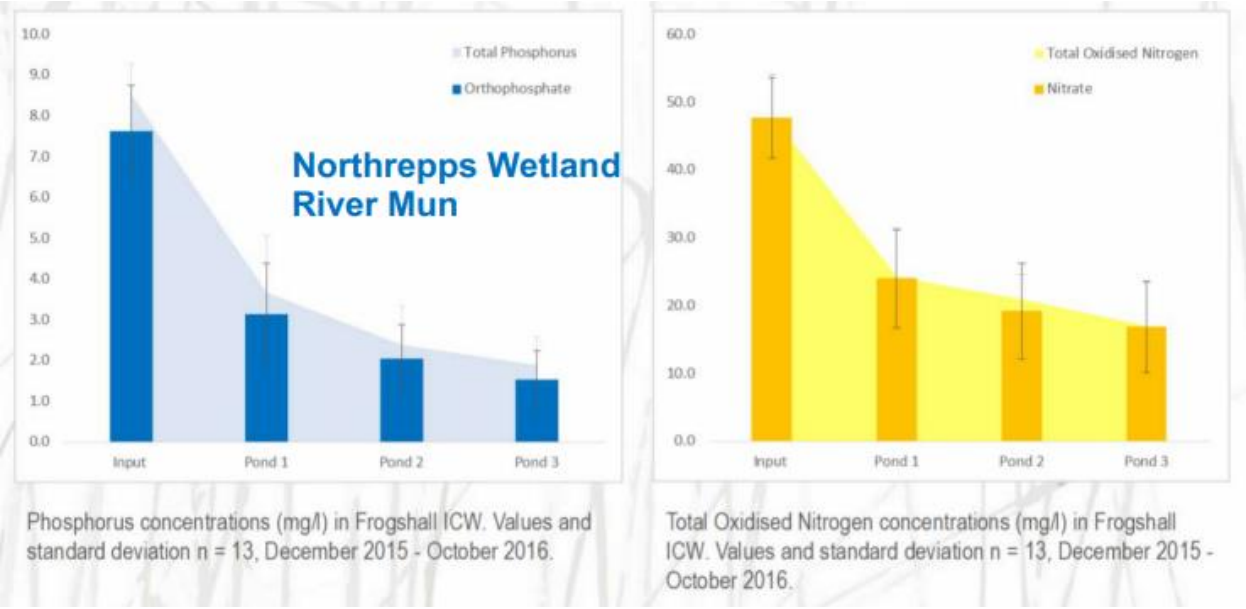


Figure 10-5: Water quality changes from the WwTW input through the wetland

Reproduced from “Stripping the Phosphate” a presentation by the Norfolk Rivers Trust (2018) (Diggins, 2018).

10.8.3 Agricultural Management

There is a big potential to improve water quality by interventions aimed at agricultural sources, especially considering the measures already taken by STW to reduce their contribution to phosphate load.

Potential schemes could include:

- Buffer strips.
- Cross slope tree planting.
- Runoff retention basins.
- Contour ploughing.
- Cover crops.

There is considerable overlap with NFM measures, and the challenges are also very similar. Exact impacts are difficult to measure, although modelling tools such as Farmscoper (ADAS, 2020) exist to help with this. Once a scheme is implemented it relies on the landowner to continue to maintain it in order to maintain the mitigation benefit.

Funding for agricultural interventions could come from Catchment Sensitive Farming or a Payment for Ecosystem Services approach.

Wessex Water and United Utilities have both recently used a reverse auction approach (Entrade, 2020), which enables farmers to bid for funding to plant cover crops in winter to manage runoff from agricultural land.

10.9 Conclusions

- WwTWs serving growth within Telford and Wrekin are point sources of pollution in the study area.
- Development sites within Telford and Wrekin could also be sources of diffuse pollution from surface runoff.
- SuDS are required on all sites and their design must consider water quality as well as quantity.
- Runoff from these sites should be managed through implementation of a SuDS scheme with a focus on treating water quality of surface runoff from roads and development sites.
- Opportunities exist for these SuDS schemes to offer multiple benefits of flood risk reduction, amenity value and biodiversity, as well as opportunities for groundwater recharge to provide a water resources benefit.
- Telford and Wrekin Council, as an LLFA, should be consulted at an early stage to ensure SuDS are implemented and designed in response to site characteristics and policy factors.

- Although primarily an urban area, opportunities exist to implement natural flood management techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

10.10 Recommendations

Table 10-5: Recommendations from the environment section

Action	Responsibility	Timescale
The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.	TWC	Ongoing
The local plan should include policies that require all development proposals with the potential to impact on areas with environmental designations to be considered in consultation with Natural England (for national designations).	TWC	Ongoing
In partnership, identify opportunities for incorporating SuDS into open spaces and green infrastructure, to deliver strategic flood risk management and meet WFD water quality targets.	TWC, STW, and EA.	Ongoing
Developers should include the design of SuDS at an early stage to maximise the benefits of the scheme.	Developers	Ongoing
Work with developers to discourage connection of new developments into existing surface water and combined sewer networks. Prevent connections into the foul network, as this is a significant cause of sewer flooding.	TWC, STW, and Developers	Ongoing
Opportunities for Natural Flood Management that include schemes aimed at reducing / managing runoff should be considered to reduce nutrient and sediment pollution alongside reducing flood risk within Telford and Wrekin.	TWC and STW.	Ongoing

11 Climate change impact assessment

11.1 Approach

An assessment was undertaken to assess the potential impacts of climate change on the assessments made in this Water Cycle Study. This was conducted using a matrix which considered both the potential impact of climate change on the assessment in question, and also the degree to which climate change has been considered in the information used to make the assessment.

The impacts have been assessed on a Telford and Wrekin area wide basis; the available climate models are generally insufficiently refined to draw different conclusions for different parts of Telford and Wrekin or doing so would require a degree of detail beyond the scope of this study.

Table 11-1: Climate change pressures scoring matrix.

Have climate change pressures been considered in the assessment?	Low Potential Impact	Medium Potential Impact	High Potential Impact
Yes- quantitative consideration	GREEN	AMBER	AMBER
Some consideration but qualitative only	GREEN	AMBER	RED
Not considered	AMBER	RED	RED

11.2 Impact assessment

Severn Trent Water recognise the threat of climate change in their WRMP published Climate Change Adaption Report in 2021.

Table 11-2: Climate change risk assessment

Assessment	Impact of Pressure (source of information)	Have climate change pressures been considered in the Water Cycle Study?	RAG
Water resources	High	Yes – quantitative assessment within the WRMP.	AMBER
Water supply infrastructure	Medium – some increased demand in hot weather	Yes – qualitative assessment within the WRMP.	AMBER
Wastewater	High – Intense	This has not been considered in	AMBER

Assessment	Impact of Pressure (source of information)	Have climate change pressures been considered in the Water Cycle Study?	RAG
Collection	summer rainfall and higher winter rainfall increases flood risk	site-by-site assessments.	
Wastewater treatment	Medium – Increased winter flows and more extreme weather events reduces flow headroom	This has not been considered in site-by-site assessments.	AMBER
WwTW odour	Medium – higher temperatures will exacerbate existing odour control issues.	This has not been considered in site-by-site assessments.	AMBER
Water quality	Nutrients: High Sanitary determinands: Medium to High	Reduction in river low flow (summer) values could reduce dilatation available and increase deterioration in water quality due to growth.	AMBER
Flooding from increased WwTW discharge	Low	No – not considered	AMBER

11.3 Conclusions

The impact of Climate Change on water resources and water infrastructure are receiving increasing levels of attention by water companies and sewerage undertakers at a strategic level. This has not been included in assessments at a site level as detailed modelling has not been carried out, as this would be disproportionate at the allocations stage. Changes in water and wastewater demand should be considered when carrying out detailed site assessments in the future.

There is a risk that lower river flows in the future could exacerbate water quality issues as there would be less opportunity for dilution of pollutants.

11.4 Recommendations

Table 11-3: Climate change recommendations

Action	Responsibility	Timescale
When undertaking detailed assessments of environmental or asset capacity, consider how the latest climate change guidance can be included.	EA and STW	As required
Take “no regrets” * decisions in the design of developments which will contribute to mitigation and adaptation to climate change impacts. For example, consider surface water exceedance pathways when designing the layout of developments.	TWC and Developers	As required

* “No-Regrets” Approach: “No-regrets” actions are actions by households, communities, and local/national/international institutions that can be justified from economic, and social, and environmental perspectives whether natural hazard events or climate change (or other hazards) take place or not. “No-regrets” actions increase resilience, which is the ability of a “system” to deal with different types of hazards in a timely, efficient, and equitable manner. Increasing resilience is the basis for sustainable growth in a world of multiple hazards (Heltberg, Siegel, Jorgensen, 2009; UNDP, 2010).

12 Conclusions and recommendations

12.1 Conclusions

12.1.1 Overview

This section summarises the conclusions contained within this report. Overall, no issues have been identified that would impede the progress of any development sites. Any necessary investments or infrastructure planning can be managed through the established procedures over the course of the plan period. Consequently, from a WCS perspective, the Council is on track to meet the development projections outlined in the Local Plan.

12.1.2 Water resources and water supply

It is important that new development from Telford and Wrekin does not result in an unsustainable increase in water abstraction. This can be undertaken in several ways from reducing the water demand from new houses through to achieving “water neutrality” in a region by offsetting a new developments water demand by improving efficiency in existing buildings.

The baseline supply demand balance assessment contained in the dWRMP24 shows that Whitchurch and Wem, Shelton and North Staffs WRZs will have a supply-demand deficit by 2034 and Stafford WRZ by 2039 if no action is taken. The dWRMP then outlines how a supply demand balance will be achieved through demand management, leakage reduction and water supply options including new and expanded water treatment works.

Currently, Building Regulations provide for a water efficiency target of 125l/p/d or 110l/p/d in water stressed areas. Based on the EA classification of water stress and the information contained in the RBMPs alongside the national objective to achieve a water efficiency target of 110l/p/d across the UK by 2050, there is clear evidence to support the 110l/p/d as a minimum.

However, this figure is under review and is expected to change. In response to the Environmental Improvement Plan, the Future Homes Hub have proposed a roadmap to achieve the 110l/p/d national target that includes a target of 100l/p/d in water stressed areas from 2025. This figure reduces to 90l/p/d by 2030.

This WCS therefore recommends that the Council adopts a policy requiring a water efficiency target of 100l/p/d in their Local Plan and allow for a reduction in this target to 90l/p/d from 2030.

This should be supported by an equivalent non-household water efficiency target. The BREEAM New Construction Standard can be used for this, and it is recommended that non-household development achieves a minimum of 3 credits under the measure “Wat01” which provides a 40% improvement in water consumption compared to the baseline for that type of building.

12.1.3 Wastewater collection

47 network overflows serve Telford and Wrekin. Six of these exceed the annual thresholds for investigation. There are opportunities through the planning system to ease pressure on the wastewater network by separating foul and storm flow in existing combined systems and not allowing new surface water connections. Surface water can also be better managed by retrofitting SuDS in existing residential areas, and in new development, ensuring SuDS are incorporated into designs at the master planning stage to maximise the potential benefits.

Six storm overflows exceed their annual limit:

- Broseley- Cockshutt Lane (CSO)
- Broseley- Dark Lane (CSO)
- Doseley- Holywell Lane (SPS)
- Ironbridge- Severnside (SPS)
- Ironbridge (Shaft) SPS and Ladywood (Ironbridge Shaft (TPS))
- Madeley- Park Avenue (CSO)

Both Broseley overflow (Cockshutt Lane and Dark Lane) are within Shropshire and will not serve development within Telford & Wrekin.

12.1.4 Wastewater treatment

There are 16 WwTWs that may serve growth during the plan period in Telford and Wrekin. Coalport (STW) storm tank exceeds its annual limit.

Two WwTWs are expected to exceed their flow permit during the Local Plan period and will require an increase in their permit and / or upgrades to treatment processes in order to serve growth. These are Edgmond and Newport.

12.1.5 Odour assessment

The odour screening assessment has identified one site, (Land South of Plough Lane, Newport), within 800m of a WwTW where an odour impact assessment would be recommended. This should be funded by the developer.

12.1.6 Water quality

The modelling indicates the growth during the Local Plan period would not result in a significant deterioration with the exception of Newport, where a deterioration in BOD class from High to Good is predicted during the future and TAL scenarios. This effect disappears further downstream from the WwTW.

In all other cases, deterioration could be prevented by improvements in treatment. Some tightening of permit limits may already be planned in AMP8 but details have not yet been published.

Growth alone will not prevent good ecological status being prevented in the future should improvements in upstream water quality.

Where a WwTW is shared with a neighbouring authority, coordination of growth plans in collaboration with Severn Trent Water is essential to ensure that infrastructure is in place prior to development to prevent a breach of the environmental permit.

12.1.7 Environmental impacts

- WwTWs serving growth within Telford and Wrekin are point sources of pollution in the study area.
- Development sites within Telford and Wrekin could also be sources of diffuse pollution from surface runoff.
- SuDS are required on all sites and their design must consider water quality as well as quantity.
- Runoff from these sites should be managed through implementation of a SuDS scheme with a focus on treating water quality of surface runoff from roads and development sites.
- Opportunities exist for these SuDS schemes to offer multiple benefits of flood risk reduction, amenity value and biodiversity, as well as opportunities for groundwater recharge to provide a water resources benefit.
- Telford and Wrekin Council, as an LLFA, should be consulted at an early stage to ensure SuDS are implemented and designed in response to site characteristics and policy factors.
- Although primarily an urban area, opportunities exist to implement natural flood management techniques to achieve multiple benefits of flood risk, water quality and habitat creation.

12.1.8 Climate change impact assessment

The impact of Climate Change on water resources and water infrastructure are receiving increasing levels of attention by water companies and sewerage undertakers at a strategic level. This has not been included in assessments at a site level as detailed modelling has not been carried out, as this would be disproportionate at the allocations stage. Changes in water and wastewater demand should be considered when carrying out detailed site assessments in the future.

There is a risk that lower river flows in the future could exacerbate water quality issues as there would be less opportunity for dilution of pollutants. This risk is not accounted for within the existing environmental permitting regime.

12.2 Recommendations

12.2.1 Overview

This section is made up of the collated recommendations from the sections of this report.

12.2.2 Water resources and water supply

Table 12-1 Telford and Wrekin Council water resources recommendations

Action	Responsibility	Timescale
Continue to regularly review forecast and actual household growth across the supply region through WRMP Annual Update reports, and where significant change is predicted, engage with Local Planning Authorities.	STW	Ongoing
Provide yearly profiles of projected housing growth to water companies to inform the WRMP update.	TWC	Ongoing
The Council adopts a policy requiring a water efficiency target of 100l/p/d in their respective Local Plans and allow for a reduction in this target to 90l/p/d from 2030. This would be subject to viability testing.	TWC	In Telford and Wrekin LP
Use planning policy to require new build non-residential development to achieve at least 3 credits in the Wat01 Measure for water in the BREEAM New Construction standard.	TWC	In Telford and Wrekin LP
Larger residential developments (including new settlements), and commercial developments should consider incorporating greywater recycling and/or rainwater harvesting into development at the master planning stage in order to reduce water demand.	TWC and STW	In Telford and Wrekin LP
The concept of water neutrality or water positive development has the potential to provide a benefit in improving resilience to climate change and enabling all waterbodies to be brought up to "Good" status. Explore further with the water companies and the Environment Agency how the Council's planning and climate change policies can encourage this approach. This approach could have application in strategic sites and new settlements.	TWC, STW and EA	In Telford and Wrekin LP
Water companies should advise TWC of any strategic water resource infrastructure developments within the study, where these may require safeguarding of land to prevent other type	TWC and STW	Part of Telford and Wrekin LP process

Action	Responsibility	Timescale
of development occurring.		

12.2.3 Water supply infrastructure

Table 12-2 Telford and Wrekin water supply infrastructure recommendations

Action	Responsibility	Timescale
STW should undertake network modelling on a site-by-site basis to ensure adequate provision of water supply is feasible. This should be done as part of the planning process.	STW and developer	Through the STW developer services process
TWC and Developers should engage early with STW, once there is certainty on the scale and location of development, to ensure that any infrastructure required to support the site is in place prior to occupation.	STW, TWC and developers	In Local Plan

12.2.4 Wastewater collection

Table 12-3 Telford and Wrekin wastewater collection recommendations

Actions	Responsibility	Timescale
Early engagement between Developers, TWC and STW is required to ensure that where upgrades to infrastructure is required, it can be planned in by STW.	TWC Developers STW	Ongoing
Take into account wastewater infrastructure constraints in phasing development in partnership with the sewerage undertaker	TWC STW	Ongoing
Developers will be expected to work with the sewerage undertaker closely and early in the planning promotion process to develop an outline foul Drainage Strategy for sites to the satisfaction of the LPA that the development will not increase sewer flooding or the frequency or duration of storm overflow operation. The Outline Foul Drainage strategy should set out the following: What – What is required to serve the site Where – Where are the assets / upgrades to be located When – When are the assets to be delivered (phasing)	Developers STW	Ongoing

Actions	Responsibility	Timescale
Which – Which delivery route is the developer going to use s104 s98 s106 etc. The Outline Drainage Strategy should be submitted as part of the planning application submission, and where required, used as a basis for a drainage planning condition to be set.		
Developers will be expected to demonstrate to the Lead Local Flood Authority (LLFA) that surface water from a site will be disposed using a sustainable drainage system (SuDS) with connection to foul sewers seen as the last option. New connections for surface water to foul sewers will be resisted by the LLFA. Where a surface water connection is proposed to the public sewerage network, it should be demonstrated to Severn Trent Water that there is no other technically feasible option by selecting options as high as possible within the surface water hierarchy.	Developers LLFA STW	Ongoing

12.2.5 Wastewater treatment

Table 12-4 Telford and Wrekin wastewater treatment recommendations

Action	Responsibility	Timescale
Consider the available WwTW capacity when phasing development going to the same WwTW.	TWC STW	Ongoing
Provide Annual Monitoring Reports to STW detailing projected housing growth.	TWC	Ongoing
STW to assess growth demands as part of their wastewater asset planning activities during the next AMP period to enable growth to come forward and feedback to the Council if concerns arise.	STW TWC	During AMP8 (2025-2030)

12.2.6 Odour assessment

Table 12-5 Telford and Wrekin odour assessment recommendations

Actions	Responsibility	Timescale
Consider odour risk in the site identified to be potentially at risk from nuisance odour.	TWC	Ongoing
Carry out an odour assessment for site identified as being at risk of nuisance odour.	Developers	Ongoing

12.2.7 Water quality

Actions	Responsibility	Timescale
Provide annual monitoring reports to STW detailing projected housing growth in the Local Authority.	TWC	Ongoing
Take into account the full volume of growth (from TWC and neighbouring authorities) within the catchment.	TWC and STW	Ongoing

12.2.8 Environmental impacts

Table 12-6 Telford and Wrekin environmental impacts recommendations

Action	Responsibility	Timescale
The Local Plan should include policies that require development sites to adopt SuDS to manage water quality of surface runoff.	TWC	Ongoing
The local plan should include policies that require all development proposals with the potential to impact on areas with environmental designations to be considered in consultation with Natural England (for national designations).	TWC	Ongoing
In partnership, identify opportunities for incorporating SuDS into open spaces and green infrastructure, to deliver strategic flood risk management and meet WFD water quality targets.	TWC, STW, and EA.	Ongoing
Developers should include the design of SuDS at an early stage to maximise the benefits of the scheme.	Developers	Ongoing
Work with developers to discourage connection of new developments into existing surface water and combined sewer networks. Prevent connections into the foul network, as this is a significant cause of sewer flooding.	TWC, STW, and Developers	Ongoing

Action	Responsibility	Timescale
Opportunities for Natural Flood Management that include schemes aimed at reducing / managing runoff should be considered to reduce nutrient and sediment pollution alongside reducing flood risk within Telford and Wrekin.	TWC and STW.	Ongoing

12.2.9 Climate change impact assessment

Table 12-7 Telford and Wrekin climate change impact assessment recommendations

Action	Responsibility	Timescale
When undertaking detailed assessments of environmental or asset capacity, consider how the latest climate change guidance can be included.	EA and STW	As required
Take “no regrets” * decisions in the design of developments which will contribute to mitigation and adaptation to climate change impacts. For example, consider surface water exceedance pathways when designing the layout of developments.	TWC and Developers	As required

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14 Appendices

A Appendix A - Network overflows

Table 14-1 Network EDM averages and RAG ratings

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
BROSELEY - COCKSHUTT LANE (CSO)	S/02/21005/O	92	180.33	23	29.62	52	80.22	55.67	Red
BROSELEY - DARK LANE (CSO)	S/02/21268/O	0	0	0	0	108	225.37	108	Amber
Buck's Head Football Ground		1	0.11	Not assessed	Not assessed	Not assessed	Not assessed	1	Green
DONNINGTON - SCHOOL ROAD (CSO)	S/04/20914/O	Not assessed	Not assessed	7	7.45	17	11.9	12	Amber
DOSELEY - HOLYWELL LANE (SPS)	S/02/55806/O	213	1238.06	59	217.14	20	153.59	97.33	Red
DOWNTON COURT		0	0	Not assessed	Not assessed	Not assessed	Not assessed	0	Not assessed
FIELD ADJ TO CHURCH STREET	S/02/55701/O	0	0	93	107.8	3	2.63	32	Amber

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
(BROSELEY - CHURCH ST (FIELD 7365) (SO))									
FOREST GLEN SPS		39	35.52	Not assessed	Not assessed	2	14.51	20.5	Amber
HIGH ERCALL - CHURCH ROAD (CSO)	NPSWQD006196	Not assessed	Not assessed	0	0	37	487.44	37	Amber
HIGH ERCALL - CHURCH ROAD CSO	NPSWQD006196	Not assessed	Not assessed	0	0	Not assessed	Not assessed	0	Not assessed
HONNINGTON - LILLESHALL (SPS)	S/04/55811/O	8	3.07	0	0	32	126.63	13.33	Amber
HONNINGTON ON A518 (CSO)	S/04/20894/O	14	12.55	38	367.81	47	114.08	33	Amber
HORTONWOOD TRENCH SSO	S/04/55294/O	26	70.97	0	0	28	46.35	18	Amber
IRONBRIDGE - CHURCH HILL (CSO)	EPR-KB3098RU	46	221.98	0	0	Not assessed	Not assessed	46	Amber
IRONBRIDGE - IRONBRIDGE	S/02/21267/O	10	0.95	Not assessed	Not assessed	1	0.15	5.5	Green

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
RD (CSO)									
IRONBRIDGE - NEW ROAD #1		6	96.53	Not assessed	Not assessed	0	0	6	Green
IRONBRIDGE - NEW ROAD #2		0	0	Not assessed	Not assessed	0	0	0	Not assessed
IRONBRIDGE - ST. LUKES ROAD (MH4501)		4	0.82	Not assessed	Not assessed	0	0	4	Green
IRONBRIDGE, ST. LUKES ROAD		0	0	Not assessed	Not assessed	Not assessed	Not assessed	0	Not assessed
JACKFIELD - COALFORD (TPS)	S/02/08939/O	29	104.13	0	0	28	107.49	19	Amber
LADYWOOD CSO (IRONBRIDGE - LADYWOOD (CSO))	S/02/26850/O	65	122.22	0	0	19	14.31	28	Amber
MADELEY - PARK AVENUE (CSO)	S/02/55675/O	145	1438.06	0	0	0	0	145	Amber

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
NEWPORT - BRIDGE TERRACE (CSO)		7	4.54	Not assessed	Not assessed	18	20.21	12.5	Amber
NEWPORT - LOWER BAR (CSO)		1	0.14	Not assessed	Not assessed	0	0	1	Green
NEWPORT - WATER LANE (CSO)	S/04/20900/O	22	6.65	30	140.47	0	0	17.33	Amber
Pinewood Avenue #X		0	0	Not assessed	Not assessed	Not assessed	Not assessed	0	Not assessed
ROYAL EXCHANGE CAR PARK CSO	S/04/12251/O-1	23	10.16	2	0.33	35	51.23	20	Amber
ROYAL EXCHANGE CAR PARK CSO	S/04/12251/O-2	39	335.31	4	66.14	Not assessed	Not assessed	21.5	Amber
SOMERWOOD - SUNNINGDALE (CSO)		2	0.22	Not assessed	Not assessed	28	131.25	15	Amber

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
TELFORD - JAMES WAY (CSO)	XP3429 GN	20	53.44	Not assessed	Not assessed	Not assessed	Not assessed	20	Amber
THE WHARFAGE PUMPING STATION	S/02/074 45/O	44	401.91	24	74.08	Not assessed	Not assessed	34	Amber
THE WHARFAGE PUMPING STATION (IRONBRIDGE - WHARFAGE (SPS))	S/02/074 45/O	25	43.15	Not assessed	Not assessed	Not assessed	Not assessed	25	Amber
TIBBERTON - GREENHOUSES (SPS)	S/04/552 50/O	31	315.17	25	43.64	35	97.91	30.33	Amber
WATERS LANE CSO		45	904.91	Not assessed	Not assessed	15	15.24	30	Amber
WELLINGTON - BUCKS HEAD (CSO)	S/04/500 87/O	0	0	1	1.01	22	18.47	7.67	Green
WELLINGTON - GAS WORKS (SST)	S/04/500 10/O	22	136.52	30	315.96	3	3.44	18.33	Amber

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
WELLINGTON - MORRISONS (SST)	S/04/50009/O	15	62.46	34	134	19	73.67	22.67	Amber
PARK AVENUE CSO	S/02/55675/O	10	0.95	11	1.44	7	100	9.33	Green
TELFORD - DEERCOTE HOLLINSWOOD (CSO)	TBC	Not assessed	Not assessed	Not assessed	Not assessed	0	0	0	Not assessed
Wellington-Urban Garden (CSO)	TBC	Not assessed	Not assessed	Not assessed	Not assessed	1	70.9	1	Amber
IRONBRIDGE - DALE END (SPS)	S/02/55807/O	0	0	43	221.04	15	45.88	19.33	Not assessed
IRONBRIDGE - SEVERNSIDE (SPS)	TSC3863	109	168.55	Not assessed	Not assessed	Not assessed	Not assessed	109	Not assessed
IRONBRIDGE - WATERLOO STREET (SPS)		0	0	Not assessed	Not assessed	3	26.62	3	Green

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
IRONBRIDGE (SHAFT) SPS AND LADYWOOD (IRONBRIDGE SHAFT (TPS))	S/02/56046/O	0	0	0	0	60	446.03	60	Red

*Averages from years available

B Appendix B - Storm tank overflows

Table 14-2 WwTW EDM averages and RAG ratings

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
BUILDWAS - PARK VIEW (STW)	NPSWQD007895	39	62.17333	52	93.11	1	0.33	30.67	Amber
COALPORT (STW)	S/02/56070/R	28	60.89333	48	45.14	71	702.28	49	Red
COALPORT SEWAGE TREATMENT WORKS (COALPORT (SEWAGE TREATMENT WORKS))	S/02/56070/R	0	0	13	3.46	36	206.15	16.33	Amber
EDGMOND (STW)	S/04/56016/R	26	41.40194	Not assessed	Not assessed	33	179.14	29.5	Amber
ELLERDINE (STW)	S/04/55874/O	0	0	0	0	0	0	0	Not assessed
FORTON (STW)	S/04/55545/R	5	92.77611	0	0	0	0	5	Green
GREAT BOLAS	S/04/55714/	3	54.76472	59	217.14	57	130.81	39.67	Red

Storm overflow	Permit Ref.	Number of operations in 2021	Duration in 2021 (hours)	Number of operations in 2022	Duration in 2022 (hours)	Number of operations in 2023	Duration in 2023 (hours)	Average *	RAG
(STW)	O								
GREAT BOLAS SEWAGE TREATMENT WORKS	S/04/56001/R	Not assessed	Not assessed	0	0	Not assessed	Not assessed	0	Not assessed
HIGH ERCALL (STW)	S/04/55903/R	0	0	0	0	6	49.3	2	Amber
NEWPORT (STW)	S/04/09049/R	15	77.52306	0	0	50	459.22	21.67	Amber
RODEN (STW)	S/04/56176/R	0	0	1	0.06	22	21.45	7.67	Green
RUSHMOOR (STW)	S/04/55141/R	Not assessed	Not assessed	4	1.48	16	69.94	10	Amber
RUSHMOOR (STW)	S/04/55141/R	Not assessed	Not assessed	6	13.55	5	19.27	5.5	Green

* Averages from years available

C Appendix C - Groundwater Dependent Terrestrial Ecosystems

Table 14-3 Groundwater Dependent Terrestrial Ecosystems that are within a groundwater body that overlaps with water resource zones serving TWC.

GWDTE name	Groundwater body name	SWMI (Y/N)
Abbots Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Allimore Green Common (SSSI)	Staffordshire Trent Valley - Merica Mudstone West	N
Allscott Settling Ponds	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Aqualate Mere (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Areley Wood (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Bagmere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Ballidon Dale (SSSI)	Dove - Carboniferous Limestone	N
Bar Mere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Baswich Meadows (SSSI)	Staffordshire Trent Valley - PT Sandstone Staffordshire	Y
Bath Pasture (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Beechmill Wood & Pasture (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Bees Nest & Green Clay Pits (SSSI)	Dove - Carboniferous Limestone	N
Betley Mere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Big Hyde Rough (SSSI)	Staffordshire Trent Valley - Merica Mudstone West	N
Black Firs & Cranberry Bog (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Black Lake, Delamere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Black Venn Pasture	Teme - Secondary Combined	N

GWDTE name	Groundwater body name	SWMI (Y/N)
Bliss Gate Pastures (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Bomere, Shomere & Betton Pools (SSSI)	Severn Uplands Carboniferous Shrewsbury	N
Broad Green (SSSI)	Teme - Secondary Combined	N
Brookhouse Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Brown Moss (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Brownheath Moss (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Brown's Close Meadow (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Buckeridge Meadow (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Burrington Meadow (SSSI)	Teme - Secondary Combined	N
Bush Wood & High Wood (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Caldon Dales (SSSI)	Dove - Carboniferous Limestone	N
Cannock Chase (SSSI)	Staffordshire Trent Valley - PT Sandstone Staffordshire	Y
Catherton Common (SSSI)	Teme - Secondary Combined	N
Chapel Mere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Chartley Moss (SSSI)	Staffordshire Trent Valley - Mercia Mudstone East & Coal Measures	N
Chasewater And The Southern Staffordshire Coalfield Heaths (SSSI)	Staffordshire Trent Valley - Mercia Mudstone East & Coal Measures	N
Chasewater And The Southern Staffordshire Coalfield Heaths (SSSI)	Tame Anker Mease - Coal Measures Black Country	N
Chasewater And The Southern Staffordshire	Staffordshire Trent Valley - PT Sandstone Staffordshire	Y

GWDTE name	Groundwater body name	SWMI (Y/N)
Coalfield Heaths (SSSI)		
Checkhill Bogs (SSSI)	Worcestershire Middle Severn - PT Sandstone	Y
Chorley Covert & Deserts Wood (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Churnet Valley (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Churnet Valley (SSSI)	Dove - PT Sandstone Leek	Y
Clayhanger (SSSI)	Tame Anker Mease - Coal Measures Black Country	N
Cole Mere (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Colshaw Pastures (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Comber Mere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Compstall Nature Reserve (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N
Cop Mere (SSSI)	Staffordshire Trent Valley - Merica Mudstone West	N
Cotteril Clough (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Crofts Mill Pasture (SSSI)	Severn Uplands - PT Sandstone Knockin	N
Dane-in-Shaw Pasture (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Danes Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Derrington Meadow (SSSI)	Teme - Secondary Combined	N
Dimmings Dale & The Ranger (SSSI)	Dove - PT Sandstone Mayfield	N
Doley Common (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Dove Valley & Biggin Dale (SSSI)	Dove - Carboniferous Limestone	N
Downton Gorge (SSSI)	Teme - Secondary Combined	N

GWDTE name	Groundwater body name	SWMI (Y/N)
Doxey & Tillington Marshes (SSSI)	Staffordshire Trent Valley - Merica Mudstone West	N
Dumbleton Dingle (SSSI)	Teme - Secondary Combined	N
Dunham Park (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Fenemere (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
FENN'S, WHIXALL, BETTISFIELD, WEM AND CADNEY MOSSES	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
FENN'S, WHIXALL, BETTISFIELD, WEM AND CADNEY MOSSES	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Fens Pools (SSSI)	Shropshire Middle Severn - Coal Measures Dudley	N
Fernhill Pastures (SSSI)	Severn Uplands - Carboniferous Oswestry	N
Flat Coppice (SSSI)	Teme - Secondary Combined	N
Flaxmere Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Ford Green Reedbed (SSSI)	Staffordshire Trent Valley - Coal Measures Stoke	N
Frog End Meadow (SSSI)	Teme - Secondary Combined	N
Froghall Meadow and Pastures (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Gentleshaw Common (SSSI)	Staffordshire Trent Valley - Mercia Mudstone East & Coal Measures	N
Gleads Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Goyt Valley (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N

GWDTE name	Groundwater body name	SWMI (Y/N)
Hamps & Manifold Valleys (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Hamps & Manifold Valleys (SSSI)	Dove - Carboniferous Limestone	N
Hanley Dingle (SSSI)	Teme - Secondary Combined	N
Hartlebury Common & Hillditch Coppice (SSSI)	Worcestershire Middle Severn - PT Sandstone	Y
Hatch Mere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Hatherton Flush (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Hay Wood & Tinkers' Coppice (SSSI)	Teme - Secondary Combined	N
Hencott Pool (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Hill Houses & Crumpsbrook Meadows (SSSI)	Teme - Secondary Combined	N
Hillend Meadow & Orchard (SSSI)	Teme - Secondary Combined	N
Hilton Gravel Pits (SSSI)	Dove - Mercia Mudstone	N
Hipley Hill (SSSI)	Dove - Carboniferous Limestone	N
Hodnet Heath (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Holly Banks (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Huddersfield Narrow Canal (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N
Hulland Moss (SSSI)	Dove - Mercia Mudstone	N
Hurcott & Podmore Pools (SSSI)	Worcestershire Middle Severn - PT Sandstone	Y
Illey Pastures (SSSI)	Shropshire Middle Severn - Coal Measures Dudley	N
Jockey Fields (SSSI)	Tame Anker Mease - Coal Measures Black Country	N
Leek Moors (SSSI)	Dove - Millstone Grit/ Coal	N

GWDTE name	Groundwater body name	SWMI (Y/N)
	Measures	
Leek Moors (SSSI)	Dove - Carboniferous Limestone	N
Leek Moors (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N
Leigh Brook Valley (SSSI)	Teme - Secondary Combined	N
Lin Can Moss (SSSI)	Severn Uplands - PT Sandstone Knockin	N
Lindow Common (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Linmer Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Llanymynech & Llynclys Hills (SSSI)	Severn Uplands - Carboniferous Oswestry	N
Llanymynech Hill (SSSI)	Severn Uplands - Carboniferous Oswestry	N
Long Dale, Hartington (SSSI)	Dove - Carboniferous Limestone	N
Long Mynd (SSSI)	Teme - Secondary Combined	N
Lord's Wood Meadows (SSSI)	Teme - Secondary Combined	N
Lower Peaslows Farm Meadow (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N
Loynton Moss (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Lydebrook Dingle (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Madams Wood (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Maer Pool (SSSI)	Staffordshire Trent Valley - PT Sandstone Staffordshire	Y
Maer Pool (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Marked Ash Meadows (SSSI)	Teme - Secondary Combined	N
Melverley Farm (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N

GWDTE name	Groundwater body name	SWMI (Y/N)
Mercaston Marsh & Muggington Bottoms (SSSI)	Dove - PT Sandstone Mayfield	N
Monk Wood (SSSI)	Teme - Secondary Combined	N
Monkwood Green (SSSI)	Teme - Secondary Combined	N
Montgomery Canal, Aston Locks-Keeper's Bridge (SSSI)	Severn Uplands - PT Sandstone Knockin	N
Morton Pool & Pasture (SSSI)	Severn Uplands - PT Sandstone Knockin	N
Moss Carr (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Mottey Meadows (SSSI)	Staffordshire Trent Valley - Merica Mudstone West	N
Muxton Marsh (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Newport Canal	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Nine Holes Meadows (SSSI)	Teme - Secondary Combined	N
Norbury Meres (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Oak Mere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Oakhanger Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Old River Bed, Shrewsbury (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Old River Dove, Marston on Dove (SSSI)	Dove - Mercia Mudstone	N
Oss Mere (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Pasturefields Salt Marsh (SSSI)	Staffordshire Trent Valley - Mercia Mudstone East & Coal Measures	N
Pennerley Meadows (SSSI)	Teme - Secondary Combined	N
Penorchard & Spring	Shropshire Middle Severn -	N

GWDTE name	Groundwater body name	SWMI (Y/N)
Farm Pastures (SSSI)	Coal Measures Dudley	
Pettypool Brook Valley (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Plumley Lime Beds (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Prees Branch Canal (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Prince's Rough (SSSI)	Teme - Secondary Combined	N
Puxton Marshes (SSSI)	Worcestershire Middle Severn - PT Sandstone	Y
Quarry Farm Meadow (SSSI)	Teme - Secondary Combined	N
Quoisley Meres (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Ranters Bank Pastures (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Rawbones Meadow (SSSI)	Staffordshire Trent Valley - PT Sandstone Staffordshire	Y
Rhos Fiddle (SSSI)	Teme - Secondary Combined	N
Risley Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
River Teme (SSSI)	Teme - Secondary Combined	N
Roe Park Woods (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N
Romsley Hill (SSSI)	Shropshire Middle Severn - Coal Measures Dudley	N
Romsley Manor Farm (SSSI)	Shropshire Middle Severn - Coal Measures Dudley	N
Ruewood Pastures (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Saltersford Lane Meadows (SSSI)	Dove - Mercia Mudstone	N
Shelve Pool (SSSI)	Teme - Secondary Combined	N
Showground Meadow, Callow Hill (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Shrawardine Pool (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y

GWDTE name	Groundwater body name	SWMI (Y/N)
Shrawley Wood (SSSI)	Worcestershire Middle Severn - PT Sandstone	Y
Sound Heath (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
South Pennine Moors (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N
Stafford Brook (SSSI)	Staffordshire Trent Valley - PT Sandstone Staffordshire	Y
Stanton Pastures & Cuckoocliff Valley (SSSI)	Dove - PT Sandstone Mayfield	N
Stanton Pastures & Cuckoocliff Valley (SSSI)	Dove - Carboniferous Limestone	N
Stocking Meadows, Oreton (SSSI)	Teme - Secondary Combined	N
Stourvale Marsh (SSSI)	Worcestershire Middle Severn - PT Sandstone	Y
Stowe Pool and Walk Mill Clay Pit (SSSI)	Staffordshire Trent Valley - Mercia Mudstone East & Coal Measures	N
Stubbers Green Bog (SSSI)	Tame Anker Mease - Coal Measures Black Country	N
Swan Pool & The Swag (SSSI)	Tame Anker Mease - Coal Measures Black Country	N
Sweat Mere & Crose Mere (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Sweeney Fen (SSSI)	Severn Uplands - Carboniferous Oswestry	N
Tatton Meres (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Teddon Farm (SSSI)	Shropshire Middle Severn - Secondary Combined	N
The Dark Peak (SSSI)	Manchester and East Cheshire Carboniferous Aquifers	N
The Malvern Hills (SSSI)	Teme - Secondary Combined	N
The Stiperstones & The Hollies (SSSI)	Teme - Secondary Combined	N

GWDTE name	Groundwater body name	SWMI (Y/N)
The Wilderness & Vermin Valley (SSSI)	Shropshire Middle Severn - Secondary Combined	N
The Wrekin & The Ercall (SSSI)	Shropshire Middle Severn - Secondary Combined	N
The Wrekin & The Ercall (SSSI)	Shropshire Middle Severn - PT Sandstone East Shropshire	Y
Thorncliffe Moor (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Tick Wood & Benthall Edge (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Titterstone Clee (SSSI)	Teme - Secondary Combined	N
Trefonen Marshes (SSSI)	Severn Uplands - Carboniferous Oswestry	N
Via Gellia Woodlands (SSSI)	Dove - Carboniferous Limestone	N
Warburton's Wood & Well Wood (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Wenlock Edge (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Wenlock Edge (SSSI)	Teme - Secondary Combined	N
Wetley Moor (SSSI)	Dove - Millstone Grit/ Coal Measures	N
Wetley Moor (SSSI)	Staffordshire Trent Valley - Coal Measures Stoke	N
Wettenhall & Darnhall Woods (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Whiston Eaves (SSSI)	Dove - Millstone Grit/ Coal Measures	N
WHITE GRIT MEADOWS	Teme - Secondary Combined	N
White Mere (SSSI)	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	N
Whitwell Coppice (SSSI)	Shropshire Middle Severn - Secondary Combined	N
Wilden Marsh & Meadows (SSSI)	Worcestershire Middle Severn - PT Sandstone	Y
Wimboldsley Wood (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N

GWDTE name	Groundwater body name	SWMI (Y/N)
Wybunbury Moss (SSSI)	Weaver and Dane Quaternary Sand and Gravel Aquifers	N
Wyre Forest (SSSI)	Shropshire Middle Severn - Secondary Combined	N

D Appendix D - Protected sites adjacent to rivers within WRZs serving TWC

Table 14-4 SSSIs that are adjacent to waterbodies within the WRZs serving TWC

SSSI name	Surface waterbody name	SWMI (N/Y)
Allscott Settling Ponds	Roden - conf Sleap Bk to conf R Tern	N
Allscott Settling Ponds	Tern - conf R Meese to conf R Roden	N
Aqualate Mere	Meese - Aqualate Mere tributaries	N
Aqualate Mere	Meese - Outflow Aqualate Mere to conf R Ter	N
Ashleworth Ham	R Severn - conf R Avon to conf Upper Parting	N
Ashmoor Common	Severn - conf R Teme to conf R Avon	N
Attingham Park	Severn - Sundorne Bk to conf M Wenlock-Farley Bk	N
Attingham Park	Tern - conf R Roden to conf R Severn	N
Bar Mere	Marbury Brook	N
Baswich Meadows	Sow from R Penk to R Trent	N
Belvide Reservoir	Penk - Saredon Bk to Whiston Bk	N
Betley Mere	Wistaston Brook	N
Blithfield Reservoir	Blithe from Source to Tad Brook	Y
Brownend Quarry	Hamps from Source to R Manifold	N
Buildwas River Section	Severn - Sundorne Bk to conf M Wenlock-Farley Bk	N
Buildwas River Section	Severn conf M Wenlock-Farley Bk to conf R Worfe	N
Bullhill Brook	Coundmoor Bk - source to conf Cound Bk	N
Cannock Chase	Sow from R Penk to R Trent	N
Cannock Chase	Trent from River Sow to Moreton Brook	N
Cannock Chase	Penk - Whiston Bk to R Sow	N
Chaceley Meadow	R Severn - conf R Avon to conf Upper Parting	N
Chermes Dingle	Severn - Sundorne Bk to conf M Wenlock-Farley Bk	N

SSSI name	Surface waterbody name	SWMI (N/Y)
Churnet Valley	Combes Brook Catch (trib of R Churnet)	N
Churnet Valley	Churnet from Endon Brook to Consall	Y
Churnet Valley	Churnet from Consall to River Dove	Y
Comber Mere	Sales Brook	N
Combes Valley	Combes Brook Catch (trib of R Churnet)	N
Combes Valley	Churnet from Endon Brook to Consall	Y
Coombe Hill Canal	R Severn - conf R Avon to conf Upper Parting	N
Cop Mere	Sow from Source to Brockton Brook	N
Coundmoor Brook	Coundmoor Bk - source to conf Cound Bk	N
Crofts Mill Pasture	Morda trib - Morton Common	N
Crofts Mill Pasture	Morda - conf unnamed trib to conf Afon Vyrn	N
Dane-in-Shaw Pasture	Biddulph Brook	N
Dimmings Dale & The Ranger	Churnet from Consall to River Dove	Y
Doley Common	Whiston Bk	Y
Dove Valley and Biggin Dale	Dove - conf R Manifold to conf R Churnet	N
Dove Valley and Biggin Dale	Dove from Source to River Manifold	N
Dove Valley and Biggin Dale	Manifold - source to conf R Dove	N
Doxey and Tillington Marshes	Sow - Brockton Bk to Doxey Bk	Y
Doxey and Tillington Marshes	Sow - Doxey Bk to R Penk	Y
Doxey and Tillington Marshes	Doxey Bk - source to R Sow	N
Earl's Hill & Habberley Valley	Pontesford Bk - source to conf Rea Bk	N
Ecton Copper Mines	Manifold - source to conf R Dove	N
Fenemere	War Bk - source to conf R Perry	N

SSSI name	Surface waterbody name	SWMI (N/Y)
Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses	Tributary - source to conf R Roden	N
Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses	Roden - source to conf unnamed trib	N
Fernhill Pastures	Perry - source to conf Common Bk	N
Flat Coppice	Onny - conf R E Onny to conf R Teme	N
Ford Green Reedbed	Ford Green Brook from Source to R Trent	N
Froghall Meadow and Pastures	Churnet from Consall to River Dove	Y
Gordano Valley	Portbury Ditch - source to conf R Severn Estuary	N
Grimley Brick Pits	Grimley Bk - source to conf R Severn	N
Grimley Brick Pits	R Severn - conf R Stour to conf RIver Teme	N
Hamps and Manifold Valleys	Dove from Source to River Manifold	N
Hamps and Manifold Valleys	Manifold - source to conf R Dove	N
Hartlebury Common and Hillditch Coppice	R Severn - conf R Stour to conf RIver Teme	N
Hencott Pool	Severn - conf Bele Bk to conf Sundorne Bk	N
Holly Banks	Dane (Cow Brook to Wheelock)	Y
Hope Valley	Minsterley Bk - source to conf Rea Bk	N
Hughley Brook	Sheinton Bk - source to conf R Severn	N
King's and Hargreaves Woods	Trent from Fowlea Brook to Tittensor	N
King's and Hargreaves Woods	Park Brook Catchment (trib of Trent)	N
Leek Moors	Dove from Source to River Manifold	N
Leek Moors	Dane (Source to Clough Brook)	N
Leek Moors	Meerbrook - source to R Churnet	N
Leek Moors	Churnet from Source to Meerbrook	N
Leek Moors	Manifold - source to conf R Dove	N

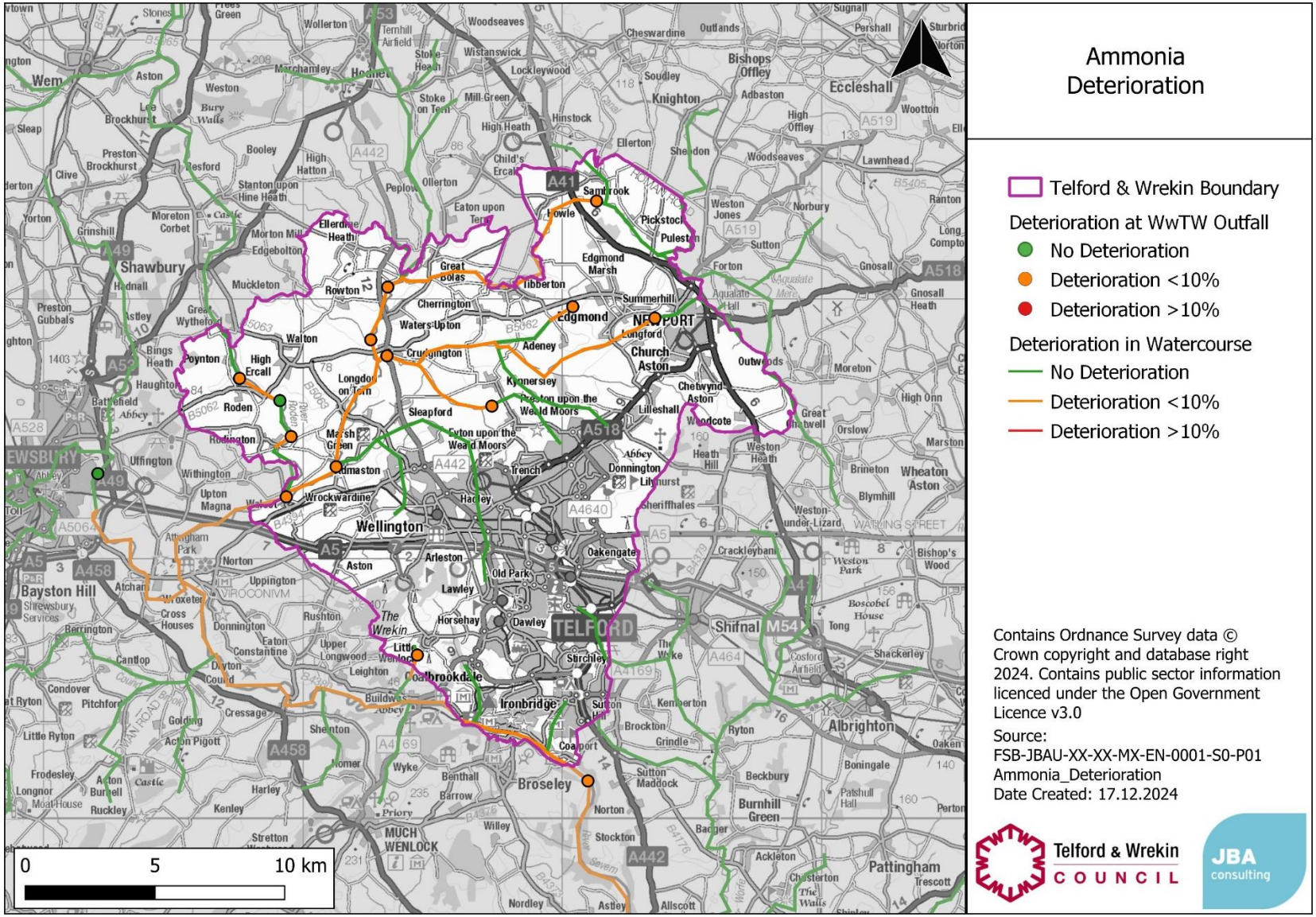
SSSI name	Surface waterbody name	SWMI (N/Y)
Long Mynd	Cound Bk - source to conf unnamed trib	N
Long Mynd	Criftin Bk - source to conf R Onny	N
Long Mynd	Onny - conf R E Onny to conf R Teme	N
Long Mynd	Quinny Bk - source to conf R Onny	N
Lydebrook Dingle	Lyde Bk - source to conf R Severn	N
Madams Wood	Dane (Cow Brook to Wheelock)	Y
Marton Pool, Chirbury	Aylesford Bk - source to conf R Camlad	N
Marton Pool, Chirbury	Rea Bk - source to conf Rowley Bk	N
Montgomery Canal, Aston Locks - Keeper's Bridge	Oswestry Bk	N
Mottey Meadows	Whiston Bk	Y
Muxton Marsh	Wall Bk - source to conf Pipe Strine	N
Newport Canal	Strine Bk - source to conf Wall Bk	N
Northwick Marsh	R Severn - conf R Stour to conf RIver Teme	N
Old River Bed, Shrewsbury	Severn - conf Bele Bk to conf Sundorne Bk	N
Old River Severn, Upper Lode	R Severn - conf R Avon to conf Upper Parting	N
Onny River Section	Onny - conf R E Onny to conf R Teme	N
Pasturefields Salt Marsh	Trent from Tittensor to River Sow	N
Rawbones Meadow	Sow from R Penk to R Trent	N
River Dane	Loach Brook	N
River Dane	Dane (Cow Brook to Wheelock)	Y
River Severn at Montford	Severn - conf Bele Bk to conf Sundorne Bk	N
River Teme	Onny - conf R E Onny to conf R Teme	N
River Teme	Severn - conf R Teme to conf R Avon	N
River Wye	Valley Bk - source to conf R Wye	N
Ruewood Pastures	Roden - conf unnamed trib to conf Sleap Bk	N
Severn Estuary	N/A	N

SSSI name	Surface waterbody name	SWMI (N/Y)
Severn Ham, Tewkesbury	R Avon - Tolsey Lane to conf R Severn	N
Sheinton Brook	Sheinton Bk - source to conf R Severn	N
Shrawley Wood	Dick Bk - source to conf R Severn	N
Stafford Brook	Trent from River Sow to Moreton Brook	N
Stanton Pastures & Cuckoocliff Valley	Stanton/Wootton/Ellastone Catch (trib of Dove)	N
Stowe Pool and Walk Mill Clay Pit	Saredon Brook from Source to River Penk	N
Sweat Mere and Crose Mere	Roden - source to conf unnamed trib	N
Thatchers Wood and Westwood Covert	Mor Bk - conf Beaconhill Bk to conf R Severn	N
Tick Wood and Benthall Edge	Severn conf M Wenlock-Farley Bk to conf R Worfe	N
Tick Wood and Benthall Edge	Much Wenlock-Farley Bk - source to conf R Severn	N
Upper Severn Estuary	Gilgal Bk - source to Severn R Estuary	N
Upton Ham	Severn - conf R Teme to conf R Avon	N
Wainlode Cliff	R Severn - conf R Avon to conf Upper Parting	N
Whitwell Coppice	Sheinton Bk - source to conf R Severn	N
Wybunbury Moss	Checkley Brook - Lower	N
Wyre Forest	Severn - conf R Worfe to conf R Stour	N

E Appendix E - Water quality mapping

E.1 Future scenario

The set of maps below show the modelled results if wastewater discharges increased by the volume predicted during the Local Plan period. They show a result at the point of mixing (i.e., where the WwTW discharges) and the results downstream in the river. These are colour coded based on whether deterioration is greater (red) or less than (amber) 10%. Areas where no deterioration is predicted are coloured green.


Ammonia
Deterioration
Telford & Wrekin Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2024. Contains public sector information licenced under the Open Government Licence v3.0
Source:
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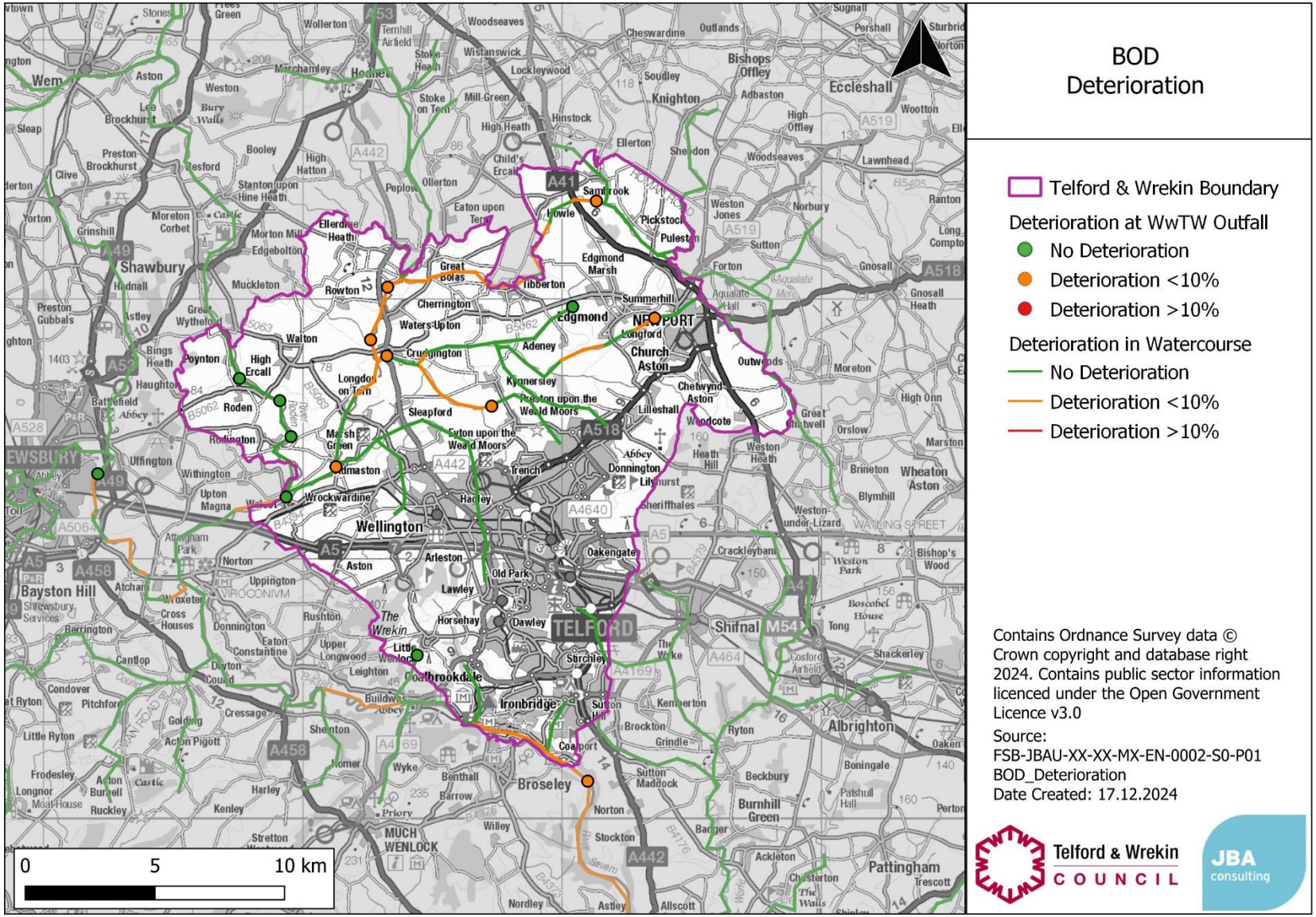
Ammonia_Deterioration
Date Created: 17.12.2024
Telford & Wrekin COUNCIL
JBA consulting
0
5
10 km
Wellington
TELFORD
Shawbury
Newport
Broseley
Ironbridge
Albrighton
Shifnal
Bayston Hill
Pattingham
MUCH WENLOCK


BOD
Deterioration
Telford & Wrekin Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2024. Contains public sector information licenced under the Open Government Licence v3.0
Source:
FSB-JBAU-XX-XX-MX-EN-0002-S0-P01
BOD_Deterioration
Date Created: 17.12.2024
Telford & Wrekin COUNCIL
JBA consulting
0
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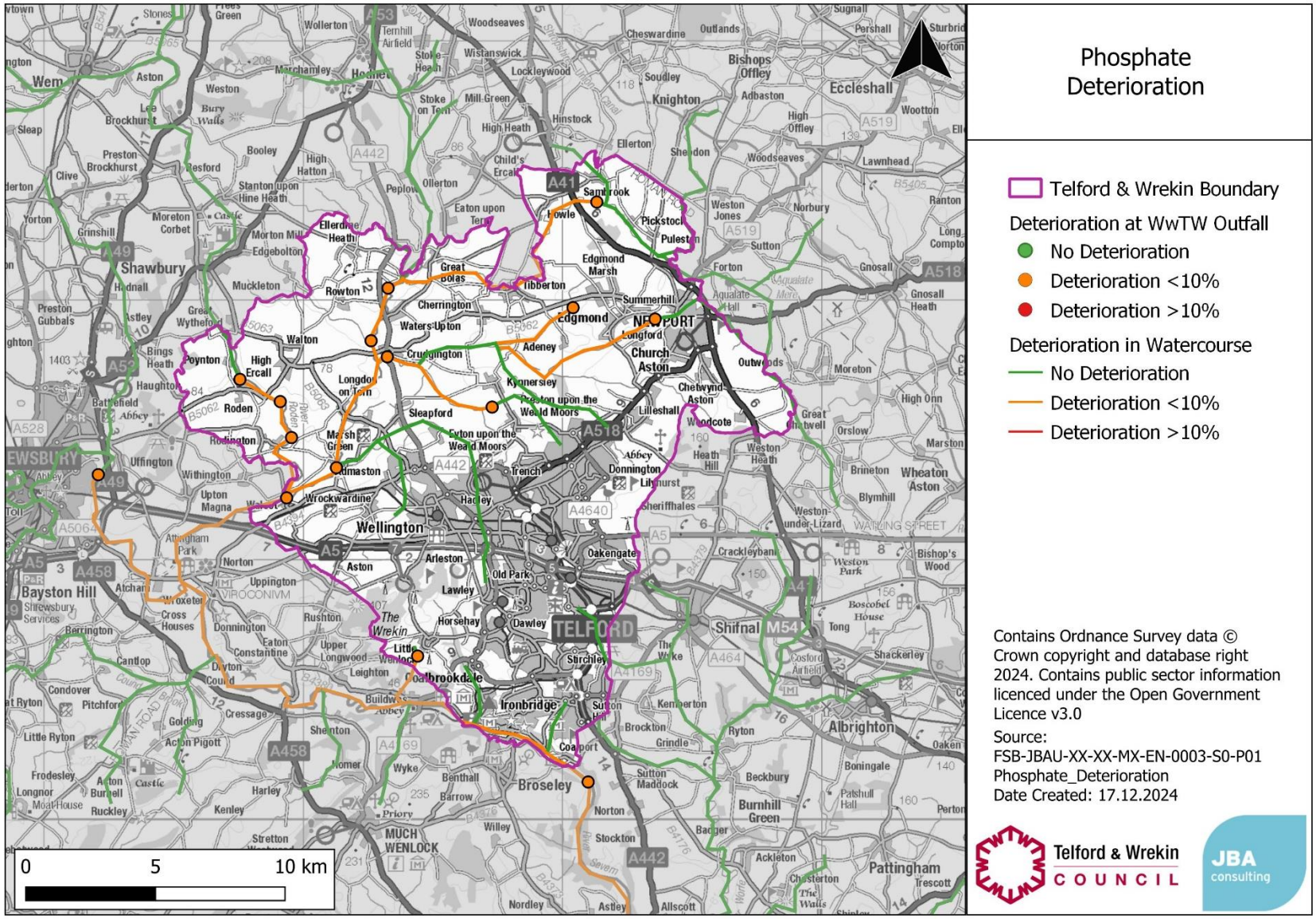
10 km
Wellington
TELFORD
Shawbury
Newport
Broseley
Ironbridge
Albrighton
Shifnal
Bayston Hill
Pattingham
MUCH WENLOCK


Phosphate Deterioration
Telford & Wrekin Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2024. Contains public sector information licenced under the Open Government Licence v3.0
Source: FSB-JBAU-XX-XX-MX-EN-0003-S0-P01 Phosphate_Deterioration
Date Created: 17.12.2024
Telford & Wrekin COUNCIL
JBA consulting
0
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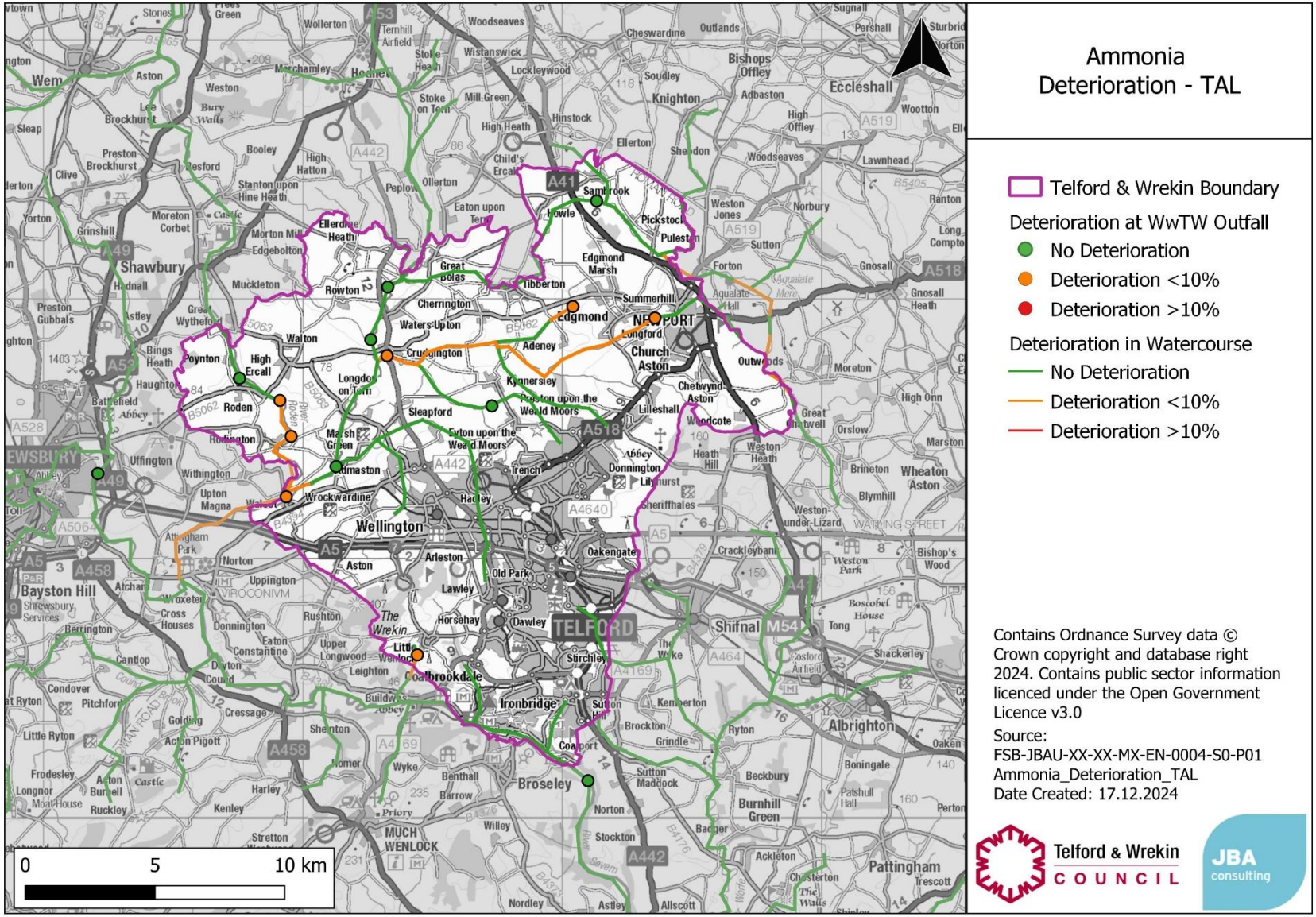
10 km
Wellington
TELFORD
Shawbury
Newport
Ironbridge
Broseley
Albrighton
Shifnal
Bayston Hill
Pattingham
MUCH WENLOCK

E.2 TAL scenario

This second set of maps show the modelled results in the TAL scenario, where each WwTW has been upgraded to the technically achievable limit (TAL). This shows areas where deterioration could not be prevented. In each case this is less than 10%.


Ammonia
Deterioration - TAL
Telford & Wrekin Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2024. Contains public sector information licenced under the Open Government Licence v3.0
Source:
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Telford & Wrekin COUNCIL
JBA consulting
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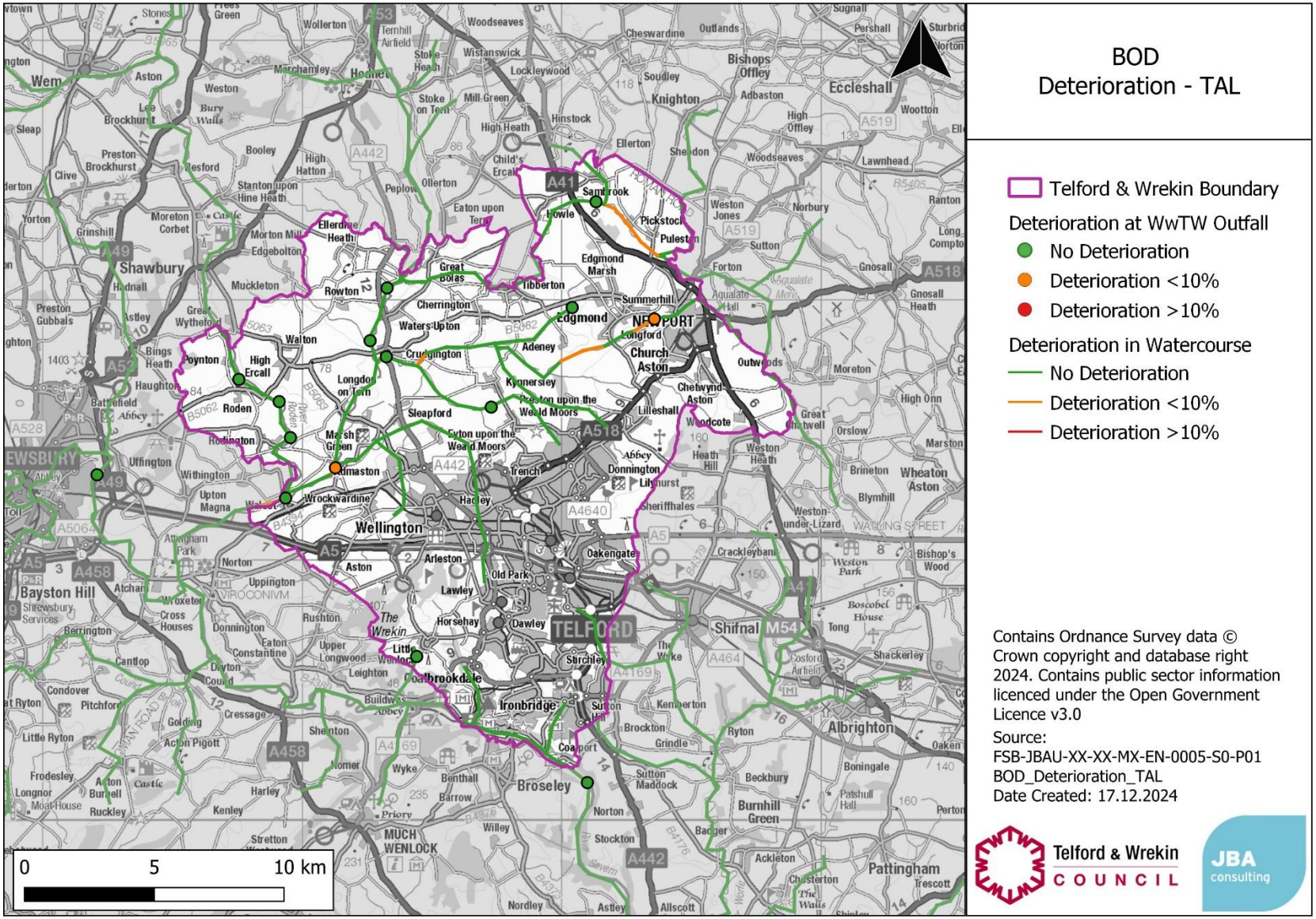
10 km
Shawbury
Wellington
TELFORD
Newport
Albrighton
Broseley
Ironbridge
Bayston Hill
Shifnal
Oakengate
Dawley
Coalbrookdale
MUCH WENLOCK


BOD
Deterioration - TAL
Telford & Wrekin Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Deterioration
Deterioration <10%
Deterioration >10%
Contains Ordnance Survey data © Crown copyright and database right 2024. Contains public sector information licenced under the Open Government Licence v3.0
Source:
FSB-JBAU-XX-XX-MX-EN-0005-S0-P01 BOD_Deterioration_TAL
Date Created: 17.12.2024
Telford & Wrekin COUNCIL
JBA consulting
0
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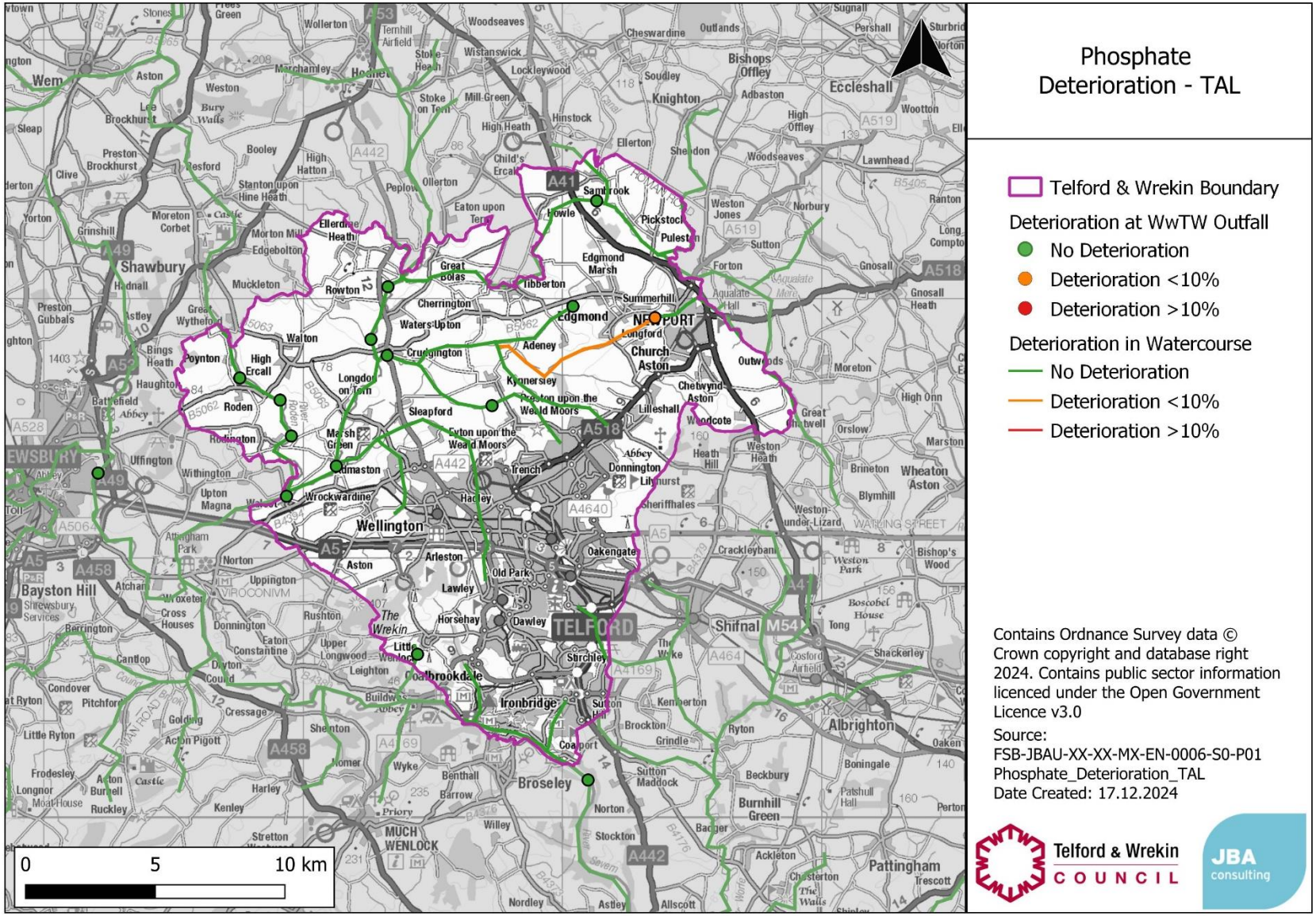
10 km
Wellington
TELFORD
Shawbury
Bayston Hill
Broseley
Ironbridge
Coalbrookdale
Newport
Shifnal
Albrighton
Eccleshall
Pattingham
MUCH WENLOCK


Phosphate
Deterioration - TAL
Telford & Wrekin Boundary
Deterioration at WwTW Outfall
No Deterioration
Deterioration <10%
Deterioration >10%
Deterioration in Watercourse
No Deterioration
Deterioration <10%
Deterioration >10%
0
5
10 km
Contains Ordnance Survey data © Crown copyright and database right 2024. Contains public sector information licenced under the Open Government Licence v3.0
Source:
FSB-JBAU-XX-XX-MX-EN-0006-S0-P01 Phosphate_Deterioration_TAL
Date Created: 17.12.2024
Telford & Wrekin COUNCIL
JBA consulting

F Appendix F - Water quality results

F.1 Ammonia

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class	Future Class	TAL Class
COALPORT STW	0.0887	0.0922	4%	0.0798	-10%	HIGH	HIGH	HIGH
CRUDGINGTON	0.2497	0.2542	2%	0.2523	1%	HIGH	HIGH	HIGH
EDGMOND STW	0.4976	0.5006	1%	0.5006	1%	GOOD	GOOD	GOOD
ELLERDINE (W	0.0762	0.0762	0%	0.0714	-6%	HIGH	HIGH	HIGH
HIGH ERCALL STW	0.1380	0.1380	0%	0.1387	0%	HIGH	HIGH	HIGH
LITTLE WENLOCK STW	0.4967	0.4967	0%	0.4967	0%	GOOD	GOOD	GOOD
NEWPORT STW	0.4267	0.4645	9%	0.4645	9%	GOOD	GOOD	GOOD
OSBASTON STW	0.0711	0.0711	0%	0.0682	-4%	HIGH	HIGH	HIGH
OXMOOR (WRW)	0.3467	0.3470	0%	0.3467	0%	GOOD	GOOD	GOOD

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class	Future Class	TAL Class
RODEN STW	0.1446	0.1446	0%	0.1444	0%	HIGH	HIGH	HIGH
RUSHMOOR STW	0.1876	0.1941	3%	0.1868	0%	HIGH	HIGH	HIGH
SAMBROOK (WR	0.0816	0.0816	0%	0.0743	-9%	HIGH	HIGH	HIGH
SHREWSBURY MONKMOOR	0.0787	0.0787	0%	0.0774	-2%	HIGH	HIGH	HIGH
SUGDON (WRW)	0.1331	0.1331	0%	0.1337	0%	HIGH	HIGH	HIGH
WALCOT (WRW)	0.1866	0.2037	9%	0.1937	4%	HIGH	HIGH	HIGH

F.2 BOD

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class	Future Class	TAL Class
COALPORT STW	2.1631	2.1667	0%	2.1564	0%	HIGH	HIGH	HIGH
CRUDGINGTON	1.7751	1.7789	0%	1.7745	0%	HIGH	HIGH	HIGH
EDGMOND	3.5352	3.5248	0%	3.5248	0%	HIGH	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class	Future Class	TAL Class
STW								
ELLERDINE (W	1.6030	1.6031	0%	1.5963	0%	HIGH	HIGH	HIGH
HIGH ERCALL STW	2.9779	2.9777	0%	2.9701	0%	HIGH	HIGH	HIGH
LITTLE WENLOCK STW	15.5470	15.5460	0%	15.5460	0%	BAD	BAD	BAD
NEWPORT STW	3.9616	4.0029	1%	4.0029	1%	HIGH	GOOD	GOOD
OSBASTON STW	1.5140	1.5141	0%	1.5110	0%	HIGH	HIGH	HIGH
OXMOOR (WRW)	1.1651	1.1763	1%	1.1651	0%	HIGH	HIGH	HIGH
RODEN STW	3.0499	3.0499	0%	3.0462	0%	HIGH	HIGH	HIGH
RUSHMOOR STW	1.8026	1.8108	0%	1.8092	0%	HIGH	HIGH	HIGH
SAMBROOK (WR	1.1811	1.1812	0%	1.1771	0%	HIGH	HIGH	HIGH
SHREWSBURY MONKMOOR	2.1120	2.1120	0%	2.1091	0%	HIGH	HIGH	HIGH
SUGDON (WRW)	2.9178	2.9177	0%	2.9151	0%	HIGH	HIGH	HIGH
WALCOT	1.9630	1.9616	0%	1.9593	0%	HIGH	HIGH	HIGH

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class	Future Class	TAL Class
(WRW)								

F.3 Phosphate

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class	Future Class	TAL Class
COALPORT STW	0.1690	0.1705	1%	0.1246	-26%	POOR	POOR	MODERATE
CRUDGINGTON	0.2164	0.2272	5%	0.1777	-18%	POOR	POOR	MODERATE
EDGMOND STW	0.6865	0.6988	2%	0.2402	-65%	POOR	POOR	POOR
ELLERDINE (W	0.2371	0.2372	0%	0.2077	-12%	POOR	POOR	POOR
HIGH ERCALL STW	0.3346	0.3349	0%	0.2431	-27%	POOR	POOR	POOR
LITTLE WENLOCK STW	0.2868	0.2871	0%	0.1855	-35%	POOR	POOR	POOR
NEWPORT	0.1336	0.1433	7%	0.1433	7%	MODERA	MODERA	MODERA

WwTW (SIMCAT name)	Baseline concentration (mg/l)	Future concentration (mg/l)	Percentage deterioration (%)	TAL concentration (mg/l)	TAL Percentage deterioration (%)	Baseline Class	Future Class	TAL Class
STW						TE	TE	TE
OSBASTON STW	0.2384	0.2385	0%	0.2091	-12%	POOR	POOR	POOR
OXMOOR (WRW)	0.0946	0.0996	5%	0.0946	0%	MODERATE	MODERATE	MODERATE
RODEN STW	0.3349	0.3351	0%	0.2461	-27%	POOR	POOR	POOR
RUSHMOOR STW	0.2427	0.2452	1%	0.2078	-14%	POOR	POOR	POOR
SAMBROOK (WR	0.2901	0.2902	0%	0.2649	-9%	POOR	POOR	POOR
SHREWSBURY MONKMOOR	0.1403	0.1403	0%	0.1061	-24%	MODERATE	MODERATE	MODERATE
SUGDON (WRW)	0.3287	0.3290	0%	0.2419	-26%	POOR	POOR	POOR
WALCOT (WRW)	0.2377	0.2444	3%	0.2039	-14%	POOR	POOR	POOR

G Appendix G - Environmental sites water quality impact

G.1 SSSIs

The tables within this appendix detail the predicted deterioration in water quality in the river adjacent to each SSSI, SAC, SPA and Ramsar downstream of WwTWs serving growth in the Local Plan period. It includes the protected site name, reference and the point in the SIMCAT model used to obtain the result. The first three results show the predicted deterioration at the end of the plan period if all planned growth were delivered. The final three columns show the result of the TAL scenario where all WwTWs are upgraded to their technically achievable limit. A negative number indicates an improvement in water quality compared to the future scenario, i.e. deterioration can be prevented.

SSSI name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Allscott Settling Ponds	SJ601129	RUSHMOOR STW "	3%	0%	1%	0%	0%	-14%
Allscott Settling Ponds	SJ601129	Extra Plot Point - Reach 219 No 22 "	0%	0%	0%	0%	0%	-25%
Ashleworth Ham	SO832262	Extra Plot Point - Reach 1034 No 2 "	0%	0%	0%	-36%	-1%	-38%
Ashmoor Common	SO852466	KERSWELL GRE "	0%	0%	0%	-32%	-1%	-34%
Ashton Court	ST552721	Extra Plot Point - Reach 1041	0%	0%	0%	-34%	-1%	-37%

SSSI name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
		No 3 "						
Attingham Park	SJ551095	Start Of Reach 272 "	4%	0%	2%	2%	0%	-17%
Aust Cliff	ST568898	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Avon Gorge	ST558739	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Buildwas River Section	SJ640045	Start Of Reach 299 "	0%	0%	1%	-3%	0%	-21%
Chaceley Meadow	SO857305	FS Severn Deerhurst "	0%	0%	0%	-38%	-1%	-38%
Coombe Hill Canal	SO867268	Extra Plot Point - Reach 1034 No 1 "	0%	0%	0%	-37%	-1%	-38%
Frampton Pools	SO753073	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Garden Cliff	SO718127	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%

SSSI name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Gordano Valley	ST436732	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Grimley Brick Pits	SO838616	CSO 908 "	1%	0%	1%	-20%	0%	-30%
Grimley Brick Pits	SO838616	Start Of Reach 437 "	0%	0%	1%	-19%	0%	-30%
Grimley Brick Pits	SO838616	Extra Plot Point - Reach 407 No 1 "	1%	0%	1%	-20%	0%	-30%
Hartlebury Common and Hilldtch Coppice	SO823707	GB109054049145 Boundary "	1%	0%	1%	-7%	0%	-29%
Horseshoe Bend, Shirehampton	ST540767	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Lydney Cliff	SO653017	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Newport Canal	SJ736193	NEWPORT STW	9%	1%	7%	9%	1%	7%

SSSI name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
		"						
Northwick Marsh	SO835579	Extra Plot Point - Reach 443 No 1 "	1%	0%	1%	-18%	0%	-30%
Old River Severn, Upper Lode	SO880330	GB109054039760 Boundary "	0%	0%	0%	-32%	-1%	-37%
Portishead Pier to Black Nore	ST452767	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Purton Passage	SO686044	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
River Teme	SO507745	GB109054049144 Boundary "	0%	0%	0%	-32%	0%	-35%
River Wye	SO519384	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Severn Estuary	ST529870	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Severn Ham,	SO885325	GB109054039760 Boundary	0%	0%	0%	-32%	-1%	-37%

SSSI name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Tewkesbury		"						
Shrawley Wood	SO808659	Extra Plot Point - Reach 396 No 2 "	0%	0%	1%	-19%	-1%	-30%
Tick Wood and Benthall Edge	SJ663033	Extra Plot Point - Reach 301 No 2 "	1%	0%	1%	-2%	0%	-21%
Upper Severn Estuary	SO716063	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Upton Ham	SO859400	HOLLY GREEN STW "	0%	0%	0%	-34%	-1%	-38%
Wainlode Cliff	SO845257	Start Of Reach 1039 "	0%	0%	0%	-35%	-1%	-37%
Walmore Common	SO744151	Extra Plot Point - Reach 1041 No 3 "	0%	0%	0%	-34%	-1%	-37%
Wyre Forest	SO745766	UPPER ARLEY STW "	2%	0%	1%	-10%	0%	-29%
Wyre	SO7457	Extra Plot Point	2%	0%	1%	-10%	0%	-29%

SSSI name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Forest	66	- Reach 349 No 1 "						
Wyre Forest	SO745766	TRIMPLEY WTW EYMORE WOOD TE "	2%	0%	1%	-9%	0%	-29%
Wyre Forest	SO745766	UPPER ARLEY STW "	2%	0%	1%	-10%	0%	-29%

G.2 SAC

SAC name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Allscott Settling Ponds	SJ601129	RUSHMOOR STW "	3%	0%	1%	0%	0%	-14%
Allscott Settling Ponds	SJ601129	Extra Plot Point - Reach 219 No 22 "	0%	0%	0%	0%	0%	-25%
Ashleworth Ham	SO832262	Extra Plot Point - Reach 1034 No 2 "	0%	0%	0%	-36%	-1%	-38%

G.3 SPA

SPA name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Allscott Settling Ponds	SJ601129	RUSHMOOR STW "	3%	0%	1%	0%	0%	-14%
Allscott Settling Ponds	SJ601129	Extra Plot Point - Reach 219 No 22 "	0%	0%	0%	0%	0%	-25%

G.4 Ramsar

Ramsar name	Reference ID	SIMCAT Model Point	Ammonia Deterioration	BOD Deterioration	Phosphate Deterioration	Ammonia Deterioration TAL	BOD Deterioration TAL	Phosphate Deterioration TAL
Allscott Settling Ponds	SJ601129	RUSHMOOR STW "	3%	0%	1%	0%	0%	-14%
Allscott Settling Ponds	SJ601129	Extra Plot Point - Reach 219 No 22 "	0%	0%	0%	0%	0%	-25%

H Appendix H - STW foul and surface water network assessment

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
0	Land North of A442 Wheat Leasows (Wappens hall)	Rushmoor	High	No HFRR locations along the flow path. Adjacent to a cluster of developments. A potential "High" impact risk level is assumed for this site.	Low	Near to water course.
187	Land West of Wellington Road, Telford	Coalport	Low	N/A	Low	The gravity connection is assumed to a 225 mm sewer with a Pipe full capacity of 74 l/s, with limited upstream
233	Land South of A518, Newport	Newport	High	N/A	Low	The gravity connection is assumed to be 300mm storm sewer. Assuming a runoff of 5 l/s/ha, the downstream

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
233	Land South of A518, Newport	Newport	High	N/A	Low	The gravity connection is assumed to be 300mm storm sewer. Assuming a runoff of 5 l/s/ha, the downstream
237	Land North East of Muxton	Rushmoor	High	Adjacent to a cluster of development sites. Multiple HFRR points and assets along the downstream trace. A potential "High" impact risk level is assumed for this site.	Low	Near to water course.
251	Land South of Holyhead Road, Wellington	Rushmoor	High	Adjacent to development sites(LPA-601[78 dwellings]&378[45 dwellings]). Multiple HFRR points along the flow route, the nearest one being 800m away from the dev. Site. A "High" potential risk level is assumed.	Medium	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network. Adjacent to development sites(LPA-601&378), thus a potential "Medium" impact risk level is assumed.
269	Land at Park	Coalport	Low	There are no reported flooding points along the flow route.	Low	No Nearby watercourses in the vicinity of the site.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
	Road, Dawley Bank.			There are no assets in the immediate downstream of the site which may be impacted by the development. Considering the size of the development a "Low" potential risk level is assumed.		Site to be connected to surface water network.
274	Land off Church Rd & Lillyhurst Road Lilleshall	Rushmoor	Low	N/A	Low	N/A
301	Land off Ironmasters Way known as Station Quarter	Coalport	Medium	There are no reported flooding points along the flow route. An overflow is modelled 0.8km d/s of the development. Sufficiently large sized pipes along the flow route. Considering the size of the development a "Medium" potential risk level is assumed.	Low	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network. Sufficiently large sized pipes along the flow route.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
303	Land at Southwater	Coalport	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
313	Land North of Middle Farm, Field Aston	Newport	High	N/A	Low	Local Watercourse
334	Site of Former Bush Hotel,High Street, Hadley, Telford	Rushmoor	Low	Not assessed; assumed low risk due to small development size.	Low	Not assessed; assumed low risk due to small development size.
337	Land opposite The Shawbirch PH, Trench,	N/A	N/A	N/A	N/A	N/A

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
	Road, Trench, Telford					
339	Land between Hartsbridge Road and Beveley Roundabout, Oakengates, Telford	Rushmoor	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
341	Former Cross Keys PH, Haybridge Road, Hadley, Telford	N/A	N/A	N/A	N/A	N/A

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
342	Land at Badhan Factory, Waterloo Road, Hadley, Telford	Rushmoor	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
347	Land on The North Side of St Georges By Pass, St Georges, Telford	Coalport	Low	N/A	Low	N/A
350	Land at Madley Court Way	Coalport	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
352	Land South of Holyhead Road	Coalport	High	HFRR point present 1km d/s of the site. Considering the size of the development a "High" potential	Low	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
				risk level is assumed.		
378	Land east and south of Vesey Court,Wellington	Rushmoor	High	Adjacent to development sites(LPA-601[78 dwellings]&251[105 dwellings]). Multiple HFRR points along the flow route, the nearest one being 800m away from the dev. Site. A "High" potential risk level is assumed.	Medium	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network. Adjacent to development sites(LPA-601&251), thus a potential "Medium" impact risk level is assigned.
398	Land North of A518 Newport	Newport	Medium	N/A	Low	N/A
399	Land East of A518 Newport	Newport	High	N/A	Low	N/A
408	Land at Bratton	Rushmoor	High	N/A - JBA Score, 4 individual Bratton sites were previously assessed by STW as Medium and High RAG. It is assumed the combined site would therefore be	High	N/A

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
				High RAG.		
410	Longwood Farm, Redhill	Coalport	Medium	N/A	High	A 300mm surface water sewer is located. Assuming a runoff of 5 l/s/ha would result in a higher flow rate that could be accommodated. SuDS will need to be utlised to minimise runoff rates, or alternatives considered.
411	Land at junction of Hay Street, Tibberton, Newport, Shropshire	Edgmond	Low	Not assessed; assumed low risk due to small development size.	Low	Not assessed; assumed low risk due to small development size.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
412	Hill Top Farm, Ketley Telford Shropshire	Rushmoor	Medium	Assume to small sized site Multiple HFRR points present within 50m radius. A potential "Medium" impact risk level is assumed for this site.	Medium	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network. Multiple HFRR points within 50m radius, A potential "Medium" impact risk level is assumed for this site.
419	Land south of Plough Lane, Newport	Newport	High	N/A	Low	Local Watercourse
422	Former Phoenix School, Manor Road, Dawley, Telford	Coalport	Medium	There are no reported flooding points along the flow route. There are no assets in the immediate downstream of the site which may be impacted by the development. Considering the size of the development a "Medium" potential risk level is assumed.	Low	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
424	Brandon Avenue Shawbirch Telford	Rushmoor	Low	No HFRR points along the flow path. A potential "Low" impact risk level is assumed for this site.	Low	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network.
443	Land at Arleston Lane, Telford	N/A	N/A	N/A	N/A	N/A
445	Land at Arleston Manor Drive, Telford	Rushmoor	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
449	Land east of Dawley Road, Lawley	Rushmoor	Medium	No HFRR location in the immediate vicinity of the site. A potential "Medium" impact risk level is assumed for this site.	Low	Near to Brook.
450	Land north and west of Allscott Meads,	Rushmoor	Low	N/A	Low	N/A

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
	Allscott, Telford					
459	J A Harris Engineering,Old Parks Works, Baptist Avenue, Telford	N/A	N/A	N/A	N/A	N/A
462	Land Southeast of Newport Town Centre	Newport	High	Few HFRR points are reported in the far d/s of the connection point. LPA-398,462,472 adjacent to each other, thus a potential "High" risk level is assumed for the development.	Medium	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network. Multiple HFRR locations along the flow route. LPA-398,462,472 adjacent to each other, a potential "Medium" risk level is assumed for the development site.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
471	Elephant & Castle,1 High Street,Dawley, Telford(Inc. 16 & 17 Burton Street)	N/A	N/A	N/A	N/A	N/A
472	Land South of The Dale,Church Aston, Newport	Newport	High	Few HFRR points are reported in the far d/s of the connection point. LPA-398,462,472 adjacent to each other, thus a potential "High" risk level is assumed for the development.	Medium	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network. Multiple HFRR locations along the flow route. LPA-398,462,472 adjacent to each other, a potential "Medium" risk level is assumed for the development site.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
473	Land East of Dawley Road, Lawley	Rushmoor	High	Few HFRR points are reported in d/s of the connection point. Considering the size of the development a potential "High" impact risk level is assumed for the development.	Low	Near to water course.
483	Legges Way, Madeley, Telford	Coalport	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
498	Land at Aga Rangemaster, Waterloo Road	Rushmoor	Low	Assume to small sized site. No HFRR points in the immediate vicinity of the site. A potential "Low" impact risk level is assumed for this site.	Low	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network.
515	Blue Willow Car Park, Telford centre.	N/A	N/A	N/A	N/A	N/A

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
515	Blue Willow Car Park, Telford centre.	Coalport	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
516	Lime Green Car Park, Telford centre.	Coalport	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
516	Lime Green Car Park, Telford centre.	Coalport	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
627	Land at Audley Courtt, Audley Avenue, Newport	Newport	Medium	N/A	Low	N/A

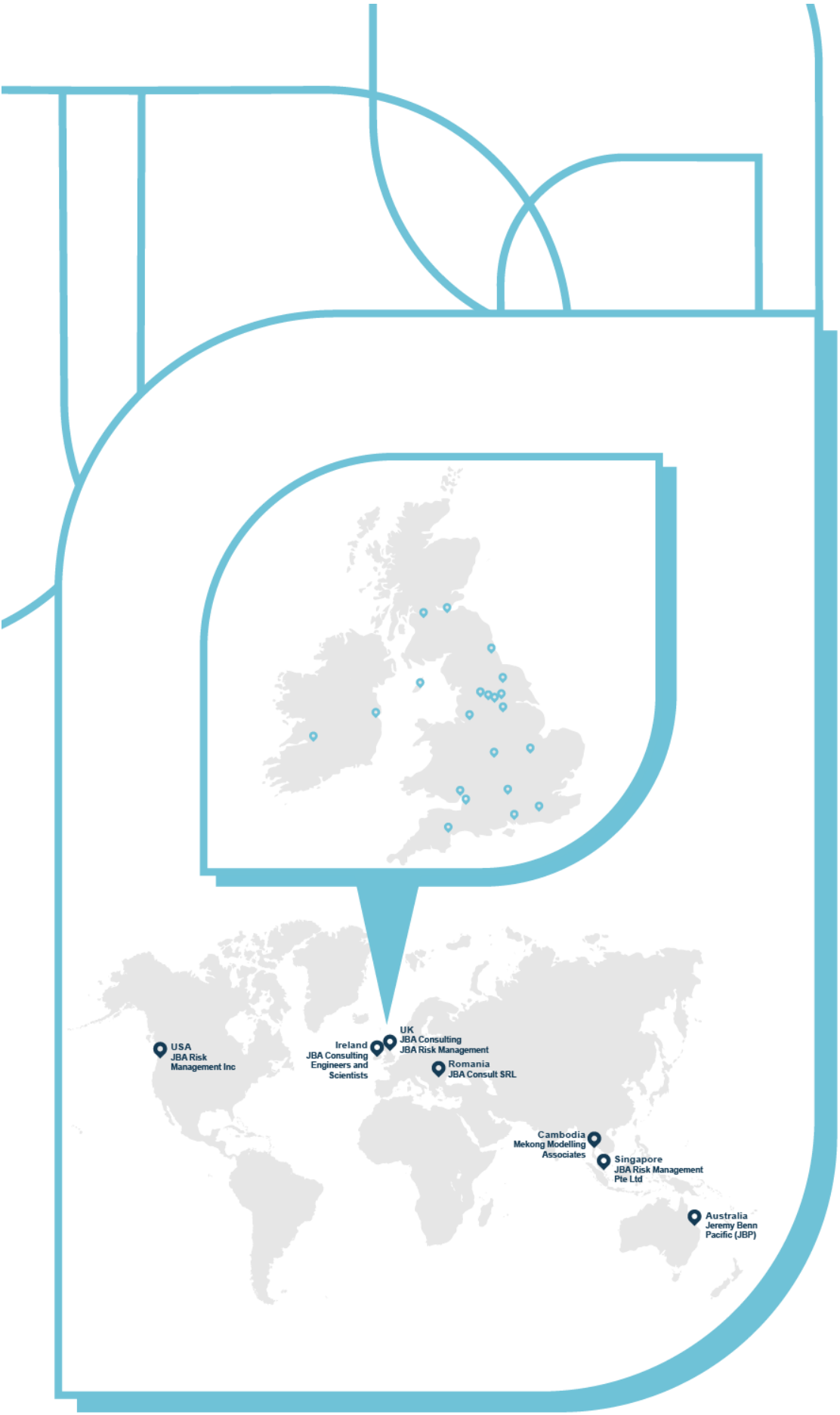
Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
630	Agriculture House Southwater Way Telford	Rushmoor	Low	Not assessed; assumed low risk due to small development size	Low	Not assessed; assumed low risk due to small development size
685	Land south and west of Somerfield Road, Telford	Rushmoor	Low	N/A	Low	N/A
689	Land Southern side of Waters Upton	Rushmoor	Low	Site is just upstream of SPS. A potential "low" impact risk level is assumed for this development.	Low	Near to water course.
695	Former Dairy Crest Foods, Crudgington	Rushmoor	Low	N/A	Low	N/A

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
699	Tafs Salop Ltd, Gower Street, St Georges, Telford	Rushmoor	High	Multiple HFRR locations along flow route(in far d/s). Dev site is just 900m upstream of an overflow, thus a potential "high" risk level is assumed for the development.	Low	No Nearby watercourses in the vicinity of the site. Site to be connected to surface water network.
701	South of Hutchinson Gate	Newport	Low	N/A	Low	The gravity connection is assumed to 225mm combined sewer. Assuming a runoff of 5 l/s/ha, the downstream conduit can accommodate the flows.
702	Land South of Old Vicarage	N/A	N/A	N/A	N/A	N/A
705	Old Railway Line, Church Aston	N/A	N/A	N/A	N/A	N/A

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
707	Little Dessert Shop	N/A	N/A	N/A	N/A	N/A
714	Land off Church Road, Lilleshall	Rushmoor	Red	N/A	Red	There is a 150mm combined water sewer located approximately 500 meters from the development. Assuming a runoff rate of 5 l/s/ha the combined sewer would likely be overwhelmed. SuDS will need to be utilized to minimize runoff rates, or alternative solutions considered.There is a local pond located on the south side of the development. Low risk to ST if flow goes direct to waterbody.

Site ID	Location / Site Address	Sewerage catchment	Foul Sewerage Network Capacity RAG	Foul Sewerage Network Capacity Comments	Surface water network RAG	Surface water network comments
716	Old Park	Coalport	Low	N/A	Low	There is a 675 mm surface water sewer located west of the site with a flow rate of 4372l/s. Assuming a runoff of 5 l/s/ha then the flow rate will be 68.89l/s.Hence it can be accomodated . A "low" impact on the network is considered
717	Telford Station	Coalport	Low	N/A	N/A	N/A
718	AGA Site	Coalport	High	N/A	Medium	N/A
719	Pink Skips	Rushmoor	Low	N/A	High	N/A
720	Former Wilkinson Site	N/A	N/A	N/A	N/A	N/A

Note: STW have not assessed non-residential development sites or residential sites with less than 50 houses proposed.



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