

Autumn 2022



Regional Water Resources Plan—Eastern and Midlands

Non-Technical Summary

Irish Water’s 25 Year Plan for Our Water Assets



Tionscadal Éireann
Project Ireland
2040

Data disclaimer: This document uses best available data at time of writing. Some sources may have been updated in the interim period. As data relating to population forecasts and trends are based on information gathered before the Covid-19 pandemic, monitoring and feedback will be used to capture any updates. The National Water Resources Plan (NWRP) will also align to relevant updates in applicable policy.

Baseline data included in the Regional Water Resources Plan Eastern and Midlands has been incorporated from numerous sources including but not limited to; National Planning Framework, Central Statistics Office, Regional Spatial and Economic Strategies, Local Authority data sets, Regional Assembly data sets and Irish Water data sets. Data sources will be detailed in the relevant sections of the RWRP-EM. 2019 was selected as the base year to align with the planning period (2019-2025) of the NWRP.

Copyright © Ordnance Survey Ireland. Licence number EN 0094521.

Table of Contents

1.	REGIONAL WATER RESOURCES PLAN – EASTERN AND MIDLANDS.....	1
1.1	INTRODUCTION	1
1.2	REGIONAL WATER RESOURCES PLAN EASTERN AND MIDLANDS	3
1.3	PUBLIC CONSULTATION FOR THE RWRP-EM.....	5
1.4	RWRP EASTERN AND MIDLANDS REGIONAL PLAN OVERVIEW	7
2.	EASTERN AND MIDLANDS REGION KEY CHARACTERISTICS.....	9
2.1	GROWTH AND DEVELOPMENT.....	10
2.2	NATURAL RESOURCES AND WATER SUPPLY	10
3.	EASTERN AND MIDLANDS REGION – NEEDS	12
3.1	QUALITY.....	12
3.2	QUANTITY	12
3.3	RELIABILITY.....	13
3.4	SUSTAINABILITY.....	15
4.	EASTERN AND MIDLANDS REGION – CURRENT STATUS OF INFRASTRUCTURE.....	16
5.	SOLUTIONS – IRISH WATER APPROACH.....	17
6.	THE OPTION DEVELOPMENT PROCESS.....	18
6.1	UNCONSTRAINED OPTIONS	18
6.2	OPTION SCREENING	19
6.3	FEASIBLE OPTIONS.....	19
6.4	PROJECT LEVEL SUMMARY	20
7.	STUDY AREA PREFERRED APPROACH DEVELOPMENT PROCESS FOR THE RWRP-EM.....	22
7.1	APPROACH DEVELOPMENT PROCESS	22
7.2	STUDY AREA PREFERRED APPROACH SUMMARY.....	24
7.3	REVIEW OF THE PREFERRED APPROACHES ARISING FROM CONSULTATION.....	33
7.4	INTERIM SOLUTIONS.....	34
7.5	SENSITIVITY ANALYSIS.....	35
8.	PREFERRED APPROACH – REGIONAL LEVEL	36
8.1	SENSITIVITY TESTING OF REGIONAL APPROACH.....	39
9.	EASTERN AND MIDLANDS REGION – MONITORING AND FEEDBACK	41
9.1	MONITORING AND MITIGATION	41
9.2	INTERNAL AND EXTERNAL FACTORS.....	42
9.3	FUTURE ACTIONS	43
10.	CONCLUSION.....	44
10.1	PLAN OUTCOME	44
10.2	BENEFITS OF THE PREFERRED APPROACH FOR THE EASTERN AND MIDLANDS REGION - TRANSFORMATION.....	44
10.3	BENEFITS OF THE PREFERRED APPROACH – QUALITY, QUANTITY, RELIABILITY AND SUSTAINABILITY	46
11.	PUBLIC CONSULTATION AND IMPLEMENTATION OF THE EASTERN AND MIDLANDS PLAN	47
11.1	CONSULTATION ON THE DRAFT RWRP EASTERN AND MIDLANDS	47
11.2	NEXT STEPS.....	48
12.	REFERENCES.....	49

1. Regional Water Resources Plan – Eastern and Midlands

This is the Non-Technical Summary for the Regional Water Resources Plan for the Eastern and Midlands Region (RWRP-EM).

The development of the RWRP-EM will allow Irish Water for the first time to review water supply needs (Needs) collectively for the entire Eastern and Midlands Region and across the spectrum of risk including Quality, Quantity, Reliability and Sustainability. It allows us to consider local Options to resolve these Needs and larger Regional Options that can address multiple supplies across a wider area.

Within this document we will summarise how our Options Assessment Methodology was applied to the water supplies within the Eastern and Midlands region, and how this resulted in a Preferred Approach, that involves:

- Developing larger interconnected water supply systems (known as Water Resource Zones (WRZs) within the region;
- Constructing an estimated 970 kilometres of trunk mains to develop the interconnected WRZs;
- Reducing the existing number of WRZs in the region from 134 to 89;
- Developing 4 new water treatment plants (WTPs);
- Decommissioning 70 WTPs and discontinuing 73 abstractions;
- Upgrading 130 existing WTPs to reduce water quality risks across all WRZs; and
- Reducing leakage to 22% of regional demand. This is achieved through, pressure management, active leakage control, and targeted asset replacement.

The outcomes and benefits of this Regional Preferred Approach, if all projects identified within it are delivered include:

- Improved performance across all of the water supplies in terms of Quality and Quantity;
- Strategic transformation from the existing fragmented supply to a more resilient and sustainable interconnected supply; and
- Ability to support growth and economic development across the Eastern and Midlands Region.

1.1 Introduction

Irish Water is developing its first National Water Resources Plan (NWRP). The NWRP is Irish Water's 25-year strategic plan for Ireland's public water supplies. The Plan allows us to move towards a safe, secure, reliable, and sustainable drinking water supply for all Irish Water customers, whilst safeguarding the natural environment.

The preparation of the NWRP provides an opportunity to plan for delivery of water services at a national level. It allows Irish Water to review all public water supplies in a consistent way and to develop a clear approach to address the current and future needs of our supplies. This approach in turn will allow Irish

Water to understand and prioritise the required investment in water services over the short, medium and long term.

Water resources planning plays an essential part in ensuring a safe, secure, sustainable, and reliable public water supply that supports Government policy and Irish Water policy.

The NWRP contains a large amount of detailed and technical information. To ensure the plan is clearly communicated Irish Water is delivering the Plan in two (2) phases:



Figure 1.1. Regional Areas of the NWRP

Phase 1 - NWRP Framework Plan: The Framework Plan sets out the methodology we use to identify needs across our 539 existing water supplies in a uniform way, and to review options in order to develop a "Preferred Approach" for addressing Need in each supply or group of supplies. The Framework Plan was adopted in May 2021 following Strategic Environmental Assessment (SEA), Appropriate Assessment (AA) and extensive public consultation. The Framework Plan and supporting documentation are available at <https://www.water.ie/projects/strategic-plans/national-water-resources/>.

Phase 2 – The Regional Water Resources Plans: Phase 2 involves the development of four (4) Regional Water Resources Plans (RWRPs) that will apply the methodology in the Framework Plan. Each Regional Plan will summarise the Needs within the water supplies in the applicable region and develop a Preferred Approach to resolve them.

Phase 2 is being delivered as four (4) Regional Plans for the Eastern and Midlands, South West, North West and South East regions (see Figure 1.1). Each Regional Plan will undergo SEA and AA. The delivery of Phase 2 as four (4) Regional Plans is to make the process more manageable and to facilitate public engagement in the consultation process. However, as each Regional Plan is delivered it will include a cumulative assessment of the Plans that have been developed and consulted upon previously.

The RWRP-EM is the first of the four (4) Regional Plans to be delivered, it will be followed closely by the Regional Plans for the South West, North West and South East over the next 12 months.

Once Phase 1 and Phase 2 of the NWRP have been finalised, comprising the Framework Plan and four (4) RWRPs, together they will be treated as a unified Plan and the relevant regional groupings will have no ongoing application.

The structure of the NWRP is set out in Figure 1.2

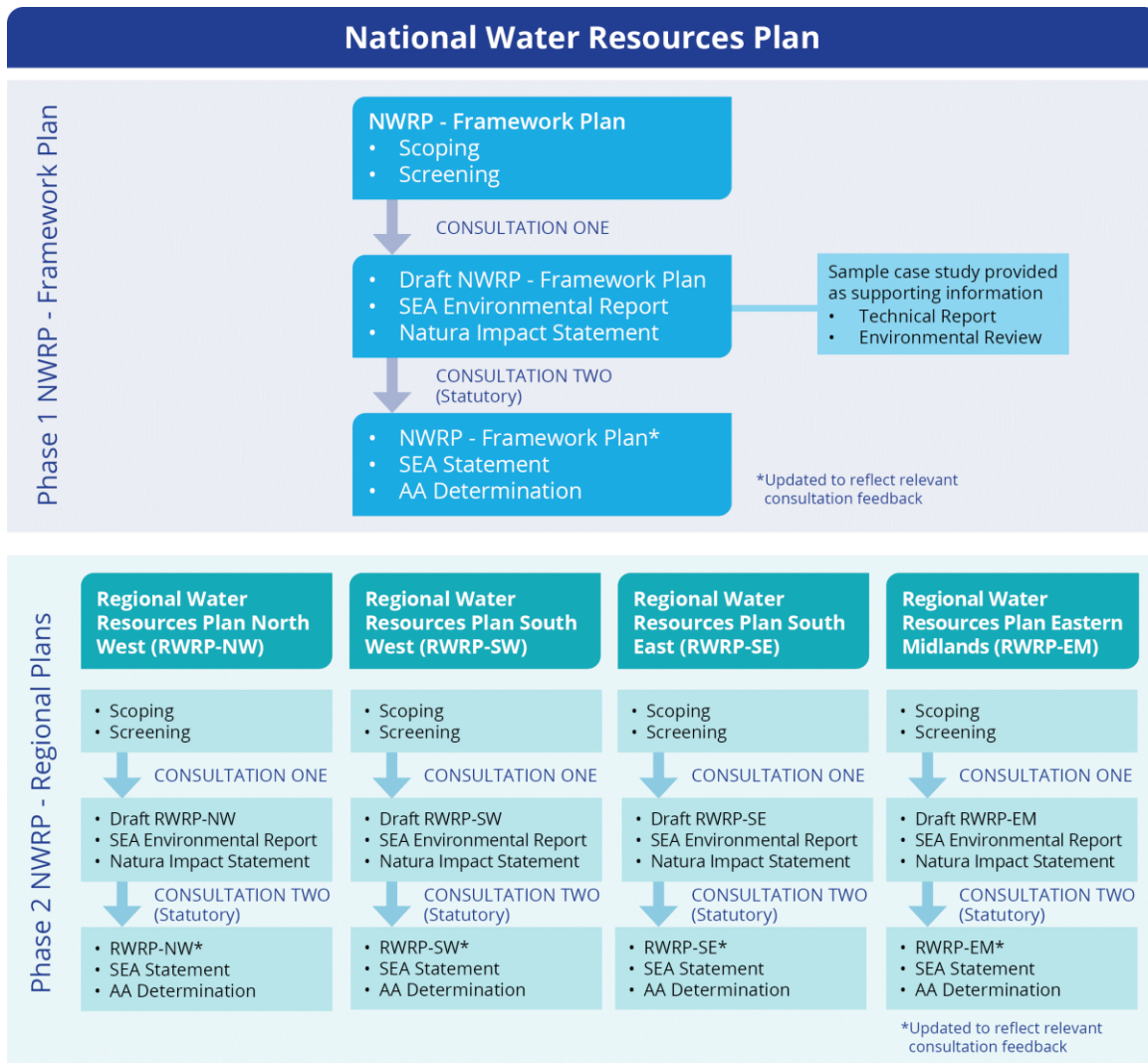


Figure 1.2 Components of the National Water Resources Plan

 For more information on the NWRP Framework Plan visit www.water.ie/nwrp

1.2 Regional Water Resources Plan Eastern and Midlands

This is the Non-Technical Executive Summary (ES) for the Regional Water Resources Plan – Eastern and Midlands (RWRP-EM), being delivered as part of the overall NWRP.

The purpose of this ES is to provide a summary of the content and to signpost key areas of the RWRP-EM. This will assist readers to navigate the RWRP-EM document pack.

Throughout this ES you will see key signposts, which will point you to where you can find further information within the documents provided. It also gives some guidance to help readers understand the RWRP-EM.

The complete set of documents for this consultation process include:

RWRP-EM

The RWRP-EM presents an overview of the Eastern and Midlands Region with respect to population, development and the natural environment and identifies specific challenges within the Eastern and Midlands Region. It summarises progress to date, the Options considered, and the Preferred Approach identified at Water Resource Zone (WRZ), Study Area and Regional Scale.

Study Area Technical Reports

To deliver the RWRP-EM, we subdivided the region into smaller units to enable us to manage the process of identifying potential water supply solutions (Options) and the selection of our Preferred Approaches to resolve our water supply and water quality deficits. These smaller units are referred to as Study Areas (SA). The Eastern and Midlands Region comprises nine SAs as shown in Figure 1.3.

A detailed Technical Report is provided for each Study Area describing the solution types at SA Level and providing a summary of the detailed Option and Approach Development process and resulting outcomes for each SA. The Study Area Technical Reports are provided as appendices (Appendix 1-9) to the RWRP-EM document.

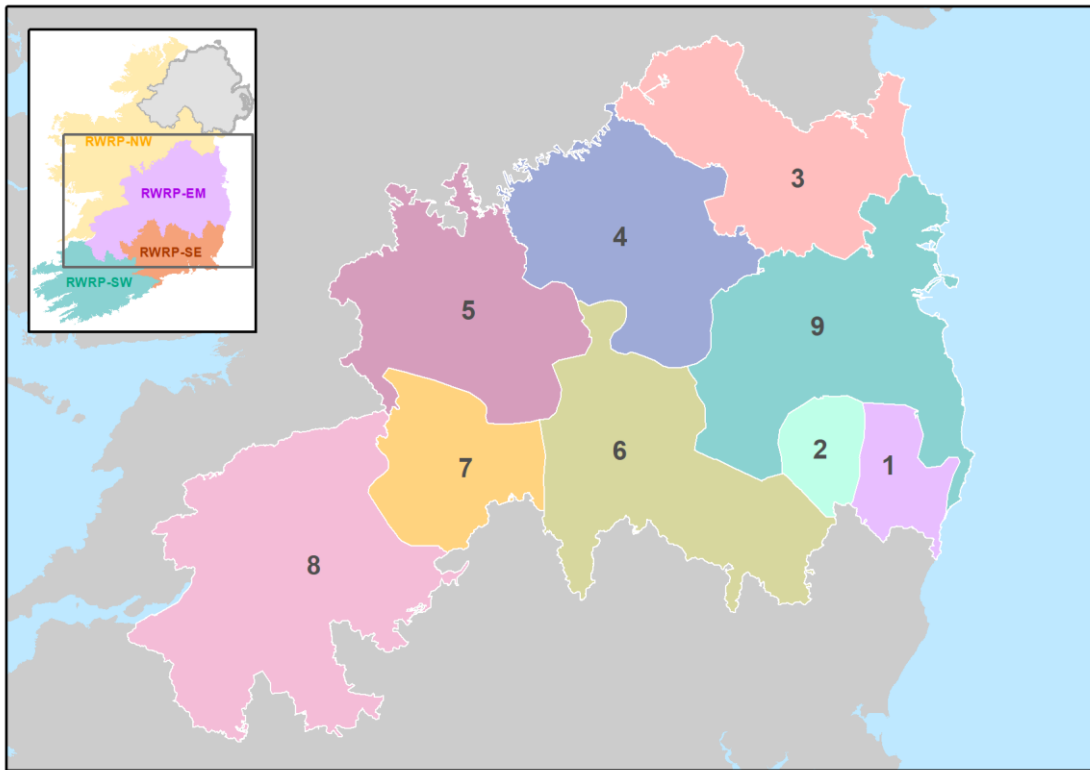


Figure 1.3 Study Areas of the RWRP Eastern and Midlands

SEA Environmental Report

SEA is a process that integrates environmental considerations into the preparation and adoption of plans and programmes, with a view to promoting sustainable development. Irish Water has prepared a SEA Environmental Report, in accordance with the requirements of the European Union SEA Directive and associated Irish regulations. The SEA Environmental Report identifies and evaluates likely significant effects of the RWRP-EM and potential mitigation measures. It considers alternatives to the approach for the RWRP-EM and aims to identify potential interactions with other plans and programmes, including the

potential for cumulative effects. The SEA Environmental Report provides the methodology for integrating SEA and AA requirements throughout the development of the RWRP-EM and provides mitigation and implementation recommendations for the RWRP-EM and a monitoring plan.

Study Area Environmental Reviews

The Study Area Environmental Reviews form part of the SEA Environmental Report for the RWRP-EM. The Environmental Reviews apply the SEA objectives and environmental assessment methodology set out in the Framework Plan. The Environmental Reviews summarise the environmental assessment undertaken for each Study Area within the Eastern and Midlands Region in relation to the options and approaches considered, as outlined in the Study Area Technical Reports.

Natura Impact Statement

A Natura Impact Statement (NIS) has been prepared to support the AA of the RWRP-EM for the purposes of the European Union Habitats Directive and associated Irish regulations. Screening for AA of the RWRP-EM assessed whether, on the basis of objective scientific information, the RWRP-EM individually or in-combination with other Plans or projects, is likely to have a significant effect on a European site. The outcome of that screening process was that the Option types arising from the RWRP-EM had the potential to give rise to likely significant effects on European sites, in view of the sites' conservation objectives. Accordingly, full AA of the RWRP-EM was considered to be required, and a NIS was prepared. The NIS provides relevant information and analysis to inform the AA determination by Irish Water on the RWRP-EM (noting that Irish Water's ultimate AA determination will also take into account wider factors, including feedback received through consultation).



The RWRP-EM includes a full glossary of terms to support readers

1.3 Public Consultation for the RWRP-EM

Consultation on the SEA Scoping Report for the RWRP-EM was held in June and July 2021. The SEA Scoping Report was provided to all environmental authorities as specified in the SEA Regulations, for the purposes of initial consultation on the scoping of the SEA for the Eastern and Midlands Region. The feedback obtained was considered and reflected in the draft RWRP-EM and associated SEA Environmental Report and the NIS. Irish Water then undertook public consultation on the draft RWRP-EM and supporting material, between December 2021 and March 2022 which allowed interested parties to provide feedback on the draft RWRP-EM, including SEA and NIS, in the usual way. Feedback from this consultation process was considered and is reflected in the final RWRP-EM.

RWRP Eastern & Midlands Public Consultation Roadmap

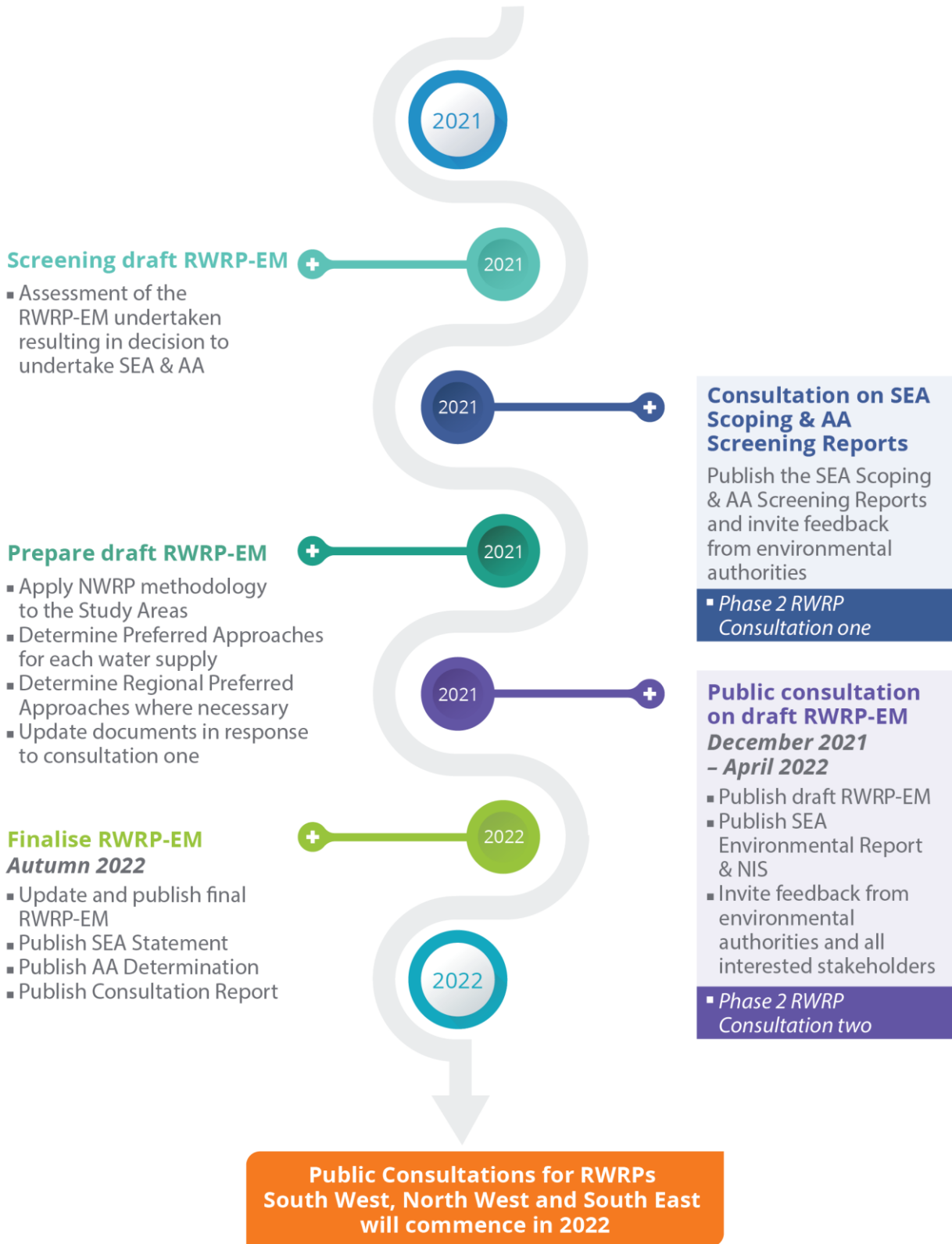


Figure 1.4 RWRP Eastern and Midlands Public Consultation Roadmap.

1.4 RWRP Eastern and Midlands Regional Plan Overview

The process we use to identify Needs and develop a Preferred Approach is known as the Options Assessment Process and was adopted as part of the NWRP Framework Plan. The RWRP-EM consists of ten (10) sections or chapters. Each of these sections is aligned with the Option Assessment Methodology set out in the Framework Plan, as summarised in Figure 1.5.



The Option Assessment Methodology is further detailed in Chapter 8 of the NWRP Framework Plan

Section 2 & 3 – Identify the baseline conditions and Need across the 134 WRZs in the Eastern and Midlands Region

Section 4 & 5 – Considers the current status of infrastructure in the SAs and summarises the ongoing activities across our supplies

Section 6 – Option Development presents how we applied our option development process to the Eastern and Midlands Region. It summarises the extent and scale of the options we reviewed, and the feasible options remaining after we completed our screening processes.

Section 7 & 8 – Approach Development outlines how the Preferred Approach for the nine SAs, and for the entire region collectively, was identified. It also describes the “Interim Solutions” we have identified to address short-term needs and the Sensitivity of the Preferred Approaches to climate change, abstraction regulation, leakage targets and growth projections.

Section 9 provides an overview of Monitoring and Feedback into the Plan

Section 10 summarises the overall outcomes of the RWRP-EM

Identify the Need
(Drinking Water Safety Plan)

Scoping of the Study Area

Option Development

Approach Development

Monitoring and Feedback

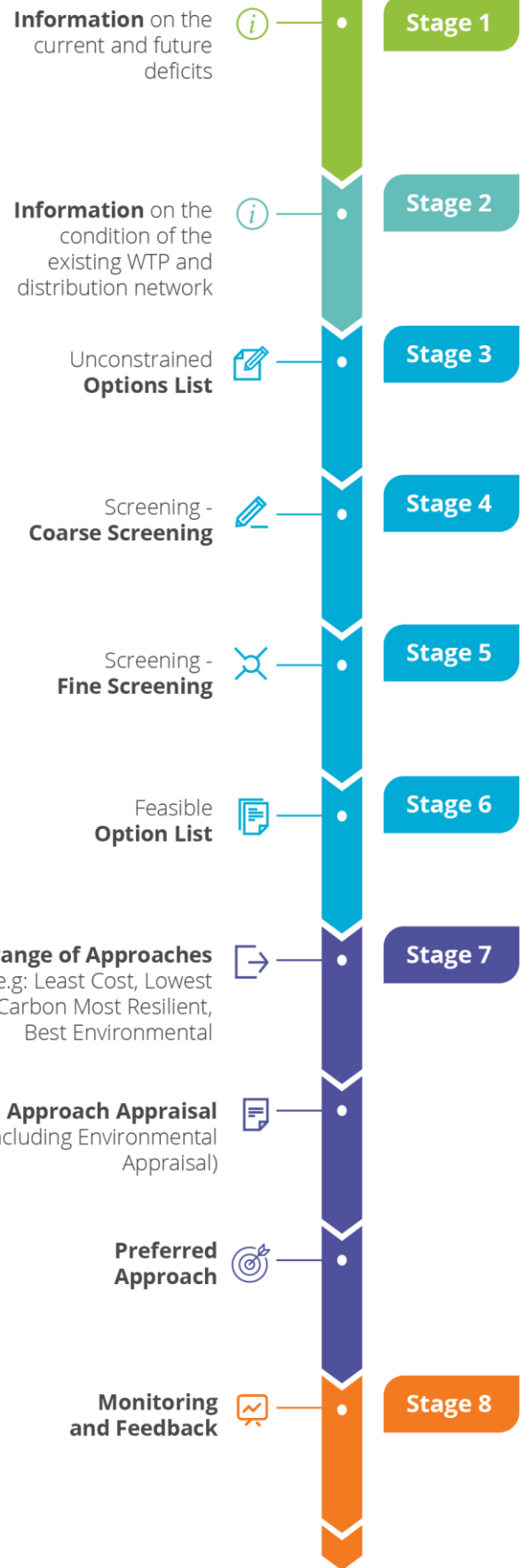


Figure 1.5 Option Assessment Methodology

2. Eastern and Midlands Region Key Characteristics

Section 2 of the RWRP-EM outlines the key characteristics of the Eastern and Midlands Region, including population, land use and water supply, as summarised in Figure 2.1.

It also identifies a number of specific challenges for the Eastern and Midlands Region which Irish Water must address both now and into the future, including:

- Growth and Development
- Natural Resources
- Water Supply

Regional Planning Areas

- | | |
|------------|-----------------------|
| ■ Border | ■ South-East |
| ■ Dublin | ■ South-West |
| ■ Mid-East | ■ West |
| ■ Midlands | = Study Area Boundary |
| ■ Mid-West | |

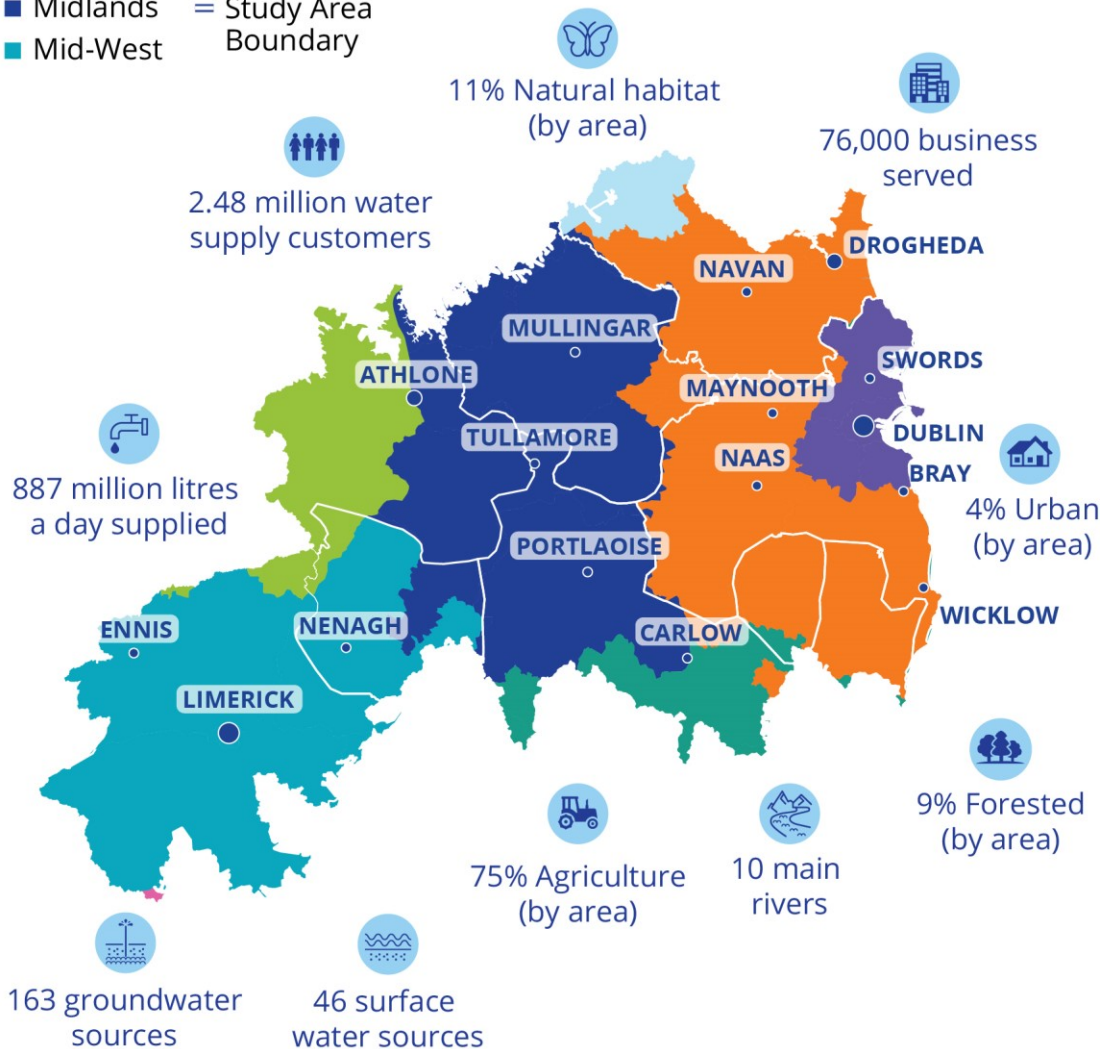


Figure 2.1 Key characteristics of the Eastern and Midlands Region

2.1 Growth and Development

The RWRP-EM is the largest of the four (4) regions defined as part of the NWRP in both land area and population size. It includes 19 counties encompassing 24 local authorities. Almost seventy percent (70%) of the regional population is situated in Study Area 9 (SA9) which comprises Dublin City and the surrounding areas. The next most populated study area is SA8 containing Limerick City, followed by SA3, in which Drogheda is located, on the north east coast of the region.

The overall regional population is expected to grow by 25% between 2019 and 2044. All SAs in the Eastern and Midlands Region have a projected growth rate that exceeds the 12% national rate observed in the 10-year period from 2006 to 2016. The Limerick Clare Study Area has the highest projected growth rate at 37%, which is driven by the Limerick City forecast growth of 61% by 2044. Population growth at a Water Resource Zones Level is presented in Figure 2.2.

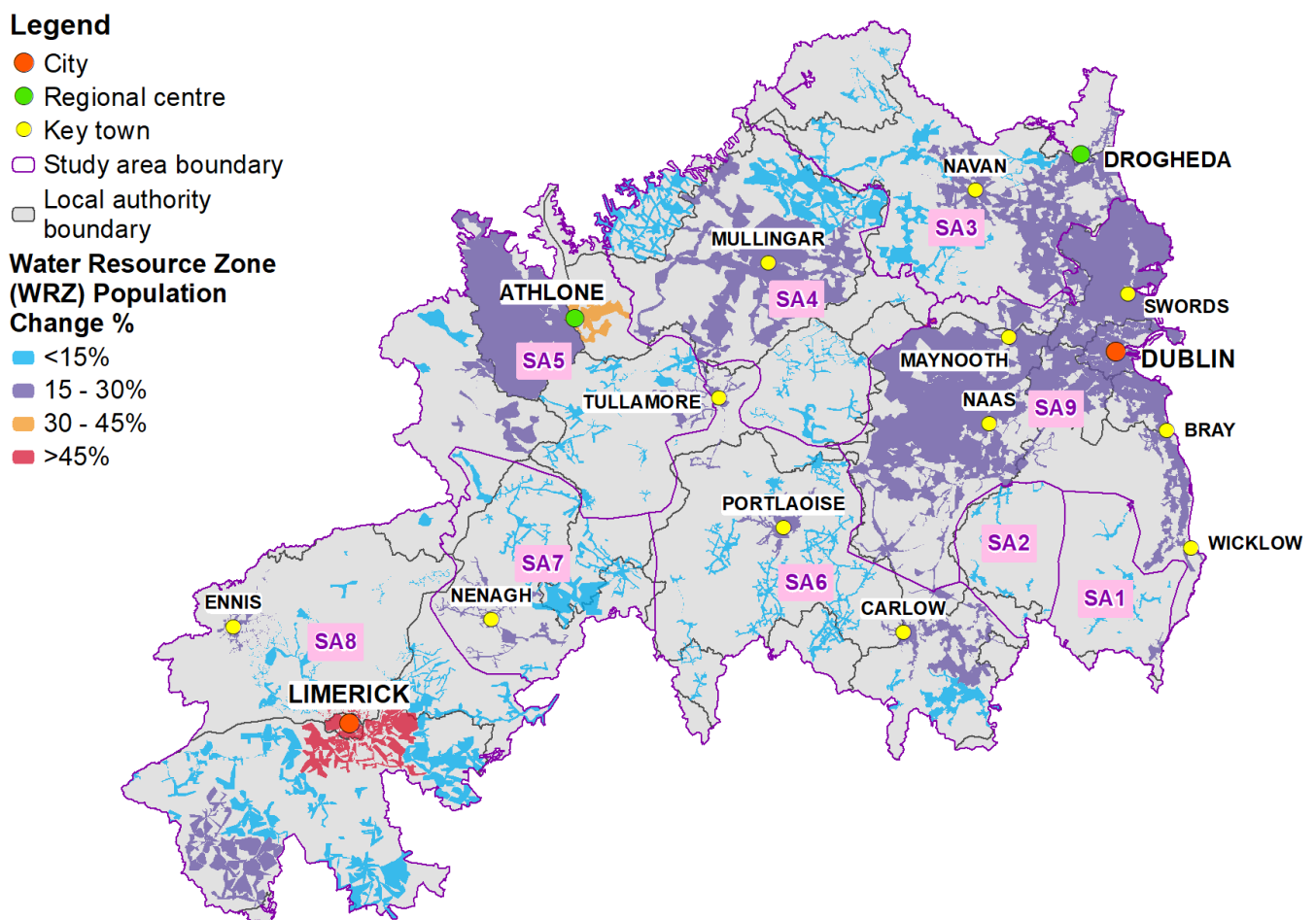


Figure 2.2 Regional Overview

2.2 Natural Resources and Water Supply

In the Eastern and Midlands Region, Irish Water currently abstracts from 209 different water sources and has 201 water treatment plants (WTPs), all of which need to be maintained and operated in a sustainable way.

Surface water abstractions make up 87% of the water delivered to customers from rivers or lakes, with the remaining 13% coming from groundwater sources. The available natural resources and the interaction between surface water and groundwater are important considerations when assessing the

baseline of our existing water sources, identifying options to support increased water demands, and managing the quality of the water we supply.

Some of the lowest levels of annual average rainfall in Ireland occur across the Eastern and Midlands Region, despite this being the most populated region, with the counties of Louth, Meath, Dublin and Kildare experiencing the driest annual average weather conditions.

Water supply Quality and Reliability is impacted by adverse weather conditions including storms, cold weather and dry periods. The availability of water is anticipated to change over the 25-year planning period due to climate change with water availability increasing during autumn/winter and decreasing during the summer. Precipitation responsible for the recharge of our groundwater and surface water sources could increase by 5-35% during the autumn and winter months, while summer precipitation could decrease by 0 -30% during the summer. Our water services infrastructure therefore needs to be adaptable and capable of providing reliable supplies during these periods.

Other challenges in the Eastern and Midlands Region include:

- Ensuring that our water supply activities support Ireland as a country in meeting its obligations under the European Union Water Framework Directive (WFD).
- Ensuring that the RWRP-EM proactively considers and protects the 618 nationally and internationally designated European sites protected under the Habitats Directive in the Region.



Further information regarding our drought management approach is available in Appendix E of the NWRP - Framework Plan.



The baseline conditions for the water supply in the Eastern and Midlands are discussed in Section 2 of the RWRP-EM.

3. Eastern and Midlands Region – Needs

This section describes the current and future water supply ‘Needs’ of the Eastern and Midlands Region, in terms of Quality, Quantity, Reliability and Sustainability.

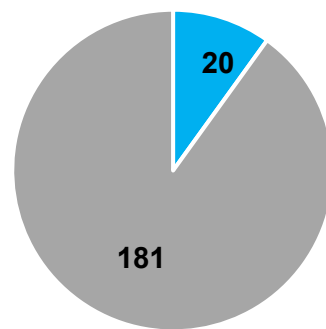
3.1 Quality

At present there are 201 individual water treatment plants (WTPs) in the Eastern and Midlands Region. Our water supplies perform well in terms of compliance with drinking water quality standards, with 99.6% of all samples taken in 2020 fully compliant with the limits set out in Ireland's Drinking Water Regulations¹.

However, Irish Water take a risk-based approach to managing our drinking water supplies. As set out in our Framework Plan, we use the Drinking Water Safety Plan hazard assessment and interim "barrier assessments" to quantify the “risks” across our water supplies.

These assessments provide an indicator of the need to invest in areas of our assets (or how we manage them), to ensure that we can address potential risks or emerging risks to our supplies. These risks usually manifest themselves as precautionary boil water notices after heavy rainfall or during unplanned disruptions to the operation of our water treatment plants.

When applied to the Eastern and Midlands Region, our barrier assessments show that 181 of the 201 WTPs in the Region need some form of investment in order to reduce risk. This assessment does not necessarily indicate non-compliance with the Drinking Water Regulations, but instead is an internal Irish Water process to indicate where works are required.

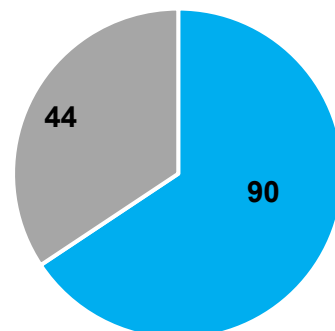


■ At Risk WTPs ■ Low Risk WTPs

3.2 Quantity

It is necessary to assess public water supply requirements to identify whether there is likely to be a Surplus or shortfall (Deficit) of available water.

We carry out this assessment known as the Supply Demand Balance (SDB) calculation over a 25-year timeframe (2019-2044). The SDB considers water availability in the natural environment, infrastructure and operational constraints, and demand for water. Our forecast of demand over the 25 -year planning period uses projected population growth forecasts provided in the National Planning Framework (NPF) and updated information from the Regional Spatial and Economic Strategies (RSES) and Local Authority Plans where available.



■ WRZ in deficit ■ WRZ not in deficit

There are 134 individual water supplies known as Water Resource Zones (WRZs) in the Eastern and Midlands Region. Two thirds of these have a SDB Deficit, even in normal weather conditions. Our existing supplies do not meet current or future needs in terms of source availability, water treatment plant

capacity or demand growth requirements. This means that customers can experience interruptions to supply, particularly during extreme weather events. It also means that Irish Water will have difficulty supporting projected growth and economic development in these areas. At present, in most areas we are facilitating capacity for growth through network improvements and proactive leakage reduction. However, these measures alone will not resolve the issues with our supplies over the medium-to-long term.



Chapter 3 of the NWRP Framework Plan describes the methods used to calculate the current (2019) and forecast Water Available for Use (WAFU), including the potential impacts of climate change and pending abstraction legislation changes; while Chapter 4 describes the method used to calculate the current (2019) demand and forecast demand using estimates of growth.

3.3 Reliability

In this NWRP, we have assessed the reliability of our supplies in terms of Level of Service (LOS) to our customers. LOS is the potential for an interruption to water supply (a customer receiving a reduced or restricted supply of water at their tap), due to insufficient water being available in supply or high demands for water exceeding available supply.

As described in chapter 2 of the NWRP Framework Plan, we also review LOS across different weather conditions, including:

- Normal Year Annual Average (NYAA): Typical weather conditions in Ireland
- Dry Year Critical Period (DYCP): Drought Events

As can be seen in Figure 3.3 and 3.4, the LOS across our supplies varies significantly, with most WRZs providing insufficient LOS, particularly during drought conditions. In most European countries, water utilities strive to achieve a 1 in 100-year LOS. This means that at any given time, there is a 1% probability of having an interruption to customer supply. As this is our first NWRP and we need to incrementally transform all of our water supplies, we have set an initial target of LOS of 1 in 50 year, or a 2% probability of outage.

Legend

- City
- Regional centre
- Key town
- ▭ Study area boundary
- ▭ Local authority boundary

Level of Service*

- >1 in 50
- >1 in 40
- >1 in 30
- >1 in 20
- >1 in 10
- <1 in 10

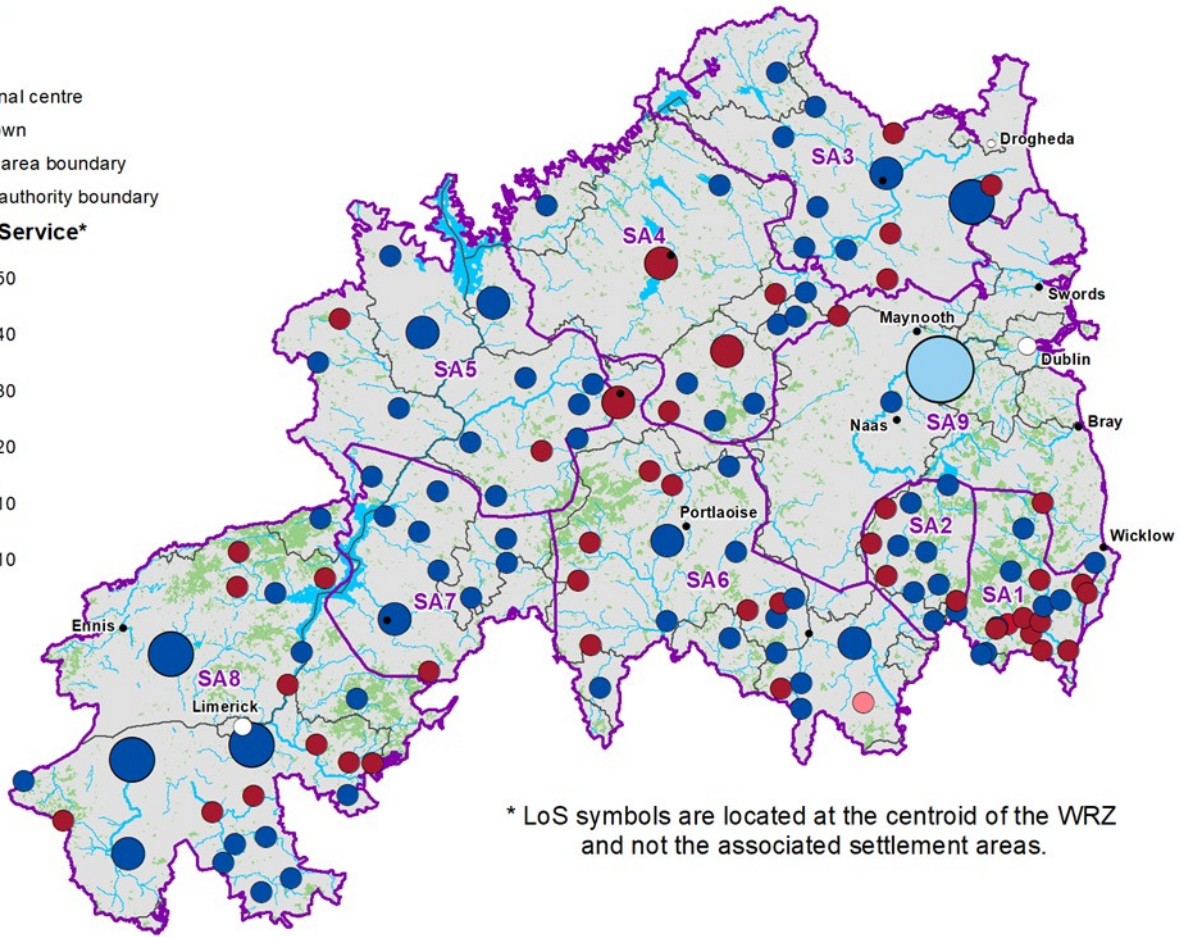


Figure 3.3 Level of Service Normal Year Annual Average (NYAA)

Legend

- City
- Regional centre
- Key town
- ▭ Study area boundary
- ▭ Local authority boundary

Level of Service*

- >1 in 50
- >1 in 40
- >1 in 30
- >1 in 20
- >1 in 10
- <1 in 10

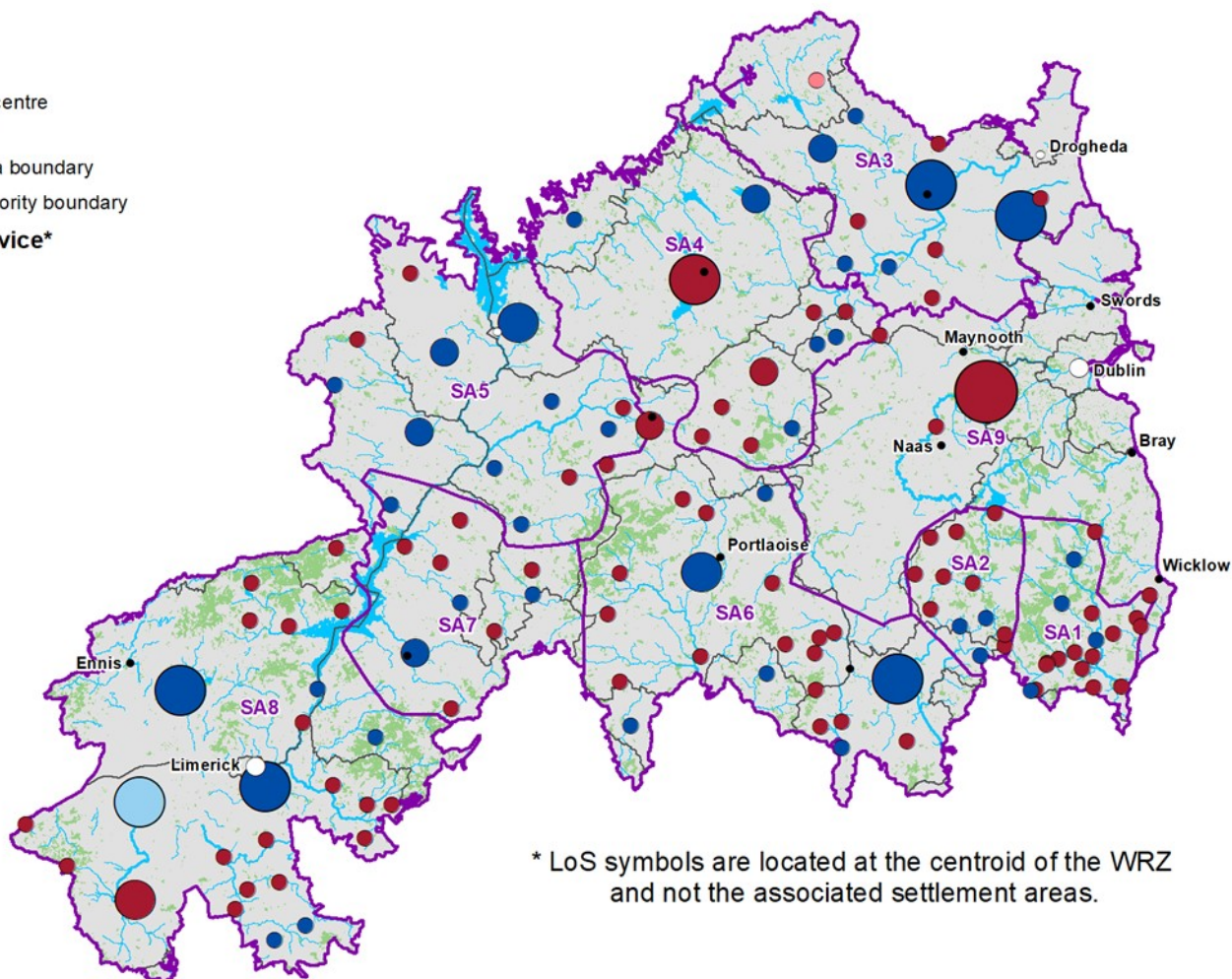


Figure 3.4 Level of Service Dry Year Critical Period (DYCP)

3.4 Sustainability

At present Irish Water abstracts water from 209 groundwater and surface water sources within this region. Many of these abstractions were developed before the introduction of legislation affecting abstraction, including the Water Framework Directive (WFD) and the Habitats Directive.

At present the Irish Government is developing new legislation and regulations on water abstraction, to align all water abstraction activities with the WFD. This new regime may result in Irish Water having to make some modifications to our surface water and groundwater abstractions. A key objective of the NWRP is to improve the sustainability of the national water supply from its current baseline. This will include consideration of sustainable abstraction limits.

Although we do not yet have detail on the final legislation as it will be adopted or implemented, when we assess our abstractions using UKTAG guidelines² on sustainable flow, we estimated that we may need to reduce the quantity of abstraction from existing sources in the Eastern and Midlands Region by approximately 115 Ml/day.

4. Eastern and Midlands Region – Current Status of Infrastructure

Section 4 of the RWRP-EM details Stage 2 of the Options Assessment Methodology (see Figure 1.5).

Within this section we “scope” or review the baseline conditions of the water supplies in each Study Area (SA). This allows us to consider within our Plan:

- Existing infrastructure deficiencies, including known problems with our existing water treatment plants (WTPs) and the reliability of the distribution network
- 62 critical infrastructure projects that have already been completed or are underway (inflight). This includes:
 - Construction of 11 new WTPs and the upgrade of 36 WTPs in the region between 2014 and 2019
 - Programmes to address water quality risk, including the Disinfection Programme and the THM (trihalomethane) reduction programme
 - Capital maintenance programmes, including WTP upgrades, reservoir cleaning programmes and network cleaning
 - Irish Water’s National Leakage Reduction Programme

As part of the scoping exercise for the SAs, Irish Water conducted workshops with our local authority partners and stakeholders, to ensure a full and comprehensive understanding of Need and the existing condition of assets across the SAs. The identified infrastructure improvement works are summarised in the Option descriptions within the Study Area Technical Reports Appendices 1-9 and Study Area Environmental Reviews that accompany the RWRP-EM.



The Needs assessments completed for each Study Area are presented in the Study Area Technical Reports as Appendices 1 to 9



Section 3 of the RWRP-EM and each of the Study Area Technical Reports provided in Appendices 1-9 outline the Need (Deficits) in both Quantity and Quality across the region and in each of the Study Areas.

5. Solutions – Irish Water Approach.

The types of solutions that Irish Water uses to address the identified Needs across our water supplies can be categorised under three “Pillars”; Lose Less, Use Less and Supply Smarter as set out in the Framework Plan.



Figure 5.1 Three Pillars to address the Key challenges

These pillars encompass water conservation, leakage reduction and transformation of our water supply sources and treatment plants. They are the foundations of the NWRP and resolving the identified Needs within our Water Resource Zones (WRZs) involves activities across all pillars. This means that for all WRZs, our Preferred Approach includes Use Less and Lose Less activities in addition to the Supply Smarter Options we set out in the RWRP-EM.

The Use Less and Lose Less activities are already underway, and in Section 5 of the RWRP-EM we summarise the relevant activities under these headings.

Lose Less: Irish Water’s National Leakage Reduction Programme includes measures such as pressure management, active leakage control and targeted water mains replacement across the Eastern and Midlands Region.

We recognise that current leakage levels are too high, and under this program we aim to reduce leakage nationally by 213 MI/d by 2034 in order to meet the Sustainable Economic Level of Leakage (SELL). In addition to this we have set additional targets to reduce leakage levels to 21% of demand in WRZs where the demand is greater than 1,500 m³/d (cities, towns and large villages) by 2034. In the Eastern and Midlands Region this represents a further 42 MI/d of leakage reductions.

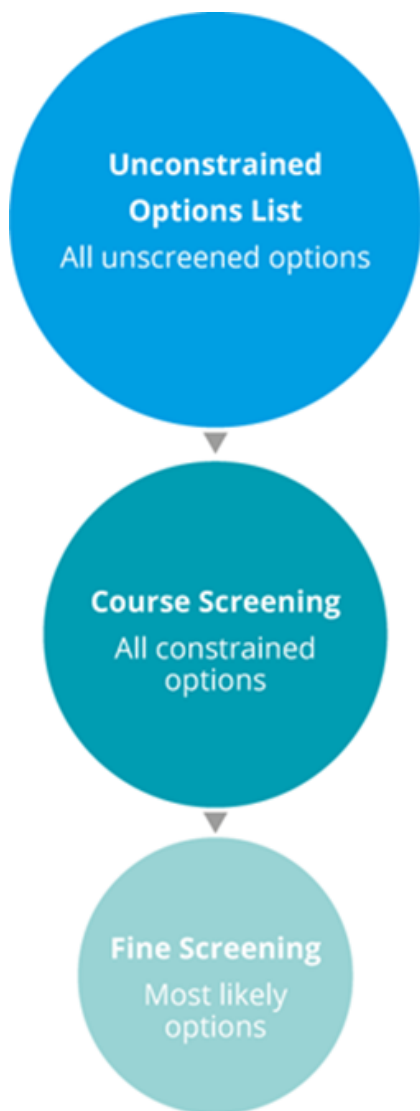


Details of the Sustainable Economic Level of Leakage (SELL) assessment process can be found in Appendix H of the NWRP - Framework Plan

The Use Less pillar focuses on activities to help understand water use habits, influence behaviour, encourage change and to promote the use of water efficient devices and appliances. Irish Water is actively promoting water conservation in schools, business, and communities through various activities. These include our partnership with An Taisce’s Green-Schools Programme, our Water Stewardship Programme and ongoing water conservation campaigns. We also provide advice on reducing water usage in homes and businesses on our website <https://www.water.ie/conservation/>

6. The Option Development Process

In Section 6 of the RWRP-EM we apply the Option Screening Process, which encompasses Stages 3-6 of the Options Assessment Methodology (see Figure 1.5).



The purpose of the Option Screening Process is to, in the first instance, identify all of the potential options (**Unconstrained Options**) we might use to address Needs within the region, and to then screen out Options that are not Feasible, environmentally Sustainable, or Resilient. At the end of the process, we are left with a list of **Feasible Options**, which can address the Needs of individual Water Resource Zones (WRZs), or across groups of WRZs within the region, depending on the size and scale of the Option.

The screening process involves Coarse Screening and Fine Screening which are described in detail in Section 8.3 of the NWRP Framework Plan.

6.1 Unconstrained Options

At the start of the Option Screening Process, all Options are considered, and our team of experts including hydrologists, hydrogeologists, environmental scientists, ecologists, and engineers, reviews a range of natural resources such as rivers, lakes and groundwater aquifers that might have potential for water supply. We then conduct workshops with the Local Authorities and other stakeholders, to ensure that we have included local knowledge, and appropriately take into account Options that may have been considered previously. This initial list is known as the "Unconstrained Option List".

During the development of the RWRP-EM, we identified 1132 Unconstrained Options for the Region. These Options covered a broad range of solution types, including groundwater sources, surface water sources and water treatment plant (WTP) upgrades, as summarised in Figure 6.2.

Figure 6.1 Options Screening Process

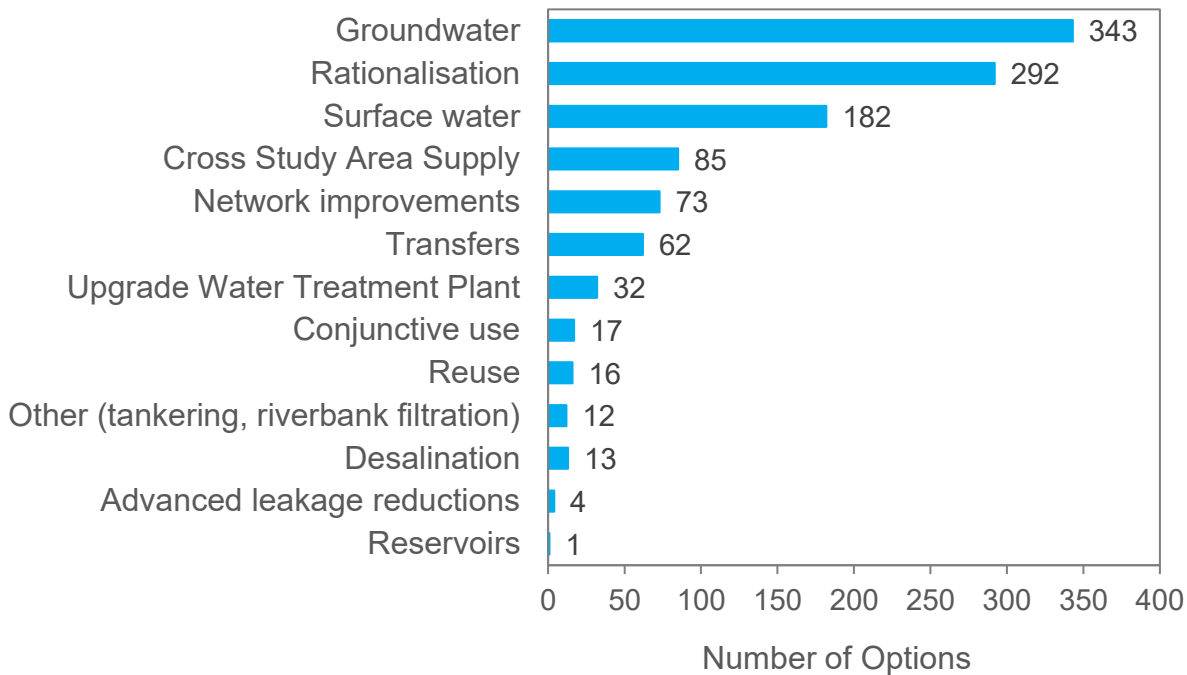


Figure 6.2 Unconstrained Option Types

6.2 Option Screening

Environmental considerations are at the heart of our NWRP, and the Coarse and Fine Screening criteria applied to the Unconstrained Options list, incorporate the objectives from the Strategic Environmental Assessment.

During the Coarse Screening stage for the Eastern and Midlands Region, 515 of the Unconstrained Options were eliminated.

During Fine Screening, a further 23 Options were eliminated, leaving 594 Feasible Options.

During the Fine Screening process all of the Options are assessed and scored in a uniform way against the 33 criteria set out in our Framework Plan. This scoring information allows us to compare the relative benefits of each of the Options and is used as part of our Multi Criteria Analysis (MCA) at the next stage of our Options Assessment Methodology.



Details of the rejected Options and the justification for their rejection are outlined in Annex B of the Study Area Technical reports.

6.3 Feasible Options

At the end of the screening process for the Eastern and Midlands Region, 594 Feasible Options were identified, as summarised in Figure 6.3.

Of these Feasible Options, 342 are WRZ Options, which can only address needs within a WRZ supply. In most cases these are small, localised Options. The remaining 252 Options are Study Area Grouped Options that can resolve needs across multiple WRZs. The Feasible Option list includes a wide range of option types as shown in Figure 6.3.

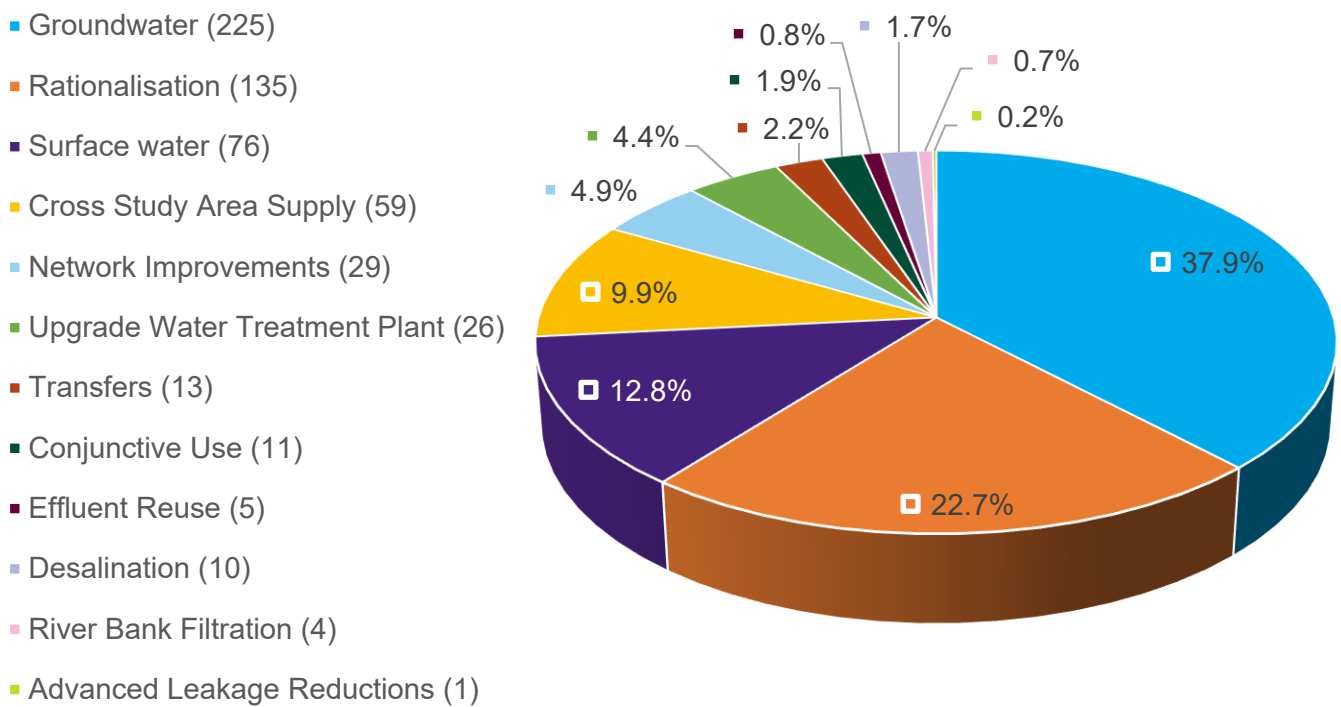



Figure 6.3 Feasible Option Types

One of the Feasible Options, referred to in the RWRP-EM as the New Shannon Source (NSS), is the only Option identified with the supply capacity and capabilities to supply multiple WRZs across the entire region. This type of Option is known as a Regional Option.

At the end of the Option Development Process, an outline design and estimated cost is developed for each Feasible Option. The plan level cost estimate is a whole life cost including:

- Capital costs to deliver the Option
- Operational cost of the Option over its design life, including labour, chemicals, energy and capital replacement
- Embodied carbon and whole life carbon costs
- Environmental and social costs.

The use of operational, carbon and environmental criteria within our costing process allows for a broader consideration of whole life costs at a plan level.

 **Section 6 and the Study Area Technical Reports, included as Appendices 1-9 of the RWRP-EM, summarise our Options Development Process.**

6.4 Project Level Summary

The Feasible Options are considered at plan level and the assessment of the Options are desktop-based. Any Options that are progressed following the NWRP will be considered in more detail at project level.

The first step prior to the development of any solution will be to carry out a review of the data feeding into the project. The data that is reviewed at project level will include, but will not be limited to: the Supply Demand Balance, to review any change to the volume of water required; water quality data, to review if

any further upgrades to infrastructure are required; and the environmental baseline, to determine if there has been a change in the baseline information - for example a change in Water Framework Directive waterbody status or a new Special Area of Conservation designation that the proposed project could impact. In addition to refining the data feeding into the project, the scope and design of the project will be developed in parallel with a number of feasibility and environmental assessments along with stakeholder engagement. The level of assessments and stakeholder engagement will be dependent on the size and scale of the project. All Options will be developed to ensure all potential opportunities that can be afforded by the solution are realised.

7. Study Area Preferred Approach Development Process for the RWRP-EM

7.1 Approach Development Process

Within Sections 7 and 8 of the RWRP-EM, we evaluate the Feasible Options and identify which combination of these provides the best overall outcome for the 134 Water Resource Zones (WRZs) in the Eastern and Midlands Region. This process is called "Approach Development".

This process involves assessing all of the Feasible Options against the six "Approach Categories" identified in the Framework Plan. These Approach Categories allow us to align our decisions with policy drivers and are summarised in Table 7.1.

Table 7.1 Range of Approaches to Test Feasible Options

Approaches Tested	Description	Policy Driver
Least Cost	Lowest Net Present Value (NPV) cost in terms of Capital, Operational, Environmental and Social and Carbon Costs	Public Spending Code
Best Appropriate Assessment (Best AA)	<p>Lowest score against the European Sites (Biodiversity) sub-criteria question:</p> <p>Score = 0 equates to no likely significant effects (LSEs). If, in our opinion, these 0 scoring options meet the deficit/ plan objectives, they are automatically picked as the Preferred Approach.</p> <p>Score = -1 or -2 equates to LSEs that can be addressed with general/standard mitigation measures.</p> <p>Score = -3 equates to LSEs that may be harder to mitigate or require significant project level assessment.</p>	Habitats Directive
Quickest Delivery	<p>Based on an estimate of the time taken to bring an option into operation (including typical feasibility, consent, construction and commissioning durations) as identified at Fine Screening</p> <p>This is particularly relevant where an option might be required to address an urgent Public Health issue.</p>	Statutory Obligations under the Water Supply Act 2007 and Drinking Water Regulations
Best SEA Environmental	This is the option or combination of options with the highest total score across the 19 No. SEA Multi Criteria Assessment (MCA) sub-criteria questions	SEA Directive and Water Framework Directive
Most Resilient	This is the option or combination of options with the highest total score against the resilience criteria. The criteria include outages, financial uncertainty, regulatory changes and climate change.	National Adaptation Plan and Climate Action Plan

Approaches Tested	Description	Policy Driver
Lowest Carbon	This is the option or combination of options with the lowest embodied and operational carbon cost	Climate Action Plan

We then follow an approach assessment process (Figure 7.1) that allows us to compare the best-performing options within each Approach Category relative to each other, in order to develop a Preferred Approach.

STEP 0 Best AA	If there is an option that meets the Objectives of the Plan, and is assessed as having no potential impact on a European Site (based on desktop assessment), it is automatically adopted as the Preferred Approach
STEP 1 Least Cost	Compare Least Cost against best AA Approach, and consider again at Step 6
STEP 2 Quickest Delivery	Compare Least Cost against Quickest Delivery Approach and develop Modified Approach if appropriate
STEP 3 Best Environmental	Compare Least Cost or Modified Approach against Best Environmental, and modify approach if appropriate
STEP 4 Most Resilient	Compare Least Cost or Modified Approach against Most Resilient
STEP 5 Least Carbon	Compare Least Cost or Modified Approach against Lowest Carbon
STEP 6 Approach Comparison	Compare output from Steps 1 to 5 against: <ul style="list-style-type: none"> • SEA required outcomes • Best AA outcomes • Sectoral Adaptation Outcomes • Public Expenditure Code Outcomes
STEP 7 Preferred Approach	Select Preferred Approach based on steps 0 to 6

Figure 7.1 Approach Assessment Process

In many cases, a Feasible Option for a given WRZ may be the best Option across a number of Approach Categories. For example, an Option such as a groundwater source might score highest in terms of the Least Cost, Best Environmental and Lowest Carbon approaches.

As set out in Section 6 of the RWRP-EM, our Feasible Options vary in size from smaller, localised Options, to large regional Options, summarised as follows:

Water Resource Zone Options – These are Options that can only resolve Need for a single water supply. In most cases they are small, localised Options.

Study Area Options – These are Options that can resolve Needs across multiple water supplies in a Study Area (SA). These tend to be larger Options.

Regional Options – These are the largest Options that can resolve Needs in multiple supplies across the entire Region.

If we were to progress a Preferred Approach for each of the 134 WRZs in the Region using WRZ Options alone, we could potentially resolve the identified Needs; however, we could miss the opportunity to assess whether there are operational synergies that can improve sustainability, cost and reliability outcomes by considering larger Options that resolve needs across multiple supplies. The Study Area and Regional Options allow us to consider a more holistic and strategic way of transforming our water supplies. Therefore, within the RWRP-EM we take the following approach:

- a) We develop the Preferred Approach for all of the WRZs individually within each Study Area by selecting the WRZ Options that perform best overall in terms of whole life cost and MCA scores (based on environmental, resilience, carbon, biodiversity, and delivery criteria). This combination of WRZ Options, which addresses the need of all WRZs within the SA, is known as the **WRZ Level Preferred Approach**.
- b) We then consider whether the individual WRZ Options (which make up the WRZ Level Preferred Approach) can be rationalised into combinations of larger SA Options, where available, in order to see if this offers any improved outcome for the Study Area in terms of whole life cost and MCA scores. The best performing combination of WRZ Options and SA Options that address the Need of all WRZs within the Study Area is known as the **Study Area Preferred Approach**.
- c) Finally, we take the best outcome for each Study Area across the Region and consider whether any WRZ Options and SA Options can be rationalised into any Regional Options that may be available. Again, this allows us to see whether there are any improvements that can be made to the outcome in terms of whole life cost and MCA scores at Regional Level. **This is known as the Regional Level Preferred Approach**.

In **Section 7** of the RWRP-EM, we review the outcome of a) and b) above, being the WRZ level and SA Preferred Approaches. In **Section 8** we review the Preferred Approach at Regional Level.

7.2 Study Area Preferred Approach Summary

Our SA Preferred Approaches consist of a combination WRZ Options and SA Options that perform best against our criteria of Resilience, Deliverability and Flexibility and Sustainability. These solutions have been developed with input from technical and local experts through workshops involving the assessment of 594 Feasible Options.

The SA Preferred Approach for the nine (9) SAs across the Eastern and Midlands Region can be summarised as follows:

- 98 Options, including 85 WRZ Level Options and 13 SA Grouped Options.
- The WRZ Options consist of 58 local groundwater supplies, and 5 surface water supplies that contribute to meeting an estimated 13% of the supply deficit across the Region.

- Upgrades to all water treatment plans (WTPs) to reduce water quality risks identified through our Barrier Assessments.

The Preferred Approach for each Study Area is described in Table 7.2 and represented in terms of new and upgraded WTPs and trunk mains in Figures 7.3, 7.4, and 7.5 for the nine (9) Study Areas in the Eastern and Midlands Region. This can be compared to the existing infrastructure in Figure 7.2.

The WRZ Level Approach and the SA Preferred Approach are compared in detail for each Study Area in Section 7.3 of the RWRP-EM. The MCA scores show that the outcome of the Preferred Approach at Study Area level is significantly better than the WRZ Level approach, particularly in terms of Ecology (Best AA) and Environment (Best Env). This shows the benefit of reviewing the transformation opportunities at a regional level, and the effective use of the SEA process to improve the environmental outcomes of our decision making at plan level.

Other benefits of the Study Area Preferred Approach relative to assessing the WRZs individually, include:

- Reduced whole life investment costs of approximately 6% across the Region.
- Increased resilience through interconnections and rationalisation.
- Improved sustainability and reduced operational risk through decommissioning 70 WTPs and discontinuing 73 associated abstractions. This includes 9 surface water abstraction sites potentially impacted by future abstraction legislation.
- The Study Area Preferred Approach is adaptable to change across a range of future scenarios including climate change, growth projections, sustainability outcomes and changes in leakage targets.



Section 7 of the RWRP-EM sets out how we identify our Preferred Approach to address the Need at WRZ and Study Area level. The Study Area Technical Reports and Environmental Reviews for Study Areas 1-9 set out how the Preferred Approach has been developed in more detail.

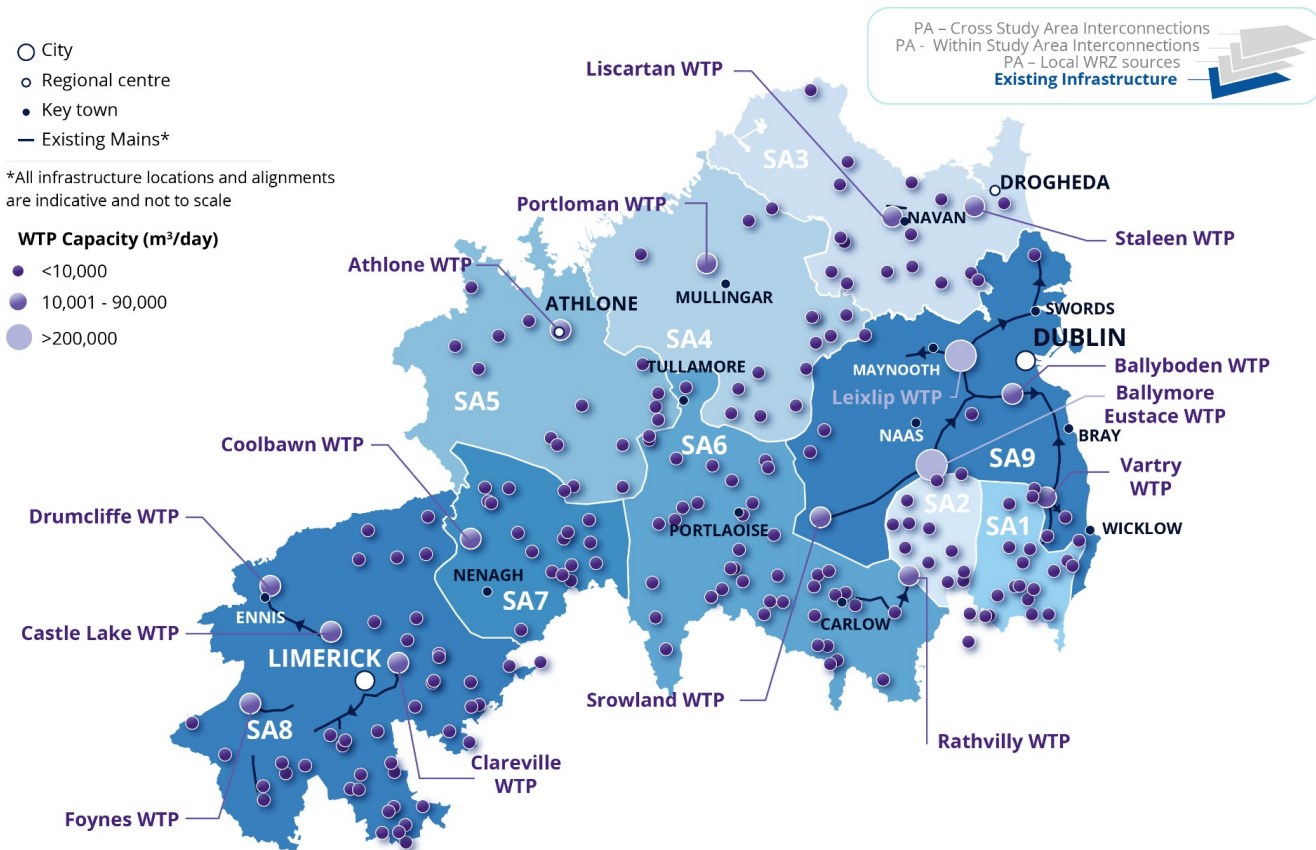


Figure 7.2 Existing Infrastructure

Table 7.2 Study Area Preferred Approach Description

Study Area	Description
SA1	<p>The Preferred Approach for SA1 Mid Wicklow, consists of 10 local WRZ Options and 2 SA Options. The WRZ Options involves decommissioning WTPs, WTP upgrades, new and increased groundwater abstractions, and improved interconnection.</p> <p>There are two SA Options:</p> <ul style="list-style-type: none"> - The first rationalises 6 WRZs to Vartrey WTP in SA9, improving resilience through interconnections: Avoca Ballinaclash, Redcross Canary, Ballinteskinn, Rathdrum. Laragh Annamoe, Barndarrig. The Option will require new pumps and approximately 48 km of new/upgraded network to connect the WRZs and allow for the additional supply. New service reservoirs or upgrades to existing reservoirs will be required at Rathdrum. - The second SA Option involves an increased groundwater abstraction at an existing wellfield at Woodenbridge, Arklow Ballyduff WTP upgrade, new WTP at Woodenbridge, new storage and BPT, new/upgraded pumps and approximately 13 km of new/upgraded network to allow for the additional supply. <p>10 WTPs and 10 abstractions will be decommissioned.</p>
SA2	<p>The PA for SA2, West Wicklow, consists of WRZ Options for 10 of the 12 WRZs in the Study Area. The WRZ Options involve new and increased groundwater abstractions, upgrades to existing WTPs, a new connection to the existing network at Rathvilly and the decommissioning of Hacketstown WTP.</p>

Study Area	Description
	<p>The connection to Rathvilly (SA6) will require additional supply from the New Shannon Source to Carlow. The Option includes new pump/s and approximately 11.4 km of new/upgraded network to allow for the additional supply.</p> <p>For the other 2 WRZs - Hollywood - Donard Public Supply and Dunlavin Public Supply - the SA Option involves rationalising the WRZs to Ballymore Eustace WTP (SA9) via a new connection to the Ballymore Eustace (Old Kilcullen trunk main). This Option includes a new pumping station, a new service reservoir and approximately 15 km of new/upgraded network to allow for the additional supply.</p> <p>3 WTPs and 3 abstractions will be decommissioned.</p>
SA3	<p>The PA for SA3, Meath, consists of WRZ Options for 4 WRZs in the Study Area. The Options involve new and increased groundwater abstractions, along with WTP upgrades.</p> <p>A single SA Option resolves the Deficit for 7 of the WRZs, namely Athboy, Ballivor, Kells-Oldcastle, Kilmessan, Navan-Mid Meath, South Louth & East Meath, and Trim. This involves improved interconnection between WRZs, and supply from a New Shannon Source. New storages, new pumps and watermain network of approximately 154 km will be required as part of this option. Stalleen, Kiltrough, Dunshaughlin and Curragha WTPs will be upgraded for water quality purposes.</p> <p>11 WTPs and 12 abstractions will be decommissioned.</p>
SA4	<p>The PA for SA4, Westmeath, consists of 2 WRZ Options and 1 SA Grouped Option.</p> <p>The WRZ Options relate to WRZs that do not have a supply Deficit. The Options therefore maintain existing groundwater sources and upgrade 2 WTPs for water quality only.</p> <p>The SA Grouped Option interconnects 11 of the 13 WRZs and supplies the merged WRZs from the proposed New Shannon Source.</p> <p>13 WTPs and 13 abstractions will be decommissioned.</p>
SA5	<p>The PA for SA5, Offaly/Roscommon, consists of WRZ Options for all of the WRZs in the study area.</p> <p>For one of the larger demand areas, South Roscommon (Lisbrock & Killeglan), the SA Preferred Approach involves increasing the existing groundwater abstraction at Killeglan and Lisbrock, upgrading the associated WTPs and providing new/upgraded network to allow for the additional supply.</p> <p>The SA Preferred Approach for the remaining WRZs involves a new WTP, new and increased groundwater abstractions, along with increased surface water abstractions and WTP upgrades.</p> <p>No decommissioned WTPs or abstractions.</p>
SA6	<p>The PA for SA6, Laois, consists of WRZ Options for 24 of the 28 WRZs in the Study Area. For the large demand area of Carlow Town, the SA Preferred Approach involves a cross study area transfer from the GDA to Carlow Town (Browneshill reservoir) via Srowland WTP (SA9). This Option will require the provision of new storage, new pumps and lay approximately 28.6 km of new network. Derrymoyle, Rathvilly, Tullow, Oak Park and Sion Cross WTPs will be upgraded for water quality purposes.</p> <p>The other WRZ Options involve new and increased groundwater abstractions, rationalisation and WTP upgrades. The rationalisation includes Cloonin Hill, Drim and Knocks WTPs. The GW abstraction at Knock WTP will be increased. The Option also includes an upgrade to the Knocks WTP, new/upgraded pumps and approximately 7.5 km of new/upgraded network to allow for the additional supply</p> <p>There are two SA Options:</p> <ul style="list-style-type: none"> - Ballinakill and Durrow WRZs will be interconnected. This will include an increased GW abstraction and WTP upgrades. - Tullamore and Mountbolus will be supplied via a connection to the proposed NSS. This includes balancing storage at New Shannon Source connection, new reservoir, new/upgraded

Study Area	Description
	<p>pumps and approximately 25.5km of new/upgraded network to allow for the transfer of the additional supply.</p> <p>6 WTPs and 7 abstractions will be decommissioned.</p>
SA7	<p>The PA for SA7, North Tipperary, consists of WRZ Options for 7 of the 10 WRZs in the Study Area. One of the Options is a new GW abstraction at Crossanagh, including an upgrade to Crossanagh WTP, new/upgraded pumps and approximately 500 m of new/upgraded network to allow for the additional supply. New service reservoir or upgrades to existing reservoir will be required in Terryglass.</p> <p>The remaining WRZ Options involve increased groundwater or surface water abstractions and WTP upgrades.</p> <p>One SA Option improves the interconnection between three WRZ, namely Dunkerrin/Moneygall, Greyford Source to Crotta and Cloughjorda. A new supply will be provided from the proposed New Shannon Source. This Option includes new/upgraded pumps, new storage at Jones Well WTP and approximately 29.3 km of new/upgraded network to allow for the transfer of additional supply between WRZs.</p> <p>7 WTPs and 7 abstractions will be decommissioned.</p>
SA8	<p>The PA for SA8, Limerick Clare, consists of WRZ Options for 18 of the 31 WRZs in the Study Area. For some of the larger demand areas, the SA Preferred Approach used 5 SA Options to rationalise and provide spare capacity to 13 WRZs:</p> <ul style="list-style-type: none"> - Supplies spare capacity from Limerick City to neighbouring WRZs, rationalising Cappamore/Murroe/Foileen, Pallasgreen and Doon. This Option includes new/upgraded pumps, new reservoirs and approximately 38 km of new/upgraded network to allow for the transfer of the additional supply - Supplies spare capacity from Glenosheen/Jamestown/Kilmallock to KilfinaneArdpatrick. Rationalise Kilfinane Ardpatrick to Kilmallock WRZ (rationalise to Jamestown WTP (Mount Russell borehole). The option includes a new pumps and approximately 6.8 km of new network to allow for the transfer of the additional supply. Ballygaddy, Glenosheen, Kilmallock and Jamestown WTPs will be upgraded for water quality purposes. - Rationalisation of Adare, South West Regional and Limerick City Environs PWS to Limerick - Rationalisation of Upperchurch to Kilcommon - One interconnection from the NSS to Newport and Killaloe whilst decommissioning 3 WTPs. The Option includes new storage, new pumps and approximately 11 km of watermain. <p>The SA Preferred Approach for the remaining WRZs involves new and increased groundwater abstractions, along with increased surface water abstractions, WTP upgrades, improved connectivity between WRZs and an advanced leakage reduction programme for the Ennis WRZ. The leakage reduction programme needs to be implemented in conjunction with a local GW Option to meet the full WRZ Deficit.</p> <p>18 WTPs and 19 abstractions will be decommissioned.</p>
SA9	<p>This Option proposes to increase supply to the WRZ by a new Surface Water abstraction of 194 MI/d from The Parteen Basin. The Option also includes a new WTP at Birdhill with an output capacity of 185 MI/d. Twin rising mains from abstraction to WTP (2km), a new break pressure tank, 2 clear water tanks, new pumping station & booster pumping station, new termination point reservoir in Peamount. The supply will be transferred approximately 41 km from the WTP to the break pressure tank via a new 1600mm pumped pipeline. From the break pressure tank the supply will flow by gravity for the first 170 MI/d and pumped when demand goes above 170 MI/d. The pipeline from the Break pressure tank to the termination point reservoir will be 1600mm diameter with an approximate length of 130 km</p> <p>A Network upgrade will be required to pipeline from Peamount to Dublin.</p>

Study Area	Description
	<p>Other network improvements are also part of the Preferred Approach for SA9 but are required independently of the supply Option selected.</p> <p>There will be no decommissioned abstractions</p>

* New Shannon Source (NSS) - transfer from the Parteen Basin to the Greater Dublin Area (GDA).

** SA9 consists of a single WRZ. For this reason, all Options (or combinations of Options) that address the Need for SA9 are defined as WRZ Options. The WRZ Level Approach and SA Preferred Approach are therefore the same.

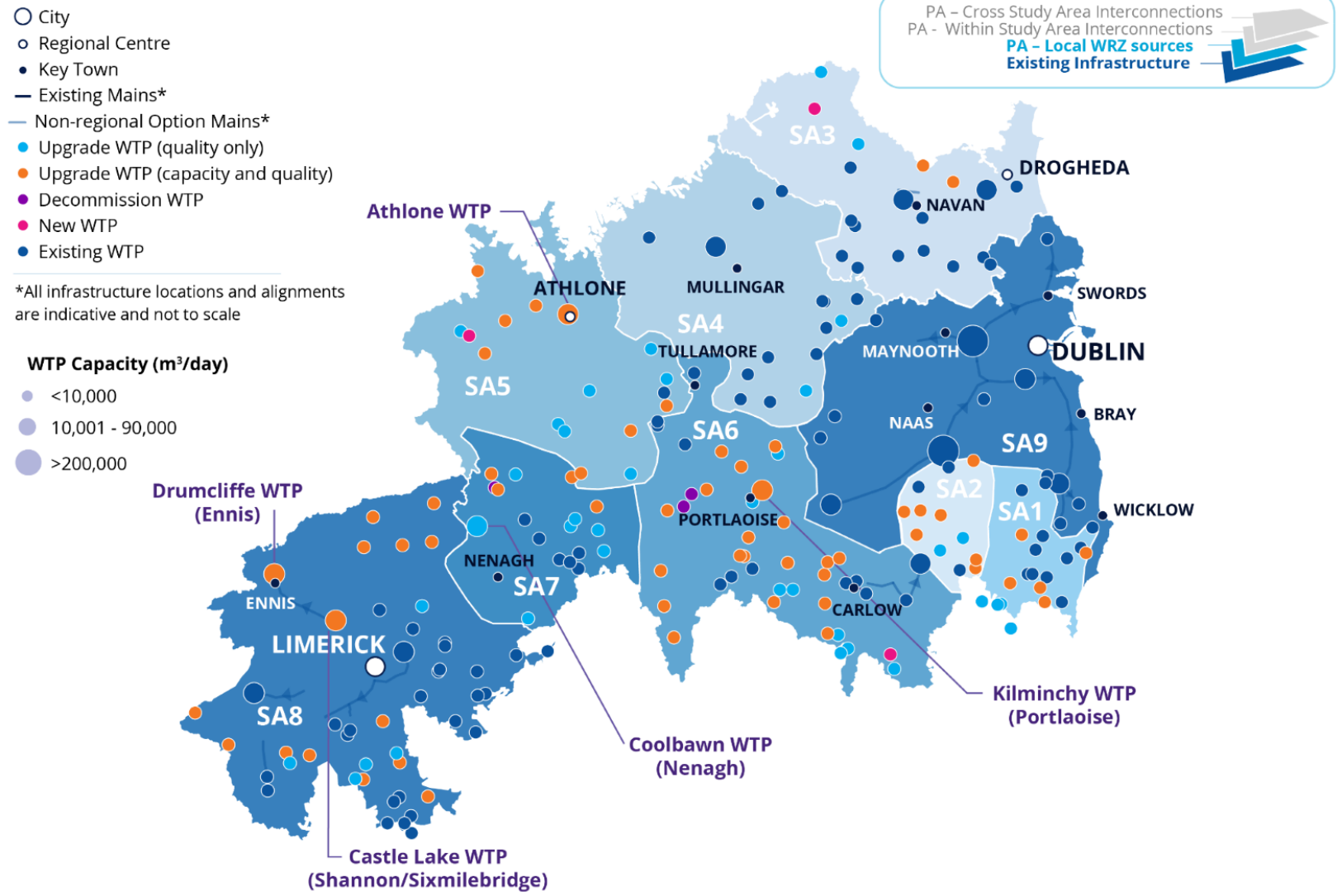


Figure 7.3 – Preferred Approach – Local WRZ Sources

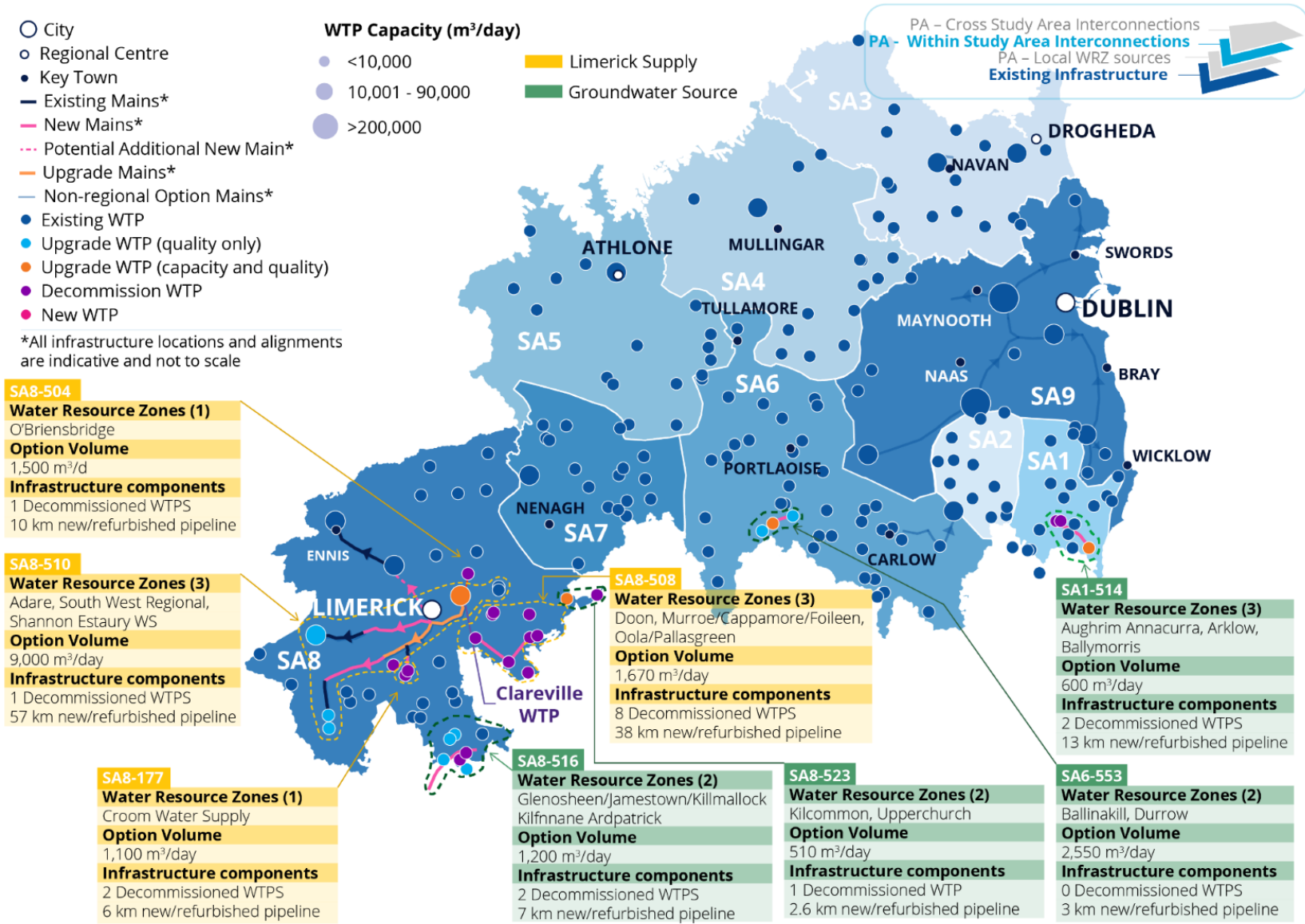


Figure 7.4- Preferred Approach - Within Study Area Interconnections

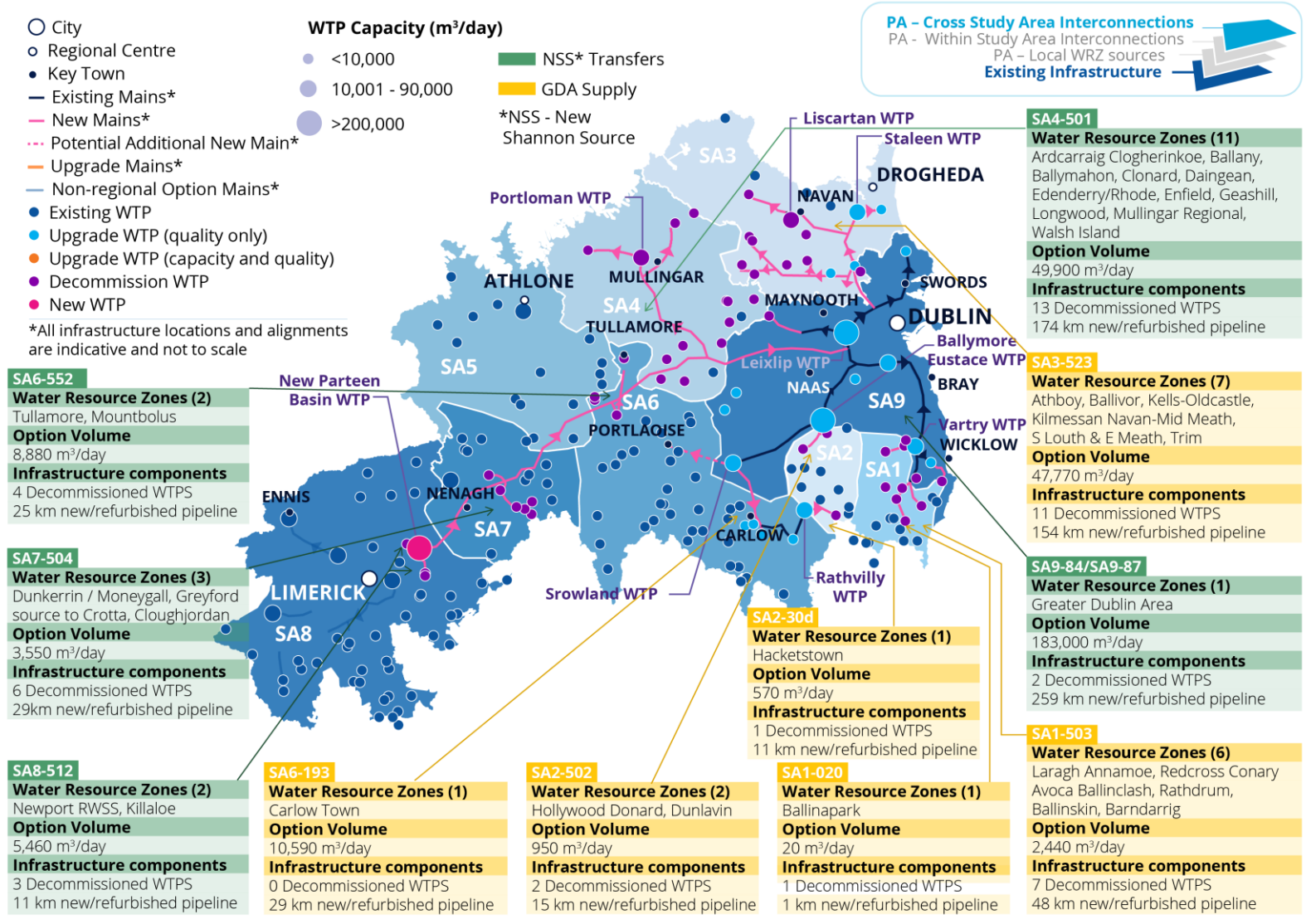


Figure 7.5 Preferred Approach – Cross Study Area Interconnections

7.3 Review of the Preferred Approaches arising from Consultation

As set out in Section 9 of the RWRP-EM, the NWRP will be formally updated every five years at which point there will be further opportunities for public participation. Baseline forecasts and data feeding into the NWRP will be reviewed annually. Our data is continuously improving, and it is important that we review our Preferred Approach further to the receipt of updated data. During the consultation period for the RWRP-EM we received updated data for a number of WRZs through consultation workshops and subsequent further assessment. This resulted in a review of the Preferred Approach for those WRZs.

Following the consultation period on the draft RWRP-EM, the Preferred Approach for five (5) WRZs (Barndarrig WRZ, Rahan WRZ, Mountbolus WRZ, Upperchurch WRZ and Killaloe WRZ) were revised to take account of new data that became available through the consultation workshops. Furthermore, the Preferred Approach for the GDA was modified to account for increased leakage targets determined through a review of leakage undertaken by the Irish Water leakage reduction team.

A summary of the updated data and resulting change to the relevant Preferred Approaches is provided below. These changes are reflected throughout Section 7, Section 8 and Section 10 of the RWRP-EM.

7.3.1 Barndarrig WRZ (Study Area 1)

The initial Preferred Approach for the Barndarrig WRZ was to increase the existing groundwater abstraction and upgrade the existing WTP (Option reference SA1-037 in Appendix 1). However, further to a review of existing WTP infrastructure and the raw water quality, it was determined the level of upgrade required at the WTP was greater than initially assumed. The groundwater exhibits high nitrate levels, requiring additional treatment processing capability. On reviewing the Feasible Options to consider the additional costs associated with the required WTP upgrade, the Preferred Approach for the Barndarrig WRZ has been amended to rationalise the Barndarrig WRZ to the GDA WRZ and decommission the existing WTP in Barndarrig (Option reference SA1-503 in Appendix 1). Barndarrig will obtain supply from the Vartry WTP and the additional demand in the GDA will be offset by the proposed New Shannon Source. Therefore, this PA will form part of the Regional Preferred Approach (as described in Section 8), which can resolve Need in multiple WRZs across Study Areas.

The details of the updated PA for the Barndarrig WRZ are reported in the Study Area 1 Technical Report (Appendix 1), which includes analysis of this updated PA through the option assessment process.

7.3.1 Rahan WRZ (Study Area 5)

The initial Preferred Approach for the Rahan WRZ was to upgrade the existing Tully and Holmshill WTPs (Option reference SA5-085 in Appendix 5) for water quality purposes only, as the source yield data that was available at the time indicated a surplus rather than deficit for the Rahan WRZ. However, further to a review of existing WTPs it was determined that the available yield from the existing sources was lower than previously understood. Therefore, a deficit has been identified and additional supply is required to support the current and future needs of the WRZ. On reviewing potential Feasible Options to provide additional supply to the Rahan WRZ, the Preferred Approach for the Rahan WRZ has been amended to provide a new GW source and provide upgrades to the existing WTPs (Option reference SA5-086 in Appendix 5).

The details of the updated PA for the Rahan WRZ are reported in the Study Area 5 Technical Report (Appendix 5), which includes analysis of this updated PA through the options assessment process.

7.3.2 Mountbolus WRZ (Study Area 6)

The initial Preferred Approach for the Mountbolus WRZ was to upgrade the existing WTP (Option reference SA6-198 in Appendix 6) as the source yield data that was available at the time indicated a surplus rather than deficit for the Mountbolus WRZ. However, further to a review of existing WTP

infrastructure it was determined that the available yield from the sources was lower than previously understood. Therefore, a deficit has been identified and additional supply is required to support the current and future needs of the WRZ. On reviewing potential Feasible Options to provide additional supply to the Mountbolus WRZ, the Preferred Approach for the Mountbolus WRZ has been amended to rationalise Mountbolus WRZ to the Tullamore WRZ and decommission the WTPs in the Mountbolus WRZ (Option reference SA6-552 in Appendix 6). The Mountbolus WRZ will obtain supply from a connection to the pipeline transferring water from the proposed New Shannon Source to the GDA. Therefore, this PA will form part of the Regional Preferred Approach (as described in Section 8), which can resolve Need in multiple WRZs across Study Areas.

The details of the updated PA for the Mountbolus WRZ are reported in the Study Area 6 Technical Report (Appendix 6), which includes analysis of this updated PA through the options assessment process.

7.3.3 Upperchurch WRZ and Killaloe WRZ (Study Area 8)

The initial Preferred Approach for Upperchurch WRZ was to increase the existing groundwater abstraction and upgrade the WTP (Option reference SA8-165 in Appendix 8). However, further to a review of existing WTP infrastructure and the raw water quality it was determined the level of upgrade required at the WTP was greater than initially assumed as the existing UV treatment would need to be replaced. On reviewing the Feasible Options to consider the additional costs associated with the required WTP upgrade, the Preferred Approach for the WRZ has been amended to rationalise Upperchurch WRZ to the Kilcommon WRZ and decommission the existing WTP in Upperchurch (Option reference SA8-523 in Appendix 8).

The initial Preferred Approach for Killaloe WRZ was to upgrade the existing WTP (Option reference SA8-180 in Technical Appendix 8). However, further to a review of existing WTP infrastructure and the raw water quality it was determined the level of upgrade required at the WTP was greater than initially assumed. The water exhibits high pH levels and the hardness of the water is eroding services and resulting in failures of service connections. On reviewing the Feasible Options to consider the additional costs associated with the required WTP upgrade, the Preferred Approach for the Killaloe WRZ has been amended to rationalise Killaloe WRZ to the Newport WRZ and decommission the existing WTP in Killaloe (Option reference SA8-512 in Appendix 8). Killaloe will obtain supply from the proposed new WTP at Birdhill and form part of the Regional (as described in Section 8), which can resolve Need in multiple WRZs across Study Areas.

The details of the updated PA for the Upperchurch WRZ and the Killaloe WRZ are reported in the Study Area 8 Technical Report (Appendix 8), which includes analysis of this updated PA through the options assessment process.

7.3.4 GDA WRZ (Study Area 9)

Further to a review of leakage targets carried out by the leakage reduction team the leakage targets for the GDA were revised from 84 MI/d to 92 MI/d and these revised targets were built into the SDB. This reduced the deficit in the SDB the GDA and all feasible solutions were reconsidered for this reduced deficit. On reviewing the revised Feasible Options to consider the reduced deficit it was determined that the solution to provide supply to the GDA from the New Shannon Source remained the Preferred Approach. The magnitude of the supply required however, was reduced.

The details of the revised SDB deficit, and revised Feasible Options for the GDA are reported in the Study Area 9 Technical Report. The updated version of the Supply Demand Balance is provided in Appendix 10 of the RWRP-EM.

7.4 Interim Solutions

As it will take a number of investment cycles to deliver the Preferred Approach across all WRZs, Irish Water must continue to deliver safe, secure, and reliable water supplies to meet customers' needs and enable growth in the region.

Therefore, within our RWRP EM we have identified 196 interim short term capital maintenance solutions across each of the SAs which will be utilised when needed. These solutions will allow Irish Water time to deliver the Preferred Approach, while at the same time, maintaining a sustainable water supply. These interim solutions are generally smaller in scale and rely on existing infrastructure.



The interim solutions we have identified to address the short-term Needs within the Eastern and Midlands Region are detailed in Section 7.6 of the RWRP-EM and in each of the Study Area Technical Reports (Appendices 1-9).

7.5 Sensitivity Analysis

Within Section 7 of the RWRP-EM, we test the Sensitivity of the Preferred Approach to changes in the Supply Demand Balance (SDB) to ensure that the Preferred Approach is robust and that our Plan is adaptable. We consider how the Preferred Approaches would perform across a range of future events, such as climate change and new abstraction legislation, which could alter the SDB and introduce uncertainty to our long-term forecasts.

The Sensitivity Assessment is based on the following questions:

- What if the deployable output from existing supplies is reduced based on sustainability limits required by new water regulation and abstraction legislation resulting in a larger SDB Deficit?
- What if climate change impacts on our existing supplies are greater than anticipated?
- What if our forecasts overestimate projected Demand and expected demand growth does not materialise resulting in a smaller SDB Deficit?
- What if we are able to reduce leakage below SELL within the timeframe of the Plan resulting in lower Needs?
- What if leakage targets are not met?

Overall, the Sensitivity assessment of the Interim and Preferred Approach indicates they are highly adaptable to a broad range of futures, and therefore represent 'no regrets' infrastructure.



The outcomes of the Sensitivity Assessment are discussed in more detail in the Study Area Technical Reports included as Appendices 1 – 9 of the RWRP-EM.

8. Preferred Approach – Regional Level

In [Section 7](#) of the RWRP EM, we reviewed the Preferred Approach at Water Resource Zone (WRZ) and Study Area (SA) Levels. In some of the Study Areas, this resulted in a Preferred Approach which involves a transfer from an existing supply within another Study Area. For example, in SA1, the Preferred Approach involves a transfer from the existing Vartry water treatment plant (WTP) in SA9 to 6 WRZs in SA1.

We must therefore review the Preferred Approaches across all Study Areas collectively to ensure that we properly assess impacts on the “parent sources” as well as the Regional Options.

In the Eastern and Midlands Region, SA9, the Greater Dublin Area (GDA), is the ‘parent’ supply for transfers into 4 neighbouring Study Areas (SA1, SA2, SA3 and SA6) supplying 18 WRZs. Therefore, the Preferred Approach for SA9, the transfer from the New Shannon Source (NSS) Option, must be reviewed to ensure that it can meet the Deficit within the GDA and also support transfers into the neighbouring Study Areas.

In addition to this, the NSS Option is also the Preferred Approach for 19 WRZs which lie close to the route of the proposed pipeline transferring treated water from the NSS to the GDA. This includes 2 WRZs in SA8, 3 WRZs in SA7, 11 WRZs in SA4 and 2 WRZs in SA6. The additional water requirements for these WRZs must also be assessed.

The first check we carried out at Regional Level was to confirm that the Option is still feasible at this scale, accounting for the direct and indirect transfers outlined in Figure 8.1. This was confirmed through our screening process, and an updated outline design, costing and Multi Criterial Assessment (MCA) was prepared for the larger NSS Option. We will refer to this as [Combination 1](#).

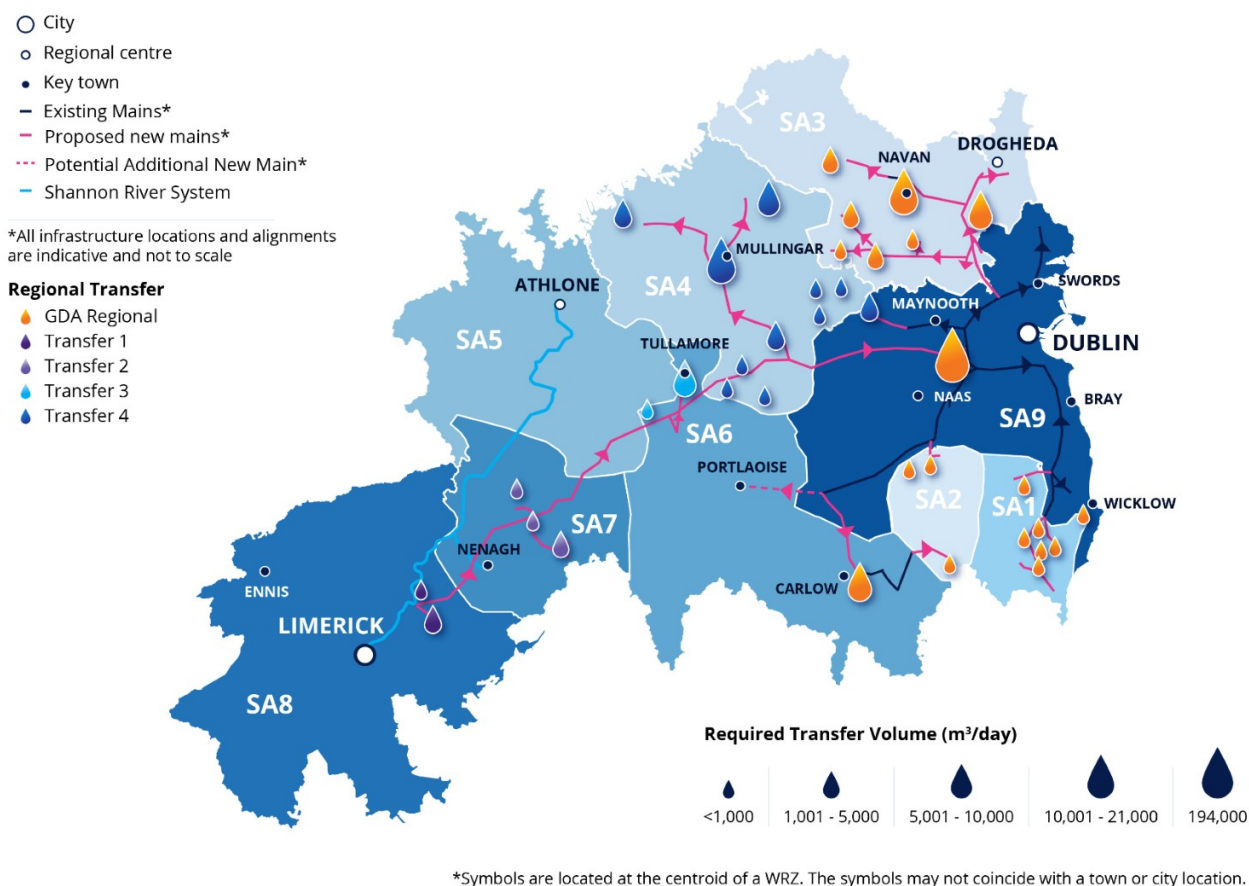


Figure 8.1 - New Shannon Source Option with Direct and Indirect Transfers

In order to ensure that Combination 1 still provides the best overall outcome, as a final check we compared this combination to 2 alternatives.

Combination 2: Regional Approach One Without Transfers – In this Regional Option we replace all Options involving transfers from the GDA to other Study Areas with WRZ Level Options (however, the WRZ Level Preferred Approach for the SA9 still involves the NSS).

Combination 3: Regional Approach Two Without Transfers – In this Regional Option we replace all Options involving transfers from the GDA to other Study Areas with WRZ Level Options. We have also replaced the NSS Option for SA9 with the next best alternative that does not include a supply from the River Shannon. In this case it is a combination including desalination and other local Options.

The assessment of these three (3) combinations is summarised in Figure 8.3. As can be seen, Combination 1 at Regional Level, performs significantly better than the other two (2) combinations, particularly in relation to environmental outcomes.

Table 8.6 MCA Scores for Regional Approaches

Approach Category	Combination 1 Regional Approach With Transfers	Combination 2 Regional Approach One Without Transfers	Combination 3 Regional Approach Two Without Transfers
Least Cost	Best		Worst
Quickest Delivery	Worst	Best	
Best AA *no. of -3 scores against biodiversity	2 No. -3 scores Best	4 No. -3 scores	7 No. -3 scores Worst
Lowest Carbon	Worst	Best	
Most Resilient	Best		Worst
Best Environmental	Best		Worst

Therefore, the Preferred Approach outcome for the RWRP-EM is a combination of the Regional Option Combination 1, and remaining output from the SA Preferred Approaches. This is represented in Figure 8.2 in terms of the WTPs and trunk mains that will deliver the supply required to address the Regional Needs.

In summary, the Regional Approach provides a solution to supply the Deficit to:

- The GDA and 18 additional WRZs, which collectively would become the new GDA Regional WRZ.
- 18 WRZs via 4 transfers from the pipeline connecting the NSS to the GDA.
- Within Study Area Transfers, benefitting 17 WRZs, including the interconnection of 8 WRZs to the Limerick supply system (forming the new Limerick Regional WRZ) and 9 WRZs interconnected to form 4 new WRZs supplied from increased local groundwater sources.
- Local new and increased groundwater sources supplying 58 WRZs.
- Local new and increased surface water sources supplying 5 WRZs.
- WTP upgrades to reduce water Quality risks identified through our Barrier Assessments (including 16 WRZs that are not in supply Deficit).

Each of the projects and Options identified in the Regional Preferred Approach for the four (4) RWRPs that make up the NWRP will be subject to their own planning and regulatory processes and will be delivered on a phased basis. This will allow for progress on a risk-based prioritisation of capital investment across the country allowing Irish Water to address Need across the entire water supply and asset base. It will take a number of investment cycles to progress these projects and they may evolve in later iterations of the NWRP.

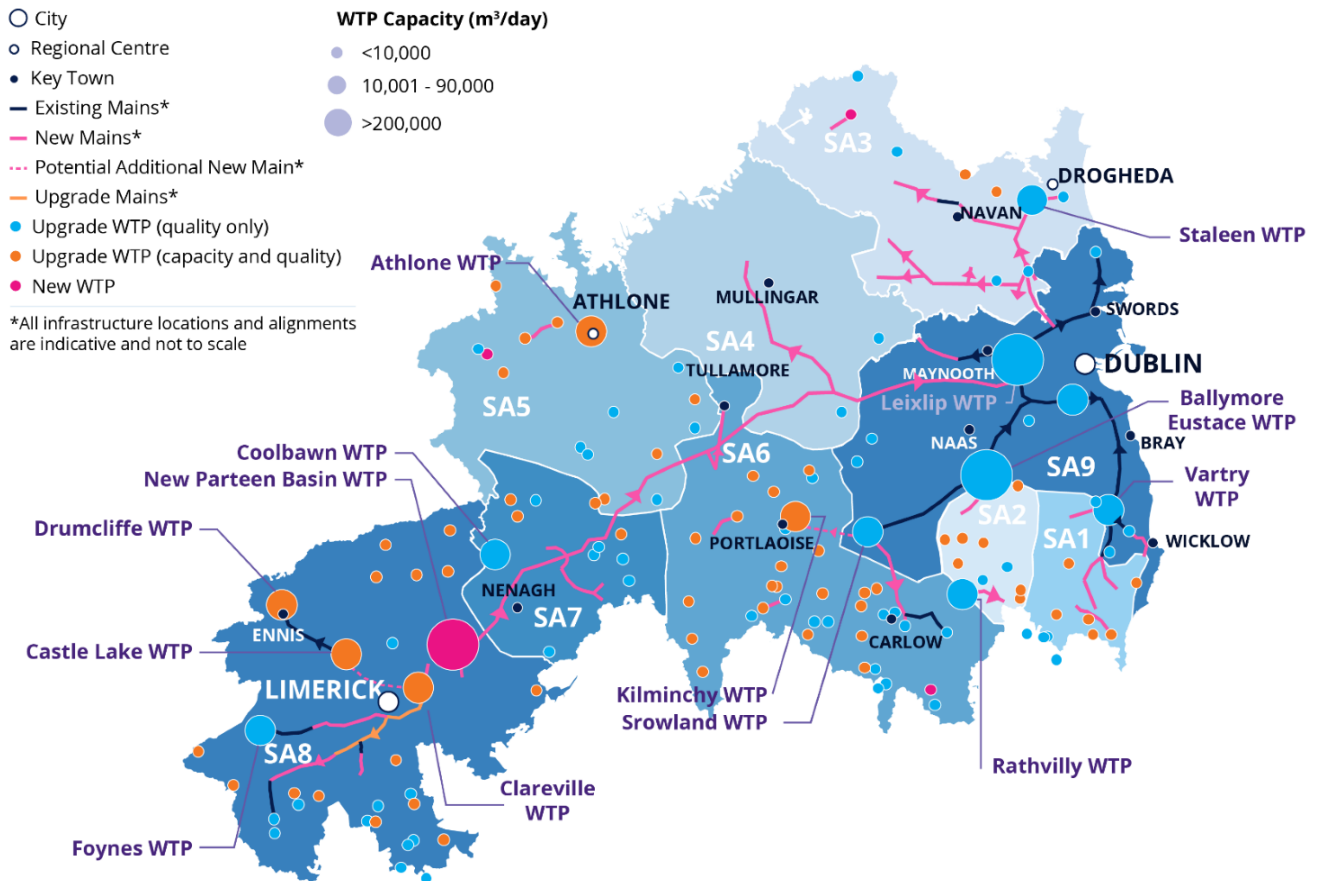


Figure 8.2: Preferred Approach Eastern and Midlands Region

8.1 Sensitivity Testing of Regional Approach

As with the SA Preferred Approach, we also explore the sensitivity of our Preferred Approach at Regional Level by testing the effect of a range of future events, such as climate change and new abstraction legislation, on the Supply Demand Balance (SDB). This allows us to understand Sensitivity of the Regional Preferred Approach to changes in Need, in turn allowing us to ensure that the Regional Preferred Approach is robust and that our Plan is adaptable.

Based on the Sensitivity Assessment, the Regional Preferred Approach is highly adaptable to a broad range of future scenarios, and therefore represents ‘no regrets’ infrastructure.



The RWRP-EM looks at a range of solutions to meet the need in a WRZ or Study Area. These solutions are not limited by distance, therefore, some solutions for the WRZ or Study Area will optimise regional transfers. By way of example, there are 37 WRZs in the RWRP-EM which are capable of benefitting from regional transfers. Section 8 of the RWRP-EM outlines how the regional solution is developed and compared against solutions that do not involve a regional transfer.

It should be noted that all Options to resolve Need are at a plan level. Environmental impacts and costing of projects are further reviewed at project level and where alternatives will need to be considered as part of the Environmental Impact Assessment process in the usual way. No statutory consent or funding consent is conferred by inclusion in the NWRP. Any projects that are progressed following this plan will require individual environmental assessments, including, where appropriate, Environmental Impact Assessment and Appropriate Assessment (as required), in support of planning applications (where a project requires planning permission) or in support of licencing applications (for example, for new abstractions). These applications will also be subject to further rounds of public consultation. The future investment needed to deliver these projects must also be identified and quantified through Irish Waters economic regulatory process in line with government policy.

9. Eastern and Midlands Region – Monitoring and Feedback

Section 9 of the RWRP-EM details Stage 2 of the Options Assessment Methodology (see Figure 1.5). The NWRP will be formally updated every five years. Baseline forecasts and data feeding into the NWRP will be reviewed annually. Irish Water has prepared a regionally specific:

- Monitoring and Mitigation Plan for the RWRP-EM which is based on Section 4 of the Strategic Environmental Assessment (SEA) Statement prepared in relation to the NWRP Framework Plan. The Monitoring Plan has been designed to provide a basis for the identification and continuous review of the positive, negative and cumulative impacts of the RWMP-EM, and it forms part of the SEA statement for the final Regional Water Resources Plan for the Eastern and Midlands. The Monitoring Plan is provided in two parts to cover both plan level monitoring and project level monitoring. Indicators and targets to measure performance are set out in Section 4 of the Framework Plan SEA Statement.
- The Environmental Action Plan (EAP) set out in Section 10 of the SEA Environmental Report for the RWRP-EM outlines the recommendations of the SEA in relation to the RWPR-EM and mitigation measures to take forward. Irish Water’s commitment to implement this monitoring and mitigation is given in Chapter 8.3.8 of the NWRP Framework Plan.



Irish Water’s commitment to implement the Monitoring and Mitigation Plan is set out in Section 8.3.8 of the NWRP Framework Plan

9.1 Monitoring and Mitigation

The monitoring and mitigation process involves:

- Identifying the internal and external factors that may impact the NWRP and mapping the areas of the NWRP that they will influence.
- Updating Needs identification by updating the Supply Demand Balance (SDB), Drinking Water Safety Plans (DWSP) and Barrier Scores to reflect these changes; and
- Incorporating feedback from SEA mitigation actions and Monitoring Plan set out in the SEA Statement prepared in relation to the NWRP Framework Plan.

The SEA and Natura Impact Statement (NIS) options assessment account for the implementation of mainly standard mitigation measures, such as the use of good construction practice with specific mitigation measures also presented in the NIS. Examples of standard measures expected to be embedded in the design and development of infrastructure options are listed in Appendix D of the SEA Environmental Report for the draft RWRP-EM. Standard and specific mitigation measures identified include recommendations for further environmental assessment work to be undertaken at project stage (to further inform the development of suitable project specific mitigation measures), as well as mitigation to be implemented directly at project stage.

An Environmental Action Plan (EAP) is provided in Section 10 of the SEA Environmental Report for the RWRP-EM and this summarises the actions and areas of further study identified in the SEA. The SEA Environmental Report in Section 10 also includes a Monitoring Plan that identifies the targets and indicators to be measured or recorded to determine progress towards meeting SEA objectives. The EAP considers the Options and Approach appraisal process as well as the integration of environmental considerations.

With respect to the NIS assessment, standard and option specific mitigation measures (see Sections 6.3.1 – 6.3.5 of the NIS) will be applied, unless project level Appropriate Assessments (AAs) or project-specific environmental assessments demonstrate that they are: not required (i.e., the predicted effect will not occur), are not appropriate, or that alternative or additional measures are necessary or are more appropriate.

The proposed Monitoring Plan indicates a range of recommendations for the RWRP-EM including (but not limited to) issues relating to:

- Climate change such as decarbonisation, increased contribution of renewable/low carbon energy and improved energy efficiency.
- Catchment Management including carbon offsetting, supporting biodiversity, and recreational objectives for population wellbeing.
- Biodiversity, flora and fauna for example ensuring no adverse effects on the integrity of any European site and, where feasible, to seek to maintain and/or contribute to the site achieving Favourable Conservation Status and ensuring the protection of nationally designated sites and wider biodiversity.

In certain circumstances, monitoring and feedback will identify the need for a variation of the NWRP - Framework Plan or a Regional Water Resources Plan. Where a variation is required, as noted above, Irish Water will screen the change for SEA and AA in accordance with its legal obligations.

9.2 Internal and External Factors

Irish Water is committed to a programme of continuous monitoring to ensure both internal and external factors which may influence the NWRP are identified.

External factors which can influence the performance of our water supplies include:

- Changes in legislation and policy that impact the way we operate our asset base or the impact of this on the environment.
- Reductions in water supply availability due to climate disruption and environmental impacts.
- Growth in demand for water for domestic and non-domestic use.
- Funding availability and requirements to improve Levels of Service to water users.

Irish Water is committed to reviewing the RWRP-EM following the publication of any relevant new legislation, regulations, and policies. Irish Water will review policies routinely and update the Framework Plan as necessary.

In order to address reductions in water supply availability due to climate disruption and environmental impacts, Irish Water has ensured that conservative estimates have been used within our Supply Demand Balance (SDB) but will continue to assess supply availability and modify the SDB appropriately.

In order to address domestic demand growth, the Irish Water Spatial Planning team continues to interface directly with the Regional Assemblies and the Local Authority Planning departments, through a ten-year capacity register, during preparation of the regional growth strategies and the County Development Plans.

Internal factors which can influence the performance of our water supplies include:

- Leakage and network performance
- Data quality, quantity and availability

Irish Water is committed to the development and delivery of a long term and intelligence improvement strategy, on data related to supply demand balance, water quality, asset register, outage allowances, headroom, and performance of asset base (including network models). As actual data becomes available, this data will be updated in accordance with the feedback and monitoring process.

Upon identification of a change through the monitoring process Irish Water will assess the impact of these changes on the Framework Plan and the Regional Water Resources Plans

9.3 Future Actions

Additional opportunities were identified following consideration of stakeholder feedback from the Framework Plan, public consultations. A list of commitments which are subject to funding were identified by Irish Water to further support the implementation of the NWRP and are listed in the RWRP-EM.

10. Conclusion

Section 10 of the RWRP-EM details the key outcomes of the RWRP-EM.

10.1 Plan Outcome

When we apply our water resources planning methodology to the 134 Water Resource Zones (WRZs) in the Eastern and Midlands Region, the Regional Preferred Approach consists of a combination of local water supply sources and regional solutions. This involves:

- Developing larger interconnected water supply systems (known as Water Resource Zones (WRZs) within the region;
- Constructing an estimated 970 kilometres of trunk mains to develop the interconnected WRZs;
- Reducing the existing number of WRZs in the region from 134 to 89;
- Developing 4 new water treatment plants (WTPs);
- Decommissioning 70 WTPs and discontinuing 73 abstractions;
- Upgrading 130 existing WTPs to reduce water quality risks across all WRZs; and
- Reducing leakage to 22% of regional demand. This is achieved through, pressure management, active leakage control, and targeted asset replacement.

10.2 Benefits of the Preferred Approach for the Eastern and Midlands Region - Transformation

The development of the RWRP-EM allows Irish Water for the first time to review water supply Needs collectively across the Eastern and Midlands Region and across the entire spectrum of risk including Quality, Quantity, Reliability and Sustainability. It allows us to consider local Options to resolve these Needs and larger regional Options that can address multiple supplies.

The Plan allows us to move away from reactive management of risk at a single source or for a single Need (e.g., Quality risk alone), to a more holistic view of the transformation required across all of our supplies to meet the objectives set out in the Water Services Strategic Plan (WSSP)¹ and the Water Services Policy Statement (WSPS)².

The Regional Preferred Approach across the Eastern and Midlands Region will result in 89% of the population being served via the Eastern and Midlands interconnected WRZs and the Limerick Regional WRZ, which as outlined in Section 8.5 are systems that benefit from the Shannon catchment. In addition to this, the supplies for Nenagh and Athlone will be interconnected via the River Shannon source.

If the Preferred Approach identified in the RWRP-EM is delivered it will mean that all of the cities, regional cities, and Key Towns identified as part of the Regional Spatial and Economic Strategies (RSEs) and the Local Authority Development Plans (LADPs), will be part of an interconnected water supply, as shown in Figure 10.1.

¹ The Water Services Strategic Plan is Irish Waters Strategic Plan. It is plan required under statute and sets out Irish Waters business objectives in terms of water and wastewater services

² The Water Services Policy Statement 2018-2025, is the Governments policy document on water services

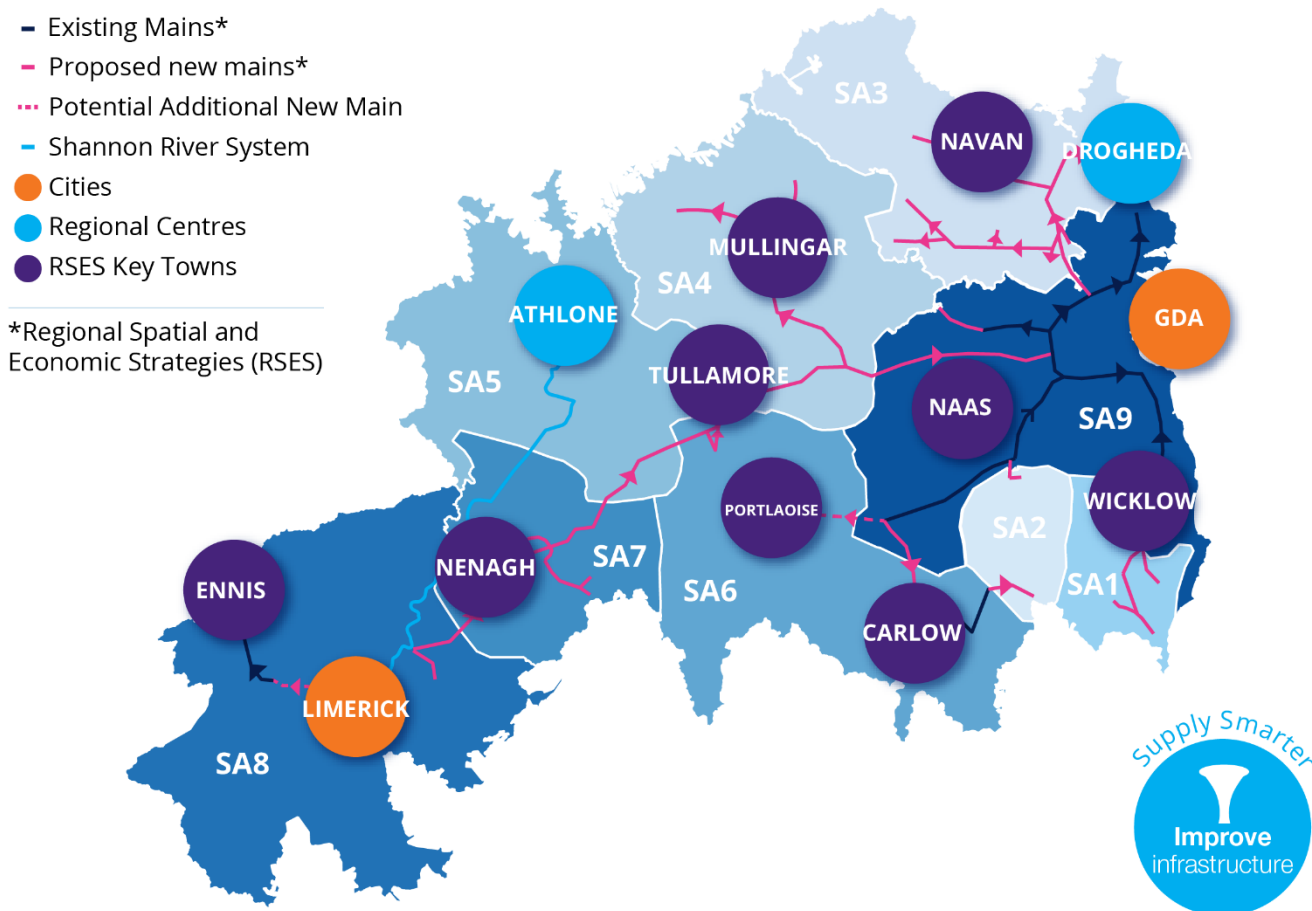


Figure 10.1 Regional Transfer Interconnectivity Servicing Regional Towns

The RWRP-EM provides the following in terms of strategic transformation of our water supplies:

- A high degree of flexibility in our plans, particularly in terms of domestic and non-domestic growth. For example, our baseline figures for non-domestic growth, include high growth in water Demand in the Greater Dublin Area, and medium growth in the Key Towns and cities. Having an interconnected network allows us to facilitate and support higher growth in the smaller connected settlements within the Eastern and Midlands Region, if Needs manifests itself in that way over time.
- More balance across the Eastern and Midlands Region, with the abstractions for regional supplies balanced across all of the major catchments within the region. Therefore, water abstraction to support public water supply will become more sustainable and resilient to future shocks such as drought and climate change.
- Improved risk management and operational control across a smaller number of interconnected WRZ, where possible. Where this is not possible, we will manage risk by selecting secure protected water sources and appropriate treatment barriers.
- An understanding of the transformation required across our water supplies, to ensure that we can have reliable and sustainable supplies into the future.
- An understanding of the scale and asset type we require to ensure that our customers receive the required Quality and Quantity in their water supplies.

- The combination of solutions - Use Less, Use Less and Supply Smarter.
- The investment required over the short, medium and long term to transform our supplies.
- A Sensitivity Assessment that allows us to test the Preferred Approach against a range of future scenarios to ensure the Preferred Approach is robust and adaptable.

10.3 Benefits of the Preferred Approach – Quality, Quantity, Reliability and Sustainability

Delivery of the Preferred Approach will provide the best overall outcome for the region, particularly in relation to environmental, ecology and resilience outcomes, and will result in:

- All WRZs in the Eastern and Midlands Region meeting the minimum 1 in 50 Level of Service (LOS) during normal, dry, drought and winter conditions.
- All WRZs will include appropriate barriers to mitigate against Water Quality risk.
- All WRZ's will be resilient with improved environmental Sustainability.
- Transformation of water services in the region, from a fragmented supply system with large variation in LOS, to an interconnected supply with uniform and improved LOS.
- Customer benefits in terms of increased Reliability and reduced occurrence of outages across our supplies.
- Customer benefits in terms reduced water Quality risk and the instances of boil water notices
- Improved Resilience, with 95% of the population supplied via sources with impounding storage or aquifer storage that will allow us to manage seasonal variation in water availability and drought events.
- Sources that are more environmentally sustainable and allow us to adapt to climate change and align with the requirements of the Water Framework Directive and Habitats Directive.
- Improved operational control across our water supplies, and ability to react to adverse events.
- Improved efficiency of our distribution networks in terms of leakage, pressure and strategic storage.
- Ability to facilitate growth and economic development.

11. Public Consultation and Implementation of the Eastern and Midlands Plan

11.1 Consultation on the draft RWRP Eastern and Midlands

Irish Water consulted on the draft Regional Water Resources Plan for the Eastern Midlands (RWRP-EM) Region during the period December 2021 through to April. Public consultation is a key element in ensuring stakeholders and members of the public have an opportunity to contribute to the development of the RWRP.

This consultation was an opportunity to consider the process of how we identify the issues in, and determine what opportunities are feasible, for the water supply in the Eastern and Midlands Region and how we develop solutions to these issues.

Stakeholders were invited to make submissions or observations on the Options outlined in the draft RWRP-EM. Irish Water considered all submissions and observations received, and where appropriate, revised the RWRP-EM to take account of them. All feedback received was reviewed and categorised under key themes. The feedback relevant to the Eastern and Midlands Region was then summarised and responded to in a consultation report.

Relevant feedback was incorporated into the final RWRP-EM and associated SEA Statement and Appropriate Assessment Determination. How feedback from the consultation has influenced the final RWRP-EM was also detailed in the consultation report and SEA Statement.

Consultation submissions from individuals were reported anonymously and feedback from organisations was attributed to them. Individual submissions were not individually responded to but were responded to in the consultation report which will be published on www.water.ie/nwrp_in 2022.

Feedback received outside the scope of the draft RWRP-EM and the associated environmental reports was not considered as part of the public consultation process and was not reported on. Any feedback in relation to in-flight Irish Water projects, or in reference to any other area of the Irish Water business was sent directly to those project teams', unless applicable to how they were included in the RWRP-EM. The project team details can be found on www.water.ie

View our privacy notice at www.water.ie/privacy-notice

In order to help members of the public or organisations to make a submission, and to ensure clarity on the scope of what consultees could consider in their feedback, Irish Water invited submissions on the following questions. However, this was just an aide and all relevant submissions received in response to the consultation was considered.:

1. The Eastern and Midlands Region baseline is discussed in Section 2 of the draft RWRP-EM. Do you have any comments on the Eastern and Midlands Region or in respect of the population growth and economic development and how this is considered in our water resources planning approach?
2. Within the Eastern and Midlands Region we consider 134 water supplies (Water Resource Zones) represented across nine (9) Study Areas. Do you have any comments on the Study Area delineation?
3. Section 3 of the draft RWRP-EM and each of the Technical Appendices 1-9 outline the Need (Deficits) in both Quantity and Quality across the Region and in each of the Study Areas. Do you have any comment on the Need (Deficit)?

4. Section 6 and the Technical Appendices 1-9 of the draft RWRP-EM summarises our Options Development Process. Do you have any comments on how the Feasible Options for the Water Resource Zones (WRZs), Study Areas and the Region have been identified?
5. Section 7 sets out how the Preferred Approach is identified at WRZ and Study Area Level. Each Preferred Approach will outline how it intends to address the Need in the relevant study area. Technical Appendix for Study Areas 1-9 and Environmental Review for Study Areas 1-9 sets out how the Preferred Approach has been developed in more detail. Have you any feedback on any of the WRZ Preferred Approaches or Study Area Preferred Approaches?
6. The draft RWRP-EM will look at a range of solutions to meet the Need in a Water Resource Zones or Study Area. These solutions are not limited by distance, therefore, some solutions for the Water Resource Zones or Study Areas will utilise regional transfers. For example, there are 33 Water Resource Zones in the draft RWRP-EM which are capable of benefitting from regional transfers. Section 8 of the draft RWRP-EM outlines how the regional solution will be developed and compared against solutions that do not involve a regional transfer. Have you any comments on the Regional Preferred Approach?
7. Interim Solutions are outlined in Section 7 and 8 of the draft RWRP- EM and in each of the Technical Appendices 1-9. Have you any comments on this as a strategy of reducing risk to water supplies while developing our Preferred Approaches?
8. Do you have any comments on the Strategic Environmental Assessment (SEA) Environmental Report and Natura Impact Statement (NIS) which accompany the draft RWRP-EM?
9. We have produced a draft-RWRP-EM Consultation Roadmap. Do you have any comments on this?
10. How would you like Irish Water to communicate with you as the RWRPs progress?

11.2 Next Steps

- Further consultation on the remaining three (3) Regional Water Resources Plans including corresponding SEA Environmental Reports and Natura Impact Statements will be undertaken in over the next 12 months.
- Following on from the public consultation, submissions and observations received will be taken into consideration before adopting all four (4) RWRPs. Once the first NWRP has been finalised, it will be comprised of the Framework Plan and the four (4) RWRPs and together they will be treated as a unified Plan.
- The NWRP will ensure that there is a transparent Framework Plan and RWRPs to allow Irish Water to provide a safe, secure, reliable, and sustainable water supply now and into the future. This will be used to inform future regulated capital investment plans and operational plans.



How would you like Irish Water to communicate with you as the RWRPs progress?

12. References

1. European Union (Drinking Water) Regulations 2014. (S.I. No. 122/2014).
2. UK Technical Advisory Group (UKTAG). 2008. UK Environmental Standards and Condition (PHASE 1). Water Framework Directive