

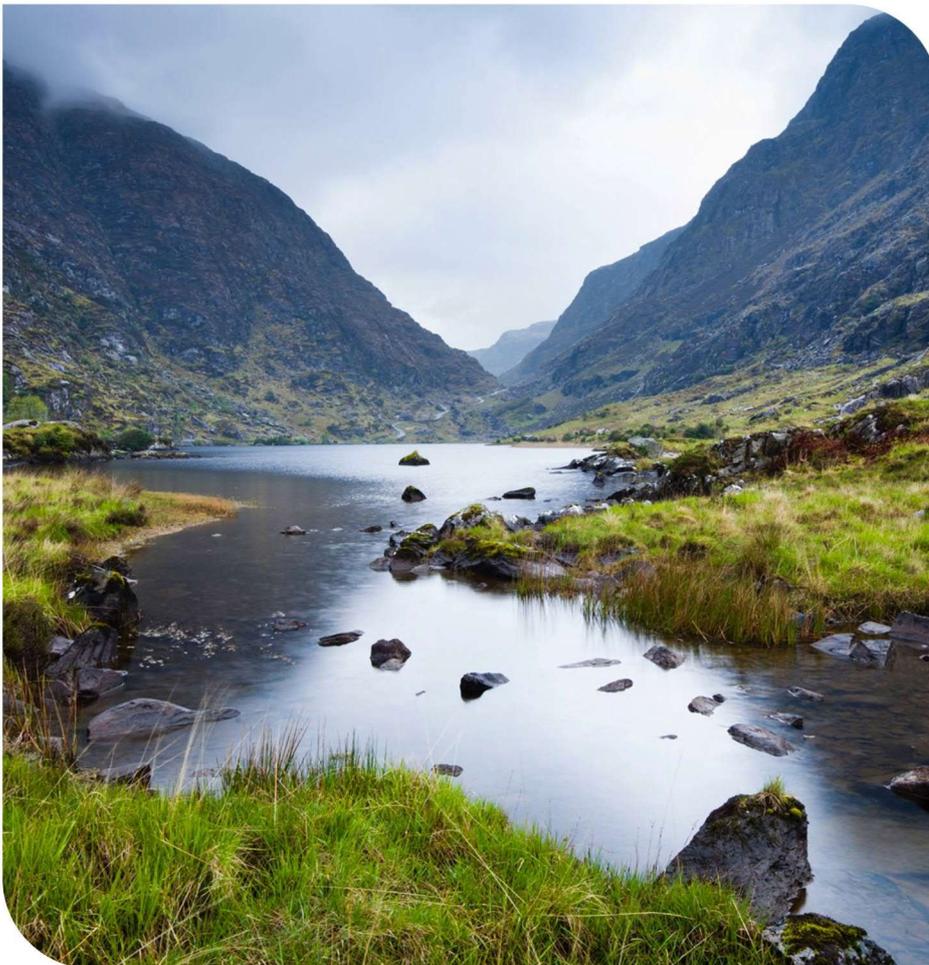
Spring 2021



National Water Resources Plan

Phase 1 – NWRP Framework Plan Consultation Two Report

Irish Water's 25 Year Plan for Our Water Assets



Data Disclaimer:

This document uses best available data at time of writing. 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 will also align to relevant updates in applicable policy.

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1. Introduction

1.1 Introduction

Irish Water is developing its first National Water Resources Plan (NWRP) that will outline how we move towards a safe, sustainable, secure, and reliable drinking water supply for everyone over the next 25 years whilst safeguarding our environment.

The preparation of the NWRP provides, for the first time, an opportunity to strategically and consistently plan the way drinking water services are delivered in Ireland at a national level.

The NWRP will set out how we can balance the amount of drinking water we can supply with the demand for water that is needed, over the short, medium, and long term.

It is a 25-year strategy to ensure we have a safe, sustainable, secure, and reliable drinking water supply for everyone.

1.2 Benefits of the NWRP

Previously the availability of water resources was mostly considered at a local or regional level. Undertaking a national plan now means that we can provide all our customers with a more consistent level of water supply that will ensure the best sustainable use of water resources for the benefit of all.

The NWRP sets out a standardised approach to water resources and services at national, regional and local levels, in the short, medium and long-term. This means that in the future, wherever you are in the country, when you turn on your tap you will have a safe, secure, sustainable and reliable public water supply.

The NWRP is a long-term plan, to ensure our water resources are sustainable for future generations. A robust and sustainable water resources plan will ensure that Ireland's water supplies will have the capacity to support future growth and encourage investment.

1.3 Why do we need a NWRP?

Water is part of our everyday lives, we need it when we turn on the taps to get a drink, to wash our dishes and clothes, to have a shower and to flush the toilet. Businesses throughout the country also depend on a reliable water supply, from coffee shops and restaurants, to hairdressers, and farming enterprises right up to multi-national companies. It is essential to everything we do.

Our water infrastructure is already under increasing pressure to meet the current demand for water as a result of population growth, climate change, and our changing environment. The quality of our drinking water can be affected in many ways including soil or rock types, land use practices, pollution, and even heavy rainfall. To prevent unplanned water outages, water conservation orders, reductions in water pressure or restrictions to water supplies, we have to plan ahead. How we choose to plan our water

resources today will determine the water supply we can provide now and into the future.

1.4 Background

As the NWRP is the first such plan to be delivered in Ireland, and the task is enormous, we have divided it into two phases each of which have been or will be fully consulted on as described in detail in section 1.5 and chapter 3.

- Phase 1 – NWRP Framework Plan. The purpose of this Phase of the NWRP (now complete) was to allow Irish Water to establish an appropriate set of guidelines, key water resources planning parameters and methodologies to develop Preferred Approaches (solutions to need), that are suitable for the public water supply in Ireland. This consultation two report outlines the public consultation that was carried out in respect of Phase 1- NWRP Framework Plan. This consultation two report summarises the submissions received, our response to them, and the consequential changes made to the draft Framework Plan (as well as some updating required) which has allowed for the finalisation and adoption by Irish Water of the NWRP Framework Plan; and
- Phase 2 – Four Regional Water Resources Plans covering the whole country. This Phase consists of the development of four Regional Water Resources Plans covering respectively the North West Region, South West Region, South East Region and Eastern and Midlands Region. Each of these Regional Plans will summarise the needs for each Water Resources Zone in terms of quality, quantity, reliability and sustainability and will apply the methodology developed in the Framework Plan, to each water supply. This allows for the development of plan-level Preferred Approaches (solutions to identified need) for each supply. The four Regional Water Resources Plans are currently being developed and following scoping and screening, will each undergo public consultation.

The development of the NWRP commenced in 2017 and involved:

- Identifying best practices across the UK and Europe that could be applied to water resource planning in Ireland;
- Identifying all issues related to public water supply including, quality, quantity, leakage, reliability and sustainability;
- Developing a robust methodology to identify and prioritise programmes of work to address the identified need; and
- Early stakeholder engagement and consultation with key stakeholders.

The overall NWRP - both Phases 1 and 2 - is subject to Strategic Environmental Assessment (SEA) as outlined in European Union (EU) Directive 2001/42/EC (SEA Directive) and the European Communities (Environmental Assessment of Certain Plans

and Programmes) Regulations 2004 (SI No 435/2004) (SEA Regulations). The purpose of SEA is to assess the extent to which a given policy, plan or programme:

- provides an adequate response to environmental and climate change–related challenges;
- may adversely affect the environment and climate resilience; and
- offers opportunities to enhance the state of the environment and contribute to climate-resilient and low-carbon development.

SEA screening was conducted in August 2017 by Irish Water and we determined that an SEA of the NWRP was required in accordance with the SEA Directive. Irish Water then prepared an SEA Scoping Report to establish the parameters for the required SEA for the NWRP, which was published in November 2017. The next step was to prepare a detailed SEA Environmental Report to inform the substantive SEA process and conclusions. It was determined that splitting delivery of the NWRP into two phases was the best way to proceed in view of the size of the task. The SEA Environmental Report for Phase 1 of the NWRP – Framework Plan was published along with the draft Framework Plan in December 2020.

The NWRP was also determined to be subject to Appropriate Assessment (AA) under EU Directive 92/43/EEC (Habitats Directive) and the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No 477/2011). The purpose of AA is to determine that the NWRP (as the relevant plan), will not adversely affect the integrity of an identified “European Site” for the purposes of the Habitats Directive. A component of the AA process is preparation of a Natura Impact Statement (NIS), which is a report comprising the scientific examination of the relevant plan and the relevant European Site(s), to identify and characterise any possible implications of Framework Plan individually or in combination with other plans or projects in view of the conservation objectives of the site or sites. The NIS for Phase 1 of the NWRP Framework Plan was published in December 2020 along with the draft Framework Plan and SEA Environmental Report.

SEA and AA are being carried out in parallel with the phased development of the NWRP. In particular, as part of Phase 1, Irish Water has conducted both an SEA and AA of the Framework Plan. SEA and AA will also be carried out in respect of the four individual Regional Water Resources Plans currently being prepared. This approach ensures that we evaluate any possible environmental impacts likely to arise from the NWRP as a whole, both positive and negative, and outline any prevention and/or mitigation measures that may be appropriate.

The consideration given to all of the submissions received on the draft Framework Plan is contained in this consultation two report. The consultation two report attaches a version of the Framework Plan showing all changes made to the draft Framework Plan at Appendix H.

The Framework Plan is an amended version of the draft Framework Plan as consulted on and has been amended in light of and following consideration of all submissions

received as well as being updated where appropriate. It is in substantively the same form as the draft Framework Plan.

The Framework Plan is accompanied by an SEA Statement and Appropriate Assessment Determination as required by law, which are all being adopted by Irish Water.

These Phase 1 NWRP Framework Plan documents can be viewed at www.water.ie/nwrp

1.5 Consultation one

The first round of public consultation to inform the development of the SEA Environmental Report and NIS for the NWRP took place from 9 November to 22 December 2017. During this consultation period we requested feedback on the SEA Scoping Report and invited comments and suggestions to be considered at this stage.

Feedback from this SEA scoping consultation was incorporated into our draft Framework Plan and the SEA and AA process relative to the preparation of that draft Framework Plan and was summarised in Appendix C of the SEA Environmental Report. Ongoing stakeholder engagement took place with the environmental authorities and local authorities identified in sections 2.1 and 2.3 respectively throughout 2018, 2019 and 2020.

A consultation one report summarising the feedback received during what we are now terming Phase 1 NWRP was published and is available at water.ie/nwrp

Members of the public, interested parties and environmental authorities were invited to contribute to the development of the draft Framework Plan as part of the SEA and AA process through public consultation at key stages, as outlined in the NWRP Consultation Roadmap in Figure 1.1.



Figure 1-1 NWRP Consultation Roadmap

2. Pre-Consultation two engagement

As part of the development of the Phase 1 NWRP Framework Plan and in advance of public consultation (Consultation two), two pre-consultation engagement phases were undertaken. A series of briefings were facilitated by Irish Water as part of pre-consultation on the draft Framework Plan and associated environmental reports. Emails offering pre-consultation briefings were issued to all stakeholder organisations detailed in Table 2-1 on 15 May 2018 and on 1 September 2020.

The purpose of the briefings in 2018 was to update stakeholders on our progress and discuss the new information available in light of the 2018 drought and the publication of the Water Environment (Abstractions) Bill.

The 2020 briefings are outlined in more detail in the following sections.

Table 2-1 NWRP individual stakeholder briefings

NWRP individual stakeholder briefings
Commission for Regulation of Utilities (CRU)
HSE Environmental Health Services
HSE National Drinking Water Group
Inland Fisheries Ireland (IFI)
Local Authority Waters Programme (LAWPRO)
An Fóram Uisce (AFU)
Waterways Ireland

2.1 Environmental authorities

On 1 September 2020 Irish Water launched a period of pre-consultation engagement with the statutory stakeholders prescribed under the SEA Regulations, including environmental authorities. All statutory stakeholders received an invitation to a briefing with the NWRP Project Team. The environmental authorities included:

- Environmental Protection Agency (EPA);
- Department of Housing, Local Government and Heritage (DHLGH);
- Department of the Environment, Climate and Communications (DECC);
- Department of Agriculture, Food and the Marine (DAFM); and

- Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media – Development Applications Unit (DAU).

Although not prescribed under the SEA Regulations, we have also included the following two stakeholders in our statutory stakeholders list due to the transboundary nature of the Framework Plan and the level of engagement required with our regulator.

- Northern Ireland Environment Agency (NIEA); and
- Commission for Regulation of Utilities (CRU).

Please see Table 2-2 for a list of all twelve pre-consultation briefings completed during 2020.

Table 2-2 Pre-consultation workshops

Stakeholder	Date of Briefing
Environmental Protection Agency (EPA including SEA Team)	1 September 2020
Inland Fisheries Ireland	2 September 2020
Local Authority Waters Programme (LAWPRO)	3 September 2020
National Parks & Wildlife Service (NPWS)	7 September 2020
An Fóram Uisce (AFU)	8 September 2020
Commission for the Regulation of Utilities (CRU)	15 September 2020
HSE (including Drinking Water Team)	16 September 2020
Northern Ireland Environment Agency (NIEA)	18 September 2020
Geological Survey Ireland (GSI)	25 September 2020
Northern Ireland Water	6 October 2020

2.2 Irish Water National Stakeholder Forum

As part of Irish Water’s ongoing commitment to stakeholder engagement, regular updates on the NWRP were provided to all attendees of Irish Water’s National Stakeholder Forum on the following dates: 1 July 2020, 8 October 2020, and 2 December 2020.

An Fóram Uisce (AFU), a member of the National Stakeholder Forum, facilitates public engagement on issues relating to water as an environmental, social, and economic resource and the implementation of the Water Framework Directive (WFD) and the River Basin Management Plan (RBMP) for Ireland 2018-2021. Irish Water regularly attends meetings with AFU to provide updates on issues of interest to its members. Irish Water briefed AFU on several occasions throughout the development of the draft Framework Plan including during this period of pre-consultation engagement on 8 September 2020 and again on 26 November 2020.

2.3 Local authorities

Since June 2018, we have undertaken extensive engagement with our local authority partners. As part of the development of the Phase 1 NWRP draft Framework Plan, regular presentations and workshops were undertaken with each of the 31 local authorities across the country. During each of the local authority workshops reviews were completed on the supply demand balance for each water resource zone (WRZ). The “need” across each water supply was also confirmed in collaboration with the local authorities. As part of the development of the draft RWRPs, Irish Water will continue to consult and engage with each local authority and update data as it becomes available.

3. Consultation two

3.1 Introduction

Irish Water undertook statutory consultation on the Phase 1 NWRP draft Framework Plan in accordance with the consultation requirements of the SEA Regulations. We have termed that Phase 1 NWRP Framework Plan consultation as Consultation two. Consultation two also included an opportunity to make submissions on the accompanying SEA report, and on the NIS relative to AA matters, required to be taken into account in the AA process as outlined in the Birds and Natural Habitats Regulations 2011.

Irish Water's consultation and engagement processes are in line with the public participation requirements of the Aarhus Convention, along with the requirements for public consultation for the purposes of the SEA Directive and Habitats Directive. Our public participation process includes different phases with reasonable timeframes in excess of the statutory minimums under the SEA Regulations, allowing the public to be informed, and for the public to participate effectively during the decision-making process.

Irish Water commits to continuing to provide communications and public consultation that are accessible, meaningful, transparent, proportionate and accountable for all stakeholders including those without a technical background. These principles have underpinned the approach Irish Water has taken to the communications and public consultation for the NWRP to date relative to Phase 1 NWRP Framework Plan and will also apply to Phase 2 NWRP, the four Regional Water Resource Plans.

Table 3-1 sets out Irish Water's guiding principles for communications and public consultation that have been observed throughout the development to date of the NWRP Framework Plan.

Table 3-1 Principles of consultation

Principle	Explanation
Accessible	Information should be easy to access, it should be communicated in a manner that is appropriate to the stakeholder group and should avoid the use of industry jargon. The consultation process should be inclusive, and it should be straight forward to participate in the process. This includes making submissions, asking questions and attending events.
Meaningful	Consultation is a two-way process and should be viewed as a genuine opportunity for stakeholders to influence outcomes. The Project Team should be prepared to consider all submissions that are received through the consultation process. Consultation should take place at identified stages in the development process

	in advance of key decisions being made and feedback should be used to inform those decisions.
Transparent	Core to all engagement and communications in respect of a decision-making process is that the process is transparent, that people can understand and see the process by which decisions were made and how their input was considered. They may not agree with a decision, but they should have full access to the fair and objective process by which these decisions were made.
Proportionate	Undertaking communications activities that are appropriate for the specific project and circumstances. Ensuring Irish Water provides value for money at all times, while using its resources to make a real difference. Being flexible in our approach in order to respond to the complexities of each individual project.
Accountable	Accountable project decision making ensures that the project has taken on board relevant feedback, has responded to the feedback provided in a fair and transparent manner and that the project only moves forward once each phase has been appropriately developed and reported on. Careful record keeping of submissions and the review process are features of this principle.

Throughout the development of the NWRP, Irish Water has consulted with members of the public and all interested stakeholders in accordance with the following legislative, planning and best practice requirements:

- Aarhus Convention requirements;
- Strategic Environmental Assessment (SEA) Directive requirements;
- Habitats Directive requirements; and
- International best practice, including Gunning Principles and International Association for Public Participation Guidelines (IAP2).

3.2 Phase 1 – NWRP Framework Plan - Consultation two

A statutory public consultation, now termed Phase 1 NWRP Framework Plan Consultation two for ease of reference, sought feedback on the NWRP draft Framework Plan and associated SEA Environmental Report and NIS from 8 December 2020 until the initial closing date of 16 February 2021.

Irish Water subsequently facilitated two extensions to this statutory public consultation at the request of stakeholders, with consultation finally closing on 12 March 2021. In order to assist stakeholders in making a submission as part of this public consultation, we invited feedback on the following consultation questions:

- Do you have any suggestions that you would like Irish Water to consider as part of the draft Framework plan?

- Do you have any suggestions that you would like Irish Water to consider as part of how we assess supply/demand balance, water quality, quantity and resilience?
- The draft Framework Plan sets out Irish Water’s methodology to find high level solutions to address short, medium and long-term issues. Do you have any comments on our methodology?
- Do you have any comments on the Strategic Environmental Assessment (SEA) Environmental Report and associated Natura Impact Statement (NIS) which accompanies the draft Framework Plan?
- The project roadmap has been updated. Do you have any comments or feedback on this?
- How would you like Irish Water to communicate with you as the NWRP progresses?

A number of communications tools were developed to promote the consultation and to raise awareness among the public, interested parties and environmental authorities and to encourage participation in the consultation process.

The following communications tools were used:

- NWRP webpage on the Irish Water website;
- Consultation two information leaflet available in English and Irish;
- NWRP infographic;
- NWRP consultation roadmap;
- Non-technical summary of the draft Framework Plan;
- Press releases to national and regional media;
- Media interviews;
- Newspaper adverts;
- Briefings;
- Webinars;
- Social media;
- Animations, explaining water resource planning topics including: population growth, balancing water supply, demand and climate change;
- Public display of hardcopy documents; and
- Correspondence and briefings with:
 - a) Environmental authorities;
 - b) Elected representatives;
 - c) Local authorities;
 - d) Interested parties;
 - e) Media; and
 - f) General public.

These communications tools and channels are discussed in more detail in section 3.3.

3.3 Consultation promotion

3.3.1 NWRP webpage

A NWRP dedicated webpage was provided on the water.ie website and went live on 13 October 2017 at www.water.ie/nwrp. The webpage was updated with details of the Phase 1 NWRP Framework Plan, Consultation two on 8 December 2020. An Irish version of the webpage was also made available.

The draft Framework Plan, the SEA Environmental Report and the Natura Impact Statement (NIS) were available to view or download from the NWRP dedicated webpage on 8 December 2020, along with all other relevant information, including the NWRP consultation roadmap, the consultation information leaflet, the non-technical summary and the NWRP infographic.

Details on how to participate in the consultation were included on the NWRP webpage. Submissions were invited via the following channels:

By email: nwrp@water.ie

Or by Post: National Water Resources Plan, Irish Water, P.O. Box 13216, Glenageary, Co. Dublin

For the period of the consultation (between 8 December 2020 and 12 March 2021) there were 5,587 page views and 3,675 unique page views of www.water.ie/nwrp

Those that visited the site spent on average 3.36 minutes on the page. The majority of pages on water.ie are visited for less than a minute, showing the interest in the content and information provided.

Table 3-2 outlines the number of opens of the consultation documents available on the webpage. The webpage will continue to be regularly updated with the latest information as the project progresses.

Table 3-2 Consultation document opens

Document	No. of openings
NWRP draft Framework Plan	538
NWRP draft Framework Plan Non-Technical Summary	306
NWRP SEA Report	108
NWRP NIS	78
Case study	164
Consultation two leaflet	184

3.3.2 Consultation two information leaflet

A consultation information leaflet outlining the NWRP, details of the consultation questions and information on how stakeholders could provide feedback on the draft Framework Plan and associated environmental reports was published on the NWRP webpage on 8 December 2020 and issued to the 31 local authorities.

The leaflet provided a summary of the draft Framework Plan, how the Framework Plan will be delivered and the next steps.

The information leaflet was made available in both English and Irish. A copy of the English version can be found in Appendix A.

3.3.3 NWRP infographic

An updated NWRP infographic was produced to be used in printed materials and on the webpage. The infographic is a helpful visual aid, which clearly illustrates water resources planning and outlines our approach to Ireland's first NWRP. The infographic aids communication, through an alternative format to text, assisting our efforts to effectively inform as broad a demographic as possible. The infographic can be found in Appendix B.

3.3.4 Press releases

A press release announcing the commencement of statutory consultation on the draft Framework Plan, now termed Phase 1 NWRP Framework Plan Consultation two, was issued to national, regional, and local media on 8 December 2020. It was issued to raise awareness of the consultation amongst the general public and to increase public participation. The press release included details of the NWRP and information on the consultation, along with links to the documentation and all necessary information on how to participate.

A second press release was issued on 21 January 2021 to announce the first extension to the consultation period and to invite people to register for an information webinar. The second consultation extension was referenced in national advertisements as detailed in section 3.3.6 of this report.

The press releases were also added to the news section of the Irish Water website, www.water.ie/news

Media coverage generated from the press releases and a copy of the press releases issued are available in Appendix C.

3.3.5 Media interviews

Briefings were offered to journalists who were interested in learning more about the NWRP and Irish Water spokespersons were made available for media interviews and press briefings throughout the consultation period.

A considerable amount of national and regional coverage was generated across all media channels throughout the consultation period, particularly around the time of the launch of Consultation two. In total, 31 articles were published about the Phase 1

NWRP draft Framework Plan Consultation two in national and regional newspapers. Angela Ryan, Water Resource Strategy Specialist, was interviewed on The Pat Kenny Show on Newstalk, and on Community Radio Kilkenny City. Sean Laffey, Head of Asset Management was interviewed on Drivetime with Mary Wilson on Radio 1. Des Joyce, Irish Water Operations, discussed the consultation in an interview on Mid-West Radio.

Coverage of the NWRP also featured in the Irish Times, Irish Independent, Irish Examiner, the Herald, the Irish Farmers Journal, and the Business Post.

Media briefings resulted in media coverage across a range of online, broadcast and print media in promoting the consultation as shown in Appendix D.

3.3.6 Newspaper adverts

Statutory newspaper adverts were placed in the Irish Independent and the Irish Times on 8 December 2020, 22 January 2021 and 1 March 2021 and the Irish Farmers Journal on 10 December 2020, 28 January 2021, and 4 March 2021. The advertisements were published in national newspapers to raise awareness of the consultation across the country and to encourage participation. The advertisements advised where copies of the documentation could be obtained or viewed, the dates of the consultation, as well as the various means of engaging with the NWRP project team. The subsequent advertisements also publicised the consultation extensions.

Copies of the newspaper adverts are included in Appendix E.

3.3.7 Social media

The launch of the NWRP Framework Plan consultation was promoted on social media using the Irish Water LinkedIn page, as displayed in Figure 3-1 below. Promoting the consultation on this platform enhanced the potential to inform a higher volume of people across a broad demographic.

A suite of engaging animations was developed for use on social media to explain many water resource planning topics including: population growth, climate change and supply demand balance.

In total, eight Facebook posts, ten Twitter posts and three LinkedIn posts were shared, eight of which were promoted to achieve optimum stakeholder reach. In total, 3,456,613 impressions were made.

Figure 3-1 Social media posts

Irish Water @IrishWater · Jan 22

Our National Water Resources Plan (NWRP) is a 25 year strategy to ensure a safe, sustainable, secure and reliable drinking water supply for everyone. The public consultation for this has been extended to 1 March. See water.ie/nwrp to find out more and have your say.



0:01 121.7K views

27 46 60

Irish Water
22,319 followers
1 mo ·

Our National Water Resources Plan (NWRP) is a 25-year strategy to ensure a safe, sustainable, secure, and reliable drinking water supply for everyone. The public consultation for this closes on March 1st. See <http://water.ie/nwrp> to find out more and have your say.



0:03 / 0:06

We want your feedback

36 · 812 Views

3.3.8 Public display of documents

In order to ensure the draft Framework Plan and associated environmental reports were readily accessible, hard copies of the draft Framework Plan in English, including appendices, the SEA Environmental Report, the Non-Technical Summary, the NIS, consultation information leaflets, the Case Study and promotional posters were provided for public display in 29 local authority offices and at two county libraries for the duration of the consultation period.

The availability and location of these documents at the planning counter in local authority offices and at the county libraries was promoted through the project website and advertisements. A full audit of all 31 displays was undertaken by the NWRP team during the consultation period to ensure all documents were received and available as advertised. In addition, hard copies and electronic copies of these reports were available upon request through the project information service. Irish Water also provided information posters to each of the planning counters and libraries where the documents were on display.

A full list of the planning counters and libraries where the documents were displayed is included in Appendix F.

3.3.9 NWRP freephone phonenumber

The NWRP team introduced a dedicated phonenumber during this period of consultation to improve accessibility due to Covid-19 restrictions or for those with limited or no internet access. The freephone number, 1800 46 36 76, was publicised in national newspapers, on all of the consultation documents, and on the website. The phonenumber was manned by the NWRP team during office hours throughout the consultation period.

3.4 Direct engagement

3.4.1 Introduction

At Irish Water we take the nature and quality of our relationships with all our stakeholders very seriously. We have worked closely to understand your views and interests, to deliver the NWRP in partnership, and respond to your interests as we progress our plan.

Irish Water engages with stakeholders through public consultation and ongoing engagement on our infrastructure projects and plans. We commit to continuous and responsive two-way communication, at every stage of the consultation process to ensure that information is accessible, meaningful, transparent, and accountable for all stakeholders.

3.4.2 Environmental authorities

As part of the development of the NWRP draft Framework Plan there has been pre-consultation engagement with the environmental authorities undertaken as outlined in section 2 of this report.

On the commencement of the statutory consultation on the draft Framework Plan and associated environmental reports, an email announcement was issued to all statutory stakeholders including environmental authorities as required by the SEA Regulations

on 8 December 2020. Further briefings were offered throughout the consultation period and hard copies of the documents were distributed to the environmental authorities on request. Two additional follow up emails were issued to the environmental authorities to announce the extensions of the consultation period on 22 January 2021 and 1 March 2021 respectively.

3.4.3 Elected representatives

A letter was issued from Irish Water's Managing Director Niall Gleeson to the Minister for Housing, Local Government and Heritage, Darragh O'Brien on 7 December 2020 announcing the commencement of the statutory consultation on the NWRP Framework Plan and inviting him to a briefing.

Emails were issued to all elected representatives, including Ministers, TDs, Senators, MEPs, and Councillors on 8 December 2020. The correspondence included details of the consultation and invited feedback on the draft Framework Plan, NIS, and SEA Report, with the consultation questions set out. The correspondence also included links to the above documents, outlined the next steps in the process for developing the NWRP, as well as the offer of a dedicated online briefing with the NWRP team for further information and included an online booking form in order to arrange this. Further emails were issued to the elected representatives to announce the extension of the consultation period on 22 January 2021 and 1 March 2021. The email issued on 22 January also extended an invitation to an online webinar.

3.4.4 Local authorities

To increase awareness and encourage participation in the draft Framework Plan consultation, Chief Executives and Directors of Services for Water / Environmental Services of all 31 local authorities were notified of the consultation by email on 8 December 2020. Correspondence included details of the NWRP, an outline of the consultation and the consultation questions, and all necessary information on how to participate.

A hard copy of each of the consultation documents was provided to each of the 31 local authorities to provide council employees and members of the public alike the opportunity to view the documents in person.

On 2 February 2021, each of the local authorities also received a hard copy poster which advertised the extension of the public consultation.

Further emails were issued to the local authorities to announce the extension of the consultation period on 22 January 2021 and 1 March 2021. The email issued on 22 January also included an invitation to an online webinar.

3.4.5 Interested parties

Interested parties were identified through a stakeholder mapping process from existing stakeholders that Irish Water engage with regularly on plans and projects and stakeholder groups who may have a valid interest in the development of the NWRP.

This is to ensure that a wide range of stakeholder groups were made aware of the consultation and given the opportunity to engage and participate in the process.

An email was issued on 8 December 2020 to those identified, informing them of the details of the consultation and inviting them to give their feedback on the draft Framework Plan and associated environmental reports.

A copy of the email sent is included in Appendix G.

Further emails were issued to the interested parties to announce the extension of the consultation period on 22 January 2021 and 1 March 2021. The email issued on 22 January included an invitation to an online webinar.

3.4.6 Irish Water National Stakeholder Forum

Irish Water host an Irish Water National Stakeholder Forum which meets quarterly and has representations from the three pillars of sustainability: economic, social and the environment.

The NWRP team presented and provided such a briefing to the Irish Water National Stakeholder Forum on 2 December 2020.

Following the closure of this consultation, the NWRP Team met with the AFU again on 19 March 2021 to go through their submission with them in detail.

3.4.7 Webinars

A public webinar was held on 27 January 2021 and 27 interested members of the public registered their attendance. This was advertised on the Irish Water website and an email update issued to all stakeholders on the NWRP mailing list. A presentation on the draft Framework Plan was given followed by a Q&A session with the NWRP team. Written responses were issued to any queries not answered at the webinar and uploaded to the Irish Water website.

All national elected representatives were offered a dedicated briefing between the 15 and 17 December 2020 and again on 19 January 2021, where the NWRP team facilitated eight 1-2-1 meetings via Zoom. In addition to this, an elected representative webinar was held on 27 January 2021, to which all public representatives were invited. 36 elected representatives attended this webinar.

3.5 Outcomes of Consultation two

All feedback received during this public consultation process, on Phase 1 NWRP Framework Plan, was reviewed by the NWRP team and all relevant feedback has been incorporated into the Framework Plan. A summary of the feedback received, our response to this feedback and any consequential changes made to the NWRP Framework Plan is detailed in chapters 4 - 14 of this report.

The SEA Statement and AA Determination adopted by Irish Water outline how environmental considerations have been integrated into the NWRP Framework Plan and how consultation influenced the development of the Framework Plan.

4. Analysis of feedback

This section of the report outlines the approach taken to analysing the 84 submissions received during this period of statutory consultation, Consultation two on the Phase 1 NWRP draft Framework Plan and associated environmental reports.

4.1 Methodology

Each submission received via email has been acknowledged by the NWRP team and reviewed in its entirety. The personal data of individuals who made submissions is not documented within this report and is being held in accordance with GDPR 2018.

Following a review of the feedback received, the key themes which emerged were identified to assist consideration and review, and are as follows:

- Policy;
- Regional plans;
- Environment;
- Need;
- Solutions methodology;
- Consultation process;
- Plan implementation;
- Option types;
- Water Resource Planning Concepts; and
- Topics outside the scope of the NWRP.

The following chapters of this Consultation two report comprise a summary of all submissions received under each theme followed by Irish Water's response. Some direct quotes from submissions are included, as well as a summary of similar issues raised by several respondents. The views represent the views of those who made submissions as part of the public consultation process. The issues outlined in the feedback section are in the order in which they appear in the draft Framework Plan and therefore there is no bias implied by the order in which they are addressed. Some feedback may be relevant to a number of themes and so will be addressed under several headings.

We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the "Conclusions" section at the end of each chapter.

4.2 Submissions overview

The following figures present the results of the overall analysis of the 84 submissions. Figures 4-1 and 4-2 display the themes and sub-themes mentioned as a percentage of the overall mentions.

A 'mention' does not imply the sentiment of the comment, whether it was positive or negative or to what extent it was discussed in a submission.

Figure 4-1 Theme mentions

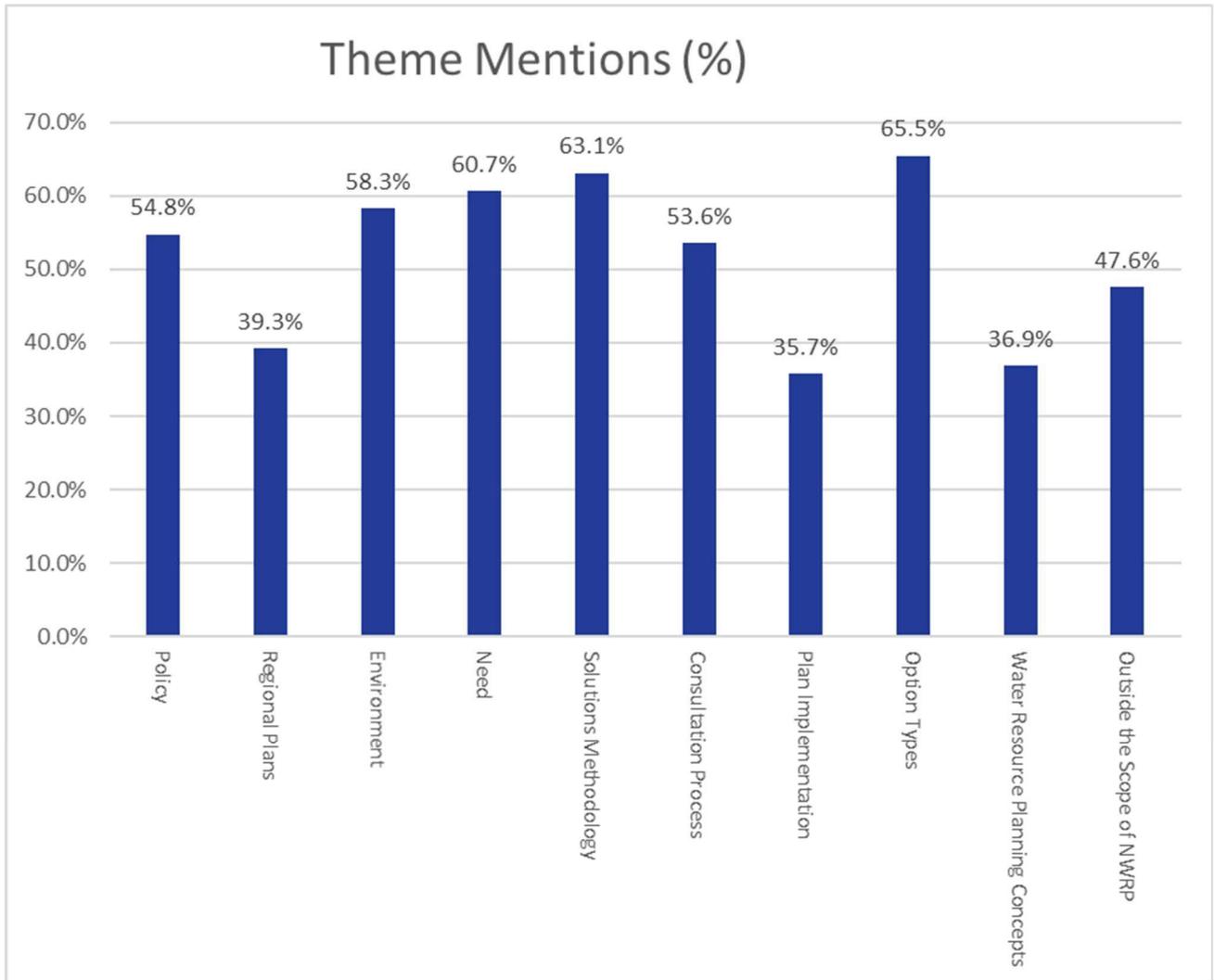
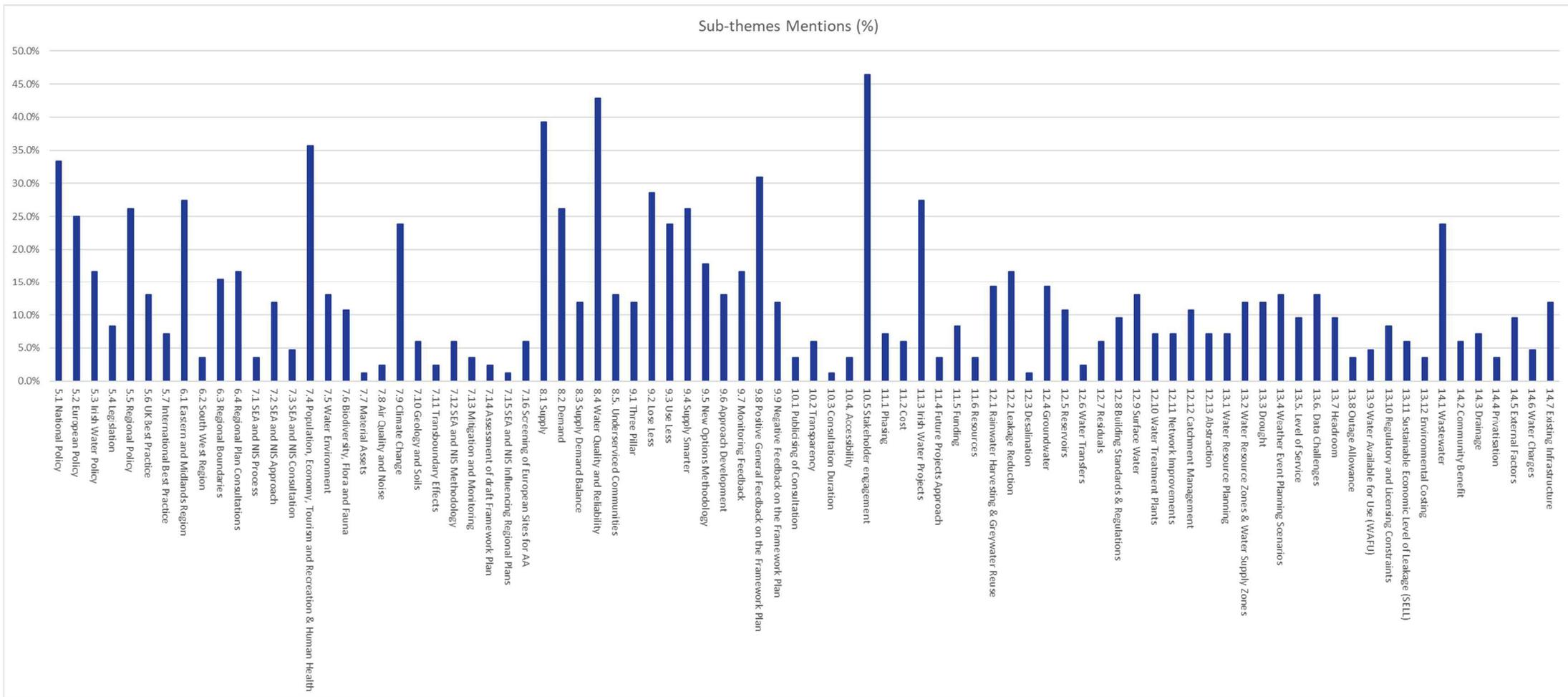


Figure 4-2 Sub-themes mentions



5. Policy

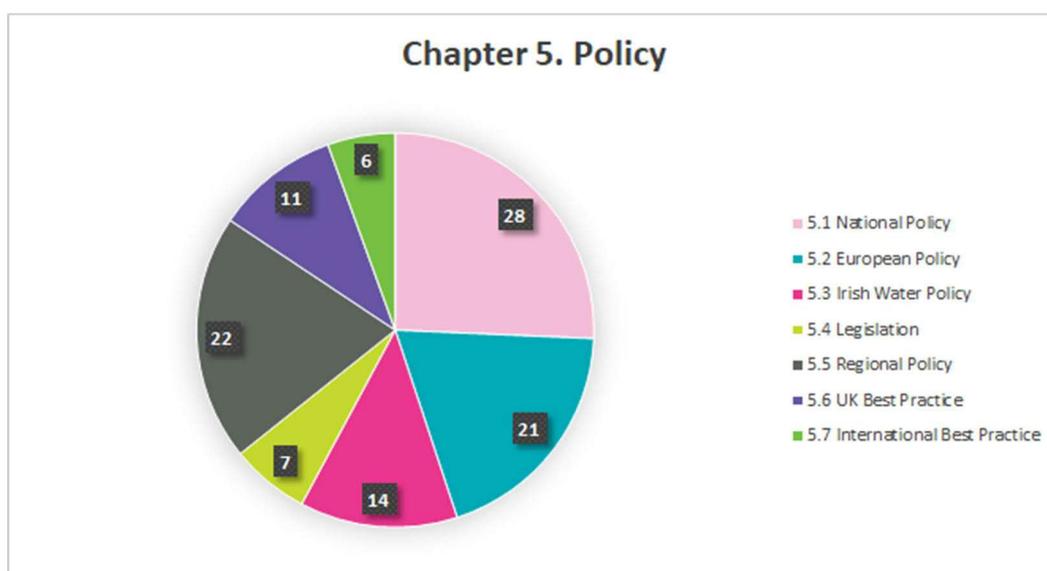
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Policy”. Within the overall Policy theme, we identified seven sub-themes, which we set out in Figure 5-1. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 5-1 details the breakdown of feedback received under the theme Policy. It shows that of the 109 mentions in the submissions to policy, national policy was the most frequently referenced with 28 mentions, followed by regional policy with 22 mentions. Each of the Policy Themes are addressed in following sections. Figure 5-1 below also identifies the seven sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 5-1 Policy Theme



¹ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

5.1 National Policy

5.1.1 Summary of National Policy Feedback

The Office of the Planning Regulator (OPR) noted that Irish Water is well informed of the planning policy context included in the National Planning Framework (NPF) and Regional Spatial Economic Strategies (RSES) for the three regional assembly areas, and further recommended that the Framework include reference to the NPF's key planning policy objectives as well as the need for consistency with population projections for settlements identified in the NPF and RSES. They advised that any adjustments need to consider National Policy Objectives (NPO) or the recent section 28 Guidelines: Housing Supply Target Methodology for Development Planning.

The OPR requested that Irish Water consider the NPO regarding the Metropolitan Area Strategic Plan (MASP) that permits up to 20% of the phased population growth targeted in the principal city and suburban area, to be accommodated in the wider metropolitan area.

Dublin Chamber welcomed the commitment to the development of the NWRP and its alignment with the NPF, National Development Plan (NDP), and the RSES. Cork Chamber requested that Irish Water take a coordinated approach to funding and delivery of the Ireland 2040 project.

The Eastern and Midlands Regional Assembly noted that the context for the NWRP lies in the policy for water services, growth and development, protection of the environment and climate change adaptation as stated in the RSES, the NPF, the NDP and Project Ireland 2040.

The Southern Regional Assembly stated that they support the delivery of infrastructure under the NWRP as outlined in the NPF, NDP, RSES and MASP regional policies and recognised the need for significant levels of capital investment to meet the outcomes of the NWRP. The Assembly stressed the urgency of directing more capital expenditure towards essential water services. The Assembly also acknowledged the references to the RSES within the draft NWRP as well as the strategic outcomes of the NPF.

Limerick City and County Council (LCCC) stated that the proposed Regional Water Resource Plans do not conform with the NPF's approach to future development and associated infrastructural investment, and this may hinder the achievement of the NPF's National Strategic Outcomes.

LCCC also advised that the NWRP needs to align with the Regions identified in the NPF and the RSES as well as Investment Plans around the supply of water services. They highlighted that the timeframe around NWRP will directly impact growth in Limerick and will hinder the delivery of its obligations under the NPF and the RSES for a fit for purpose water supply network serving the county.

This was reiterated by Meath County Council and Tipperary County Council who raised similar concerns in relation to balanced regional growth, coupled with informed investment decisions.

The Department of Enterprise, Trade and Employment, Enterprise Ireland and the IDA highlighted the need for Irish Water to align with economic development projections, set out in the NPF, RSES and local level plans to ensure that water services provision is in keeping with the zoned planning system.

Chambers Ireland advised that the NWRP must support the updated NDP and Climate Action Plan and are concerned with timelines. They stated that the NWRP was the foundation upon which the NDP will be built and that if it is weakened in any respect, it will undermine the NPF's goals. Chambers Ireland highlighted Urban Revival as an important ambition and requested that Irish Water carry out the works that are necessary to accelerate the growth of our cities and towns. They outlined that densification, future growth, environmental obligations, and long-run development are all dependent on water infrastructure.

One stakeholder stated that the Framework Plan providing a platform for the Water Supply Project should be included in national policy and could be achieved now. The DCU Water Institute advised Irish Water to make policy and economic growth decisions that will have a direct impact on water demand.

Clare Public Participation Network (PPN) expressed concern regarding democratic oversight and the management of an essential natural resource and stated its preference for a commitment to public ownership of all significant national water resources in the 25-year plan.

The Department of Enterprise, Trade and Employment, Enterprise Ireland and IDA requested that Irish Water and the Environmental Protection Agency (EPA) collaborate and inform prospective non-domestic water users of their options and relevant connection or regulatory processes. They explained that early engagement by Irish Water in resource planning needs to be responsive to the needs of industry to facilitate development projects of scale and support investment and employment for regional and national economic development.

The Department of Enterprise, Trade and Employment, Enterprise Ireland and IDA further outlined that using the UK as an example to forecast the non-domestic demand over the next 25 years is not a useful model for water services demand projection and offered their assistance to better profile likely non-domestic demand. In addition to the NPF and RSES, they asked that Irish Water reference policies such as Enterprise 2025, Manufacturing 4.0, and sector specific publications such as BioPharma and Distilling.

The Northern Ireland Department of Agriculture, Environment and Rural Affairs (DAERA) SEA team observed that the list of policies, plans and programmes in relation to the transboundary theme does not contain reference to Northern Ireland marine legislation or current marine policy documents including the Marine Act (Northern Ireland) 2013, the UK Marine Policy Statement and draft Marine Plan for Northern Ireland.

The EPA acknowledged that the NWRP references other national plans and programmes and asked that Irish Water incorporate and consider the findings and data of several other listed strategies and reports.

The EPA reminded Irish Water that it has an obligation to comply with any requirements stipulated in regulations in a timely manner and asked that consideration be given to the updated information in the Agri-Food 2030 Strategy when published. The EPA stressed the need for adaptability of the NWRP to satisfy the regulatory requirements on infrastructure funding of both the EPA and the Commission for the Regulation of Utilities (CRU).

Údarás na Gaeltachta stated that lack of investment is having a profound impact on their ability to attract companies to Gaeltacht regions and existing companies to expand their operations.

The Department of Agriculture, Food and the Marine (DAFM) referenced the Programme for Government's commitments to reduce the use of inorganic nitrogen fertiliser, work with farmers and industry to protect and deliver improvements in water quality and reforms to the Common Agricultural Policy (CAP) to reward farmers for improving water quality.

Sustainable Water Network Ireland (SWAN) highlighted that a greater emphasis is needed for an integrated approach to water conservation, and the recognition of the importance of the River Basin Management Plan (RBMP) in influencing Irish Water abstraction activity.

AECOM noted that Drinking Water Safety Plans (DWSPs) underpin both the World Health Organisation (WHO) protection of consumers and the EU Drinking Water Directive (DWD) and should be considered in the NWRP.

Geological Survey Ireland (GSI) welcomed the emphasis on the principles set out in the Water Framework Directive (WFD) and the current and recast Drinking Water Directives (DWD). GSI advised that they welcome further discussion with Irish Water regarding GSI's role in hosting public water supply source protection zones on its website and including them within its Groundwater Protection Scheme products.

Limerick Greens highlighted that there are several projects which have already been undertaken in relation to ecological flow requirements to identify minimum flows required to achieve appropriate water status as defined in the RBMP. They requested that all such data be incorporated into Irish Water's methodologies.

Waterford Institute of Technology stated that the Department of Agriculture Food and Marine has not specifically addressed drought conditions that farmers in Ireland have experienced and outlined it is indicative of poor land management practice.

5.1.2 Response to National Policy Feedback

Having carefully reviewed the submissions received on the sub-theme of National Policy, Irish Water considered that no changes should be made to the draft Framework Plan. However, some of the points made in the submissions will be taken forward in other ways, as explained below.

Irish Water welcomes the responses from the OPR, the Eastern and Midlands Regional Assembly, the Southern Regional Assembly, local authorities, the Department of Enterprise Trade and Employment, the IDA, Enterprise Ireland, Chambers Ireland, Cork Chamber and Dublin Chamber in relation to national policy for growth and development, the National Planning Framework (NPF) and the National Development Plan (NDP). Irish Water confirms that the Regional Policy Objectives (RPOs) are central to our plan and the growth projections used within the draft Framework Plan were based on best available data from the Regional Assemblies at the base year for our Plan. A workshop was also held with each local authority planning and water services section to review data and information in advance of the publication of the draft Framework Plan.

It should be noted that planning settlements are not exactly aligned with the existing water supply asset base, as our water supplies can serve large areas covering urban and rural settlements through an interconnected asset base. Where this is the case, we have attributed the differing growth rates to the proportion of the supply that is in the urban and rural settlements, in order to ensure that the overall growth is aligned with the figures obtained from the RSES and aligned with the NPF. We recognise the ongoing work between the Regional Assemblies and the local authorities over the course of the development of the Local Authority Development Plans. As these plans are finalised, Irish Water will incorporate the increasingly refined growth rates into our demand forecasts. The information including MASP, SDZ and core strategies will also be used to stress test models of our networks. We note comments on urban revival, and from Chambers Ireland and Dublin Chamber through the planning forums.

Within section 8.3.8 of the draft Framework Plan, we summarised the feedback and monitoring process we will use to incorporate this data. We also confirm that there are structured protocols and interface points for these updates through Irish Water's Forward Planning Team. The team lead manages the stakeholder interface with the OPR and there is an Irish Water forward planning lead assigned to interface with each of the three regional assemblies.

As identified in the draft Framework Plan, the NWRP is the framework for delivering the objectives set out in Irish Water's Water Services Strategic Plan. Two of these objectives are "Support Social and Economic Growth" and "Invest in our Future". These objectives align our strategy with both the NPF and the NDP. By transforming our water supplies to ensure that they are safe, secure, reliable, and sustainable, we are striving to ensure that measures to support growth and economic development, incorporate protection of the natural environment and resilience to climate change. These objectives are part of the service measure framework for our regulated capital investment plans and are one of the factors considered in driving investment decisions. Where possible, investment plans are aligned with local authority housing and planning functions to support development. However, it should be noted that there are significant legacy issues across our supplies, and it will take many capital investment cycles to resolve these issues. It should be noted that some "in-flight" projects are called out specifically in the NDP, these will be reviewed in line with the outcome of the NWRP.

We note the concerns of a number of local authorities that the Regional Water Resources Plans (RWRPs) do not align with the regional assemblies' spatial areas or local authority boundaries. We confirm that the four RWRPs are a mechanism for delivery of this iteration of the NWRP, and that the outputs from the RWRPs for all supplies will be assessed nationally and prioritised on an equivalent basis for future investment plans. Irish Water is regulated by the CRU, and one of the prioritisation criteria for our investment plans is Growth and Economic Development. When prioritising growth projects through Irish Water's Capital Investment Plans, we will ensure that these decisions are based on dialogue with the RSES and local authority housing and planning functions. We also recognise the obligations to comply with our regulator for water quality and the environment, the EPA, and the requirements stipulated in relevant legislation and regulations.

Irish Water also recognises the need for balanced development and the need to support rural communities. As national prioritisation methodologies can be skewed towards larger populations, Irish Water will facilitate rural growth through a ring-fenced investment programme known as the "Small Towns and Villages Programme." However, it should also be noted that all supplies from the largest to the smallest are considered within the NWRP, with needs assessments and Preferred Approach developments conducted for every one of the 539 supplies nationally.

We will also engage with the Department of Enterprise, Trade and Employment, Enterprise Ireland, IDA and Údarás na Gaeltachta in relation to forecasts for non-domestic growth requirements. It was noted that UK forecasts for non-domestic demand, which has been decreasing for a number of years, are not a useful model for forecasting likely non-domestic demand in Ireland. There is uncertainty in relation to the relationship between increase in non-domestic activity and water use, we have used the forecasts set out in section 4.3.2.3 of the Framework Plan. We will review policy and trends in relation to this over the coming years and refine our forecasts as per the monitoring and feedback process set out in section 8.3.9 of the Framework Plan. Particular reference will be given to policies such as Enterprise 2025, Manufacturing 4.0, and sector specific publications such as BioPharma and Distilling. Through our Connection Developer Services function, Irish Water has an early engagement process in place (Pre-Connection Enquiry) to facilitate forward planning for new connections. Further information can be found on our website www.water.ie.

The Department of Housing Local Government and Heritage has recently published a policy paper on the future of Irish Water "Irish Water - Towards a national, publicly owned, regulated, water services utility." This confirms public ownership and regulation of Irish Water.

Reference to Northern Ireland marine legislation or current marine policy documents including the Marine Act (Northern Ireland) 2013, the UK Marine Policy Statement and draft Marine Plan for Northern Ireland, are included in the SEA Statement for the Framework Plan.

The EPA asked that consideration be given to the updated information in the Agri-Food 2020 Strategy when published and to consider its potential impact on Water Available

for Use (WAFU). Irish Water will consider the data as it becomes available but may need to work with the EPA and other stakeholders to understand its potential impact on raw water availability and WAFU.

Under the themes of National and European Policy as outlined in sections 5.1.1 and 5.1.2 of this report, a number of respondents raised issues in relation to the WFD, sustainable abstraction, hydromorphology and knowledge of our water supplies. A key objective of the NWRP is to improve the sustainability of the national water supply from its current baseline. This is the basis of our options assessment methodology and means that any feasible option considered as part of the RWRPs has been subject to a desktop assessment of ecological flow guidelines, and adherence to WFD objectives at a project level.

In reality, unsustainable supplies are rarely resilient. We will work collaboratively with agencies such as IFI and SWAN throughout the development of our NWRP and subsequent projects delivered through Irish Water's Capital Investment Plans. Throughout this process we will endeavour to ensure that our plans give consideration of all aspects of aquatic ecology, including the requirement for improving the morphology of waterbodies. We welcome the Programme for Government's commitments to protect and deliver improvements in water quality through the Common Agricultural Policy (CAP).

We confirm the Drinking Water Safety Plan approach is incorporated into the Framework Plan (refer to section 5.5 of the Framework Plan). Irish Water is the first water services utility to take the approach of building this directly into our National Water Resources Plan, to ensure that our supplies are both safe and secure.

5.2 European Policy

5.2.1 Summary of European Policy Feedback

A number of submissions were made in respect of the WFD. One stakeholder noted that in recent years Ireland's water quality has fallen below EU requirements, and another highlighted that the imposition of fines by the EU needs to be emphasised to the public.

The Eastern and Midlands Regional Assembly requested that the implementation of the WFD be a key priority. They advised this is important to achieve and maintain good environmental status for all water bodies in the Region and ensure policy alignment between the core objectives of the WFD, RBMP and local authority land use plans.

Inland Fisheries Ireland (IFI) cited the WFD in respect to regulatory legislation around sustainable water management and stated that overall principles should be laid down for control on abstraction and impoundment, to ensure the environmental sustainability of the effected waters

While IFI noted the increasing demand for water supply, they sought proper water management, in line with the overall principles expressed in the WFD. They requested that a similar licensing mechanism be considered as already implemented at Irish Water wastewater treatment plants, granted and monitored by the EPA under the Wastewater Discharge Regulations, 2007 (S.I. No. 684 of 2007).

The River Shannon Protection Alliance (RSPA) asked whether there is dialogue between Irish Water and the ESB regarding optimising existing resources considering the requirement in the WFD to utilise modified and/or artificial waterways in preference to natural lakelands.

The OPR stated the Department of Housing, Local Government and Heritage is currently preparing Guidelines for Planning Authorities on the Planning System and River Basin Management and the guidelines will include practical advice to planning authorities on how water management and the planning system will be integrated and meet the objectives of the WFD. They welcomed the recognition in Table 8.9 of the draft Framework Plan that WFD “legislation and subsequent regulations on abstraction may have the potential to alter the volumes of water we currently abstract at existing sites and the volumes of water we can abstract from new supplies.” The OPR recommended that the Framework Plan reference the forthcoming guidelines for river basin management and be cognisant of any implications and obligations that may arise from these.

Ballyboden Tidy Towns found issue with new developments coming on stream in their area which do not consider cumulative effects on their community which, they stated, was contrary to EU law.

Environmental Trust Ireland submitted that the SEA report and Natura Impact Statement (NIS) prepared by Irish Water are completely inadequate and not in accordance with EU law in respect of the Habitats Directive, the Birds Directive, the WFD, the Groundwater Directive and the 2014 Environmental Impact Assessment Directive.

As such, Environmental Trust Ireland requested revised documentation from Irish Water which fully assesses and considers the environmental and ecological consequences of the NWRP on the European Natura 2000 protected sites including the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. They requested a commitment from Irish Water that it will not seek to extract water from the River Shannon to supply Dublin by way of pipeline or otherwise, having regard to the protected status at European level of the Lower River Shannon SAC.

The HSE welcomed Irish Water referring to the WHO Drinking Water Safety Plan approach for hazard assessments which will contribute to defining ‘identified needs’ in the NWRP.

The Southern Regional Assembly noted that Natural Water Retention Measures have come more into prominence, in response to the water, climate and biodiversity crisis facing the planet and this approach is promoted internationally by organisations such as the International Union for Conservation of Nature (IUCN) and supported by the EU’s Green Deal.

The DAERA Department for Communities (DfC) Historic Environment Division (HED) noted that the Valletta and Granada Conventions, referred to in Appendix B’s review of plans and programmes in the SEA Environmental Report, are Council of Europe

Treaties, rather than European Union treaties. In terms of scope these have a wider geographical application, beyond the boundaries of EU member states.

The EPA noted the emphasis on Irish Water's statutory obligation to produce a Drinking Water Safety Plan (DWSP) approach, to include the regulatory standards that are set out in the European Union (Drinking Water) Regulations 2014. The EPA is concerned that the NWRP makes only brief references to some aspects of the DWSP approach. The EPA submitted that the NWRP option prioritisation criteria should include all aspects of the DWSP approach, including potential management measures in the catchment, to inform decision making on the barrier assessment and demonstrate a reduction in risks to public water supplies.

The EPA also asked that under Climate Change, Irish Water include reference to the European Green Deal in the context of climate and environmental-related challenges, and the EU Biodiversity Strategy should also be referenced under Biodiversity.

Chambers Ireland noted that the Framework Plan must support the updated NDP to accommodate any relevant changes since it was first published including the economic shocks of Covid-19 and Brexit. However, the Chambers continued, that even more important to the NDP's capacity to meet the needs of the NPF will be the Climate Action Plan and opportunities for Ireland presented by the European Green Deal.

5.2.2 Response to European Policy Feedback

Having carefully reviewed the submissions received on the sub-theme of European Policy, Irish Water considered that no changes should be made to the draft Framework Plan. However, some of the points made in the submissions will be taken forward in other ways, as explained below.

As outlined in sections 5.1.1 and 5.1.2 of this report, a number of respondents raised issues in relation to the WFD, sustainable abstraction, hydromorphology and knowledge of our water supplies. A key objective of the NWRP is to improve the sustainability of the national water supply from its current baseline. This is the basis of our options assessment methodology and means that any feasible option considered as part of the RWRPs will be subject to a desktop assessment of ecological flow guidelines, and adherence to WFD objectives at a project level.

In reality, unsustainable supplies are rarely resilient. We will work collaboratively with agencies such as IFI and SWAN throughout the development of our NWRP and subsequent projects delivered through Irish Water's Capital Investment Plans. Throughout this process we will ensure that our plans give consideration to all aspects of aquatic ecology, including the requirement for improving the morphology of waterbodies. This will also allow us to facilitate the RPOs in a sustainable manner. We are aware that the Department of Housing, Local Government and Heritage is preparing Guidelines for Planning Authorities on the Planning System and River Basin Management, and will review and incorporate these guidelines into the Framework Plan when available, in accordance with the monitoring and feedback process.

As highlighted by a number of respondents, there may be some uncertainty in our forecasts for WAFU in the Framework Plan until such a time as all of our abstractions

have progressed through the pending regulatory framework for water abstraction. However, the assessments used as part of the development of the Framework Plan are aligned with those that will be used by the regulatory authorities for water abstraction. As part of the impending regulatory process for water abstraction, mitigation measures at existing impoundments and abstractions, throughout the duration required to transform our supplies, will be considered appropriately.

Irish Water confirms that it has continuous engagement with ESB regarding waterbodies that are controlled for the purposes of hydroelectric generation and water abstraction.

Industrial Water Treatment is included in the options assessment process in the RWRPs.

Cumulative impact assessments on waterbodies are included within the Framework Plan and the RWRPs.

Our Framework Plan and accompanying SEA and NIS are fully compliant with the SEA Directive, Habitats Directive, the Birds Directive, the WFD, and the Groundwater Directive. At each stage in the development of the Framework Plan we have interfaced with the regulatory authorities for these directives. Irish Water has also an inhouse SEA and AA specialist who has reviewed the draft Framework Plan prior to consultation.

As part of the draft RWRPs we will consider all unconstrained options for water supply. These options will then be screened as set out in our options assessment methodology. A desktop assessment of potential impacts on European Designated Sites will then be undertaken for each feasible option. Should a Preferred Approach progress through a capital investment plan, it will be subject to site level environmental assessments as part of the normal consenting process.

The EPA and HSE raised the need to progress the national roll out of the World Health Organisation, Drinking Water Safety Plan approach to ensure a risk-based approach to safety and security of our water supplies. In relation to improving water quality and reducing risk across our supplies, a number of respondents emphasised the need for catchment measures, and ecosystems services. Irish Water concurs with this view and is an active participant in catchment-based initiatives. As part of the roll out of the Drinking Water Safety Plan, we will also progress site specific source risk assessments.

Irish Water recognises that sustainable and resilient supplies are required to facilitate the NDP, and transformation of our supplies and climate change adaptation are at the heart of our Framework Plan.

The Framework Plan has a continuous feedback and monitoring process to allow for incorporation of emerging policy and data.

5.3 Irish Water Policy

5.3.1 Summary of Irish Water Policy Feedback

Tipperary County Council welcomed the Irish Water Investment Plan 2020-2024 and a commitment to prepare Water Network Development Plans, thereby ensuring that

areas zoned for residential land including Strategic Development Zones (SDZs) can be serviced by water through forward planning over a long-term 25-year plan.

Clare PPN raised concerns regarding the management of an essential natural resource and preferred that a commitment to public ownership of all significant national water resources be included in the 25-year plan.

Fight the Pipe noted that Irish Water should be cautious when using the UK as a model when it comes to its investments.

An Fóram Uisce (AFU) suggested quantifying the performance of future Irish Water policies by using commonly accepted definitions of resilience-sustainability-flexibility. The advantages, they stated, include the ability to facilitate the current low availability of data, to define the scale, the future hazards-threats to the supply-demand balance, and the water supply operation standards in a justified way.

Referring to the Non-Domestic Tariff Framework, the Department of Enterprise, Trade and Employment, Enterprise Ireland and IDA noted that Irish Water is funded jointly by the exchequer and Irish non-domestic users, primarily enterprises, who are planned to contribute up to 23% of Irish Water's revenue in the coming years. It is therefore essential, they stated, that Irish Water considers the impacts of water policies on Ireland's enterprise base.

The DAERA SEA Team queried the policy development regarding water abstraction and possible impacts on Irish fisheries interests. The EPA noted that the NWRP emphasises Irish Water's statutory obligation to produce safe drinking water which complies with regulatory standards set out in the EU Drinking Water Regulations. However, to date the National Disinfection Programme has not achieved the timelines set for its delivery. The EPA cited this work is critical and there should be no delay in the delivery of this programme.

SWAN requested a greater emphasis on the need for an integrated approach to water conservation, with less emphasis on personal behaviour change and more on the policy interventions to secure efficient water use domestically, as well as by businesses and on farms.

5.3.2 Response to Irish Water Policy Feedback

Having carefully reviewed the submissions received on the sub-theme of Irish Water Policy, Irish Water considered that one change should be made to the draft Framework Plan. In addition, some of the points made in the submissions will be taken forward in other ways, as explained below.

It should be noted that planning settlements are not exactly aligned with the existing water supply asset base, as our water supplies can serve large areas covering urban and rural settlements through an interconnected asset base. Where this is the case, we have attributed the differing growth rates to the proportion of the supply that is in the urban and rural settlements, in order to ensure that the overall growth is aligned with the figures obtained from the RSES and aligned with the NPF. We recognise the ongoing work between the regional assemblies and the local authorities over the course of the development of the Local Authority Development Plans. As these plans

are finalised, Irish Water will incorporate the increasingly refined growth rates into our demand forecasts. The information including MASP, SDZ and core strategies will also be used to stress test models of our networks. We note comments on urban revival, and from Chambers Ireland and Dublin Chamber through the planning forums.

As identified in the draft Framework Plan, the NWRP is the framework for delivering the objectives set out in Irish Water's Water Services Strategic Plan. Two of these objectives are "Support Social and Economic Growth" and "Invest in our Future". These objectives align our strategy with both the NPF and the NDP. By transforming our water supplies to ensure that they are safe, secure, reliable, and sustainable, we are striving to ensure that measures to support growth and economic development, incorporate protection of the natural environment and resilience to climate change. These objectives are part of the service measure framework for our regulated capital investment plans and are one of the factors considered in driving investment decisions. Where possible, investment plans are aligned with local authority housing and planning functions to support development. However, it should be noted that there are significant legacy issues across our supplies, and it will take many capital investment cycles to resolve these issues. It should be noted that some "in-flight" projects are called out specifically in the NDP. These will be reviewed in line with the outcome of the NWRP.

The Department of Housing Local Government and Heritage has recently published a policy paper on the future of Irish Water "Irish Water - Towards a national, publicly owned, regulated, water services utility." This confirms public ownership and regulation of Irish Water.

In relation to the use of UK methodologies within our plan, some respondents questioned the use of these guidelines on the basis that the water utilities in England and Wales are privatised. However, it should be noted that the utilities in Scotland and Northern Ireland are in public ownership and also use these methodologies. The rationale for basing our initial NWRP on these methodologies, is the absence of Irish guidelines, similarities in the means of regulating our supplies, climatic conditions, and the evolution of our water supply asset base. It is, however, important to note that Ireland is 25-30 years behind the UK in terms of water resources planning, and we will need to develop and improve our data and intelligence systems. Due to the relatively low performance of our asset base, we have also included water quality risk within our plan, to ensure that we have appropriately understood our strategic transformation and associated funding requirements.

AFU made suggestions about models that could be used to understand resilience across our water supplies, which could potentially inform our policies and improve their outcomes. Irish Water is interested in progressing more granular assessments of reliability and resilience and will engage with AFU through our innovation section to review the potential for pilot studies to allow us to trial some of these methodologies for use in later iterations of our resources plans.

Irish Water will continually review all policies and consider the impact of these on Ireland's enterprise base. We will also engage with the Department of Enterprise, Trade and Employment, Enterprise Ireland, IDA and Údarás na Gaeltachta in relation

to forecasts for non-domestic growth requirements. It was noted that UK forecasts for non-domestic demand, which has been decreasing for a number of years, are not a useful model for forecasting likely non-domestic demand in Ireland. As there is uncertainty regarding the relationship between increase in non-domestic activity and water use, we used the forecasts set out in section 4.3.2.3 of the draft Framework Plan. We will review policy and trends in relation to this over the coming years and refine our forecasts as per the monitoring and feedback process set out in section 8.3.9 of the Framework Plan. Particular reference will be given to policies such as Enterprise 2025, Manufacturing 4.0, and sector specific publications such as BioPharma and Distilling. Through our Connection Developer Services function, Irish Water has an early engagement process in place (Pre-Connection Enquiry) to facilitate forward planning for new connections. Further information can be found on our website www.water.ie.

Under the themes of National and European Policy as outlined in sections 5.1.1 and 5.1.2, a number of respondents raised issues in relation to the WFD, sustainable abstraction, hydromorphology and knowledge of our water supplies. A key objective of the NWRP is to improve the sustainability of the national water supply from its current baseline. This is the basis of our options assessment methodology and means that any feasible option considered as part of the RWRPs has been subject to a desktop assessment of ecological flow guidelines, and adherence to WFD objectives at a project level. In reality, unsustainable supplies are rarely resilient. We will work collaboratively with agencies such as IFI and SWAN throughout the development of our NWRP and subsequent projects delivered through Irish Water's Capital Investment Plans. Throughout this process we will try to ensure that our plans give consideration of all aspects of aquatic ecology, including the requirement for improving the morphology of waterbodies. We welcome the Programme for Government's commitments to protect and deliver improvements in water quality through the Common Agricultural Policy (CAP).

Critical projects and programmes to address potential public health issues are on-going and not impacted or delayed by the delivery of the NWRP. We have included a process for reviewing projects that are underway (known as "in-flight projects"). We have also set out a process for developing interim options to address critical water quality issues while we deliver our Preferred Approaches through the coming investment plans. Box 8.1 in section 8.3.7 of the Framework Plan has been added to reflect this.

Leakage reduction and water conservation is an integral part of our NWRP and is one of the key pillars to resolving supply demand balance deficit.

5.4 Legislation

5.4.1 Summary of Legislation Feedback

Clare PPN noted that there is no legislative framework in Ireland which sets the standards for the development of the NWRP which they consider essential. Limerick City and County Council further emphasised this and highlighted that such projects are subject to approval processes under the Planning and Development Act 2000 and should provide for water supply repairs/replacement/upgrades/re-routing at design and

implementation stages. They asked that Irish Water provide for such works as the opportunity presents itself as a responsive feature of the NWRP.

The CRU and the Inland Waterways Association of Ireland (IWA) noted uncertainty around current and future surface water and groundwater abstractions pending new legislation in this area. Similarly, the EPA suggested this legislation may impact on Irish Water's WAFU projections and water quality barrier assessments. The EPA asked that Irish Water account for any new or revised legislation relating to the recast Drinking Water Directive and the forthcoming abstractions control regime. They further requested that Irish Water consider a review of the NWRP, as well as the four Regional Water Resource Plans, following the publication of any new regulations on water abstractions and revisions to the drinking water regulations.

The EPA sought clarification on the statement in the draft Framework Plan that the current WAFU forecast does not include the pending abstraction legislation. In the absence of the abstraction legislation, the EPA requested we publish the criteria in the NWRP used in lieu of the pending abstraction legislation.

Longford County Council questioned the approach of Irish Water regarding the facilitation of abstraction licences for local authorities. While cost effective, they stated it is generally predicated on increasing headroom and abstraction licence limits from specific sources. They submitted that it is extremely risky as there are no guarantees that an abstraction licence will be facilitated with an increase, and in some cases the limit may be decreased. They asked that the process of upgrading and increasing abstraction licences be commenced as a matter of urgency under the Framework Plan as the type of licence granted will greatly affect the level and type of capital investment required.

The issue with impending abstraction legislation was noted by Dublin Chamber as they argued that the over-reliance on abstraction from the River Liffey and lack of alternative water resources threatens Dublin's economic growth and in some areas is proving to be a significant infrastructure blockage to the development of new housing construction projects. Dublin Chamber stressed the urgent need to progress the Water Supply Project to provide water security for the Dublin region and enable future development. Dublin Chamber maintained that Government investment on a multi-year basis is required to ensure that the NWRP has the funding to be achieved.

Meath County Council addressed the potential for delays with legislative changes on abstraction.

5.4.2 Response to Legislation Feedback

Having carefully reviewed the submissions received on the sub-theme of Legislation, Irish Water considered that no changes should be made to the draft Framework Plan. However, some of the points made in the submissions will be taken forward in other ways, as explained below.

There are no Ireland-specific guidelines for water resource planning. Accordingly, we have developed and publicly consulted on the Framework Plan.

Where possible, Irish Water will facilitate public realm projects. However, this is not always possible due to budget constraints and the need to address priority supplies.

Irish Water has submitted a full list of our abstractions to the EPA as required under SI No. 261 of 2018 which is called the European Union (Water Policy) (Abstractions Registration) Regulations 2018 as part of the new legislative framework on water abstraction. We will engage fully with the requirements of the new legislation, including general binding rules relating to measurement of abstraction.

Any additional legislative and regulatory requirements will be incorporated into the NWRP based on the monitoring and feedback process set out in section 8.3.8 of the Framework Plan.

As highlighted by a number of respondents, there may be some uncertainty in our forecasts for WAFU in the Framework Plan until such a time as all of our abstractions have progressed through the pending regulatory framework for water abstraction. However, the assessments used as part of the development of the Framework Plan are aligned with those that will be used by the regulatory authorities for water abstraction. Please refer to Appendix C in the Framework Plan.

Irish Water will initiate the process of obtaining licences for new abstractions, and regularising the licensing position of existing abstractions, once the abstraction legislation has been enacted and the applicable regulatory process is in place.

It is not proposed to retire any current sources for the GDA WRZ; however, this supply will be reviewed as part of the RWRP for the Eastern and Midlands Region.

5.5 Regional Policy

5.5.1 Summary of Regional Policy Feedback

Limerick Greens questioned the appropriateness of the River Shannon being included in the Eastern Zone to provide sufficient water supply for the Eastern Region which contains the Greater Dublin Area. They suggested that Irish Water review the legal requirements and protection that the WFD affords to water status against large scale inter-basin transfer of water.

Limerick Greens also recommended that Irish Water align the publication of the four Regional Water Supply Plans with the timing of the Characterisation and Status Classification Reports of the RBMP, undertaken in Ireland in line with WFD requirements.

Kerry County Council requested that infrastructural improvements should be coordinated with other infrastructural projects such as road realignments and Greenway developments and this should be incorporated in the Framework Plan. It is imperative, they stated, that the infrastructural developments required as part of the security of water supply are integrated with the planning policies and priorities of the Kerry County Development Plan 2022 – 2028 to ensure a coordinated delivery of sufficient water supplies to support residential, industrial and tourism development in County Kerry.

Limerick City and County Council again referred to its commitment to the RSES for the Southern Region and the effect the NWRP has on this strategy for Limerick City and County Council. They requested that when Irish Water carries out works identified in the Framework Plan in the forthcoming ten years, that they try to avoid less than optimum road design outcomes, and further disruption, degradation of surfaces and additional cost and disruption to the taxpayer.

Clare PPN requested a commitment to a bi-annual review with public participation of both the Framework Plan and the various regional and implementation plans which devolve from it. This would be essential, they stated, to ensure flexibility and renewed risk assessment in the face of an uncertain climate and changing weather patterns.

Clare PPN also raised concerns that the Framework Plan is oriented towards providing solutions to supply in the areas of greatest population and should include balanced regional and rural development. They noted too that as a national body, the system of priorities which Irish Water establishes for itself may be extremely damaging for areas with low populations, and they recommended that below certain levels of population, local solutions, supported by Irish Water, should be facilitated.

Clare PPN stated their concern that access to both water and wastewater treatment services is affecting rural development in County Clare. The transfer of management of water resources from local authorities to Irish Water has, they stated, exacerbated the situation. They highlighted that land now zoned for development will lose its designation if Irish Water does not provide infrastructure within the life of each successive County Development Plan.

AFU supported the reduction of Water Resource Zones (WRZs) as it will improve the management actions and facilitate the country's regional management approach. This reduction, they stated, will also contribute to the creation of consistent databases, the better mapping of the WRZs, and continuous monitoring.

Meath County Council cited the RSES and agreed with the strategic investment priorities for water in this strategy. They also supported the Water Supply Project and the need to address water supply for the Dublin region as some areas of Meath obtain their water supply from these schemes. They asked that contingency planning to address the long term demands of the region form a key part of the Framework Plan.

Tipperary County Council also cited the RSES, as well as County Development Plans and Local Area Plans, and recommended a partnership approach to investment decisions in water infrastructure with Irish Water to the level required in County Tipperary. They emphasised that fit-for-purpose water infrastructure is a key component to the delivery of any development in the county.

Tipperary County Council also noted that the Southern Regional Assembly identified three key towns in Tipperary for growth using RSES. They asked that the Framework Plan reflect this. They further highlighted that the Tipperary County Development Plan 2022-2028 and the zoning of land for development purposes requires that water services infrastructure, coupled with water quality, are key to the achievement of their

county planning objectives. The availability of land, they stated, that is serviced or will be serviced with adequate water supply, is crucial.

Tipperary County Council continued that the inclusion of all of County Tipperary in a single Regional Water Resources Plan will more easily identify security of supply needs throughout the county and describe plans and timeframes to address such needs. They noted that the formulation, publication, and finalisation of these Regional Water Resources Plans will coincide with the preparation of the Tipperary County Development Plan 2022-2028, a draft of which is anticipated to be published in July 2021.

Councillor Thomas Phelan suggested that a sustainable and balanced development plan between Irish Water and local authorities be put in place to unlock land for housing in suitable locations by ensuring that water and water infrastructure be provided at the right time in the right places.

Cork Chamber requested a coordinated approach to funding and delivery of the Ireland 2040 project in particular an agreement between Irish Water, and a list of key stakeholders to ensure coordinated delivery.

The OPR welcomed the incorporation of relevant information from regional development plans into the Framework Plan and to allow for a continuous engagement between Irish Water, the regional assemblies and planning authorities regarding plan making. They acknowledged the positive working relationship with Irish Water and the detailed assessments Irish Water carries out of local authority statutory plans. They requested that Irish Water and the Framework Plan recognise the importance of the role of the three regional assemblies and their adoption of the RSES in supporting the implementation of the NPF.

The OPR outlined how each regional assembly has prepared a Metropolitan Area Strategic Plan (MASP) for each of the five cities and their respective metropolitan hinterlands. The OPR noted the need for water network and storage upgrades enabling infrastructure for several strategic development areas.

The OPR highlighted that Irish Water do not use the term 'key towns' in the Framework Plan but instead groups settlements together based on their size which is not consistent with the RSES. They advised that Irish Water consult with the three regional assemblies regarding the growth rates identified for the five regional centres, key towns and MASP areas and specific targets for individual settlements or higher targets. The OPR also recommended grouping settlements together based on their designation in the NPF and RSES rather than using their existing population level and assuming a 'business as usual' growth pattern.

The OPR also advised Irish Water to refer to the Tables in Appendix 1 of the Ministerial Circular relating to Structural Housing Demand in Ireland and Housing Supply Targets, and the associated section 28 Guidelines: Housing Supply Target Methodology for Development Planning and consult with planning authorities currently reviewing their development plan regarding any proposed adjustments.

They emphasised that any assumptions about the need for future water supply are consistent with the population projections for settlements as set out in the NPF or relevant RSES and the necessary adjustments made considering the NPO 68 and section 28 Guidelines. The OPR advised that regional growth centres need to be assessed against each RSES and the Framework Plan recognises that policies in the RSES support significant employment growth in MASP settlements outside the immediate city area.

The Southern Regional Assembly recommended that Irish Water engages closely with each local authority in completion of the Framework Plan and in the preparation of the Regional Water Resources Plans during Phase 2. The Assembly also advised that a pro-active approach by Irish Water to deliver services for each MASP is a requirement of the RSES.

The Eastern and Midlands Regional Assembly noted that Irish Water is directed to the Regional Policy Objectives (RPOs) set out in the RSES which support the sustainable management of water resources to ensure a healthy society, economic development requirements and a cleaner environment for the region. Taking the RSES report into consideration the Assembly stated that Irish Water should seek collaboration between the Climate Action Regional Offices and local authorities to inform and collaborate on the identification of critical infrastructure and the longer-term adaptation planning and investment priorities.

The EPA noted that in the section Influencing Regional Water Resources Plans (RWRPs) it “would be useful to also consider the use of the EPA-supported Environmental Sensitivity Mapping Webtool (www.enviromap.ie) to assist in identifying sensitive receptors and areas of environmental sensitivity when the process of screening options begins. It may also be useful to refer to this in section 9.9.4 - Sensitivity Analysis.”

GSI cited their expertise on groundwater source protection and how their Groundwater Protection Scheme methodology, maps and data are officially embedded in the planning process via local authority County Development Plans. They emphasised that a collaborative multiagency approach to the management of drinking water quality in Ireland is essential and they can provide hydrogeological expertise directly to Irish Water, via the recast Drinking Water Directive working group.

5.5.2 Response to Regional Policy Feedback

Having carefully reviewed the submissions received on the sub-theme of Regional Policy, Irish Water considered that one change should be made to the draft Framework Plan which we have explained below. This change is by way of elaboration or amendment to the draft Framework Plan, to clarify issues that arose during the consultation process. In addition, some of the points made in the submissions will be taken forward in other ways, also as explained below.

In light of the fact that this is the first NWRP, with 539 WRZs and a very significant challenge in terms of historic underinvestment in water infrastructure to date, it was considered necessary and prudent to divide the public water supply system into the

four Regional groups. These regional boundaries are only relevant for the development of the first NWRP and have been identified as the most appropriate way to allow Irish Water to identify Preferred Approaches for each WRZ in an efficient and timely manner. Once the first NWRP has been finalised, while it is comprised of the Framework Plan and four Regional Water Resources Plans, together they will be treated as a unified plan. The relevant regional groupings will have no ongoing application. In particular, the Preferred Approaches identified in each RWRP will be prioritised collectively through Irish Water's planning and investment cycles (in other words, there will not be any difference in investment priority across the four regional groupings). Where local authority areas have been split, Irish Water will engage with the relevant local authorities following the finalisation of the RWRPs, on the outcomes for all of the water supplies in their areas.

Large-scale inter basin transfer of raw water is not considered as part of the NWRP. The standards used for assessing sustainable abstraction are based on eflows assessments.

As any data becomes available from the River Basin Management Plans, it will be incorporated into the NWRP in accordance with the monitoring and feedback process as outlined in section 8.3.8 and Table 8.9 of the Framework Plan.

As identified in the draft Framework Plan, the NWRP is the framework for delivering the objectives set out in Irish Water's Water Services Strategic Plan. Two of these objectives are "Support Social and Economic Growth" and "Invest in our Future". These objectives align our strategy with both the NPF and the NDP. By transforming our water supplies to ensure that they are safe, secure, reliable, and sustainable, we are striving to ensure that measures to support growth and economic development, incorporate protection of the natural environment and resilience to climate change. These objectives are part of the service measure framework for our regulated capital investment plans and are one of the factors considered in driving investment decisions. Where possible, investment plans are aligned with local authority housing and planning functions to support development. However, it should be noted that there are significant legacy issues across our supplies, and it will take many capital investment cycles to resolve these issues. It should be noted that some "in-flight" projects are called out specifically in the NDP, these will be reviewed in line with the outcome of the NWRP.

Where possible, Irish Water will facilitate public realm projects. However, this is not always possible due to budget constraints and the need to address priority supplies.

The Framework Plan has a continuous feedback and monitoring process to allow for incorporation of emerging, policy and data. It also involves regular consultation with the local authorities in development of the Preferred Approaches.

Rural growth and development will be supported through the Small Towns and Villages Growth Programme or additional programmes as required. Box 4.1 in section 4.3.2 of the Framework Plan confirms this.

It should be noted that planning settlements are not exactly aligned with the existing water supply asset base as, our water supplies can serve large areas covering urban

and rural settlements through an interconnected asset base. Where this is the case, we have attributed the differing growth rates to the proportion of the supply that is in the urban and rural settlements, in order to ensure that the overall growth is aligned with the figures obtained from the RSES and aligned with the NPF. We recognise the ongoing work between the Regional Assemblies and the local authorities over the course of the development of the Local Authority Development Plans. As these plans are finalised, Irish Water will incorporate the increasingly refined growth rates into our demand forecasts. The information including MASP, SDZ and core strategies will also be used to stress test models of our networks. We note comments on urban revival, and from Chambers Ireland and Dublin Chambers through the planning forums.

We note the concerns of a number of local authorities that the Regional Water Resources Plans (RWRPs) do not align with the Regional Assemblies' spatial areas or local authority boundaries. We confirm that the four RWRPs are a mechanism for delivery of this iteration of the NWRP, and that the outputs from the RWRPs for all supplies will be assessed nationally and prioritised on an equivalent basis for future investment plans. Irish Water is regulated by the CRU, and one of the prioritisation criteria for our investment plans is Growth and Economic Development. When prioritising growth projects through Irish Water's Capital Investment Plans, we will ensure that these decisions are based on dialogue with the RSES and local authority housing and planning functions. We also recognise the obligations to comply with our regulator for water quality and the environment, the EPA, and the requirements stipulated in relevant legislation and regulations.

The population projections for settlements are and will continue to be based on information from the NPF, RSES and Local Authority Development Plans. Section 1.8.2 has been updated to reflect this.

The reduction in the number of Water Resource Zones will be quantified as part of the RWRPs.

Irish Water will use the EPA-supported Environmental Sensitivity Mapping Webtool (www.enviromap.ie) to assist in the identification of sensitive receptors and areas of environmental sensitivity when screening options and have referred to this in chapter 4 of the SEA Statement.

Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as it becomes available.

5.6 UK Best Practice

5.6.1 Summary of UK Best Practice Feedback

Fight the Pipe questioned why Irish Water would model the Framework Plan on UK best practice especially considering that water utilities in England and Wales were privatised in 1989. They also highlighted that Brexit and Covid-19 are not referenced in the draft Framework Plan.

The CRU noted that the inclusion of Quality, Asset Performance and Drinking Water Safety Plans, as part of water resources planning, is a shift from the previously adopted approach which was based on the UK's Final Water Resources Planning Guidelines 2016. The CRU noted that Irish Water had identified the 2016 Guidelines as best practice and stated that these were used as the starting point for its Framework Plan.

Dublin Chamber welcomed the 1 in 50-year Level of Service (LoS) target but compared it to the UK 1 in 100-year LoS target citing Irish Water's lack of infrastructure and lack of investment as a hindrance to its competitiveness.

GSI cited British Geological Survey research on the impact of climate change on groundwater recharge that suggests that groundwater recharge in England and Wales is likely to increase over time while the impact of climate change on Irish surface water suggests that Irish rivers are likely to reduce. The research states that as Ireland begins to feel the impacts of climate change, the natural storage provided by Irish groundwater systems (low by international comparisons) means that groundwater supplies are likely to be more resilient than surface water supplies during periods of low rainfall and drought.

Waterford Institute of Technology (WIT) requested that Irish Water considers the adoption and development of sustainable farm and water management practices similar to the UK private water companies such as Infinity Water and Thames Water who have actively and successfully engaged with farmers in this regard. WIT proposed Irish Water supports specific research and development initiatives and assists with education and training initiatives with pioneering farmers.

The Southern Regional Assembly cited an example of Upstream Thinking in the UK as highlighted in the RSES Report. This method adopted an Ecosystem Services approach to tackle water quality problems at source which reduced the need for expensive water treatment solutions. The Assembly suggested that this is an approach that Irish Water could adopt regarding catchment management.

The Department of Enterprise, Trade and Employment, Enterprise Ireland and the IDA debated that using the UK as an example to forecast the non-domestic demand over the next 25 years is not a useful model for water services demand projection. They suggested they can assist in better forecasting likely non-domestic demand.

AFU referred to Scottish Water International's (SWI) Report as a good benchmark for Irish Water. AFU noted that the draft Framework Plan appears more short-term oriented and highlighted the importance of incorporating the project planning and efficiency recommendations made in the SWI report in the Framework Plan. AFU sought further engagement with Irish Water via the development of a unit or a team of experienced project-financial managers.

AFU referenced several UK approaches to leakage reduction for consideration by Irish Water. However, AFU continued that the methods and practices in the draft Framework Plan that are "borrowed from the UK (e.g. Final Water Resources Planning Guidelines 2016, Institute of Hydrology Report No. 108 for the water supply estimation)" do not mention any proposals to develop alternatives tailored specifically for Ireland.

The RSPA and Kennedy Analysis referred to several UK best practice programmes and approaches to leakage reduction which are captured in more detail in section 9.2 of this report.

5.6.2 Response to UK Best Practice Feedback

Having carefully reviewed the submissions received on the sub-theme of Legislation, Irish Water considered that three changes should be made to the draft Framework Plan. Some of the points made in the submissions will also be taken forward in other ways, as explained below.

In relation to the use of UK methodologies within our plan, some respondents questioned the use of these guidelines on the basis that the water utilities in England and Wales are privatised. However, it should be noted that the utilities in Scotland and Northern Ireland are in public ownership and also use these methodologies. The rationale for basing our initial NWRP on these methodologies, is the absence of Irish guidelines, similarities in the means of regulating our supplies, climatic conditions, and the evolution of our water supply asset base. It is, however, important to note that Ireland is 25-30 years behind the UK in terms of water resources planning, and we will need to develop our data and intelligence systems. Due to the relatively low performance of our asset base, we have also included water quality risk (and Drinking Water Safety Plans) within our plan, to ensure that we have appropriately understood our strategic transformation and associated funding requirements.

A 1 in 50-year Level of Service is used in this iteration of the NWRP. It will allow us to have a uniform improvement in Level of Service to all our customers. Once we have achieved this outcome, we will review the applicable standard.

In order to future proof our water supplies and ensure that they can adapt to climate change, greater emphasis will be placed on utilising natural groundwater storage and impounding storage as part of the NWRP.

As part of our risk-based approach, incident plans are also being developed for our supplies. The purpose of the DWSPs and inclusion of water quality risk in our NWRP, is to take a proactive approach to reducing the incidence and risk of non-compliance in our water supplies. We will also seek to reduce risk through catchment measures and source protection.

Irish Water is an active participant in catchment protection and will proactively engage in this process over the coming years. This participation will include source risk assessments for all our supplies, progression of Drinking Water Safety Plans and integrated catchment management measures. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9 of the Framework Plan.

We will also engage with the Department of Enterprise, Trade and Employment, Enterprise Ireland, IDA and Údarás na Gaeltachta in relation to forecasts for non-domestic growth requirements. It was noted that UK forecasts for non-domestic demand, which has been decreasing for a number of years, are not a useful model for forecasting likely non-domestic demand in Ireland. There is uncertainty in relation to the

relationship between increase in non-domestic activity and water use, we have used the forecasts set out in section 4.3.2.3 of the Framework Plan. We will review policy and trends in relation to this over the coming years and refine our forecasts as per the monitoring and feedback process set out in section 8.3.9 of the Framework Plan. Particular reference will be given to policies such as Enterprise 2025, Manufacturing 4.0, and sector specific publications such as BioPharma and Distilling. Through our Connection Developer Services function, Irish Water has an early engagement process in place (Pre-Connection Enquiry) to facilitate forward planning for new connections. Further information can be found on our website www.water.ie.

The Scottish Water International Report is being reviewed internally within Irish Water. The processes established in that document have informed the development of the NWRP. The NWRP is a 25-year strategic plan, which takes a short, medium, and long-term view of the public water supply.

5.7 International Best Practice

5.7.1 Summary of International Best Practice Feedback

Just as the draft Framework Plan adopted the Institute of Hydrology methodology to estimate the hydrological yields from river, lake, and reservoirs sources, GSI suggested that an internationally recognised methodology should be adopted when estimating the hydrological yield from groundwater. The advantages being the ability to garner additional data, track any changes in output, inform on-going maintenance programmes and allow any impact of climate change to be identified.

GSI also welcomed Irish Water's approach to the identification and management of risk to water supplies by the inclusion of the principles within the WHO's Drinking Water Safety Plans and the recast Drinking Water Directive.

5.7.2 Response to International Best Practice Feedback

Irish Water has noted comments from the CRU and GSI on the Surface Water and Groundwater Assessment methodologies used within the NWRP and has provided some further detail to assist in the understanding the processes undertaken. Please refer to Appendix C in the Framework Plan.

The EPA, HSE and GSI raised the need to progress the national roll out of the World Health Organisation, Drinking Water Safety Plan approach to ensure a risk-based approach to safety and security of our water supplies. In relation to improving water quality and reducing risk across our supplies, a number of respondents emphasised the need for catchment measures, and ecosystems services. Irish Water concurs with this view and is an active participant in catchment-based initiatives. As part of the roll out of the Drinking Water Safety Plan, we will also progress site specific source risk assessments.

5.8 Conclusions on Policy Feedback

Having carefully reviewed the submissions received on the theme of Policy, Irish Water considered that a number of changes should be made to the draft Framework Plan. These changes are outlined in section 5.8.1 of this report regarding "Clarifications"

below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 5.8.2 regarding “Recommendations” below.

5.8.1 Clarifications on Policy Feedback



The following sections of the Framework Plan have been updated to reflect feedback on under the theme of Policy:

Section 1.9.4, Table 2.2, and Figure 2.3

Section 1.8.2

Box 4.1 in section 4.3.2

Box 5.2 in section 5.5 and cross referenced in section 5.9

Box 8.1 in section 8.3.7

5.8.2 Recommendations on Policy Feedback

1. We will include reference to the NPF key policy objectives in the RWRPs.
2. We will further update the draft RWRPs and demand calculations based on emerging data through the monitoring and feedback process set out in the Framework Plan.
3. We will engage with the RSES, local authorities and the Department of Enterprise, Trade and Employment on domestic and non-domestic growth requirements.
4. We will reference the European Green Deal and EU Biodiversity Strategy in section 3 of the SEA Statement.
5. We will work with the EPA and GSI on improving knowledge of our supplies, including improved conceptual understanding of groundwater bodies, and the potential impacts of agricultural intensification and climate change.
6. We will progress pilot studies to better understand and quantify water conservation and efficiency measures such as rainwater harvesting and greywater reuse.
7. We will progress pilot studies to test network resilience models.

6. Regional Plans

In this chapter, we summarise the key references in submissions to issues under the broad theme of “Regional Plans”. Within the overall Regional Plans theme, we identified four sub-themes, which we set out in Figure 6-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

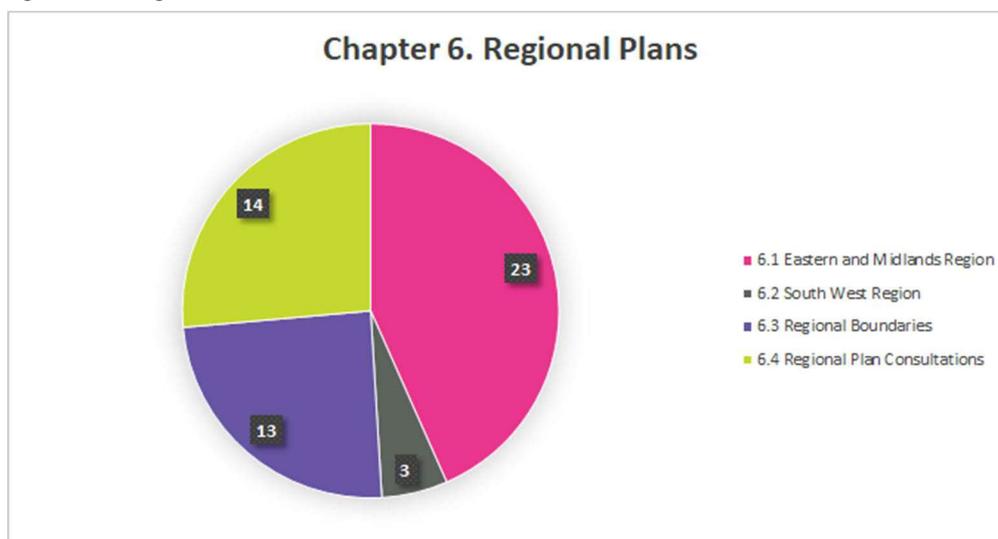
Relevant feedback captured in this chapter will be fed forward to those involved in the development of the Regional Plans during Phase 2 NWRP – RWRPs.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 6-1 details the breakdown of feedback received under the theme Regional Plans. It shows that of the 53 mentions² in submissions that mentioned regional plans, the most frequently mentioned were related to the Eastern and Midlands Region with 23 mentions, followed by regional plan consultations with 14 mentions. Figure 6-1 below also identifies the four sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 6-1 Regional Plan Theme



² The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

6.1 Eastern and Midlands Region

6.1.1 Summary of Eastern and Midlands Region Feedback

Kildare County Council referred to the workshops that Irish Water undertook last year regarding Water Supply Zones and requested that once Irish Water finalise the screening and identify preferred options that these options are discussed in more detail to establish their practicality, cost, benefits, and overall implications

Deputy Fergus O'Dowd highlighted concerns relating to the projected populations of Drogheda and East Meath in the NWRP. He stated the NDP 2040 noted Drogheda was designated as a centre for population growth and advised that any increases in population will leave the current wastewater treatment plant under significant pressure in the coming years. As a result, he requested assurance that appropriate and proper planning be undertaken to manage future capacity needs.

Limerick City and County Council noted that Newcastle West is identified as a key town for growth in the RSES and requested that a Water Resource Plan be prepared for Limerick. The Council stated it is essential to be able to achieve the objectives of the NPF and the RSES through its own City and County Development Plan.

The Environmental Trust claimed the designation of parts of Limerick, Tipperary, Clare, and other counties along the River Shannon into a Group with Dublin is arbitrary, with significant potential adverse consequences for European Natura protected sites. They urged Irish Water to remove Limerick, Clare and Tipperary and other counties on the River Shannon from this designation group.

The RSPA raised concerns with Irish Water's proposition in the draft Framework Plan that the resource allocation is already established in the Eastern and Midlands area and that the Shannon Estuary to Dublin forms an integrated resource and supply area already. They questioned why a pipeline is proposed to cross fields and boglands when two canal systems already exist from Shannon to Dublin, both of which require substantive water resources. They stated that the main inputs to the NWRP are incorrectly structured to fit around this and questioned whether dialogue between Irish Water and IWAI is in place. A stakeholder included an extract from Dublin City Council in relation to the Drumcondra area of Dublin. They noted that Dublin City Council cited constraints on development in the area. The stakeholder added "since the document was prepared, Irish Water has effectively supported further developments in this area, without seeming to have increased capacity of the local water services."

The CRU stated that the publication of Irish Water's assessment of forecast non-domestic demand would help the understanding of the selection of demand scenarios. The CRU submitted that the 67% increase in growth in non-domestic demand in the Greater Dublin Area (GDA) is not adequately validated in the NWRP. Given the impact of this growth, Irish Water should provide a justification for its assumptions and evidence of the forecasts.

Councillor Johnny Flynn referred to the planning application for the Clonroadmore Wastewater Treatment Upgrade, document titled "Ennis Main Drainage – Overview," which identified several proposals for sustainable wastewater management. Councillor

Flynn noted that since a review in 2009 no progression has been made and that these findings should be considered when progressing with any major water infrastructural plans around the Ennis Public Water Supply.

Dublin Chamber referred to the population growth outlined in the NWRP for the GDA and submitted that a situation cannot develop where water security and supply issues force a cap on any potential growth. Dublin Chamber welcomed the front loading of the growth to 1.3% between 2020 and 2030 for the Water Resource Zone that covers the GDA. They stressed the urgent need to progress the Water Supply Project, to provide water security, sustain current services, and enable future development. Dublin Chamber endorsed Irish Water's preferred scheme, being the Parteen Basin option, for the Water Supply Project.

Deputy Imelda Munster referenced Staleen Water Treatment Plant and a recent visit she undertook and claimed that the necessary volumes of treated water required to facilitate Drogheda's projected growth have not been addressed by Irish Water.

6.1.2 Response to Eastern and Midlands Region Feedback

As the Framework Plan has been adopted, the next Phase of the NWRP is the preparation of the four Regional Water Resource Plans. These will include the identification of Preferred Approaches for each Water Resource Zone. We will progress the development of the Feasible Options and Preferred Approaches, in advance of publication of the draft RWRPs, with the Local Authority Water Services sections. This information will then be subject to public consultation.

A number of respondents highlighted concerns about the ability of water and wastewater infrastructure to support growth. This is one of the primary objectives of the NWRP. By incorporating national policy on growth, we can better understand our existing asset base and the interventions required to support growth and economic development across the regions. To ensure we can support growth while transforming our supplies, we also include for interim measures within our NWRP. Interim measures such as the upgrade to Vartry WTP and Staleen WTP have been progressed to support growth as part of our current regulated investment cycle. However, it should be noted that such measures do not improve Levels of Service, they prevent current levels from deteriorating further.

In light of the fact that this is the first NWRP, with 539 WRZs and a very significant challenge in terms of historic underinvestment in water infrastructure to date, it was considered necessary and prudent to divide the public water supply system into the four Regional groups. These regional boundaries are only relevant for the development of the first NWRP and have been identified as the most appropriate way to allow Irish Water to identify Preferred Approaches for each WRZ in an efficient and timely manner. The regional boundaries were established according to the factors set out at section 1.9.4 of the Framework Plan.

Once the first NWRP has been finalised, while it is comprised of the Framework Plan and four Regional Water Resources Plans, together they will be treated as a unified plan. The relevant regional groupings will have no ongoing application. In particular, the

Preferred Approaches identified in each RWRP will be prioritised collectively through Irish Water’s planning and investment cycles. In other words, there will not be any difference in investment priority across the four regional groupings. Where local authority areas have been split, Irish Water will engage with the relevant local authorities following the finalisation of the RWRPs, on the outcomes for all of the water supplies in their areas. As IWAI is a stakeholder, there is ongoing dialogue with Irish Water. Irish Water recognises that canals are waterbodies in the RBMP and must achieve "good status" under the WFD (SEA Statement chapter 3).

Options such as the transfer of water from Shannon to Dublin, more reservoirs, and modern water treatment plants are “unconstrained” options and are considered within the RWRPs.

We will also engage with the Department of Enterprise, Trade and Employment, Enterprise Ireland, IDA and Údarás na Gaeltachta in relation to forecasts for non-domestic growth requirements. It was noted that UK forecasts for non-domestic demand, which has been decreasing for a number of years, are not a useful model for forecasting likely non-domestic demand in Ireland. There is uncertainty in relation to the relationship between increase in non-domestic activity and water use. We have used the forecasts set out in 4.3.2.3. We will review policy and trends in relation to this over the coming years and refine our forecasts as per the monitoring and feedback process set out in section 8.3.9 of the Framework Plan. Particular reference will be given to policies such as Enterprise 2025, Manufacturing 4.0, and sector specific publications such as BioPharma and Distilling. Through our Connection Developer Services function, Irish Water has an early engagement process in place (Pre-Connection Enquiry) to facilitate forward planning for new connections. Further information can be found on our website www.water.ie. Irish Water is satisfied that it has used appropriate assumptions.

A number of respondents highlighted issues in relation to wastewater treatment capacity restricting growth. This iteration of the water resources plan focuses on water services. However, future iterations of the NWRP may consider both water and wastewater services.

Irish Water has sought to provide a good balance of detail (based on available data) during the consultation period, without making the plan inaccessible through excess technical detail. The forecasted 67% increase in non-domestic demand in the GDA is based on our analysis of both contracted demand and forecasted sectoral demand. Additional data to both evidence and justify assumptions made, will be provided in the context of the development of, and consultation on, the RWRPs.

6.2 South West Region

6.2.1 Summary of South West Region Feedback

Tipperary County Council noted the capacity register used by Irish Water to identify key areas for water infrastructure investment, and that the supply demand balance and barrier standards in the Framework Plan are not set in stone with regard to indicators of where growth and economic development can progress. The Council requested that an

accelerated programme of water main rehabilitation throughout the county is urgently needed to address growing issues with security of water supply. They stated that reliable evidence is available to assist in the prioritisation of certain locations within which the most critical issues arise in achieving leakage reduction in addition to security of supply. They noted the Southern Regional Assembly has adopted a RSES 2020-2032 for the Southern Region, which identified several Key Towns in Southern Region for projected growth.

The EPA requested that consideration be given to the updated information in the Agri-Food 2030 Strategy when published as it projected agricultural growth, especially in the southern region, including increased Agri-industry related demand, may be significant. The EPA advised this should be accounted for in the NWRP within the WAFU figures and assessment.

6.2.2 Response to South West Region Feedback

A number of respondents highlighted concerns about the ability of water and wastewater infrastructure to support growth. This is one of the primary objectives of the NWRP. By incorporating national policy on growth, we can better understand our existing asset base and the interventions required to support growth and economic development across the regions. To ensure we can support growth while transforming our supplies, we also include for interim measures within our NWRP. Interim measures such as the upgrade to Vartry WTP and Staleen WTP have been progressed to support growth as part of our current regulated investment cycle. However, it should be noted that such measures do not improve Levels of Service, they prevent current levels from deteriorating further.

The National Leakage Reduction Programme which includes measures such as pressure management, active leakage control and targeted water mains replacement will be one of the major interventions to support growth over the timeframe of the NWRP.

The EPA asked that consideration be given to the updated information in the Agri-Food 2020 Strategy when published and to consider its potential impact on Water Available for Use (WAFU). Irish Water will consider the data as it becomes available but may need to work with the EPA and other stakeholders to understand its potential impact on raw water availability and WAFU.

6.3 Regional Boundaries

6.3.1 Summary of Regional Boundaries Feedback

Several stakeholders queried why the Framework Plan did not give the technical basis for adopting the regional areas noting that major infrastructural investments will be based on these.

There was a request that the NWRP refer to the former River Basin Management Plans, which separated rivers such as the Shannon to its catchment, and that Irish Water commits to providing for the future needs of these areas in the first instance before committing to supplying out of the catchments based on a prior decision as to distribution of the resource.

The Southern Regional Assembly and the Eastern and Midlands Regional Assembly echoed this and requested clarity around the assignment of regional configurations, on the basis that they did not appear to be geographically compatible with the Nomenclature of Territorial Units for Statistics (NUTS) regions in Ireland nor did they appear to be determined based on river basin catchments.

Both Tipperary County Council and Limerick City and County Council highlighted that the proposed regions for the purposes of the NWRP are not aligned to planning regions or River Basin Districts and will not provide for the appropriate planning, investment and delivery of balanced regional growth as expressed in the NPF. They requested that the identification of Regional Water Resource Plan areas should be aligned with the regions identified in the NPF and the RSES.

Tipperary County Council added that two of the Regional Water Resources Plans apply to County Tipperary: the South East and the Eastern and Midlands. Tipperary County Council advised that all of County Tipperary should be included in a single RWRP and the areas covered by the four RWRPs should align with the boundaries of the existing spatial regions within the country, and Irish Water's own regional structure.

Clare PPN noted that the county of Clare will be split into two separate regions in the RWRPs and highlighted that this could cause difficulty in the preparation of County Development Plans and RSES. They also noted that this could cause competition for water investment between neighbouring counties rather than collaboration. Clare PPN requested that the regions should be mapped on existing regional planning divisions such as those used by the Southern Regional Assembly.

Longford County Council recommended early consideration of options involving the strengthening of supplies across county boundaries where possible. They stated this is a more appropriate regional approach for all parties from the perspective of timescale, environmental impact, and capital cost.

Environmental Trust Ireland stated that the four geographical areas of these RWRPs are not aligned geographically, spatially, economically, environmentally, or ecologically and should be abandoned.

Another stakeholder argued that dividing County Westmeath into two for the RWRPs does not make sense. They pointed to the fact that there are only 28 miles separating its two principal towns – Mullingar and Athlone, where Athlone and its environs is supplied by water from the River Shannon and Mullingar and its environs is supplied by Lough Owel.

DAERA Drinking Water Inspectorate (DWI) welcomed the inclusion of transboundary watercourses in the Framework Plan. They stated they are satisfied that Transboundary impacts are accounted for and asked that the proposed utilisation of groundwater sources in transboundary areas does not impact on the quality or sufficiency of existing private water supplies in Northern Ireland.

6.3.2 Response to Regional Boundaries Feedback

In light of the fact that this is the first NWRP, with 539 WRZs and a very significant challenge in terms of historic underinvestment in water infrastructure to date, it was

considered necessary and prudent to divide the public water supply system into the four Regional groups. These regional boundaries are only relevant for the development of the first NWRP and have been identified as the most appropriate way to allow Irish Water to identify Preferred Approaches for each WRZ in an efficient and timely manner. The regional boundaries were established according to the factors set out at section 1.9.4 of the Framework Plan.

Once the first NWRP has been finalised, it is comprised of the Framework Plan and four Regional Water Resources Plans which together will be treated as a unified plan. The relevant regional groupings will have no ongoing application. In particular, the Preferred Approaches identified in each RWRP will be prioritised collectively through Irish Water's planning and investment cycles. In other words, there will not be any difference in investment priority across the four regional groupings. Where local authority areas have been split, Irish Water will engage with the relevant local authorities following the finalisation of the RWRPs, on the outcomes for all of the water supplies in their areas.

A needs assessment and Preferred Approach is developed for every single water supply, incorporating population data from the RSES, local authority development plan information will be used as it comes available as per the monitoring and feedback process outlined in section 8.3.8 of the Framework Plan.

The NWRP is a national plan, and the four RWRPs are for delivery purposes only. Within the Strategic Environmental Assessment, we consider cumulative assessments at a catchment level. Options such as the transfer of water from Shannon to Dublin, more reservoirs, and modern water treatment plants are "unconstrained" options and are considered within the RWRPs.

The Regional Groupings are for delivery purposes only and prioritisation of activities/interventions for coming capital investment plans will be progressed when the NWRP is delivered in its entirety. Growth and economic development will be one of the considerations during prioritisation. Irish Water will interface with the Regional Assemblies and local authority planning and development departments during this process as outlined in section 1.8.2 of the Framework Plan.

As part of the Framework Plan, the groundwater assessment used to develop Preferred Approaches is designed to ensure no impact on neighbouring supplies, public or private. Please refer to Appendix C of the Framework Plan for further detail. This is also assessed at a project level.

6.4 Regional Plan Consultations

6.4.1 Summary of Regional Plan Consultation Feedback

AFU requested the provision of a more detailed report on the public water supply issue in the GDA within the NWRP. The GDA, they stated, is a specific case and should be an urgent priority for Irish Water.

The Southern Regional Assembly referenced the facilitated workshops between Irish Water and local authorities as part of the Framework Plan development process and stated they look forward to continued consultation in the preparation of Phase 2

RWRPs. They recommended for both the completion of the NWRP and RWRPs that Irish Water, in coordination with local authorities, align with their objectives of the RSES and MASPs for infrastructure led regeneration and growth.

The EPA considered Irish Water's approach to regional solutions a positive step that supports the rationalisation of smaller and more vulnerable water supplies. They advised it is essential that the NWRP and the four RWRPs take account of any new or revised legislation relating to the recast Drinking Water Directive and the forthcoming abstractions control regime.

The CRU stated that Irish Water should quantify the population served, the size of deficits and the impact this is having in terms of unplanned outages for customers across the four regions.

SWAN requested a precautionary approach be adopted by the NWRP and the RWRPs by Irish Water regarding abstraction.

AECOM noted that the Framework Plan is utilising the 2019 year as the base year for the supply/demand balance and highlighted that recent pandemic conditions have resulted in not only significant impacts to the 2020 year demands but will also impact ongoing years due to the redistribution of resources and therefore growth projections. AECOM suggested that this aspect needs further consideration and should be addressed in a consistent manner in the four RWRPs.

Limerick Greens advised they would prefer to see the Limerick City Water Treatment Plant form a major part of the public consultation on the RWRP in 2021. They recommended that Irish Water align the four RWRPs with the RBMP and further undertake a rationalisation of existing infrastructure to allow for smarter investment at strategic locations within each of the four zones.

A stakeholder asked why the NWRP does not provide the estimated resources in each regional area in terms of river, lake, groundwater resources and therefore how can future needs be considered satisfied.

6.4.2 Response to Regional Plan Consultations Feedback

The NWRP is a national plan, and the four RWRPs are for delivery purposes only. As part of the Strategic Environmental Assessment for the Framework Plan, we have considered cumulative assessments at a catchment level. The Preferred Approaches will also be assessed cumulatively, as part of the SEA processes for each of the RWRPs.

A needs assessment and Preferred Approach is developed for every single water supply, incorporating population data from the RSES, local authority development plan information will be used as it comes available as per the monitoring and feedback process outlined in section 8.3.8 of the Framework Plan.

The NWRP relates to a live and functional water supply, therefore "need" across our existing supplies is the starting point for our NWRP. Where need is identified, we then set about assessing options to address need. As continuity of water supply must be ensured whilst delivering NWRP, the existing asset base is the logical starting point.

The Greater Dublin WRZ will be assessed as part of the RWRP for the Eastern and Midlands Region.

Irish Water has submitted a full list of our abstractions to the EPA as required by SI No. 261 of 2018 which is called the European Union (Water Policy) (Abstractions Registration) Regulations 2018 as part of the new legislative framework on water abstraction. We will engage fully with the requirements of the new legislation on abstraction, including general binding rules relating to measurement of abstraction. We will also engage fully with the requirements of the recast Drinking Water Directive.

Any additional legislative and regulatory requirements will be incorporated into the NWRP based on the monitoring and feedback process set out in section 8.3.8 of the Framework Plan.

Within our water resources planning process, we strive to improve environmental outcomes including the transformation of our existing supplies and migration to sustainable abstraction through our investment plans. We take a conservative approach when conducting desktop assessments of Preferred Approaches using the methodology set out at Appendix C of the Framework Plan.

The base year used by Irish Water in the development of its NWRP is 2019, as 2018 was a significant drought year, and a National Water Conservation Order was issued for much of the summer period. Similarly, in 2020, restrictions related to Covid-19 may have altered the baseline demand figures for that year. Irish Water remains of the view that it is appropriate to use 2019 as the base year.

6.5 Conclusions on Regional Plans Feedback

Having carefully reviewed the submissions received on the theme of Regional Plans, Irish Water considered that one change should be made to the draft Framework Plan. This change is explained in section 6.5.1 of this report regarding “Clarifications” below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 6.5.2 regarding “Recommendations” below.

6.5.1 Clarifications on Regional Plans Feedback



The following section of the Framework Plan has been updated to reflect feedback under the theme of Regional Plans:

Section 1.8.2

6.5.2 Recommendations on Regional Plans Feedback

1. Irish Water will engage individually with each of the local authorities on completion of the RWRPs to summarise outcomes and discuss prioritisation for all the water supplies on a national basis.

2. Irish Water will continue to engage with the Regional Assemblies and the local authority planning and development departments through our Forward Planning team.
3. Irish Water will ensure that relevant feedback from this Phase 1 NWRP Framework Plan is fed forward to those involved in Phase 2 NWRP – RWRPs.

7. Environment

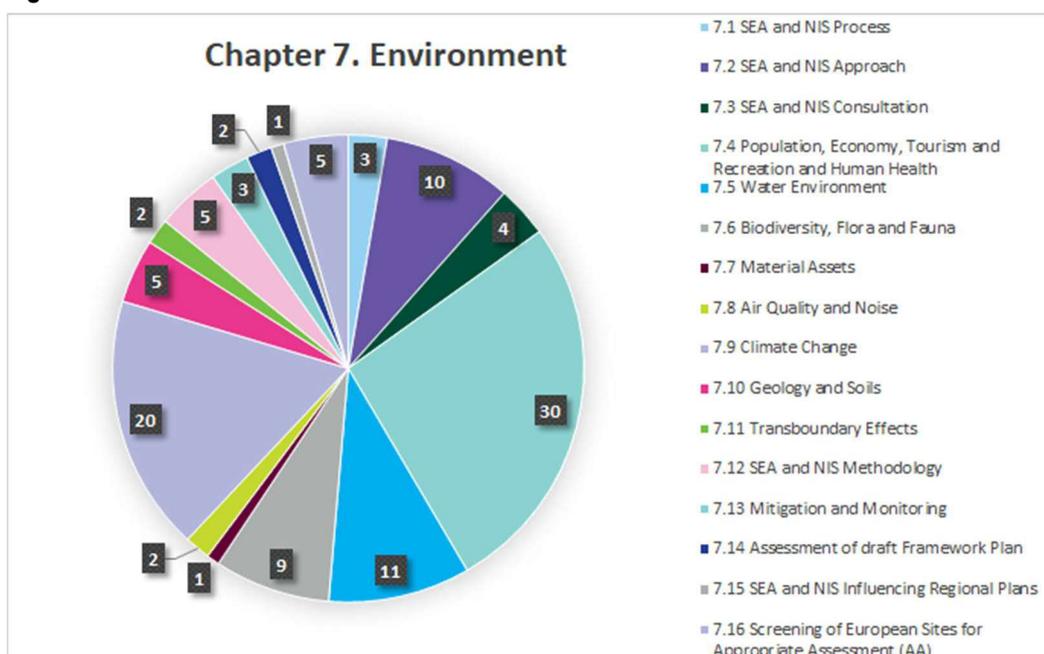
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Environment”. Within the overall Environment theme, we identified 16 sub-themes, which we set out in Figure 7-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 7-1 details the breakdown of feedback received under the theme Environment. It shows that of the 113 mentions³ in submissions that mentioned environment, the most frequently mentioned were related to population, economy, tourism and recreation and human health with 30 mentions, followed by climate change with 20 mentions. Figure 7-1 below also identifies the 16 sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 7-1 Environment Theme



³ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

7.1 Strategic Environmental Assessment (SEA) Process

7.1.1 Summary of SEA Process Feedback

The HSE referred to a recent development process published in Water News Europe in relation to the potential environmental impact of desalination which should be reviewed to determine whether the environmental impacts estimated for desalination in the SEA are still valid. Overall, the HSE found no issue with the SEA and NIS assessment approach.

SWAN requested a more comprehensive response regarding sensitive sites. Additionally, SWAN recommended that measurements for abstractions over 20m³/day should be taken as part of a licensing regime, which should be used to assess and regulate ecological impacts.

DAERA Countryside, Coast & Landscapes team welcomed the inclusion of Transboundary impacts and Zone of Influence in both the SEA and NIS. The DAERA Drinking Water Inspectorate welcomed the inclusion of their comments on transboundary considerations and the scope of the assessment in the NWRP SEA Environmental Report and stated that they are content that the transboundary impacts have been considered.

DAERA Climate Change Unit noted that Northern Ireland's second Climate Change Adaptation Programme (NICCAP2) which was published in September 2019 and spans from 2019-2024, should be noted in the Transboundary section of Appendix B of the SEA.

7.1.2 Response to SEA Process Feedback

Overall, the EPA, HSE and some local authorities found no issue with the SEA and NIS assessment approach and DAERA welcomed inclusion of the transboundary impacts considered following their submission during the scoping stages. While some respondents expressed the view that the SEA and NIS were inadequate, however it must be noted that the SEA and NIS are for the purpose of Plan level assessments only. Irish Water is satisfied that the process regarding the draft Framework Plan has fully complied with the requirements of the SEA Directive and Habitats Directive at that scale.

The Preferred Approaches developed as part of the overall NWRP, are plan level desktop assessments. With that in mind, we have taken a conservative approach to identifying potential impacts on sensitive sites (without mitigation measures). We have used conservative methodologies to assess water availability from such sites. Any Preferred Approach identified in the RWRPs that is prioritised and included or initiated within a capital investment cycle, will include project-level applications for consents as required, and full site level environmental assessments will be carried out as necessary at that point. Sensitive sites will be fully assessed as part of the development of the RWRPs.

General Binding Rules on measurements of water abstraction and thresholds are likely to be stipulations in any future legislation on water abstraction which Irish Water will fully comply with.

Reference to potential General Binding Rules on measurements of water abstraction and thresholds will be included in Regional Plan SEAs. See chapter 3 of the SEA Statement.

7.2 Strategic Environmental Assessment (SEA) Approach

7.2.1 Summary of SEA Approach Feedback

Roscommon County Council noted that both the SEA and NIS are quite comprehensive, and they will provide more feedback when the “SEA and AA of the Regional Water Resources Plans are issued out to public consultation.” Environmental Trust Ireland commented that the SEA and the NIS are inadequate and not in accordance with EU law, in particular “the Habitats Directive, the Birds Directive, the Water Framework Directive, the Groundwater Directive, and the 2014 Environmental Impact Assessment Directive.”

Conversely, the HSE noted that they found no issue with the overall approach to the SEA or NIS, and Kildare County Council had no comments on the SEA and NIS.

The Southern Regional Assembly noted that the draft NWRP “should advocate for a cross-agency and multi-disciplinary integrated approach to Nature-Based Solutions and Blue-Green Infrastructure.” They submitted that these approaches should be incorporated into the early design, as if used correctly it can help better utilise existing water management infrastructure.

DAERA SEA Team stated that any structures which are to be introduced to watercourses or similar facilities should have an individual maintenance plan in which consideration is made to the potential transboundary impacts of such work. They added that the Erne System has had a considerable impact from construction, in particular the construction of the hydroelectric dams at Ballyshannon. They also questioned why Table 6.4 of the SEA Environmental Report did not contain the Erne and Melvin catchments.

DAERA Department for Communities (DfC) Historic Environment Division (HED) welcomed “that the historic environment and cultural heritage have been scoped in for assessment, and particularly that they are receiving consideration in light of the potential for transboundary effects.” They highlighted that consideration should be given to potential impact on heritage assets as they should have the same impact of changes in hydrology, such as archaeological features and survival remains. They acknowledged and welcomed the use of their datasets in the environmental report and highlighted the “the wider transboundary elements of heritage articulated through our intertwined post-medieval vernacular heritage and landscape character.”

The EPA acknowledged “the main environmental issues identified for the various environmental criteria considered in the assessment and the plan.” They noted that the EPA’s State of the Environment Report was incorporated within the SEA Environmental Report, however requested that the next iteration, Ireland’s Environment – An Integrated Assessment 2020 (EPA, 2020), should also be included and used to update relevant sections and to address environmental challenges facing Ireland.

Longford County Council noted that many of the main sources for water supplies around the country have environmental constraints and planning restrictions especially from designations such as Special Area of Conservation (SAC). These restrictions also impact the cost and timing of infrastructure projects. Longford County Council recommended that the constraints be identified early and options that have a lower level of environmental risk are utilised to minimise delays to project delivery.

AECOM stated that it is not clear how the “three ecosystem services of interest (climate regulation, food – crops and livestock, and traffic-related impacts)” have been explored and identified, and the extent at which they are relevant to all of the options. They would be interested in understanding how the three priority services were identified and the rationale to explain why other important ecosystem services were excluded such as biodiversity, water quality regulation, water supply, and natural hazard regulation, flooding, and erosion.

Chambers Ireland strongly supported improving the nation's environmental performance as on most of the environmental metrics Ireland fails to meet the standards set out by European nations. As a result, significant work is required to restore Ireland's natural resources. Chambers Ireland stated that many of the actions required to improve Ireland's environmental performance would be complementary to Irish Water's activities.

Clare PPN noted that the SEA contains clear objectives and targets however they were unable to establish where accountability for monitoring these objectives lies and requested that Irish Water revert on this.

7.2.2 Response to SEA Approach Feedback

While some respondents submitted that the SEA and NIS were inadequate, on the basis the SEA and NIS are for the purpose of Plan level assessments, Irish Water is satisfied that they fully comply with the requirements of the SEA Directive and Habitats Directive at that scale.

Irish Water is an active and engaged stakeholder in catchment-based measures and agrees with comments from the Southern Regional Assembly that cross-agency integrated approaches should be advocated.

DAERA's SEA team raised the consideration of maintenance plans for structures introduced in water bodies, which is aligned with similar submissions from IFI on impediments to fish movement. These considerations will be incorporated into the scoping documents for infrastructure developments at project level. The fine screening questions used in the options assessment methodology as described in the draft Framework Plan are based on the categories for consideration as set out in the SEA Directive, including heritage considerations. As we progress through our resource planning cycles and continue to engage with research bodies through our Innovation Team, we will further integrate ecosystem services into our Preferred Approaches. At project level, appropriate archaeological studies will be carried out as part of the consenting process. We will also consider whole life environmental and carbon costings in our RWRPs.

Table 3.3 in chapter 3 of the SEA Statement includes reference to "Ireland's Environment – An Integrated Assessment 2020 (EPA, 2020)".

Considerations of planning and consenting constraints relating to SACs are included in the screening assessments for all options to be considered in the RWRPs.

The Monitoring Plan is included in chapter 4 of the SEA Statement and the implementation of the Monitoring Plan is committed to in the Framework Plan as noted in section 8.3.8.

Delivery of the NWRP will ensure sustainable growth and resilient water supplies to support the growth strategies set out by the Regional Assemblies and the local authority development plans.

7.3 Strategic Environmental Assessment (SEA) Consultation

7.3.1 Summary of SEA Consultation Feedback

Kildare County Council noted that Irish Water held a workshop to discuss the NWRP as part of the screening process. The Council stated that their understanding of the NWRP is that the main objective is to identify new water resources to augment the supply in the Greater Dublin Area (GDA).

Environmental Trust Ireland noted that they look "forward to receiving extensively revised and adequate documentation pertinent to the National Water Framework Plan and in particular, information relating to the environmental and ecological effects of Irish Water's proposals including cumulative and predicted in combination effects based on a full assessment and a thorough analysis." Additionally, Environmental Trust Ireland requested the Framework Plan take into consideration European Natura 2000 protected sites.

GSI requested access to all groundwater source protection information, to fulfil their role as a statutory consultee for Strategic Environmental Assessments (SEA), Environmental Impact Assessment Reports (EIAR), and County Development Plans.

7.3.2 Response to SEA Consultation Feedback

The objective of the NWRP is to ensure quality, quantity, reliability, and sustainability across all public water supplies, it is not focused on any one area. Where need is identified, a Preferred Approach will be developed for each water supply (water resource zone) as part of the RWRPs.

The Framework Plan and the RWRPs being developed will all comply with the SEA and AA obligations applying at a Plan level. Cumulative impacts and in-combination effects will be considered in each of the draft RWRPs to the fullest extent possible as based on available data. The Methodology in the Framework Plan will be applied in the development of the draft RWRPs and full consideration given to all relevant Natura 2000 sites.

Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies.

Irish Water will also incorporate information from the GSI regional assessments into our options assessments as they become available.

7.4 Population, Economy, Tourism & Recreation and Human Health

7.4.1 Summary of Population, Economy, Tourism & Recreation and Human Health Feedback

Several stakeholders commented on the projected growth across regions, cities and towns which should be considered in the NWRP and supported financially.

Limerick City and County Council noted that the NWRP and associated funding should be aligned with the timeframes of the provision of the NPF and RSES. They stated this is not currently the position and the consequence of this is that the compact growth of Limerick cannot be delivered.

The Eastern and Midlands Regional Assembly stated that the “RSES presents a Spatial Strategy, devised and informed by a complementary Economic Strategy, which provides a framework for future growth, ensuring the delivery of effective regional development through the realisation of viable and vital places. This includes championing the capital city of Dublin as a smart, climate resilient and global city region.” They noted that climate-resilient regional growth centres including Athlone, Drogheda and Dundalk would act as regional economic drivers, to support the surrounding catchment areas and promote a network of large economically active Key Towns that provide employment and services to their surrounding areas.

In addition, they stated, “the sustainable growth of the Region outlined in the RSES requires the investment and provision of services and infrastructure, including water services infrastructure in a plan led manner to ensure that there is adequate capacity to support future development and targeted growth.” The Assembly also noted the population growth rate of settlements included in the draft Framework Plan are based on the draft NPF. The Assembly requested that Irish Water take into consideration the Implementation Roadmap for the NPF under DHPLG Circular FPS04/2018, and the Housing Supply Target Methodology for Development Planning (issued as Guidelines for Planning Authorities) which provides the transitional set of regional and county population projections to 2031 which are informing the current review cycle of City and County Development Plans and should be the primary source of population growth forecasts for the NWRP.

The Assembly also noted the terminology used in the draft Framework Plan in terms of Regional Growth Cities and requested that Irish Water recognise that “Athlone, Drogheda, Dundalk (within the EMRA region) and Letterkenny and Sligo (within the NWRA region) are designated ‘Regional Growth Centres’ with lower growth population projections than that of the cities in accordance with NPO 8 of the NPF and which are further defined in the respective regional spatial and economic strategies.”

The Assembly also noted the critical need for the prioritisation of water supply investment to facilitate future growth of the GDA in line with NPF population growth projections, and stated that the Water Supply Project is required to ensure sufficient treated water is available to meet the long-term water supply needs of the GDA Region.

The Southern Regional Assembly stated the importance of identifying water infrastructure needs in rural areas, in particular, where significant levels of population and employment growth are projected in line with the RSES and MASPS for infrastructure led regeneration and growth.

The Assembly continued that on-going retrofitting and upgrades to the existing water supply networks should be addressed, and servicing core strategies of each local authority City and County Development Plans should be undertaken to support infrastructure led regeneration, growth and resilience for all locations in the Southern Region.

Additionally, the Assembly suggested that Irish Water should support the delivery of housing developments and achievements of growth targets and deliver incentive infrastructure packages to help build an economically resilient, competitive, and growing region.

The Assembly requested that Irish Water be cognisant of the population projections for the cities and metropolitan areas of Cork, Limerick Shannon and Waterford as outlined in the RSES and MASPs when preparing its Plan and to take into account the Region's growth trajectory as outlined in section 1.0. Within our Region, 2021-2022 of the RSES.

IFI acknowledged the importance of angling to the Irish economy as freshwater and marine recreational angling supports over 11,000 existing Irish jobs and is used by thousands in a recreational capacity, especially as Ireland is an international recreational angling location.

Clare PPN raised concern that the draft Framework Plan currently provides solutions directed towards areas of largest populations and requested that balanced regional and rural development is also considered in the Framework Plan.

Clare PPN also raised a concern that water and wastewater treatment services are adversely affecting rural development in County Clare, particularly since the transfer of water services management from the local authorities to Irish Water. They mentioned that no democratic process exists where its members, the elected Councillors or the local authority can prevent rural depopulation and actively participate and prioritise the rural economic and social development in the county. Clare PPN proposed that Irish Water puts in place local task forces and works with them to establish the priorities for the county to ensure the best outcomes.

Councillor Johnny Flynn also noted that having a safe drinking water supply is essential for the nation's health including rural Clare. The Councillor continued that in "Clare over 20% of the population use private or group water supplies due to the public water supply network not being readily accessible to them." Councillor Flynn requested that the Framework Plan consider the potential to increase the proportion of the population served by public water supplies as without water, growth and development cannot occur in the region.

Chambers Ireland highlighted Urban Revival as an area where our national ambitions need to be expanded. However, this will not be possible until Irish Water carry out essential works to accelerate growth. Chambers Ireland continued "developing

Sustainable Cities and Communities (Goal 11) will not only support our economic achievement it also directs us towards investing in our urban cores to support town centre living.”

The Chamber stated that urbanised living also promotes more active travel and a reduction in carbon emissions, and upgrading the vacant premises of our cities and towns “offers an opportunity to efficiently retrofit those buildings which will not only reduce the cost of living for urban populations but will also have a disproportionate effect on reducing fuel poverty.” The Chamber noted that densification of the population is a core aim of the NWRP and will be essential if Ireland is to become a resilient, robust, and prosperous society.

The Dublin Chamber also noted urbanisation and population growth and raised a concern that water security and supply issues will force growth to slow. The Dublin Chamber continued that an overreliance on abstraction from the River Liffey threatens Dublin's economic growth and the Government must prioritise the completion of new abstraction legislation.

Several local authorities noted the growth capacity in their region and the supply demand balances set out in the NWRP. Meath County Council stated that Meath is one of the fastest-growing counties in the country. They noted that substantial investment in water infrastructure was provided to County Meath over the last 15-20 years in response to growth in the area. However, as the population continues to grow sustained investment in infrastructure will be key to facilitate the additional demand from services, businesses, and homes.

Meath County Council stated that it has been proactive in its approach to economic development in the county in recent years. They noted that the draft Framework Plan acknowledges that economic activity is likely to increase over the 25-year period, however “allows growth in non-domestic demand only in towns and cities identified for growth in the National Planning Framework.” As a result, the Council is concerned that there is insufficient available capacity to accommodate development arising out of the Economic Development Strategy.

Deputy Imelda Munster noted that the Staleen WTP will not be able to deliver the increased volumes of treated water required for Drogheda and South Louth's projected growth.

Tipperary County Council stated that Irish Water's capacity register included in Box 4.1 of the draft Framework Plan is essential in informing both Irish Water and the Council when to plan for investment to provide growth in County Tipperary. The Council also referred to the population forecasts in the draft Framework Plan and requested that Table 4.4 be revised to consider the growth rates included in the RSES 2020-2032 for the Southern Region.

They added that further details on population projections within County Tipperary will be included in the Tipperary Draft County Development Plan 2022-2028, which is anticipated to be published in July 2021. They also raised concern that Irish Water's Investment Plan 2020-2024 will be unable to provide appropriate security of water

supply to ensure integrated delivery of sustainable development and suggested that a reliable water supply would facilitate domestic and economic development.

The OPR noted that “population forecasts in table 4.5 of the draft Framework appear to be based on the draft NPF rather than those in the final NPF and the NPF Implementation Roadmap,” and suggested that these be updated in the Framework Plan.

The Department of Enterprise, Trade and Employment, Enterprise Ireland, and IDA noted that Ireland is rated 24th out of 141 countries in the World Economic Forum’s Global competitiveness index and the water reliability is rated at 47th out of 141 countries which have reduced eight positions since 2018. They added that water infrastructure and services are vital in supporting key growth sectors including food and drink, pharmaceuticals, technology, and manufacturing which provide considerable employment in Ireland.

Several stakeholders noted the impact of Covid-19 and Brexit on the economy. They have both created huge pressure on economic activities worldwide and recovery is dependent on several aspects including resilient, responsive water, and wastewater services.

The Department of Enterprise, Trade and Employment, Enterprise Ireland and IDA stated that “the wider public policy framework, including economic regulation and the planning system, will, of course, need to be conducive to the delivery of capital projects in an efficient manner.”

Chambers Ireland stated that “the swift execution, and success, of the National Development Plan, is essential for our national wellbeing given the immediate economic hurdles our country faces.” The Chamber continued that the NWRP will help stimulate the economy and will be a cornerstone in creating a more resilient country economically and environmentally.

The EPA noted that water infrastructure issues should be addressed immediately to reduce risk to public health. Additionally, the EPA requested information on the short-term plan for emergencies such as when the treatment barrier is compromised.

The EPA also requested that the following documentation is referenced in the Framework Plan: Agri-Food Strategy 2030, Fáilte Ireland’s 10 Year Tourism Strategy, Fáilte Ireland Visitor Experience Development Plans, Waterways Ireland Tourism Masterplan for the River Shannon.

The Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media welcomed the inclusion of Tourism under the heading of sustainability.

Wicklow County Council noted that the “delivery of adequate, resilient and modern water supply infrastructure is essential to meet the needs of current and planned future development in County Wicklow concerning residential, industrial, commercial, agricultural and tourism.”

7.4.2 Response to Population, Economy, Tourism and Recreation and Human Health Feedback

Irish Water confirms that the Regional Policy Objectives (RPOs) are central to the Framework Plan, and the growth projections used were based on best available data from the Regional Assemblies at the base year of 2019. The published data in the draft NPF was used and will be supplemented as more up-to-date data becomes available. A workshop was also held with each local Authority's planning and water services section to review data and information in advance of publication of the draft Framework Plan. The outputs from the draft RWRPs, for all supplies, will be assessed nationally and prioritised on an equivalent basis for future investment plans. Irish Water is regulated by the CRU, and one of the prioritisation criteria for our investment plans is Growth and Economic Development. When prioritising growth projects through Irish Water's Capital Investment Plans, we will ensure that these decisions are based on dialogue with the RSES and local authority housing and planning functions. We also recognise the obligation to comply with our regulator for water quality and the environment, the EPA, and the requirements stipulated in relevant legislation and regulations.

Irish Water also recognises the need for balanced development and the need to support rural communities. As national prioritisation methodologies can be skewed towards larger populations, Irish Water will facilitate rural growth through a ring-fenced investment programme known as the "Small Towns and Villages Programme." However, it should also be noted that all supplies from the largest to the smallest are considered within the NWRP, with needs assessments and Preferred Approach developments conducted for every one of the 539 water supplies nationally.

Irish Water recognises that water infrastructure and services are vital in supporting key growth sectors including food and drink, pharmaceuticals, technology, and manufacturing which provide considerable employment in Ireland. Irish Water will review non-domestic demand requirements through the feedback and monitoring process set out in section 8.3.8 of the Framework Plan.

The NWRP is aligned with the principles underlying the European Green Deal which will be factored into the national prioritisation of preferred options following adoption of the RWRPs in the context of our Strategic Funding Plan and our Capital Investment Programme. The European Green Deal is now referenced in Table 3.3 in chapter 3 of our SEA Statement.

Irish Water recognises the importance of the water environment in job creation and will work with other organisations through the RBMP process to investigate complementary activities to contribute to continuous improvement in Ireland's overall environmental performance. At a project level we will also consider impacts on habitats and natural biological functions of the environment.

Irish Water has an "opt in" process for taking in charge Group Water Schemes.

Climate change has been addressed in the Framework Plan. Drought is a naturally occurring phenomenon, and Ireland has experienced significant droughts over the past

150 years. For the past 40 years, we have experienced a relatively wet period compared to the historical record. Climate change impact models would suggest a return to these types of weather patterns with wetter winter conditions followed by drier summer conditions. Many of our water supplies were not designed with these types of conditions in mind. On that basis option types to ensure resilience, such as impoundments, groundwater abstractions and raw water storage are considered within our RWRPs.

The following documentation is referenced in Table 3.3 in chapter 3 of the SEA Statement; Agri-Food Strategy 2030, Fáilte Ireland's 10 Year Tourism Strategy, Fáilte Ireland Visitor Experience Development Plans, Waterways Ireland Tourism Masterplan for the River Shannon.

7.5 Water Environment

7.5.1 Summary of Water Environment Feedback

Several stakeholders commented on the water environment and requested consideration be given to cumulative impacts to the aquatic environment. IFI recommended that the Framework Plan should include a statement regarding the “prevention of river fragmentation and encourage the connectivity or the re-connectivity where possible on fisheries waters,” and that IFI be consulted on any such proposals.

IFI noted that the NWRP created an opportunity to promote and educate the public on water policies and conservation.

IFI also stated that protection of the aquatic environment is a greater commitment than just the prevention of fish mortality or protecting water quality and quantity. Hydrological regimes are required to be sustainably managed to safeguard fisheries and avoid impacts to habitat and natural biological functions of the environment. Additionally, improvements and maintenance of aquatic habitat is part of a wider remit for many environmental authorities.

Cork Chamber noted that provision of water infrastructure, both in terms of supply, and wastewater management is essential not just for development, but also in terms of the environmental and amenity assets of rivers, lakes, and Cork harbour.

Environmental Trust Ireland requested that Irish Water provide revised documentation which considers the environmental and ecological impacts of the NWRP on protected sites including the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA.

Several stakeholders mentioned the transboundary theme. IWAI requested that the River Erne system should be included in the water environment section of Table 6.5 in the SEA as a transboundary waterbody and that any future preferred options to address the supply demand balance in the area should take the Erne system into consideration.

DAERA Marine Plan team noted that the SEA for the NWRP “provides the opportunity to explicitly reflect on transboundary effects within the marine environment.”

The EPA noted the supply challenges Irish Water is facing from extreme weather events and welcomed the Framework Plan’s “focus on building resilience in water-related infrastructure to guard against the impacts of weather and climate-related extremes on water services and the water environment.”

7.5.2 Response to Water Environment Feedback

The reference to the need to avoid fragmentation and encourage connectivity is acknowledged as being important. The cumulative and in-combination impacts of the identified Preferred Approaches will be assessed during the delivery of the RWRPs, both within each region and nationally. This will ensure that IFI concerns are addressed as the RWRPs are developed.

A key objective of the NWRP is to improve the sustainability of the national water supply from its current baseline. This is the basis of our options assessment methodology and means that any feasible option considered as part of the RWRPs will be subject to a desktop assessment of ecological flow guidelines and adherence to WFD objectives at a project level. In reality, unsustainable supplies are rarely resilient. We will work collaboratively with agencies such as IFI and SWAN throughout the development of our NWRP and subsequent projects delivered through Irish Water’s Capital Investment Plans. Throughout this process we will seek to ensure that our plans give consideration to all aspects of aquatic ecology, including the requirement for improving the morphology of waterbodies.

Irish Water considers all designated European Sites as part of its desktop assessment process in developing Preferred Approaches through the draft RWRPs in accordance with the Framework Plan.

Transboundary issues have been considered and consulted on. IWAI requested that the River Erne system should be included in the water environment section of Table 6.5 in the SEA as a transboundary waterbody and that any future preferred options to address the supply demand balance in the area should take the Erne system into consideration. The River Erne system will be taken forward to the RWRP North West and is referenced in chapter 3 of the SEA Statement.

Climate extremes including drought impacts are considered in the draft Framework Plan. Drought conditions can have a significant impact on particular areas due to geology and catchment characteristics. Box 2.3 has been updated in the Framework Plan to refer to Figure 1.1 in Appendix E. These factors will be further reviewed as part of the development of the RWRPs.

7.6 Biodiversity, Flora and Fauna

7.6.1 Summary of Biodiversity, Flora and Fauna Feedback

IFI requested that the draft Framework Plan take appropriate consideration of aquatic biological diversity, the fisheries resource and relevant stakeholder interests. IFI also noted that the draft Framework Plan should “recognise that protection of the aquatic environment/habitat not only requires the protection of water quality but also necessitates the protection and maintenance of physical habitat, hydrological processes and regimes, and broader biological diversity.” Additionally, IFI advocated

that the Framework Plan should prioritise the maintenance and, where possible, the restoration of ecological status in surface waters.

Meath County Council noted that County Meath has a “rich and extensive aquatic environment which performs a variety of functions: as a water supply, support for wildlife/biodiversity, maintaining healthy communities through recreation, tourism, etc.” The Council also noted that the two main rivers in the county are designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The Southern Regional Assembly noted that a nature-based approach to Sustainable Drainage Systems has become more popular in response to the water, climate, and biodiversity crisis the world is facing. This approach has also been promoted internationally at the International Union for Conservation of Nature (IUCN) and championed by the EU’s Green Deal. IWAI noted that in section 6.4.1 of the SEA there was no reference to canals as freshwater ecosystems or to native or invasive aquatic weed growth on rivers or canals.

They stated that aquatic weed can have a negative impact on biodiversity, reduce water quality and increase the risk of flooding. IWAI suggested that Irish Water considers their Nav-Watch Report 2020 chapter 3.8 in this regard.

DAERA Countryside, Coast & Landscapes team noted the potential impact on migratory species such as salmon and on SPAs. The DAERA Inland Fisheries team also noted that although they are mostly concerned with inland watercourses, they also provide advice regarding migratory fish species such as Atlantic Salmon, Seatrout, Lamprey and European Eels as they may be impacted by coastal developments.

The EPA noted that reference should be made within the Framework Plan to reflect the Biodiversity Strategy to 2030 report, National Biodiversity Action Plan, the All Ireland Pollinator Plan, and that Table 6.5 should be updated to reference the EU Biodiversity Strategy under Biodiversity.

One stakeholder noted that “what happens to land is impacted in the water and when there is nowhere on land for wild plants and insects and animals, the impact on water will be very serious,” in relation to water quality. They continued that the smokeless fuel plan may also impact water quality, due to large quantities of remaining woodland being cut. The stakeholder concluded that “the land will be transformed to agricultural land, soaked with nitrates that will make more green water. Perhaps some inter-departmental consultation on such matters would help.”

The Environmental Coordination Unit of the Department of Agriculture, Food and the Marine noted that there were gaps in measures addressing pressures, activities, and impacts for biodiversity. Waterford Institute of Technology noted that the creation of storage ponds would add to the landscape biodiversity in rural areas and mitigate against flooding from catchments to main river channels.

7.6.2 Response to Biodiversity, Flora and Fauna Feedback

Biodiversity, flora, and fauna are considered within the screening and options assessment process as part of the NWRP. A key objective of the NWRP is to improve the sustainability of the national water supply from its current baseline. This is the basis

of our options assessment methodology and means that any feasible option considered as part of the RWRPs has been subject to a desktop assessment of ecological flow guidelines and adherence to WFD objectives at a project level. In reality, unsustainable supplies are rarely resilient.

We will work collaboratively with agencies such as IFI, SWAN and DAERA throughout the development of our NWRP including the four RWRPS, and subsequently relative to projects delivered through Irish Water's Capital Investment Plans. Throughout this process we will seek to ensure that our plans give consideration to all aspects of aquatic ecology, including the requirement for improving the morphology of waterbodies. The Framework Plan methodology requires consideration of designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) and this will feed through at Plan level in the RWRPs, and at project level relative to any Preferred Approaches.

The NWRP is aligned with the principles underlying the European Green Deal. The European Green Deal is now referenced in Table 3.3 in chapter 3 of our SEA Statement.

Irish Water recognises that canals are waterbodies in the RBMP and must achieve "good status" under the WFD and the need to consider canals is recognised in Table 3.3 in chapter 3 of the SEA Statement. We consider invasive non-native species within our options screening process.

The Biodiversity Strategy to 2030 report, National Biodiversity Action Plan, the All Ireland Pollinator Plan, and the EU Biodiversity Strategy have all been referenced in Table 3.3 in chapter 3 of the SEA Statement.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9 of the Framework Plan. This will ensure no gaps in measures addressing pressures will arise.

7.7 Material Assets

7.7.1 Summary of Material Assets Feedback

The EPA noted that the reference to the National Spatial Strategy in Table 5.1 of the draft Framework Plan should be replaced with the NPF.

They also suggested that the Government's National Waste Action Plan for a Circular Economy strategy document should be referenced here as it outlines targets concerning food waste, which includes drinking water. Additionally, the EPA requested that reference is made to the National Hazardous Waste Management Plan, which is currently being developed, and the three Regional Waste Management Plans in Table 6.6 of the draft Framework Plan. The National Waste Action Plan will replace the Regional Plans.

7.7.2 Response to Material Assets Feedback

The reference to the National Spatial Strategy in Table 5.1 of the Framework Plan has been replaced with the NPF.

The National Waste Action Plan for a Circular Economy strategy document and the National Hazardous Waste Management Plan are now referenced in Table 3.3 in chapter 3 of the SEA Statement.

7.8 Air Quality and Noise

7.8.1 Summary of Air Quality and Noise Feedback

The EPA stated that it would be helpful to include where relevant acoustic screening measures that have been implemented already in water treatment plants and similar facilities. The EPA requested that Table 6.6 of the draft Framework Plan consider the potential for linkages between air quality and climate change, and cultural heritage and geology.

7.8.2 Response to Air Quality and Noise Feedback

The potential linkages between air quality and climate change, and cultural heritage and geology are included in Table 3.3 of the SEA Statement. Acoustic screening measures are assessed and developed at project level for all Preferred Approaches that are developed through the NWRP.

7.9 Climate Change

7.9.1 Summary of Climate Change Feedback

Many stakeholders requested that climate change be addressed within the NWRP. Several stakeholders stated that not enough consideration has been given to climate change and its potential impacts, and ultimately that preparation for climate change should be central to decision making and risk should be assessed.

Stakeholders noted the extreme and changing weather patterns associated with climate change and the impact this will have on water supply and requested this be taken into consideration in the Framework Plan. Dublin Chamber welcomed the commitment to developing a resilient water supply system to limit the impact of extreme weather events in the future.

The Eastern and Midlands Regional Assembly stated that the NWRP needs to be “progressive and responsive to circular economy and champion smart water solutions and technology choice, present best practice in greywater and rainwater use, all to positively engage local authorities and communities.” This stakeholder also noted the significant climate benefits of water conservation, by reducing operational energy use and infrastructure requirements.

The Assembly welcomed the approach set out in the draft Framework Plan proposed to improve the sustainability and resilience of the water supply in Ireland and manage climate change impacts through the development of secure water sources and improved connectivity of Irish Water networks within the existing infrastructure.

The Assembly continued that Climate Action Regional Offices and local authorities should identify critical infrastructure within their areas, particularly where there is interconnectivity between infrastructure, to aid in future-proofing these services and to help inform long-term adaptation planning and investment priorities.

IFI stated that “climate disruption is expected to have diverse and wide-ranging impacts on Ireland’s environment, society and economic development, including managed and natural ecosystems, water resources, agriculture and food security, human health and coastal zones.” They explained that the most immediate risk to Ireland regarding climate change is extreme weather conditions such as flooding or drought.

IFI requested that these factors be considered when planning surface or groundwater management. They continued that temperature fluctuation can also cause changes in species distribution and phenology for native and invasive species. They also noted that water abstraction can have major impacts on fish that spawn on the lake shore or in riverine areas and gave several examples of possible issues that arise from abstraction.

GSI stated that “the NWRP does not attempt to consider the impacts of climate change on groundwater sources. Groundwater is likely to be a dependable and resilient supply of water into a climate-changed future.” Additionally, GSI referenced their GW Climate project that is currently assessing the impact of climate change on groundwater by developing predictive future groundwater recharge maps and methodologies to better understand the likely impact climate change will have on Ireland’s groundwater sources. GSI stated that it would welcome collaboration with Irish Water on this project.

DCU Water Institute noted the Framework Plan is set for 25 years, however, they suggested a 25-year vision with a rolling 5-year action plan to allow for reactivity and resilience.

Additionally, DCU Water Institute stated that investment and action on key areas are required immediately stating that the Framework Plan has not sufficiently recognised the significant challenges and risks posed by climate change and considered this a missed opportunity for ensuring resilience and response readiness. They suggested robust risk assessment be built in across the whole Framework Plan. Additionally, they suggested that framing water issues within climate change adaptation could help with public perception of issues.

A few stakeholders mentioned specific regions and the extreme weather those areas are experiencing due to climate change. Kerry County Council noted that there is a need for more impoundments and natural wetland retention systems to be implemented since the impact of climate change has resulted in periods of high rainfall followed by droughts so water should be retained for these dry periods. It was noted that this issue is a key concern for County Kerry due to their high proportion of surface water sources.

Clare PPN noted that County Clare is one of the most affected counties by extreme weather events and rises in sea level causing flooding. They requested that the Framework Plan needs to assess the warming climate adequately. The Clare PPN highlighted that the UN stated current commitments on emissions are not sufficient to

keep temperatures below 2 degrees increase, and they requested that “this situation and its potential for impacting our current and future water sources given a more prominent position in the NWRP and included as a risk category in every assessment of options.”

Meath County Council agreed that the draft Framework Plan correctly referenced that drought conditions that have been experienced in recent years in Ireland have emphasised the pressure the water network is currently under and has raised concerns that if our climate and weather patterns continue to change, existing water sources may potentially dry up placing even greater pressure on our supply.

Meath County Council proposed to address these concerns through considerable investment in water source resilience, such as new source identification and upgrading of existing sources and rationalisation. This approach should ensure there is sufficient headroom to consider climate change and population and economic growth.

Tipperary County Council welcomed the acute priority impacts of climate change on water services and the associated risk controls and adaptation measures included in the draft Framework Plan. Tipperary County Council stressed the “urgency of addressing climate change is a necessary catalyst to progress the achievement of a high-quality environment to enhance the well-being of society.” They also noted that the draft Framework Plan takes account of Water Available for Use (WAFU) decreasing due to climate change and where the current level of abstraction is causing environmental damage in line with the requirements of the RBMP.

The CRU requested clarification on how climate change impacts the baseline WAFU.

Chambers Ireland added that the performance of water systems should be continually monitored to consider the baseline projections, the new normal distribution may need to be continually revised to commit to greater capture and high standard of product.

The EPA noted that Irish Water has incorporated national climate change projections from the ICARUS team and Met Éireann TRANSLATE project which project a 1-5% reduction in WAFU.

Some stakeholders commented on the energy-efficient improvements that should be made to mitigate the effects of climate change, such as setting energy efficiency standards for buildings and phasing out fossil fuel heating. The EPA also noted that energy-efficient improvements such as utilising renewable energy sources contribute to decarbonisation of the society and economy.

The EPA recommended that the following publications be considered in the Framework Plan: the ‘National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action’, Ireland’s National Climate Action Plan 2019, Offshore Renewable Energy Development Plan, and Climate Change Adaptation Plan for the Health Sector 2019-2024.

The EPA requested that Table 6.5 of the draft Framework Plan be updated to reference the European Green Deal in the context of climate and environmental-related challenges under Climate Change.

The Southern Regional Assembly commented that the RSES acknowledges the important role of integrating Nature-Based Solutions (NBS) and Blue-Green Infrastructure (BGI) as a key principle in placemaking. They stressed that both are essential in addressing the urgency of climate change and with planning of sustainable settlements with reduced carbon emissions. The Assembly noted that climate change is addressed in the draft Framework Plan but recommended further strengthening to integrate BGI and NBS as a key design principle for water conservation and protection of water quality. They recognised the leadership role Irish Water has to play in this area and noted that Irish Water is currently a stakeholder on the 'Blue Green Cities' project that is seeking to improve policy making and implementation of projects that integrate NBS and BGI at regional and local levels.

Chambers Ireland noted it is vital that the NWRP considers the Climate Action Plan in the context of the more stringent EU Climate Action CO₂ reduction targets, and the opportunities for Ireland presented by the European Green Deal. They continued that it is essential that the investments Irish Water make over the coming years support our economic growth to ensure longer-term resilience against future climate shocks.

The Chambers stated that preparation for Climate Change needs to be central to the decision making and the risk assessment processes of Irish Water. They also requested that continuous monitoring of the performance of our water systems against climate change predictions needs to be undertaken.

Waterford Institute of Technology stated that it is "no longer adequate that water infrastructural developments should 'take into account' future climate changes."

AECOM stated that climate change was not mentioned at all within the Framework Plan and queried how the effects of climate change will be dealt with in drought planning, drought prediction and asset management. They acknowledged that regarding climate regulation, impacts are assessed concerning potential effects of options on woodland areas. Additionally, AECOM requested details on the approach used to estimate the quantity or value of net emissions from land use.

7.9.2 Response to Climate Change Feedback

Climate change impacts and adaptation are considered within the Framework Plan. Reduction factors are applied in our WAFU calculations and adaptation is one of the considerations in our options assessment process to be applied during the development of the RWRPs. Temperature fluctuation will invariably have an impact on raw water quality and will be investigated further as part of the roll out of the Drinking Water Safety Plans.

Under the Use Less pillar, conservation activities are underway at present in Irish Water, however we will need to review outcomes from these initiatives over the coming years in order to quantify potential outcomes. We will continue to progress water conservation measures and will engage with other stakeholders in driving the need for policy to support water conservation measures. At present Irish Water is also progressing a water conservation app to enable consumers to save water in their homes. This has been updated in the Framework plan in section 7.3.2.2. We will also

work with our Innovation team to review the potential for pilot studies to understand the potential benefits and outcomes for conservation measures such as rainwater harvesting and grey water reuse.

Irish Water is regulated by the CRU, and one of the prioritisation criteria for our investment plans is “Protecting Our Environment”. When prioritising growth projects through Irish Water’s Capital Investment Plans, we will ensure that these decisions are based on dialogue with the RSES and local authority housing and planning functions. We also recognise the obligations to comply with our regulator for water quality and the environment, the EPA, and the requirements stipulated in relevant legislation and regulations.

Drought impacts are also included in the NWRP. Drought conditions can have a significant impact on particular areas due to geology and catchment characteristics. Box 2.3 has been updated in the Framework Plan to refer to Figure 1.1 in Appendix E. These factors will be further reviewed as part of the RWRPs.

It is recognised that groundwater is likely to be a dependable and resilient supply of water into a climate-changed future, and Irish Water will collaborate with the GSI in realising the full potential for groundwater as an integral part of the public water supply. However, it is also recognised that climatic conditions vary significantly across the country and fluctuate across seasons. Due to geology and topography across the country many of our groundwater bodies and surface water catchments can have poor storage characteristics compared to other European countries. This means that based on existing infrastructure, large parts of the country are vulnerable to climate change impacts and drought. We witnessed these impacts during the drought in 2018, where a significant number of groundwater and surface water supplies were severely impacted after a relatively short period of dry weather conditions. Natural wetland retention and impoundments will be a key consideration in this area.

The NWRP is a 25-year plan, with rolling updates. Baseline forecasts and data are reviewed annually and the NWRP will be formally updated every five years, with further opportunities for public participation. Annual reporting on the implementation of the monitoring plan will also be undertaken as set out in chapter 4 of the SEA statement.

Irish Water recognises the need for energy efficiency as part of the wider climate change adaptation strategy. Within the RWRPs embodied and whole life carbon costs of all feasible options are assessed.

The European Green Deal is now referenced in our SEA Statement. The SEA Statement also refers to the ‘National Risk Assessment of Impacts of Climate Change: Bridging the Gap to Adaptation Action’, Ireland’s National Climate Action Plan 2019, Offshore Renewable Energy Development Plan, and Climate Change Adaptation Plan for the Health Sector 2019-2024.

Irish Water will ensure that our NWRP considers the European Green Deal, particularly in developing our strategic funding requirements for water services. As we progress through our resource planning cycles, and further engage with research bodies through

our innovation function, we will further integrate natural capital and ecosystem services into our Preferred Approach assessments.

7.10 Geology and Soils

7.10.1 Summary of Geology and Soils Feedback

One stakeholder stated that land use considerations, past and present, influence water quality and supply, such as deforestation agriculture domestics and wastewaters, etc. The stakeholder also outlined the use of helophyte-vegetated and constructed wetlands in the treatment of a variety of polluted water sources.

Another stakeholder commented on town planning, particularly regarding all Kast Limestone areas. They asked if the effluent and water supplies were monitored to ensure the standard of water conditions for these areas, due to them living on top of a highly permeable landscape. The stakeholder continued that for areas such as Bunmore, Ballycroy, and Mayo highly permeable Blanket Bog is recorded in the area so they would have similar issues to that of the Kast Limestone areas.

GSI welcomed “the inclusion and prominence of the (i) Resilience criterion, particularly it’s regulation’ and ‘climate change’ components and the (ii) Sustainability (Environmental and Social Impacts) criterion, particularly its ‘Water Environment: quality and resources’ and the ‘Geology and Soils’ sub-criteria.”

Waterford Institute of Technology noted that land drainage of wetland and heavy solids should be regulated. They continued that multi-species wards with taller forage growth harness and recycle water more efficiently when compares to tight grazing pastures and close cuttings of forage swards. They allow for better infiltration which results in higher groundwater levels. The Institute advocated conservation agriculture systems “including no-tillage, soil residue cover, rotations, and cover cropping” as these techniques have better infiltration of water through the soil resulting in higher groundwater levels.

7.10.2 Response to Geology and Soils Feedback

Irish Water considers land use activities during the development of Drinking Water Safety Plans, including site specific Source Risk Assessments. Further information on our source risk assessment process has been included in Box 5.2 in the Framework Plan.

Irish Water confirms that groundwater is a vital component of our water resources plan and is considered at the options assessment process for all water supplies. Section 3.2.2 of the Framework Plan has been updated to reflect the strategic importance of groundwater as part of our National Water Resources Plan.

7.11 Transboundary Effects

7.11.1 Summary of Transboundary Effects Feedback

DAERA SEA Team requested that consideration be made of transboundary watercourses.

DAERA Drinking Water Inspectorate (DWI) team stated that they are, “content that the Transboundary impacts are taken into account in this report.” Additionally, DAERA DWI team welcomed the inclusion of the sections on transboundary considerations and scope assessment. In particular, that the Framework Plan will be considering transfers as an option type and will not be making any recommendations for water resources planning in Northern Ireland.

However, they stated that the transboundary effects and issues will be taken into consideration in the SEA, including the river catchments shared between Northern Ireland and Ireland. DAERA DWI team also noted that the Framework Plan has the potential to influence water quality and quantity within surface water and groundwater bodies through abstractions or discharges and these water environments were scoped into the assessment.

DAERA DWI team also noted that water resources options are proposed to either share or be in close proximity to Northern Ireland surface or groundwater catchments, however no specific proposals and locations are identified, however, acknowledged the approach will be included within the RWRPs. The team also stated that Northern Ireland Water recently published a 25-year plan for managing supply and demand in Northern Ireland; Water Resource and Supply Resilience Plan (WR&SR Plan), March 2020. They outlined that “in the event that the Regional Plans involve, for example, an option which could cause impacts to waterbodies within any of these catchments, there is potential for transboundary effects. In such a case, impacts on these areas would need to be assessed, including cumulative impacts with the Northern Ireland WRS&R Plan, and consultation will be required.” They noted that under transboundary effects in Table 6.5 of the draft Framework Plan should include reference to the Fisheries Act (NI) 1966.

The EPA noted that Northern Ireland has started a consultation on a Draft Flood Risk Management Plan 2021-2027 which runs until June 2021 which should be included in Table 6.5 of the Framework Plan under transboundary effects.

7.11.2 Response to Transboundary Effects Feedback

Transboundary effects have been considered and consulted on. Northern Ireland’s second Climate Change Adaptation Programme (NICCAP2) will be noted in the Transboundary section of the SEA for the RWRPs, both the North West and Eastern and Midlands, and is also referenced in section 3 of the Framework Plan SEA Statement. The River Erne system will be taken forward to the RWRP North West and is referenced in section 3.3 of the SEA Statement.

Section 3.3 of the SEA Statement includes reference to the Fisheries Act (NI) 1966 and the draft Flood Risk Management Plan 2021-2027 under transboundary effects.

7.12 SEA and NIS Methodologies

7.12.1 Summary of SEA and NIS Methodologies Feedback

AFU acknowledged that the SEA and NIS are detailed and consider most issues described in the draft Framework Plan. AFU noted that in terms of data, monitoring, metering, and developing methods the overall goals seem very ambitious and AFU is

concerned if this is achievable. Furthermore, they continued that appropriate resourcing models are critical and should be applied to ensure that NWRP goals and objectives are met.

The EPA acknowledged that consideration of alternatives is described within the draft Framework Plan. The EPA also noted the reference to the EPA 2017 draft Guidelines on Information required within the Environmental Impact Assessment Reports and added that the EPA has published a Good Practice Guidance Note on Cumulative Effects Assessment in Strategic Environmental Assessment in 2020 that should also be considered.

The EPA stated that the SEA Environmental Report should identify data gaps that were encountered during the SEA process, which would ultimately contribute to the “implementation of the final plan and the preparation and assessment of the four Regional Water Resources Plans.”

Some submissions were in support of the NIS Assessment Methodology, whereas others provided suggestions for improvement.

Limerick Greens noted that when assessing the biological flow requirements, existing studies and outcomes of the RBMP should be used. Additionally, if there are any gaps in the information, Limerick Greens suggested that scientific assessments should be undertaken by Irish Water before undertaking the Appropriate Assessment. They continued that this approach should also be used regarding potential impacts to “discharges of wastewater into receiving waters that are themselves or flow into or are located inside protected areas or have water-dependent qualifying interests.”

7.12.2 Response to SEA and NIS Methodologies Feedback

Irish Water acknowledges the need to avoid data gaps. As any data becomes available from the River Basin Management Plan or other sources, it will be incorporated into the NWRP in accordance with the monitoring and feedback process as outlined in section 8.3.8 and Table 8.9 of the Framework Plan.

Irish Water has reviewed these submissions and is satisfied that, given the high-level nature of the Framework Plan, no additional information was required for the assessment and that the information presented in the NIS was sufficient for a complete, precise and definitive assessment to be carried out with no lacunae or gaps.

Irish Water will review the level of detail on sensitive sites as part of the rollout of the RWRPs. However, it should be noted that the Preferred Approaches developed as part of the overall NWRP are plan level desk assessments only. On that basis a conservative approach has been taken in identifying potential impacts on sensitive sites, and conservative methodologies have been used to assess water availability from such sites. Any Preferred Approach that is prioritised and included/initiated within a capital investment cycle will include feasibility studies and project-level applications for consents as required, and comprehensive site investigations and surveys including hydrological surveys will be carried out as necessary at that point.

7.13 Mitigation and Monitoring

7.13.1 Summary of Mitigation and Monitoring Feedback

IFI noted that they are among the public bodies that create policies and programmes for surface water in Ireland. They noted that critical and sensitive habitats and species need to be protected. They stated that from their perspective “all fish species and associated habitats within its remit require protection and management for conservation and development.” IFI advocated the use of a precautionary principle when considering fisheries resource and aquatic ecology in the current process.

IFI also noted that consideration and support should be afforded to the National Blue Dots Catchment Programme which focuses on the restoration of high ecological status water bodies, which is the main component in fishery, freshwater ecology, and the diversity of Ireland’s aquatic biology.

Clare PPN noted that the SEA contains clear objectives and goals however were unable to establish where accountability for monitoring lies. They requested that Irish Water clarify this.

The EPA requested that Table 10.1 Environmental Action Plan-EAP and Table 10.2 Monitoring Plan of the SEA Environmental Report be included in the NWRP. The EPA also suggested the inclusion of how SEA recommendations have been incorporated in the Framework Plan. They recommended that a commitment on the proposed environmental monitoring and actions in the SEA Environmental Report be included in the Framework Plan.

The EPA suggested that the “monitoring programme should indicate monitoring responsibilities and should be flexible to take account of specific environmental issues and unforeseen adverse impacts should they arise. The monitoring programme should consider and address the possibility of cumulative effects and impacts on other activities. To aid transparency and tracking, consideration should also be given to assigning reference numbers, where possible, to the proposed monitoring indicators and targets.”

They suggested that the NWRP should include clear commitments to implement the recommended mitigation measures identified in the SEA, “and that information on the frequency of monitoring is provided in Tables 10.1 and 10.2 of the SEA Environmental Report, as appropriate.”

One stakeholder questioned whether adequate mitigation measures were included within the NWRP. The EPA stated that in relation to the Appropriate Assessment, the General Mitigation Measures and Principles, the Further assessments and data to inform potential impacts and the associated Table 8.1 of the NIS should also be included in the NWRP.

7.13.2 Response to Mitigation and Monitoring Feedback

The Preferred Approaches developed as part of the overall NWRP are plan level desk-based assessments. On that basis we have taken a conservative approach to identifying potential impacts on sensitive sites (without mitigation measures), and we

have used conservative methodologies to assess water availability from such sites. Any Preferred Approach that is prioritised and included/initiated within a capital investment cycle will include feasibility studies and project-level applications for consents as required, and full site level environmental assessments will be carried out as necessary at that point.

Irish Water will interface with IFI through the National Blue Dots Programme as it develops the RWRPs.

Irish Water has included clear commitments to implement the recommended mitigation measures identified in the SEA. The monitoring and feedback process involves implementing the Environmental Action Plan and Monitoring Plan as described in chapter 4 of the SEA Statement and has been included in section 8.3.8 of the Framework Plan so that accountability is clear.

7.14 Assessment of draft Framework Plan

7.14.1 Summary of Assessment of draft Framework Plan Feedback

The EPA acknowledged section 8.6 SEA Recommendations for implementing the draft Framework Plan and recommended that this be included in the NWRP to highlight how SEA recommendations have been integrated into the Framework Plan.

The EPA also suggested it would be helpful to identify any vulnerable water-related service infrastructure and supporting networks about storm events in section 8.6.2 of the SEA. They requested more information on residuals and how they are treated and managed be included in section 8.6.2 of the SEA.

GSI commented that the NWRP depicts groundwater as a constrained, vulnerable, and difficult to understand water resource. However, they stated this is not the case as in Ireland, groundwater represents an important, naturally good quality and resilient source of water.

7.14.2 Response to Assessment of draft Framework Plan Feedback

The SEA recommendations are set out in the EAP and Monitoring Plan in chapter 4 of the SEA Statement and commitment to implementing these is provided in section 8.3.8 of the Framework Plan.

As part of the needs identification process we conducted workshops with each Local Authority Water Services Department and included identification of critical infrastructure.

Irish Water's understanding of residuals and how they are treated on a site by site basis will improve through data acquisition over the coming years. High level risk assessment of residuals will be included in the RWRPs. This is set out in Appendix K in the Framework Plan.

Groundwater is a key option for our public water supplies, and we recognise that it can deliver improved water quality, storage, and source protection. This option is confirmed in our Framework Plan, and it will be assessed further through the RWRPs. We have updated section 3.2.2 in the Framework Plan to reinforce the significance of groundwater to our resources planning process.

7.15 SEA Influencing Regional Plans

7.15.1 Summary of SEA Influencing Regional Plans Feedback

The EPA noted the options and methodology proposed to further consider and select appropriate options at a regional level in chapter 9 of the SEA Environmental Report. The EPA also suggested the use of the EPA-supported Environmental Sensitivity Mapping Webtool (www.enviromap.ie) to assist in the identification of sensitive receptors and areas of environmental sensitivity when screening options and to refer to this in section 9.9.4 of the SEA.

Additionally, the EPA suggested that there would be benefits to “setting the four Regional Water Resource Plans in the context of the National Planning Framework and the three Regional Spatial Economic Strategies,” continuing that chapter 9 of the SEA provides a useful overview on how SEA will be integrated in the Regional plans. They mentioned that there would be benefits to including the Appropriate Assessment process and the Strategic Flood Risk Assessment in Table 9.1.

7.15.2 Response to SEA Influencing Regional Plans Feedback

Irish Water will use the EPA-supported Environmental Sensitivity Mapping Webtool (www.enviromap.ie) to assist in the identification of sensitive receptors and areas of environmental sensitivity when screening options and have referred to this in chapter 4 of the SEA Statement.

The four RWRPs are being used to facilitate the delivery of the first NWRP, but the NWRP is a national plan. This has been clarified in the Framework Plan in section 1.9.4, Table 2.2, and Figure 2.3. Within the NIS for the Framework Plan we consider all relevant designated European sites at a plan level and will take the same approach when delivering the RWRPs.

7.16 Screening of European Sites for Appropriate Assessment (AA)

7.16.1 Summary of European Sites for AA Feedback

Some stakeholders commented on the appropriate assessment of European Sites. The importance of appropriate site assessments was noted by one stakeholder.

Environmental Trust Ireland noted that no separate screening for AA was undertaken for the NWRP. They added that this is a separate document to the Natura Impact Statement (NIS) and is an “essential procedural requirement which has not been complied with by Irish Water.”

Additionally, Environment Trust Ireland noted that the proposed designation of parts of Limerick, Tipperary, Clare and other counties along the River Shannon into a Group with Dublin is completely arbitrary and has significant potential adverse consequences for European Natura protected sites and in particular, the Lower River Shannon SAC, the River Shannon and River Fergus Estuaries SPA and Askeaton Fen Complex.

IFI highlighted that there are many surface waters, which are not formally designated under legislation, but which support populations of species as designated under the Habitats Directive. The 1997 Habitats Regulations and Special Areas of Conservation (SAC) Directive do not extend to the inclusion of all aquatic habitats of fish being of

significant biodiversity or of amenity value. Therefore, they argued the reliance of any plan on these designations alone will exclude significant numbers of waterways which require consideration and protection.

IFI advised they are available for consultation in respect of ‘protected sites’ designations.

IFI further noted there is little reference in the NWRP to the potential and actual impact of abstractions on the ecological status of waterbodies – it is only briefly mentioned in section 7.3.4.1. They requested that the ecological sustainability of existing abstraction rights granted under the Planning Acts, Fisheries Acts and Water Supplies Act should be reassessed in the context of the current Plan.

IFI asked that any proposed increase in abstraction volume at individual locations must be mindful of WFD requirements and the broad principles of environmental sustainability, and that any potential negative impacts of strategic policy framework on aquatic habitats should also be addressed.

IFI endorsed the selection of topics under the heading ‘Biological Diversity’ and welcomed the inclusion of Leakage Reduction, Effluent Reuse, Reservoirs and Desalination and the reference to The Fisheries Consolidation Acts 1959 to 2010. They also requested justification to cease abstraction from an unsustainable source and advised that the issue of source protection should be thoroughly addressed.

7.17.2 Response to European Sites for AA Feedback

Biodiversity, flora, and fauna are considered for designated sites and sites of local importance within the screening and options assessment process as part of the NWRP as summarised in Table 8.6 of the Framework Plan and detailed in Table 1.1 of Appendix N.

Screening was undertaken for the NWRP and this document was included in Appendix A of the Natura Impact Statement.

The roll out of the Preferred Approaches as part of the four RWRPs is for delivery purposes only. The four RWRPs are being used to facilitate the delivery of the first NWRP, but the NWRP is a national plan. This has been clarified in the Framework Plan in section 1.9.4, Table 2.2, and Figure 2.3.

Irish Water recognises the importance of habitats that are not formally designated as European Sites and confirms that it included consideration of locally important sites, as summarised in Table 8.6 of the Framework Plan and detailed in Table 1.1 of Appendix N. Irish Water welcomes IFI’s offer for consultation on “protected sites”.

At present, Irish Water has limited understanding of the impact of our existing abstractions on the ecological status of waterbodies. We have carried out desktop assessments of potential impacts and have submitted a complete register of all abstractions for public water supplies to the EPA as part of the characterisation process for the 3rd cycle of the River Basin Management Plan. Through our monitoring and feedback process in section 8.3.8, we will review emerging data and information from the characterisation and status classification reports from the third cycle RBMP. We will

also complete Source Risk Assessments for all of Irish Water’s drinking water abstractions, as part of the roll out of the Drinking Water Safety Plans.

The basis for the limits we have set for sustainable abstraction within the Framework Plan are eflows standards as based on UKTAG standards. These standards were developed on the basis of achieving the “good status” and “high status” objectives within the WFD. It is envisaged that site-by-site assessments will be required as part of the proposed abstraction licencing regime.

Irish Water has submitted a full list of our abstractions to the EPA as required by SI No. 261 of 2018 European Union (Water Policy) (Abstractions Registration) Regulations 2018 to form part of the new legislative framework on water abstraction. We will engage fully with the requirements of the new legislation, including general binding rules relating to measurement of abstraction.

7.17 Conclusions on Environment Feedback

Having carefully reviewed the submissions received on the theme of Environment, Irish Water considered that a number of changes should be made to the draft Framework Plan. These changes are explained in section 7.17.1 regarding “Clarifications” below.

7.17.1 Clarifications on Environment Feedback



The following sections of the Framework Plan have been updated to reflect feedback under the theme of Environment:

Box 2.3 has been updated to refer to Figure 1.1 in Appendix E

Box 5.2

Section 3.2.2

Section 1.9.4, Table 2.2, and Figure 2.3

Section 7.3.2.2

Section 8.3.8

Box 5.2 in section 5.5 and cross referenced in section 5.9

Table 5.1

The following chapters in the SEA Statement reflect feedback on the theme Environment:

Chapter 3

Chapter 4

7.17.2 Recommendations on Environment Feedback

1. Irish Water will review all environmental data, new abstraction legislation and all applicable policy development as per our monitoring and feedback process in section 8.3.8 of the Framework Plan and implement them in the future RWRPs and associated environmental assessments.

8. Need

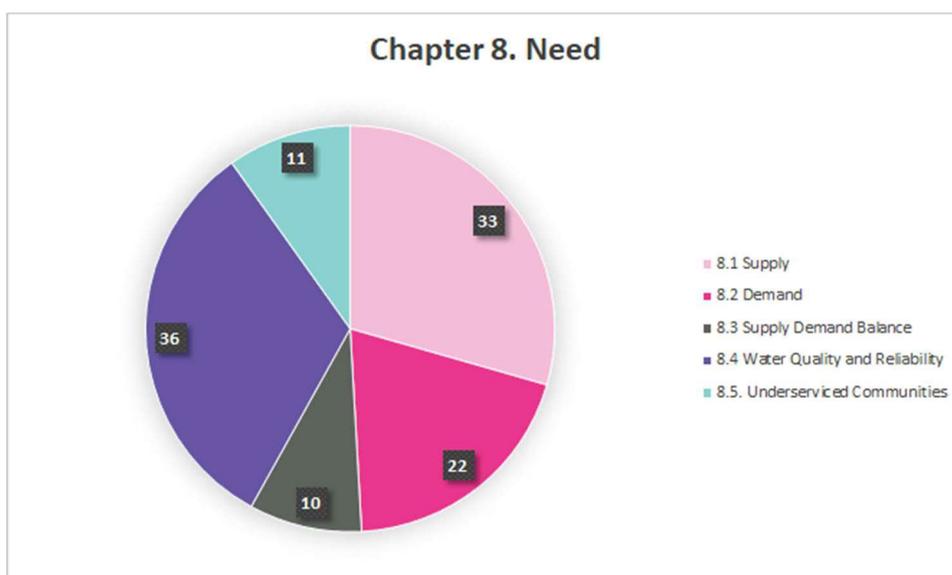
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Need”. Within the overall Need theme, we identified five sub-themes, which we set out in Figure 8-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 8-1 details the breakdown of feedback received under the theme Need. It shows that of the 112 mentions⁴ in submissions that mentioned need the most frequently mentioned were related to water quality and reliability with 36 mentions followed by supply with 33 mentions. Figure 8-1 below also identifies the five sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 8-1 Need Theme



⁴ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

8.1 Supply

8.1.1 Summary of Supply Feedback

A number of stakeholders discussed the topic of water scarcity in their submissions, they also discussed Ireland's rainfall and raw water supplies and their capacity to cater for the needs of the country.

A respondent submitted that in Ireland there isn't a shortage of water but a leakage of treated domestic water that comes from our reservoirs.

It was stated that Ireland's water supply has been 'neglected' and requires urgent upgrading due to water quickly being directed away after rainfall.

AFU stated that water scarcity needed to be addressed in the NWRP in terms of natural water scarcity, a lack of investment in water infrastructure and a lack of quality water in particular areas. AFU noted that Deployable Output (DO) is limited by the uncertainty of hydrological yield in addition to a number of other uncertainties.

However, the EPA outlined that the ongoing threat of climate change poses a risk to Ireland's water supplies. They expressed the view that improvements are too slow, as cited in the Drinking Water Quality Report 2019.

The Clare PPN stated that Ireland's water supply was 'unreliable' with a chemical smell and high leakage rates.

Chambers Ireland outlined the huge dependence on security of supply.

Údarás na Gaeltachta emphasised the point that companies are unable to grow due to water services not meeting their requirements.

Kennedy Analysis stated that the NWRP needs to address Dublin's reliance on river water as its primary supply, leaving the area vulnerable. Alternative measures to protect this supply were outlined in this submission.

Councillor Johnny Flynn made specific reference to the security of supply in Ennis, noting that its public supply lacked resilience with no back-up supply.

Chambers Ireland stated that supplying new reservoirs will be difficult in periods of persistent rain, which are likely to be less frequent but more intense, leading to flooding which has a negative impact on security of supply. They added that Irish Water would need to invest in its capital base.

It was advised by the RSPA that the primary solution to improving Ireland's water supply is addressing its existing pipes. Tipperary County Council echoed this sentiment, noting that the condition of the water supply in addition to the infrastructure should be a motivating factor in directing resources where security of supply is needed most.

Dublin Chamber welcomed the focus on Weather Event Planning in the Framework Plan. Their submission compared Ireland to the UK regarding level of service targets and stated the security of supply is "critical to national economic wellbeing."

A system for identifying groundwater was described in a submission, detailing how they were protected, referencing zone of contribution and the data behind this. A stakeholder gave a list of the variables involved in the calculation of the safe yield of groundwater and submitted that such decisions should be transparent. The submission also articulated that unlike surface water abstractions, the yield of a particular well does not define the available yield from the wider aquifer. It was noted that producing desktop analysis for this data is difficult. Another submission noted that this may take years to obtain, suggesting Irish Water should retain ownership of groundwater supplies.

Kerry County Council stated that existing schemes have a lack of storage which impacts supply and requested this be addressed in the Framework Plan. They also stated that Irish Water should have greater powers for management of catchments for drinking water supplies.

Tipperary County Council highlighted the importance of security of supply and noted that insufficient capacity of drinking water services presents challenges in delivering employment and housing opportunities. They added that many locations in Tipperary experience ongoing unplanned water outages. They called on Irish Water to determine security level of service objectives and recommended a number of objectives for Irish Water to include.

Several submissions suggested alternative water supplies that could be harnessed and utilised by Irish Water. One stakeholder outlined that the construction of small dams on Ireland's mountain streams could be a viable water source for the country.

Kildare County Council stated that a main objective of the NWRP is to identify new water sources to supply the GDA. AFU noted that there were inadequate catchment sources in the GDA.

The EPA outlined that Irish Water should define the sustainability criteria used for the NWRP to ensure no risk is posed to supplies. As the Framework Plan focuses on public water supplies, the EPA suggested renaming the NWRP the National Public Water Resources Plan to reflect usage of private water supplies, agriculture, and other industries.

The Department of Enterprise, Trade and Employment, Enterprise Ireland and the IDA outlined that businesses looking to expand their operations were a vital player in terms of water supply requiring clear policy and regulation from Irish Water and engagement in this area would be required.

The EPA stated that known water supply issues should be addressed by Irish Water at the RWRP stage.

Longford County Council criticised the resilience of the current supply and highlighted that night-time shutdowns have been incorporated on occasion to allow for adequate supply. They stated that quantity and resilience are intrinsically linked and without resilience it is impossible to increase quantity in times of need.

The Water Supply Project, Eastern and Midlands Region (WSP) was referenced in several submissions regarding future water supply.

One submission stated that they could show that the water supply for the GDA could be supplied for free, saving the country the cost of the WSP. They advised that the best option for now would be to reserve more water in the Poulaphuca reservoir.

The Clare PPN cited the Project Need Report published in 2015 for the WSP, noting the differing approaches of the consultants' reports and that a single source supply has now been identified as a risk in the NWRP, despite it being the Preferred Approach on the WSP. They questioned if the points made in the Kennedy Analysis at the time were valid and if it would be appropriate to retire existing water sources in the GDA upon execution of the WSP.

Another submission questioned why certain counties had been divided in the NWRP regional boundaries, stating that the "possibility of Mullingar and environs obtaining a new water supply from a new trunk pipe from the Shannon to Dublin can only be an aspiration."

The methodology behind certain calculations regarding supply in the draft Framework Plan was mentioned in several submissions. Some disputed the accuracy of the data used by Irish Water. Kennedy Analysis queried if the process losses cited in the Framework Plan had been counted twice and questioned the categorisation of unaccounted for water.

The RSPA stated that the best approach for Irish Water to take in the final NWRP would be to quantify the resources and then undertake a full hydrological assessment and catchment assessment and assess a number of characteristics to identify available abstraction and allow for future sustainable use.

A stakeholder queried the amount of water produced by Irish Water and there was a suggestion to account for the food industry and other sectors' dependence on wells, aquifers and groundwater abstraction when calculating supply.

Appendix C – Supply Assessment in the draft Framework Plan was frequently referenced. Irish Water was asked to draw attention to the wide variation in the regional dependency on surface water or groundwater. In reference to Appendix C, a submission noted that this approach could be applied to catchments in river flows. This submission also stated that larger water resource zones should be identified and percentages of groundwater and surface water supplied attributed to them with the Preferred Approach for each supply developed through a full options assessment process.

AFU outlined that there was no information to estimate the relevant limits with a numerical example in Appendix C. They concluded that the hydrological yield had been calculated for some UK regions, but not for Ireland and the results presented in the draft Framework Plan appear to be estimated.

The CRU stated that Irish Water should clarify whether it has used the approach set out in section 1.3.1 of Appendix C to calculate the yield of surface water sources.

The CRU also requested that Irish Water provide an explanation for the concept of a 22-hour day in its discussions of deployable output and why it is being used.

Regarding calculations and data, the CRU also stated that no supporting data is provided to describe and explain Irish Water's choice of particular percentages in allocating process losses to its treatment plants.

It is also unclear why disinfection would have any process loss. They noted that the Ballymore Eustace site has a <2% process loss yet other sites in Ireland (with the same process) have been assigned 7.5%. The CRU noted that it is unclear why Ballymore Eustace is an outlier or why the data from the Ballymore site has not been used to represent the other sites across Ireland.

Limerick City and County Council requested that Irish Water identify a clear programme for lead and asbestos pipe replacement and to stop the rerouting of water supply through unmaintained asbestos pipes in the event of a burst pipe. Tipperary County Council also suggested the replacement of lead and asbestos piping.

8.1.2 Response to Supply Feedback

In the context of the NWRP, the identified deficits across our 539 water supplies in terms of quality, quantity, reliability, and sustainability are referred to as "need." There is a misconception that demand side issues such as leakage and demand growth are the only issues with the public water supply. In fact, many of our current and future issues with water quality, quantity and sustainability are driven by issues with our water sources and treatment processes. Some local authorities noted that issues with our supplies are becoming a challenge in terms of provision of housing and employment and maintaining security of supply. Within the NWRP we strive towards achieving improved security of supply by setting a level of service for interruptions to supply of 1 in 50 years, which will in turn provide capacity in the system for development. Small dams and all other options will be looked at as part of the options assessment.

Although groundwater is an enormously important raw water resource, in some areas it is of limited value as a significant water resource. Climatic conditions vary significantly across the country and fluctuate across seasons. Due to geology and topography across the country many of our groundwater bodies and surface water catchments can have poor storage characteristics compared to other European countries. This means that based on existing infrastructure, large parts of the country are vulnerable to climate change impacts and drought. We witnessed these impacts during the drought in 2018, where a significant number of groundwater and surface water supplies were severely impacted after a relatively short period of dry weather conditions. Some local authority respondents reiterated this, emphasising the link between resilience and water availability.

As our water supplies developed organically over a long period without the benefit of national or regional planning, many of our existing supplies will need to be reinforced or replaced over the coming years. These investments provide both a challenge and an opportunity for the public water supply in Ireland. Although it will take time and significant funding to transform our supplies, if we make the correct decisions and focus on long-term sustainable water sources, we have the potential to become a leader in terms of sustainable and resilient water supplies. The NWRP will allow us to address the "need" in a strategic and planned way.

This investment will be coupled with improvements to our distribution networks, including improved interconnectivity, strategic and local network storage, network capital maintenance, calm networks, and targeted water mains replacement.

Within our RWRPs we will review unconstrained options for all 539 water supplies including local and regional options. Various potential water sources or expansion of existing impounding reservoir sources were raised during the consultation. These will be assessed as part of the unconstrained options in the RWRPs.

The options appraisal process will involve assessment of unconstrained options including groundwater and surface water. Details of our plan level assessments of groundwater are included in Appendix C of the Framework Plan.

Within the Framework Plan, single source supplies are a risk if they are not understood, well protected, and operated and maintained appropriately. Where possible, better interconnectivity will be assessed as part of the development of the RWRPs, although this approach is not always feasible given the dispersed nature of the population in Ireland.

It is not proposed to retire any current sources for the GDA WRZ; however, this supply will be reviewed as part of the RWRP for the Eastern and Midlands Region.

The roll out of the Preferred Approaches as part of the four RWRPs is for delivery purposes only. The four RWRPs are being used to facilitate the delivery of the first NWRP, but the NWRP is a national plan. This has been clarified in the Framework Plan in section 1.9.4, Table 2.2, and Figure 2.3.

Where no site-specific data is available, process losses are assessed on the basis of standardised estimates of losses. Over time, as our information base improves, we will replace this standardised data for each site with site-specific data. Process losses have not been considered twice within the supply demand balance assessments, and it should be noted that process losses in the GDA are extremely low compared to standard estimates. Process losses in the Ballymore Eustace WTP are below 2%, due to the high water quality at Poulaphuca as detailed in section 3.3.2 in the Framework Plan. Disinfection does give rise to a small process loss because of the need to calibrate our disinfection processes, which requires an element of run-to-waste. The approach set out in section 1.3.1 of Appendix C has been used to calculate the yield of surface water sources within the Framework Plan.

Irish Water uses eflows assessments in the development of Plan level options. The purpose of this approach is to ensure that the feasible options are sustainable.

The base year production figure used in the NWRP is 1,720 MI/d. The supply demand balance for all WRZs has been included in Appendix L of the NWRP. Within the RWRPs, we will identify which supplies are groundwater and surface water supplies.

The methodology outlined in Appendix C, is used to assess the surface water supplies within the NWRP. This methodology was reviewed by the EPA hydrometrics team during the early development stages of the NWRP and follows the same principles that will be applied as part of the proposed regulatory process on abstraction.

For the design of all new water treatment plants, the specification is based on output over 20 hours. Operational hours are part of the normal design standards used for water treatment plants, it allows for sizing of tanks, processes, and manifolds. However, we allow our plants to operate above 20-hour capacity during peak events.

Lead backyard service replacement is included within the National Leakage Reduction Programme.

8.2 Demand

8.2.1 Summary of Demand Feedback

A number of submissions discussed demand, with many questioning the inclusion of leakage in demand figures.

Fight the Pipe stated that water demand in Europe had declined over the years despite thriving economies, as is the case for Ireland, and commented that Irish Water's messaging did not reflect this.

Fight the Pipe added that "leakage in Ireland is so extreme that it constitutes by far the biggest single element of demand," more so than any other factor or industry. They argued that it is Ireland's leakage that sets it apart from the rest of Europe. Fight the Pipe gave some examples to emphasise their point and challenged Irish Water to confirm their rationale behind its graphs and calculations to support its messaging.

They contested that Irish Water's messaging on Dublin's water demand is misleading stating that true consumption in Dublin is going up and that leakage is going down whereas data published by Irish Water highlights that the current situation is the opposite.

Kennedy Analysis and the RSPA highlighted that leakage is reported by Irish Water as part of "demand", so an increase in leakage translates to an increase in demand, and vice versa. Kennedy Analysis stated that it is this dichotomy that has led to the reported water deficit for the GDA and the advancement of Irish Water's proposed Water Supply Project.

Kennedy Analysis and the RSPA argued that the approach taken to leakage by Irish Water in the NWRP is the most important aspect and is the biggest driver of whether there will be a potential water deficit or surplus in 2044. Kennedy Analysis requested that Irish Water provide like-for-like leakage data for 2019 to verify their findings.

Considering the projected water deficit for the GDA, Kennedy Analysis criticised the use of the safety buffer amounts for the water deficit for the "winter critical period" (WCP) in the Framework Plan stating it is calculated in a way that is not in line with international best practice.

Furthermore, Kennedy Analysis argued the "peaking factor" applied to "total demand" is made up of various components of water use including headroom and is not best practice and resulting in an inflation of the "headroom" safety buffer and consequently inflation of the projected water deficit for the GDA.

Kennedy Analysis disputed the assumption by Irish Water in the NWRP that, over the next 25 years, per capita consumption (PCC) will be flat. The RSPA argued that PCC is

not reflected adequately in the Framework Plan despite it being a major focus in both the UK and the EU to reduce water consumption.

Both Kennedy Analysis and the RSPA pointed to the expansion of the First Fix Free scheme whereby customer side leakage (CSL) constitutes a major part of PCC in Ireland – which is a different approach than the UK, whereby losses from customer supply pipes are treated as part of “leakage” – this fact they claimed must be considered when Irish Water uses UK assumptions in relation to potential Irish PCC reduction. They maintained that this failure to account for the proposed expansion of the First Fix Free scheme further results in an inappropriate inflation of the projected water deficit for the GDA. They highlighted that in Ireland PCC includes leakage from CSL and the Framework Plan does not reflect the latest status of the scheme whereby Irish Water successfully reduced CSL over the last five years. The RSPA stated that since Irish Water includes CSL within its PCC figure, any reduction in CSL equates to a reduction in PCC.

In addition, Kennedy Analysis queried when the non-domestic demand and CSL analysis for the GDA will be published for consultation.

The CRU stated that technical appendices outlining how Irish Water has estimated current and forecast demand would provide greater clarity around their approach and assumptions. They asked that Irish Water outline how it has assessed its decision to assume that metered properties are representative of all domestic properties in Ireland and the implications of this. They further requested that for unmetered non-domestic properties, Irish Water should clarify whether the estimates are based on an average of all non-domestics or an average of non-domestics of a similar type. They stated that Irish Water should clarify whether Reported Domestic Demand has been used in Irish Water’s forecasts of increasing Domestic Demand and assumptions that PCC will remain static.

Furthermore, the CRU requested that Irish Water publish its decision and strategies that conclude there is no increase in PCC. The CRU noted that clarity of Irish Water’s assessment of forecast non-domestic demand would help improve understanding of Irish Water’s selections of demand scenarios.

Meath County Council welcomed the proposed increased capacity through leakage reduction acknowledged in the Framework Plan and the ongoing investment planned in water conservation measures is supported. Regarding leakage reduction targets the NWRP states that only 1% of all water output in 2019 was apparent losses. The Council argued that losses account for a much higher proportion of water output and is estimated as being closer to 10%. The low figure estimated by Irish Water, they stated, inflates the leakage figure.

Meath County Council also noted the NWRP assumed no significant increase in non-domestic demand, based on UK research and trends, and the Framework Plan further considers it likely that any increase in demand in these areas would be offset by water efficiencies and conservation measures. The Council raised concerns that this approach may result in a lack of available capacity to accommodate development proposed in the implementation of the Council’s Economic Strategy.

The Southern Regional Assembly recommended that Irish Water, in coordination with local authorities, determine the detail of demand for water across urban and rural settlements especially where significant levels of population and employment growth are targeted aligned with the objectives of the RSES and MASPS for infrastructure led regeneration and growth. They recommended the need for coordinated infrastructure planning between Irish Water and local authorities for the successful completion of the NWRP and RWRPs.

Cairn PLC asked Irish Water to ensure that the Framework Plan includes the key locations as noted in the NPF for population growth, ensuring they have all necessary water infrastructure in place to grow sustainably in the short term and to cater for the development of these sites and regions and assist with demand forecasting.

Chambers Ireland stated that the housing crisis and Covid-19 have accelerated the decline in commercial retail, and the shift towards remote working has put the future of some city centre corporate headquarters at risk. This, they maintained, has a direct effect of depressing demand across the economy, while also creating an opportunity for more efficient public spending in infrastructure.

AFU highlighted that national restrictions implemented because of Covid-19, resulted in observed changes in water demand and pressure patterns to different nodes of Water Distribution Systems and such changes should be incorporated in the Framework Plan.

AFU stated that water demand increased by approximately 20% because of increased hygiene behaviours and that the geographical location of water demand shifted from industrial and working centres to residential areas. They continued that the response of Ireland's water system needs to be amended to cope with such changes when future planning. They added that the increase in hygiene behaviour can be incorporated into longer-term planning, for example as an additional seasonal "headroom", or as another variable to the existing Supply Demand Balance (SDB) and its future estimation or at least as an "uncertain factor" for estimation under the "sensitivity analysis".

Tipperary County Council outlined that population, household size and growth, together with the strength of the national economy, will affect the demand for water.

The Department of Enterprise, Trade and Employment, Enterprise Ireland, and the IDA, stated that the new regulatory framework for water abstraction could also have an impact on non-domestic customer behaviour or preferences, with an impact on existing abstractions or future operations development. They outlined that the potential for companies who currently abstract their water to move to an Irish Water connection should be taken into consideration.

One stakeholder stated that in terms of population growth and post Brexit economic changes, more strain will be put on the water systems. The submission noted "with future demands in mind, I do not believe your plans will meet the needs. They need to be more ambitious."

8.2.2 Response to Demand Feedback

Demand for water distribution input, is the amount of water that needs to be input into the top of a distribution network to meet customer needs at the end of the networks.

Therefore, demand includes accounted for water and unaccounted water, some of which is leakage. This method is the standard International Water Association approach for water balance in water supply. However, when we are calculating future demand, we only grow our forecast for “accounted for water”. Therefore, when we estimate demand increase over time, we do not increase leakage.

A number of submissions questioned the inclusion of demand growth in the NWRP, noting decline in water use across Europe even in thriving economies. We have used a stable PCC within this iteration of the Framework Plan on the basis that the PCC is already relatively low. Population growth is significant in Ireland and that household occupancy rates are falling which can in turn generate an upward pressure on PCC. Sections 4.2.2.2 and 4.3.5 of the Framework Plan have been updated to reflect this.

Also, many European countries have been de-industrialising for the last number of decades, whereas Ireland has experienced strong non-domestic growth particularly in the agri-food, pharma, and manufacturing industries. Economic growth and job creation are driven by national policy, and the significant work of the IDA and Enterprise Ireland. Within the consultation period, submissions from some local authorities and industry groups suggested that insufficient provision had been made for non-domestic growth and that comparisons with water supplies in the UK where non-domestic demand was falling were not applicable to Ireland.

In addition, the Department of Enterprise, Trade and Employment highlighted that industries with their own private water supplies might migrate to the public water supply when the new abstraction legislation is enacted. Irish Water will review trends in relation to this issue through our Connection Developer Services section. The Framework Plan has a continuous feedback and monitoring process to allow for incorporation of emerging policy and data.

Data on population growth and core development strategies is directly sourced from the Regional Assemblies and local authority planning departments by our Forward Planning section. Leakage has reduced in the GDA. Data improvements through the development of Irish Waters Leakage Management System has allowed for better understanding of the water balance within the water resource zone. This is an important step in our leakage reduction journey, as it allows us to better target leakage reduction measures.

The 2019 base year leakage level in the NWRP is 741 MI/d. This figure is the sum of assigned leakage water balance for each of the 539 WRZs. The figure is calculated and presented in this way as we have included supply demand balance calculations for each WRZ within the NWRP. The water balance for each supply is initially taken from the LMS. However, it is manually corrected, based on information gathered as part of the local authority workshops including corrections to distribution input and use of surrogate water balance. The corrections represent a 2% variation in overall terms, and the findings are used by the LMS team to inform data improvement areas in the system. As the LMS system improves over time, this 2% variation will reduce.

As Irish Water must provide water supplies in all weather conditions, we have included normal, dry, drought and winter conditions in our NWRP. It should be noted that there are few water availability issues during winter periods, and we allow our treatment plants to operate at their maximum outputs during these conditions. Therefore, the Winter Critical Period is not usually the worst-case design criteria in the SDB calculations. It is, however, a useful planning scenario for reviewing network and storage resilience.

Demand for water is not uniform at all times, between day and night, weekday to weekend, summer to winter, normal conditions to drought conditions. These changing demands can be seen by tracking data from our telemetry systems. Our telemetry systems record the volume of water input into our supplies (distribution input). During drought conditions, for instance, we can see distribution input (DI) increasing. From these observations, we can develop a peaking factor for a given supply. A telemetry system is continuously reporting DI, it does not differentiate between leakage and accounted for water, it shows an overall increase. Therefore, peaking factors are applied to demand side calculations. High leakage in a supply dampens peaking, therefore the lower the leakage is in a supply the higher the peaking trends increase. Therefore, there is no inflation in the figures used.

Initiatives such as the First Fix Free scheme deliver significant gross leakage savings, however as new leaks on the customer side occur continuously, they do not result in significant overall demand reduction. If we look at the average meter reads before and after First Fix Free at a national scale, there is marginal difference. However, the First Fix Free scheme is significantly important in controlling the natural rate of leakage increase. Therefore, there is no inflation of the water deficit.

The baseline demand figures for the GDA are sourced from the regional telemetry system which records live 15 minute data from the treatment plants and meters on the distribution network. Accordingly, we are satisfied that that baseline data used are robust.

Irish Water has provided an appropriate level of detail (based on available raw data) during the consultation period, to ensure that the Framework Plan is accessible and understandable. Further data and information will be provided in the context of consultation on the draft RWRPs.

Some submissions from local authorities asserted that that “apparent losses” (water that is actually used but is considered to be a water loss due to data inaccuracies or unauthorised consumption) have been grossly underestimated in our leakage calculations, and therefore leakage could be lower than we are stating in our Plan. Similarly, as we have made assumptions on non-metered domestic use being the same as metered use, this may also inflate our leakage estimates. A key constraint was the lack of actual data available to Irish Water at a Water Resource Zone level, such that estimates had to be used. These estimates were established based on UK experience. As actual data becomes available, this data will be updated in accordance with the feedback and monitoring process set out in section 8.3.8 of the Framework Plan.

Long term impacts of Covid-19, Brexit and new abstraction legislation on demand will need to be assessed over the coming years before significantly altering forecasts.

Planning for growth and economic development will be one of the parameters used to prioritise roll out of the Preferred Approaches identified in the RWRPs through the capital investment cycles on a national basis. We have developed a ten-year capacity register that enables us to interface with the Regional Assemblies and the local authority planning departments during the delivery of our Plan. The capacity register enables growth based on no deterioration of current Level of Service, which in most cases is below the target Level of Service.

8.3 Supply Demand Balance

8.3.1 Summary of Supply Demand Balance Feedback

A number of stakeholders discussed supply demand balance in their submissions.

Roscommon County Council stated in relation to the supply demand balance detailed in the Framework Plan that hydrological yields from water sources need to be determined more accurately. Longford County Council noted that there may be an anomaly in how the current data is interpreted for calculating supply demand issues. They suggested investment is required to ensure that data used by Irish Water to make decisions is robust and accurate.

Kennedy Analysis noted that the supply demand data table in the draft Framework Plan does not contain a breakdown of demand regarding the Water Supply Project. They also stated that they had identified errors in supply demand balance data tables in past reports. They stated the need for “SDB data tables to be fully populated with data for each line of the ‘demand’ calculation, and to be fully transparent and available for consultation.”

Kennedy Analysis also questioned the calculation of the projected 2044 national deficit and stated, “the deficit should be calculated by deducting the demand figure from the supply figure for that scenario.” Additionally, the submission discussed the 20 hour, 22 hour and 24 hour design capacity and stated it is unclear how this data is relevant to the supply demand balance calculations. Regarding leakage, they questioned whether double counting occurred in the supply demand balance tables stating, “process losses are accounted for on both the supply side and on the demand side.”

AFU raised concerns regarding some limitations in the methodologies presented in the draft Framework Plan. They noted “supply-demand calculations are limited by poor data and calculations (e.g. using methods from similar UK catchments and streams). No validated methods for Ireland are used, rather ‘based on data from other water utilities.’” They recommended that Irish Water increases data availability and adjusts methods to allow for “the building of solid bases that would enable more efficient water resource management.”

The Department of Enterprise, Trade and Employment, Enterprise Ireland and the IDA noted “the NWRP sets out objectives for supply-demand balance on the provision of ‘drinking water standard.’ The ‘quality’ of water provided to many industrial premises is not currently specified or part of the service-level agreement between Irish Water and a

business. Some industries may require a specific quality for their manufacturing processes and may treat water on site ahead of their manufacturing processes.” They added that the supply demand balance and barrier standards within the draft Framework Plan are not intended to be used as a deterrent to new connections to the network.

The EPA requested that consideration be given to the updated information in the Agri-Food 2030 Strategy when published as they noted that an increase in agri-industry related demand should be accounted for in the WAFU figures.

The CRU discussed Irish Water’s assessment of supply demand balances across the country and the correlations with investment decisions. They noted “where Irish Water identifies a need for investment to meet supply-demand deficits, the CRU considers that it is important that it is appropriately appraising the potential solutions and prioritising delivery of those solutions in a cognisant and objective manner.”

The CRU questioned the statement made by Irish Water that the capital maintenance requirements of assets have been considered in the resource planning process and stated that this is not in line with UK Water Resources Planning Guidelines. They stated, “it is not clear how this is considered within the process and whether this is having an impact on Irish Water’s SDB analysis, Irish Water should clarify and quantify this issue.” They also asked for Irish Water to clarify what is meant by an amended supply demand balance when it’s referred to its capacity register.

In addition, the CRU stated it is unclear why Irish Water considers that “excluding an estimate of sustainable abstraction in its supply demand balance calculations is a precautionary approach.” The CRU sought clarifications on course screening regarding the supply demand balance and whether the Economics of Supply Demand Balance model produces options/combinations of options under each of the six approach headings.

8.3.2 Response to Supply Demand Balance Feedback

The methodology set out in Appendix C of the NWRP is used to develop the surface water assessment within the NWRP. Further information on the surface water assessments used has been provided in section 3.2.1 and Appendix C of the Framework Plan. Irish Water will develop and deliver a 5 to 10-year data and intelligence improvement strategy, on data related to supply demand balance, water quality, asset register 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 set out in section 8.3.8 of the Framework Plan.

One of the key objectives of the NWRP is to improve transparency. Although it is not a legislative requirement in this country, Irish Water is committed to the completion of the NWRP within its Water Services Strategic Plan. A search of published information from other jurisdictions, including publicly available water resource plans in the UK, supports the position that Irish Water has provided the correct level of detail as part of our first NWRP. Further data as collected will inform the development of the RWRPs and the next cycle of the NWRP. As actual data becomes available, this data will be

updated in accordance with the feedback and monitoring process set out in section 8.3.8 of the Framework Plan.

The supply demand balance deficit is calculated by subtracting demand from supply for each weather planning scenario. We are satisfied this has been correctly calculated. The normal design for a water treatment plant is to operate over 20 hours, Within the Framework Plan we allow for the plants to operate at 22 and 24 hours in peak conditions, to ensure that we do not oversize assets. Process losses are accounted for on the supply side and headroom accounts for uncertainties in all values.

The methodology outlined in Appendix C, is used to assess the surface water supplies within the NWRP. This methodology was reviewed by the EPA hydrometrics team during the early development stages of the NWRP and follows the same principles that will be applied as part of the proposed regulatory process on abstraction.

The objectives of the NWRP are to provide safe, secure, reliable, and sustainable water supplies to all current and future customers. The quality standards are set by the Drinking Water Regulations (S.I. No.122 of 2014) (as amended). We have set a 1 in 50-year level of service within the Framework Plan.

The EPA asked that consideration be given to the updated information in the Agri-Food 2020 Strategy when published and to consider its potential impact on Water Available for Use (WAFU). Irish Water will consider the data as it becomes available and will work with the EPA and other stakeholders to understand its potential impact on raw water availability and WAFU.

At this stage of the NWRP, the Preferred Approaches and the delivery of our 25-year plan has not been completed. National prioritization will occur when the four RWRPs have been finalised.

Due to the poor condition of the water supply asset base, Irish Water identifies critical capital maintenance issues during need workshops with the Local Authority water service providers. This is not directly included in the supply demand balances but is considered within the Preferred Approaches.

On a precautionary basis we have identified potential sustainability issues across our supplies. However, we have not built these into the supply demand balances until we have visibility of the pending legislation on abstraction of water.

Hard water is not considered to be a need within this iteration of the NWRP, as it is not a compliance issue under the Drinking Water Regulations and provides health benefits. Quality and chemistry of raw water is considered through the DWSP assessments that will be carried out for each water supply over the coming years. Some respondents requested live access to water quality sampling data. At present compliance data for each water supply is available on our website. While it will take a number of years to put in place, Irish Water will consider mechanisms for providing live water quality data in the future.

8.4 Water Quality and Reliability

8.4.1 Summary of Water Quality and Reliability Feedback

Many stakeholders raised concerns regarding water quality and resilience. An individual discussed water quality in their submission as they live in an area where hard water is prevalent and as a result are against water charges as they noted the product is unsatisfactory.

One individual highlighted that there is no mention of the quality/chemistry of the raw water at surface water intakes in the Framework Plan. The submission suggested Irish Water include a comparison of raw water quality/chemistry at some of the larger and smaller surface water abstractions. They added that the Framework Plan would benefit from a detailed section on raw water quality/chemistry that includes a list of substances and parameters permitted, as well as a strategy to inform the public of their responsibility regarding surface water quality.

The individual also noted that there is little discussion within the draft Framework Plan regarding groundwater quality/chemistry and suggested a fuller description would be beneficial and the benefits and difficulties that are associated with such abstractions.

In addition, the submission questioned how vulnerable the water supply is and asked whether Irish Water has a disaster recovery plan in place to address natural, economic, and environmental disasters.

A respondent requested that fluoride be removed from drinking water, while another submission noted that access to clean drinking water is a basic human right. They requested that Irish Water works towards publishing near real time water treatment plant operational/quality data, stating “examples of the data in mind might include Free Chlorine Residual, Turbidity, UVI, UVT, pH, Residual Aluminium and so on.” The submission suggested that this type of real time data would indicate good current operational performance of water treatment plants thus providing assurances on the quality of drinking water being supplied.

Another respondent noted that there is no detailed information about water-using behaviour in the Framework Plan.

A stakeholder called for closer collaboration between Irish Water, the EPA, and local authorities regarding raw water source quality. The stakeholder added “primary raw water sources must be managed in a manner that ensures they are pollution free – thus reducing the costs of water treatment.”

The Eastern and Midlands Regional Assembly welcomed the recognition within the draft Framework Plan of the importance of water quality, reliability and security and supported the risk management approach.

Roscommon County Council stated continuous raw water monitoring of applicable parameters should categorise water resources and highlight sources that are of poorer quality and how they perform in extreme weather events. They highlighted that if the abstraction legislation allows and hydrological yields are determined, quantity and

resilience can be achieved by interconnectivity of water supply zones and rationalisation of poor unreliable sources in the short to medium term.

Longford County Council requested consideration be given to future growth when sizing pumps and chemical tanks to allow for a more efficient growth within the system. They added that Longford currently operates with no resilience in the system countywide and they view this as their greatest operational risk which puts a significant strain on daily operations.

Clare PPN outlined that many areas in Clare are frequently under boil notices and supply interruptions. A stakeholder stated due to ongoing issues and global warming, people are experiencing issues such as drought, no available water for prolonged periods, and substantial rain which impacts the quality of water.

Fight the Pipe stated that Ireland's water supply is unreliable and noted "water often smells strongly of chlorine and its leakage levels are among the highest in the world. But the problem is not lack of raw water, the problem is the water pipes."

Kennedy Analysis highlighted the benefits of water mains replacement, which included, offsetting asset deterioration and improved reliability and improved water quality and leakage reduction. The RSPA echoed the need for water mains replacement and noted it is necessary to address the quality of water.

AFU provided suggestions for water quality improvements. They noted the EPA has called on Irish Water to address delays in providing wastewater infrastructure that will deliver improvements to meet the WFD. They added, "regarding the matter of raw sewage discharge into receiving waters, we recognise the existing efforts to upgrade, replace and construct new Wastewater Treatment Plants (WWTPs)...although we acknowledge the distinction between sewage discharge and potable water issues concerned by the draft Framework Plan, given the magnitude of the problem, the environmental consequences, and the progress to date, AFU highlight the issue for Irish Water's future plans."

In addition, they noted Irish Water should undertake sampling more frequently, and improving water quality monitoring would assist in addressing the EPA's recommendations regarding upgrades on wastewater disposal practice.

DCU Water Institute stated that there are current water quality issues of public health concern that need to be urgently addressed in the Framework Plan.

The HSE raised concerns regarding water quality and another submission also raised concern about "the amount of lethal chemicals that are allowed by law to be flushed away and queried how these can be extracted from our recourses."

Ballyboden Tidy Towns noted the Ballyboden reservoir is non-compliant and areas around the Botherboy pipe are not maintained.

The Southern Regional Assembly outlined that protecting water quality and bringing strategic infrastructure projects to fruition are integral to implementing the RSES and MASPs.

An individual suggested that diversification would enhance the safety and reliability of water supply.

The EPA discussed water quality and resilience at length in their submission. They noted, while the majority of public water supplies are safe, further improvements are necessary. They also suggested the Framework Plan should address how Irish Water will rectify current issues, with details and commitments in the four RWRPs. They added (regarding the National Disinfection Programme), that the timelines have not been achieved and noted “it is the view of the EPA that no delay should be introduced into the delivery of this programme as these works are of fundamental importance in addressing disinfection issues in water supplies.” They suggested that Irish Water should include proposals to address the removal of chemicals and pharmaceuticals in wastewater treatment and a reduction in the spread of antimicrobials into the environment via wastewater.

They added, the Framework Plan should include monitoring of water quality “for a broader range of emerging and radiological containments and not just those which already have specified drinking water limits.”

The Environmental Co-ordination Unit of the Department of Agriculture, Food and the Marine outlined commitments made regarding the Programme for Government in relation to water quality.

AECOM made some observations regarding Appendix J – Irish Water’s Multi Barrier Approach for Achieving Safe and Secure Water of the draft Framework Plan. They stated it has omitted some methods such as removing organics and suggested consideration of wider treatment methods to manage and control organics would give a more balanced approach and suggested a more detailed explanation around Drinking Water Safety Plans and changing regulations be included.

Councillor Johnny Flynn stated that Drumcliffe water supply is vulnerable to contamination and noted “the groundwater and surface water systems throughout the catchment are inexplicably linked and the source is difficult to protect.” The Councillor also outlined water quality risks in the area.

GSI stated that an aim of the recast Drinking Water Directive is to “empower consumers by providing them with information on their water supplies.” They included further information on the Directive and noted that the availability of open and transparent data on Ireland’s water supplies is essential for efficient water management.

Limerick Greens recommended that abstractions from the largest water supply zones be considered of National Strategic Importance and be afforded protections in terms of continuity of supply and in terms of barriers to pathogen removal that would not normally be required by other water supply zones. They stated, “due to the presence of high quantities of Cryptosporidium in the agricultural catchments that supply this same city drinking water supplies, UV treatment or other such appropriate barriers to pathogens such as Cryptosporidium be provided for in each of these Strategic Water

Supplies.” They also listed several points in relation to Appendix J included in the draft Framework Plan.

Limerick Greens also outlined that the EPA noted the Limerick City Water Supply Zone has one of the longest recorded histories of non-compliance with trihalomethanes. They noted that although Irish Water installed temporary infrastructure to alleviate this issue, namely the dosing of chlorine dioxide to try and inactivate the high levels of organics, this is not an appropriate long-term solution and a danger to public health.

Waterford Institute of Technology noted the use of multi-species swards reduces and could eliminate the use of and need for pesticides, synthetic fertiliser nitrogen and phosphorus and associated leaching and run-off and loss to waterbodies, which they noted as a major impediment to achieving water quality standards in recent years.

One respondent discussed issues with water quality in Mullingar and its environs and noted “in recent times, there was an outbreak of *Cryptosporidium* in the Mullingar supply.”

8.4.2 Response to Water Quality and Reliability Feedback

Hard water is not considered to be a need within this iteration of the NWRP, as it is not a compliance issue under the Drinking Water Regulations and provides health benefits. Quality and chemistry of raw water is considered through the DWSP assessments that will be carried out for each water supply over the coming years. Some respondents requested live access to water quality sampling data. At present compliance data for each water supply is available on our website. While it will take a number of years to put in place, Irish Water will consider mechanisms for providing live water quality data.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9 of the Framework Plan.

Groundwater is a key option for our public water supplies, and we recognise that it can deliver improved water quality, storage, and source protection. We will confirm this option in our Framework Plan, and it will be assessed further through the RWRPs. We have updated section 3.2.2 in the Framework Plan to reinforce the significance of groundwater to our resources planning process. Outputs from the GSI GW3D project will be utilised by Irish Water in future assessments as information becomes available via the monitoring and feedback process set out in the Framework Plan in section 8.3.8.

As part of our risk-based approach, incident plans are being developed for our supplies.

Addition of fluoride to water supplies is a public health policy and is facilitated rather than initiated by Irish Water.

At present we do not have micro-component detail on water using behaviour. However, this will be part of our 5 to 10-year data improvement strategy.

Irish Water recognises the increasing importance of nature-based solutions and catchment measures in relation to improving water quality and reducing risk across our supplies. Irish Water is an active participant in catchment-based initiatives and where possible will incorporate NBS solutions at project level.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9 of the Framework Plan.

The sizing of our Preferred Approaches is based on the supply demand balance. This ensures that growth and peak output are considered at the earliest design stages. This will ensure resilience in future operations.

The purpose of the NWRP is to ensure quality, quantity, reliability, and sustainability of all 539 water supplies.

The issues with the public water supply relate to a number of factors including: compliance, water quality risk, environment, level of service, water sources, existing infrastructure, residuals, drought, resilience, climate change, population growth and economic development, interconnectivity of supplies as well as issues such as network performance and leakage. Typically, problems with the public water supply cannot be related to a single issue or cause and cannot be solved with a single solution such as leakage reduction alone.

Water mains replacement is an integral part of our leakage reduction programme and is included in section 7.3.1 of the Framework Plan.

The purpose of the NWRP is to improve level of service in terms of quality, quantity, reliability, and sustainability across all of our supplies, including those in Gaeltacht Areas.

Irish Water agrees that greater protections should be given to abstractions that are of strategic national importance. The objective of the WFD is to achieve “good status” in waterbodies, which will in turn reduce risk in our water supplies.

Rationalisation and regional solutions are considered within the RWRPs. There will be no impact on programmes to address critical water quality issues, including the National Disinfection Programme, during the delivery of the NWRP.

Treatment measures to address organisms including technologies such as granular activated carbon are considered at project stage.

Irish Water will collaborate with the GSI in terms of our existing supplies, future supplies, and available data in relation to our groundwater assets. This has been confirmed in the Framework Plan in section 7.3.4.1. Outputs from the GSI GW3D project will be utilised by Irish Water in future assessments as information becomes available via the monitoring and feedback process set out in the Framework Plan in section 8.3.8.

8.5 Underserviced Communities

8.5.1 Summary of Underserviced Communities Feedback

The topic of water quality and supply to rural areas of Ireland was discussed in submissions.

An individual noted the Framework Plan contains little on access to water, and referenced Article 16 of the Drinking Water Directive which sets out two challenges for access, “to supply water to households who currently don’t have access to safe drinking water and to supply water in public places.” The submission stated they would like to see both objectives translated into the programme extending the public supply network to villages currently without a public water supply.

Clare PPN noted their members are concerned that the Framework Plan focuses on areas with greater populations and stated it needs to include balanced regional and rural development. They also raised concern that access to both water and wastewater treatment services is adversely affecting rural development in Clare. They recommended that in areas that fall below certain levels of populations, that local solutions with support from Irish Water should be facilitated. They also requested the draft Framework Plan include a commitment to provide local small-scale remedies.

Meath County Council welcomed the proposal for rural areas to develop small geographic groups of water resource zones to form study areas where regional solutions can be considered.

The Southern Regional Assembly noted the importance of identifying water infrastructure needs for rural areas, and funding projects identified by local authorities at a local level to support rural communities and economies.

One respondent outlined an issue in the Keenagh area in County Mayo, noting that 24 families are currently living without access to clean drinking water and they are relying on gravity feed systems to gain access to water from local water streams. The submission added that over the past number of years the residents have received no viable option to resolve the issue. They requested that Irish Water provide the necessary support to reach a solution.

Údarás na Gaeltachta noted that as a result of Covid-19, people will migrate to rural areas putting more pressure on the provision of services in rural areas. They also stated the lack of investment in rural and Gaeltacht areas is having an impact on companies basing themselves in these areas.

Councillor Johnny Flynn stated that 20% of County Clare’s population use private or group water supplies due to the public water supply network not being readily accessible to them and asked for the Framework Plan to consider the potential to increase the proportion served by public water supplies.

Wicklow County Council provided a list of underserviced areas that need particular attention in any regional plan regarding water supply.

The HSE suggested that Irish Water undertakes an analysis of distribution networks to understand the potential within areas only serviced by private water to provide all communities access to public water supplies, particularly for rural Ireland.

8.5.2 Response to Underserviced Communities Feedback

Information on connection to the public water supply, is available from our Connection Developer Services department. Irish Water also has a policy for taking in charge group water schemes. We also support growth in rural communities through the Small Towns and Villages Growth Programme or additional programmes as required. Box 4.1 in section 4.3.2 of the Framework Plan confirms this.

As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the "need" drivers for each supply. The NWRP considers all feasible options.

8.6 Conclusions on Need feedback

Having carefully reviewed the submissions received on the theme of Need, Irish Water considered that a number of changes should be made to the draft Framework Plan. These changes are explained in section 8.6.1 regarding "Clarifications" below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 8.6.2 regarding "Recommendations" below.

8.6.1 Clarifications on Need Feedback



The following sections of the Framework Plan have been updated to reflect feedback under the theme of Need:

Section 4.2.2.2 and 4.3.5

Section 3.2.1 and Appendix C

Section 7.3.1

Section 3.2

Section 3.3.2

8.6.2 Recommendations on Need Feedback

1. Irish Water will review trends in domestic and non-domestic demand over the coming years and assess the impacts of Covid-19, Brexit, agricultural intensification and new abstraction legislation and all applicable policy development as per our monitoring and feedback process in section 8.3.8 of the Framework Plan.
2. We will also review means of providing access to live raw water quality data.

9. Solutions Methodology

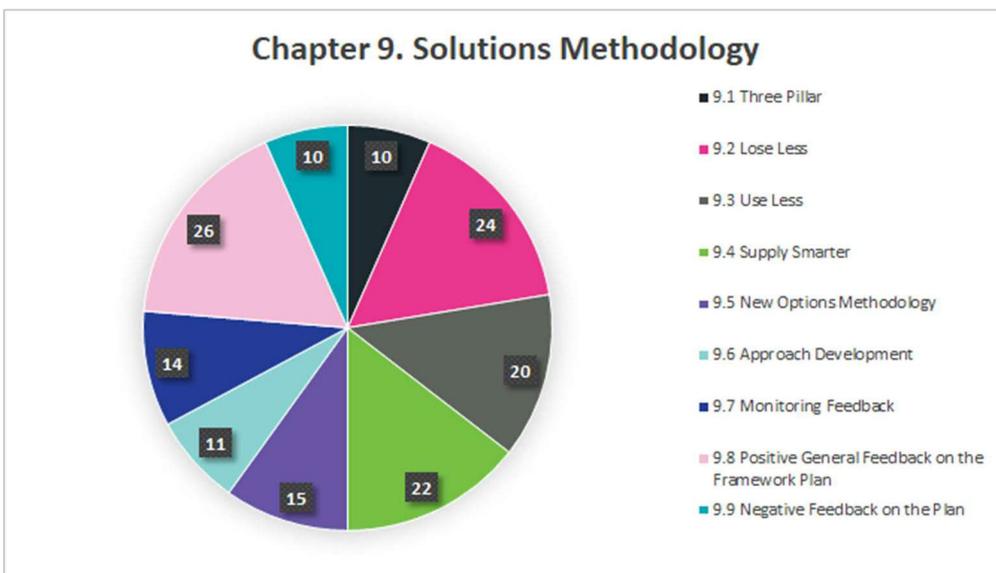
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Solutions Methodology”. Within the overall Solutions Methodology theme, we identified nine sub-themes, which we set out in Figure 9-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 9-1 details the breakdown of feedback received under the theme Solutions Methodology. It shows that of the 152 mentions⁵ in submissions that mentioned the solutions methodology the most frequently mentioned were related to positive general feedback on Framework Plan with 26 mentions followed by Supply Smarter with 22 mentions. Figure 9-1 below also identifies the nine sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 9-1 Solutions Methodology Theme



⁵ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

9.1 Three Pillar

9.1.1 Summary of Three Pillar Feedback

Regarding the three key pillars, a number of stakeholders recognised how such an approach is required. Chambers Ireland stated the outlined targets will reduce pressures on the water supply and ensure long term viability. The HSE noted “the lose less-supply smarter concept represents a holistic approach which has long been needed in Ireland.”

The Eastern and Midlands Regional Assembly welcomed the three-pillar approach as it aligns with the RSES approach to water management.

A number of stakeholders stated however that this approach was not enough. DCU Water Institute commented “the current conservation strategy focuses on fixing leaks. The lack of attention to the issue of water conservation through behaviour change, the uses of water, and the application of new technologies is a weakness.”

Stakeholders suggested a number of options that could be integrated into the approach, it was noted that the Covid-19 situation demonstrated how previous barriers to large scale problems can be overcome and this can be used as an opportunity for large interventions.

Additionally, the Southern Regional Assembly suggested integrating the use of Blue and Green Infrastructure (BGI) and Nature Based Solutions (NBS) as part of the Developing Solutions and Supply Smarter Infrastructure measures and methodologies of the NWRP.

DCU Water Institute discussed a sustainable approach to water, they stated “framing the water challenge within the wider context of climate/green deal/sustainable development could help to address the interconnected nature of these challenges, as well as stimulating joint initiatives with other entities to solve the problem.” They also noted that in order to achieve sustainable water management, Irish society’s perception of water as a free resource needs to shift.

9.1.2 Response to Three Pillar Feedback

The “Three Pillar” approach of “Use Less”, “Lose Less” and “Supply Smarter”, allows Irish Water to consider the broadest possible range of solutions through the development of the NWRP.

We recognise that the tangible outcomes and benefits to the supply-demand balance (SDB) of some of the solutions, particularly under the “Use Less” (or water conservation) pillar, are not quantifiable at present. However, Irish Water recognises the strategic importance of this pillar and is proactively investing in measures, including water conservation campaigns, Green Schools initiatives to promote grassroots understanding of water conservation, development of a Water Conservation App and a successful Water Stewardship Programme with non-domestic users. These initiatives verify Irish Water’s commitment to conservation. Over the coming years our ability to quantify the impact of these initiatives in terms of reduction in water use will improve as our data and intelligence systems become more refined.

Irish Water recognises the increasing importance of nature-based solutions and catchment measures in relation to improving water quality and reducing risk across our supplies. Irish Water is an active participant in catchment-based initiatives and where possible will incorporate NBS solutions at project level.

9.2 Lose Less

9.2.1 Summary of Lose Less Feedback

The lose less option was discussed at length in submissions. Stakeholders raised concerns in relation to demand figures, infrastructure, and targets regarding leakage.

Many stakeholders voiced their dissatisfaction on how leaks are currently fixed in Ireland and noted that Ireland lags behind European cities.

An individual calculated the water available per day currently and suggested that the demand projections outlined in the draft NWRP can be met by reducing the leakage targets alone and current capacity would allow time for leakage repairs.

Another respondent discussed the issue of leakage and noted the water transmission network infrastructure has been neglected, they stated “nationwide the water supply network needs significant investment to a level that water loss in transmission is kept to a minimum. It is difficult to achieve a totally leak free transmission system.” Clare PPN also raised concerns regarding the level of leakage of potable water.

The Eastern and Midlands Regional Assembly recommended that Irish Water pursue a long-term strategy of minimising leakage for the long-term economic benefit of the region.

AFU recommended monitoring and controlling the water distribution system as an approach to reducing leaks. They highlighted pillars that can be adopted by Irish Water including: improving the operational control of the systems through monitoring, metering, modelling, and controlling the systems and improving the overall systems regarding the management of leaks.

The CRU stated domestic meters will provide Irish Water with significant data relating to water use and utilising this data with the First Fix Free scheme will allow for a robust estimate of the total amount of water being lost to leaks through customer supply pipes. They added that Irish Water should disaggregate where water is being lost from source to tap. They also noted “Irish Water should clarify whether it has carried out sensitivity analysis or sense checking, in the form of pilot studies or modelling work, around its assumptions for apparent losses, distribution operational use and meter-under-registration losses.” They also questioned the data available and noted that Irish Water should clarify the consideration of using Managing Leakage 2011 estimations.

Chambers Ireland requested greater effort should be made to ensure water loss through the network, or usage, is limited. They stated “water-loss metrics need to remain a core metric by which Irish Water is evaluated, indeed its importance will only become greater as time passes. Simultaneously, consideration needs to be given to the fact that Irish Water faces a substantial burden with respect to the aged nature of

much of the water supply network and the capital/time it will take to improve the network."

The EPA outlined opportunities to address multiple issues when undertaking leakage reduction works, for example, "replacing cast iron mains and lead service connections which may compromise the quality of water delivered to the public. These opportunities for synergies should be identified and implemented via the Plan, as they deliver the maximum benefit."

It was stated that leakage levels in Ireland have historically been compared to that of the UK, which the RSPA stated is a poor performer internationally when it comes to leakage. This stakeholder suggested instead we consider the "2017 KPMG 'City Benchmarking' study which considers water leakage in 35 cities from countries across the world including Nigeria, South Africa, Uganda, Brazil, Colombia, Poland, Russia, Albania, Bulgaria, the UK and Northern Ireland" which cited an average loss of between 10% and 13% of water to leakage in cities in comparison to 43% in Ireland.

Furthermore, they highlighted unambitious leakage targets that are not in line with international best practice. They cited that the CRU set Irish Water a 25% leakage reduction target for the 2020-2024 period however the draft Framework Plan adopts a 2% leakage reduction target for the 2020-2024 period. They questioned why, if it is recognised that a long-term leakage target methodology is no longer considered international best practice, would Irish Water launch a major project based on that methodology.

Kennedy Analysis advised that it has been a decade since Engineers Ireland stated in its 2011 report that the "renewal of water pipe infrastructure is vital" and it should be a "national imperative" that Ireland upgrade "at least 1%, or more" of the water pipes every year.

Fight the Pipe highlighted that Ireland's water pipes are so corroded and damaged that they leak more treated water than is used by all households every day in Ireland. Fight the Pipe and Kennedy Analysis both stated that leakage problems in Ireland are so extreme, that it constitutes the biggest single element of "demand". They outlined that the draft Framework Plan adopts low leakage reduction targets, even though Ireland experiences one of the highest leakage rates in the world. Fight the Pipe highlighted that Irish Water plan to continue using find-and-fix as its primary leakage reduction method but stated that this is not enough for Ireland and a major mains replacement programme is needed. "

Fight the Pipe outlined that Irish Water's country-wide leakage data shows that, since 2014, its leakage programme, otherwise known as find-and-fix has done little more than offset the 'natural rise' of leakage. Fight the Pipe stated that offsetting the 'natural rise' is very different to cutting leakage by a considerable volume.

Kennedy Analysis stated that over 700 million litres of treated water are lost through network leaks every day. "Failure to properly address leakage will result in projects being undertaken to develop new raw water sources and increase treatment capacity that would otherwise not be necessary – yet Irish Water's leakage reduction targets in

this plan are extremely unambitious and do not comply with international best practice, as is shown in detail in our submission.” Kennedy Analysis highlighted that Ireland’s leakage is reported at 43%, which is the highest in the world. They outlined that Irish Water publicly broadcast that leakage went down in 2019, but that this reduction in leakage was driven by a narrowing of the definition of ‘leakage’ by Irish Water.

Kennedy Analysis also highlighted that the water wasted through leaks every day is not raw water, it is water which has been extracted from a raw water source, pumped into a treatment plant and treated, before going through the supply system where it is then lost. They stated that reducing leakage, would come from the creation of a brand new raw water source and additional water treatment capacity and highlighted that the approach taken to leakage for the next 25 years, is the most important aspect of the draft Plan.

Kennedy Analysis referred to the leakage reduction target of 25% set by the CRU for the 2020-2024 period and that this target should be reflected in the draft Plan. They stated that, the draft Plan does not reflect the 25% leakage reduction plan and instead adopts a 2% leakage reduction target for 2020-2024 period. They also outlined that the draft Plan cites three different levels of base year (2019) leakage and neither of these aligns with the actual levels of leakage in 2019, as reported by the CRU.

Another stakeholder also highlighted the CRU leakage reduction target for the 2020-2024 RC3 period. They stated that this leakage reduction target should be honoured and reflected in the draft Plan. They continued that the draft Plan proposes a leakage reduction rate of just 2% over the next five years as opposed to the 25% leakage reduction target over five years in the RCS. The stakeholder stated that Ireland cannot expect to reduce its leakage unless it abandons its reliance on find-and-fix, as the primary leakage reduction method. The stakeholder stated that Irish Water claimed that average leakage in Ireland is down to 43%, but that this 43% only relates to losses on the distribution side.

The RSPA stated that the unacceptably low leakage reduction targets set out by the draft Framework Plan, do not reflect best practice in the UK or a sustainable approach to water supply management.

They further summarised that the UK Water Resources Planning Guidelines states a 25% leakage reduction target over five years is appropriately ambitious, and in line with the targets set by OFWAT. They outlined that the most recent guidelines in the UK, which supersede the 2016 version cited by Irish Water in the Framework Plan, reflected OFWAT’s position, outlining the previously used SELL method to determine levels of leakage is no longer acceptable for use in Water Resource Management Plans. OFWAT asserts that percentage leakage reduction is transparent and measurable, and the RSPA suggested that this is the approach Irish Water should be taking.

The RSPA stated that within the UK and the EU there is a major focus on the need to reduce water consumption, particularly per capita consumption (PCC). They suggested that Irish Water should look at leakage reductions that have been achieved in other jurisdictions and decide on the most appropriate approach and set targets accordingly,

such as the Thames Water mains replacement programme in London which resulted in a huge reduction in leakage.

Kennedy Analysis also promoted OFWAT's position on leakage reduction and SELL. Namely that OFWAT stopped using SELL for leakage targets because it did not encourage sufficient ambition in leakage reduction. Therefore, they noted it would be entirely inappropriate, considering the recent developments in the UK regarding SELL for Irish Water to adopt SELL for its long-term leakage target in the NWRP. They stated that an absolute percentage-reduction target is simple, measurable, and accessible for all members of the public.

Kennedy Analysis referred also to the mains replacement programme (MRP) in the UK and the London MRP Thames Water as being a success. They stated that after the privatisation of the UK water supply in the nineties, large scale MRP's were undertaken with a huge positive impact on leakage levels which effected a step-change in leakage in England and Wales. Kennedy Analysis continued that after the MRPs were completed in the UK, find-and-fix has been the primary leakage-reduction strategy, leading to leakage levels in the UK plateauing with nothing like the reductions that were achieved in the nineties

Kennedy Analysis also cited a recent major project, commissioned by the UK Water Industry Research on behalf of the UK water industry to assess whether current UK replacement rates are sufficient to offset the natural deterioration of the pipe system over the next 50 years. They stated that its key finding was that even though the UK pipes are currently considered to be in a "reasonable" state, the current mains replacement rate in the UK is low and insufficient. Kennedy Analysis noted in the report that the current UK replacement rate is similar to rates in Europe, despite parts of Europe having much newer pipes.

AFU stated that "the existing efforts on leakage reduction and their continuation are warmly supported by AFU, but greater urgency and ambition is required." AFU stated that 12 leakage reduction projects are in progress for the county of Dublin and that no further projects are planned that AFU is currently aware of.

Meath County Council acknowledged the opportunity to increase capacity through leakage reduction and noted that the ongoing investment in water conservation measures is supported and welcomed by the Council. The Council highlighted that the targets set out for leakage reduction are acknowledged in the draft Plan as ambitious. "Over reliance on behavioural change and/or a failure to reach leakage reduction targets may result in supply problems and/or a failure to meet future demand."

Tipperary County Council stated that the co-ordination of efforts to reduce water leakage nationally, must form a central focus of the operation of water services. "Attention in this regard must be given to renewed activity in leakage reduction, accompanied by the allocation of the necessary budget resources and setting of realistic water savings targets." The Council stated that the Framework Plan needs to provide for a renewed incentive, coupled with adequate resources, to address water leakage at both a national and local level. Tipperary County Council also "recommends

the use of higher leakage reduction targets for abstractions causing most environmental damage.”

One stakeholder welcomed a more ambitious plan regarding the replacement of pipes, as the percentage of pipes replaced in the Dublin area per year, is lacking behind other European countries.

A submission from the EPA noted that the Framework Plan recognises that historic underdevelopment in capital maintenance has resulted in an asset base in poor condition, which in turn results in high leakage rates across the networks. The EPA welcomed the planned reduction in leakage but is concerned at the rate of progress. “Irish Water agreed a leakage reduction of 176 MI/d with the CRU as part of the 2020-24 investment programme, but the NWRP only projects a 41 MI/d leakage reduction by 2024.”

AFU suggested that consideration be given to re-establishing Irish Water’s domestic metering programme stating that this would allow Irish Water to improve data availability and further understand the drivers of water demand. “Improving such data availability through increased metering would allow any upcoming measure to be applied in a volumetric basis.”

Kennedy Analysis and the RSPA highlighted that the CRU recommended leakage reduction target of 25% should be referenced in the NWRP, a target previously agreed to by Irish Water and similarly stated in the UK Water Resources Planning Guidelines. Similarly, Kennedy Analysis pointed to the fact that the EPA welcomes the planned reduction in leakage but is concerned at the rate of progress predicted despite the agreed leakage reduction with the CRU.

9.2.2 Response to Lose Less Feedback

Leakage reduction and water conservation form an integral part of our NWRP and together form one of the key pillars to resolving supply demand balance deficit. In Ireland the understanding of our water distribution networks is improving, and although transmission losses across our distribution networks are high compared to European norms, due to legacy underinvestment, we have set up the information systems, intelligence, processes, people and programmes to deliver sustained and continued leakage reduction. We have also sought advice from industry specialists in setting up our National Leakage Reduction Programme.

Our dedicated National Leakage Reduction Team has established a programme of activities across the water supplies in all counties. The team has developed a Leakage Management System and has set short- and medium-term SELL targets. As data and information improve and we progress along leakage reduction glidepaths, further long-term targets will be established. The increased operational data and understanding of asset performance of our networks will also inform the areas of the network where targeted mains replacement is required, allowing us to increase renewal rates over time. Wholesale mains replacement is not recommended as a standalone solution. We are also looking at emerging acoustic technologies and intelligence systems to allow us to optimise our active leakage control activities, and non-destructive testing technology

to improve targeted water mains replacement. Further text has been provided on this in section 7.3.1 of the Framework Plan.

Over the course of the development of the NWRP, including ongoing engagement with key stakeholders such as Government departments and our local authority partners, the extent of the issues with the current public water supplies have become evident. These issues relate arise due to a number of factors including: compliance challenges, water quality risk, environmental impacts, level of service, water sources, existing infrastructure, residuals, drought, resilience, climate change, population growth and economic development, interconnectivity of supplies as well as issues such as network performance and leakage. Typically, problems with the public water supply cannot be related to a single issue or cause and cannot be solved with a single solution such as leakage reduction alone.

As set out in Box 4.1 of the Framework Plan leakage reduction will play an integral part in improving the current capacity and facilitating growth and economic development. Irish Water has meter data for approximately 55% of domestic properties. Whilst this metered data has been used within the Framework Plan, it is currently not known how representative this data is of non-metered domestic demand. Also, in order to understand the long-term outcomes of initiatives such as the First Fix Free scheme, we must build up data sets on gross to nett ratios for these activities and natural rate of rise across private customer supply pipes.

In most European countries, domestic demand is 100% metered. In the UK where domestic meter coverage varies, estimates of usage are applied for unmetered demand, which are usually in the order of 20% higher than metered. Therefore, as we have used a flat rate of PCC, based on metered data in the Framework Plan, we may be overestimating leakage across our supplies at present.

In order to improve data confidence in our Leakage Management System, innovation studies have been set up to investigate the water balance across a number of supplies. Due to the large number of supplies, it may take a number of years to build up an appropriate understanding of domestic use based on socio-economic and geographical differences across our supplies. Irish Water is also progressing meter calibration, meter replacement programmes and DMA optimisation to better understand the water balance within the LMS. The sensitivity analysis cannot be accurately done for losses assumptions pending the collection of more accurate data, which is underway.

Leakage reduction is a key performance indicator for Irish Water, and part of our regulated performance assessment framework. Our aim is to reduce levels of leakage and migrate towards an Infrastructure Leakage Index of “3” over the coming 10 years. This equates to a similar level of leakage reduction as was achieved by Scottish Water. It should however be noted that SELL calculations drive and enable the development of the processes, network understanding and controls, data and information that allow us to better understand our networks and therefore refine and successfully deliver leakage reduction.

Irish Water addresses lead services as part of the National Leakage Reduction Programme, targeted watermains replacement and pH optimisation are also used to address network related water quality issues.

Percentage (%) leakage is a poor indicator of leakage performance and is rarely used by regulators as a metric to compare leakage performance across water supplies or water suppliers. This is due to the differing ways different companies estimate leakage and the sensitivity of % leakage calculations to water usage. For example, consider a 10 kilometre network with 5 customers. In this example there is 500 litres per day of leakage on the distribution network and each of the customers uses 100 litres of water. Therefore the % leakage would be 50% (500 litres leakage and 500 litres usage). However, take a similar supply with 10 kilometres of network leaking 500 litres, but this time each customer uses 200 litres of water. The % leakage in this case would be 33% (500 litres leakage, 1000 litres usage). Even though the two networks are the same length and have exactly the same amount leakage, one network looks like it has significantly better performance (33% leakage as opposed to 50% leakage). Instead we use an industry standard performance indicator developed by the International Water Association, known as the Infrastructure Leakage Index. When we apply this index, the public water supply in Ireland performs poorly when compared to other European water supplies.

However, the medium-term targets we have set for ourselves, will align us with acceptable performance standards. The European Commission has produced a Reference document “Good Practices on Leakage Management WFD CIS WG PoM”, which is a good reference document on leakage reduction. Irish Water sought the advice of one of the authors of this document in developing our National Leakage Reduction Programme.

The use of Sustainable Economic Levels of Leakage or SELL methodologies as part of our medium-term targets is of key importance to the business, as the use of this methodology drives the need for data improvement and understanding of our distribution networks. This in turn increases our ability to refine our leakage reduction programmes and to deliver sustained leakage savings. We will continuously review our leakage targets, and as we approach SELL we will develop WRZ targets for appropriate levels of leakage as set out in section 4.3.3 in the Framework Plan. Good Practice Guidance documents on leakage management have been published by the European Commission, which include case studies from a range of countries on how they reduced leakage in water supply networks. These documents also set out the potential difficulties in using percentage leakage comparisons between utilities and companies.

In all of the case studies, the primary measures for successful leakage reduction have been appropriate establishment of district metered areas, pressure management and active leakage control. Of particular interest is the case study for Scottish Water, a publicly owned utility that halved leakage losses by setting up a dedicated leakage management programme and setting SELL targets.

SELL methodologies have not been discontinued in the UK. As companies have achieved or progressed towards SELL targets, the industry regulators challenge the companies to go beyond SELL. However, it would be difficult to process towards short term or long-term targets, without having first enabled and set SELL targets. It is not an outdated methodology.

Irish Water agrees with the need for an integrated approach to water conservation supported by policy interventions.

When we consider leakage reduction in the context of the Framework Plan, it is on the basis of nett leakage savings. The SELL glidepaths are aligned with those used for the National Leakage Reduction Program. However due to the need to improve calibration within the Leakage Management System over the coming 2-3 years, and as Irish water do not assume operational control of the distribution networks until 2023, within the Framework Plan we kept the SELL glidepath flat until 2024, with the SELL targets accounted for between 2024 and 2034. In overall terms that target leakage reduction is the same. Irish Water will continuously update these figures as our data and information improves, as set out in section 8.3.8 of the Framework Plan.

As part of our solutions methodology we assess the impact of further leakage savings on our Preferred Approach decisions. As part of the RWRPs we will ensure flexibility in our Preferred Approaches and subsequent projects by considering delivery new and additional capacity in phases. Therefore, if we exceed leakage targets, we can modify and resize the later phases of projects to reflect reduced need. Within the Framework Plan we use the water balance and leakage definitions developed by the International Water Association.

Irish Water's review of approaches implemented in other jurisdictions confirms that mains replacement on its own is not a method to deliver leakage reduction. In the UK, for example, targeted mains replacement initiatives in the early 2000s were coupled with ALC, pressure management and network optimisation activities. In most cases, the supplementary activities actually delivered the leakage reductions. A major water mains replacement programme is not included in our unconstrained options list as it is already included as a core element of our National Leakage Reduction Programme as noted in section 7.3.1 of the Framework Plan. However, major water mains replacement would be a poor option to address demand as a stand-alone option. Demand interventions alone do not address the multitude of other issues with our existing supplies, including sustainability of our sources, climate change impacts, drought impacts, resilience, and drinking water quality. In most WRZs a combination of interventions under the Use Less, Lose Less and Supply Smarter pillars will be required.

As set out in the European Commission's EU Reference document Good Practices on Leakage Management WFD CIS WG PoM Case Study, there are no records of countries or jurisdictions that use largescale watermains replacement programmes as a stand-alone method to reduce leakage (even those with low leakage levels).

Instead, the primary methods for leakage reduction in comparator jurisdictions are pressure management and active leakage control, coupled with speed and quality of repairs. Mains renewal is an ancillary process that is usually driven by the need to

reduce interruptions to supply where mains have a high burst frequency (however this can also be improved via pressure management) or where water quality is deteriorating in the distribution network.

Over time, through improved data and intelligence, coupled with operational understanding of our networks and their responsiveness to leakage control measures, targeted mains replacement rates will increase, focusing on areas of the network where there are high natural rates of rise.

Age is also a poor indicator of network performance, as some of our older trunkmains, constructed nearly 150 years ago, have very low rates of leakage. Leaks that do occur on these types of mains, are usually at joints and are very responsive to repairs.

All water input into the public water supply is treated. There are a multitude of issues with the current 539 water supplies nationally, leakage reduction alone will not address these. A number of the local authorities raised concerns that data issues may result in overestimation leakage across the distribution networks by Irish Water, and if this is the case there might be insufficient supplies to support growth in accordance with the development plans. The feedback and monitoring process set out in section 8.3.9, will allow Irish Water to continually assess this and update our RWRPs where necessary.

The 2019 base year leakage level in the NWRP is 741 MI/d. This figure is the sum of assigned leakage water balance for each of the 539 WRZs. The figure is calculated and presented in this way as we have included supply demand balance calculations for each WRZ within the NWRP. The water balance for each supply is initially taken from the LMS. However, it is manually corrected, based on information gathered as part of the local authority workshops including corrections to distribution input and use of surrogate water balance.

The corrections represent a 2% variation in overall terms, and findings are used by the LMS team to inform data improvement areas in the system. As the LMS system improves over time, this 2% variation will reduce.

In relation to the EPA's submission that the Leakage Reduction Programme be expedited, Irish Water confirms that (within its economic/regulatory context) all appropriate actions will be taken to continue to deliver this important work.

Leakage reduction and water conservation is an integral part of our NWRP and is one of the key pillars to resolving supply demand balance deficit.

9.3 Use Less

9.3.1 Summary of Use Less Feedback

The use less pillar was discussed by several stakeholders, mostly referring to changes in the domestic and commercial use of water.

One stakeholder requested that the Framework Plan contain some advice for the average household on what comes from the tap, so that they use less water. AFU supported this view. They added, as consumers they contribute towards the operation of the system and act as decision makers so therefore suggested educational and informational material be provided to consumers on the issues mentioned in the draft

NWRP. They noted the advice on water saving tips, information and training and materials to tackle droughts should be available online. AFU also recommended improving data availability through increased metering, which would lead to consumers becoming more informed of their water consumption. In addition, they suggested an app, so consumers could monitor their water usage.

SWAN recommended the Framework Plan should emphasise the need for an integrated approach to water conservation and focus on the policy interventions to secure efficient water use domestically and move away from the emphasis on personal behavioural change.

Fight the Pipe called for the industry sector to become more economical with water usage and households to become more efficient. They used the Manchester region as an example noting a reduction in leaks, industry's becoming less water intensive and households becoming more water efficient and recommended that Ireland follow suit. Additionally, they referenced an EPA article that outlined improvements in water conveyance systems can decrease water usage in households regardless of growing populations.

Meath County Council also supported long term consumption habit changes and investment in water conservation measures. Tipperary County Council echoed this and noted "the goals of water conservation efforts must be reflected in the NWRP to ensure the availability of water for future generations. Consolidation and expansion of existing water conservation programmes must continue at local level, which programmes must be adequately resourced."

The Eastern and Midlands Regional Assembly suggested that the Framework Plan needs to be more progressive regarding water conservation and should be responsive to the circular economy. They suggested the Framework Plan should champion smart water solutions and technology which could lead to positive engagement with communities and local authorities in relation to water conservation.

IFI echoed this sentiment and noted that water saving technology can be used in order to conserve water at home and in industry. IFI added that the NWRP provides an opportunity to promote policies and awareness of water conservation which in turn leads to reduced water use. They noted increases in water conservation and water use efficiency will be required to ensure reliable water supplies in the future, this in turn restores ecosystems and responds to climate change and changing demographics.

One individual requested that Irish Water specify how building standards can contribute towards the Use Less pillar.

A stakeholder outlined small changes they have made to their own home to increase water conservation and suggested if a grant was in place, people would avail of it.

9.3.2 Response to Use Less Feedback

Many European countries have been de-industrialising for the last number of decades, whereas Ireland has experienced strong non-domestic growth particularly in the agri-food, pharma, and manufacturing industries. Economic growth and job creation are driven by national policy, and the significant work of the IDA and Enterprise Ireland.

Within the consultation period, submissions from some local authorities and industry groups suggested that insufficient provision had been made for non-domestic growth and that comparisons with water supplies in the UK where non-domestic demand was falling were not applicable to Ireland. In addition, the Department of Enterprise, Trade and Employment highlighted that industries with their own private water supplies might migrate to the public water supply when the new abstraction legislation is enacted. Irish Water will review trends in relation to this issue through our Connection Developer Services section.

Irish Water agrees with the need for an integrated approach to water conservation supported by policy interventions.

At present Irish Water is developing a water conservation app to enable consumers to save water in their homes. This app will be hosted on our webpage www.water.ie and will be available within the coming months. This has been updated in the Framework Plan in section 7.3.2.2.

Under the Use Less pillar, conservation activities are underway at present in Irish Water, however we will need to review outcomes from these initiatives over the coming years in order to quantify potential outcomes. We will continue to progress water conservation measures and will engage with other stakeholders in driving the need for policy to support water conservation measures. At present Irish Water is also progressing a water conservation app to enable consumers to save water in their homes. This has been updated in the Framework Plan in section 7.3.2.2. We will also work with our Innovation Team to review the potential for pilot studies to understand the potential benefits and outcomes for conservation measures such as rainwater harvesting and grey water reuse.

9.4 Supply Smarter

9.4.1 Summary of Supply Smarter Feedback

Regarding the supply smarter pillar, stakeholders outlined several suggestions they would like to see implemented in the final NWRP Framework Plan.

An individual noted that there is no mention of groundwater yield assessments in the draft NWRP and suggested this should be addressed in the final NWRP.

Many respondents requested an investment in infrastructure, which included upgrades to water and wastewater treatment plants, servicing, upgrading, and re-routing of the drinking water infrastructure, innovation, and measures to develop a resilient, efficient, and sustainable water supply for all users. An individual questioned whether hydro power was considered while another respondent questioned whether the basic use of rainfall resource, the hydrological cycle and sustainable water management has been ignored.

Dublin Chamber noted that for the economy to reopen and recover “strengthening water infrastructure and security of supply are key priorities in this context. Ireland’s ability to remain competitive depends on meeting the essential requirement of world-class infrastructure including an appropriate water system.”

The EPA noted that public water supplies are not as secure or reliable as they need to be, and that the asset base is old and in need of upgrade and investment. They added, actions to address current infrastructure deficits should be immediately addressed to reduce associated risk to public health.

They also discussed, “opportunities to address multiple issues when undertaking leakage reduction works e.g. replacing cast iron mains and lead service connections which may compromise the quality of water delivered to the public. These opportunities for synergies should be identified and implemented via the Plan, as they deliver the maximum benefit.”

Both Limerick City and County Council and Tipperary County Council stated that the NWRP should recognise when infrastructure projects like public realm or road works take place, as it is an opportunity for necessary water services work to be carried out in tandem, therefore reducing the impact in the surrounding area.

The Southern Regional Assembly outlined their support for strengthened integration of blue green infrastructure and nature-based solutions in supply smarter planning. They also stated their support at a national level for “design tools such as Sustainable Urban Drainage Systems, Rain Water Harvesting, Integrated Constructed Wetlands and incorporation of Ecosystem Services approaches to protect, conserve and enhance our natural water capital inter alia should be included and have prominence in the NWRP as priorities in developing solutions to water management, quality and supply needs.”

Chambers Ireland outlined their national ambition of urban revival and suggested this would be impossible without Irish Water first carrying out the works that are necessary to accelerate the growth of cities and towns. They suggested one of the NWRP aims should be “the creation of a suitably robust and resilient water network which is sufficient to meet the challenges that are to come.”

They added, investment in Irish Water’s capital base will meet the challenge of maintaining security of supply for Ireland’s industry and households which will be needed to accommodate weather extremes.

Clare PPN suggested the inclusion of a commitment to provide local small-scale remedies, so measures which are necessary for the sustainability of rural communities and businesses are not overlooked.

Additionally, they requested clarification of the term ‘quick win’ strategy and what the benefits of these might be for the overall distribution network. Adding their participants “called on Irish Water in this respect to take what remedial action is feasible on a cost benefit analysis basis as soon as is possible even if these are temporary leakage prevention measures which will need to be replaced in the longer term with durable sustainable solutions.”

The National Bioeconomy Implementation Group asked if the Framework Plan is giving consideration to the role water infrastructure can play as biorefineries and playing an active role in development of the Irish bioeconomy and circular economy at the same time as addressing National Resources.

The Eastern and Midlands Regional Assembly noted the RSES supports the development of a new rural settlement investment approach to ensure that sustainable water services solutions are implemented, this would happen through coordinating local authorities, Irish Water, developers, and the community.

Councillor Johnny Flynn suggested Ennis water needs financial analysis and requested the implementation of the 2002 Ennis Main Drainage Report and to construct new water reservoirs and mains, relocate tidal barrage and invest to protect the catchment flooding and contaminating the Ennis water source.

Kennedy Analysis noted Dublin's reliance on river water as its dominant water supply is a severe disadvantage. They cited that the draft Framework Plan states that Ireland gets 83% of its water supply from surface water sources, which is considerably higher than the EU average. They stated that leaving Dublin city and county reliant on a class 'S3' water, widely considered the most vulnerable type, is far from international best practice. They continued that it is recognised internationally, particularly in countries where the pipes are in poor condition, that mains replacement programmes (MRPs) are the more sustainable long-term option for water supplies.

9.4.2 Response to Supply Smarter Feedback

As part of our "Supply Smarter" pillar, desktop assessments of yield are calculated. Should a supply be prioritised and progress to initial stages of the Capital Investment Plan, further site-based studies will be progressed. The desktop assessments are outlined in Appendix C of the Framework Plan.

The scale of investment to transform our water supplies will be considerable. However, the outcome in terms of ability to protect the environment, provide a good Level of Service for all customers, support growth and economic development, and adapt to climate change impacts will be substantial. The development of the NWRP will enable us to understand the scale of strategic investment required across our supplies, and to propose the appropriate level of investment needed within the National Development Plan.

Irish Water recognises that our supplies are not as resilient as they should be and that economic competitiveness requires appropriate levels of service, including support of urban revival in towns and villages.

Specific solutions for each Water Resource Zone will be addressed through the RWRPs, using the methodology established in the Framework Plan. In particular, the "need", and appropriate solution, for the Greater Dublin Area will be assessed through the RWRP for the Eastern and Midlands region.

The delivery and implementation of the NWRP will not slow down critical asset interventions to address quality risk across our supplies, including the National Disinfection Programme. Programmes to improve resilience, such as reservoir storage and network connectivity will also continue. Where possible, Irish Water will facilitate public realm projects. However, this is not always possible due to budget constraints and the need to address priority supplies.

Irish Water recognises the increasing importance of nature-based solutions and catchment measures in relation to improving water quality and reducing risk across our supplies. Irish Water is an active participant in catchment-based initiatives and where possible will incorporate NBS solutions at project level.

The NWRP considers interim options to address critical need as set out in section 8.3.7.6 of the Framework Plan.

As outlined in Box 4.1 in section 4.3.2 of the Framework Plan Irish Water supports the need for urban renewal and development in rural areas and will support this through programmes such as the Small Towns and Villages Growth Programme or additional programmes as required.

At this stage of the NWRP, the Preferred Approaches and the delivery of our 25-year plan has not been finalised. This will be completed when the four RWRPs have been finalised.

9.5 New Options Methodology

9.5.1 Summary of New Options Methodology Feedback

Several stakeholders commented on the new options methodology presented in the Framework Plan.

GSI welcomed the inclusion of the resilience and sustainability criterion in the Framework Plan, however they noted “to understand the impacts of Irish Water’s current surface water and groundwater abstractions on the water environment, and therefore to be able to assess sustainability and resilience of future options, a catchment-scale cumulative assessment of all abstractions and discharges is required. Irish Water’s New Option Assessment is based at the Water Resource Zone scale and does not include the necessary catchment scale approach.”

Additionally, GSI noted they do not consider the methodology outlined in the draft Framework Plan to estimate the hydrological yield from groundwater sources to be the most appropriate method for a national utility to employ in a long-term planning strategy. They stated “the NWRP outlines that the Institute of Hydrology methodology is used to estimate the hydrological yields from river, lake and reservoirs sources. GSI suggest a similar internationally-recognised methodology is used to estimate the hydrological yield from groundwater sources.” They added their own outputs from the GW3D project would be relevant to Irish Water and suggested a multi-agency approach and for both parties to collaborate and disseminate results and quantify local and regional scale groundwater resources.

The RSPA disagreed with the approach undertaken in the Framework Plan, they noted “the fundamental rationale behind the development of a water resource plan would be to base it on a logical sequential methodology and then drawing well informed conclusions based on assessments of the facts arising from such information gathering. The approach adopted obviates this as the conclusion had already been arrived at before such investigations are undertaken in the first place.” They stated the approach should first quantify the resources, then undertake a full assessment, then quantify the assessment.

Kennedy Analysis noted that the methodology represented in the Framework Plan is not in line with international best practice. The submission also noted that the unconstrained options list in the Framework Plan should include, a major water mains replacement programme and in situations where treatment capacity at water treatment plants for a water resource zone is a constraining factor in the supply demand balance calculation for that zone, then the expansion of treatment capacity should be considered as a standalone solution.

Kennedy Analysis also noted “it must be a top priority option i.e. it should be considered as a priority over the development/expansion of new raw water supplies – it will almost always be more sustainable to expand existing treatment capacity than to expand/develop new raw water sources.”

AFU proposed modifications to the methodology and conceptualisation in the Framework Plan, these included, “scientific methods and techniques such as hydrological analysis, observation of the water resources and the knowledge of the water demand timely and spatially...operational interventions and administrative measures aiming to the maximum benefit from the use of water systems, according to criteria, priorities and goals, already set...all technical works and legislation required to achieve the above.”

Regarding flexibility, AFU disagreed with the description used in the Framework Plan, instead stating it is the ability to change options if the results are not satisfactory. They stated, “the general suggestion for the whole set of these ‘criteria’ is to consider them based on systems theory, using measurable indicators, allowing for a uniform approach-framework.”

On sustainability, AFU noted it cannot be restricted to being defined as “to avoid the known environmental impacts” as stated in the draft Framework Plan. They noted “it should reflect the reserves of adequate water volume of good quality available for the future. This can only be achieved following hydrological and water quality modelling, considering future demand, and ideally establishing water use and pollution limits. Then, each option can be evaluated based on the degree it achieves (or approaches) these goals. Sustainability can be measured as the water availability of each water body after n years (or in a year-target) of the analysis.”

To conclude the AFU noted that the options selection presented appear more complicated than a single Multi Criteria Analysis (MCA) application. They stated the process could be clarified and simplified. They recommended that “the MCA criteria must not be seen as questions to be answered. On the basis previously described these criteria can be indicators that can be monitored, measured, or modelled so the result-performance should be specific and known. Then a single MCA can be used for the overall ranking of the options, instead of relying on fine-screening.” The AFU provided an example of how this would work and noted the overall process if this was utilised would become more objective and simplified.

The EPA welcomed the draft Framework Plan’s focus on building resilience in relation to water infrastructure to mitigate weather impacts and climate change. The EPA noted it is unclear how the water resource zone options are prioritised when competing for

funds in other water resource zones. They added, “Irish Water should define the sustainability criteria and benchmarks used in the NWRP. An environmentally sustainable supply will be one which can be delivered by Irish Water without posing a risk to a water body’s environmental objectives. In addition, the plan would benefit from clearly stating benchmarks and/or standards in relation to reducing demand.”

The Department of Enterprise, Trade and Employment, Enterprise Ireland and the IDA discussed the weighted methodology. They noted “the multi-criteria analysis is a useful tool for quantifying and ranking options and selection of most feasible option. It is welcome that a wide range of factors are considered in this process: although our most immediate priority is the safety of drinking water, we also recognise that wider environmental factors impact on human health.”

The CRU sought clarification on whether the draft Framework Plan considers only the six options/combination of options that top the six approaches.

Clare PPN noted social and community impacts for all options should be at the forefront of all considerations and recommended it be included as a defined step in the options assessment process. They stated, “our members are concerned that the framework as currently constructed is orientated towards providing solutions to supply in the areas of greatest populations, and whilst this is understandable, there is also a need to include balanced regional and rural developments in this plan.”

An individual stated where groundwater is available, additional weight should be given within the screening stages. Adding, “the need for multiple groundwater abstractions to provide large amounts of water in contrast to a single point abstraction for a surface water source further complicates the decision-making process and undoubtedly will play into the planned fine and coarse screening process. However, the screening process should include for the option of a multiple well or well-field where an increased supply is required from an existing groundwater source.”

Chambers Ireland suggested that the early stages of the option identification process should involve the maximum amount of engagement and consultation with stakeholders.

9.5.2 Response to New Options Methodology Feedback

Cumulative impact and in-combination effects assessments will be carried out to the fullest extent possible based on then available data as part of the development of the RWRPs, including at catchment scale.

Additional detail has now been provided on the groundwater assessments used in the NWRP in appendix C of the Framework Plan.

The NWRP relates to a live and functional water supply, therefore “need” across our existing supplies is the starting point for our NWRP. Where need is identified, we then set about assessing options to address need. As continuity of water supply must be ensured whilst delivering NWRP, the existing asset base is the logical starting point. It is not the case that the methodology can be said to in any way prejudge the approaches ultimately to be determined as part of the RWRPs, because we assess all

potential “unconstrained” options in the development of “feasible” options and Preferred Approaches within the RWRPs.

Targeted watermains replacement is a core element of our National Leakage Reduction Programme and is set out in section 7.3.1 of the Framework Plan. As stated in our draft Framework Plan, sustained leakage reduction involves first establishing the data and information to allow us to understand our networks (a process which is ongoing) and then implementing a range of interventions, including:

- Effective management of excess pressure and pressure transients
- Speed and quality of repairs
- Active Leakage Control (ALC)
- District Metered Area (DMA) optimisation
- Asset renewal, including:
 - Valves and controls
 - Targeted mains replacement
 - Service connections.

The above represents industry best practice and aligns with EU Reference Document “Good Practices on Leakage Management” (WFD CIS WG PoM).

Issues with the current water supply relate to a number of factors including: compliance challenges, water quality risk, environmental impact, level of service, water sources, existing infrastructure, residuals, drought, resilience, climate change, population growth and economic development, interconnectivity of supplies as well as issues such as network performance and leakage. Typically, problems with the public water supply cannot be related to a single issue or cause and cannot be solved with a single solution such as leakage reduction alone. This explains why we use a multi criteria assessment methodology, as opposed to identifying a single factor for consideration.

Irish Water will develop and deliver a 5 to 10-year data and intelligence improvement strategy, on data related to supply demand balance, water quality, asset register and performance of asset base (including network models). This is in accordance with the feedback and monitoring process set out at section 8.3.8 of the Framework Plan.

At this stage of the NWRP, the Preferred Approaches and the delivery of our 25-year plan has not been completed. National prioritization will occur when the four RWRPs have been finalised.

The fine screening questions used in the options assessment methodology, including the multi-criteria analysis, as described in the draft Framework Plan and Appendix N, are based on the topics required to be considered as set out in the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (SEA Regulations). SEA objectives were developed to cover these topics and take account of the policy and baseline context for the assessment. This ensures that environmental considerations are at the core of our options assessment process.

An environmentally sustainable supply will be one which can be delivered by Irish Water without posing a risk to a water body's environmental objectives. At a plan level we ensure this by utilising eflows assessments for all.

The multi-criteria assessment allows us to consider the SEA objectives as part of the Preferred Approach methodology.

As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the "need" drivers for each supply. The Framework Plan methodology ensures all feasible options are considered.

Although this is a national plan, Irish Water recognises the need to focus it primarily at a local level. The needs across our supplies are workshopped with our local authority partners and their water services sections. We interface directly with the Regional Assemblies and local authority planning departments and will workshop the Preferred Approach development with the relevant local authorities. The outcomes will be opened to public consultation as part of the draft RWRPs to ensure transparency in the decision-making process at strategic plan stages in the development of all future projects.

The Framework Plan level costs associated with groundwater are less than higher cost water treatment processes. Wellfields are allowed for in the options assessment.

A workshop was held with each local authority planning and water services section to review data and information in advance of the publication of the draft Framework Plan. The options development process will also be progressed through workshops with the individual local authorities and subject matter experts including engineers, ecologists, hydrogeologists, hydrologists, and environmental scientists as set out at section 8.3.7.4 of the Framework Plan.

9.6 Approach Development

9.6.1 Summary of Approach Development Feedback

Submissions discussed the approach to development highlighted in the draft Framework Plan.

Chambers Ireland welcomed the criteria presented and noted "no one factor can be superior to the others – all of these criteria interact with each other." They noted through filters set out to establish viable alternatives followed by weighting of the criteria to identify projects that are most suited for exploration is an appropriate way to balance the various and competing community interests, while taking on board sustainability and environmental observations and ultimately addressing the total cost of options.

An individual noted the list of technical experts invited to take part in the planned Approach Development Approach workshop did not include a hydrogeologist and recommended that one should be included.

Roscommon County Council outlined that the options assessment process and the Preferred Approach development is an eight-stage process which can be used across all water supplies. They added, “it is crucial that the information and data used in the approach development is the best available in order to provide meaningful outputs to be used in the Preferred Approach development.”

Clare PPN requested an outline of the weighting given to each criterion at Approach Development Stage, they noted “testing a range of approaches should be included in the framework as it is not possible to evaluate whether the assessment process will serve society unless it is clear which criteria is prioritised.”

AFU raised concerns with the sensitivity analyses outlined in the draft Framework Plan, noting “the sensitivity analyses presented in this draft plan are based on hypotheses without characterizing the ‘level of confidence’ attached to them.”

The Southern Regional Assembly discussed ecosystem services and recommended connecting the ecosystem services approach to the initiatives included like the source to tap project, as it demonstrates practical benefits of such an approach.

The EPA stated it is unclear how the Preferred Approach in a water resource zone is determined within the draft Framework Plan.

Kildare County Council suggested that once the final screening and preferred options have been identified, these options should be discussed in more detail to establish cost, benefit, implications, and practicalities.

9.6.2 Response to Approach Development Feedback

We have purposely not included weighting within the methodology for testing a range of approaches, on the basis that there are different drivers and issues across each of our supplies. The approach development is progressed via a workshop attended by engineering, environmental scientists, ecology, hydrology, and hydrogeology experts, operational teams, and local authority operators to ensure the appropriate outcome for a given supply. Best available information is used within the process, and updated data and information is incorporated via the monitoring and feedback process set out in section 8.3.8. of the Framework Plan. Hydrogeologists have been used to develop the draft Framework Plan.

The sensitivity analysis allows us to address uncertainties. At present we do not have confidence ratings for these uncertainties and test the Preferred Approaches against a range of futures. This allows us to ensure that the Preferred Approaches are flexible and allow for phased interventions.

Irish Water will ensure that our NWRP considers the European Green Deal, particularly in developing our strategic funding requirements for water services. As we progress through our resource planning cycles, and engage with research bodies through our

innovation function, we will further integrate natural capital and ecosystem services into our Preferred Approach assessments.

The approach development is set out in section 8 of the Framework Plan. Irish Water will set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies.

9.7 Monitoring Feedback

9.7.1 Summary of Monitoring Feedback

Stakeholders provided suggestions on how the NWRP can monitor feedback. These are highlighted below.

Clare PPN requested Irish Water publish annual usage statistics, they noted that would assist people in planning, prioritising, and conserving water. They added “this usage would need to be broken down regionally but also on a sector and activity basis to include industry, technology including data centres, commerce, private, public services and public buildings, agriculture broken down into grain dairy, beef, biofuels, other livestock.” They also requested a bi-annual review with public participation of both the Framework Plan and the RWRPs.

AFU stated the methods presented in the draft Framework Plan are a way to move forward despite the lack of available data in Ireland and made suggestions that should accompany the NWRP to mitigate this. These include: acknowledging the gaps in data and improving the methodology in time, improving data collection and monitoring, assessing uncertainties and assumptions and a recalculation of the forecasting to 2044 when improvements to data are available.

They added Irish Water should incorporate the project planning and efficiency recommendations made in the Scottish Water International report. Additionally, they noted “monitoring and metering by using data of acceptable quality regarding the physical processes, and consumer data, will facilitate better modelling. This in turn, will improve understanding of the changing system dynamics, which will indicate the most appropriate set of options.”

Meath County Council welcomed the proposal to review the NWRP every five years and the monitoring commitments included in the draft Framework Plan. This sentiment was echoed by the HSE who suggested the inclusion of a clause to allow for a review of the NWRP to be brought forward if a significant event occurs.

The EPA added following the publication of any new regulations that a review of the NWRP and four RWRPs should take place. The CRU also noted the importance of reviewing the NWRP, including when new or improved data becomes available.

DCU Water Institute questioned the goal of effectively engaging with universities and stated, “we don’t see a philosophy to learn from others, to identify innovation or willingness to work with public and private partners.”

Chambers Ireland discussed continually monitoring the performance of water systems against climate change expectations and that the 'new normal' needs to be continuously revised.

GSI suggested the NWRP takes the same approach as the convention of water industry internationally. They stated that the NWRP should "have a 25-year look forward but that a new Water Resource Plan to be published every 5 years."

9.7.2 Response to Monitoring Feedback

At present we do not have the granularity of data that would be needed to provide sectoral reports on usage, however this will be reviewed through our 7 to 10-year data strategy. All new data will be incorporated into the Framework Plan and RWRPs via the feedback and monitoring process set out in section 8.3.8.

Irish Water has strengthened the text on the process for feedback and monitoring in the Framework Plan with references to the implementation of a monitoring plan and the implementation of SEA recommendations in the Environmental Action Plan (EAP).

The NWRP is a 25-year plan, with rolling updates. Baseline forecasts and data are reviewed annually and the NWRP will be formally updated every five years, with further opportunities for public participation. The five-year review can be brought forward should a significant event occur, or new legislation/policy come into force that would require a material change to either the Framework Plan or the RWRPs.

Irish Water is committed to innovation and learning and has an active Innovation team.

9.8 Positive General Feedback on the Framework Plan

9.8.1 Summary of Positive General Feedback on the Framework Plan Feedback

The draft Framework Plan generated some positive feedback within the submissions. Some stakeholders stated the draft Framework Plan was informative, comprehensive, and impressive. Several stakeholders welcomed the NWRP and the opportunity to provide feedback.

Clare PPN added "we welcome the opportunity to provide input to Irish Water's Consultation and recognise the substantial work including case studies, video guides etc done by Irish Water in preparation for this public consultation."

An individual noted that if the draft Framework Plan translates into reality, Ireland will have an efficient and effective water management system that addresses the potable water supply.

The Eastern and Midlands Regional Assembly welcomed the sample Case Study technical report which demonstrated the level of scoping of the study area to be undertaken and the detailed screening of available options which they stated will be "focused on quality, quantity, reliability and sustainability."

This sentiment was echoed by AFU who welcomed the wide scope of work undertaken to develop the draft Framework Plan and the related public consultation document. They added "it is imperative that Irish Water must continue its efforts on maintaining and upgrading water services infrastructure, however, it is also necessary to examine

its systems in a more dynamic way, and to further understand the drivers of water demand and plan accordingly, balancing realistic short and long-term goals.”

Roscommon County Council stated “the preparation of the NWRP provides an opportunity to plan for delivery of water services at a national level over the next 25 years. The intention is that it allows all supplies to be reviewed in a consistent way and to develop a clear approach to resolve any issues that are found. This in turn will allow investment to be prioritised in water services over the short, medium and long term.” Meath County Council and Tipperary County Council also welcomed the Framework Plan.

The EPA stated they “consider the move to regional solutions a positive step that supports the rationalisation of smaller and more vulnerable water supplies, as Irish Water invests in providing safe and secure drinking water infrastructure throughout the country.”

The CRU noted the NWRP allows for greater transparency in the decision-making process. The Dublin Chamber also complimented the draft Framework Plan and welcomed its commitment to aligning with existing Government policy.

In addition, GSI welcomed the emphasis placed on adhering to the principles set out in the WFD and the current and recast Drinking Water Directives and the WHO Drinking Water Safety Plans. SWAN supported the recognition of the importance of the RBMP in influencing Irish Water abstraction activity.

9.8.2 Response to Positive General Feedback on Framework Plan Feedback

One of the key objectives of the NWRP is to improve transparency. Although it is not a legislative requirement in this country, Irish Water committed to the completion of a NWRP within its Water Services Strategic Plan. A search of published information from other jurisdictions, including publicly available water resource plans in the UK, shows the extent to which Irish Water has sought to provide the correct level of detail as part of our first NWRP so as to ensure it is understandable such as to facilitate public consultation to the fullest extent possible.

9.9 Negative Feedback on the Framework Plan

9.9.1 Summary of Negative Feedback on Framework Plan Feedback

Some submissions noted their dissatisfaction with the draft Framework Plan.

Environmental Trust Ireland submitted that the available information regarding the draft Framework Plan lacks specificity and stated this prevents informed decision making. They added they look “forward to receiving extensively revised and adequate documentation pertinent to the National Water Framework Plan and in particular, information relating to the environmental and ecological effects of Irish Water’s proposals including cumulative and predicted in combination effects based on full assessment and a thorough analysis.”

Kennedy Analysis stated it “was inconsistent, contradictory and cites old data and many of the key calculations are based on methodology that is not international best practice.”

The RSPA outlined their objections to the draft Framework Plan, stating information required to base the conclusions of the Framework Plan have been omitted. They also challenged the rationality and reasonability with the baseline information for future projections. They noted “these flaws fundamentally undermine the whole Plan as these shortcomings will feed into and form the foundation and inform the future planning and public investment decision process.” They added the NWRP should abandon the old short-term approach of water management and adopt a long-term approach which would be more sustainable.

AFU also outlined dissatisfaction with certain areas of the draft Framework Plan, highlighting vague terminology, simplistic and misleading definitions. While DCU Water Institute noted the draft Framework Plan does not set out clear prioritisation of issues.

SWAN noted that the approach to the Drinking Water Safety Plan should not only be presented as a long-term plan and does not contain a clear statement of this as an overarching priority and lacks tangible actions or specific resources.

GSI observed that the draft Framework Plan does not include an adequate attempt to understand the impact of the upcoming abstraction legislation on groundwater source. In relation to the recast Drinking Water Directive, they recommended that catchment-based source protection is included in the Framework Plan.

9.9.2 Response to Negative Feedback on the Framework Plan Feedback

This is Ireland's first NWRP, with 539 WRZs and a very significant challenge in terms of historic underinvestment in water infrastructure to date. There are no specific guidelines for water resources planning in this jurisdiction. Irish Water investigated the approach taken in England, Scotland and Wales and conducted significant stakeholder consultation in the development of the draft Framework Plan. We are satisfied that we have utilised the best possible methodologies, considering the condition and stage of evolution of the public water supply in Ireland, and that we have ensured that the draft Framework Plan was as comprehensible as possible.

One of the key objectives of the NWRP is to improve transparency. Although it is not a legislative requirement in this country, Irish Water set the completion of a NWRP within its Water Services Strategic Plan. A search of published information from other jurisdictions, including publicly available water resource plans in the UK, shows the extent to which Irish Water has sought to provide the correct level of detail as part of our first NWRP.

It should be noted that the SEA and NIS are for the purpose of Plan level assessments, and Irish Water is satisfied that they fully comply with the requirements of the SEA Directive and Habitats Directive at that scale.

Within our Plan we consider cumulative impacts and we confirm that DWSPs are integral to our resources planning process. We propose to have DWSPs prepared for each of the 539 WRZs within eight years.

It is envisaged that site-by-site assessments will be required as part of the proposed abstraction licencing regime.

9.10 Conclusions on Solutions Methodology Feedback

Having carefully reviewed the submissions received on the theme of Solutions Methodology, Irish Water considered that a number of changes should be made to the draft Framework Plan. These changes are explained in section 9.10.1 regarding “Clarifications” below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 9.10.2 regarding “Recommendations” below.

9.10.1 Clarifications on Solutions Methodology Feedback



The following sections of the Framework Plan have been updated to reflect feedback under the theme of Solutions Methodology:

Section 3.2.1 and Appendix C

Section 7.3.1

Box 4.1 in section 4.3.2

Section 8.3.8

9.10.2 Recommendations on Solutions Methodology Feedback

1. Through our Innovation team we will progress pilot studies on the benefits of rainwater harvesting and grey water re-use.
2. Irish Water will reinforce detail of groundwater assessments undertaken in Appendix C of the Framework Plan.
3. Irish Water will establish a multi-agency approach to collaborate and share information on groundwater protection initiatives and local/regional resource availability.
4. Irish Water will assess the potential for including usage statistics on our website.
5. Irish Water will progress a five to seven-year data improvement strategy.

10.Consultation Process

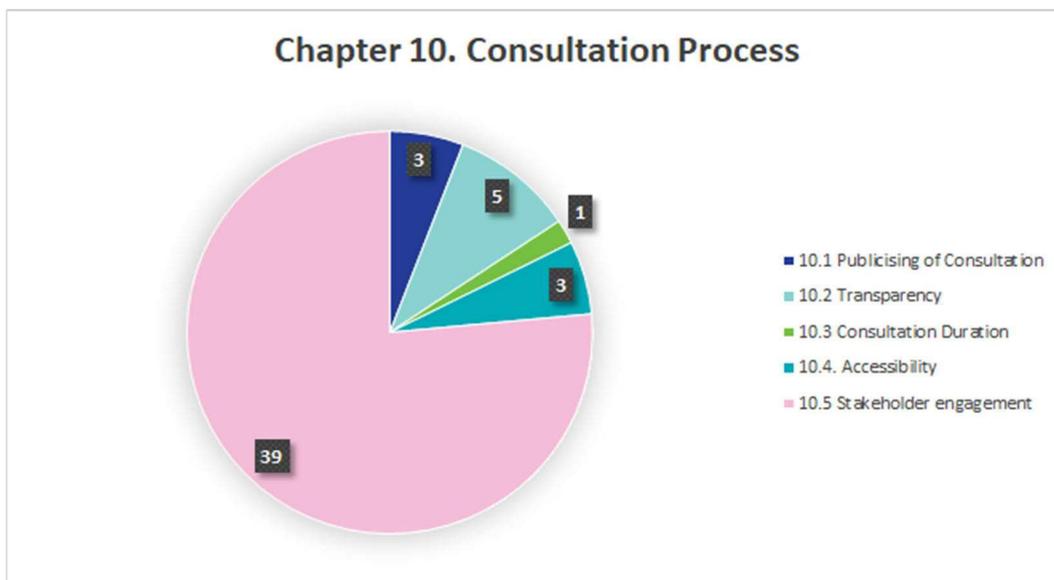
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Consultation Process”. Within the overall Consultation Process theme, we identified five sub-themes, which we set out in Figure 10-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 10-1 below details the breakdown of feedback received under the theme Consultation Process. It shows that of the 51 mentions⁶ in submissions that mentioned the consultation process the most frequently mentioned were related to stakeholder engagement with 39 mentions followed by transparency with five mentions. Figure 10-1 below also identifies the five sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 10-1 Consultation Process Theme



⁶ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

10.1 Publicising of Consultation

10.1.1 Summary of Publicising of Consultation Feedback

Several respondents requested an extension to the public consultation period with one stating “we have not had any time to fully go through the documentation that you published online so we want you to extend the period of public consultation so that residents and we mean all residents can meaningfully engage.”

Another respondent stated that they read about the consultation in a local paper, while another queried the cost of Irish language adverts.

A submission from Ballyboden Tidy Towns outlined how there was no effort made to reach out to them or community groups during lockdown. They noted “no effort was made to reach out to us and community groups during Lockdown which was compounded by restricted access to local authorities and libraries. Not everybody is online and interestingly nothing was published in local newspapers or national papers by you. You did not issue to any of your customers notification of this public consultation either.”

10.1.2 Response to Publicising of Consultation Feedback

The draft Framework Plan was published for public consultation between 8 December 2020 and an initial closing date of 16 February 2021. The consultation closing date was extended twice at the request of stakeholders, with consultation finally closing on 12 March 2021 (an overall period of approximately 13.5 weeks). We are satisfied that there was more than adequate time, as a result, for those looking to make a submission.

An extensive media campaign was launched in advance of the consultation, including national press and media. Briefings were offered to journalists who were interested in learning more about the NWRP, and Irish Water spokespersons were made available for media interviews and press briefings throughout the consultation. A considerable amount of national and regional coverage was generated across all media channels throughout the consultation period, particularly around the time of the launch of consultation. We were conscious of Covid-19 related constraints and sought to ensure that anyone interested in making a submission would have notice of it. We consider the fact we received 84 submissions on the draft Framework Plan indicative of a high degree of engagement with and knowledge of the consultation process and are very grateful for the volume and quality of the submissions received.

Irish Water considered it appropriate to advertise the consultations in both English and Irish, as Irish language versions of the NWRP documentation were required to be published in accordance with the Official Languages Act 2003.

In order to ensure the draft Framework Plan and associated environmental reports were readily accessible, hard copies in English of the draft Framework Plan including appendices, the SEA Environmental Report, the Non-Technical Summary, the NIS, consultation information leaflets, the Case Study and promotional posters were provided for public display in 29 local authority offices and at two county libraries for the duration of the consultation period. Hard copies of all documents in Irish were also

provided to local authorities on request. We consider that we adhered to best practise in our consultation process.

The availability and location of these documents at the planning counter in local authority offices and at the county libraries was promoted through the project website and newspaper advertisements. A full audit of all 31 displays was undertaken by the NWRP team during the consultation period to ensure all documents were received and available as advertised. In addition, hard copies and electronic copies of these reports were available upon request through the project information service. Irish Water also provided information posters to each of the planning counters and libraries where the documents were on display.

We introduced a NWRP phonenumber during this period of consultation to improve accessibility due to Covid-19 restrictions or for those with limited or no internet access. A freephone 1800 was provided and manned by the NWRP team during office hours throughout the consultation period.

10.2 Transparency

10.2.1 Summary of Transparency Feedback

The CRU welcomed Irish Water's consultation on the draft Framework Plan stating that "this Plan, and future plans, should allow Irish Water to make better decisions while simultaneously improving the transparency of that decision-making process." As a general principle, the CRU considers that Irish Water should err on the side of openness and transparency in all its activities, including its publication of the draft Framework Plan. In that context, where Irish Water has made assumptions, used studies, or referenced previous work, this information should be published within, or be made available alongside, the Framework Plan. It was also advised that more clarity, additional information, and justification is needed to better understand Irish Water's proposed approach.

The RSPA stated that the draft Framework Plan is based on "the proposition that resource allocation is already established and that the area from the Shannon Estuary to Dublin forms an integrated resource and supply area involving a 170 km large diameter connector pipeline from Parteen near Limerick to Dublin in order to effect this. All the main inputs to the draft Framework Plan are then structured and fit around this."

Kennedy Analysis noted that Irish Water had a history of dismissing issues raised in previous public consultations regarding the Water Supply Project and that the issues raised in their submission must not be ignored.

10.2.2 Response to Transparency Feedback

The draft Framework Plan, the SEA Environmental Report and the Natura Impact Statement (NIS) were available to view or download from the NWRP dedicated webpage on 8 December 2020, along with all other relevant information, including the NWRP consultation roadmap, the consultation information leaflet, the non-technical summary and the NWRP infographic.

One of the key purposes of developing a draft plan is to allow for open and transparent engagement, to allow us to engage with statutory consultees as well as the wider public in our strategic plans, including on matters such as:

- The policies that influence our public water supply;
- The standards we have set out to achieve;
- The needs across our asset-base; and
- How we develop projects and interventions for feasibility stages before they become projects.

The NWRP is the 25-year plan for a public water supply covering 539 individual water supplies, and as such is an enormous undertaking. We have broken it down into two phases to make it easier to understand and make submissions on. The Framework Plan has now been adopted, and we will move to Phase 2 the RWRPs, which will be widely consulted on prior to adoption.

For this first iteration of the NWRP, we reviewed a range of examples of equivalent water resources plans from other jurisdictions in preparing the draft Framework Plan. We also provided an illustrative case study with the draft Framework Plan when we went out to consultation. We believe we have struck the correct balance in the level of detail we have published, without compromising the accessibility of the draft Framework Plan. We were grateful for both the quantity and quality of the submissions received and consider that the Framework Plan as adopted has benefitted from our consideration of those submissions. The publication of this detailed Consultation Report is a further example of the way in which we are seeking to be as transparent as possible in development of the NWRP.

It should be noted that Phase 1 NWRP Framework Plan Consultation two process relates to the draft Framework Plan and associated environmental reports, and therefore did not include individual feasible options. No individual preferred options have been finalised at this point.

The options assessment process will be conducted in collaboration with the local authority's water services sections, and the draft assessment of Preferred Approaches will be subject to consultation as part of the RWRPs.

"In-flight" projects will be assessed against the Preferred Approaches identified in the NWRP and adapted as required. The Preferred Approaches will also have their own public consultations as part of the development of the RWRPs will also have their own public consultations. These public consultations will take place throughout 2021 and 2022.

It is not proposed to retire any current sources for the GDA WRZ; however, this supply will be reviewed as part of the RWRP for the Eastern and Midlands Region.

10.3 Consultation Duration

10.3.1 Summary of Consultation Duration Feedback

AFU raised concern about the duration of the NWRP public consultation period, stating, “while it is recognised that IW have adhered to the statutory timeframes for delivering public consultation, it should be noted that this is the absolute minimum period of consultation required.”

10.3.2 Response to Consultation Duration Feedback

The draft Framework Plan was published for public consultation between 8 December 2020 and an initial closing date of 16 February 2021. The consultation closing date was extended twice at the request of stakeholders, with consultation finally closing on 12 March 2021 (an overall period of approximately 13.5 weeks). Irish Water is satisfied that plenty of time was allocated for public consultation and is grateful for the volume and quality of submissions received.

Our statutory consultation was designed to be fully compliant with the Aarhus Convention and we are satisfied that it has been delivered in accordance with these requirements.

10.4 Accessibility

10.4.1 Summary of Accessibility Feedback

One stakeholder commented that the draft Framework Plan was difficult to read in terms of length and technical wording. It was mentioned that to understand the draft Framework Plan it takes a considerable amount of work and a reasonable knowledge of water supply.

A submission from the SWAN commented on the challenges faced in understanding the draft Framework Plan. “The length of the document and the technical language and industry jargon employed also make it challenging to respond to for all except either policy, technical or industry specialists.”

Another submission by GSI, suggested that information from Irish Water needed to be made more available and suggested that Irish Water come in line with their own Directive. “All source protection information that is required to inform appropriate and sustainable planning decisions should be made freely available.”

10.4.2 Response to Accessibility Feedback

The NWRP is the 25-year plan for a public water supply covering 539 individual water supplies, and as such is an enormous undertaking.

For this first iteration of the NWRP, we reviewed a range of examples of equivalent water resources plans from other jurisdictions in preparing the draft Framework Plan. We also provided an illustrative case study with the draft Framework Plan when we went out to consultation. We believe we have struck the correct balance in the level of detail we have published, without compromising the accessibility of the draft Framework Plan. We were grateful for both the quantity and quality of the submissions received and consider that the Framework Plan as adopted has benefit from our

consideration of those submissions. The publication of this detailed Consultation Report is a further example of the way in which we are seeking to be as transparent as possible in development of the NWRP.

Non-technical summaries for the draft Framework Plan, infographics, and animations to explain technical aspects were all developed to assist in articulating the Framework Plan to the widest possible audience and a case study was also provided.

Where required, Irish Water facilitated additional reasonable requests for information from groups or individuals with a specific issue in a particular area or aspect of the draft Framework Plan. Irish Water facilitated 21 briefing requests from environmental authorities and interested stakeholders.

A public webinar was held on 27 January 2021 and 27 interested members of the public registered their attendance. A presentation on the draft Framework Plan was given followed by a Q&A session with the NWRP team. Written responses were issued to any queries not answered at the webinar and published on the Irish Water website.

Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as it becomes available.

One of the key purposes of developing a draft plan is to be open and transparent and facilitate engagement with the wider public in our strategic plans, including on matters such as:

- The policies that influence our public water supply;
- The standards we have set out to achieve;
- The needs across our asset-base; and
- How we develop projects and interventions for feasibility stages before they become projects.

10.5 Stakeholder Engagement

10.5.1 Summary of Stakeholder Engagement Feedback

Many submissions welcomed the opportunity to comment on the draft Framework Plan and invited further engagement from Irish Water.

One respondent asked about engagement with industry and the Irish Home Builders Association to promote the use of rainwater harvesting.

One stakeholder thanked Irish Water for the opportunity to comment and suggested that their comments may hopefully raise some issues not previously addressed.

The Eastern and Midlands Regional Assembly welcomed the preparation of the draft Framework Plan and looked forward to continued engagement with Irish Water. It was suggested that the draft Framework Plan would benefit from recognising the role of the Local Authority Waters Programme (LAWPRO) set up to co-ordinate local authorities on water issues and to engage with local communities on water related projects. It was suggested that Climate Action Regional Offices and local authorities should consider

the identification of critical infrastructure within their functional areas and recommended that Irish Water seek partnerships between the Climate Action Regional Offices and local authorities “to inform future solutions in this regard. The Regional Assembly welcomes the opportunity to engage in the process of preparing the NWRP and looks forward to continuing engagement with Irish Water in the next phase of consultation including the preparation of Regional Water Resource Plans to support the sustainable water supply and services for the Eastern and Midland Region.”

Roscommon County Council commented that the project consultation roadmap was ambitious. “This timeframe may be ambitious, as additional inputs would be expected on the Regional Plans. We look forward to the publication of these Regional Plans for review and comment.”

IFI thanked Irish Water for the opportunity to comment and have their views considered. “Thank you for the opportunity to contribute to the NWRP draft Framework Plan and associated SEA Environmental Report and Natura Impact Statement (NIS).”

Limerick City and County Council welcomed the opportunity to contribute to the consultation process. “Limerick City & County Council (LCCC) welcomes the opportunity to feed into the process of how Irish Water will identify the issues, opportunities and solutions for water supply before the methodology is applied in the Regional Water Resource Plans as part of the second phase of the NWRP.”

Clare PPN acknowledged the work done by Irish Water to prepare for the public consultation. The organisation highlighted how their participants would like to be kept informed and trusted that the views of their members will be given careful consideration and sought a regular review of the NWRP. “Our participants would like to see a commitment to a bi-annual review with public participation of both the framework and the various regional and implementation plans which devolve from it. This would be essential to ensure flexibility and renewed risk assessment in the face of an uncertain climate and changing weather patterns.”

AFU welcomed the opportunity to contribute to the public consultation on the NWRP and acknowledged the wide scope of work undertaken by Irish Water and its efforts and communication of the NWRP for consultation. AFU recognised the sensitivity of this national issue and the importance of public engagement and awareness within the process.

Meath County Council welcomed the opportunity to comment on the NWRP and highlighted the effective level of engagement between Irish Water and the Council to date. “The Water Services Section of the Council has, over circa 18 months, participated in several workshops with IW in relation to the draft Framework Plan, this level of engagement is considered helpful. Maintaining a productive working relationship between IW and all stakeholders is central to successful implementation of the National Water Resources Plan and the preparation of Regional Resource Plans.” The Council was supportive of the preparation of a NWRP and requested that any comments they included in their submission deemed applicable are included in the Framework Plan.

Tipperary County Council welcomed the opportunity to make a submission on the NWRP and looked forward to further consultation with Irish Water, “in the development of the Draft Regional Water Resources Plans under Phase 2.”

DCU Water Institute, recommended looking at a more ambitious Framework Plan that is supported by a communications and engagement strategy, which highlights the value of water. The organisation asked if Irish Water could have a pro-active role in encouraging and enabling innovation. It was also highlighted that the language which relates to research is not specific and that Irish Water does not engage with any groups. “The current policy of open engagement means that Irish Water don’t engage with any groups, though similar problems exist for other utility companies.”

Cork Chamber suggested using a forum as a useful mechanism for agreeing priorities among stakeholders.

The Department of Enterprise, Trade and Employment, Enterprise Ireland and the IDA welcomed the publication of the NWRP and the opportunity to provide feedback. It was noted that collaboration between the Department of Enterprise, Trade and Employment, Enterprise Ireland, the IDA, and Irish Water is more important than ever as they plan for the future. They highlighted that for Irish Water to provide responsive and resilient water services for the next phase of our economic development, ongoing consultation and engagement will be required to forecast and prepare for future non-domestic water demand.

It was suggested that Irish Water, the EPA, and national policy makers work together to plan and communicate a national vision for the future of water use.

It was also highlighted that early engagement with the IDA, Enterprise Ireland and the Department of Enterprise, Trade and Employment is needed to improve Ireland’s competitiveness to business investments and expansion. “Enterprise Ireland and the IDA Ireland are committed to working constructively with Irish Water to ensure that the NWRP and Irish Water’s service enhances and supports the competitiveness of the Irish economy and has agility to respond to the emerging needs of industry - supporting investment, job creation and a sustainable economy. Communicating early, clearly and in concert with other state bodies (local authorities, the EPA, planning bodies) will allow businesses make informed investment and development decisions.”

A submission from Kildare County Council outlined that the Council participated in the workshops held by Irish Water. It was noted that Irish Water did not progress on the objective to identify new water sources, whether surface water or groundwater to augment the water supply for the GDA, since last year.

The Southern Regional Assembly welcomed the publication of the draft Framework Plan and the opportunity to make a submission. The Assembly highlighted the successful collaboration between Irish Water during the preparation of the RSES and look forward to continued consultation in the preparation of Phase 2 Regional Water Resources Plans. The Southern Regional Assembly will seek to engage on clarities and details for the Region under the RWRPs Groups 1-4 as Phase 2 advances.

It was recommended that Irish Water engage closely with each local authority on completion of Phase 1 NWRP and into the preparation of RWRPs Groups 1-4 in their Region during Phase 2. The Southern Regional Assembly stated that they are a committed stakeholder and key consultee for Irish Water and continued engagement is welcomed and encouraged.

IWAI acknowledged the inclusion of their feedback from the SEA Scoping Consultation. IWAI highlighted the need for consultation and requested further involvement in this process. “IWAI wishes to reinforce the need for stakeholder consultation with all organisations who could be impacted by the granting of new abstraction licences, in addition to stakeholders already noted as consultees. These organisations include Waterways Ireland, the Irish Boat Rental Association (IBRA) and the Heritage Boat Association (HBA).”

DAERA thanked Irish Water for the consultation regarding the SEA Environmental Report and NIS for the NWRP.

Inland Fisheries in Northern Ireland noted that as a statutory consultee, they will continue to consult on any planning applications made by Irish Water which could have potential transboundary impacts. Inland Fisheries proposed that the Loughs Agency should be consulted in relation to this consultation and welcomed the opportunity of continued engagement as part of the process through the current channels of DAERA SEA Team.

The EPA welcomed the opportunity to make a submission to the NWRP and looks forward to the opportunity to comment on the four RWRPs.

Údarás na Gaeltachta welcomed the draft Framework Plan and acknowledged all the work carried out to bring the Framework Plan together. Údarás na Gaeltachta suggested that a greater emphasis is needed on the circular economy in rural areas and they could help Irish Water in terms of engagement, on getting this message across to communities. “Where water is sourced, it needs to be clean, therefore discharges from treatment plants and from local farmers need to be at the right discharge levels. This requires significant investment in the upgrading of existing treatment plants, subsidies to farmers for treatment equipment and education of both local communities and farmers of this wonderful resource we have and how to protect it. The Údarás could help Uisce Éireann with engagement and getting this message across to the communities we both serve.”

The CRU highlighted its role in protecting the interests of the people and businesses served by Irish Water. “In carrying out its role, the CRU seeks to ensure that Irish Water appropriately plans and prioritises its delivery of investments and services so that it can meet the demand for water, now and in the future, in a safe, secure and sustainable manner.”

Longford County Council stated how the input from local authorities to date has allowed for a more polished and deliverable Framework Plan to be devised in collaboration with Irish Water. Longford County Council suggested that a quarterly meeting is held, similar to the current SLA Tier 2 meetings involving the Senior Managers from the local

authority and Irish Water operational areas, to make sure that the ongoing development needs of a county and in particular smaller counties like Longford are effectively prioritised by Irish Water. “Longford County Council emphasised the need for a forum between Irish Water and the local authority to encourage communication and engagement which is structured and continuous and will support the success of the Framework Plan going forward, with the needs of country being met in an appropriate and sustainable manner. Longford County Council stated that they have and will continue to actively engage with the National Water Resources Plan process.”

SWAN welcomed the opportunity to make a submission to the consultation. SWAN suggested that a longer period for input from the public which embraces engagement methodologies to actively involve as many sectors of society as possible should have been employed.

SWAN recommended Irish Water review the principles set out in the 2020 National Water Forum paper on public engagement in water resources against Irish Water’s public consultation methodology. SWAN noted that the wording in the draft Framework Plan suggested that the NWRP may or may not be updated depending on what is required and SWAN is of the view that it is a fundamental part of the process that public and stakeholder input and responses will substantially influence the Framework Plan.

Chambers Ireland suggested that the earliest stages of the option identification process should include the maximum amount of consultation with stakeholders and community members as possible. Chambers Ireland highlighted that engaging with the broadest set of people from an early stage will help act as a counterweight against the other members of the community with the loudest voices. Chambers Ireland stated that it is important community and stakeholder engagement is a key part of the Options Development process.

Dublin Chamber welcomed the opportunity to comment on the draft Framework Plan and highlighted how “the consultation comes at a critical time for the country, its residents, and its businesses. In recent years there have been moves, through the likes of the NPF and NDP to consolidate national planning and infrastructure policies.”

A submission from GSI highlighted the importance of agencies working together with expertise in each specific area within the water cycle for the management of Ireland’s water resources. GSI outlined that they have offered and will continue to offer, hydrogeological support in terms of data, expertise, and advice to Irish Water.

GSI welcomed further collaboration with Irish Water on the quantification of local-and regional- scale groundwater resources. GSI also welcomed future project and research collaboration with Irish Water, focused on the impact of climate change on groundwater resources. GSI would welcome further discussions regarding their role in hosting public water supply source protection zones on its website and including them within its Groundwater Protection Scheme products, which are officially embedded in the planning process. “As such GSI consider it necessary for Irish Water to meaningfully engage with GSI on groundwater issues to avoid significant supply, environmental and financial consequences.

Limerick Greens welcomed the consultation on the draft Framework Plan as well as the proposed methodologies outlined in the report. “We look forward to the development of the four regional water resource plans throughout 2021 and the subsequent public consultation of those draft plans.”

Wicklow County Council welcomed the opportunity to make a submission and supported the endeavours by Irish Water to prepare and deliver a NWRP. The Council also requested additional consultation and engagement with Irish Water in the preparation and development of the RWRPs.

10.5.2 Response to Stakeholder Engagement Feedback

Most respondents welcomed the opportunity to engage on the draft Framework Plan and requested further stakeholder engagement and ongoing collaboration with Irish Water. Irish Water will continue to consult with stakeholders and interested parties throughout the development of the RWRPs. Irish Water recognises the role of the Local Authority Waters Programme at section 7.3.3 of the draft Framework Plan. The role of the Climate Action Regional Offices is also recognised by Irish Water and we will include reference to this in the RWRPs.

Irish Water actively encourages water conservation measures and supports policy change to facilitate this. Under the Use Less pillar, conservation activities are underway at present in Irish Water, however we will need to review outcomes from these initiatives over the coming years in order to quantify potential outcomes. We will continue to progress water conservation measures and will engage with other stakeholders in driving the need for policy to support water conservation measures. At present Irish Water is also progressing a water conservation app to enable consumers to save water in their homes. This has been updated in the Framework Plan in section 7.3.2.2. We will also work with our Innovation Team to review the potential for pilot studies to understand the potential benefits and outcomes for conservation measures such as rainwater harvesting and grey water reuse.

Further public consultations will be conducted on each of the four draft RWRPs. We are satisfied that such consultations can be delivered within the indicative timeframes specified in the project consultation roadmap.

The Framework Plan has a continuous feedback and monitoring process to allow for incorporation of emerging policy and data. It also involves regular consultation with the local authorities in development of the Preferred Approaches.

Irish Water has a permanent Innovation team within Asset Management that interfaces directly with learning institutions and the private sector in relation to innovation studies and piloting new technology.

We will also engage with the Department of Enterprise, Trade and Employment, Enterprise Ireland, the IDA and Údarás na Gaeltachta in relation to forecasts for non-domestic growth requirements.

The NWRP is a 25-year strategy to ensure we have a safe, sustainable, secure, and reliable drinking water supply for everyone. The NWRP has involved, and will continue to involve, extensive consultation with relevant authorities, stakeholders, and the public.

Irish Water will continually review all policies and consider the impact of these on Ireland's enterprise base.

It should be noted that Phase 1 NWRP Framework Plan Consultation two process related to the draft Framework Plan and associated environmental reports, and therefore did not include individual feasible options.

The options assessment process will be conducted in collaboration with the local authority water services sections, and the draft assessment of Preferred Approaches will be subject to consultation as part of the development of the RWRPs. This consultation will include an opportunity to provide feedback on each individual Preferred Approach identified as part of the RWRPs.

Irish Water will adhere to the licensing requirements to be introduced as part of the forthcoming abstraction legislation once this legislation is enacted.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies. We will actively engage as a stakeholder in catchment initiatives, including with local farming and interest groups, such as Údarás na Gaeltachta. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9.

The objective of the NWRP is to ensure safe, secure, reliable, and sustainable water supplies nationally, and to develop Preferred Approaches to address need across every Water Resource Zone. The Preferred Approaches will be prioritised and progressed through Irish Water's Capital Investment Plans. It is the role of the CRU to regulate these plans.

The draft Framework Plan was published for public consultation between 8 December 2020 and an initial closing date of 16 February 2021. The consultation closing date was extended twice at the request of stakeholders, with consultation finally closing on 12 March 2021 (an overall period of approximately 13.5 weeks).

Our statutory consultation was designed to be fully compliant with the Aarhus Convention and we are satisfied that it has been delivered in accordance with these requirements. As part of the delivery of the NWRP, there will be 5 significant public consultation processes relating to the Framework Plan, which has been completed, and the four RWRPs, which are now in progress.

A legal review of submissions was conducted and based on this review Irish Water is satisfied that no material changes are required either to the overall approach of delivering the NWRP in phases, or to the approach or methodologies detailed in the draft Framework Plan.

Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as it becomes available.

10.6 Conclusions on Consultation Process Feedback

Having carefully reviewed the submissions received on the theme of Consultation Process, Irish Water considered that one change should be made to the draft Framework Plan. This change is explained in section 10.6.1 regarding “Clarifications” below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 10.6.2 regarding “Recommendations” below.

10.6.1 Clarifications on Consultation Process Feedback



The following section of the Framework Plan has been updated to reflect feedback under the theme of Consultation Process:

Section 7.3.2.2

10.6.2 Recommendations on Consultation Process Feedback

1. Irish Water will review the principles set out in the 2020 National Water Forum paper on public engagement, to see if we can make any improvements to our consultation for the RWRPs.
2. Irish Water will continue to share groundwater data with the GSI.

11. Plan Implementation

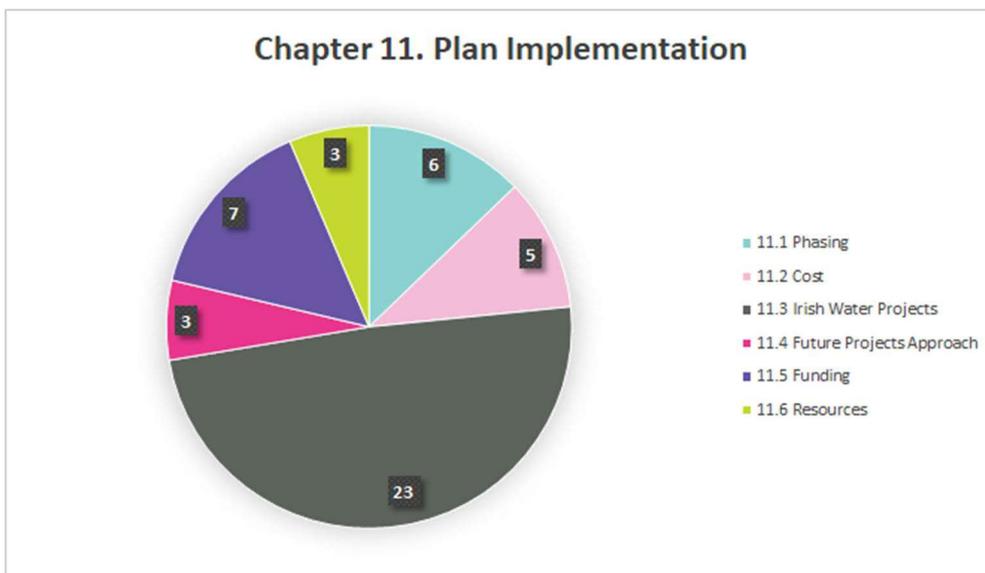
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Plan Implementation”. Within the Plan Implementation theme, we identified six sub-themes, which we set out in Figure 11-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 11-1 details the breakdown of feedback received under the theme Plan Implementation. It shows that of the 47 mentions⁷ in submissions referring to the plan the Framework Plan implementation, the most frequently mentioned were related to Irish Water projects with 23 mentions, followed by funding with seven mentions. Figure 11-1 below also identifies the six sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 11-1 Plan Implementation Theme



⁷ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

11.1 Phasing

11.1.1 Summary of Phasing Feedback

Several stakeholders referenced the project consultation Roadmap in their submissions. Roscommon County Council noted that the Roadmap is clearly defined. However, they raised a concern that the timeframe for publishing the Regional Water Resources Plans (RWRPs) in Q4 2021 may be ambitious.

Longford County Council stated the Roadmap has been appropriately updated and that they understand that the setting out of tight targets for deliverables is required in identifying any unexpected weaknesses in the NWRP.

DCU Water Institute discussed the timeline set out in the draft Framework Plan and recommended a rolling 5-year action NWRP in order to enable reactivity and resilience as a result of anticipated changes like climate change and economic uncertainty.

The EPA highlighted that there are supplies on the Remedial Action List that have been on that list for over a decade and that “the pace of implementation arising from various action programmes and the associated improvements is too slow. The EPA added “The plan needs to provide greater clarity and include assessment criteria in relation to Irish Water’s short-term response where urgency such as where a treatment barrier has been compromised.”

A number of stakeholders discussed current infrastructure deficits and submitted that these should be addressed immediately. Chambers Ireland stated “for our network it is critical that infrastructure programmes, such as that underlying the resilience work within the National Water Resources Plan are rapidly advanced at the earliest opportunity. Chambers Ireland is calling on Irish Water to accelerate implementation of the NWRP, particularly around the investment in infrastructure. Since the creation of Irish Water, far more has happened to the global, and our domestic economy, than could have been reasonably anticipated.”

11.1.2 Response to Phasing Feedback

Further public consultations will be conducted on each of the four RWRPs. We are satisfied that such consultations can be delivered within the indicative timeframes specified in the project consultation Roadmap. While it is an ambitious programme, its delivery is a priority for Irish Water.

The NWRP is a 25-year plan to ensure we have a safe, secure, reliable, and sustainable water supply for everyone and will be updated every five years. As part of the NWRP we have included a continuous monitoring and feedback process as outlined in section 8.3.8 of the Framework Plan to ensure that we are able to take into account emerging policy, information from external bodies, regulators, and our own data improvements. Public consultation will be a key element in ensuring members of the public and interested parties have the chance to participate in the decision-making process in the development of the NWRP generally, including Phase 2 NWRP on the four RWRPs.

The delivery and implementation of the NWRP will not delay critical asset interventions to address water quality issues across our supplies being delivered as part of Irish Water's National Disinfection Programme. Additional programmes to improve resilience such as reservoir storage and network connectivity will also continue. This is outlined in Box 8.1 in the Framework Plan.

We will ensure that these programmes and other interim solutions are aligned with and take into consideration the Preferred Approaches (permanent solutions) identified in the NWRP as per the methodology in chapter 8 of the Framework Plan.

The scale of investment to transform our water supplies will be significant. However, the outcome in terms of our ability to protect the environment, provide a good Level of Service for all customers, support growth and economic development, and adapt to climate change impacts, will be considerable.

The development of the NWRP will enable us to understand the scale of strategic investment required across our water supplies, and to propose the appropriate level of investment required, within the National Development Plan. The Preferred Approaches identified through this process will be prioritised on a national basis and progressed through Irish Water's Capital Investment Plans.

11.2 Cost

11.2.1 Summary of Cost Feedback

In relation to cost, a respondent noted that if this plan is implemented then Ireland's water management will improve. However they stated "unfortunately, the downside is the cost implication of implementation of what is set out in the NWRP, no doubt over the forthcoming years the elements of the plan will be implemented on a phased basis, mindful of demographic changes and needs."

Roscommon County Council highlighted that based on the scale of need across some water supply zones, numerous investment cycles will likely take place before all identified needs can be addressed. They added, "therefore, smaller localised interventions may be required on an interim basis to secure priority need in existing supplies until the Preferred Approach can be delivered."

Clare PPN submitted that currently interest rates are low, therefore this may be an opportune time to invest in infrastructure.

Chambers Ireland noted that significant investment in infrastructure is required if the NPF is to be realised. They stated, "it is essential that while costs must be controlled within Irish Water, those metrics should not act as a constraint upon wider society." In addition, they recommended that Irish Water utilise a robust model that allows for comparisons on long run costs of various investments. Adding, "such a process may allow for a more robust and resilient financial modelling for Irish Water, particularly considering the timelines its investment schedules operate over, and the frequency of the economic downturns that are likely to occur over the coming years."

11.2.2 Response to Cost Feedback

The scale of investment required to transform our water supplies is undoubtedly considerable. However, the outcome in terms of ability to protect the environment, provide a good Level of Service for all customers, support growth and economic development, and adapt to climate change impacts, will be substantial.

The development of the NWRP will enable us to understand the scale of strategic investment required across our supplies, identify suitable solution, and then propose the appropriate level of investment needed within the context of the National Planning Framework, and prioritised on a national basis.

Key decisions are based on sensitivity assessments of Preferred Approaches. We review the outcomes and assess our decisions based on a range of potential futures. An example would be whether a new water treatment plant would need to be constructed if we exceeded our leakage targets in future. In this example, Irish Water would respond to this sensitivity question by ensuring the proposed WTP was built on a modular phased basis, with capacity only delivered in line with need. When solutions involve pipelines, we can optimise the size of the pipeline to best suit a range of capacity requirements, which enables us to start with lower water flows, and include booster pumps when the maximum output capacity is required. In many cases, there are multiple needs driving interventions, including resilience, levels of service and climate change adaptation.

The delivery and implementation of the NWRP will not delay critical asset interventions to address water quality issues across our supplies, being delivered as part of Irish Water's National Disinfection Programme. Additional programmes to improve resilience such as reservoir storage and network connectivity will also continue and addressed in Box 8.1 in the Framework Plan.

We will ensure that these programmes and other interim solutions are aligned with and take into consideration the Preferred Approaches (permanent solutions) identified in the NWRP as per the methodology in chapter 8 of the Framework Plan.

11.3 Irish Water Projects

11.3.1 Summary of Irish Water Projects Feedback

A number of stakeholders discussed the Water Supply Project (WSP) in their submissions where many respondents noted their dissatisfaction towards the project. Submissions outlined that the priority for Dublin should be to fix the leaks first. One respondent described the WSP as “another burden to our financial woes and would involve unnecessary environmental risk.” Adding, “the proposal does not prioritise local, present and future needs which is for the catchment area itself and the Shannon Estuary.”

The Climate Action, Biodiversity and Environmental Strategic Policy Committee of Limerick City and County Council noted their objection to the WSP. While Environmental Trust Ireland sought confirmation that Irish Water will not seek to extract water from the River Shannon to supply Dublin.

Fight the Pipe questioned the findings on the need, projections, and approach towards the WSP. They also suggested that the advice provided to them by their consultants involved “the retirement of all existing water supplies within the benefitting corridor meaning that those regions would then rely on water coming from just one source (the River Shannon) via one treatment plant and one pipeline.” They added that they were “surprised therefore to see (in part 1.4 of the draft Framework Plan) that Irish Water has, at the top of its list of risks for water resource zones: ‘single source supplies’.”

In addition, they questioned whether Irish Water now acknowledges points made in Kennedy Analysis and the impacts of the errors in the region.

An individual also stated that the predicted water deficit for the Greater Dublin Area is incorrect. The respondent noted “if the use of inappropriate data/methodology results in the prediction of an overstated water deficit for the GDA then the Shannon pipeline may be considered a feasible solution on the basis of a false premise. This would risk taxpayers’ money being spent on an unnecessary project that would not even address Dublin’s main problems: its unrealistic pipes and lack of diversification.” The respondent discussed previous correspondence regarding data and methodology errors and requested that the demand calculations to be fully transparent and available.

The RSPA also discussed the WSP in their submission, raising concern that the Framework Plan is based on the proposition that the resource allocation is already in place and the main inputs to the Framework Plan are then structured to fit around this. They questioned whether consideration was given to connecting other rivers such as the Boyne or Slaney.

They also questioned the data and methodology used for the WSP and noted the draft Framework Plan “is a poorly disguised scheme seeking to justify by stealth the inclusion of Irish Water’s Shannon Pipeline proposal. It contains an expanded WRZ and increased SDB for Dublin. While jacking up these demand requirements it reduced investment in conservation measures and refuses to seriously consider viable less costly sources of additional supply close to Dublin.”

They also discussed leakage rates in Dublin and the background of the WSP itself.

Roscommon County Council questioned whether consideration would be given to WSP supplying other areas as well as the Greater Dublin Area.

Meath County Council noted their support for the need to address water supply for the Dublin region as some areas of Meath obtain their water supply from these schemes. They added, “the draft NWRP needs to address the potential for delay as projects, in some cases, are dependent on legislative changes, for example, abstraction legislation. Contingency planning to address the long-term demand of the region must form a key part of the draft NWRP.”

A respondent stated there is a need for more large reservoirs, more effective modern treatments plants and good water incentives instead of extracting water from the Shannon for Dublin.

The Eastern and Midlands Regional Assembly were supportive of the WSP in their submission, noting it is required “to ensure sufficient treated water is available to meet

the long-term water supply needs of the Region, to provide for projected growth in the medium to long term (up to 2050) and contribute to resilience and security of supply in the Region.” Dublin Chamber highlighted their support for the WSP also.

Councillor Johnny Flynn proposed setting up a fund based on a 1% levy per litre of water abstracted from Lough Derg to provide funds for rural Clare and Tipperary. In addition, the submission discussed Ennis Main Drainage and Flooding Study which recommended a single treatment plant to serve Ennis and environs and the proposal of investigative works within the Clonroadmore catchment.

The EPA discussed the National Disinfection Programme and noted their timelines have not been achieved, stating “only a third of all water treatment plants have had their works completed.” Adding, “it is the view of the EPA that no delay should be introduced into the delivery of this programme as these works are of fundamental importance in addressing disinfection issues in water supplies.”

Cairn PLC highlighted that only Irish Water’s Regional Contractor can lay Irish Water services in public roads and suggested this causes delays and an increase to costs. They requested, “where a developer has put forward a competent/experienced civil works contractor that they should be permitted to complete these off site works under the supervision of a Field Engineer and their Consulting Engineer.”

Kildare County Council noted that they have participated in workshops with Irish Water to discuss the NWRP, including scenarios that were identified for County Kildare which included upgrading the capacity of Srowland water treatment plant, increasing the capacity at Leixlip water treatment plant and increasing production from Ballymore water treatment plant.

11.3.2 Response to Irish Water Projects Feedback

As part of the development of the RWRPs, the “need” across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the “need” drivers for each supply. The water resources planning process does not retire supplies unless it is determined to be appropriate on a case-by-case basis. The methodology in the Framework Plan does not prejudice any particular Preferred Approach. Rather it is a robust and objective mechanism to identify need and supply/demand deficits, and in turn Preferred Approaches to resolve the issue(s).

The NWRP addresses all 539 WRZs nationally, using the set methodology finalised in the Framework Plan, adopted following extensive consultation. The objective of the NWRP is to ensure safe, secure, reliable, and sustainable water supplies nationally. It’s focus is not on a single project or option and will provide the basis for a strategic funding assessment to enable us to plan for all of our future water supplies. Over the course of the development of the NWRP, including ongoing engagement with key stakeholders such as Government departments and our local authority partners, the

extent of the issues with our existing supplies is evident. These issues relate to a number of factors including environmental compliance challenges, level of service, adequacy of sources, existing infrastructure, residuals, drought resilience, climate change, population growth and economic development, interconnectivity of supplies as well as issues such as network performance and leakage. Typically, problems with the public water supply cannot be related to a single issue or cause and cannot be solved with a single solution.

In-flight projects will be assessed against the Preferred Approaches identified in the NWRP and adapted as required. The Preferred Approaches will also be consulted on in the context of the public consultations planned as part of the development of the RWRPs which will take place throughout 2021 and 2022.

Options such as a water transfer from the Shannon catchment, or abstractions from the Rivers Boyne and Slaney, will be reviewed as part of the RWRPs.

Irish Water has reviewed all submissions in relation to the draft Framework Plan and some amendments and clarifications are contained in the Framework Plan as adopted. In some instances, our data will improve over the coming years, which will allow us to refine the supply-demand balance. We will progress such additional data through the feedback and monitoring process identified in section 8.3.8 of the Framework Plan.

The delivery and implementation of the NWRP will not delay critical asset interventions to address water quality issues across our supplies being delivered as part of Irish Water's National Disinfection Programme. Additional programmes to improve resilience such as reservoir storage and network connectivity will also continue as outlined in Box 8.1 in the Framework Plan.

Irish Water has also set out a process for developing interim options to address critical water quality and quantity issues while we deliver our Preferred Approaches through the coming investment plans. Box 8.1 has been added to the Framework Plan to reflect this.

Establishment of a dedicated levy on abstraction from Lough Derg is outside the scope of the NWRP.

We will forward comments on the installation of service connections to our Connection Developer Services Team.

11.4 Future Projects Approach

11.4.1 Summary of Future Projects Approach Feedback

Kennedy Analysis suggested key decisions must be made on the basis of appropriate long-term leakage targets in line with best practice. Adding, "it is highly likely that key decisions in terms of future strategic projects will be made within the next 5 years. Some of these (such as the proposed Shannon pipeline project) would be enormously expensive. It is vital that they are not made on the basis of inappropriate methodology."

Adding that the omission of a major mains replacement programme as a solution is a short-sighted approach that will not deliver a sustainable water supply.

It was noted that investment in infrastructure is crucial to the water management system in Ireland. Chambers Ireland discussed building a resilient water network, they noted “while in the short-term the immediate response to environmentally negative processes (such as the discharge of raw wastewater) needs to be addressed, this must occur in parallel with the medium-term action that is needed to ensure both the continuity of existing supply and the longer-term projects which will ultimately facilitate the development of the resilient water network we need.”

11.4.2 Response to Future Project Approach Feedback

The development of the NWRP will enable us to understand the scale of strategic investment required across our supplies, and to propose the appropriate level of investment needed within the National Development Plan in an informed way.

As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the "need" drivers for each supply. No Preferred Approaches have been prejudged by the methodology contained in the Framework Plan.

The NWRP addresses all 539 WRZs nationally, using the set methodology finalised in the Framework Plan, adopted following extensive consultation. The objective of the NWRP is to ensure safe, secure, reliable, and sustainable water supplies nationally. It's focus is not on a single project or option but rather it will provide the basis for strategic funding assessment to enable us to plan for all of our future water supplies. Over the course of the development of the NWRP, including ongoing engagement with key stakeholders such as Government departments and our local authority partners, the extent of the issues with our existing supplies is evident. These issues relate to a number of factors including compliance challenges, water quality risk, environmental impacts, level of service, water sources, existing infrastructure, residuals, drought, resilience, climate change, population growth and economic development, interconnectivity of supplies as well as issues such as network performance and leakage. Typically, problems with the public water supply cannot be related to a single issue or cause and cannot be solved with a single solution.

Medium-term leakage reductions targets are included in the Framework Plan as adopted. We have also included a sensitivity analysis to ensure that long-term leakage reduction targets are included in the development of the Preferred Approaches. Please refer to section 8.3.7.5 of the Framework Plan.

A major water mains replacement programme is not included in our unconstrained options list, as this is automatically included as one of the interventions to be progressed as part of the National Leakage Reduction Programme. However, major water mains replacement would be a poor standalone option to address demand. Demand interventions alone do not address the multitude of other issues with our existing supplies, including sustainability of our sources, climate change impacts,

drought impacts, resilience, and drinking water quality. In most WRZs a combination of interventions under the Use Less, Lose Less and Supply Smarter pillars will be required.

As set out in the European Commission's EU Reference document Good Practices on Leakage Management WFD CIS WG PoM Case Study, there are no records of countries or jurisdictions that use largescale watermain replacement programmes as a stand-alone method to reduce leakage (even those with low leakage levels).

The delivery and implementation of the NWRP will not delay critical asset interventions to address water quality issues across our supplies being delivered as part of Irish Water's National Disinfection Programme. Additional programmes to improve resilience such as reservoir storage and network connectivity will also continue as noted in Box 8.1 in the Framework Plan.

We will ensure that these programmes and other interim solutions are aligned with and take into consideration the Preferred Approaches (permanent solutions) identified in the NWRP as per the methodology in chapter 8 of the Framework Plan.

11.5 Funding

11.5.1 Summary of Funding Feedback

AFU suggested enhancing Irish Water with project and financial resources to boost their project management expertise. The Southern Regional Assembly stated in order for Irish Water to meet their ambitious targets they require an ambitious alignment in funding priorities and service delivery and noted water infrastructure is fundamental to service the growth outlined in the NDP and Project 2040.

The EPA noted that sustained investment by Irish Water is required to address water management issues. They added "the planning horizon of the NWRP is such that flexibility, adaptability and regular touch points should be included to satisfy the regulatory requirements of both the EPA and CRU. This should include being able to adapt to any future EPA guidance, or CRU intervention on infrastructure funding."

Longford County Council requested a single point of contact instead of the current separate silo approach to funding.

Chambers Ireland emphasised the importance of investing in infrastructure in order to support the growth of cities and towns especially as a result of the current Irish landscape. They noted "if there is insufficient investment by Irish Water to support the rapid growth in our cities and towns then the demand for housing will see the further diffusion of our population across wider areas where it is possible to squeeze once-off housing onto the existing infrastructure."

Dublin Chamber called for further investment by the Government to counter the decades of under investment in water infrastructure. They stated that increased and appropriate funding is required to deliver the ambitions set out in the NWRP. They stated that "a Government commitment to investment on a multi-year basis is required to ensure that the NWRP has the funding to be achieved and that Irish Water has the certainty it needs to plan and execute long-term projects."

Councillor Johnny Flynn discussed funding opportunities for Clare and Tipperary and setting aside funds for the expansion or provision of new water treatment plants for rural towns and growth.

11.5.2 Response to Funding Feedback

The scale of investment required to transform our water supplies is undoubtedly considerable. However, the outcome in terms of ability to protect the environment, provide a good Level of Service for all customers, support growth and economic development, and adapt to climate change impacts will be substantial.

The development of the NWRP will enable us to understand the scale of strategic investment required across our supplies, and to propose the right solutions and the appropriate level of investment needed within the context of the National Planning Framework.

The NWRP is a 25-year plan to ensure we have a safe, secure, reliable, and sustainable water supply for everyone and will be updated every five years. As part of the NWRP we have included a continuous monitoring and feedback process as outlined in section 8.3.8 of the Framework Plan to ensure that we are able to take into account emerging policy, information from external bodies, regulators, and our own data improvements. Public consultation will be a key element in ensuring members of the public and interested parties have the chance to participate in the decision-making process in the development of the NWRP, with the next Phase being consultations on the RWRPs.

As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the "need" drivers for each.

Where possible, investment plans are aligned with local authority housing and planning functions to support development. However, it should be noted that there are significant legacy issues across our supplies, and it is acknowledged that it will take many capital investment cycles to resolve these issues. Irish Water will continue its direct engagement with local authorities through the NWRP and the Capital Investment Plan process.

Irish Water recognises the need for balanced development and the need to support rural communities. As national prioritisation methodologies can be skewed towards larger populations, Irish Water will facilitate rural growth through a ring-fenced investment programme known as the "Small Towns and Villages Programme." However, it should also be noted that all supplies from the largest to the smallest are considered within the NWRP, with needs assessments and Preferred Approach developments conducted for every one of the 539 water supplies nationally.

11.6 Resources

11.6.1 Summary of Resources Feedback

AFU suggested that Irish Water should enhance their project and financial management resources. They noted “Irish Water should aim to ‘own’ the functions and operations of the water supply system in order to develop feasible solutions and seek continuous improvements in levels of service.” They added that significant resources will be required to achieve the goals for the resilient supply and levels of service objectives of the NWRP.”

The EPA stated there is little reference to knowledge gaps in the NWRP. They suggested that Irish Water should identify these gaps with research. They added, “commitments in the Programme for Government refer to Irish Water commissioning a range of research projects to explore innovative ways of improving water infrastructure and reducing consumption. Developments in these areas could be captured in the NWRP.”

GSI outlined that hydrogeological expertise is essential to understand “how pollutants travel from the land surface to a groundwater and via groundwater to surface water. As such, GSI expertise is essential to a collaborative multiagency approach to the management of drinking water quality in Ireland. GSI welcomes the opportunity to provide hydrogeological expertise directly to Irish Water, via the recast Drinking Water Directive working group and other fora.”

11.6.2 Response to Resources Feedback

The Department of Housing, Local Government and Heritage has recently published a policy paper on the future of Irish Water "Irish Water - Towards a national, publicly owned, regulated, water services utility." This paper sets out how Irish Water will integrate the day-to-day operation and delivery of water services into its own internal structure, in place of the existing Service Level Agreements, on a phased basis.

The NWRP is a 25-year plan to ensure we have a safe, secure, reliable, and sustainable water supply for everyone and will be updated every five years. As part of the NWRP we have included a continuous monitoring and feedback process as outlined in section 8.3.8 of the Framework Plan to ensure that we are able to take into account emerging policy, information from external bodies, regulators, and our own data improvements. Public consultation will be a key element in ensuring members of the public and interested parties have the chance to participate in the decision-making process in the development of the NWRP.

Irish Water has a permanent Innovation team within Asset Management that interfaces directly with learning institutions and the private sector in relation to innovation studies and piloting new technology.

Irish Water will set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies, and emerging data will be used to inform ground water source protection initiatives. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as it becomes available.

11.7 Conclusions on Plan Implementation Feedback

Having carefully reviewed the submissions received on the theme of Plan Implementation, Irish Water considered that one change should be made to the draft Framework Plan. This change is explained in section 11.7.1 regarding “Clarifications” below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 11.7.2 regarding “Recommendations” below.

11.7.1 Clarifications on Plan Implementation Feedback



The following section of the Framework Plan has been updated to reflect feedback under the theme of Plan Implementation:

Box 8.1 in section 8.3.7

11.7.2 Recommendations on Plan Implementation Feedback

1. Irish Water will review the principles set out in the 2020 National Water Forum Paper on Public Engagement, to assess if any improvements could be included as part of the consultations for the RWRPs.
2. Irish Water will continue to share groundwater data with GSI.
3. Irish Water will progress a five to seven-year data improvement strategy to improve our information and operation of the public water supply. This will include source assessments that will be progressed based on consultation and interface with GSI and the EPA Hydrometrics Department.

12. Option Types

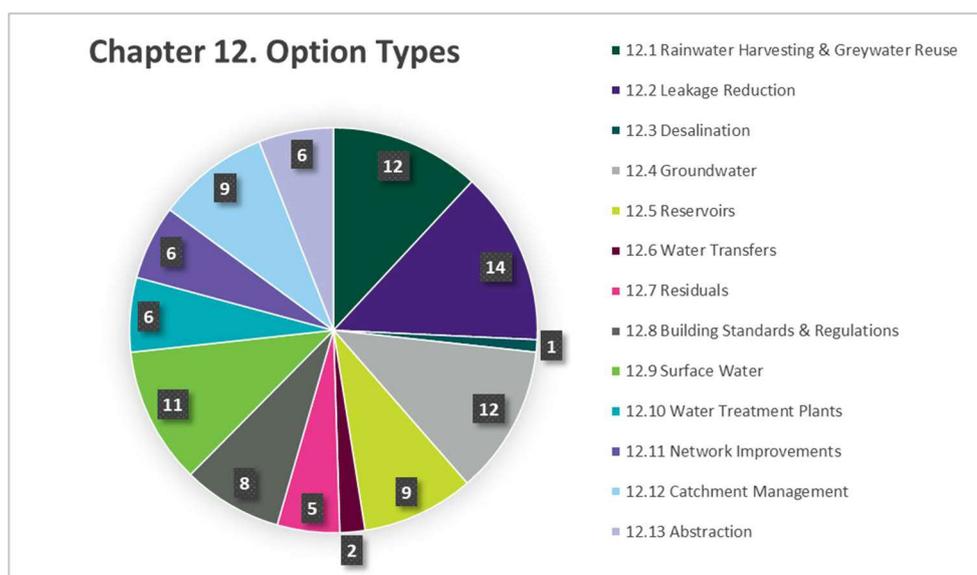
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Option Types”. Within the overall Option Types theme, we identified 13 sub-themes, which we set out in Figure 12-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross-reference the response given to other sub-themes.

Figure 12-1 details the breakdown of feedback received under the theme Option Types. It shows that of the 101 mentions⁸ in submissions referring to option types the most frequently mentioned were related to leakage reduction with 14 mentions followed jointly by rainwater harvesting and greywater reuse and groundwater both with 12 mentions. Figure 12-1 below also identifies the 13 sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 12-1 Option Types Theme



⁸ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

12.1 Rainwater Harvesting and Greywater Reuse

12.1.1 Summary of Rainwater Harvesting and Greywater Reuse Feedback

Several stakeholders requested that greywater and rainwater harvesting be utilised by Irish Water instead of treated water especially for industry and building corporations.

Several stakeholders commented on greywater or rainwater use in the home. One individual questioned why there is no mention of greywater reuse or rainwater harvesting technology in the NWRP. This individual noted that 30% of domestic water is used to flush toilets and proposed that a scheme should be implemented to use rainwater in its place.

An individual explained that they have already installed a rainwater harvesting system in their industrial unit and have not used any water from the public supply since. They suggested the financial compensation received by some on their energy bills through using green electricity could be replicated for rainwater harvester users.

In addition, another respondent proposed a Government grant scheme to incentivise homeowners to use rainwater harvesting.

An individual suggested Irish Water require local councils and developers to use greywater while building houses to conserve treated water for household use only. Another stakeholder referred to a proposal to fit all new developments in Dublin with rainwater harvesting systems. One stakeholder requested Irish Water provide every household with a water butt using a nationwide installer to emphasise the need for water conservation.

Waterford Institute of Technology proposed that rainwater storage on-site should be a planning requirement for any private residence or housing development. They stated that it should be a condition of planning that a sustainable water management plan should be implemented to capture rainwater and methods should be put in place to secure additional water runoff in a local storage system for reuse in the public water network.

The Eastern and Midlands Regional Assembly submitted that the NWRP should be progressive and responsive to circular economy principles. It should champion smart water and technological solutions, such as using greywater and rainwater in order to positively engage local authorities and communities.

Kerry County Council noted that capturing and producing greywater for any activities other than consumption should be advanced and incorporated in policies to safeguard treated water being used for any functions or production that grey water or harvested rainwater can be used as an alternative and in turn protecting our water sources.

Clare PPN noted the lack of reference to greywater use and rainwater harvesting within the draft Framework Plan and requested that education and action plans around both greywater reuse and rainwater harvesting be included in the aims of the Framework Plan where it commits to use less, lose less, and supply smarter.

Councillor Johnny Flynn commented on the utilisation of greywater and how it should be encouraged to reduce the demand on treated water which in turn reduces consumption of other resources, including energy.

12.1.2 Response to Rainwater Harvesting and Greywater Reuse Feedback

Within the NWRP, we look at solutions across three pillars: “Use Less” (Conservation), “Lose Less” (leakage reduction) and “Supply Smarter” (sustainable sources and improved interconnectivity of supplies). Within the “Supply Smarter” pillar set out in the draft Framework Plan, we had included options such as treated water effluent reuse.

Greywater cannot be introduced to the public water supply, to prevent contamination. Non-potable water supplies must be kept separate to treated drinking water in distribution networks and domestic-plumbing systems. A parallel network of pipeline would be required to deliver a non-potable water supply. As detailed below, Irish Water is active in seeking to incentivise customer-side greywater usage initiatives.

Under the Use Less pillar, conservation activities are underway at present in Irish Water. We will need to review outcomes from these initiatives over the coming years in order to quantify potential outcomes in terms of demand reduction. We will continue to progress water conservation measures and will engage with other stakeholders in driving the need for policy to support water conservation measures. At present Irish Water is progressing a water conservation app to enable consumers to save water in their homes and this has been updated in the Framework Plan in section 7.3.2.2.

Greywater and rainwater harvesting are private side measures, that can potentially result in a reduction in demand (greywater) or a reduction in some peaking in dry conditions. However, storage volume required particularly to address peaking in drought conditions can be substantial. Irish Water is supportive of initiatives to improve the use of greywater and rainwater harvesting. We will support studies on the potential for such interventions and based on outcome support wider Government policies in this area. We will progress studies through our Innovation team to review the potential outcomes and benefits for conservation measures such as rainwater harvesting and grey water reuse.

As part of its initiatives to encourage sustainable solutions, Irish Water, when discussing new connections with non-domestic users who require water for cooling purposes during hot temperatures, will encourage those customers to include in their developments, facilities for on-site storage and reuse of water.

12.2 Leakage Reduction

12.2.1 Summary of Leakage Reduction Feedback

Many stakeholders considered leakage reduction in both drinking water and wastewater to be an urgent priority for Irish Water and should come above individual and business concerns.

One respondent submitted that leakage is a priority and requires an incremental approach rather than large sums of money spent on future projects. Furthermore, they

stated that the risk of fines by the European Union need to be highlighted to the public and continued that the sooner leaks are repaired the greater the economic benefit.

Another stakeholder noted the RBMP sets out national targets to save water leakage and queried Irish Water's claim to have reduced leakage from 50% to 38% in the Greater Dublin Area (GDA).

Kerry County Council noted that leakage reduction is key to provide capacity in the short term. Furthermore, the Council requested the removal of cast iron and lead pipes within the network as a matter of urgency to improve leakage and reduce demand.

Several stakeholders commented on the leakage reduction achieved in various countries in Europe and requested that some of those techniques to reduce leaks be implemented by Irish Water.

One respondent commented on the ducting of public water supplies in Rome which makes it easier to detect and repair leaks. They proposed that the Framework Plan include the following text, "Irish Water will invest in more sustainable pipe replacement that promotes leak control and network management (e.g. ducting) and will draw on international experience to identify the best system over the long term."

Fight the Pipe commented on the Paris water supply and how leakage has steadily decreased over the last 25 years to 5%. There has also been a shift in attitude and water conservation for both businesses and private citizens as water consumption has decreased on average 2% each year. They requested the NWRP include more ambitious leakage targets.

The Climate Action, Biodiversity and Environment Strategic Policy Committee of Limerick City and County Council stated their "objection to the extraction of water from the River Shannon to service water supply issues in Dublin and that the efforts of Irish Water should be concentrated in relation to repairing leaks in the existing networks in Dublin and Limerick."

Clare PPN requested that Irish Water investigates new advancing technologies for pipe maintenance and leakage which should be utilised instead of full pipe replacement to minimise leakage as a less impactful and more cost-effective solution.

Kennedy Analysis noted that the Find and Fix approach to leakage cannot achieve the necessary results needed for leakage reduction and the draft Framework Plan's over-reliance on it is an oversight. Kennedy Analysis requested that a Mains Replacement Programme (MRP) is considered to combat leakage. Kennedy Analysis also referenced the CRU Independent Review that noted it was very difficult to achieve large reductions in leakage using Find and Fix.

The RSPA noted that leakage is losing expensively treated water and addressing all leakage in the network would have the same impact as a new supply source.

AFU stated that greater operational control is needed through metering and modelling with more technical innovations applied to reduce leakage. They suggested that leakage should be approached by controlling and monitoring the Water Distribution System (WDS). Improving the operational control of the existing network by the

subdivision of WDS into small District Metered Areas (DMAs) and using algorithms to establish an optimal location for control valves to be placed along the route will help to meet the demand. AFU also stated that the water network overall needs to be improved. They suggested Irish Water could use satellite technology and underground listening equipment to detect leaks which would not require a large financial investment.

Other solutions suggested by AFU included using drones, acoustic loggers to pinpoint leaks, trained sniffer dogs, pressure management and customer metering. Additionally, AFU suggested an academic collaboration to develop useful and cost-effective tools such as spatio-temporal simulation of leakage, using EPANET or leakage localisation methodologies which are based on head pressure and flow measurements.

Dublin Chamber noted that our ageing transmission infrastructure needs upgrading to prevent leakage and to conserve water.

12.2.2 Response to Leakage Reduction Feedback

Leakage reduction and water conservation is an integral part of our NWRP and is one of the key pillars to resolving supply demand balance deficit.

In terms of the Lose Less pillar, leakage reduction activities are prioritised through using the supply demand balance and delivered via the National Leakage Reduction Programme. Short and medium-term targets have been developed, and as these targets are approached and met, additional targets will be set. Leakage reduction is a key business priority, and the reduction activities used, including, improved operational control, pressure management, calm networks, active leakage control and targeted mains replacement are based on industry best practice. We are also trialling innovative acoustic logging technology, data intelligence systems technology, the use of satellite imaging, sniffer dogs and non-destructive testing. The development of improved data on our distribution networks will allow us to optimise our leakage reduction activities, and to facilitate an expanded programme of targeted water mains replacement. This has been updated in section 7.3.1 of the Framework Plan.

Percentage (%) leakage is a poor indicator of leakage performance and is rarely used by regulators as a metric to compare leakage performance across water supplies or water suppliers. For example, consider a 10-kilometre network with five customers. In this example there is 500 litres per day of leakage on the distribution network and each of the customers uses 100 litres of water. Therefore the % leakage would be 50% (500 litres leakage and 500 litres usage). However, take a similar supply with 10 kilometres of network leaking 500 litres, but this time each customer uses 200 litres of water. The % leakage in this case would be 33% (500 litres leakage, 1000 litres usage). Even though the two networks are the same length and have exactly the same amount leakage, one network looks like it has significantly better performance (33% leakage as opposed to 50% leakage).

Instead we use an industry standard performance indicator developed by the International Water Association, known as the Infrastructure Leakage Index. When we apply this index, the public water supply in Ireland performs poorly when compared to

other European water supplies. However, the medium-term targets we have set for ourselves, will align us with acceptable performance standards. The European Commission has produced a Reference document “Good Practices on Leakage Management WFD CIS WG PoM”, which is a key reference document on leakage reduction. Irish Water sought the advice of one of the authors of this document in developing our National Leakage Reduction Programme.

Irish Water addresses lead services as part of the National Leakage Reduction Programme, while asbestos mains are addressed through targeted mains replacement.

Watermains replacement on its own is not an appropriate method to deliver leakage reduction. In the European Commission’s EU Reference document Good Practices on Leakage Management WFD CIS WG PoM Case Study, there are no records of countries or jurisdictions that use largescale watermains replacement programmes as a stand-alone method to reduce leakage (even those with low leakage levels).

Some respondents referred to examples in other countries where leakage rates have been significantly reduced. We confirm that our leakage reduction activities, although they are starting approximately twenty years later than comparator countries, follow the same best practice processes used in other jurisdictions, including understanding of networks, pressure reduction, active leakage control and targeted water mains replacement.

Our aim is to reduce levels of leakage and migrate towards an Infrastructure Leakage Index of “3” over the coming 10 years. This equates to a similar level of leakage reduction as was achieved by Scottish Water. It should however be noted that SELL calculations drive and enable the development of the processes, network understanding and controls, data and information that allow us to better understand our networks and therefore refine and successfully deliver leakage reduction. We are satisfied that this is an appropriate medium-term target for Irish Water. As we approach this level of leakage reduction, we will assess longer-term leakage reduction targets.

The issues with the public water supply relate to a number of factors including: compliance challenges, water quality risk, environmental impact, level of service, water sources, existing infrastructure, residuals, drought, resilience, climate change, population growth and economic development, interconnectivity of supplies as well as issues such as network performance and leakage. Typically, problems with the public water supply cannot be related to a single issue or cause and cannot be solved with a single solution such as leakage reduction alone.

As part of the development of the RWRPs, Irish Water will consider all feasible options for water supply. The objective of the NWRP is to improve the quantity, quality, reliability, and sustainability of all of our water supplies, and solutions for a water resource zone include a combination both supply and leakage reduction interventions. Specific options to address need will be assessed through the development of the RWRPs.

12.3 Desalination

12.3.1 Summary of Desalination Feedback

One stakeholder suggested the Framework Plan consider water refinement through desalination, which removes the salt from water. They referenced how it has worked very well in Israel, a water stressed country.

The RSPA submitted that Irish Water is dismissive of other sources including desalination, increasing reservoir capacity, and the use of groundwater in favour of using the River Shannon.

12.3.2 Response to Desalination Feedback

Supply Smarter is the third pillar of solutions that we review as part of the NWRP, and includes the use of sustainable groundwater, surface water, interconnectivity of supplies, conjunctive use, impoundments, water treatment plant upgrades and technologies such as desalination and treated water re-use. To understand the sustainability of potential sources at a high level, we conduct desktop assessments for all options considered within the NWRP. Any potential options including potentially desalination will be addressed at RWRP level.

12.4 Groundwater

12.4.1 Summary of Groundwater Feedback

Several stakeholders commented that groundwater should be utilised more for supply by Irish Water as it is a stable and safe resource, and that investment in groundwater should be provided to ensure diversification of resources and more reliable and safe water resources.

Northern Ireland Inland Fisheries noted that groundwater should be used to limit the impacts on surface watercourses and aid in maintaining natural flows.

One stakeholder noted that Irish Water's approach to groundwater appears non-committal. It should be policy to find and develop groundwater resources in a standby capacity as they will require groundwater protection schemes. Additionally, back-up supplies and sources should involve an integrated approach to groundwater and surface water resource development, intrinsically linked to network upgrades. This stakeholder added that groundwater resources should be evaluated, and their seasonal and annual capacity identified so deficiencies could be made up seasonally as required.

One stakeholder noted that Figure 3.4 of the draft Framework Plan states that Irish Water manages 293 surface water sources and 797 groundwater sources, while surface water abstractions account for 83% of the total supply and groundwater provides only 17% despite the larger number of groundwater abstractions in Ireland. They noted the general downgrading of groundwater abstractions contained within section 3.2.2 and suggested that the food industry and other sectors are reliant on groundwater abstractions and Irish aquifers.

Additionally, this stakeholder noted that the EPA identified only a few groundwater bodies in poor status in relation to safe yields.

Furthermore, it was submitted that exploration into aquifers over the last 50 years has been restricted in depth to 100-150m, however there are instances where wells have been drilled to a deeper depth and a higher yield has been encountered. They continued that although the capacity of these deeper aquifers is unknown, they could be a valuable source of unpolluted water.

This stakeholder stated that “the final Framework Plan should not contain the option listed in the Table 8.3 of injecting treated surface waters into aquifers. The idea of injecting water of a lower quality into groundwater aquifers is objectionable as a matter of principle.” They recommended that a larger list of water resource zones should be provided in the Framework Plan with volumes and percentages of ground and surface water supplied to these WRZs.

The stakeholder submitted that the regularisation of the existing situation will require a significant reduction in groundwater sources and surface water abstractions, which “for practical and operational reasons are deemed by Irish Water to be inefficient and costly to maintain.” They continued that calculating the safe yield of a surface water abstraction in comparison with the work required to provide the same safe yield information for the large number of existing groundwater abstractions suggests that groundwater sources are the least effective option. The stakeholder recommended that the preferred option should consist of a number of large surface water abstractions with their own treatment facilities that feed into an interconnected distribution network.

This stakeholder continued that large volumes of groundwater are not always available so reliance on groundwater abstractions is not a sustainable option. However, where groundwater is available it should undergo planned fine and coarse screen stages.

This stakeholder suggested that yield estimates should be based on “a three-dimensional assessment of the geology within the vicinity of the supply, supplemented with long term records on pumping and drawdown of water levels over many years,” and stated that site specific studies on groundwater will be required to create this level of data.

They noted the hydrogeological variables that need to be taken into consideration in the calculation of safe yield estimates such as aquifer depth and status, transmissivity, and storage, and intergranular or fracture flow. They noted that developing groundwater sources and aquifers cannot be easily resolved without financial investment and time.

This stakeholder also noted that pumping wells develop a cone of depression in water tables and so develop a Zone of Influence (ZOI) around the abstraction whereas a Zone of Groundwater Contribution (ZOC) approach includes groundwater that may conceptually arrive at this location on the next 20-100 years. They acknowledged the demands on finances available to Irish Water and suggested ring-fencing a small percentage of the annual budget for groundwater exploration at sites.

Another stakeholder stated that there is currently no regulation on companies abstracting from aquifers for profit.

Roscommon County Council noted that groundwater tends to be of good quality and only requires simple treatment to meet drinking water standards, such as disinfection, aeration, and sand filtration. However, the Council continued, if groundwater is polluted, cleansing of groundwater bodies takes a very long time as there is a time lag in the renewal of groundwater. As a result, the long-term planning of protective measures is necessary.

Roscommon County Council also commented on Article 7.3 of the WFD which noted that members must ensure protection for the bodies of water identified and aim to avoid deterioration of the quality of water to reduce treatment required.

The RSPA noted that a groundwater assessment should be undertaken before any abstraction to ensure that the sustainable productivity of the resource is not impacted. Additionally, they noted that groundwater and river flow are intertwined. They stated that overreliance on just one resource of water would leave a supply vulnerable if issues arise so Water Resource Zones should have a good balance of surface and groundwater solutions.

The RSPA stated that expanding new water sources and treatment facilities should be a priority in the Framework Plan. They stated that the NWRP does not address the “(i) the unreliability of the pipes, (ii) leakage levels, and (iii) the lack of diversification protection is the approach that has been taken in Ireland for decades.”

They added that Irish Water is dismissive of other sources including desalination, increasing reservoir capacity, and the use of groundwater in favour of using the River Shannon. They noted that there is also a well-known source of groundwater 80km from Dublin and Irish Water has shown no interest in investigating this further.

The Steering Committee for the Geo-Drilling Apprenticeship noted that in the past they have collaborated with Irish Water to develop guidelines for good drilling and the Institute of Geologists of Ireland has also developed similar guidelines. The Committee stated it has entered discussions with Irish Water to ensure that appropriately qualified personnel for good drilling services are employed in its procurement procedures. The Committee supported the opportunity to contribute to the important work Irish Water is conducting.

GSI noted that Hydrogeological expertise is essential in identifying and understanding how potential pollutants travel from the land surface to groundwater and via groundwater to surface water. GSI stated that a multiagency approach to managing drinking water in Ireland is required and GSI would welcome the opportunity to provide hydrogeological expertise directly to Irish Water.

They observed that section 3.2.2 of the draft Framework Plan states that Irish Water does not have all information available to calculate the hydrological yield of their groundwater supplies and noted that this data is often available for abstraction points but has not been collated and put in a database to cover the whole country, which is detrimental to Irish Water’s ability to understand the water resources in Ireland.

GSI noted that a clear structured plan of the following should be included in the NWRP “how (i) existing data, information and reports on groundwater resources will be

compiled and processed, (ii) what new data are required to increase the confidence of the estimation of groundwater resources, and (iii) how on-going data should be collected, used and managed.”

GSI stated that Irish groundwater resources support drinking water facilities, industry, and agriculture and that groundwater is a far more reliable resource when compared to surface water. GSI welcomed the groundwater studies proposed in the multi-year programme of work.

Limerick Greens noted that in relation to groundwater resources and determining safe yields, the NWRP contains an inefficient assessment for impacts on Groundwater Dependent systems and habitats. They noted that in parts of Ireland, surface water and groundwater are intrinsically linked such as in karst areas.

12.4.2 Response to Groundwater Feedback

Groundwater is a key option for our public water supplies, and we recognise that it can deliver improved water quality, storage, and source protection. We have confirmed this option in our Framework Plan, and it will be assessed further through the RWRPs. We have updated section 3.2.2 in the Framework Plan to reinforce the significance of groundwater to our resources planning process. Irish Water will not “dismiss” any potential source within the RWRPs, and all potential sources will be subject to further assessment and consideration. In particular, Irish Water recognises the connectivity between groundwater and surface water supplies in our assessments and the knock-on impacts groundwater abstraction can have on surface water sources. The Preferred Approach for each water supply is developed through the full options assessment process, depending on the issues and factors for consideration in each supply.

There is a significant variation in the use of groundwater and surface water sources across the country. This tends to reflect natural resource availability in the local area. For example, County Laois utilises almost 100% groundwater sources. County Roscommon and Wexford also utilise significant groundwater supplies. It is also worth noting that food production and other sectors can be reliant on private groundwater abstractions.

Impacts of abstractions on groundwater bodies, and on groundwater dependent habitats, are considered within our assessments and option screening activities. We have clarified this matter in Appendix C of the Framework Plan. In some cases, the achievement of “good” status in groundwater bodies is due to the fact that no (or limited) abstractions are taking place. It is worth noting that, in respect of the two groundwater bodies in Ireland that are at “poor” status, that status is due to the significant pressures generated by the level of abstraction from them.

Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as it becomes available. Emerging data

and information will be incorporated into the NWRP through the feedback and monitoring process set out in section 8.3.8.

The competent authority in relation to regulation and licensing of water abstraction under the forthcoming abstraction legislation is the EPA.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9.

Supply Smarter is the third pillar of solutions that we review as part of the NWRP, and includes sustainable groundwater, surface, interconnectivity, conjunctive use, impoundments, water treatment plant upgrades and technologies such as desalination and treated water re-use. To understand the sustainability of potential sources at a high level, we conduct desktop assessments for all options considered within the NWRP. We will look at all possible options as part of the Preferred Approach development for each supply option in the RWRPs.

It is recognised that groundwater is likely to be a dependable and resilient supply of water into a climate-changed future, and Irish Water will collaborate with the GSI in realising the full potential for groundwater as an integral part of the public water supply. However, it is also recognised that climatic conditions vary significantly across the country and fluctuate across seasons. Due to geology and topography across the country many of our groundwater bodies and surface water catchments can have poor storage characteristics compared to other European countries. This means that based on existing infrastructure, large parts of the country are vulnerable to climate change impacts and drought. We witnessed these impacts during the drought in 2018, where a significant number of groundwater and surface water supplies were severely impacted after a relatively short period of dry weather conditions. Natural wetland retention and impoundments will be a key consideration in this area.

Irish Water was a stakeholder in the development of the guidelines on good drilling practice, and these will be utilised as part of procurement processes for works delivered by Irish Water.

Irish Water will use in-house hydrogeology expertise and will work with the GSI during the rollout of investigative studies for supplies and development of new groundwater sources. Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as it becomes available.

12.5 Reservoirs

12.5.1 Summary of Reservoirs Feedback

Several stakeholders commented on the Poulaphuca reservoir and noted its underuse in terms of water supply. One stakeholder stated that artificial lakes and reservoirs should be created where there are supply issues. These structures could then be used

as an amenity and resource. They further emphasised that artificial water bodies should be used in preference over natural surface water structures, such as rivers and lakes, to minimise the impact on ecology and the environment.

An individual commented on water-related investment proposals based on projections of future water use and wastewater amounts. They provided the example of the North Dublin sewage scheme which is estimated to cost €500m which is based on Dublin growing by 50% in 30 years. However, this stakeholder was not confident that much expansion would happen in 30 years and noted that interim investments every 30 years would be a better solution. They also noted that the compensation flow to the Liffey from Ballymore Eustace is roughly 663,000 m³/d. They suggested that sufficient supplies should be retained in a reservoir in case of drought which in the case of the Liffey should be 663,000 m³/d, multiplied by 90 days.

They continued that originally the primary purpose of reservoir construction was electricity generation then water supply secondary and these priorities should be switched allowing an expansion of the Dublin water supply. Additionally, Dublin/Wicklow mountains runoff would supply Dublin's water needs and the Vartry reservoir should be considered in case of emergencies.

The RSPA agreed with the use of Poulaphuca as a water supply to service Dublin's needs and stated that it would have considerably less impact on the environment, costs and landowners when compared to laying a pipeline across the country.

Fight the Pipe submitted that Table 8.3 of the draft Framework Plan should contain potential solutions for Irish Water for regions that have projected water deficits in the future. However, they requested measures to reduce reservoir leakage and waste within both raw and treated water facilities, and the expansion of existing raw water reservoirs be included in Table 8.3.

Chambers Ireland noted that supplying new reservoirs will be a challenge considering the weather climate in Ireland, and persistent rain could make flooding more likely, which could bring security of the supply into question. The Chambers stated that when rain is in short supply it would narrow the time when water is available to capture and store as the baseline capacity for the water capture infrastructure will need to be much higher than what it is currently. They also noted that runoff from short bursts of intense periods of rain could impact the quality of raw surface waters.

Councillor Johnny Flynn noted that Ennis Public Water Supply is currently lacking in resilience as it has no adequate reservoir storage and Ennis is currently only supplied by a single source that only contains 75% of the daily water requirement against a minimum standard of 1.5% reservoir storage. The Councillor raised concern about the lack of water pressure in case of storage in the event of a major fire.

Wicklow County Council noted Dunlavin, Newtownmountkennedy, Kilcoole, and Cronroe as areas that require particular attention in relation to reservoirs and storage.

12.5.2 Response to Reservoirs Feedback

Supply Smarter is the third pillar of solutions that we review as part of the NWRP, and includes sustainable groundwater and surface sources, interconnectivity, conjunctive

use, impoundments, water treatment plant upgrades and technologies such as desalination and treated water re-use. To understand the sustainability of potential sources at a high level, we conduct desktop assessments for all options considered within the NWRP.

The catchment of the upper River Liffey and Poulaphuca Reservoir is 314 km² and must support a continuous compensation flow along the river Liffey, along with two abstractions at Poulaphuca and Leixlip Dam. The reservoir is not underutilised and directly supports 85% of the drinking water supply for the Greater Dublin Area. The reservoir was built as a joint venture between the ESB and Dublin Corporation, but its primary use is now water supply.

ESB operations give maximum consideration to this, but within the constraints of dam safety and its obligations under the Floods Directive.

We will review all unconstrained options as part of the development of the RWRPs. These options will include impoundments and new reservoirs. Also, artificial reservoirs (such as disused quarries) will be considered. However, it should be recognised that in order to fill artificial reservoirs, we must divert water from a natural catchment or groundwater source.

Water and wastewater investment proposals are not just required to facilitate growth. They are also required to increase sustainability and resilience of the existing supplies. The growth figures we have used in the Framework Plan are based on those from the National Planning Framework and the Regional Assemblies. Any changes to these projections will be incorporated into the NWRP through the monitoring and feedback process outlined at section 8.3.8 of the Framework Plan.

Irish Water has built an industry standard water resources model for the water supplies in the Greater Dublin Area. The “Aquator” model uses 70 years of inflow data and calculates the overall output of the system for a given Level of Service. The Level of service used set in the Framework Plan is 1 in 50 years (2% probability of outage).

At present, Irish Water has a “reservoir rehabilitation programme” under the current Capital Investment Plan. Reservoir leakage is addressed through this programme. Process losses are an inherent aspect of water treatment. This is a function of raw water quality and the chemical characteristics of the source water. Irish Water has an in-house process optimisation team, which continuously reviews Irish Water’s treatment facilities to minimise process losses.

Climate change impacts will make raw water storage in impoundments and aquifers an increasingly important element of our water supplies over the coming years. However, we will need careful management of these facilities to ensure that they are environmentally sustainable and minimise risk of flooding.

As part of the development of the RWRPs, Irish Water will develop a Preferred Approach for each of the 539 water resource zones that make up the public water supply. This will include the supply for Ennis, Dunlavin, Newtownmountkennedy, Kilcoole and Cronroe.

12.6 Water Transfers

12.6.1 Summary of Water Transfers Feedback

Tipperary County Council supported the proposal in the NWRP to reduce the number of water supplies by amalgamating the water resource zones and recommended that this approach be accompanied by new supplies located in low-risk catchments, to reduce the amount of treatment and source protection required.

One stakeholder commented that Irish Water dividing the country into segments for water plants is not logical as only 28 miles separate two principal towns Mullingar and Athlone, in County Westmeath. They noted that the River Shannon supplies Athlone and Lough Owel supplies Mullingar and suggested that a pipe should connect the two supplies to facilitate an emergency cut-off should there be contamination or to prevent supply interruption to customers in the case of a pipe burst.

12.6.2 Responses to Water Transfers Feedback

Rationalisation and regional solutions will be considered within the RWRPs. As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the "need" drivers for each supply.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9 of the Framework Plan.

The roll out of the Preferred Approaches in four RWRPs is for delivery purposes only. The four RWRPs will be used to facilitate the completed delivery of the first NWRP. The NWRP is a national plan. This has been clarified in the Framework Plan in section 1.9.4, Table 2.2, and Figure 2.3.

12.7 Residuals

12.7.1 Summary of Residuals Feedback

The National Bioeconomy Implementation Group questioned whether the NWRP considers the role that water infrastructure can play as biorefineries and in the development of the Irish Bioeconomy and Circular Economy whilst also addressing national water resources.

IFI requested that a more detailed description of residuals be included in Appendix K of the draft Framework Plan, and that the sustainability of associated practices be clarified.

This was echoed by the EPA who noted information should be provided on how residuals are treated and managed and the relationship with relevant plans such as the

Waste Action Plan for a Circular Economy and the Regional Waste Management Plans considered.

The EPA noted that emerging contaminants are a future challenge for Irish Water. They suggested that “the removal of chemicals and pharmaceuticals in wastewater treatment and a reduction in the spread of antimicrobials into the environment via wastewater” be addressed in the NWRP.

Limerick Greens also recommended that Irish Water outline how each of the regional plans provide specific solutions for the use of sludge as part of Circular Economy principles and in the Sustainable Development section.

AFU stated that raw sewage discharge into receiving waters needs to be addressed, however, they recognised the efforts to upgrade, replace and construct Wastewater Treatment Plants (WwTPs). Additionally, AFU highlighted that while the distinction between sewage discharge and potable water issues is noted in the draft Framework Plan, this issue has significant environmental consequences and should be the focus of Irish Water’s plans.

12.7.2 Response to Residuals Feedback

Irish Water’s understanding of residuals and how they are treated on a site by site basis will improve through data acquisition over the coming years. High level risk assessment of residuals will be included in the RWRPs. Our proposals for residuals are summarised in Appendix K, including circular economy solutions. Any additional data will be incorporated into the NWRP through the monitoring and feedback process set out at section 8.3.8 of the Framework Plan.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9. We review emerging contaminants, and the impacts of raw sewage discharge, as part of the Drinking Water Safety Plan approach. Therefore, emerging contaminants and raw sewage discharge are considered in that context.

12.8 Building Standards and Regulations

12.8.1 Summary of Building Standards and Regulations Feedback

One respondent asked about engagement with industry and the Irish Home Builders Association to promote the use of rainwater harvesting. “Will you be considering engaging with industry & the builders association on encouraging the installation and use of rainwater harvesting.”

Councillor Thomas Phelan welcomed Irish Water’s suggestion that building standards foster the use of water saving products.

A stakeholder expressed dissatisfaction that the draft Framework Plan does not call for building standards to incorporate the installation of greywater reuse and rainwater harvesting in all new and refurbished buildings.

SWAN recognised that some decisions are not within Irish Water’s remit, however, options which require a collaborative approach with all Government departments and agencies should be identified and promoted in the NWRP. This approach should also include “an investigation of policy provisions and supports for retro-fitting and possible changes to building regulations to provide for water-efficient plumbing and water systems.”

Waterford Institute of Technology also noted that it should be a planning requirement for any private residence or housing development to have a sustainable water management plan using rainwater storage on-site so that any additional water runoff can be directed to a storage facility for recycling and reuse in the public water system network.

12.8.2 Response to Building Standards and Regulations Feedback

Under the Use Less pillar, conservation activities are underway at present in Irish Water. We will need to review outcomes from these initiatives over the coming years in order to quantify potential outcomes in terms of demand reduction.

We will continue to progress water conservation measures and will engage with other stakeholders in driving the need for policy to support water conservation measures. At present Irish Water is progressing a water conservation app to enable consumers to save water in their homes. This has been updated in the Framework Plan in section 7.3.2.2.

Greywater and rainwater harvesting are private side measures, that can potentially result in a reduction in demand (greywater) or a reduction in some peaking in dry conditions. However, storage volume required particularly to address peaking in drought conditions can be substantial. Irish Water is supportive of initiatives to improve the use of greywater and rainwater harvesting. We will support studies on the potential for such interventions and based on outcome support wider Government policies in this area. We will progress studies through our Innovation team to review the potential outcomes and benefits for conservation measures such as rainwater harvesting and grey water reuse.

Irish Water has also changed its policy on new connections from non-domestic users who require water for cooling purposes during hot temperatures. We now stipulate that these types developments must contain on-site storage and reuse water for this purpose.

12.9 Surface Water

12.9.1 Summary of Surface Water Feedback

One stakeholder asked that the NWRP highlight the wide variation in the regional dependency on surface water and/or groundwater and advised a list of larger Water Regional Zones should be provided in the final NWRP along with the total volumes and percentages of groundwater and surface water supplied to each of these WRZs.

The RSPA claimed that the NWRP fails to flag Dublin’s 99% reliance on river water as a key issue to be addressed. They argued that surface water sources from primarily rivers are the single most vulnerable type of water supply.

This is echoed by Kennedy Analysis where they further submitted that reliance is considerably higher than any other country in the EU and that diversification protection by a non-surface water source should be given a significant amount of weight in the consideration of future new water sources for Dublin.

Roscommon County Council asked that careful consideration is given to the use of surface water sources and the resulting cost to treat this water to drinking water standards. They requested further guidance and that careful consideration be exercised particularly in relation to developing the Programme of Measures under Article 11 of the WFD to treat raw untreated surface water.

The Southern Regional Assembly highlighted that Sustainable Urban Drainage Systems (SuDS) to address flood risk are promoted in The OPW's (2009) Guidelines for Planning Authorities and should be considered in the NWRP. Surface water management, they argued, should form an integral part of planning, regardless of scale.

SWAN acknowledged the detailed analysis behind the calculation of hydrological yield. However, they stated that this is based on rivers within proxy 'donor' catchments. SWAN also noted the comment in the SEA report on Surface Water Yield estimates that "producing robust desktop assessments of water availability from our existing groundwater abstractions is very difficult."

12.9.2 Response to Surface Water Feedback

There is a significant variation in the use of groundwater and surface water across the country. This tends to reflect natural resource availability in the local area. For example, County Laois utilises almost 100% groundwater sources. County Roscommon and Wexford also utilise significant groundwater supplies. Within the RWRPs, we will identify which water treatment plants utilise groundwater and surface water resources.

It is recognised that groundwater is likely to be a dependable and resilient supply of water into a climate-changed future, and Irish Water will collaborate with the GSI in realising the full potential for groundwater as an integral part of the public water supply. However, it is also recognised that climatic conditions vary significantly across the country and fluctuate across seasons. Due to geology and topography across the country many of our groundwater bodies and surface water catchments can have poor storage characteristics compared to other European countries. This means that based on existing infrastructure, large parts of the country are vulnerable to climate change impacts and drought. We witnessed these impacts during the drought in 2018, where a significant number of groundwater and surface water supplies were severely impacted after a relatively short period of dry weather conditions. Natural wetland retention and impoundments will be a key consideration in this area.

Specific solutions for each Water Resource Zone will be addressed through the RWRPs, using the methodology established in the Framework Plan. In particular, the "need", and appropriate solution, for the Greater Dublin Area will be assessed through the RWRP for the Eastern and Midlands region.

Within the RWRPs, we review the water treatment requirements of surface water and groundwater at a plan level and include them in the whole life cost assessments for each Feasible Option.

Within the Drinking Water Safety Plans, catchment hazards are assessed, including raw water deterioration following flood events. As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9.

More detail on the groundwater assessments undertaken is included as part of Appendix C in the Framework Plan.

12.10 Water Treatment Plants

12.10.1 Summary of Water Treatment Plants Feedback

One stakeholder requested a cost-benefit analysis on softening the water before it is put in the system, querying for example how much water is wasted by households using water softening systems.

Another stakeholder noted the poor performance of Irish Water's water treatment plants (WTPs) in the EPA audits and requested improvement in plant performance to be prioritised.

Roscommon County Council stated that water treatment plant assessment is required to include a check of design capacities to accurately determine available headroom.

Kerry County Council noted that County Kerry has 80 water intakes which contain a high percentage of upland water sources treated by 55 water treatment plants. Several treatment plants in the area were constructed as part of the Remedial Action List projects as a medium-term measure and therefore KCC requested that the Framework Plan prioritises fixing issues in existing infrastructure.

Environmental Trust Ireland stated that the NWRP refers to the replacement of lead and asbestos pipes. They highlighted that there is no reference to the experimental pilot programme in Limerick, whereby orthophosphate was added to the water supply instead of replacing lead pipes and requested that Irish Water provide information on the addition of orthophosphate to pipes in Limerick

12.10.2 Response to Water Treatment Plant Feedback

Hard water is not considered to be a "need" within this iteration of the NWRP, as it is not a compliance issue under the Drinking Water Regulations.

A Deployable Output (DO) assessment for each water treatment plant is included in the supply demand balance calculations in Appendix L of the Framework Plan. The DO estimates will be calibrated as our data and information systems improve.

Critical projects and programmes to address potential public health issues are on-going and not impacted or delayed by the delivery of the NWRP. We have included a process for reviewing projects that are underway (known as "in-flight projects"). We have also

set out a process for developing interim options to address critical water quality issues while we deliver our Preferred Approaches through the coming investment plans. Box 8.1 of the Framework Plan has been added to reflect this.

As part of our risk-based assessment to drinking water supplies, Barrier 8 encompasses Physical and Chemical parameters such as lead. Irish Water's "Lead in Water Mitigation Plan" addresses reduction in Plumbosolvency, including orthophosphate dosing and lead service replacement. Orthophosphate dosing is an approved way of minimising the risk to public health from plumbosolvency whilst lead is removed from the private side communication pipes and internal household plumbing systems, which can take many years. Orthophosphate dosing is not specific to Limerick and will be used where possible as an interim measure to reduce the risk of lead contamination.

12.11 Network Improvements

12.11.1 Summary of Network Improvements Feedback

There were several suggestions from stakeholders on network improvements, the most popular being a major mains replacement programme.

Fight the Pipe disputed the targeted mains replacement based on a Find and Fix approach highlighting that such an approach is below the EU and UK average. They asked Irish Water to adopt a more sustainable approach for the water supply system and that though major mains replacement is expensive in the short term, it is widely considered to be the most sustainable long-term solution in countries where pipes are in poor condition.

Kennedy Analysis echoed this, and suggested following in the footsteps of the UK and undertaking a major mains replacement programme and advised the potential selection of solutions (such as the proposed Shannon pipeline project) would be unnecessary if a major main replacement programme took place.

The RSPA highlighted that addressing Ireland's pipes is a necessary step to achieve sustainability and security of supply and that Ireland needs a major mains replacement programme as a long-term solution that has significant advantages such as reliability, network quality, continued maintenance, and a major reduction in leakage. They referenced Thames Water MRP as an example of a successful case study that Irish Water should consider.

Fergus O'Dowd TD noted the predicted growth for Drogheda and that appropriate planning should be made now to adequately manage its very significant future capacity needs. He argued that Drogheda's water infrastructure is not fit for purpose and will need to be upgraded to address the flow issues it is currently experiencing primarily along the Dublin Road.

Tipperary County Council acknowledged that the selection of rehabilitation solutions, the prioritisation of work, and the costs and benefits of intervention are analysed on a case-by-case basis. However, they requested that an accelerated programme of water main rehabilitation throughout County Tipperary be progressed to address growing

issues with security of supply and to ensure clean, safe, and reliable public water supply.

12.11.2 Response to Network Improvements Feedback

Irish Water has used data from the Regional Assemblies and Local Authority Development Plans (where available), in forecasting growth requirements for each water supply. The identified flow issue on the Dublin Road will be communicated to the appropriate team within Irish Water, and we will revert in due course.

As part of the development of the four RWRPs, a Preferred Approach will be developed for each Water Resource Zone on a case-by-case basis. A major water mains replacement programme is not included in our unconstrained options list as it is already included as a core element of our National Leakage Reduction Programme as noted in section 7.3.1 of the Framework Plan. However, major water mains replacement would be a poor option to address demand as a stand-alone option. Demand interventions alone do not address the multitude of other issues with our existing supplies, including sustainability of our sources, climate change impacts, drought impacts, resilience, and drinking water quality. In most WRZs a combination of interventions under the Use Less, Lose Less and Supply Smarter pillars will be required.

As set out in the European Commission's EU Reference document Good Practices on Leakage Management WFD CIS WG PoM Case Study, there are no records of countries or jurisdictions that use largescale watermains replacement programmes as a stand-alone method to reduce leakage (even those with low leakage levels). Instead, the primary methods for leakage reduction in comparator jurisdictions are pressure management and active leakage control, coupled with speed and quality of repairs. Mains renewal is an ancillary process that is usually driven by the need to reduce interruptions to supply where mains have a high burst frequency. However, this can also be improved via pressure management or where water quality is deteriorating in the distribution network.

Over time, through improved data and intelligence, coupled with operational understanding of our networks and their responsiveness to leakage control measures, targeted mains replacement rates will increase, focusing on areas of the network where there are high natural rates of rise.

12.12 Catchment Management

12.12.1 Summary of Catchment Management Feedback

Many stakeholders were interested in the catchment management approach to water conservation. One stakeholder noted that the draft Framework Plan did not address trans-catchment abstractions, discharges, and water bodies receiving wastewater, and another stakeholder highlighted those capacities to protect water sources are subject to management limitations.

Clare County Council requested that a strategy be set out for Irish Water to take control of Group Water Supply Schemes over 10 years, including public and private supplies. Clare County Council continued that it should "not be the case that voluntary committees should be charged with the responsibilities of providing water supplies."

The Department of Enterprise, Trade and Employment, Enterprise Ireland, and the IDA noted that the Framework Plan should promote a more efficient and cost-effective water management system within wastewater, water stewardship programmes, and timed discharges. Additionally, they stated that the Framework Plan should consider sharing best practices between water suppliers and industrial operators.

The EPA noted the NWRP option prioritisation criteria should include all aspects of the DWSP approach, including potential management measures in the catchment to inform decision making on the barrier assessment and demonstrate a reduction in risks to public water supplies.

GSI approved of Irish Water's participation in source protection and catchment management activities. However, they highlighted that the draft Framework Plan does not include risk identification and risk management within the catchment. GSI considered it essential that catchment-based source protection is included in the Framework Plan without delay.

12.12.2 Response to Catchment Management Feedback

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9 of the Framework Plan.

Irish Water has an "opt in" process for taking in charge Group Water Schemes.

Irish Water recognises the strategic importance of the "Use Less" pillar and is proactively investing in measures, including water conservation campaigns, Green Schools initiatives to promote grassroots understanding of water conservation, development of a Water Conservation App and a successful Water Stewardship Programme with non-domestic users. These initiatives evidence Irish Water's commitment to conservation.

12.13 Abstraction

12.13.1 Summary of Abstraction Feedback

One stakeholder queried if the NWRP should include a commitment regarding abstraction from modified artificial water bodies, particularly if the existing abstraction is from "unmodified" groundwater, lakes, and rivers. This stakeholder commented that abstractions have environmental impacts.

The Department of Enterprise, Trade and Employment, Enterprise Ireland, and the IDA requested more clarity from Irish Water on the process and incentives in providing water services in non-domestic sectors, particularly within abstraction and licensing.

Roscommon County Council commented on the regulation of abstractions and the impact this will have on the delivery of the Framework Plan and investment cycles. Roscommon County Council questioned should Irish Water re-consider the NWRP project road map as set out in the NWRP until a clear time frame for abstractions regulation has been established.

GSI commented that to properly assess the impact of current surface water and groundwater abstractions on the water environment, and as a result assess sustainability and resilience of future options, a catchment-scale cumulative assessment of all abstractions and discharges is required.

Chambers Ireland referred to the requirement in the NWRP to find and develop new sources for abstraction to facilitate demand. They noted that drawing from sources at a rate that exceeds their recharging rate would reduce the value of investments made in them, resources will be diverted away from more viable sustainable sources which will inevitably, they advised, undermine the long-term resilience goal. Chamber Ireland requested that the Framework Plan addresses the environmental impacts of these situations and the impact abstraction has on the water networks.

The Chamber supported the balance within the Preferred Approach in the NWRP when addressing water demand, the targets to save 30% in water loss and reduce 10% in demand calculated through usage optimisation and agreed it will significantly reduce the pressures placed upon the water supply and ensure abstraction sources have long term viability.

The Chamber also noted that further explanation should be provided to communities who have the capacity for abstraction so they can better understand why this solution is the most appropriate, typically these are not the same communities that have a shortage in supply.

12.13.2 Response to Abstraction Feedback

Supply Smarter is the third pillar of solutions that we review as part of the NWRP and includes sustainable use of groundwater and surface water sources, interconnectivity, conjunctive use, impoundments, water treatment plant upgrades and technologies such as desalination and treated water re-use. To understand the sustainability of potential sources at a high level, we conduct desktop assessments for all options considered within the NWRP.

The Irish Government is developing legislation on water abstraction. It is envisaged that site-by-site assessments will be required as part of the proposed abstraction licencing regime. Irish Water will initiate the process of obtaining licences for new abstractions and regularising the licencing position of existing abstractions once the abstraction legislation has been enacted and the applicable regulatory process is in place.

Through the licencing process Irish Water will gain full insight into the regulatory requirements and sustainability of our current water sources. It may take us many years to licence all existing abstractions. It is nevertheless important to have a plan in the interim.

Under the themes of National and European Policy as outlined in sections 5.1.1 and 5.1.2, a number of respondents raised issues in relation to the WFD, sustainable abstraction, hydromorphology and knowledge of our water supplies. A key objective of the NWRP is to improve the sustainability of the national water supply from its current baseline. This is the basis of our options assessment methodology and means that any feasible option considered as part of the RWRPs will be subject to a desktop

assessment of ecological flow guidelines and adherence to WFD objectives at a project level.

In reality, unsustainable supplies are rarely resilient. We will work collaboratively with agencies such as IFI and SWAN throughout the development of our NWRP and subsequent projects delivered through Irish Water's Capital Investment Plans. Throughout this process we will try to ensure that our plans give consideration to all aspects of aquatic ecology, including the requirement for improving the morphology of waterbodies. This will also allow us to facilitate the Regional Policy Objectives in a sustainable manner. We are aware that the Department of Housing, Local Government and Heritage is preparing Guidelines for Planning Authorities on the Planning System and River Basin Management and will review and incorporate these guidelines into our NWRP when available, in accordance with the monitoring and feedback process.

An intrinsic part of the NWRP is the cumulative impact assessment of the measures identified to deliver a safe, secure, and reliable public water supply, including transboundary impacts. As part of the development of the RWRPs we will further review this and assess these impacts.

Irish Water will not "dismiss" any potential source within the RWRPs, and all potential sources will be subject to further assessment. In particular, Irish Water recognises the connectivity between groundwater and surface water supplies in our assessments.

One of the key objectives of the NWRP is to improve transparency. Although it is not a legislative requirement in this country, Irish Water set the completion of a NWRP within its Water Services Strategic Plan. A search of published information from other jurisdictions, including publicly available water resource plans in the UK, shows the extent to which Irish Water has sought to provide the correct level of detail as part of our first NWRP.

12.14 Conclusions on Option Types Feedback

Having carefully reviewed the submissions received on the theme of Option Types, Irish Water considered that a number of changes should be made to the draft Framework Plan. These changes are explained in section 12.14.1 regarding "Clarifications" below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 12.14.2 regarding "Recommendations" below.

12.14.1 Clarifications on Option Types Feedback



The following sections of the Framework Plan have been updated to reflect feedback under the theme of Option Types:

Section 7.3.2.2

Section 7.3.1

Section 3.2.2

Box 5.2 in section 5.5 and cross referenced in section 5.9

Section 1.9.4, Table 2.2, and Figure 2.3

Appendix C

Appendix L

Appendix K

12.14.2 Recommendations on Option Types Feedback

1. Irish Water continue to share groundwater data with the GSI.
2. Irish Water will continue to work with wider stakeholders to support studies on catchment measures which could improve water quality, such as “Source to Tap”, as summarised in section 7.3.3. of the Framework Plan.
3. Irish Water will continue to work with wider stakeholders to support studies on the potential for policy interventions in the area of rainwater harvesting and greywater reuse, along with other water conservation initiatives. Based on the outcome of any studies, we will support future Government policies to promote and encourage water conversation.

13. Water Resource Planning Concepts

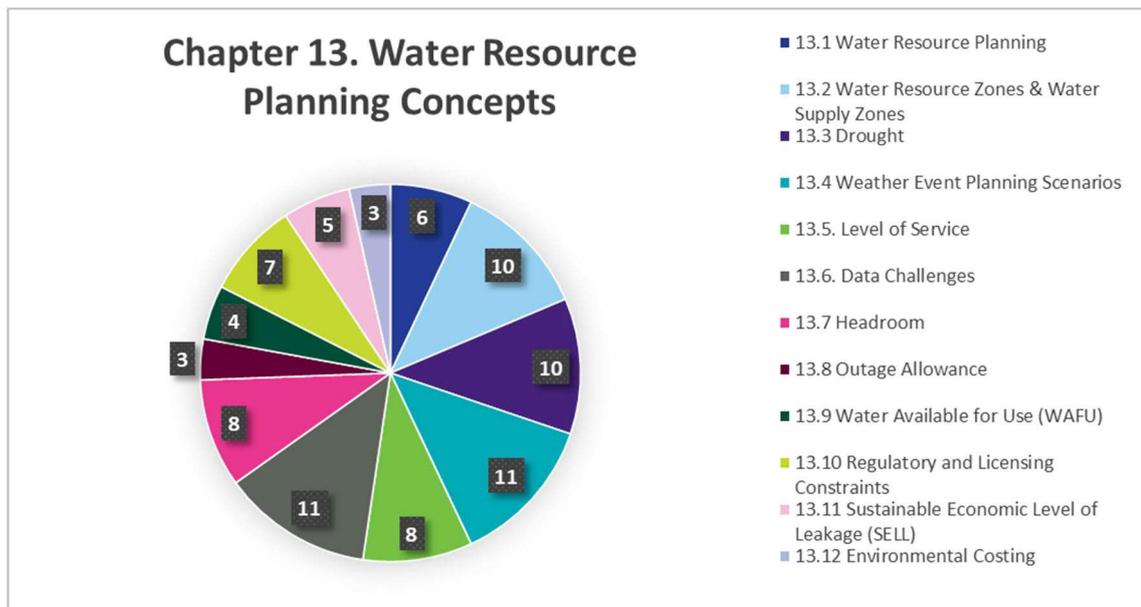
In this chapter, we summarise the key references in submissions to issues under the broad theme of “Water Resource Planning Concepts”. Within the overall Water Resource Planning Concepts theme, we identified 12 sub-themes, which we set out in Figure 13-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Our response is of necessity set out generally speaking on a broad basis. We include reference to any consequential changes made to the NWRP Final Framework Plan, any clarifications required, and any other actions considered appropriate. We include a consolidated summary of those changes and flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross reference the response given to other sub-themes.

Figure 13-1 details the breakdown of feedback received under the theme water resource planning concepts. It shows that of the 86 mentions⁹ in submissions referring to water resource planning concepts the most frequently mentioned were related to weather event planning scenarios and data challenges with 11 mentions respectively. Figure 13-1 below also identifies the 12 sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 13-1 Water Resource Planning Concepts Theme



⁹ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

13.1 Water Resource Planning

13.1.1 Summary of Water Resource Planning Feedback

In response to water resources planning, respondents made a number of submissions. One respondent stated the draft NWRP did not address trans catchment abstractions and discharges into receiving waterbodies.

Another respondent did not agree that the NWRP was sustainable and stated that in supply planning the focus should be on demand-side solutions such as leakage reduction and reductions in per capita consumption.

AFU stated that the supply-demand balance method followed by Irish Water must consider the "uncertainties which exist because of the methodologies' inherent lack of in-depth analysis for the Irish case conditions."

The CRU submission also referenced the method applied for water resources planning and requested that the inclusion of quality, asset performance and drinking water safety plans in water resources planning be quantified in supply-demand balance forecasts.

The CRU requested that gross leakage savings references be avoided in water resources planning terms as they are misleading. In addition, the CRU was unclear as to why deployable output from supplies that have an interim barrier assessment score of 3 or above is considered and asked Irish Water to explain this approach to water resources planning.

13.1.2 Response to Water Resource Planning Feedback

Overall, the EPA, HSE and the local authorities who made consultation submissions found no issue with the SEA and NIS assessment approach and the DAERA welcomed inclusion of the transboundary impacts considered following their submission during the scoping stages. While some respondents submitted that the SEA and NIS were inadequate, it should be noted that the SEA and NIS are for the purposes of plan level assessments, and accordingly Irish Water is satisfied that they fully meet the requirements of the SEA Directive, Habitats Directive and associated implementing regulations at this scale. We will further assess transboundary impacts as part of the development of the RWRPs.

Within the NWRP, we look at solutions across three pillars: "Use Less" (Conservation), "Lose Less" (leakage reduction) and "Supply Smarter" (sustainable sources and improved interconnectivity of supplies).

Uncertainties are considered in the Supply Demand Balance Calculations by inclusion of "Headroom" which is a factor for uncertainty. Nett leakage savings are considered in the Framework Plan.

Quality, asset performance and drinking water safety plans are not directly included in the Supply-Demand Balance but are considered as "need" within each Water Resource Zone.

Gross leakage savings are not used in water resource planning. We only consider nett leakage saving.

Where the barrier assessment score for an individual WTP is above “3”, we ensure that we size feasible options for the full capacity of the water treatment plant.

13.2 Water Resource Zones (WRZ) and Water Supply Zones (WSZ)

13.2.1 Summary of WRZ and WSZ Feedback

Roscommon County Council stated that there is a misinterpretation in the draft Framework Plan of the Water Resource Zone (WRZ) and Water Supply Zone (WSZ) terms.

Kennedy Analysis stated that WRZ-specific figures are more relevant than national figures and requested that the Framework Plan identify “those WRZs that currently have high exposure to vulnerable river water and, when considering which new raw water sources to develop to address future water supply deficits in those WRZs, should give non-river water sources a significant priority over river-water sources due to the importance of diversification protection.”

Longford County Council outlined the situation in Longford Central regarding meeting supply demands only with assistance from neighbouring WSZs and stated that having no resilience was the greatest daily operational risk.

AFU supported the proposal to reduce the number of WRZs and stated it will improve a regional management approach that includes better mapping and continuous monitoring.

Meath County Council welcomed the proposal for rural areas to develop small geographic groups of Water Resource Zones to form study areas where regional solutions can be considered and made a commitment to participating in such initiatives.

The EPA stated they were unclear how the Preferred Approach in a WRZ will be determined and prioritised for funding.

The CRU requested clarity on the methodology used to determine water resource zones including the assessment of data from the UK as a reliable proxy, and for water resource zones outside of the Greater Dublin Area. The CRU went on to state, “comparing Table 6.1 and Table 6.2 shows that under every scenario there is a deficit. This means that even in a NYAA scenario, Irish Water does not have the water to meet demand plus headroom. The summary presented shows that 58% of Irish Water’s WRZs are in deficit during a normal year.”

Tipperary County Council supported the intention to reduce the amount of water supplies through amalgamation and recommended that new supplies are located within low-risk catchments, thereby reducing the level of treatment and source protection activities required.

13.2.2 Response to WRZ and WSZ Feedback

Examples of the Water Resource Planning spatial units, including Water Supply Zone (quality), and Water Resource Zone (risk) are set out in Box 2.1 of the Framework Plan.

WRZ specific figures are given for each water resource zone in Appendix L to the Framework Plan. We will identify groundwater and surface water supplies in the RWRPs.

Within our RWRPs we will review unconstrained options for all 539 water supplies including local and regional options. As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the "need" drivers for each supply.

The Preferred Approach process is set out in figure 8 of the Framework Plan. Once the first NWRP has been finalised, and while it will comprise the Framework Plan and four RWRPs, together they will be treated as a unified plan. The relevant regional groupings will have no ongoing application. In particular, the Preferred Approaches identified in each RWRP will be prioritised collectively through Irish Water's planning and investment cycles. In other words, there will not be any difference in investment priority across the four regional groupings. Where local authority areas have been split, Irish Water will engage with the relevant local authorities following the finalisation of the RWRPs, on the outcomes for all the water supplies in their areas.

Water Resource Zones represent areas where the supply and demand are largely self-contained. They are geographic definitions of our water supplies and can contain a number of water supply zones. Examples of Water Resource Zone are provided in Boxes 2.1 and 2.2. Based on our supply-demand balance, the Normal Year Annual Average calculations show a deficit for 58% of our supplies. This is based on a Level of Service of 1-in-50 years. Few of the Water Resource Zones at present meet a 1-in-50-year Level of Service. The purpose of the NWRP is to ensure that the public water supply in Ireland evolves in a planned manner to achieve international standards. However, it is recognised that it will take a significant period of time to meet this standard, and that the public water supply must be able to both service existing customers and support sustainable growth. For that reason, we have developed a 10-year capacity register as described in Box 4.1 of the Framework Plan.

13.3 Drought

13.3.1 Summary of Drought Feedback

Several respondents commented on drought in general terms. One respondent doubted that the occurrence of drought in a water rich country was a valid consideration, while another submitted that water conservation methods from warmer countries should be considered.

The experiences of Dublin and Limerick during the 2018 drought were noted by respondents who urged Irish Water to address water supply during drought events. Both Meath County Council and Chambers Ireland stated the increased periods of drought, flooding and rise in water levels will require significant investment in water

infrastructure, and the Chamber stated "increased periods of drought will likely make sourcing high quality water a greater challenge for Irish Water as they will require the creation of new reservoirs of water to allow for the supply of water to be flattened out across time."

IFI welcomed the collaborative approach taken by Irish Water in identifying proposed or ongoing interventions undertaken to increase raw water availability.

AECOM stated the monitoring of groundwater levels, river flows and abstractions will assist in the understanding of how water sources behave under drought conditions and inquired if this was being carried out. AECOM commented on the definition of drought used by Irish Water, the length of records and trigger levels and gave detailed ways in which to assist in the examination of drought events and preparing for future events.

13.3.2 Response to Drought Feedback

Drought is a naturally occurring phenomenon, and Ireland has experienced significant droughts over the past 150 years. For the past 40 years, we have experienced a relatively wet period compared to the historical record. Climate change impact models would suggest a return to weather patterns with wetter winter conditions followed by drier summer conditions. Many of our water supplies were not designed with these types of conditions in mind. Option types to ensure resilience, such as impoundments, groundwater abstractions and raw water storage are considered within our Framework Plan on that basis.

Options to address need within individual WRZs will be developed as part of the RWRPs.

As set out in section 7.3.4.1 of the Framework Plan, Irish Water will develop site-specific monitoring of water levels as part of its response to the forthcoming water abstraction legislation. As further data and information become available, Irish Water will incorporate this into the NWRP through the feedback and monitoring process set out at section 8.3.8 of the Framework Plan.

The trigger levels we use within the NWRP are described at Appendix E of the Framework Plan. As our data and information improves, we will refine and update trigger levels and responses.

13.4 Weather Event Planning Scenarios

13.4.1 Summary of Weather Event Planning Scenarios Feedback

Several respondents agreed with the necessity of having weather event planning scenarios included in the NWRP. Dublin Chamber welcomed the focus on scenario planning and stated that access to a good quality uninterrupted water supply is essential for public and economic health. The EPA and HSE submissions acknowledged that extreme flooding and drought events have confirmed the relevance of the NWRP

With regard to drought events Limerick City & County Council requested consideration of extending the city supply to provide the required security of water supply to avoid future drought events having significant impact to customers.

The CRU submitted that the June and July 2018 dry months be used in assessments of appropriate peaking factors.

AFU stated that "both the Weather Event Planning scenarios and the peaking factors presented are also subject to uncertainties since they 'are based on data from other water utilities' and the estimations are index-based (not process or data-based)."

A respondent queried the level of buffer used in weather scenarios peaking factors, stating that the percentage applied inflated the headroom for the Winter Critical Period on particular projects.

Clare PPN stated that climate change impacts would affect Clare significantly and requested that this take more prominence in the draft NWRP and be included as a risk category in every assessment of options.

Chambers Ireland also expressed concern about climate change. The Chamber recommended investment in capture and storage infrastructure. It acknowledged that the metric of performance and operational efficiency would need to be revised as infrastructure designed for extreme events would be under-utilised in normal circumstances.

13.4.2 Response to Weather Event Planning Scenarios Feedback

As a continuous water supply is essential for public health, our plan includes for four weather planning scenarios. Refer to section 2.3.2 in the Framework Plan for more detail. Best available information has been used as part of the process. It should be noted that both the supply and demand are assessed as part of the scenarios.

Therefore, although the winter critical period (WCP) involves the highest peaking factor, there are usually few supply availability issues during these periods, therefore, the WCP is rarely the worst-case planning scenario for an individual WRZ. Rather, that scenario is usually the Dry Year Critical Period (DYCP) (drought) periods. The WCP is an important consideration, however, to understand peak flows in pipelines and treated water storage capacity. Headroom is a factor to address uncertainty, therefore it is applied to all the weather event planning scenarios.

For the past 40 years, we have experienced a relatively wet period compared to the historical record. Climate change impact models would suggest a return to weather patterns with wetter winter conditions followed by drier summer conditions. Many of our water supplies were not designed with these types of conditions in mind. Option types to ensure resilience, such as impoundments, groundwater abstractions and raw water storage are considered within our Framework Plan on that basis.

The combined wastewater drainage networks are not considered as part of this iteration of the NWRP.

Some local authorities raised the fact that resilience was the greatest daily operational risk from their perspective. Improved resources planning and interconnectivity between supplies will improve this resilience over the duration of the NWRP.

As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework

Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions will be based on the "need" drivers for each supply. The NWRP will ensure that all feasible options are considered.

We have reviewed the limited amount of data available from June and July 2018. However, in many cases, this data is not able to be used in the NWRP, as interventions across the supply were required. Accordingly, the peaking factors recorded are not "unconstrained", and are therefore of limited value in understanding overall peaking requirements. Irish Water has used best available information for our supplies. Where information was not available, we used information from other jurisdictions such as Northern Ireland Water to assess peaking and headroom requirements supplies. Within the next 10 years we will have the data to calculate peaking and headroom factors at an individual WRZ level. As it develops, this information will be continually updated as set out in the monitoring and feedback process is summarised in section 8.3.8 and Figure 8.13 of the Framework Plan.

Within our supply-side calculations, we consider climate change impacts by applying coefficients to water availability. We also consider climate change as part of the screening assessment undertaken on all options in the development of the Preferred Approaches.

By including weather event planning scenarios within the NWRP, we consider extreme events and ensure that this is a design consideration at the development stages of our Preferred Approaches.

13.5 Level of Service

13.5.1 Summary of Level of Service Feedback

Dublin Chamber and another respondent commended Irish Water's commitment to achieving an initial target of 1 in 50-year Level of Service (LoS) for the entire network while stating it would be a challenge requiring financial investment.

The EPA agreed that securing and providing a safe and reliable public water supply is critical and that this commitment will involve a combination of water sources, water treatment and distribution infrastructure.

The CRU queried the consideration of maintenance requirements in the Level of Service assessment and stated that it would make comparisons with UK water companies inappropriate.

Chambers Ireland stated that the metrics that Irish Water should consider were those relating to customer experience and not metrics relating to water capture and storage.

AFU stated that Irish Water 'own' the functions and operations of the water supply systems and that "significant resources will be required to achieve the goals for the resilient supply and levels of service objectives of the NWRP."

Limerick and Tipperary local authorities commented on the challenges in security in water supply due to, for example, the condition of the distribution network and unplanned outages. Tipperary County Council requested that Irish Water "identify the

costs of potential changes required to the water supply system to achieve a particular level of water supply security; and determine a suitable target, by considering the ability to meet the level of service objectives under varying circumstances" when considering level of service objectives.

13.5.2 Response to Level of Service Feedback

Some local authorities raised the fact that resilience was the greatest daily operational risk from their perspective. Improved resources planning and interconnectivity between supplies will improve this resilience over the duration of the NWRP. The "need" within individual Water Resource Zones will be addressed as part of the RWRPs, which will include an assessment of costs.

Achieving an appropriate Level of Service across our supplies will be a major undertaking, but it will transform our supplies, ensuring that they are sustainable and resilient to climate change.

Due to the condition of the existing asset base (compared to the baseline performance in the UK), we consider capital maintenance requirements of critical assets, in order to ensure that we can achieve the required level of service set out within the supply-demand balance.

In the context of the NWRP, the identified deficits across our 539 water supplies in terms of quality, quantity, reliability and sustainability are referred to as "need." There is a misconception that demand side issues such as leakage and demand growth are the only issues with the public water supply. In fact, many of our current and future issues with water quality, quantity and sustainability are driven by issues with our water sources and treatment processes. Some local authorities noted that issues with our supplies are becoming a challenge in terms of provision of housing and employment and maintaining security of supply. Within the NWRP we strive towards achieving improved security of supply by setting a level of service for interruptions to supply of 1 in 50 years. This metric allows us to measure the performance of our asset base, in terms of the customer experience/outcome.

The Department of Housing, Local Government and Heritage has recently published a policy paper on the future of Irish Water "Irish Water - Towards a national, publicly owned, regulated, water services utility." This paper sets out how Irish Water will integrate the day-to-day operation and delivery of water services into its own internal structure, in place of the existing Service Level Agreements, on a phased basis.

13.6 Data Challenges

13.6.1 Summary of Data Challenges Feedback

Meath County Council acknowledged the complexity and lack of available data regarding water usage and the difficulty this presents for future calculations. Meath County Council supported the pilot studies suggested within the draft Framework Plan regarding this.

Longford County Council recommended that a regional approach be applied to data rather than applying a national growth factor derived from an amalgamation of national

data. The Council stated, "this approach does not represent the fact that some counties are predominantly rural with targeted large urban areas which attract greater growth and development due to their locations, connectivity and ability to services large business." The Council requested a forum between the local authorities and Irish Water to support the NWRP.

GSI supported the Framework Plan's aim to complete site-specific studies of groundwater availability. The submission gives a suggested approach on how existing data be compiled, what new data is required and how ongoing data be collected. It also requested that this information be available to other Government agencies.

Several submissions highlighted areas where respondents considered that data was incomplete, incorrect, or queried why data had not been measured. SWAN stated that the abstraction register was incomplete, omitting many water abstractions less than the 20m³ proposed as the threshold for registration in the General Scheme of the Water Abstraction Bill.

Kennedy Analysis queried the accuracy of the leakage level for the base year of 2019 as, by their understanding, there are three contrary figures presented in the draft Framework Plan and none in agreement with the CRU figure.

The CRU queried the choice of percentage losses in treatment plants, citing Ballymore Eustace as an unexplained anomaly.

GSI queried if any of the existing boreholes had undergone testing as they have been in operation for some time, but information is not available to calculate the hydrological yield of their groundwater supplies.

AECOM suggested a method to provide a greater array of historic data for droughts. The submission went on to outline a method to determine period specific trigger levels to allow for supply and demand side actions within each water supply zone.

One respondent requested that groundwater yield assessments from abstractions and working with the EPA be included in the final NWRP to give further confidence in estimates.

Kennedy Analysis stated that the methodology that Irish Water is using to calculate SELL is inappropriate as it relies heavily on a long history of reliable water data. They also stated that the SDB calculation could not be confirmed as the data input was not transparent and available.

Kennedy Analysis also claimed the domestic demand predictions in the cities of Cork, Galway and Limerick were contradictory in the draft Framework Plan stating that these inconsistencies and contradictions are concerning. Examples of alleged inconsistencies in the submission included 2019 leakage data, the SELL glidepath, and the First Fix Free results and referred Irish Water to the Kennedy Analysis Report for further details.

AFU provided details on resilience-sustainability-flexibility methods so as not to rely on hydrological and water balance analysis considering the low availability of data. AFU requested that the Framework Plan acknowledge that there are gaps in current data

levels and potential miscalculations, commit to improve data collection and monitoring, assess current assumptions, and recalculate forecasting as data becomes available.

AFU stated scepticism on the ambitious nature of the NWRP's environmental goals considering the lack of available data and monitoring. AFU stated, "it is therefore critical that the appropriate resourcing models are applied to ensure that the goals and objectives of the NRWP can be achieved." AFU stated that consideration should be given to re-establishing the domestic metering programme to gather data regarding water demand.

13.6.2 Response to Data Challenges Feedback

This iteration of the NWRP has been based on best available information, and as set out in the Framework Plan, we will continuously update this data and review the RWRPs. This is described in section 7.3.4. Any additional information and data will be incorporated into the NWRP through the feedback and monitoring process set out at section 8.3.8 of the Framework Plan. We welcome the support of Meath County Council and the other local authorities in assisting with the capture of this essential information.

The growth projections used within the draft Framework Plan were based on best available data from the Regional Assemblies at the base year for our plan. A workshop was also held with each local Authority planning and water services section to review data and information in advance of the publication of the draft Framework Plan. It should be noted that planning settlements are not exactly aligned with the existing water supply asset base as our water supplies can serve large areas covering urban and rural settlements through an interconnected asset base. Where this is the case, we have attributed the differing growth rates to the proportion of the supply that is in the urban and rural settlements, in order to ensure that the overall growth is aligned with the figures obtained from the RSES and aligned with the NPF. We recognise the ongoing work between the Regional Assemblies and the local authorities over the course of the development of the Local Authority Development Plans. As these plans are finalised, Irish Water will incorporate the increasingly refined growth rates into our demand forecasts. The information including MASP, SDZ and core strategies will also be used to stress test models of our networks. We note comments on urban revival, and from Chambers Ireland and Dublin Chambers through the planning forums.

Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as it becomes available.

Irish Water confirms that our register of abstractions has been completed based on all information available to us. We have included all of our abstractions on this register, even those below 20m³/d.

The 2019 base year leakage level in the NWRP is 741 MI/d. This figure is the sum of assigned leakage water balance for each of the 539 WRZs. The figure is calculated

and presented in this way as we have included supply demand balance calculations for each WRZ within the NWRP. The water balance for each supply is initially taken from the LMS. However, it is manually corrected, based on information gathered as part of the local authority workshops including corrections to distribution input and use of surrogate water balance.

The corrections represent a 2% variation in overall terms, and findings are used by the LMS team to inform data improvement areas in the system. As the LMS system improves over time, this 2% variation will reduce.

Process losses occur in all treatment facilities. They vary depending on the treatment type, and the raw water quality. The raw water quality at Ballymore Eustace is very good, and losses have always been low at this facility. Where available we use information specific to the water treatment plant. Refer to section 3.3.2 in the Framework Plan for more detail.

More detail on the groundwater assessments undertaken is included as part of Appendix C in the Framework Plan. Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies. Irish Water will also incorporate information from the GSI regional assessments, into our options assessments as they become available.

The methodology and drought trigger points we have used for this iteration of the NWRP is summarised in Appendix E of the Framework Plan. Over the next 5 years as our data improves, we will review and refine this methodology, including long run rainfall time series data.

The leakage values reported to the CRU are direct reports from the newly developed Leakage Management System. This leakage management system went live in 2018, and therefore at the time the SELL study was undertaken, a relatively short time series of data was available (18 months). It will take a number of years to fully calibrate and improve data accuracy within the system. This process will involve investment in DMA optimisation, meter calibration and meter replacement. However, the benefits of having a functioning leakage management system are enormous, in terms of providing real-time information on our networks, allowing us to target leakage savings and reducing repair times. For consistency in reporting, and to ensure that trends can be assessed, the National Leakage Reduction Programme team report on output figures from the LMS. The quarterly reports summarise net leakage savings and reduction in apparent losses separately.

Setting the baseline for the existing water supply, and the environmental goals for the public water supply, will drive the development of systems and processes to collect the correct data.

The Framework Plan is based on best available data, and within section 7.3.4 we summarise the data acquisition and improvement process. As our data improves, we

will move towards more detailed WRZ specific models for assessing source to tap resilience assessments.

At present there is no plan to re-establish the domestic metering programme. That issue is a matter of Government policy.

13.7 Headroom

13.7.1 Summary of Headroom Feedback

The CRU acknowledged that Irish Water takes account of risk and seasonality through its headroom and peaking calculations. The CRU stated that contrasting calculation methods have been used for headroom calculations when comparing the GDA calculations and all other scenarios. They requested that Irish Water clarify what uncertainty factor has been assumed in the headroom model and what, if any, peaking factors have been applied to distribution input or to the individual components of the water balance.

Longford County Council suggested that consideration be given to parameters such as plant headroom, throughput capacity, reservoir size, population demand and retention times when assessing whether increasing water quantity is feasible.

AECOM stated that climate change uncertainty should be built into the supply headroom calculation.

One respondent queried if the addition of 5% to the supply side for outages is included in the demand calculations, and if so, questioned why the headroom allowance doesn't already cater for this in the first place. This respondent also queried the figure in the demand calculation for headroom of 8% and stated there is currently no provision for this made in Dublin. The submission referenced headroom figures in the UK of between 3% and 15% and stated that 8% headroom would be an overprovision for Dublin as you are not comparing like with like.

They stated that UK figures are adjusted annually, so are based on actual outages and experience and that although these figures may not be available for all the country, they are available for Dublin. They recommended that an initial fair estimate for Dublin would be 5% which can be adjusted annually. They considered the current estimation of 8% would lead to an overestimation of 21 MI/d by 2044.

Kennedy Analysis stated its support for the conservative buffers of headroom, peakage and outage but disagreed that headroom be applied to leakage as well as 'accounted for water' as was a method stated in previous reports by Irish Water. The respondent stated that this method has resulted in an over estimation of headroom allowance and concluded that "this is not best practice and it results in an inappropriate inflation of the projected water deficit for the Greater Dublin Area."

AFU observed that behaviour changes during the Covid-19 pandemic caused an increase in demand by 20% due to hygiene behaviours, where demand changed from industrial to residential areas. The respondent suggested that the draft NWRP should be adjusted to respond to these demand changes and the pattern in behaviours incorporated into longer-term planning in the form of seasonal 'headroom'. AFU

suggested that the headroom calculation given is vague and not adequately explained currently.

13.7.2 Response to Headroom Feedback

Headroom calculations in the Framework Plan are based on best available information. Headroom is applied to demand-side calculations to account for uncertainty in data and information on supply and demand components. As headroom is a function of demand, it is not applied to supply-side calculations. Where we do not have appropriate levels of information, surrogate data is used. As set out in Appendix I of the Framework Plan, climate change is included in supply and demand side uncertainty factors in the headroom calculation. Headroom is applied to total demand, and uncertainty applies to all weather planning scenarios.

“Outage allowance” is used to address reserve capacity requirements within water treatment plants.

Climate change reduction coefficients are applied to all of our supply calculations.

For the GDA, we have the required information to allow us to run a full headroom assessment, in accordance with the UK WIR methodology. As such, we have included the calculated headroom for the GDA within the Framework Plan. The output of this calculation is that the headroom for the GDA is 8%. Therefore, it is appropriate that we use this within the Framework Plan. The calculated headroom for the GDA is forecast to be 50.58 Ml/d in 2044, as summarised in Table 1-3 in Appendix I of the Framework Plan.

Over the coming years, Irish Water will develop Water Resource Zone-specific headroom calculations for all supplies. As this information becomes available, we will update the supply-demand balance calculations in accordance with the feedback and monitoring process set out in section 8.3.8 of the Framework Plan.

Outage allowance is provided to the supply side calculations for larger WRZs to provide a buffer to allow us to operate our supplies to the required level of service during a planned or unplanned event. It is not a factor of forecast uncertainty; it is a provision to allow for activity to recover supplies. Additional text has been provided in section 3.5 of the Framework Plan.

Demand for water is not uniform at all times, between day and night, weekday to weekend, summer to winter, normal conditions to drought conditions. These changing demands can be seen by tracking data from our telemetry systems. Our telemetry systems record the volume of water input into our supplies (distribution input (DI)). During drought conditions, for instance, we can see DI increasing. From these observations, we can develop a peaking factor for a given supply. A telemetry system is continuously reporting DI, it does not differentiate between leakage and accounted for water, it shows an overall increase. Therefore, peaking factors are applied to demand side calculations. High leakage in a supply dampens peaking, therefore the lower the leakage is in a supply the higher the peaking trends increase.

Long term impacts of Covid-19, Brexit and new abstraction legislation on demand will be assessed over the coming years before significantly altering forecasts. Irish Water

will incorporate this into the NWRP through the feedback and monitoring process set out at section 8.3.8 of the Framework Plan.

13.8 Outage Allowance

13.8.1 Summary of Outage Allowance Feedback

The CRU requested that Irish Water give details on how it arrived at the figure of 5% outage allowance, while another queried if the addition of 5% to the supply side for outages is included in the demand calculations and if so, why should the headroom allowance not cater for all these extras in the first place.

Kennedy Analysis stated it is supportive of the use of safety buffers for headroom/peaking/outage provided in the draft NWRP. They are supportive of the buffers being extra conservative and cumulative. They continued that “Headroom / peakage / outage should be applied to ‘accounted for water’ alone – but the dNWRP applies them to leakage as well.” The respondent stressed that the buffer should be only for ‘accounted for water’ and not applied to leakage or any strategic industrial allowance.

They also stated that the draft NWRP “provides for headroom and peaking on the demand side and applies them to average demand (which includes leakage and any SIA [strategic industrial allowance] provided for in the non-domestic demand analysis); - it provides for outage on the supply side but it is applied to WAFU” which is not the method used in the previous reports produced for the Water Supply Project. The respondent stated that the result is a buffer significantly larger than would have been expected if the usual methodology had been applied.

13.8.2 Response to Outage Allowance Feedback

Outage allowance is provided to the supply side calculations for larger WRZs to provide a buffer to allow us to operate our supplies to the required level of service during a planned or unplanned event. It is not a factor of forecast uncertainty, it is a provision to allow for activity to recover supplies. Additional text has been provided in section 3.5 of the Framework Plan to clarify this.

Demand for water is not uniform at all times, between day and night, weekday to weekend, summer to winter, normal conditions to drought conditions. These changing demands are monitored by tracking data from our telemetry systems. Our telemetry systems record the volume of water input into our supplies (distribution input (DI)). During drought conditions, for instance, we can see DI increasing. From these observations, we can develop a peaking factor for a given supply. A telemetry system is continuously reporting DI, it does not differentiate between leakage and accounted for water, it shows an overall increase. Therefore, peaking factors are applied to the overall demand side calculations. High leakage in a supply dampens peaking, therefore the lower the leakage is in a supply the higher the peaking trends increase. On that basis, Irish Water is satisfied that the peaking factors used within the Framework Plan are appropriate. For Water Resource Zones where surrogate data has been used, Irish Water will develop the data requirements to calculate WRZ-specific peaking factors.

This data will be incorporated through the feedback and monitoring process set out at section 8.3.8 of the Framework Plan.

13.9 Water Available for Use (WAFU)

13.9.1 Summary of WAFU Feedback

The CRU, the EPA and Tipperary County Council stated that it is not clear what impact climate change has on the baseline water available for use (WAFU) and requested clarification.

The CRU requested further clarification as changes in the WAFU for years 2020, 2022 and 2029 within Figure 3.8 are not clear. The CRU requested further explanation for the changes in "dry year critical plan and normal year annual average decrease in 2028."

The EPA requested that consideration be given to updated information in the Agri-Food 2030 Strategy when it is published as "projected agricultural growth, especially in the southern region, including increased Agri-industry related demand, may be significant and should be accounted for in the Water Available for Use (WAFU) figures and assessment in this region."

The EPA acknowledged uncertainty in relation to pending water abstraction and drinking water legislation and that this may impact on WAFU projections and water quality barrier assessments.

The EPA requested clarification on why the current WAFU forecast does not include the pending abstraction legislation, and acknowledgement that WAFU could reduce from 1,723 MI/d to 1,478 MI/d as a result of the pending abstraction legislation.

In the absence of the abstraction legislation the EPA requested that Irish Water publish the criteria in the Framework Plan that it has used in lieu of the pending abstraction legislation.

13.9.2 Response to WAFU Feedback

Climate change impacts will decrease the amount of water available for use in our DYCP planning scenario. This has been built into the supply side assessments for each Water Resource Zone and Figure 3.8 has been updated in the Framework Plan to reflect this. In 2028 we have factored in the loss of one of our existing supplies, that is the supply that sources water from Lough Owel. Irish Water does not have the primary water rights for this source, and the water body cannot support both existing abstractions. The primary rights owner has requested return of full rights.

The EPA asked that consideration be given to the updated information in the Agri-Food 2020 Strategy when published and to consider its potential impact on Water Available for Use (WAFU). Irish Water will consider the data as it becomes available and will work with the EPA and other stakeholders to understand its potential impact on raw water availability and WAFU.

Irish Water has used the assessments set out in Appendix C of the draft Framework Plan to understand water availability at our existing water supplies.

The basis for the limits we have set for sustainable abstraction within the Framework Plan are eflows standards, based on UKTAG standards. These standards were developed on the basis of achieving the “good status” and “high status” objectives within the WFD. These standards were developed in accordance with European policy whilst the UK was still a member of the EU.

The risk assessments we have carried out as part of the Framework Plan have allowed for an initial understanding of the implications of the pending water abstraction legislation on our supply. When the legislation is enacted, and regulations developed, this understanding will increase and we will modify our estimates accordingly, as per the feedback and monitoring process set out at section 8.3.8 of the Framework Plan. In the absence of more certainty we are satisfied that our Framework Plan has adopted a suitable approach.

13.10 Regulatory and Licensing Constraints

13.10.1 Summary of Regulatory and Licensing Constraints Feedback

Several respondents referred to licensing requirements. IFI commented on abstraction activities and requested thorough consideration of relevant Directives in all cases.

The IFI raised concerns on the methodology of abstraction confirmed to be affecting a waterbody status contained in the draft Framework Plan. The IFI stated "this methodology which has the potential to remove up to 15% of the of the 95%'ile flow (potentially a significant risk to achieving Good Ecological Status under WFD)."

Limerick Greens submission gave details on the environmental information they recommended Irish Water include in abstraction licence applications to the EPA. Limerick Greens also stated that no assumptions should be made on impacts of abstractions and that assessment is required on new and existing abstractions scenarios.

Fight the Pipe commented that the UK regulations may differ to EU obligations and highlighted that Irish Water modelled its 25-year plan on the UK.

Meath and Tipperary County Councils, and the EPA, noted that legislative changes may impact long term projects in particular those requiring abstraction licences.

Longford County Council stressed the importance of the process of upgrading and increasing abstraction licences be commenced under the NWRP, stating that it greatly affects the type of capital investment required.

The EPA also requested that the Framework Plan and the four RWRPs take into account any new regulations on water abstractions and revisions to the drinking water regulations.

GSI also commented on abstraction legislation on groundwater resources noting that Irish Water does not yet have the finalised information to assess the potential impacts of upcoming legislation, especially as the legislation has not been confirmed.

Additionally, GSI noted that Appendix C of the draft Framework Plan only considers the impact of the WFD groundwater quantitative status Water Balance Test, however, it should also consider the impact of legislation on groundwater supplies.

13.10.2 Response to Regulatory and Licensing Constraints Feedback

It is envisaged that site-by-site assessments will be required as part of the proposed abstraction licencing regime, and Irish Water will submit the required site level environmental studies, as set out in the new regulations on abstraction, when required by the new legislation . Irish Water will initiate the process of obtaining licences for new abstractions and regularising the licensing position of existing abstractions once the abstraction legislation has been enacted and the applicable regulatory process is in place.

The basis for the limits we have set for sustainable abstraction within the Framework Plan are eflows standards, based on UKTAG standards. These standards were developed on the basis of achieving the “good status” and “high status” objectives within the WFD. These standards were developed in accordance with European policy whilst the UK was still a member of the EU.

"In-flight " Projects will need to be modified if necessary, to align with new abstraction legislation.

13.11 Sustainable Economic Level of Leakage (SELL)

13.11.1 Summary of SELL Feedback

The CRU submission requested clarifications regarding SELL. They sought further clarification on Long Run SELL and Options Assessment Methodology tests. The CRU asked for clarity on the stance taken on Active Leakage Control, SELL glidepaths, whether the GDA is the only water resource zone (WRZ) for which an individual SELL has been determined and the assessment of SDBs throughout the country.

Fight the Pipe submitted that the concept of leakage targeting SELL has been discontinued in the UK as it does not encourage leakage reduction and therefore states that it is not acceptable for use by Irish Water. The respondent suggested the use of the latest UK guidelines for leakage using absolute reduction targets.

Another respondent made the same point regarding SELL and suggested that Irish Water look at the level of leakage in Ireland, the leakage reductions achieved in other jurisdictions, decide the most appropriate approach, and then set leakage targets for 25 years.

Kennedy Analysis also referred to the discontinued use of SELL in the UK and submitted that the current UK method of leakage reduction for the water suppliers as an absolute target, expressed as a percentage, as preferable. While disagreeing with the SELL method, this respondent continued to analyse the calculation and query the 2019 leakage data as different figures have been provided in the draft Framework Plan.

Kennedy Analysis suggested the actual leakage data for 2019 be used and the report calculations updated accordingly. The approach for the estimate of SELL regarding the Greater Dublin Area was queried, considering there are data uncertainties.

The respondent stated the apparent confusion in the draft Framework Plan between the SELL amount stated in the Executive Summary and the SELL Appendix. They concluded overall that "if the quality of Irish Water’s data is so poor that its calculation

of SELL has to resort to the use of a generic UK model using generic UK data then SELL is not the appropriate method to be using in Ireland at this stage."

13.11.2 Response to SELL Feedback

As set out in Appendix H of the Framework Plan, at present due to data issues, we calculate SELL for the GDA and then nationally for the remainder of the WRZs. Within the GDA we apply the net leakage savings directly to the supply demand balance. For this iteration of the NWRP short-run SELL has been used. We will set longer-term targets for each WRZ as our Leakage Management System develops over the next five years.

There are two options for assessing SELL: Short Run SELL, which identifies the leakage reduction to be achieved over the coming years; and long run SELL, which identifies leakage reduction to be achieved over a longer planning period, allowing for investment in further pressure management, asset renewal, improved district metering and telemetry and smart networks. The information and systems developed whilst delivering short run SELL, enable us to establish long run SELL targets.

The use of SELL calculations within a water resources plan is entirely appropriate. It gives a firm and transparent basis for calculating medium term glidepaths using a robust methodology that has been tested in other jurisdictions.

SELL methodologies have not been discontinued in the UK. As companies have achieved or progressed towards SELL targets, the industry regulators challenge the companies to go beyond SELL. However, it would be difficult to process towards short term or long-term targets, without having first enabled and set SELL targets. We are 25-30 years behind the UK in our leakage reduction programme.

The development of SELL calculations also has numerous additional benefits, including driving data improvement, improving the understanding of the condition and performance of our distribution networks, hydraulic zoning of individual WRZs, zonal pressures, nightline usage within supplies, and natural rate of rise. This data and information are not only of use in refining our understanding of leakage on a supply by supply basis but will also allow us to better target and maximise outcomes from our leakage reduction activities. By developing and refining SELL calculations, we can set targets for our supplies, and as we approach those targets, the data and information developed as part of this process allows us to understand the further targets we can set specific to each supply. Refer to section 7.3.1 in the Framework Plan for more detail on SELL.

Good Practice Guidance documents on leakage management have been published by the European Commission, which include case studies from a range of countries on how they reduced leakage in water supply networks. These documents also set out the potential difficulties in using percentage leakage comparisons between utilities and companies.

In all of the case studies, the primary measures for successful leakage reduction have been appropriate establishment of District Metered Areas, pressure management and active leakage control. Of particular interest is the case study for Scottish Water, a

publicly owned utility that halved leakage losses by setting up a dedicated leakage management programme and setting SELL targets.

Leakage reduction and water conservation is an integral part of our NWRP and is one of the key pillars to resolving supply demand balance deficit. In Ireland the understanding of our water distribution networks is improving, and although transmission losses across our distribution networks are high compared to European norms, we have set up the information systems, intelligence, processes, people and programmes to deliver sustained and continued leakage reduction. We have also sought advice from industry specialists in setting up our National Leakage Reduction Programme.

The 2019 base year leakage level in the NWRP is 741 MI/d. This figure is the sum of assigned leakage water balance for each of the 539 WRZs. The figure is calculated and presented in this way as we have included supply demand balance calculations for each WRZ within the NWRP. The water balance for each supply is initially taken from the LMS. However, it is manually corrected, based on information gathered as part of the local authority workshops including corrections to distribution input and use of surrogate water balance. The corrections represent a 2% variation in overall terms, and findings are used by the LMS team to inform data improvement areas in the system. As the LMS system improves over time, this 2% variation will reduce.

The leakage values reported to the CRU are direct reports from the newly developed Leakage Management System. This leakage management system went live in 2018, and therefore at the time the SELL study was undertaken, a relatively short time series of data was available (18 months). It will take a number of years to fully calibrate and improve data accuracy within the system. This process will involve investment in DMA optimisation, meter calibration and meter replacement. However, the benefits of having a functioning leakage management system are enormous, in terms of providing real-time information on our networks, allowing us to target leakage savings and reducing repair times. For consistency in reporting, and to ensure that trends can be assessed, the National Leakage Reduction Programme team report on output figures from the LMS. The quarterly reports summarise net leakage savings and reduction in apparent losses separately.

13.12 Environmental Costing

13.12.1 Summary of Environmental Costing Feedback

The EPA requested that consideration be given to utilising renewable energy resources were possible in relation to the energy efficiency improvements referenced in the draft NWRP. They requested that the Framework Plan reflect the most recent EPA reports on air, waste, water, and the State of the Environment Report.

AECOM agreed with the approach taken to calculate an economic cost which encompasses the financial costs to Irish Water and the general public. It noted that in Appendix M the financial cost of an option on the receptor is considered within the options appraisal methodology. The respondent stated “it is encouraging to see that Irish Water has adopted an ecosystem services approach for assessing the impacts of

options on environmental and social receptors. This is in line with good industry practice as well as Ireland’s National Biodiversity Plan 2017-2021 which includes 2020 targets for natural capital accounting.”

Chambers Ireland stated that the methodology in the Framework Plan to identify projects most suited for continued exploration is appropriate and continued to suggest risks associated with changes in interest and inflation rates be considered also.

13.12.2 Response to Environmental Costing Feedback

The most recent EPA reports on air, water, waste, and the State of the Environment are included within our SEA Statement in chapter 3. Reference to Ireland’s National Biodiversity Plan 2017-2021 is also included in our SEA Statement in chapter 3.

Economic and Social costs are at the core of our options assessment process. At a project level, Irish Water assesses every project in terms of energy efficient design. Irish Water’s Energy Efficiency Strategy also includes consideration of renewable energy resources.

For every Feasible Option developed as part of the RWRPs, a plan-level whole life cost will be developed, including capital, operational, carbon and environmental and social costs. Cost estimates used at a plan level are known as P90 estimates and account for uncertainty, including inflation. As the projects progress through the capital investment plans towards delivery, cost estimates are refined.

13.13 Conclusions on Water Resource Planning Concepts Feedback

Having carefully reviewed the submissions received on the theme of Water Resource Planning Concepts, Irish Water considered that a number of changes should be made to the draft Framework Plan. These changes are explained in section 13.13.1 regarding “Clarifications” below. In addition, some of the points made in the submissions will be taken forward in other ways, as explained in section 13.13.2 regarding “Recommendations” below.

13.13.1 Clarifications on Water Resource Planning Concepts Feedback



The following sections of the Framework Plan have been updated to reflect feedback under the theme of Water Resource Planning Concepts:

Section 7.3.1

Section 3.5

Section 3.3.2

Figure 3.8 in section 3.8

13.13.2 Recommendations on Water Resource Planning Concepts Feedback

1. Irish Water will progress a five to seven-year data improvement strategy.

2. Irish Water will provide additional detail on groundwater assessments undertaken in Appendix C of the Framework Plan.
3. Irish Water will implement a pilot study on network resilience models.
4. Irish Water will improve knowledge of our water sources through investigative studies through our source protection programme and a data improvement strategy.
5. Irish Water will share emerging data in relation to groundwater source protection and set up a steering group including the EPA Hydrometrics Team and GSI as part of the development of further studies on existing and potential future groundwater supplies.
6. Irish Water will review the Agri-Food 2030 strategy when published and will work with environmental stakeholders to understand its potential implications on water available for use in certain areas.
7. Irish Water will account for emerging policy and legislation as it is delivered.
8. Irish Water will review the potential to move towards renewable energy sources, both at a local level, such as micro generation, and at a national level through green energy providers.

14. Outside the Scope of NWRP

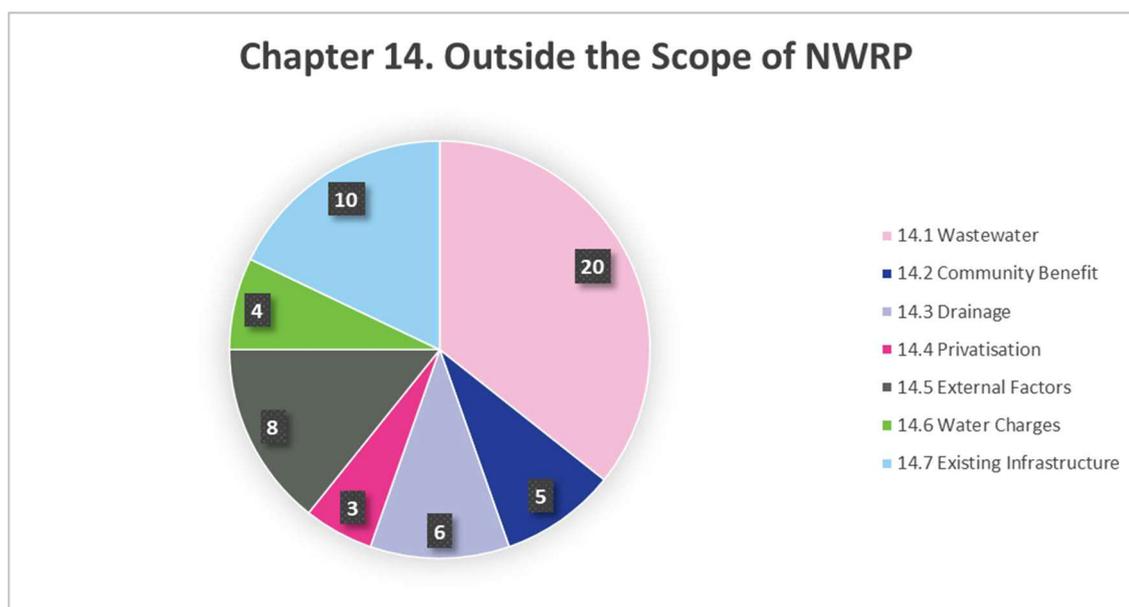
There were several submissions received during the consultation that mentioned topics outside of the scope of the NWRP. Although not directly related to this consultation, we have captured and summarised all of that feedback in this section for completeness. We have grouped the relevant submissions into seven sub-themes, which we set out in Figure 14-1 below. We deal with each of these sub-themes in order in this chapter, setting out first a summary of the relevant mentions in the submissions, followed by our response. The sub-themes are not dealt with in any particular order.

Where possible, we have forwarded on any queries to the relevant teams in Irish Water to respond. We include a consolidated summary of those flow-on actions in the “Conclusions” section at the end of this chapter.

We also acknowledge that there is a degree of repetition in some of the responses to the various sub-themes. This is to allow a reader interested in just one sub-theme to get a full picture of our response to it, without having to cross reference the response given to other sub-themes.

Figure 14-1 details the breakdown of feedback received under the theme outside the scope of the NWRP. It shows that of the 56 mentions¹⁰ in submissions under this theme the most frequently mentioned were related to wastewater with 20 mentions followed by existing infrastructure with 10 mentions. Figure 14-1 below also identifies the 12 sub-themes into which the submissions, and our response, has been broken down for ease of reference.

Figure 14-1 Outside the Scope of NWRP Theme



¹⁰ The number of mentions may, in some cases, be greater than the number of submissions received if the sub-theme was mentioned more than once in a submission. It is the number of mentions recorded overall in all 84 submissions.

14.1 Wastewater

14.1.1 Summary of Wastewater Feedback

Several stakeholders including Dublin Chamber cited wastewater management as an issue. They submitted that a lack of investment in infrastructure surrounding wastewater treatment and supply means that it has repeatedly failed to meet international standards.

One respondent highlighted the negative effect descaling chemicals being flushed into the wastewater system is having on the environment, as well as the short life cycle of domestic appliances as a result of limescale.

One stakeholder highlighted the opportunities available with wastewater, “There is an opportunity with water infrastructure upgrade and investment to explore the idea that by designing more effective recovery and processing systems that this type of development can turn organic waste into a source of value and contribute to restoring natural capital.”

Deputy Fergus O’Dowd highlighted an odour issue said to be coming from the Wastewater Treatment Plant (WwTP) in Drogheda. The submission also outlined concerns relating to the Drogheda WwTP being considered as a location for the proposed sludge hub for the East-Midland region stating “the network system in certain areas of Drogheda is not fit for purpose and will need to be upgraded/replaced going forward in order to address the flow issues it is currently experiencing which is adding to the malodour issues in particular along the Dublin Road.”

One stakeholder highlighted that septic tanks in Ireland receive very little attention or publicity. It was noted that many of the tanks in Ireland are neglected and unattended, with many left unregulated since they were commissioned. The submission proposed a five-year plan to deal with the septic tank issue in Ireland. Another stakeholder noted that septic tanks are a source of pollution and a basic level of sewerage treatment.

It was requested that a public consultation be held on how wastewater is carried away in our sewers. The submission stated that sewage pipes running through residents’ back gardens in need of repairing, are being refused by Irish Water.

Limerick City and County Council noted that a similar approach to the NWRP, should be applied to the planning of wastewater investment in Limerick.

AFU outlined that in a recent report from the EPA, 113 priority areas were identified where improvements are needed to prevent water pollution, eliminate discharges or raw sewage, meet EU treatment standards and protect bathing waters and freshwater pearl mussels. It was noted that the EPA has called on Irish Water to address the delays in delivering wastewater infrastructure, in order to provide the water quality improvements needed to meet the WFD and wastewater objectives. In terms of raw sewage discharge into receiving waters, AFU acknowledged Irish Water’s efforts to upgrade, replace and construct new WwTPs.

AFU highlighted the issues for Irish Water’s consideration including to address leakage, and deliver network upgrades.

The EPA suggested that “Irish Water should include proposals to address the removal of chemicals and pharmaceuticals in wastewater treatment and a reduction in the spread of antimicrobials into the environment via wastewater.”

Chambers Ireland highlighted how the creation of a sustainable and reliable clean water supply as well as the safe disposal of wastewater, is of highest interest. They noted that Ireland’s existing water sources and treatment facilities need upgrades and improvements. “Wastewater carriage and treatment facilities must be overhauled. Amplifying this problem of regional underinvestment are the interactions between wastewater services and the granting of planning permissions for new developments. In many parts of the country capacity limits at wastewater treatment facilities have created an effective cap on the potential for concentrated population growth. While in the short-term the immediate response to environmentally negative processes (such as the discharge of raw wastewater) needs to be addressed, this must occur in parallel with the medium-term action that is needed to ensure both the continuity of existing supply and the longer-term projects which will ultimately facilitate the development of the resilient water network we need.”

Limerick Greens suggested that Irish Water should consider the use of constructed wetlands as the receptor for treated sewage in the smaller more rural wastewater groups. They highlighted that larger wastewater facilities for larger towns and cities tend to have sufficient levels of treatment to meet the Urban Wastewater Directive and relevant EPA Discharge requirements. They recommended that Irish Water considers Public Health and Environmental Health for all wastewater discharges to sensitive receptors.

Limerick Greens recommended that each of the four regional water supply zones should have wastewater infrastructure provided at strategic centres for treatment of sludge with the aim of reuse. They recommended that Irish Water “consider Public Health and Environmental Health for all wastewater discharges to sensitive receptors such as designated bathing waters and shellfish designated waters. We recommend that as a minimum that UV treatment of all Irish Water discharges to such sensitive receptors. Such technology can easily be provided and is not expensive but would provide a marked increase in both Environmental and Public Health.”

One respondent stated that there is no monitoring being carried out on the discharge of sewage from septic tanks and treatment plants next to the channels and rivers feeding the lakes which provide critical water supplies.

One stakeholder requested that Irish Water take urgent action regarding water pollution and illegal dumping that has not been looked after by Limerick City and County Council.

Cork Chamber conceded that the delivery of facilities such as wastewater treatment can be difficult because of planning and environmental restraints. Cork Chamber also commended Irish Water’s Cork Lower Harbour project stating, “the removal of the equivalent of 40,000 wheelie bins worth of daily wastewater discharge through the Cork Lower Harbour Main Drainage Project is absolutely essential and beneficial. Irish Water completes this process with haste, and moves beyond this remediation of

unconscionable pollution, to an ambition for a crystal-clear harbour and waterway system. The treatment of wastewater in Cork Harbour and rivers must be aggressively enhanced and pursued, as quality of life, and natural environment are increasingly essential to the competitiveness of Cork.”

One stakeholder was concerned about ribbon development and how wastewater would be discharged from these new developments.

Councillor Johnny Flynn stated that to protect water quality, €500 million is needed to provide WwTPs in towns and villages across Clare. The Councillor highlighted that what was recommended in the ‘2002 Ennis Main Drainage Study’, of achieving population equivalent of 50,000 for Ennis WwTP and the replacement of two existing WwTPs, was not carried out.

Councillor Flynn highlighted that the relocation of the tidal barrage at Clarecastle is needed to prevent flooding in the Fergus River catchment, with WwTPs and up to 10,000 septic tanks in the catchment at risk of being flooded.

14.1.2 Response to Wastewater Feedback

A number of respondents highlighted issues in relation to wastewater treatment capacity restricting growth. This iteration of the water resources plan focuses on water services, and accordingly, wastewater treatment (private and public) and collection networks are outside the scope of the NWRP.

Although wastewater considerations are outside of the scope of this iteration of the NWRP, the growth figures from the regional assemblies and the local authority development plans are used to inform both the NWRP and the intervention plans for our wastewater treatment plants and networks. Irish Water acknowledges that both water and wastewater treatment capacity are essential for growth and economic development.

Irish Water also has a wastewater asset planning team, which develops short, medium, and long-term projects and programmes to address our wastewater asset base through the Drainage Area Plans programme. This programme targets critical wastewater networks that require a detailed performance assessment and improvement strategy as a result of a number of factors including planned development growth, reported flooding issues and poor environmental performance.

Significant funding will also continue to be required to transform our wastewater network facilities and networks through the regulated capital investment planning process.

We review emerging contaminants as part of the Drinking Water Safety Plan approach. Therefore, descaling chemicals and emerging contaminants are considered in that context.

Energy reuse from wastewater treatment is currently utilised at a number of our sites including Ringsend Wastewater Treatment Plant, where 50% of the energy required to power the facility is generated from the wastewater stream.

Odour issues said to arise at the wastewater treatment plant in Drogheda will be raised with our wastewater planning team.

We consider upstream wastewater discharge (private and public) within our Drinking Water Safety Plan hazard identification. Septic tanks are not in public ownership and are regulated by the EPA, but we are aware that they are being considered as part of the River Basin Management Plans.

Private wastewater mains are also outside of the scope of this NWRP.

Integrated Constructed Wetlands are utilised as solutions for smaller wastewater agglomerations. Examples include Dunhill in Co. Waterford, Clonaslee in Co. Laois, and Lixnaw in Co. Kerry. Further information can be found on our website www.water.ie/wetlands.

Water pollution is considered as part of the Drinking Water Safety Plan approach. However, enforcement in relation to water pollution and illegal dumping is the responsibility of local authorities.

Every wastewater treatment project is fully considered for environmental assessment and requires consent from both the planning authorities and the EPA before it can operate. The National Wastewater Sludge Management Plan sets out a nationwide standardised approach to ensure that treated wastewater sludge across the country is effectively managed, stored, transported and re-used or disposed of in a sustainable way, to the benefit of the public and the environment we all live in.

14.2 Community Benefit

14.2.1 Summary of Community Benefit Feedback

There were suggestions made that Irish Water provide free drinking water refill taps throughout the country for the local communities and tourists.

One stakeholder suggested that in line with the generation of renewable electricity (using wind turbines, hydro and methane gas) allowing customers to receive compensation or a reduction to their bills, this same compensation could be used to incentivise rainwater harvesting.

Tipperary County Council outlined how they are currently embarking upon a number of significant road and public realm projects at different locations throughout Tipperary. They suggested that the implementation of these projects presents Irish Water with an opportunity to make a timely intervention in investment in water supply infrastructure.

14.2.2 Response to Community Benefit Feedback

Where possible, Irish Water will facilitate public realm projects, including amenities such as free drinking water taps. However, this is not always possible due to budget constraints and the need to address priority supplies. Irish Water will facilitate and align with delivery of Local Authority projects where possible.

We will progress studies through our Innovation team to review the potential outcomes and benefits for conservation measures such as rainwater harvesting and grey water reuse.

14.3 Drainage

14.3.1 Summary of Drainage Feedback

Waterford Institute of Technology highlighted that land drainage of existing wetland areas or adjoining heavy soils should be better regulated. Waterford Institute of Technology also submitted that with the encouragement and support for the creation of storage ponds of farms for drainage water and storm water runoff, would add to the landscape biodiversity in rural areas and lessen against spate flooding from catchments to main river channels.

One stakeholder addressed the issues relating to drainage in their local area. The stakeholder stated that water is draining off a side lane into the main laneway behind houses in Brighton Square in Dublin 6, which follows the line of telegraph poles. The stakeholder highlighted that there is a P&T trench underneath these telegraph poles and water may be getting in as it drains down the laneway. The stakeholder noted that there is a need for proper drainage along this laneway. The stakeholder suggested that with the development of the Murphy & Gunn site in the near future, an opportunity may arise for Irish Water to correct this situation.

Kerry County Council requested that as part of scenario planning, separation of storm and foul drainage systems for the protection of existing water bodies be implemented.

14.3.2 Response to Drainage Feedback

Drainage is not considered as part of the NWRP as this Plan relates to public water supply only.

14.4 Privatisation

14.4.1 Summary of Privatisation Feedback

Fight the Pipe outlined that Irish Water proposes to model its 25-year plan on the UK and the draft Framework Plan sets out Irish Water's reasoning for selecting the UK as its model. They continued, however, that "it fails to address a very important point: the water suppliers in England and Wales were privatised in 1989. This is important: the primary legal duty of water suppliers in England and Wales is to their shareholders (not their customers). Their shareholders' interests may not always be aligned with the interests of customers."

Kennedy Analysis agreed with this point stating that "it is important to remember that the water supplies in England and Wales were privatised in 1989 and naturally the interests of shareholders (whose investment timeframes can be short/medium term) are not always aligned with the interests of the supply system (which needs investment for long-term benefits). OFWAT sets limits on the amount of investment in new pipes that can be charged to customers through bills - it expects shareholders to shoulder some of the burden."

14.4.2 Response to Privatisation Feedback

There are no plans to privatise Irish Water as confirmed in the recent Irish Government Water Sector Transformation Policy Paper (see www.gov.ie). The water supply is

publicly owned. As the majority of funding for the supply comes from central Government funding, we are also regulated.

In relation to the use of UK methodologies within our Framework Plan, some respondents questioned the use of these guidelines on the basis that the water utilities in England and Wales are privatised. However, it should be noted that the utilities in Scotland and Northern Ireland are in public ownership and we also use these methodologies. The rationale for basing our initial NWRP on these methodologies, as explained in the draft Framework Panel is based on the absence of Irish guidelines, similarities in the means of regulating our supplies, climatic conditions, and the evolution of our water supply asset base. It is, however, important to note that Ireland is 25-30 years behind the UK in terms of water resources planning, and we still need to develop our data and intelligence systems. Due to the relatively low performance of our asset base, we have also included water quality risk (and Drinking Water Safety Plans) within our NWRP, to ensure that we have appropriately understood our strategic transformation and associated funding requirements.

14.5 External Factors

14.5.1 Summary of External Factors Feedback

The HSE submitted that “the current pandemic has provided a prime example of the inherent weakness of long-term forecasting” and, as a result, welcomed the five year review of the NWRP but queried if this needed to be reviewed now as a result of Covid-19. They suggested a clause allowing for review to be brought forward should some event with significant potential impact on delivering the Framework Plan occur.

A number of submissions highlighted the impact that Covid-19 has had on the water sector and recommended that these changes be included in the NWRP.

Fight the Pipe stated that the draft Framework Plan made no reference to the possible impacts of Covid-19 or Brexit. They outlined that the point made by Irish Water that “at least 50% of future population growth will be focused in the five cities of Dublin, Cork, Galway, Limerick and Waterford and their suburbs,” may no longer be the case following the pandemic.

A submission from Chambers Ireland highlighted that the aim of the NWRP must be to create a strong and durable water network which can meet any challenges yet to come. “The lessons of the last decade, whether they be ones arising from the Great Financial Crisis, Brexit, Trump, or Covid-19 have taught us that the future is far less predictable than we would like it to be. An aim of the National Water Resources Plan must be the creation of a suitably robust and resilient water network which is sufficient to meet the challenges that are to come.”

Dublin Chambers outlined that as plans shift focus beyond Covid-19, it is important that the Dublin economy is in the best position to reopen and recover and strengthening water infrastructure and security of supply is crucial to this.

14.5.2 Response to External Factors Feedback

The base year used by Irish Water in the development of its NWRP is 2019, as 2018 was a significant drought year, and a National Water Conservation Order was issued for much of the summer period. Similarly, in 2020, restrictions related to Covid-19 may have altered the baseline demand figures for that year. We are satisfied 2019 remains an appropriate base year to have used for the NWRP.

Long term impacts of external factors such as Covid-19 and Brexit on demand will be assessed over the coming years before significantly altering forecasts.

At present, Irish Water is satisfied that the 25-year forecasting is appropriate. The Framework Plan has a continuous feedback and monitoring process (as set out in section 8.3.8 of the Framework Plan) to allow for incorporation of emerging, policy and data. As further data becomes available, we will incorporate it into the NWRP as required.

The purpose of the NWRP is to ensure that all Water Resource Zones have access to appropriate levels of service.

14.6 Water Charges

14.6.1 Summary of Water Charges Feedback

One stakeholder submitted that if the quality of water was satisfactory, they would not have an issue paying for it.

Another stakeholder stated that they are disappointed water charges are no longer in place. The respondent requested that water charges be brought back, as water is a precious resource and should be used sparingly. Another respondent outlined that they too are a supporter of water charges.

14.6.2 Response to Water Charges Feedback

Domestic water charges are a matter of Government policy.

14.7 Existing Infrastructure

14.7.1 Summary of Existing Infrastructure Feedback

Údarás na Gaeltachta outlined the lack of infrastructural investment in Gaeltacht regions. They stated that that the draft Framework Plan needs more clarification on how Irish Water will restore these historical shortcomings. “With changing environmental legislation, the existing water and wastewater treatment plants need significant investment to upgrade. Investment in wastewater treatment plants servicing rural industrial areas, which will allow them to meet environment requirements, to allow for further growth of companies located in Gaeltacht regions.”

Chambers Ireland submitted that it is unfortunate that infrastructure which Irish Water is unifying into a national network, has suffered from generations of underinvestment, resulting in a number of projects in need of urgent work. “Our water system is desperately in need of an overhaul. Existing water sources and treatment facilities need upgrades and improvement.”

Chambers Ireland highlighted the assumption that by 2040 parts of the country may be over-serviced, in terms of water infrastructure and that it may be less capital intensive to maintain the existing water infrastructure than to construct new infrastructure, which is at a scale appropriate to this future population.

Dublin Chambers outlined how insufficient investment in raw water treatment, water supply and wastewater treatment has posed a significant challenge for Irish Water. They highlighted that the current levels of investment in infrastructure will not be enough to make up for years of sustained underinvestment. “Current levels of investment in infrastructure will not be enough to counter the decades of sustained under-investment and if the new regional plans as outlined under the NWRP framework are to be a success there is a need to significantly boost investment and capital spend.”

Limerick Greens recommended that each of the four regional zones undergo a rationalisation of existing infrastructure to allow for smarter investment at strategic locations within each of the four zones.

Councillor Johnny Flynn discussed the ‘2002 Ennis Main Drainage and Flooding Study’, which recommended the provision of a new single treatment plant to serve Ennis and surroundings on the site of the Clareabbey wastewater treatment works.

Councillor Flynn highlighted the investigative works undertaken within the Clonroadmore catchment to reduce the influential load. “The consequent reduction in the influential load to Clonroadmore WwTP means the inherent economic value of providing treatment at the existing Clonroadmore and Clareabbey sites needs to be included in the consideration of wastewater treatment options as a sustainable solution for the short to medium term.”

Cairn PLC highlighted that a considerable delay on projects and excess in costs is due to the requirement that only Irish Water’s Regional contractor may carry out Irish Water Services in the Public Road. Cairn PLC noted that the delivery programme by Irish Water using their Regional Contractor does not line up with the development’s delivery timescales.

Cairn PLC advised it is essential that Irish Water plan to have necessary water infrastructure in place to enable regions in the Metropolitan Area, that is Dublin, Wicklow, Kildare, Meath, to grow sustainably in the short term.

They noted that on the delivery of new homes they are encountering significant delays where new issues, not identified within the Pre-Connection Enquiry (PCE) Process, are arising at a later stage leading to both delays in the delivery of units and costs. Note: The PCE process provides an indication of the feasibility of connecting developments to the Irish Water Network and what capital upgrades might be required.

Cairn PLC requested that going forward Irish Water provide more detail on the scale of upgrade required to facilitate a development so that all parties can plan for same during the statutory approval stage of the project. The Project Works Service Agreement (PWSA) process identified by Irish Water as part of the Confirmation of Feasibility process is not fit for purpose Cairn PLC stated with examples of timeframes for

PWSA's running more than 12 months due to procurement and corporate governance processes.

Cairn PLC outlined that the current Physical Connection Process set out by Irish Water is based on the connection offer being issued and accepted before development commences. Having a connection offer in place prior to commencement is therefore not realistic. Cairn PLC suggested a solution that would enable customers to apply for their Connection Agreement while the development application is within the planning process, like the Fire Certificate process.

Chambers Ireland observed access to clean water, or wastewater treatment facilities, act as a constraint on the planning process and that major investments will be needed by Irish Water to accommodate this.

One stakeholder noted that the smokeless fuel plan would further damage water quality and Old Birch woodland will be cut. It was further suggested that inter-departmental consultation on these matters would help.

14.7.2 Response to Existing Infrastructure Feedback

The purpose of the NWRP is to improve level of service in terms of quality, quantity, reliability, and sustainability across all of our supplies, including those in Gaeltacht Areas.

Irish Water will use the NWRP to identify strategic funding requirements to support the National Planning Framework.

The scale of investment to transform our water supplies will be considerable. However, the outcome in terms of ability to protect the environment, provide a good Level of Service for all customers, support growth and economic development, and adapt to climate change impacts will be substantial.

The development of the NWRP will enable us to understand the scale of strategic investment required across our supplies, and to propose the appropriate level of investment needed within the National Planning Framework.

As part of the RWRPs, the need across all individual WRZs will be identified. Feasible options for each water supply will be identified, and Preferred Approaches at WRZ level developed in accordance with the methodology set out in chapter 8 of the Framework Plan. A review will then be undertaken of the WRZs collectively and they will be compared against larger regional solutions, to develop an overall Preferred Approach. The solutions are based on the "need" drivers for each supply. The water resources planning process does not retire supplies unless it is determined to be appropriate on a case-by-case basis. Irish Water has also set out a process for developing interim options to address critical water quality and quantity issues while we deliver our Preferred Approaches through the coming investment plans. Box 8.1 has been added to reflect this.

Water pollution is considered as part of the Drinking Water Safety Plan approach. However, enforcement in relation to water pollution and illegal dumping is the responsibility of local authorities.

A number of respondents highlighted issues in relation to wastewater treatment capacity restricting growth. This iteration of the water resources plan focuses The NWRP on water services. However, future iterations of the NWRP may consider both water and wastewater services.

Although wastewater considerations are outside of the scope of this iteration of the NWRP, the growth figures from the regional assemblies and the local authority development plans are used to inform both the NWRP and the intervention plans for our wastewater treatment plants and networks. Irish Water acknowledges that both water and wastewater treatment capacity are essential for growth and economic development.

Irish Water also has a wastewater asset planning team, which develops short, medium, and long-term projects and programmes to address our wastewater asset base.

Irish Water is currently delivering a pilot project that is facilitating Self Lay of water services infrastructure in public roads by developers on behalf of Irish Water. More details of this pilot and how developers can participate in it can be found on our website.

Through our Connection and Developer Services function, Irish Water has an early engagement process in place (Pre-Connection Enquiry) to provide an early indication of the feasibility of connecting a development and what capital upgrades might be required to cater for this development. Once we complete the review of your Pre-Connection Enquiry, a confirmation of feasibility is issued which will indicate if any capital upgrades are required. It may refer to a Project Works Services Agreement (PWSA), such a PWSA may be required when further studies are needed to identify the solution to facilitate your development. The scope and extent of each PWSA varies depending on the extent of the required studies and works. Further information can be found on our website www.water.ie.

To ensure the satisfactory completion of a development, the Water Services Planning Guidelines under section 28 of the Planning and Development Act require that any grant of planning permission or approval pursuant to the Planning and Development Act 2000 (as amended) requiring direct and indirect connection(s) to water services infrastructure must include a condition requiring the applicant or developer to enter into a connection agreement(s) with Irish Water prior to the commencement of development.

The Planning Guidelines were designed to ensure developments would only progress where Irish water committed to servicing them as there have been cases where some developments proceeded without the required water services arrangements in place. Customers can apply for a connection once they have submitted for planning, however Irish Water will only issue a connection offer once planning has been granted.

We will forward comments on the installation of service connections and concerns about the Pre-Connection Enquiry, Project Works Service Agreement, and Physical Connection processes to our Connection Developer Services Team.

As part of the rollout of the Drinking Water Safety Plans, we will consider catchment measures to reduce source risk to our supplies, and we will actively engage as a stakeholder in catchment initiatives. Further information on our source risk assessment is included in Box 5.2 in section 5.5 and cross referenced in section 5.9 of the Framework Plan.

14.8 Conclusions on Outside the Scope of NWRP Feedback

Having carefully reviewed the submissions designated as “out of scope”, Irish Water considered that some of the points made in the submissions should still be taken forward in other ways, as explained in section 14.8.1 regarding “Recommendations” below.

14.8.1 Recommendations on Outside the Scope of NWRP Feedback

1. Irish Water will review proposals for community gain measures.
2. Irish Water will assess the longer-term impacts of Covid-19 through our monitoring and feedback process as outlined in section 8.3.8 of the Framework Plan. These may be short-term or long-term changes. Interconnected supplies allow for better adaptability to change.
3. Irish Water will raise issues in relation to connection delays with our connection developer services team.
4. Wastewater upgrades or options are not within the scope of the NWRP; however, we will forward proposals for the Clonroadmore WwTP and Clareabbey WwTP to our wastewater planning team and raise the odour issues referenced in relation to Drogheda WwTP with them.

15. Additional updates to the Framework Plan

Over the course of the consultation process and the finalisation of documents, a number of matters were identified by the NWRP team, which have been incorporated into the Framework Plan. These clarifications and updates have been assessed by the NWRP team and are not considered to be material but have resulted in minor changes to the Framework Plan and the principle ones are referenced here for completeness.

15.1.1 Update to data

Dry Year Annual Average (DYAA) figure.

- Figure 3.8 & Figure 6.3

Update to WCP values

- Table 3.3 & Table 6.1
- Figure 3.8 and Figure 6.3

National SDB summary

- Table 6.3 and Figure 6.7

Addition of population data

- Figure 6.8 to Figure 6.11

Resource zones in deficit

- Figure 6.12 and Table 6.4

15.1.2 Updates to diagrams

Figure 1.8 and Figure 9.5, which is the same diagram, has been updated in the Framework Plan in order to further illustrate the consultation opportunities for the four RWRPs. Section 1.9 and section 9.2 have also been updated to reflect these changes.

- Figure 1.6 Consultation Roadmap – included detail on consultation phases
- Table 1.1 – added existing table to section 1.9.4 to highlight extent of WRZ managed by UK Water Utilities
- Table 2.2 – added Regional Group Areas to table
- Regional Map of Ireland – Updated to reflect terminology of Regional Names RWRP-XX from Groups TG1-4
- Figure 2.3 Catchment Management Units to reflect prioritisation and investment at National Level
- Box 2.3 added cross reference to Appendix E figure on drought severity
- Box 5.2 add information and graphic on Source Risk Assessment
- Box 8.1 Clarifications on approach to urgent priority and interim solutions
- Figure 8.13 Feedback Loop – updated terminology to RWRPs
- Figure 8.14 Updated figure terminology from Group to Regional level

15.1.3 Addition to Stakeholder List

Inland Fisheries Ireland has been added to the statutory stakeholder list.

15.1.4 Addition to methodology section

Minor updates to clarify the approach to review, discussion and signoff on Preferred Approach Outcomes Section 8.3.7.4

15.1.5 Additional Text in relation to unassigned waterbodies

During the consultation period, a High Court judgement was issued that has implications for consenting of abstractions from unassigned waterbodies. We have updated section 8.3.3, to address how we will treat options from unassigned waterbodies in the RWRPs. There will be a further opportunity to consult on this during the statutory consultation processes on the RWRPs.

15.1.6 Update to Glossary

Clarification of Best AA terminology

15.1.7 Updates to Appendices

App A – further clarifications on consultation phases

App C – further detail added on groundwater supplies

App L – annotation of tables in SDB with further information on nature of supply

16. Next steps

The Framework Plan (with attached Appendices) has now been adopted by Irish Water together with the accompanying Strategic Environmental Assessment Statement and an Appropriate Assessment Determination. This completes Phase 1 NWRP.

The next phase of the NWRP, Phase 2, comprises the development of the four RWRPs to identify the combination of Preferred Approaches within and between regions to address the needs identified in the Framework Plan.

Each of the RWRPs will be subject to Strategic Environmental Assessment and Appropriate Assessment, including their cumulative impacts. Each of the four regions will also have their own public consultation phases. These public consultations will take place throughout 2021 and into 2022.

The scoping and screening consultation on the RWRP - Eastern and Midlands will commence first with relevant environmental authorities, to be followed by public consultation on the draft RWRP-EM. That public consultation will be carried out in a manner similar to that used for the NWRP –Framework Plan.

The remaining three RWRPs, the North West, South West and South East, will be consulted on in the same way, comprising both non- statutory screening and scoping consultation with environmental authorities, followed by statutory public consultations, throughout 2021 and 2022.

17. Glossary

Figure 17-1 Stakeholder Organisations & Technical Glossary

AA	Appropriate Assessment
AFU	An Fóram Uisce
BGI	Blue-Green Infrastructure
CAP	Climate Action Plan
CAP	Common Agricultural Policy
CARO	Climate Action Regional Offices
Clare PPN	Clare Public Participation Network
CRU	Commission for the Regulation of Utilities
CSL	Customer Side Leakage
DAERA	Department of Agriculture, Environment and Rural Affairs
DAFM	Department of Agriculture, Food and the Marine
DAU	Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media – Development Applications Unit
DCU Water Institute	Dublin City University Water Institute
DECC	Department of the Environment, Climate and Communications
DETE	Department of Enterprise, Trade and Employment
DHLGH	Department of Housing, Local Government and Heritage
DI	Distribution Input
DMA	District Metered Area
DWD	Drinking Water Directive
DWI	Drinking Water Inspectorate
DWSP	Drinking Water Safety Plan
DYAA	Dry Year Annual Average
DYCP	Dry Year Critical Period
EAP	Environmental Action Plan
EIAR	Environmental Impact Assessment Report
EMRA	Eastern and Midlands Regional Assembly
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
GDA	Greater Dublin Area
GMO	Genetically Modified Organisms

GSI	Geological Survey Ireland
HSE	Health Service Executive
IDA	Investment & Development Agency Ireland
IEN	Irish Environmental Network
IFI	Inland Fisheries Ireland
ISME	Irish Small & Medium Enterprise Association
IUCN	International Union for Conservation of Nature
IWAI	Inland Waterways Association of Ireland
LAWPRO	Local Authority Waters Programme
LCCC	Limerick City and County Council
LoS	Level of Service
LMS	Leakage Management System
MASP	Metropolitan Area Strategy Plan
MCA	Multi Criteria Analysis
MCC	Meath County Council
NBS	Nature-Based Solutions
NDP	National Development Plan
NFGWS	National Federation of Group Water Schemes
NICCAP2	Northern Ireland's second Climate Change Adaptation Programme
NIEA	Northern Ireland Environment Agency
NIS	Natura Impact Statement
NPF	National Planning Framework
NPO	National Policy Objectives
NPWS	National Parks & Wildlife Service
NWRP	National Water Resources Plan
OFWAT	Water Services Regulation Authority
OPR	Office of the Planning Regulator
OPW	Office of Public Works
PCC	Per Capita Consumption
PCE	Pre-Connection Enquiry Process
PPN	Public Participation Network
PWSA	Project Works Service Agreement
RBMP	River Basin Management Plan
RPO	Regional Policy Objectives
RSES	Regional Spatial Economic Strategies
RSPA	River Shannon Protection Alliance
RWRP	Regional Water Resources Plans

SAC	Special Area of Conservation
SDB	Supply Demand Balance
SDZ	Strategic Development Zones
SEA	Strategic Environment Assessment
SELL	Sustainable Economic Level of Leakage
SFA	Small Firms Association
SIA	Strategic Industrial Allowance
SPA	Special Protection Areas
SRA	Southern Regional Assembly
SuDS	Sustainable Urban Drainage Systems
SWAN	The Sustainable Water Network
SWI	Scottish Water International
WAFU	Water Available For Use
WFD	Water Framework Directive
WHO	World Health Organisation
WIT	Waterford Institute of Technology
WPAC	Water Policy Advisory Committee
WRZ	Water Resource Zone
WSP	Water Supply Project
WSZ	Water Supply Zone
WTP	Water Treatment Plant
WwTP	Wastewater Treatment Plant
ZOC	Zone of Contribution
ZOI	Zone of Influence

Appendices

water.ie/nwrp



National Water Resources Plan

Phase 1

NWRP draft Framework Plan
Statutory Consultation



Part of **ervia** group

National Water Resources Plan (NWRP)



The plan will set out how we can **balance the amount of drinking water we can supply with the demand for water that is needed over the short, medium and long term.**



Calculate the demand for water from homes, businesses, farms and industry now and into the future



Assess the amount of water we have available



Identify areas where there is not enough water supply to meet demand or where there are risks to water quality



How climate change will impact our water



Develop a national plan to ensure there will be enough water to meet demand and address any risks to water quality



Develop a methodology to assess the need and options appraisal process we will use within our plan

Our three pillar approach will ensure we have a safe, secure, reliable and sustainable drinking water supply for everyone

Lose Less



Reduce leakage

Use Less



Improve water efficiency

Supply Smarter



Improve infrastructure

National Water Resources Plan

Irish Water's National Water Resources Plan (NWRP) is our 25 year plan to identify how we will provide a safe, secure, reliable and sustainable water supply to our customers for now and into the future.

The plan identifies the water we have, the water we use, the water we need and where and when we need it. It identifies the risks with our current supplies and allows us to identify options to address our water supply issues over the short, medium and long term. It will also ensure that our supplies are reliable, and meet the quality standards required.

Why do we need a National Water Resources Plan?

Water is part of our everyday lives, we need it when we turn on the taps to get a drink, to wash our dishes and clothes, to have a shower and to flush the toilet. Businesses throughout the country also depend on a reliable water supply, from coffee shops and restaurants, to hairdressers, and farming enterprises right up to multi-national companies. It is essential to everything we do.

Our water infrastructure is already under increasing pressure to meet the current demand for water as a result of population growth, climate change, and our changing environment. The quality of our drinking water can be affected in many ways including soil or rock types, land use practices, pollution, and even heavy rainfall. To prevent unplanned water outages, water conservation orders, reductions in pressure or restrictions to water supplies, we have to plan ahead. How we choose to plan our water resources today will determine the water supply we can provide now and into the future.

National Water Resources Plan | Phase 1 Consultation | 3

Our solution

Irish Water aims to ensure that all of our customers have a safe and reliable drinking water supply and to safeguard our water for our future. Our plan is to use a three-pillar approach:

1. To **lose less** by reducing the amount of water lost through leakage.
2. To **use less** by encouraging us all to use less water in our everyday lives, improving water efficiency in our homes, businesses, farms and through our own operations.
3. To **supply smarter** by improving the quality, resilience and security of our water supplies through infrastructure and operations improvements and developing new sustainable sources of water.

The NWRP sets out how we do this.



What is the benefit of the National Water Resources Plan?

The National Water Resources Plan will:

- Improve the level of service to our customers and communities;
- Support growth and development;
- Be resilient in order to mitigate the impacts of climate change; and
- Be sustainable in order to protect the environment.



NWRP draft Framework Plan

The preparation of the NWRP provides, for the first time, an opportunity to strategically and consistently plan the way that drinking water services are delivered in Ireland at a national level.

Phase one of the development of the NWRP consists of a draft Framework Plan which we are currently consulting on with the accompanying SEA Environmental Report and Natura Impact Statement.

The draft Framework Plan considers:

- How we assess water quantity need through the Supply Demand Balance;
- How we assess water quality and reliability need by looking at how our existing assets are performing;
- How we address sustainability by ensuring that all new options for water supply must be based on conservative approaches to protecting water sources; and
- Our Options Assessment Process - how we find solutions to address the needs we have identified.

National Water Resources Plan | Phase 1 Consultation | 5

We are asking for your feedback on all of the points outlined on the previous page. Please visit www.water.ie/nwrp for more information.

For illustrative purposes we have also included a Case Study to demonstrate how the methodology is applied to an area. Stakeholders can refer to it to support their submissions and observations on the methodology but will not be able to influence the options for the Case Study area until a later stage of the NWRP process.

The NWRP is subject to Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA). This ensures that we evaluate environmental impacts likely to arise from the plan, both positive and negative, and outline the appropriate prevention and alleviation measures.





How can I get involved?

Irish Water is now inviting feedback on the NWRP draft Framework Plan and associated SEA Environmental Report and Natura Impact Statement (NIS).

A ten-week statutory public consultation will run from Tuesday 8 December 2020 to Tuesday 16 February 2021 during which time the NWRP draft Framework Plan and associated environmental reports can be viewed and downloaded at www.water.ie/nwrp and at your local authority's planning office or County Library (depending on the local authority) during their normal opening hours.

This is your opportunity to feed into the process of how we identify the issues and opportunities for the water supply in your area and how we find solutions, before we apply them to your Region as part of the second phase of the NWRP.

All submissions will be reviewed and relevant feedback incorporated into the final NWRP Framework Plan and associated SEA Statement and Appropriate Assessment determination.

Submissions from individuals will be reported anonymously and feedback from organisations will be attributed to them. Submissions will not be individually responded to but will be summarised in a second consultation report which will be published on www.water.ie/nwrp

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

Have your say

If you would like to make a submission, please send it by email or post by **Tuesday 16 February 2021**

Email: nwrp@water.ie

Post: National Water Resources Plan,
Irish Water, P.O. Box 13216,
Glenageary, Co. Dublin

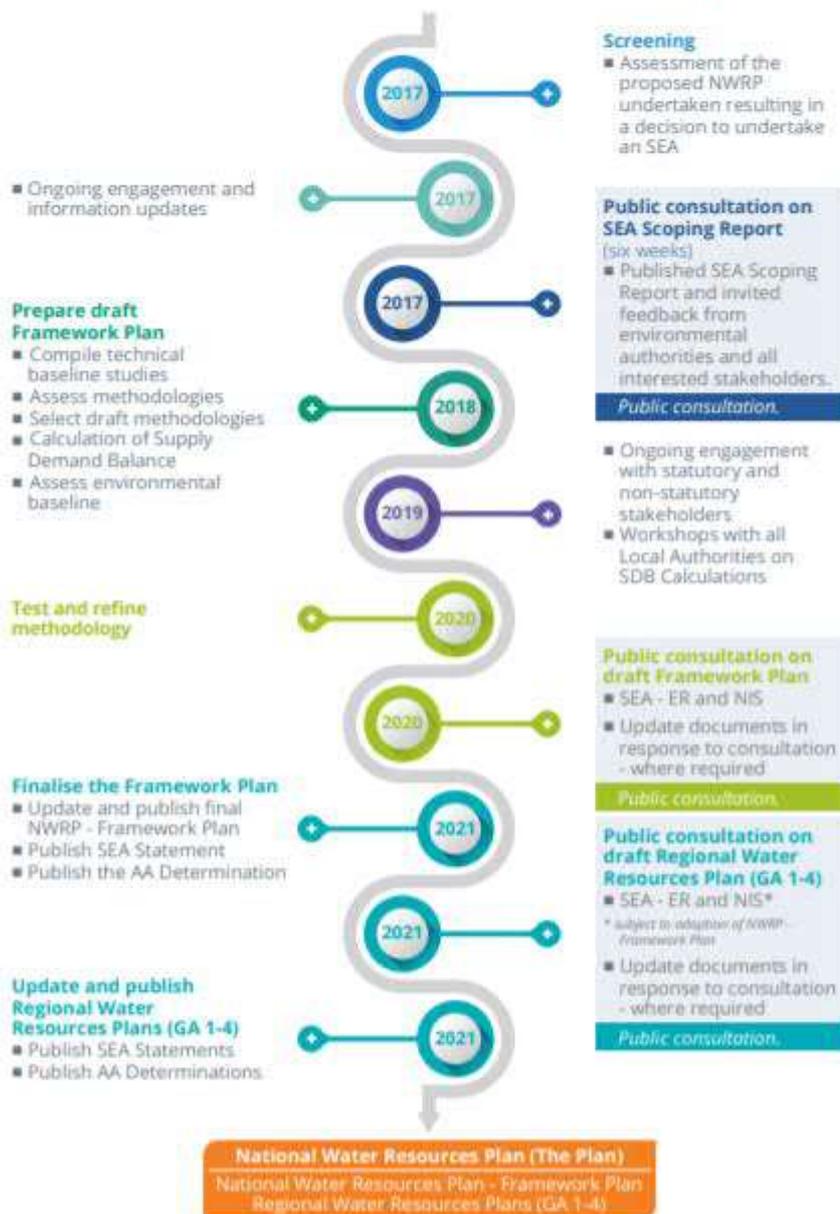
Freephone: 1800 46 36 76

The consultation questions

In order to help you in making a submission we are inviting feedback on the following consultation questions:

1. Do you have any suggestions that you would like Irish Water to consider as part of the draft Framework Plan?
2. Do you have any suggestions that you would like Irish Water to consider as part of how we assess supply/ demand balance, water quality, quantity and resilience?
3. The draft Framework Plan sets out Irish Water's methodology to find high level solutions to address short, medium and long-term issues. Do you have any comments on our methodology?
4. Do you have any comments on the Strategic Environmental Assessment (SEA) Environmental Report and associated Natura Impact Statement (NIS) which accompanies the draft Framework Plan?
5. The project roadmap has been updated. Do you have any comments or feedback on this?
6. How would you like Irish Water to communicate with you as the NWRP progresses?

NWRP Consultation Roadmap



10 | National Water Resources Plan | Phase 1 Consultation

Next steps

Following on from the public consultation on the draft Framework Plan, there is still some important work to be done before the Framework Plan is finalised.

The submissions and observations received from public consultation will be taken into consideration, and the Framework Plan updated.

The final Framework Plan will be adopted in early 2021, alongside the SEA Statement and AA Determination. The SEA statement will outline the issues raised and demonstrate the amendments that were made to the Framework Plan as a result of the consultation.

Phase 2 comprises four Regional Water Resources Plans each of which will be subject to Strategic Environmental Assessment and Appropriate Assessment. Each of the four regions will also have their own public consultation phases. These public consultations will take place throughout 2021.



Contact details

To make a submission on the Draft NWRP or for further information please contact:

Email: nwrp@water.ie

Web: www.water.ie/nwrp

Freephone: **1800 46 36 76**

**National Water
Resources Plan,
Irish Water,
P.O. Box 13216,
Glenageary, Co. Dublin**

General queries

9am-5.30pm, Mon-Fri

Telephone: **Callsave 1850 278 278** or **+353 1 707 2828**

Minicom: **LoCall 1890 378 378** (for hearing impaired customers with their own minicom equipment).

Please note that the rates charged for 1850 (Callsave) and 1890 (LoCall) numbers may vary across different service providers. Calls made using mobiles may be more expensive.

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Appendix B NWRP infographic

National Water Resources Plan (NWRP)

The plan will set out how we can **balance the amount of drinking water we can supply with the demand for water that is needed over the short, medium and long term.**

UISCE
EIREANN IRISH
WATER

Calculate the demand for water from homes, businesses, farms and industry now and into the future

Assess the amount of water we have available

Identify areas where there is not enough water supply to meet demand or where there are risks to water quality

How climate change will impact our water

Develop a methodology to assess the need and options appraisal process we will use within our plan

Develop a national plan to ensure there will be enough water to meet demand and address any risks to water quality

Our three pillar approach will ensure we have a safe, secure, reliable and sustainable drinking water supply for everyone

- Lose Less**
Reduce leakage
- Use Less**
Improve water efficiency
- Supply Smarter**
Improve infrastructure

Appendix C Press Releases

Press Release

8 December 2020

Irish Water publishes its draft Framework Plan, the first Phase of its National Water Resources Plan, for consultation

To safeguard public health, facilitate growth and meet the challenges of climate change over the next 25 years

Irish Water has published the first Phase, the draft Framework Plan of the National Water Resources Plan (NWRP), for public consultation. The NWRP is Ireland's first 25-year strategic plan enabling us to move towards safe, secure, reliable and sustainable water supplies for all of our customers and communities, whilst safeguarding public health and the environment.

For the first time, the NWRP will provide a country-wide analysis to identify the water we have, the water we use, the water we need and any potential risk to water quality. It sets out the methods and options to meet these shortfalls in a resilient and environmentally sustainable way and is accompanied by a Strategic Environmental Assessment Environmental Report and Natura Impact Statement, which looks at how our Plan considers its impact on the environment

The National Water Resources Plan will;

- calculate the demand for water from homes, businesses, and industry now and into the future,
- assess the amount of water available in existing supplies,
- assess the impact of weather events such as drought on our water supplies,
- identify areas where there is not enough water supply to meet demand or where there is a risk to water quality.

Commenting on the NWRP draft Framework Plan, Sean Laffey, Head of Asset Management with Irish Water said, "Our infrastructure is under increasing pressure to meet the current demand for water as a result of population growth, climate change, and our changing environment. To prevent unplanned water outages, water conservation orders, reductions in pressure or restrictions to water supplies, we have to plan ahead. Irish Water's first National Water Resources Plan will enable us to do that in a sustainable way whilst also supporting economic and population growth. The NPF, the key strategic plan for shaping the future growth and development of Ireland out to the year 2040, anticipates a population increase of 1 million people and the creation of 660,000 net new jobs in the economy by 2040. It is estimated that 34,000 houses will have to be built each year for the next decade just to meet demand of our

growing population¹¹. Over 380,000 jobs are supported directly by foreign and direct investment, many of which are in water intensive industries such as manufacturing and pharmaceuticals¹²”

“How we choose to plan our water resources today will determine the water supply we can provide now and into the future. We are inviting the public to play a role in shaping how we plan our water supply now and into the future by making a submission to this consultation process”.

A 10-week public consultation will seek feedback on the NWRP Draft Framework Plan and associated environmental reports from the 8th December until the 16th February 2021. Following this consultation period we will finalise and adopt the Framework Plan, and commence the Phase 2 development of four Regional Water Resources Plans which will set out the options to address identified needs across all of our supplies. We will be again be seeking the public’s views as each of the Regional Plans will be subject to public consultation.

The Reports can also be viewed online and downloaded at www.water.ie/nwrp and comments and feedback sent to Irish Water as follows:

Email: nwrp@water.ie

Post: National Water Resources Plan, Irish Water, PO Box 13216, Glenageary, Co. Dublin

Hard copies are also available at the following locations: insert link to website.

ENDS

Notes to the Editor

Draft Framework Plan

Phase one of the development of the NWRP consists of a draft Framework Plan which we are currently consulting on with the accompanying SEA Environmental Report and Natura Impact Statement.

The draft Framework Plan considers:

- How we assess water quantity need through the Supply Demand Balance;
- How we assess water quality and reliability need by looking at how our existing assets are performing;

¹¹ Central Bank Economic Letters, Population Change and Housing Demand in Ireland, Vol. 2019, No. 14.

¹²

<https://www.cso.ie/en/csolatestnews/pressreleases/2020pressreleases/pressstatementforeigndirectinvestmentinireland2018/>

- How we address sustainability by ensuring that all new options for water supply must be based on conservative approaches to protecting water sources
- Our Options Assessment Process - how we find solutions to address the needs we have identified.

Phase 2 comprises four Regional Water Resources Plans each of which will be subject to Strategic Environmental Assessment and Appropriate Assessment. Each of the four regions will also have their own public consultation phases. These public consultations will take place throughout 2021.

The four Individual Regional Water Resources Plans will cover:

- The North West Region (Group Area 1)
- The South West Region (Group Area 2)
- The South East Region (Group Area 3)
- The Eastern and Midlands Region (Group Area 4).

Consultation Questions:

1. Do you have any suggestions that you would like Irish Water to consider as part of the draft framework plan?
2. Do you have any suggestions that you would like Irish Water to consider as part of how we assess supply/demand balance, water quality, quantity and resilience?
3. The draft Framework Plan sets out Irish Water's methodology to find high level solutions to address short, medium and long-term issues. Do you have any comments on our methodology?
4. Do you have any comments on the Strategic Environmental Assessment (SEA) Environmental Report and associated Natura Impact Statement (NIS) which accompanies the draft Framework Plan?
5. The project roadmap has been updated. Do you have any comments or feedback on this?
6. How would you like Irish Water to communicate with you as the NWRP progresses?

Next Steps

The Framework Plan will be adopted in early 2021, alongside the SEA Statement and AA Determination. The SEA statement will outline the issues raised and demonstrate the amendments that were made to the Framework Plan as a result of the consultation. This will be followed by public consultation of the four Regional Water Resources Plans next year each of which will be subject to Strategic Environmental Assessment and Appropriate Assessment. Once adopted, The Framework Plan and the four Regional Water Resources Plans will together comprise Irish Water's NWRP.

Legislative context

The context of the NWRP is grounded in legislation and Government policy for water services, growth and economic development, protection of the environment and climate change adaptation.

The key policies feeding into the NWRP are:

- Water Services Policy Statement (WSPS);
- Project Ireland 2040- National Planning Framework (NPF);
- Water Framework Directive (WFD) & River Basin Management Plan (RBMP) for Ireland;
- National Adaptation Plan (NAP) & Adaptation Plan for Water Quality and Water Services Infrastructure
- Recast Drinking Water Directive (DWD).

21 January 2021

Irish Water extends public consultation of the first National Water Resources Plan (NWRP) until 1 March 2021

Irish Water has extended the statutory consultation period of the country's first National Water Resources draft Framework Plan (NWRP) and associated SEA Environmental Report and Natura Impact Statement (NIS). Irish Water is now inviting feedback on Framework Plan and associated environmental documents which was published for statutory consultation on the Tuesday 8 December, until Monday 1 March 2021.

The NWRP is Irish Water's plan to identify how we will provide a safe, sustainable, secure and reliable water supply to our customers for now and into the future whilst safeguarding the environment. The NWRP will set out how we will balance the supply and demand for drinking water over the short, medium and long term. It is a 25-year strategy to ensure we have a safe, sustainable, secure and reliable drinking water supply for everyone. The development of the NWRP will take place in two phases. Phase one the draft Framework Plan identifies how we assess needs across all of our water supplies, and the process that we will use to find solutions to address those needs. The [NWRP draft Framework Plan](#) is published with an accompanying [Strategic Environmental Assessment Environmental Report](#) and [Natura Impact Statement](#), which look at how our Plan considers its impact on the environment.

This an opportunity to feed into the process of how Irish Water identifies the issues and opportunities for the water supply in your area and how solutions are found, before they are applied to your Region as part of the second phase of the NWRP. The NWRP draft Framework Plan and associated environmental reports can be viewed and downloaded at www.water.ie/nwrp and at local authority's planning office or County Library (depending on the local authority and subject to Covid-19 restrictions). To find your nearest local authority's planning office or County Library which will display the documents please click [here](#). We have also published a [consultation leaflet](#). Irish Water is hosting a webinar next Wednesday 27th January at 2.30pm where there will be an opportunity to engage with the NWRP team and have any questions you may have answered. To register your attendance please click [here](#).

ENDS

Appendix D Media Coverage

Table 3-2 Resulting media coverage

Media	Date
Irish Examiner	8 December 2020
Irish Independent	8 December 2020
Irish Times	8 December 2020
The Herald	8 December 2020
Newstalk	8 December 2020
RTE Radio 1	8 December 2020
Engineers Journal	8 December 2020
The Irish Times	9 December 2020
EnviroSolutions.com	14 December 2020
Tipp FM	14 December 2020
Newstalk	14 December 2020
Engineers Journal	17 December 2020
Sligo Weekender	19 December 2020
Westmeath Examiner	19 December 2020
Limerick Leader	21 December 2020
Sligo Weekender	21 January 2021
Irish Times	22 January 2021
Leitrim Observer	22 January 2021
EnviroSolutions.com	25 January 2021
Sligo Champion	26 January 2021
Westmeath Examiner	26 January 2021

Business Post	31 January 2021
Dublin Inquirer	10 February 2021
Roscommon Herald	16 February 2021
Tipp FM	19 February 2021
Midland Tribune	25 February 2021
Tipperary Star	25 February 2021
Mayo Advertiser	26 February 2021
Irish Times	1 March 2021
Irish Independent	1 March 2021
Connaught Telegraph	2 March 2021
Irish Farmers Journal	6 March 2021
Mid-West Radio	4 March 2021
Connaught Telegraph	9 March 2021
Western People	9 March 2021
Mayo Advertiser	12 March 2021

Irish Water publishes National Water Resources Plan Draft Framework Plan

Public consultation

Irish Water is developing its first National Water Resources Plan (NWRP) that will outline how we move towards a sustainable, secure and reliable drinking water supply for everyone over the next 25 years whilst safeguarding our environment.

A 10-week public consultation is now underway on the NWRP Draft Framework Plan and the environmental reports that will accompany the NWRP Draft Framework Plan including the Strategic Environmental Assessment (SEA) and the Natura Impact Statement (NIS).

The documents can be viewed and downloaded at www.water.ie/nwrp and at your local authority's planning office or County Library (depending on the local authority) during their normal opening hours for 10 weeks ending on Tuesday 16 February. For details of those locations and opening hours, please visit www.water.ie/nwrp or contact the Project Team on **1800 46 36 76**.

A written submission or observation with respect to the NWRP Draft Framework Plan, and associated environmental report and NIS made to Irish Water within the 10 weeks ending on Tuesday 16 February will be taken into consideration before the finalisation of NWRP Framework Plan.

Comments and feedback can be sent to Irish Water by Tuesday 16 February 2021:

Email: nwrp@water.ie

Post: National Water Resources Plan, Irish Water, PO Box 13216, Glenageary, Co. Dublin.

There will be further opportunities to have your say if we make material modifications to the NWRP Framework Plan in the future.

Safeguarding our water for our future



Cuireann Uisce Éireann síneadh ama leis an gcomhairliúchán poiblí ar an bPlean Náisiúnta um Acmhainní Uisce Dréacht-Chreatphlean

Síneadh Ama leis an gComhairliúchán Poiblí

Tá an chéad Plean Náisiúnta um Acmhainní Uisce riamh uaidh á fhorbairt ag Uisce Éireann faoi láthair. Tabharfar breac-chuntas ann ar conas a bhogfaimid i dtreo soláthar uisce óil a bheidh inbhuanaithe, slán agus iontaofa do gach duine sna 25 bliana romhainn, agus ár dtimpeallacht á caomhnú againn ag an am céanna.

Tá comhairliúchán poiblí ar bun anois ar an bPlean Náisiúnta um Acmhainní Uisce - Dréacht-Chreatphlean agus ar na tuarascálacha timpeallachta a bheidh ag gabháil leis an bPlean Náisiúnta um Acmhainní Uisce - Dréacht-Chreatphlean, lena n-áirítear an Mheasúnacht Straitéiseach Timpeallachta (SEA) agus an Ráiteas Tionchair Natura.

Is féidir na doiciméid a léamh agus a losódáil ag www.water.ie/nwrp agus ag oifig pianála nó Leabharlann Contae d'údarás áitiúil (ag brath ar an údarás áitiúil) le linn a n-uaireanta oscailte faoin Luan an 1 Márta nó ar an dáta sin. Tá seans ann go ndéanfaidh na sríanta reatha difear do na huaireanta oscailte sin. Mar sin de, téigh chuig www.water.ie/nwrp nó déan teagmháil leis an bhFoireann Tionscadail ar **1800 46 36 76** chun mionsonraí a fháil faoi na láithreacha sin agus faoi na huaireanta oscailte.

Sula dtabharfar an Plean Náisiúnta um Acmhainní Uisce - Creatphlean chun críche, cuirfear san áireamh aon aighneachtal nó tuairimí i scríbhinn a sheolfar chuig Uisce Éireann sna 12 seachtaine dar críoch an Luain an 1 Márta i dtaca leis an bPlean Náisiúnta um Acmhainní Uisce - Dréacht-Chreatphlean agus leis an tuarascáil timpeallachta agus an Ráiteas Tionchair Natura a ghabhann leis.

Is féidir tuairimí agus aiseolas a sheoladh chuig Uisce Éireann faoin Luan an 1 Márta 2021:

Ríomhphost: nwrp@water.ie

Post: An Plean Náisiúnta um Acmhainní Uisce, Uisce Éireann, Bosca OP 13216, Gleann na gCaorach, Co. Bhaile Átha Cliath

Beidh tuilleadh deiseanna agat do thuairimí a chur in iúl má dhéanaimid modhnuithe ábhartha sa todhchaí ar an bPlean Náisiúnta um Acmhainní Uisce - Creatphlean.

Ag cosaint ár n-uisce don saol atá romhainn



Cuireann Uisce Éireann síneadh ama leis an gcomhairliúchán poiblí ar an bPlean Náisiúnta um Acmhainní Uisce Dréacht-Chreatphlean

Síneadh Ama leis an gComhairliúchán Poiblí

Tá an chéad Plean Náisiúnta um Acmhainní Uisce riamh uaidh á fhorbairt ag Uisce Éireann faoi láthair. Tabharfar breac-chuntas ann ar conas a bhogfaimid i dtreo soláthar uisce óil a bheidh inbhuanaithe, slán agus iontaofa do gach duine sna 25 bliana romhainn, agus ár dtimpeallacht á caomhnú againn ag an am céanna.

Tá comhairliúchán poiblí ar bun anois ar an bPlean Náisiúnta um Acmhainní Uisce - Dréacht-Chreatphlean agus ar na tuarascálacha timpeallachta a bheidh ag gabháil leis an bPlean Náisiúnta um Acmhainní Uisce - Dréacht-Chreatphlean, lena n-áirítear an Mheasúnacht Straitéiseach Timpeallachta (SEA) agus an Ráiteas Tionchair Natura.

Is féidir na doiciméid a léamh agus a losódáil ag www.water.ie/nwrp agus ag oifig pianála nó Leabharlann Contae d'údarás áitiúil (ag brath ar an údarás áitiúil) le linn a n-uaireanta oscailte faoin Aoine an 12 Márta nó ar an dáta sin. Tá seans ann go ndéanfaidh na sríanta reatha difear do na huaireanta oscailte sin. Mar sin de, téigh chuig www.water.ie/nwrp nó déan teagmháil leis an bhFoireann Tionscadail ar **1800 46 36 76** chun mionsonraí a fháil faoi na láithreacha sin agus faoi na huaireanta oscailte.

Sula dtabharfar an Plean Náisiúnta um Acmhainní Uisce - Creatphlean chun críche, cuirfear san áireamh aon aighneachtal nó tuairimí i scríbhinn a sheolfar chuig Uisce Éireann sna celtire seachtaine déag dar críoch an Aoine an 12 Márta i dtaca leis an bPlean Náisiúnta um Acmhainní Uisce - Dréacht-Chreatphlean agus leis an tuarascáil timpeallachta agus an Ráiteas Tionchair Natura a ghabhann leis.

Is féidir tuairimí agus aiseolas a sheoladh chuig Uisce Éireann faoin Aoine an 12 Márta 2021:

Ríomhphost: nwrp@water.ie

Post: An Plean Náisiúnta um Acmhainní Uisce, Uisce Éireann, Bosca OP 13216, Gleann na gCaorach, Co. Bhaile Átha Cliath

Beidh tuilleadh deiseanna agat do thuairimí a chur in iúl má dhéanaimid modhnuithe ábhartha sa todhchaí ar an bPlean Náisiúnta um Acmhainní Uisce - Creatphlean.

Ag cosaint ár n-uisce don saol atá romhainn



Irish Water extends public consultation on National Water Resources Plan Draft Framework Plan

Public consultation extension

Irish Water is developing its first National Water Resources Plan (NWRP) that will outline how we move towards a sustainable, secure and reliable drinking water supply for everyone over the next 25 years whilst safeguarding our environment.

A public consultation is now underway on the NWRP Draft Framework Plan and the environmental reports that will accompany the NWRP Draft Framework Plan including the Strategic Environmental Assessment (SEA) and the Natura Impact Statement (NIS).

The documents can be viewed and downloaded at www.water.ie/nwrp and at your local authority's planning office or County Library (depending on the local authority) during their opening hours ending on Monday 1 March. These opening hours may be affected by current restrictions, so for details of those locations and opening hours, please visit www.water.ie/nwrp or contact the Project Team on **1800 46 36 76**.

A written submission or observation with respect to the NWRP Draft Framework Plan, and associated environmental report and NIS made to Irish Water within the 12 weeks ending on Monday 1 March will be taken into consideration before the finalisation of NWRP Framework Plan.

Comments and feedback can be sent to Irish Water by Monday 1 March 2021:

Email: nwrp@water.ie

Post: National Water Resources Plan, Irish Water, PO Box 13216, Glenageary, Co. Dublin

There will be further opportunities to have your say if we make material modifications to the NWRP Framework Plan in the future.

Safeguarding our water for our future



Irish Water extends public consultation on National Water Resources Plan Draft Framework Plan

Public consultation extension

Irish Water is developing its first National Water Resources Plan (NWRP) that will outline how we move towards a sustainable, secure and reliable drinking water supply for everyone over the next 25 years whilst safeguarding our environment.

A public consultation is now underway on the NWRP Draft Framework Plan and the environmental reports that will accompany the NWRP Draft Framework Plan including the Strategic Environmental Assessment (SEA) and the Natura Impact Statement (NIS).

The documents can be viewed and downloaded at www.water.ie/nwrp and at your local authority's planning office or County Library (depending on the local authority) during their opening hours ending on Friday 12 March. These opening hours may be affected by current restrictions, so for details of those locations and opening hours, please visit www.water.ie/nwrp or contact the Project Team on **1800 46 36 76**.

A written submission or observation with respect to the NWRP Draft Framework Plan, and associated environmental report and NIS made to Irish Water within the 14 weeks ending on Friday 12 March will be taken into consideration before the finalisation of NWRP Framework Plan.

Comments and feedback can be sent to Irish Water by Friday 12 March 2021:

Email: nwrp@water.ie

Post: National Water Resources Plan, Irish Water, PO Box 13216, Glenageary, Co. Dublin

There will be further opportunities to have your say if we make material modifications to the NWRP Framework Plan in the future.

Safeguarding our water for our future



Appendix F Planning counters & libraries

Local authority	Location	Address
Carlow County Council	Planning Department	Carlow County Council, Athy Road, Carlow R93 E7R7
Cavan County Council	Planning Department	Cavan County Council, Cavan Courthouse, Farnham Street, Cavan H12 R6V2
Clare County Council	Planning Department	Clare County Council, Áras Contae an Chláir, New Road, Ennis, Co. Clare V95 DXP2
Cork City Council	Planning Department	Cork City Council, City Hall, Anglesea Street, Cork T12 T997
Cork County Council	Planning Department	Cork County Council, County Hall, Carrigrohane Road, Cork T12 R2NC
Donegal County Council	Central Library	Donegal Central Library, St Oliver Plunkett Rd, Letterkenny, Co. Donegal F92 R273
Dublin City Council	Planning Department	Dublin City Council, Civic Offices, Wood Quay, Dublin 8 D08 RF3F
Dun Laoghaire-Rathdown County Council	Planning Department	Dun Laoghaire Rathdown County Council, Civic Hub, Dundrum Office Park,

		Main Street, Dundrum, Dublin 14 D14 YY00
Fingal County Council	Planning Department	Fingal County Council, County Hall, Main Street, Swords, Co. Dublin K67 X8Y2
Galway City Council	Planning Department	Galway City Council, City Hall, College Road, Galway H91 X4K8
Galway County Council	Planning Department	Galway County Council, Áras an Chontae, Prospect Hill, Galway H91 H6KX
Kerry County Council	Planning Department	Kerry County Council, Co Buildings, Rathass, Tralee, Co. Kerry V92 H7VT
Kildare County Council	Planning Department	Kildare County Council, Áras Chill Dara, Devoy Park, Naas, Co. Kildare W91 X77F
Kilkenny County Council	Planning Department	Kilkenny County Council, County Hall, John Street, Kilkenny R95 A39T
Laois County Council	Planning Department	Laois County Council, Áras an Chontae, JFL Ave., Portlaoise, Co. Laois R32 EHP9
Leitrim County Council	Planning Department	Leitrim County Council, Áras An Chontae, St. Georges Terrace, Carrick on Shannon,

		Co. Leitrim N41 PF67
Limerick City & County Council	Planning Department	Limerick City & County Council, Dooradoyle Road, Dooradoyle, Limerick V94 WV78
Longford County Council	Planning Department	Longford County Council, Áras An Chontae, Great Water Street, Longford N39 NH56
Louth County Council	Planning Department	Louth County Council, Town Hall, Crowe Street, Dundalk, Co. Louth A91 W20C
Mayo County Council	Planning Department	Mayo County Council, Áras an Chontae, The Mall, Castlebar, Co. Mayo F23 WF90
Meath County Council	Planning Department	Meath County Council, Buvinda House, Dublin Road, Navan, Co. Meath C15 Y291
Monaghan County Council	Planning Department	Monaghan County Council, 1 Dublin Street, Monaghan H18 X982
Tipperary County Council	Planning Department	Tipperary County Council, Civic Offices, Nenagh, Co. Tipperary E45A099
Offaly County Council	Planning Department	Offaly County Council, Áras an Chontae, Charleville Road,

		Tullamore, Co. Offaly R35 F893
Roscommon County Council	Planning Department	Roscommon County Council, Áras an Chontae, Roscommon Town, Co. Roscommon F42 VR98
Sligo County Council	Planning Department	Sligo County Council, Sligo City Hall, Quay St, Abbeyquarter North, Sligo F91 PP44
South Dublin County Council	Planning Department	South Dublin County Council, County Hall, Tallaght, Dublin 24 D24 A3XC
Waterford City & County Council	Carrickphierish Library	Carrickphierish Library, Gracedieu Rd, Carrickphierish, Co. Waterford X91 NN9F
Westmeath County Council	Planning Department	Westmeath County Council, Áras an Chontae, Mount Street, Mullingar, Co. Westmeath N91 FH4N
Wexford County Council	Planning Department	Wexford County Council, Customer Service Unit Block B, County Hall, Carricklawn, Wexford Y35 WY93
Wicklow County Council	Planning Department	Wicklow County Council, County Buildings, Whitegates, Wicklow Town, Co. Wicklow A67 FW96

Appendix G Sample stakeholder email



National Water Resources Plan (NWRP) Draft Framework Plan - Consultation 2

Dear XXX,

Irish Water is developing its first National Water Resources Plan (NWRP) that will outline how we move towards a sustainable, secure and reliable drinking water supply for everyone over the next 25 years whilst safeguarding our environment. The National Water Resources Plan will help us understand the water we have and the water we need, which will help us develop a plan that will:

- Improve the level of service to our customers and communities;
- Support growth and development;
- Be resilient in order to mitigate the impacts of climate change; and
- Be sustainable in order to protect the environment.

As this is our first National Water Resources Plan, we have divided it into two distinct phases, the combination of which will form our overall National Water Resources Plan.

We have developed a [draft Framework Plan](#) which we are currently consulting on with the accompanying [SEA Environmental Report](#) and [Natura Impact Statement](#).

Phase 1 of the NWRP is the development of the NWRP Framework Plan, which sets out;

- How we will assess water supply needs or 'Supply Demand Balance' (quality, quantity, resilience and sustainability) for each Water Resource Zone;
- A description of the methodology we will use to develop solutions to address these needs.

Phase 1 will be subject to Strategic Environmental Assessment and Appropriate Assessment. As part of Phase 1, the NWRP draft Framework Plan and associated environmental reports, have been published for consultation. A ten-week public consultation is now underway, and we are seeking feedback on the NWRP draft Framework Plan and associated environmental reports.

A Strategic Environmental Assessment (SEA) Environmental Report and Natura Impact Statement (NIS) have been prepared to accompany the NWRP Draft Framework Plan as

part of the SEA and Appropriate Assessment processes. These reports demonstrate how environmental considerations have shaped and helped in the development of the NWRP Draft Framework Plan.

These reports have been developed following Consultation One in winter 2017. Feedback received as part of Consultation One has been reviewed and summarised and presented in the Consultation One Report, which can be found [here](#).

Irish Water is now inviting feedback on the draft Framework Plan, the SEA Environmental Report and the Natura Impact Statement (NIS).

For illustrative purposes only, we are including a [Case Study](#) that will help people understand how the methodology is applied to an area. This is not a full or final plan for this area, as the Regional Water Resources Plans are still to be developed, following the adoption of the NWRP – Framework Plan in 2021.

Accordingly, any submissions and observations at this stage will only influence the methodology and not any of the specific options or preferred approaches identified in the Case Study. After this public consultation is complete and Irish Water has adopted the NWRP Framework Plan, then options and preferred approaches in the area of the Case Study (and all other areas) can be influenced in the public consultation on the Regional Water Resources Plans. The following consultation questions have been prepared in order to guide you in making a submission:

1. Do you have any suggestions that you would like Irish Water to consider as part of the draft NWRP Framework plan?
2. Do you have any suggestions that you would like Irish Water to consider as part of how we assess supply/demand balance, water quality, quantity and resilience?
3. The draft NWRP Framework Plan sets out Irish Water's methodology to find high level solutions to address short, medium and long-term issues. Do you have any comments on our methodology?
4. Do you have any comments on the Strategic Environmental Assessment (SEA) Environmental Report and associated Natura Impact Statement (NIS) which accompanies the draft NWRP Framework Plan?
5. The project roadmap has been updated. Do you have any comments or feedback on this?
6. How would you like Irish Water to communicate with you as the NWRP progresses?

Submissions or observations in relation to may be made by 16th February 2021 as follows:

Email: nwrp@water.ie

Post: National Water Resources Plan, Irish Water, PO Box 13216, Glenageary, Co. Dublin

Following on from the public consultation, submissions and observations received will be taken into consideration, and the Framework Plan updated. The Framework Plan will then

be produced, accompanied by a Strategic Environmental Assessment Statement and an Appropriate Assessment Determination. The Framework Plan will be adopted in early 2021, alongside the SEA Statement.

Phase 2 comprises four Regional Water Resources Plans each of which will be subject to Strategic Environmental Assessment and Appropriate Assessment. Each of the four regions will also have their own public consultation phases. These public consultations will take place throughout 2021.

This is your opportunity to feed into the process of how we identify the issues in and determine what the opportunities are for water supply. We are also seeking your feedback on how we will develop options to address any problems identified.

At this stage of the process it is about determining how we assess what we need and how we find solutions. This is your opportunity to shape this process by feeding into the way we find solutions before applying them to specific areas and options.

Once we have developed a robust NWRP Framework Plan this will then allow us to go on and find solutions for the Regional Water Resources Plan.

Please do not hesitate to contact us if you would like to receive a briefing or further information.

Yours sincerely,

A handwritten signature in black ink that reads "Angela Ryan". The signature is fluid and cursive, with a long horizontal stroke extending to the right from the end of the name.

Angela Ryan
Water Resource Strategy Specialist

Appendix H Comparison version NWRP Framework Plan

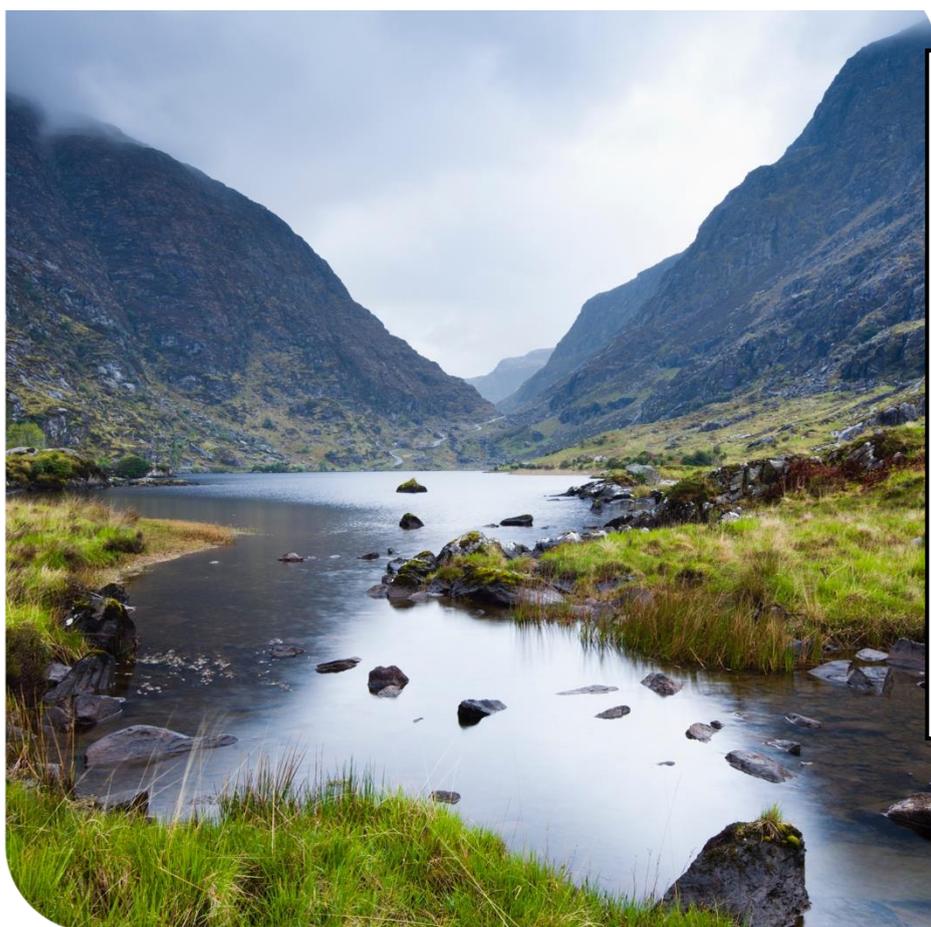
Winter 2020

Spring 2021



National Water Resources Plan – ~~Draft~~ Framework Plan

Irish Water's 25 Year Plan for Our Water Assets



Disclaimer: Irish Water has provided this comparative version document to assist interested parties in identifying changes that were made to the draft Framework Plan following consultation. It has been generated using automatic software, and accordingly there may be inconsistencies in the formatting of certain sections, or in the way that certain changes are shown. Readers should refer to the Framework Plan as definitive, and also to the Consultation Report, which lists all changes that were made to the draft Framework Plan as a result of consultation, under the relevant section headings. Irish Water accepts no responsibility for any reliance that is placed on this comparative version document.



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 will also align to relevant updates in ~~the National Planning Framework~~ [applicable policy](#).

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1

Introduction

1 Key Points

This section contains the following information:

- The National Water Resources Plan (NWRP) and its ~~relation to~~ [relationship with](#) other Irish Water Strategies, Government Policy and Legislation;
- An outline of current water services in Ireland; and
- A summary of future challenges faced in serving the needs of our customers.

1.1 Introduction

Did you know?

- Irish Water was created in 2013~~;~~
- We serve 4.2 million people~~;~~
- We deliver water services to approximately 87% of the population
- Irish Water currently manages 539 individual water supplies in Ireland~~;~~
- We produce over 1.7 ~~million~~ [billion](#) litres of drinking water every day~~;~~ and take wastewater away for treatment before it is returned to our rivers and seas.

Thousands of assets are operated and maintained to provide these services, including:

- 749 water treatment plants, which deliver water through over 65,000km of pipelines~~;~~
- ~~Collecting Wastewater through~~ an estimated 25,000km of sewer network [through which we collect wastewater](#) for treatment in over 1,000 wastewater treatment plants, with associated pumping stations and sludge treatment centres.

1.2 Who we are

On the 1st of January 2014, through the Water Services Act (No. 1) 2013, Irish Water assumed statutory responsibility for the provision of public water services and management of water and wastewater investment. Irish Water's role is to provide public water and wastewater services throughout the country. We are the custodian with the responsibility to manage ~~the~~ [Ireland's](#) precious water resources and, with our Local Authority partners, secure it for future generations. It is our responsibility to ensure that all our customers receive a safe and secure supply of drinking water and have their wastewater collected, appropriately treated and returned to the environment. We support Ireland's social and economic growth in a sustainable manner through appropriate investment in water services and strive to protect the environment in all our activities.

Irish Water is regulated by [the following](#):

- The economic regulator, the Commission for Regulation of Utilities (CRU), is charged with protecting the interests of the customer. The CRU also approves appropriate funding to enable ~~the utility~~ [Irish Water](#) to deliver the required services to specified standards in an efficient manner.

- The environmental regulator, the Environmental Protection Agency (EPA), sets standards and enforces compliance with EU and National ~~Regulations~~ Legislation for drinking water supply and wastewater discharge to water bodies. The EPA liaises with the Health Services Executive in matters of public health.

1.3 What is the National Water Resources Plan

Effective water services, including both the delivery of a sustainable and reliable clean water supply- and the safe disposal of wastewater, are essential for a modern country. Being able to understand and estimate how much water is required, where it is required, and when it is required, is essential to plan appropriately for ~~our Country's~~ Ireland's future.

~~A Water Resources Plan~~ A national water resources plan is a strategic plan used to identify deficiencies and need across ~~a~~ an entire water supply- and to develop plan level capital and operational solutions to address these issues.

Irish Water's National Water Resources Plan (NWRP) will be the first ~~resources~~ such plan for the entire public water supply in ~~the Republic of~~ Ireland. It will allow us to integrate Government Policy, Legislation and external factors including climate change that have the potential to impact our water supplies- into the planning and operation of our existing and future supply asset base.

The objective of the ~~National Water Resource Plan~~ NWRP is to manage customer and communities needs while meeting their requirements over the short, medium and long term- by ensuring safe, secure, sustainable and reliable water supplies. The NWRP will:

- Enable Irish Water to address ~~needs~~ need across our water supplies in the most effective way over time, through the regulated investment cycles;
- Ensure that there is a transparent framework to develop the most appropriate projects/programmes to meet statutory obligations in relation to water supply;
- Provide a framework to track outcomes, allowing interventions to be prioritised in order to bring the water supply up to the required standards in the shortest possible timeframe; and
- Deliver a plan to ensure that all of our customers have access to safe, secure, reliable and sustainable water supplies, wherever they live.

~~As a basis for~~ To ensure broad public and stakeholder engagement, ~~the National Water Resources Plan (the Plan) will be delivered, as described in section 1.9. During this consultation, Irish Water will consult on the methodologies we have developed in the draft Framework Plan (this document) and because it is such an enormous task, the first NWRP is being delivered in two Phases as described in section 1.9 below. Phase 1 is delivery of a Framework Plan, and Phase 2 is delivery of four Regional Water Resource Plans. During the Phase 1 NWRP – Framework Plan, Consultation one, a scoping and screening exercise with statutory consultees was undertaken in order to inform the preparation of a draft Framework Plan with accompanying SEA and Natura Impact Assessment reports. During the Phase 1 NWRP- Framework Plan Consultation two, Irish Water consulted on the draft Framework Plan with accompanying SEA and Natura Impact Assessment reports, and in particular on the methodologies detailed in the draft Framework Plan,~~ in order to identify need and find solutions to address need across all of our supplies. The Framework Plan has been updated and finalised following consideration of all submissions received during consultation and is this document which has been formally adopted by Irish Water together with accompanying SEA Statement and Appropriate Assessment Determination.

~~We will also assess~~ In the Framework Plan we have assessed need across each of the 539 public water supplies nationally, in terms of:

- **Water Quantity** that Irish Water can provide;
- **Water Quality** that Irish Water can provide; and

- Performance and operational efficiency of Irish Water's **Asset Base**.

Water ~~Resources Plans~~ [resources plans](#) are reviewed on a cyclical basis to take account of new information, data, policies and laws and are typically updated every 5 years. We know things will change over the next 25 years so, within the [Framework Plan](#), we have considered a range of possible futures, some more challenging than others. [We have also committed to an ongoing process of monitoring and feedback](#). This approach is called adaptive planning and means we are ready and flexible whatever the future holds.

A glossary of technical terms used is included at the end of the document.

1.4 Water Supply in Ireland

Water is currently abstracted from approximately 1,090 individual sources and treated in 749 Water Treatment Plants (WTPs). The size of these WTPs varies significantly across the country, with the largest 72 producing 73% of the water supplied, and the smallest 500 producing on average about 6% or 0.2MI/d of the total supply.

The WTPs feed water into supply areas known as Water Resources Zones (WRZs). Each WRZ is an independent water supply system serving a region, city, town or village and is governed by topography or the extent of the water distribution network in an area. Within a WRZ most customers receive the same Level of Service (LoS), measured as a probability of interruption to services (for example one interruption to supply in 50 years). There are 539 WRZs in Ireland. These range in size, serving populations of less than 30 people (small rural areas) up to ~~4.6~~ [1.7](#) million people (Greater Dublin Area - GDA).

Ireland has a dispersed population and water supplies were historically developed in response to need in the immediate vicinity. As a result, some supplies were developed using surface or groundwater sources with limitations in terms of quantity available and/or variable raw water quality. Also, due to long term under investment in water services, many of our water supply assets (WTPs, water mains etc) are in need of upgrades or additional infrastructure is required.

~~As a result, there~~ [There](#) are a number of key issues that impact the quality, sustainability and reliability of our existing water supplies, ~~including:~~ [including:](#)

- **Single Source Supplies:** Many WRZs rely on a single source of supply, meaning they are more vulnerable to interruptions to supply;
- **Inappropriate Water Sources:** Current supplies often come from small local rivers. We must ensure that our abstractions do not adversely impact the environment so that Ireland can comply with its obligations under the Water Framework Directive;
- **Treatment Capacity:** Rapid growth in some areas has meant that some of our WTPs are undersized and treat water in quantities that exceed the original design capacity of these facilities;
- **Water Quality:** Although 99.6% of samples passed quality tests in 2019, some of our water treatment facilities and distribution systems do not function as effective barriers to reduce risk and may not consistently ensure safe drinking water at Customer's taps. A legacy of under-investment has exacerbated the problems with some water supply assets.
- **Network Performance:** The performance of our distribution networks does not meet European norms, and leakage and distribution losses are unacceptably high. Key issues include:
 - The average age of the water mains infrastructure in Ireland is estimated at between 65 and 85 years. This compares to an EU average of 36 years¹

¹ European Benchmarking Cooperation 2013

- Some of the cast iron mains in our cities and towns are often heavily corroded and vary in age from 50 to 160 years, giving rise to high leakage, rust discolouration and high risk of failure causing supply disruption.
- Other pipe materials such as uPVC and Asbestos Cement laid between the 1960s and 1980s can also be problematic with high burst frequency
- **Constrained Funding:** Due to long term underinvestment in water services many of our assets are failing and are in need of significant capital investment. ~~Coupled with stricter~~ This issue, coupled with increasingly strict EU standards, ~~regarding~~ treated water quality and protection of the environment, are together driving the need to increase as opposed to reduce expenditure.

1.5 Progress to date

Irish Water has made positive progress in improving water quality for our customers by developing policies and strategies for our water supplies. We have progressed projects and programmes to deliver the requirements of these policies. Irish Water's Investment periods, (known as Revenue Control periods) set out how much Irish Water can spend on projects and programmes for that period and are subject to oversight by and approval of the CRU.

The first Capital Investment Plan covered the period 2014-2016. The second investment plan covered 2017 to 2019. We are currently at early implementation stages of the new investment plan for 2020-2024.

Between January 2014 and December 2019 Irish Water invested €3.9 billion in public water and wastewater infrastructure, with a further projected spend of circa €5bn by 2024. We have invested in a range of water projects and programmes that will support and enable proper planning and sustainable development at a national, regional and local level. The objective of this approach has been to deliver a balanced portfolio of investment across the three themes of Quality, Conservation and Future Proofing.

~~1.1~~ ~~1.2~~ ~~1.3~~ ~~1.4~~ ~~1.5~~ **1.5.1 Water Quality**

Irish Water aims to lift Boil Water Notices (BWN) through targeted investment and we have successfully achieved this for 79,507 people since 2014. Nearly 16,000 of these people were on long term boil water notices. Through investment in water assets and infrastructure, Irish Water has removed 174 public water schemes from the EPA's remedial action list. Over the same period (2014-2019) an additional 86 schemes have been added, leaving 52 schemes with remedial works remaining.

Since the start of 2014, 72 WTPs have been rationalised by Irish Water by laying a water main connection to a neighbouring treatment plant. We are also delivering a range of national programmes to address high risk water supplies. Through our National Disinfection Programme, we have upgraded a total of 255 WTPs and under our National Lead Programme we have replaced a total of 32,641 lead services, representing a significant investment in protecting public health.

1.5.2 Water Conservation

Water conservation is a key focus for Irish Water. Our National Leakage Reduction Programme is reducing leaks across Ireland by fixing or replacing old, damaged pipes and removing lead service pipes from the network. Through this programme we have achieved total gross leakage savings of 154.2 MI/d on the private side and 233.2 MI/d on the public side of the water distribution network for the 2014-2019 period.

1.5.3 Future Proofing

Between 2014 and 2019 we delivered key outcomes to support growth including constructing 11 new WTPs and upgrading 36 WTPs. We have also laid a total of 1,906km of new and rehabilitated water main. Major national strategic infrastructure water projects have also been progressed during this time,

including the Vartry Water Supply Scheme (Co Dublin and Wicklow) and Lough Guitane WTP (Kerry). These projects are of vital importance and critical to meeting Ireland's growing water needs.

Despite this progress, Irish Water will have further challenges to address. Therefore, it is essential that we put in place a ~~National Water Resources Plan~~ [NWRP](#) in order to keep making progress in a strategic and prioritised way for the next 25 years. ~~This Plan~~ [The NWRP](#) will ~~then~~ help Irish Water inform the capital investment plans for each future investment cycle.

1.6 Our Future Challenges

Ireland has a temperate climate with relatively high annual average rainfall, so while it is easy to assume that there is plenty of water available for supply, this is not always the case. Rainfall is unevenly distributed across the country, with more falling in the west than the east. Figure 1.1 shows that the areas with lowest rainfall have the greatest population density, meaning resources in our most populated areas can become stressed.

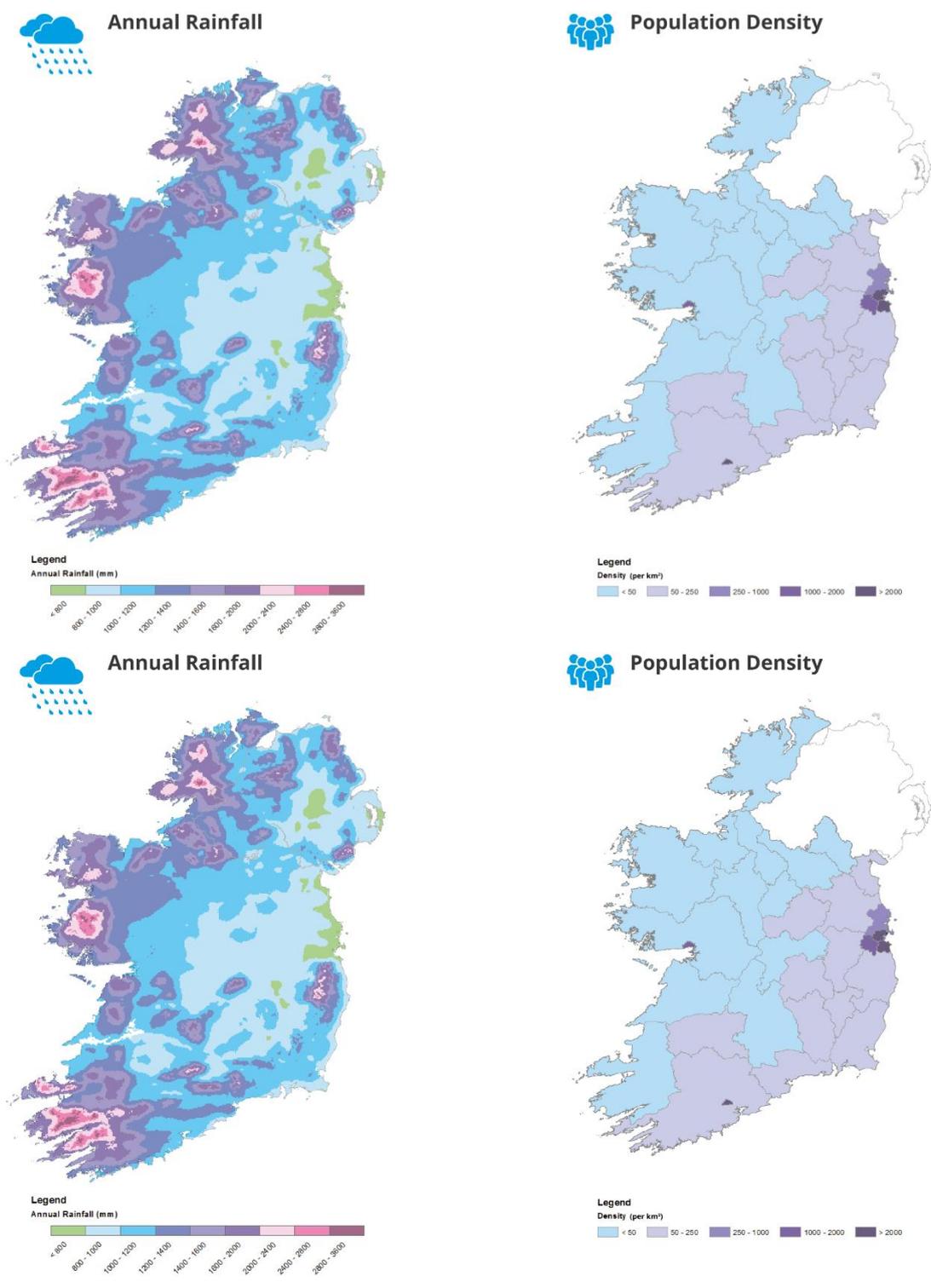


Figure 1.1 - Rainfall in Ireland compared to population density

In addition, we also face key challenges over the coming years, which have the potential to exacerbate the current problems with our water supplies:

- **A growing population:** The country's population is expected to increase by 21% or 1.2 million people over the next 25 years, this will impact on the demand for water;
- **Changes in land use and emerging contaminants:** Increasing pressure on the quality of water in the natural environment before it is treated, due to changes in land use, emerging contaminants and higher quality/supply standards required under the recast Drinking Water Directive;

- **A changing climate:** Changing weather patterns reducing available supplies and increasing the frequency of droughts and other extreme weather events that can result in interruptions to supply; and
- **An Environment in Need:** We currently abstract water from rivers and groundwater aquifers for the purpose of water supply. We need to make sure we leave enough water in the environment to protect the health of rivers and wildlife. Forthcoming ~~Abstraction Legislation~~ [abstraction legislation](#), required to ensure that Ireland can meet its obligations under the Water Framework Directive, may reduce the amount of water we are able to abstract from some of our sources in the future.

If we can address these challenges as part of our Plan, we will ensure that future infrastructure development is proportionate to identified need and is sustainable, reliable and resilient.

1.7 Thinking Ahead

The consequences of not planning properly are significant for society, the economy and the environment. We need to take proactive steps to make sure that we have sufficient water for future generations, and that our supplies are safe, secure, reliable and sustainable.

We've looked at a wide range of options to address identified ~~needs~~ [need](#) under three key pillars:

Lose Less: This pillar focuses on reducing water lost through leakage and improving the efficiency of our distribution networks. Only a tiny proportion of leaks within our distribution networks come to the surface as visible leaks. Most water leakage is absorbed into the ground or escapes into sewers and drains, so cannot be seen at ground level. The lose less pillar includes the actions which will improve our understanding of leakage, ways to reduce it, and the tools required to help us to find and fix leaks.

Use Less: This pillar focuses on the potential for us all to use less water in our everyday lives ~~and~~ and looks at activities to help understand water use habits, influence behaviour, ~~to~~ encourage change and promote water efficient devices and appliances for domestic and non-domestic customers.

Supply Smarter: This pillar focuses on improving the quality, resilience ~~and~~ and security of our supplies through infrastructure improvements, operational improvements and developing new sustainable sources of water. The Supply Smarter pillar includes actions to proactively engage in the protection our natural water resources, improve the performance and resilience of existing supplies, improve interconnectivity within our supply networks, increase the amount of water available for use, reduce risk, improve compliance, address the environmental impacts of existing abstractions and mitigate the impacts of climate change. We also support this through asset maintenance, operations and by delivering process optimisation and training.



The key option types for infrastructure improvements under the supply smarter pillar are shown in Figure 1.2.

Figure 1.2 - Key option types

1.8 Context for the National Water Resources Plan – A Plan based on Policy

The context for the NWRP lies primarily in Government Legislation and Policy for water services, growth and [economic](#) development, protection of the environment and climate change adaptation.

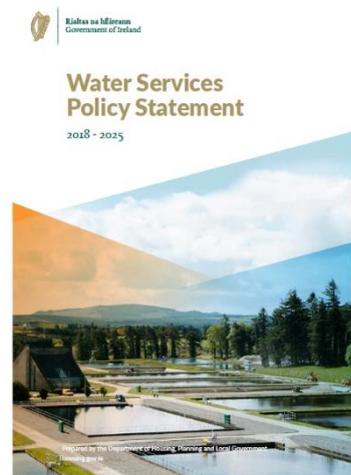
We operate under an economic regulatory regime which requires us to operate efficiently, having regard to whole life cost of supplies. We must develop a strategic plan for our water supply infrastructure that provides a clear and transparent roadmap for how we operate, maintain, reinforce, develop and invest in our asset base aligned to national policy that ensures the best outcomes for water users.

The key policies feeding into our NWRP are:

- Water Services Policy Statement (WSPS);
- Project Ireland 2040 – National Planning Framework (NPF);
- Water Framework Directive (WFD) & River Basin Management Plan (RBMP) for Ireland;
- National Adaptation Plan (NAP) & Adaptation Plan for Water Quality and Water Services Infrastructure; and the
- Recast Drinking Water Directive (DWD).

1.8.1 Water Services Policy Statement

The WSPS (2018-2025) identifies high-level objectives and priorities for delivery of water and wastewater services between 2018 and 2025. It was prepared by the Department of Housing, Planning and Local Government, in line with the Water Services Act (2017) giving clear direction to strategic planning and decision-making on water and wastewater services in Ireland. The themes and policy objectives contained within the WSPS are complementary to the strategic objectives set out in Irish Water’s Water Services Strategic Plan (WSSP).



The NWRP is aligned with the three themes in the WSPS namely:

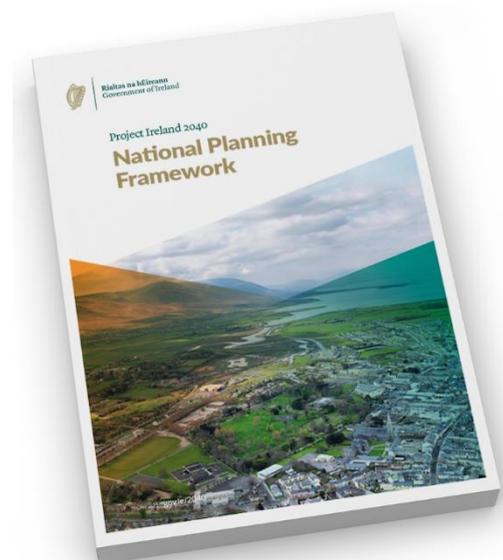
- Water Quality;
- Water Conservation; and
- Futureproofing of Assets.

1.8.2 Project Ireland 2040 - National Planning Framework

Project Ireland 2040 - National Planning Framework (NPF)² is a high-level strategic planning and development guidance for the country over the next 20 years, underpinning population growth that is economically, socially and environmentally sustainable.

[The National Development Plan \(NDP\) 2018-2027 sets out the investment priorities that will provide the foundation for implementation of the NPF and the commitment to public investment reform.](#)

We have used the best available information from the NPF and [three](#) Regional Assemblies when developing our demand forecasts within this ~~iteration of the draft~~ Framework Plan. Therefore, our ~~draft~~ Framework Plan directly aligns with national policy on growth and allows us to understand the role of the public water supply in supporting future growth and development.



[Information from the Regional Assemblies will also be used in the Regional Water Resources Plans which will be developed as Phase 2 of the NWRP, as discussed in section 1.9.](#)

² Project Ireland 2040 – National Planning Framework (Feb 2018)
 9 | Irish Water | [Draft National Water Resources Plan - Framework Plan](#)

The Local Authority Development Plans, required under the Planning and Development Act, 2000 as amended, must be consistent with the NPF. Therefore, as pertinent demographic information from the Development Plans becomes available, it will be incorporated into our NWRP on a county by county basis [as the NWRP evolves over time](#). This will ensure that our strategic plans best reflect need in the communities we serve. In turn, information from Irish Water's capacity registers will be made available for the purposes of Development Plans. This process will involve an ongoing feedback loop between the Resources Planning process and the forward planning processes in Irish Water, the Regional Assemblies and the Local Authorities.

1.8.3 Water Framework Directive and River Basin Management Plan for Ireland 2018-2021

The European Union Water Framework Directive (WFD) (2000/60/EC) and the subsequent River Basin Management Plan (RBMP), are referenced by the [Framework](#) Plan as they set the objectives for managing the water bodies in our natural environment from abstraction to final discharge.

The RBMP sets out the WFD objectives for Ireland. It considers the actions Ireland will need to take to improve water quality and to achieve at least "Good" ecological status in waterbodies (rivers, lakes, estuaries, and coastal waters) by 2027.

The RBMP drives a programme of measures to deliver a more considered and balanced approach to the water taken from the environment and any potential impacts arising.

The RBMP will influence from where, in what quantities, and under what conditions we can abstract water for the public water supply. The RBMP sets the constraints around our existing abstractions including any measures that may need to be undertaken to reduce the environmental impacts on these existing sources. It will also ~~set~~ [influence](#) the legislative framework within which any new abstractions we develop must conform.

1.8.4 National Adaptation Framework – Sectoral Adaptation Planning

Building on the work completed under the National Climate Change Adaptation Framework (NCCAF 2012), the Department of Communications, Climate Action and Environment published Ireland's first statutory National Adaptation Framework (NAF), in January 2018. The NAF sets out the national approach to adaptation in Ireland ~~in order~~ to reduce the negative impacts of climate change. The approach requires each government department to develop a Sectoral Adaptation Plan for their area of responsibility.

As part of ~~this framework~~ [the NAF](#), the Department of Housing, Planning and Local Government (DPHLG) produced the Sectoral Adaptation Plan for Water Quality and Water Services Infrastructure. Figure 1.3 lists the acute priority impacts on water services and their associated risk controls and adaptation measures as stated in the [Sectoral](#) Adaptation Plan.

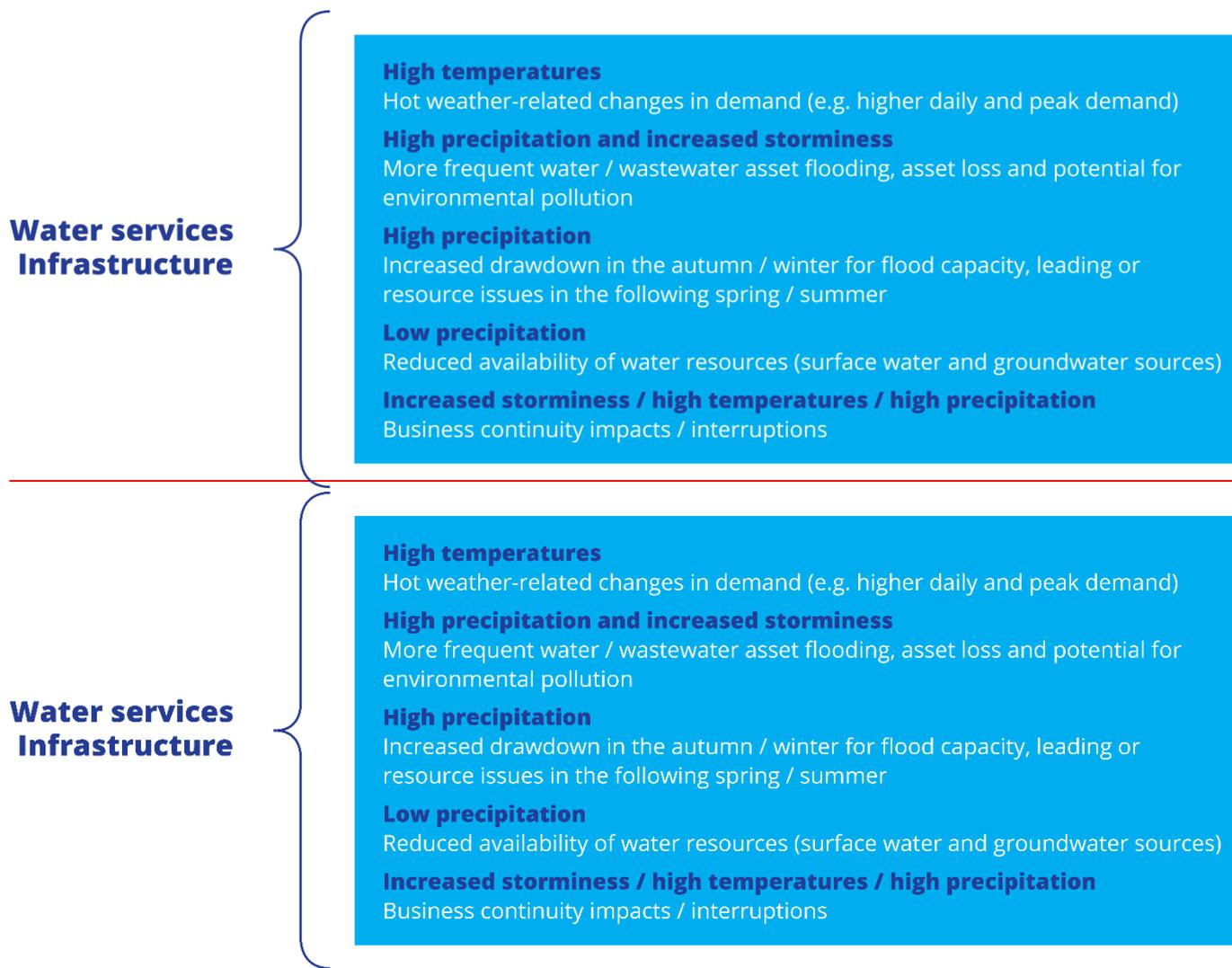


Figure 1.3 - Adaptation Plan Acute Priority Impacts

The NWRP is called out as an adaptation measure under all the identified acute priority impacts within the Sectoral Adaptation Plan.

[We note the Climate Action and Low Carbon Development \(Amendment\) Bill 2021 was published in March 2021 and at the time of finalising this Framework Plan, it is being debated by the Oireachtas. We will incorporate this new policy into our Water Resources Planning process and will review as part of the Regional Water Resources Plans in accordance with our feedback and monitoring process.](#)

1.8.5 Drinking Water Directive

The Recast Drinking Water Directive (DWD)³ has updated the quality standards for water intended for human consumption and has introduced minimum hygiene requirements for materials in contact with drinking water (e.g. pipes, taps). A watch-list mechanism will allow for the monitoring of substances or compounds of public or scientific concern to health, such as endocrine disruptors, pharmaceuticals and microplastics.

³ Drinking Water Directive (98/83/EC), Provisional Agreement of Recast Directive 18th December 2019

In addition, EU Members must ensure the safety of drinking-water supplies with a comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to consumer. Greater transparency on water quality information must also be provided.

1.8.6 How Our Plan is Designed to Incorporate Policy

On the 1st of January 2014, through the Water Services Act (No. 1) 2013, Irish Water assumed statutory responsibility for the provision of public water services and management of water and wastewater investment. Subsequent legislation, the Water Services (No. 2) Act 2013, required that Irish Water prepare a Water Services Strategic Plan (WSSP) setting out the company's objectives in relation to the provision of public water services for the State over a 25-year period. Under the Act, the WSSP is required to address the following aspects:

- Drinking Water Quality;
- The prevention or abatement of risk to human health or environment relating to provision of water services;
- Existing and projected demand for water services;
- Existing and planned arrangements for provision of water services;
- Existing and reasonably foreseeable deficiencies in the provision of water services;
- Existing and planned water conservation measures; and
- The management of the property of Irish Water.

Work on the WSSP commenced in early 2014 and included the publication of the WSSP Issues Paper in July 2014, which was subject to public consultation for a period of five weeks. Further to responses on the WSSP Issues Paper and stakeholder engagement, statutory consultation as part of ~~Strategic Environmental Assessment (SEA)~~ [SEA](#) on the draft WSSP was conducted between ~~the~~ 19 February 2015 and 17 April 2015. The final WSSP was approved by the (then) Minister of Environment Planning and Local Government in October 2015.

The adopted WSSP sets out six strategic objectives, to achieve the statutory requirements of the plan:

- Meet Customer Expectations;
- Ensure a Safe and Reliable Water Supply;
- Provide Effective Management of Wastewater;
- Protect and Enhance the Environment;
- Support Social and Economic Growth; and
- Invest in Our Future.

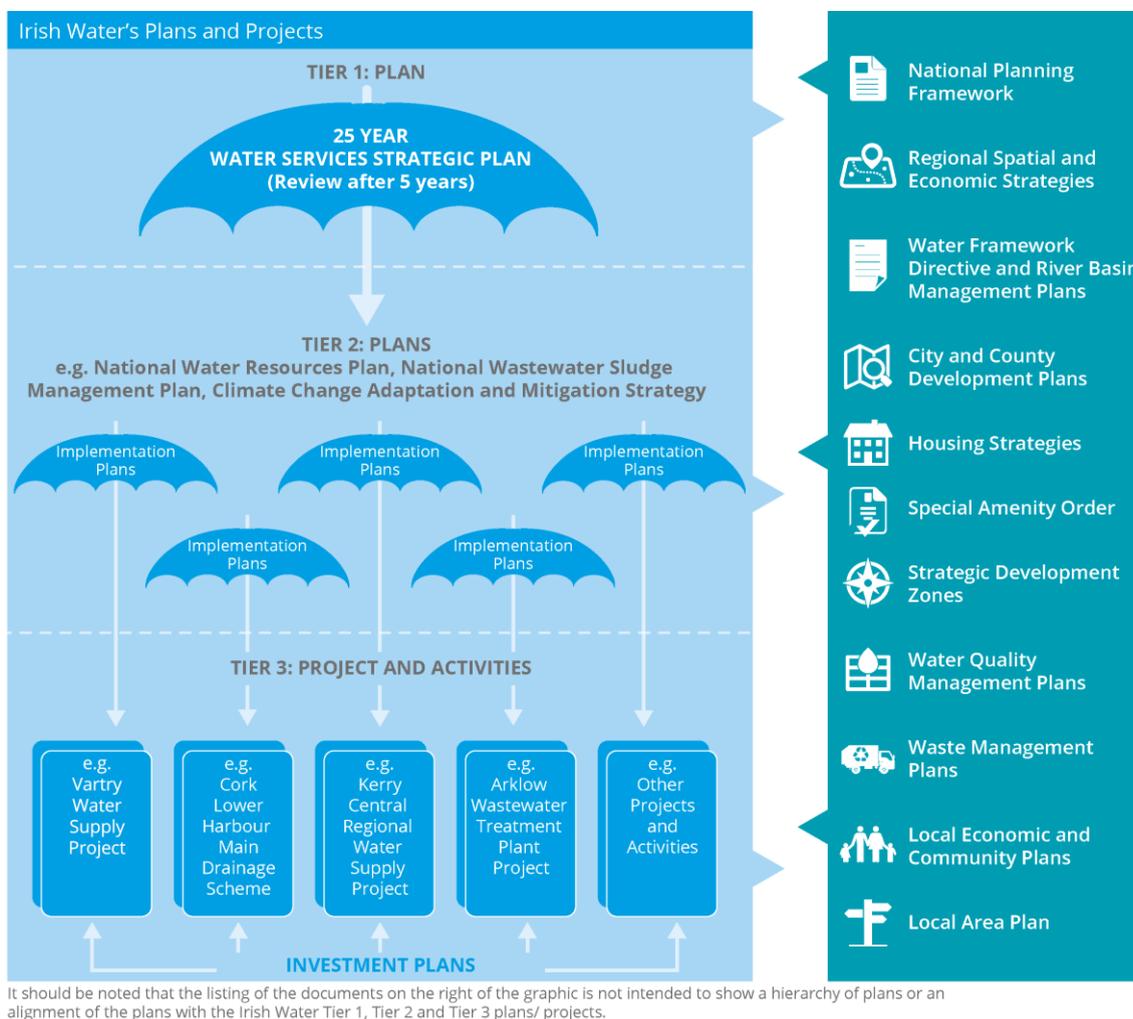
Figure 1.4 shows that the WSSP is a Tier 1 Plan, which sets out the strategic objectives for the business. It also sets the context for the Tier 2 implementation plans which are the framework by which we develop the processes, programmes and projects to meet the objectives set out in the WSSP.

The NWRP is one of our Tier 2 Implementation Plans and was called out as a requirement within the WSSP. The NWRP focusses on water supply, particularly in relation to five of the six objectives set out in the WSSP:

- Meet Customer Expectations;
- Ensure a Safe and Reliable Water Supply;
- Protect and Enhance the Environment;
- Support Social and Economic Growth; and
- Invest in Our Future.

The NWRP will ensure that we have a transparent Framework Plan and Regional Water Resources Plans to allow us to provide a safe, secure, reliable and sustainable water supply now and into the future.

In line with the statutory requirements of the WSSP, once adopted, the NWRP will become Irish Water’s strategic framework for the delivery of water services, which in turn will assist in planning projects and programmes to address water supply issues in conjunction with updates to applicable national policies. These will then be prioritised and brought forward through our regulated 5-year investment cycles. Figure 1.4 also shows that the NWRP will be the means by which we directly align government policy with our strategic plans for water services.



It should be noted that the listing of the documents on the right of the graphic is not intended to show a hierarchy of plans or an alignment of the plans with the Irish Water Tier 1, Tier 2 and Tier 3 plans/projects.

Figure 1.4 - How Irish Water incorporates government policy into our strategic plans. Please note the NWRP consists of Phase 1 National Water Resources Plan-Framework Plan & Phase 2 (x4) Regional Water Resources Plans.

1.9 National Water Resources Plan – What is the Process?

The ~~National Water Resources Plan~~ NWRP is subject to the provisions of the European Council Directive on assessment of the effects of certain plans and programmes on the environment (Directive 2001/42/EC). This is known as the Strategic Environmental Assessment (SEA) Directive and its provisions are transposed into Irish law by European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435 of 2004 as amended in 2011⁴). The Directive is applicable to the National Water Resources Plan.

As this is our first ~~National Water Resources Plan~~, NWRP we have divided it into two distinct phases, the combination of which will form our overall National Water Resources Plan.

⁴ <http://www.irishstatutebook.ie/eli/2011/si/200/made/en/print>

Phase 1 is ~~a National Water Resources Plan~~ the NWRP – Framework Plan, which ~~will be~~ has been subject to ~~Strategic Environmental Assessment~~ SEA and Appropriate Assessment. This is the final version of that Framework Plan, as adopted.

Phase 2 comprises ~~of~~ four Regional Water Resources Plans each of which will be subject to ~~Strategic Environmental Assessment~~ SEA and Appropriate Assessment.

1.9.1 What has happened to date?

The development of the NWRP commenced in 2017 and involved:

- Identifying best practice that could be applied for water resource planning in Ireland;
- Identifying all issues related to water supply including, quality, quantity, leakage, reliability and sustainability;
- Developing a robust methodology to identify and prioritise programs of work to address the identified need; and
- Early stakeholder engagement and consultation with key stakeholders.

SEA screening was conducted in August 2017 by Irish Water (as the responsible authority) and we determined that SEA of the NWRP was required in accordance with Directive 2001/42/EC.

Irish Water developed:

- An SEA Scoping Report outlining the geographical and temporal scope of the NWRP Methodology and SEA;
- The baseline environment for the plan; and
- A proposed framework of SEA objectives to inform the strategic assessment.

Consultation with the ~~Environmental Authorities~~ environmental authorities and non-statutory consultation (Phase 1 NWRP – Framework plan Consultation one) was carried out on the ~~Strategic Environmental Assessment~~ SEA Scoping Report between November 2017 and January 2018. Feedback from ~~this~~ consultation ~~has been~~ was incorporated into our draft Framework Plan and the SEA process.

Since June 2018, we have undertaken extensive engagement with our local authority partners. As part of the development of the Phase 1 NWRP draft Framework Plan, regular presentations and workshops were undertaken with each of the 31 local authorities across the country.

~~Further non-statutory consultation and engagement has been ongoing with Local Authorities and stakeholders during 2019 and 2020. Our consultations to date are~~ The feedback from the Phase 1 NWRP-Framework Plan Consultation one is summarised in Figure 1.5 and further detail is provided in Appendix A. A high-level overview of the NWRP consultation roadmap is summarised in Figure 1.6.

Phase 1 NWRP – Framework Plan SEA Scoping (Consultation One)	Phase 1 NWRP – Framework Plan Non-statutory Local Authority and Stakeholder Consultation <u>engagement</u>
<ul style="list-style-type: none"> • 1,186 Website hits • 150 update emails • 71 queries • 36 stakeholder briefings • 18 pieces of media coverage • Conferences and workshops 	<ul style="list-style-type: none"> • 29 workshops across 31 Local Authorities between June and July 2019 • Over 1800 comments reviewed • Data validated for 539 WRZs, 1090 Abstractions and 749 WTPs

Figure 1.5 - Summary of ~~NWRP Consultation~~ Phase 1 NWRP – Framework plan consultation one prior to publication of draft Framework Plan

The SEA requirements have been integral to the development of the NWRP to ensure the environment is considered throughout the process. This is described fully in the accompanying SEA ~~Environment Report~~ Statement.

SEA objectives identified through SEA scoping consultation process have been taken into account in the ~~assessment preparation~~ of the ~~draft~~ Framework Plan and the Options Assessment Methodology set out ~~therein~~ in it. This Options Assessment Methodology will be applied to each Water Resource Zone as part of Phase 2 of the NWRP, the preparation of the Regional Water Resources Plans.



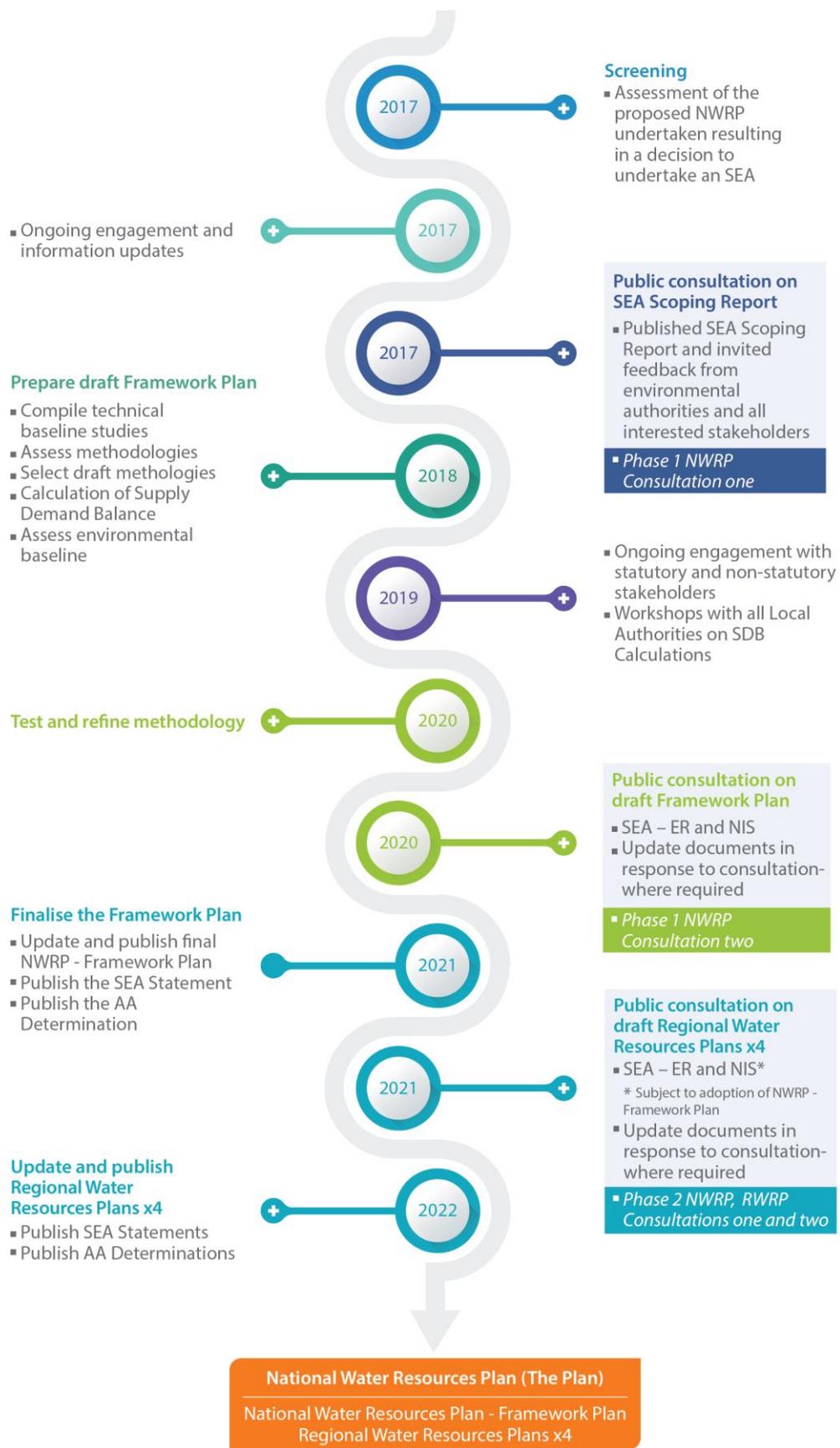
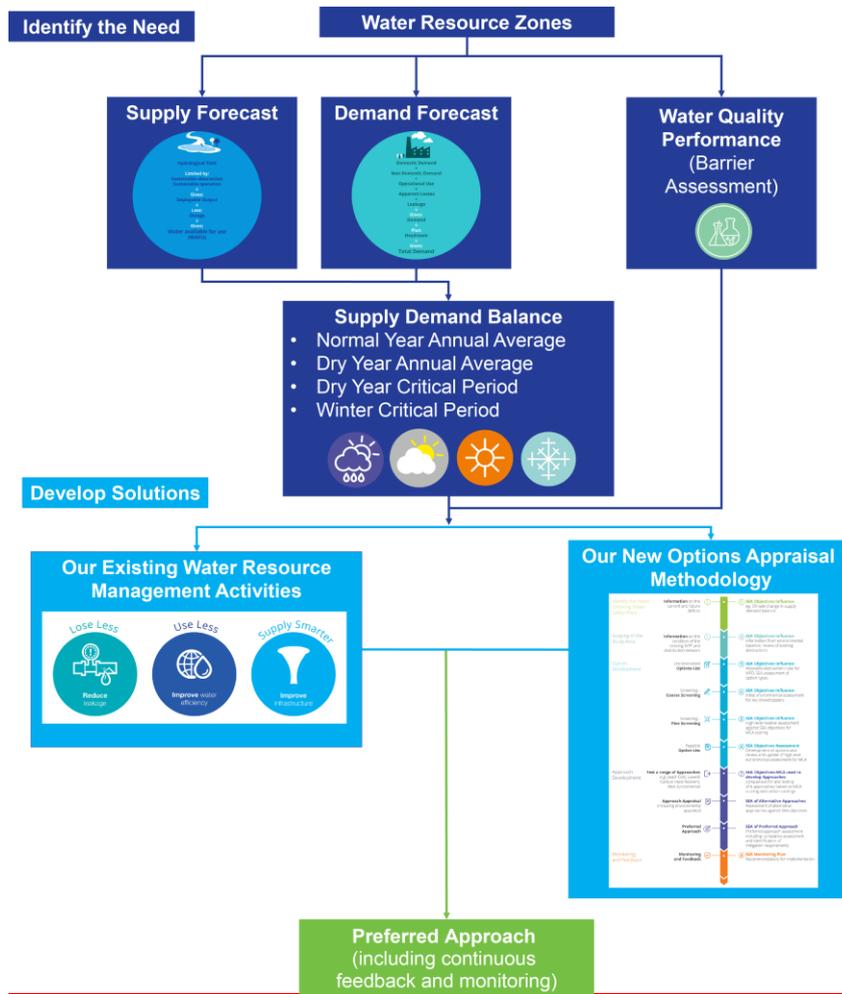


Figure 1.6 - [NWRP](#) Consultation Roadmap

1.9.2 Where Are We Now -- Phase 1 Consultation ~~This draft [NWRP – Framework Plan](#) is currently open for public consultation with accompanying SEA Environmental Report and Natural Impact Statement.~~

The Framework Plan includes:

- A description of the methodology we propose to use for Water Resources Planning:
 - How we assess quantity need through the Supply Demand Balance
 - How we assess quality and reliability need through the Barrier Assessment
 - How we address sustainability by ensuring that all new options for water supply must be based on conservative approaches to protecting water sources
 - Our Options Assessment Process
 - Our Preferred Approach Development Process
- An assessment of Need across our asset base in terms of Quality, Quantity, Reliability and Sustainability for all of our supplies nationally (Figure 1.7).



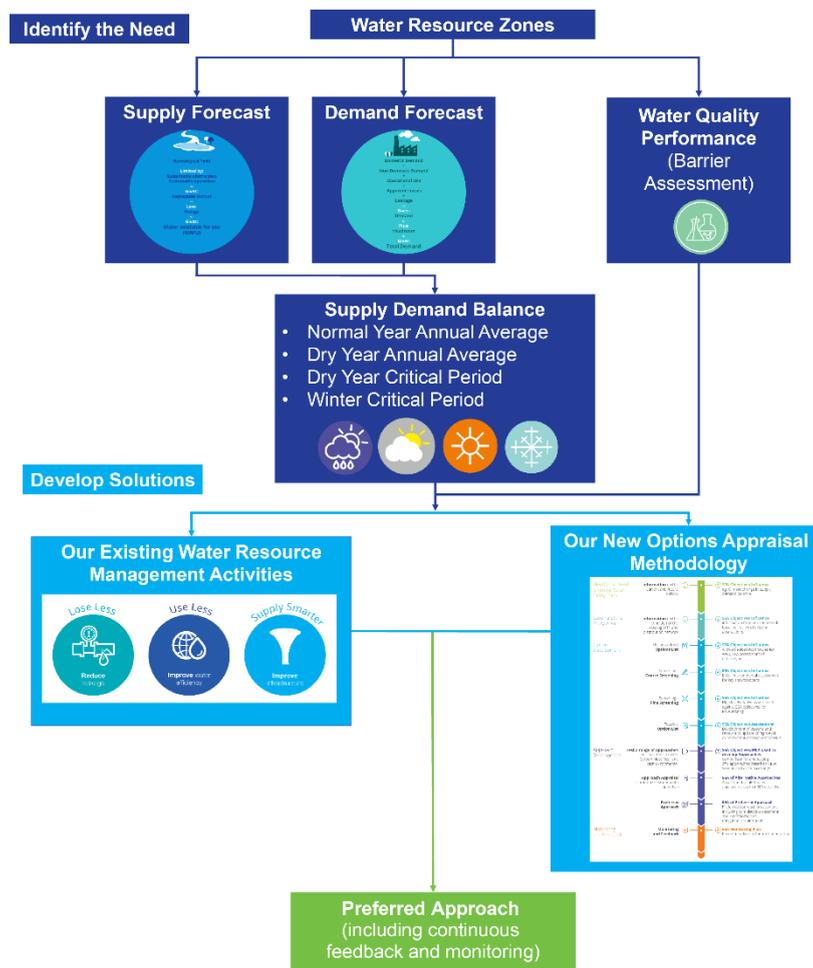


Figure 1.7 – Our NWRP Options Process

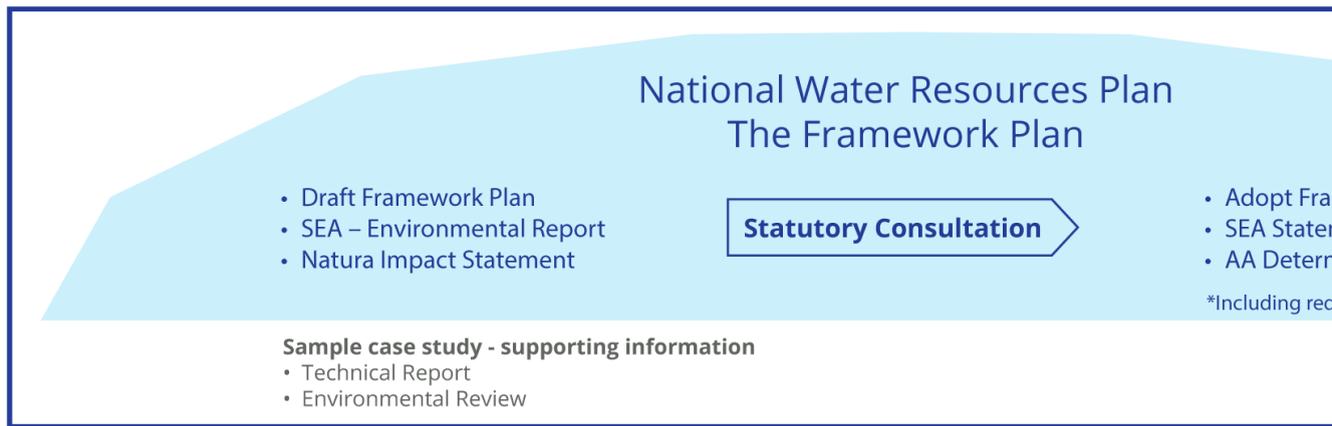
~~As part of this stage of the public consultation~~ During the Phase 1 NWRP – Framework plan Consultation two, and for illustrative purposes only, we are including included a case study that will to help people understand how the proposed methodology is was applied to an area (to bring it to life). This is case study was not a full or final plan for this area, as the full draft Regional Water Resources Plans are still to be being developed, ~~following the adoption of the NWRP – based on this~~ Framework Plan in 2021, as Phase 2 of the NWRP.

~~Figure 1.8 summarises the component parts of the parts of the National Water Resources Plan and how these interact. Phase 1 of the overall Plan, the Framework Plan (this phase), is highlighted in a blue box.~~

Figure 1.8 summarises the key components of the NWRP (the Framework Plan and four Regional Water Resources Plans) and the consultation steps that were undertaken for Phase 1 and will take place for Phase 2 of the NWRP.

National Water Resources Plan (The Plan)

PHASE 1 – Framework Plan



PHASE 2 – Regional Water Resources Plans



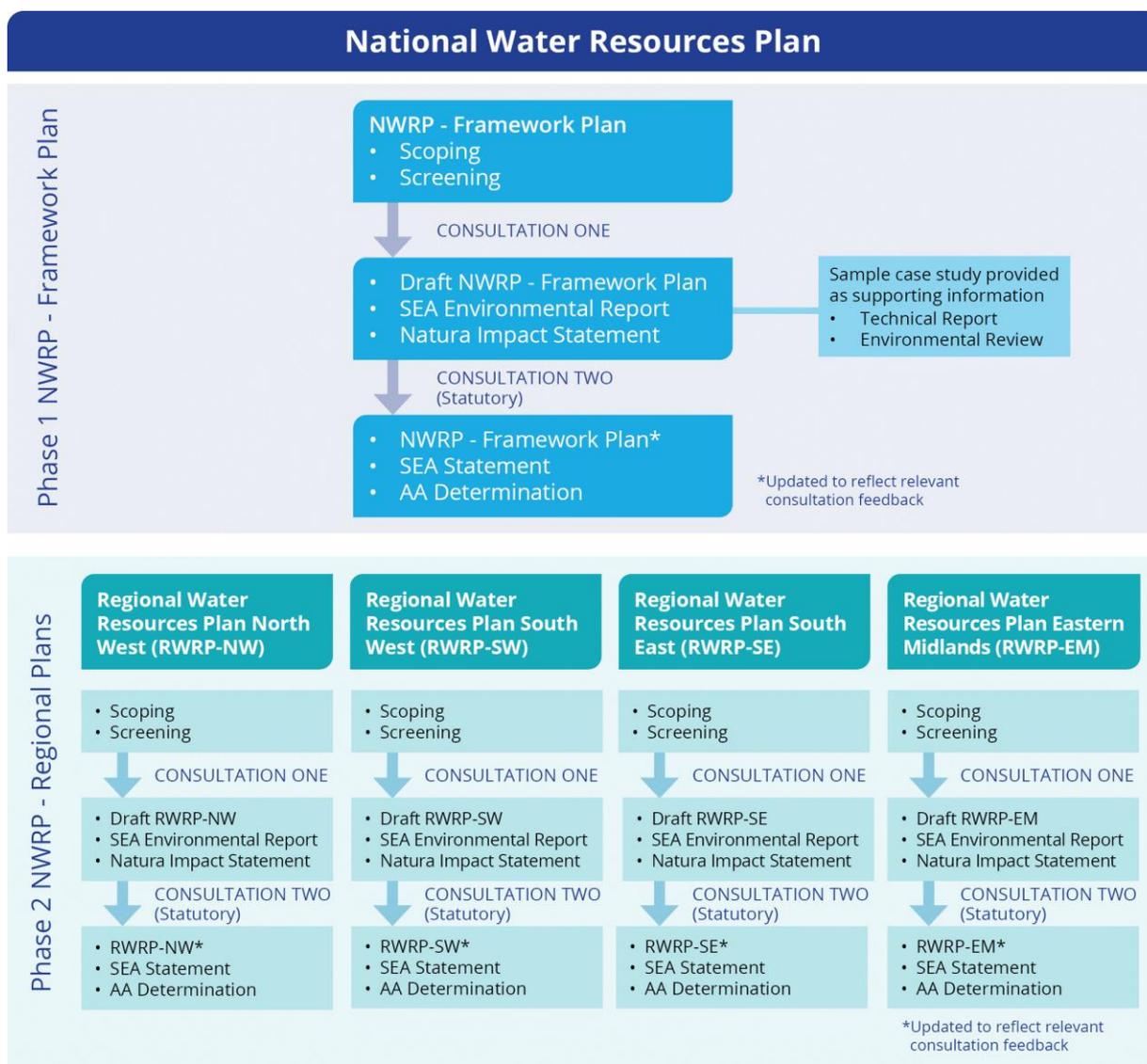


Figure 1.8 – Component Parts of National Water Resources Plan

[The Phase 1 NWRP - Framework Plan Consultation two ran from Tuesday 8th December 2020 to Friday 12th March 2021.](#)

The consultation on the draft Framework Plan will last for 10 weeks, and Irish Water is inviting feedback on the following consultation questions

- ~~Do you have any suggestions that you would like Irish Water to consider as part of the draft Framework plan?~~
- ~~Do you have any suggestions that you would like Irish Water to consider as part of how we assess supply/demand balance, water quality, quantity and resilience?~~
- ~~The draft Framework Plan sets out Irish Water’s methodology to find high level solutions to address short, medium and long term issues. Do you have any comments on our methodology?~~
- ~~Do you have any comments on the Strategic Environmental Assessment (SEA) Environmental Report and associated Natura Impact Statement (NIS) which accompanies the draft Framework Plan?~~
- ~~The project roadmap has been updated. Do you have any comments or feedback on this?~~
- ~~How would you like Irish Water to communicate with you as the NWRP progresses?~~

1.9.3 What are the next steps? 1.9.3 Adopting the National Water Resources Plan NWRP – Framework Plan

~~Following on from the consultation phase, there is still some important work to be done before the Framework Plan is finalised.~~

~~The submissions/ observations received from public consultation will be taken into consideration, and the Framework Plan updated if required.~~

This Framework Plan is an amended version of the draft Framework Plan as consulted on during Phase 1 NWRP - Framework Plan Consultation two. It has been amended in light of and following consideration of all submissions received.

The consideration given to all of the submissions received on the draft Framework Plan is contained in a Consultation Report. The Consultation Report attaches a version of this Framework Plan showing all changes made to the draft Framework Plan.

~~The Final NWRP – Framework Plan will then be produced, accompanied by a Strategic Environmental Assessment Statement and an~~ This Framework Plan is accompanied by an SEA Statement and Appropriate Assessment Determination, as required by law, which were adopted with this Framework Plan by Irish Water. A Non-Technical Summary of the Framework Plan has also been prepared.

These Phase 1 NWRP- Framework Plan documents can be viewed at <https://www.water.ie/projects-plans/our-plans/nwrp/>

1.9.4 Start of Phase 2 NWRP –Regional Water Resources Plans

As explained above, this is our first NWRP. It considers 539 individual Water Resource Zones and 65,0000 km of distribution network. The scale of the undertaking is especially significant when we compare this against the number of water resource zones that water utilities in the United Kingdom (UK) must plan for, and the depth of data that those utilities have available to them. The differential relative to the number of water resource zones is illustrated in Table 1.1 where we give an example of the number of water resource zones managed by other utilities.

Table 1.1 - UK water utilities WRZ comparison

<u>Water Utility</u>	<u>Number of WRZs</u>	<u>Total number of customers</u>
<u>Northern Ireland Water</u>	<u>7</u>	<u>1.7 million</u>
<u>Welsh Water</u>	<u>24</u>	<u>3 million</u>
<u>United Utilities</u>	<u>4</u>	<u>7 million</u>
<u>Southern Water</u>	<u>10</u>	<u>3 million</u>
<u>Scottish Water</u>	<u>approx. 220</u>	<u>5 million</u>
<u>Irish Water</u>	<u>539</u>	<u>4.2 million</u>

In light of the fact that this is the first NWRP, with 539 WRZs and a very significant challenge in terms of historic underinvestment in water infrastructure to date, it was considered necessary and prudent to divide the public water supply system into the four regional groups as shown in Figure 1.8 and as explained below. These regional boundaries are only relevant for the development of the first NWRP and have been identified as the most efficient and appropriate way to allow Irish Water to identify Preferred

Approaches for each Water Resource Zone in an efficient and timely manner. Once the first NWRP has been finalised, comprised of this Framework Plan and the four [Regional Water Resources Plans](#) (RWRPs), together they will be treated as a unified plan. The relevant regional groupings will have no ongoing application. In particular, the Preferred Approaches identified in each RWRP will be prioritised collectively through Irish Water's planning and investment cycles. In other words, there will not be any difference in investment priority across the four regional groupings. Where Local Authority Areas have been split across two RWRPs, Irish Water will engage with those local Authorities following the finalisation of the RWRPs, on the outcomes for all of the water supplies in their areas.

The formation of the four regional groups (described below) was determined based on the following criteria:

~~The SEA statement will be prepared and will outline the issues raised and demonstrate the amendments that were made to the Framework Plan as a result of the consultation.~~

~~1.1.1~~ ~~1.1.2~~ **1.9.4 Commence Phase 2 – Drafting the [Regional Water Resources Plans](#)**

~~In order to manage the delivery of Phase 2, the public water supply will be divided into the four Regional groups shown in Figure 1.8. The formation of these groups is based on:~~

~~**Environmental Impact:** In order to be able to assess the cumulative impact on proposed and existing water supplies, the first spatial zones designated are the water body catchment and sub-catchment areas, as delineated by the Environmental Protection Agency under the [River Basin Management Plans](#).~~

1. **Irish Water Operational Regions (North and West, Eastern and Midlands, and Southern Region):** In order to allow us to optimize the staffing resources during the roll out of the four ~~Regional Water Resource Plans~~[RWRPs](#).
2. **The Water Resource Zone boundaries:** To represent our current supplies. Due to the disproportionate volume of WRZs in the Southern ~~region~~[Region](#), for administration of the roll out process, the area has been split into two groups, South West and South East.
3. **Local Authority boundaries:** This allows us to align the Local Authority Development Plans to our Supply Demand forecasts, and to assess the full options assessments process with our colleagues in the Local Authority Water Services Sections. In some cases the Local Authority areas had to be split for delivery purposes.
4. **Environmental Impact:** As far possible, designated water body catchment (or at least sub-catchment areas), as delineated by the EPA under the [River Basin Management Plan](#), have been used.

The outputs of the four RWRPs will be combined for prioritisation and progression through the future cycles of capital investment planning as described above. Each of the four RWRPs, together with their respective SEA Environmental Reports and Natura Impact Statement will ensure that consideration is given to the cumulative impacts and in-combination effects of the other RWRPs, and adjustments will be made to address those impacts to the fullest extent possible based on all available information.

Each of the four regional groups will have their own RWRP as described below:

~~Using these rules, we have split the national supply into four individual regions. The Regional Plans will develop preferred approaches as set out above. As part of the SEA and Appropriate Assessment process Irish Water will examine any potential cumulative and in-combination impacts, across all regions.~~

~~These include;~~

- Regional Water Resources Plan: North West (Group Area 1)
- Regional Water Resources Plan: South West (Group Area 2)
- Regional Water Resources Plan: South East (Group Area 3)
- Regional Water Resources Plan: Eastern and Midlands (Group Area 4)

Each ~~Regional Resources Plan~~ RWRP will:

- Apply the methodology in this Framework Methodology Plan to the ~~Regional Group Areas~~ regional areas of Water Supplies
- Develop Plan Level Preferred Approaches (solutions) for all water supplies within these regional group areas.

~~For the purposes of completing the Regional Plans, each Regional Group Area has been subdivided into Study Areas. In order to illustrate how the NWRP methodology is applied to our water supplies, we have prepared a Case Study for a sample study area to accompany the Phase 1 consultation documentation. This has been provided in order to demonstrate the implementation of the methodology being consulted on.~~

~~As the area within the Case Study is a component part of the Regional Water Resource Plan – Eastern and Midlands Area, it is not being consulted upon as part of Phase 1 and is for illustrative purposes only. The technical/environmental information in this area will be updated to account for any required changes to the Framework Plan, once it has been adopted, and will be formally consulted on as part of Phase 2.~~

For the purposes of preparing the RWRPs, each regional area has been subdivided into Study Areas to assist in the identification of both need and solutions, with all of the Study Areas to be considered holistically in each draft RWRP.

1.10 Summary

Water Resources Planning plays an essential part in ensuring that we have a safe, secure, sustainable and reliable public water supply that supports Government Policy and Irish Water Policy. The NWRP will be Irish Water's first strategic plan for water services and will form the basis for the transformation of these services in Ireland over the short, medium and long term.

In this part of the ~~draft~~ Framework Plan we have:

- Described the current status of water services in Ireland;

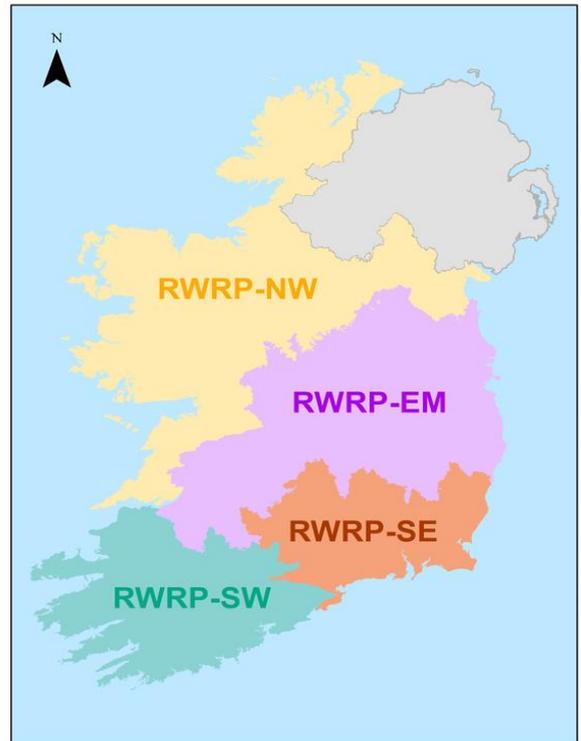


Figure 1-9 - Regional areas for roll-out of Phase 2 of the NWRP



~~Figure 1-9 – Regional Group Areas for roll-out of Phase 2 of the NWRP~~

- Outlined the specific challenges we face in serving the future needs of our customers;
- Outlined the context for the NWRP and its relationship to other Irish Water strategies, ~~government-~~ [Government](#) policy and legislation;
- ~~Our Consultation-~~ [Described our consultation](#) on the NWRP to date; and
- ~~The-~~ [Explained the](#) structure and phasing of the NWRP [into this Framework Plan, and the RWRPs now being prepared](#).



Leixlip Water Treatment Plant, County Dublin



2

Water Resources Planning & Key Concepts

2 Key Points

This section contains the following information:

- The Resource Planning process that we have adopted for this Framework Plan including the use of Drinking Water Safety Plans (DWSPs) to assess risk
- An introduction to the key water resource planning concepts

2.1 The Water Resources Planning Process

Water Resources Plans are standard practice for other utility companies that are involved in drinking water supply on a regional basis. Irish Water needs to develop a National Water Resources Plan ([NWRP](#)) that is specific to the public water supply in ~~this state~~ [Ireland](#), accounting for:

- Ireland's dispersed low-density population;
- The historical development of our existing water supply system; and
- The baseline condition of our assets and risks we must manage as part of our supplies.

2.1.1 Basis for this Plan

This section outlines the reasons we selected a water resources planning methodology based on the methodology approved by the UK's Water Services Regulation Authority (OFWAT) out of the available alternatives.

Prior to developing this ~~draft~~ Framework Plan, the resources planning methodologies used in other jurisdictions were reviewed, including the United Kingdom, France, Italy, Spain, Germany, Australia, New Zealand and the USA. Methods for water service provision vary greatly across the countries summarised in Table 2.1. Within the European Union, there is a common Legislative Framework across all countries, governed primarily by the Drinking Water Directive (98/83/EC) as amended and the Water Framework Directive (2000/60/EC) as amended.

The regulation of water service providers varies considerably across the countries. The process in Ireland is most similar to that of the United Kingdom (including England and Wales) [due to the similarities between the legislative framework for water services, catchment level populations, water asset bases and water supply asset bases, while recognising existing constraints such as data limitations. In contrast, the methodologies used in jurisdictions other than the UK arose in very different contexts and were not considered to be a viable starting point to develop a methodology suitable to the Irish context.](#) Providers of water services are supervised by independent regulators for quality, environmental and financial regulation, namely the Environment Agency and OFWAT in the ~~UK~~ [United Kingdom](#), and the Environmental Protection Agency and Commission for the Regulation of Utilities in Ireland.

In most countries water service provision is fragmented, with large urban supplies managed separately to rural supplies or regionalised where a utility provides water services for urban and rural settlements within a defined geographical region. Irish Water is a single national water utility. However, in terms of population and scale, the public water supply in this state is of similar size to regional supplies in larger countries such as the ~~UK~~ [United Kingdom](#) and Italy.

Although the Water Framework Directive and associated River Basin Management [Plans](#)[Plan](#), require cross jurisdiction collaboration and planning in relation to the environmental health of the natural raw water environment, most water service providers in the countries assessed do not have uniform prescribed guidelines or fully Integrated Water Resources Planning.

However, in order to ensure resilience and to respond to external risks such as climate change, financial constraints and aging infrastructure, it is likely that there will be an increased focus on water resources planning in all countries into the short, medium and long term.

Recently the OECD has recognised the need for its member countries to undertake strategic water supply planning to address the financial and environmental constraints on the provision of water services into the future⁵.

As Irish Water is the single national utility for water services, we must take a proactive approach to strategic planning, and we have committed to developing a Water Resources Plan within our primary business objectives as set out in our Water Services Strategic Plan.

There are a number of key considerations that influence the development of a water resources plan, including, legislative, regulatory, climatic and asset base, as listed in Table 2.1. In the development of this plan we reviewed these considerations across a number of jurisdictions and identified the commonalities when compared to Irish Water’s supply.

Table 2.1 - Comparison of water resource planning considerations across jurisdictions

	Republic of Ireland	France	Germany	Spain	Italy	United Kingdom	Australia	New Zealand	Canada	United States
Legislative Framework	==	==	==	==	==	==	==	==	==	==
- Quality	X	X	X	X	X	X	==	==	==	==
- Environment	X	X	X	X	X	X	==	==	==	==
Regulation of Water Service Providers	X	==	==	==	==	X	==	==	==	==
Provision – Local (fragmented), Regional, National	N	F	F	F	F	R	F	R	R	F
Prescribed Process for Integrated Water Resource Planning	=	==	==	==	==	X	X	X	==	==
Climate	X	==	==	==	==	X	==	==	==	==
Technical Standards						-	-	-	-	-
- Treatment Types	X	X	X	X	X	X	X	X	X	X
- Distribution	X	==	==	==	==	X	==	==	==	==
- Domestic	X	==	==	==	==	X	==	==	==	==

⁵ 2019 OECD Challenges in Financing Water Supply, Sanitation and Flood Protection – Challenges in EU Member States and Policy options

As water services provision in ~~the Republic of~~ Ireland has the most commonalities with that of the United Kingdom, we ~~have~~ used the “*Final Water Resources Planning Guidelines 2016*”, developed by the Environment Agency and Natural Resources Wales in England and Wales respectively as the starting point for our Framework Plan.

As summarised in Table 2.1, the main reasons for this decision are:

- Ireland’s legislative framework for water services is similar to that in England and Wales (and the UK including Scotland & Northern Ireland);
- Ireland's national population is similar to the population of some of the UK's water resources planning catchments;
- Our natural climatic conditions are more similar than the other countries considered;
- Our water asset base is technically comparable in terms of treatment, distribution and domestic plumbing arrangements (for example in Ireland and the UK, domestic plumbing systems use storage tanks in attics, as opposed to the pressurised systems more frequently used elsewhere in Europe. As these tanks can fill at night time, they need to be accounted for in minimum night flow calculations, and therefore impact leakage and demand estimation)
- Our water supply asset base, particularly supplies in the large urban centres, developed in parallel to those in the UK with the same design philosophy, distribution process, and materials used; and
- The regulatory framework for water services is similar, including the separation of responsibility for water services provision, environmental regulation and economic regulation.

However, there are some key differences as described below:

- **Licencing:** In general, water abstractions in other jurisdictions are licenced and environmental considerations have been factored into the long-term viability and planning for water sources. Historically in Ireland there has been limited regulation of abstraction of water from the natural environment for the purposes of public water supply. Within our existing asset base some abstractions may not be able to provide the supply of water to meet the demand required particularly during dry weather periods. As demand increases over time, this issue will become more evident and therefore needs to be given more consideration in our [NWRP Framework Plan](#).
- **Quality:** Many of our water supplies are at risk of not achieving the standards set out in the Drinking Water Regulations. They therefore require significant investment in maintenance and upgrades to ensure continued protection of public health of our customers. This may require us to commit capital investment into sites in the short term to address public health and water quality issues even though some of these supplies may not be viable in the medium to long term. Therefore, the [NWRP Framework Plan](#) must consider quality as well as quantity issues, and allow for interim steps to incrementally improve our water supplies.
- **Asset Performance:** Due to historic under investment in capital maintenance, our asset base is in poor condition compared those in the UK. This manifests itself in high leakage rates across our networks and low levels of service to our customers. These deficits require sustained long-term investments and actions across many areas that will deliver gradual improvements over multiple investment cycles. Therefore, asset performance and reliability needs must be considered within our [NWRP Framework Plan](#).
- **Data:** Water Resources Planning in UK utilities follows a well-defined process that has been developed over a 25-year period and is built off prescribed operational data for both supply and demand. At present, our information systems were not designed for the purposes of water resources planning and do not capture all of the required data sets. Therefore, within this ~~draft~~ Framework Plan we have had to use a combination of best available data and surrogate data from other jurisdictions where necessary.

- **WRZs:** ~~The~~ [As described above, the](#) national public water supply in Ireland has significantly more WRZs than a typical UK utility, which reflects the dispersed population in Ireland and the way that water services have developed over time. This adds a level of complexity to our resources plan, due to the extent of identified need we must address. To mitigate against this, Irish Water will develop our Preferred Approaches (solutions) for each water supply within four Regional Water Resources Plans, [\(RWRPs\) as described above.](#)

2.2 Tracking Progress through the Drinking Water Safety Plan

Our existing water supplies are constantly changing as new assets are incorporated into our networks and existing assets deteriorate over time. The legislative environment within which we operate is also evolving and our natural water resources are impacted by activities within the catchments and by climate change.

Irish Water's NWRP will be developed on a five-year cycle, but within these cycles reviewed annually, as we must constantly monitor and react to emerging risk and need. Monitoring and feedback into the [Framework](#) Plan is [committed to, as](#) outlined in Chapter 8 of this document.

The most effective way of monitoring our supplies is through a comprehensive risk assessment process that encompasses all steps in water supply from water sources (catchment) to consumer (tap). This approach is known as the Drinking Water Safety Plan (DWSP), as recommended by the World Health Organisation (WHO) in their Guidelines for Drinking Water Quality (2004) and Water Safety Plan Manual (2009).

Historically DWSPs were predominantly used to assess risk in terms of drinking water quality and compliance with the Drinking Water Regulations. However, Irish Water proposes to incorporate the DWSP into the way we work and use it as the means to manage risk as part of our resources planning process. The completion of Drinking Water Safety Plans is also a requirement in the Recast Drinking Water Directive (2020).

As such, we will expand our use of the DWSP to incorporate, quantity, quality and sustainability issues, as summarised in Figure 2.1.

Drinking Water Safety Plan



Drinking Water Safety Plan



Figure 2.1 - Water Resources Planning – The DWSP approach

DWSPs must be set up to align with our WRZs in order to enable us to manage quantity, quality and sustainability risk from ‘source to tap’ on a catchment basis, for the short, medium and long-term demand horizons. This process will allow us to progress and track tactical and operational interventions, and to address the risks that sit outside of the capital investment planning process. This will become increasingly important when our abstractions are regulated and subjected to licenced conditions.

2.3 Key Concepts in Water Resources Planning

Within this section we introduce some of the key concepts that we have used to develop the NWRP, including:

- Water Resource Zones (WRZs);
- Weather Event Planning Scenarios;
- Levels of Service (LOS); and
- Supply Demand Balance (SDB).

Each concept is summarised in the paragraphs below. More detailed technical information is also provided in Appendix B (Planning Scenarios), Appendix C (Supply Assessment) and Appendix D (LoS), respectively.

2.3.1 Water Resources Zones and Water Supply Zones

When assessing the need for water across a very large asset base, the first concept to be considered is the geographic definition of our water supplies. Figure 2.2 demonstrates a schematic of a simple water supply network, which consists of a water source with a treatment plant and a network to deliver water to meet water demand in a particular area.

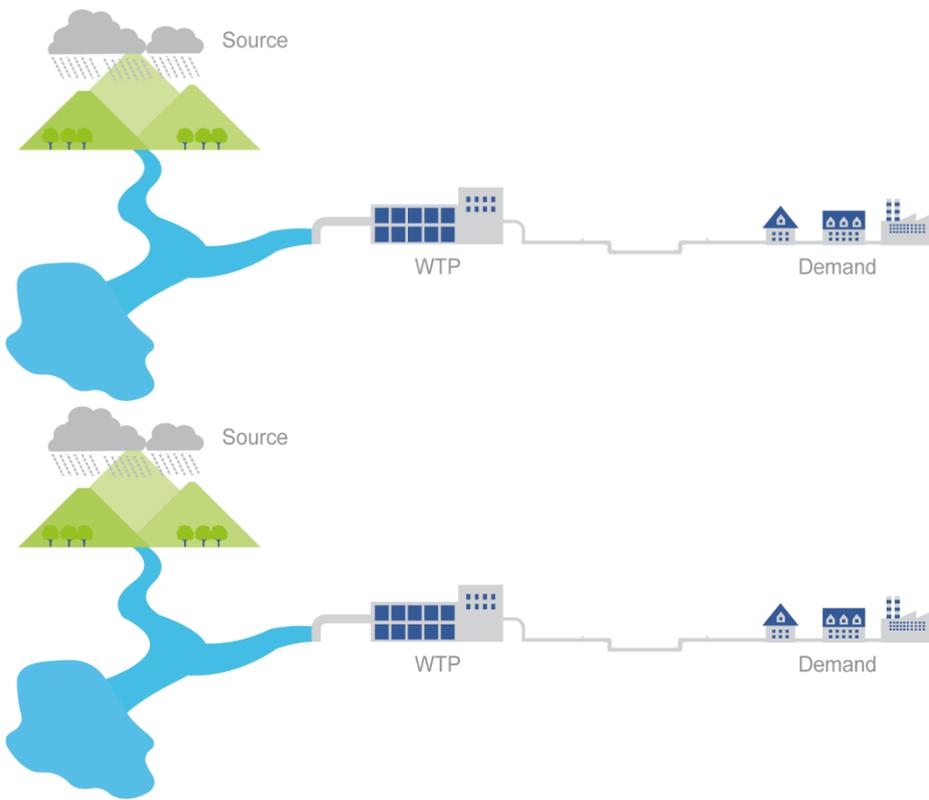


Figure 2.2 – Simple Water Supply Schematic

This configuration is only representative of our most basic remote water supplies or our more vulnerable large supplies that rely on a single source of water. As these types of supplies have no connectivity to a wider network, they have little resilience to planned or unplanned events within the asset base, which can result in water outages or boil water notices.

Some of our larger water supplies consist of multiple interconnected sources and treatment plants, with the ability to transfer large amounts of water around trunk main networks. This allows improved resilience for planned and unplanned events.

Management units need to be developed to enable us to describe, understand, manage and plan for water supplies both now and into the future. Therefore, our resource planning unit of management must allow us to consider not only the capital and operational interventions we need to make to the existing asset base, but also how we need to transform and improve connectivity between and within our supplies.

Table 2.2 and Figure 2.3 outline the different scales for the management of water supplies required to function as a regulated water service provider, and how these relate to each other.

Table 2.2 – Water Resource Spatial Management Units

Scale	Management Unit	Purpose	Regulatory Interface
National	WSSP	Setting our Business Objectives	DHLGH
	NWRP – Framework Plan	Implementing the objectives of the WSSP and applicable legislation and guidance	CRU, EPA
	NWRP Regional Resource Plan Group Areas	Cumulative impact assessment. Prioritisation of investment and outcomes for regulated investment planning strategic funding requirements	CRU, EPA
Regional	NWRP Regional Resource Plan Group Areas	Developing of Asset Management Plans covering Irish Water’s Operational Regions, for the purpose of planning investment and improving operations	CRU, EPA
Sub Regional	Catchments	Assessing our water abstractions and wastewater discharges in relation to legislative requirements including WFD, Habitats Directive, Birds Directive and pending abstraction legislation	EPA, DPHLG, NPWS
Sub Regional	Water Resource Zones (WRZ)	Identifying baseline issues with Supply and Demand, forecasting future issues with Supply and Demand, drought and critical period planning, adaptive planning, bulk transfer and strategic storage requirements.	CRU, EPA
		Identifying baseline need in relation to water quality and barrier risk and assessing the customer base that will be impacted by a deterioration in water quality or the failure or non-performance of a Water Treatment Plant within a complex network.	
Local	Water Supply Zone (WSZ)	Water Resource Zones consist of multiple Water Supply Zones. Water Supply Zones are used to delineate differing areas of our water supplies in order to assess the quality and compliance of drinking water, including within complex networks, where multiple water types are blended. The primary function of a WSZ is to report on Drinking water compliance to our regulator the EPA.	EPA
	District Metered Area (DMAs)	Each Water Supply Zone consists of a number of District Metered Areas. These are small discrete areas of our water distribution network which are used for leakage management, network control, emergency network interventions, and ensuring water quality at the extremities of our distribution networks.	CRU

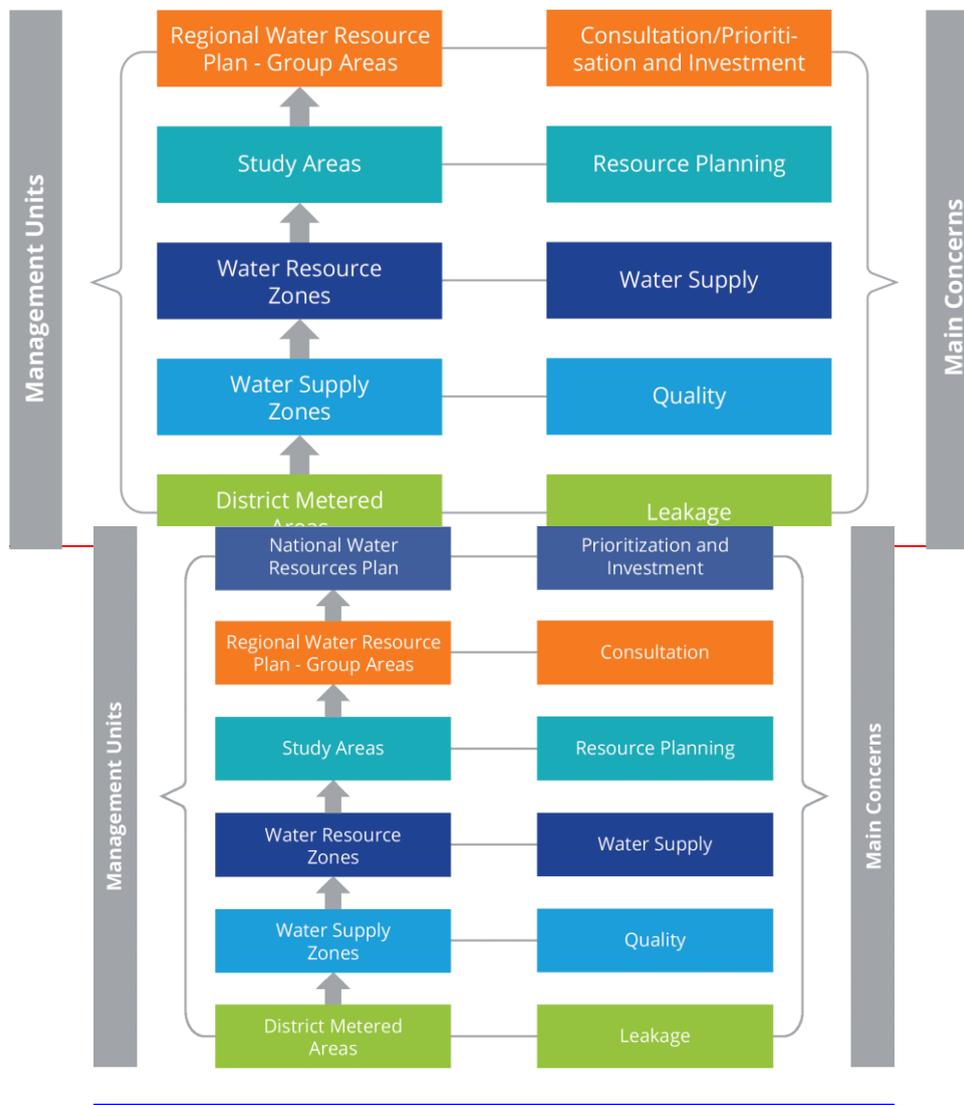


Figure 2.3 – Water Resource Planning Spatial Management Units

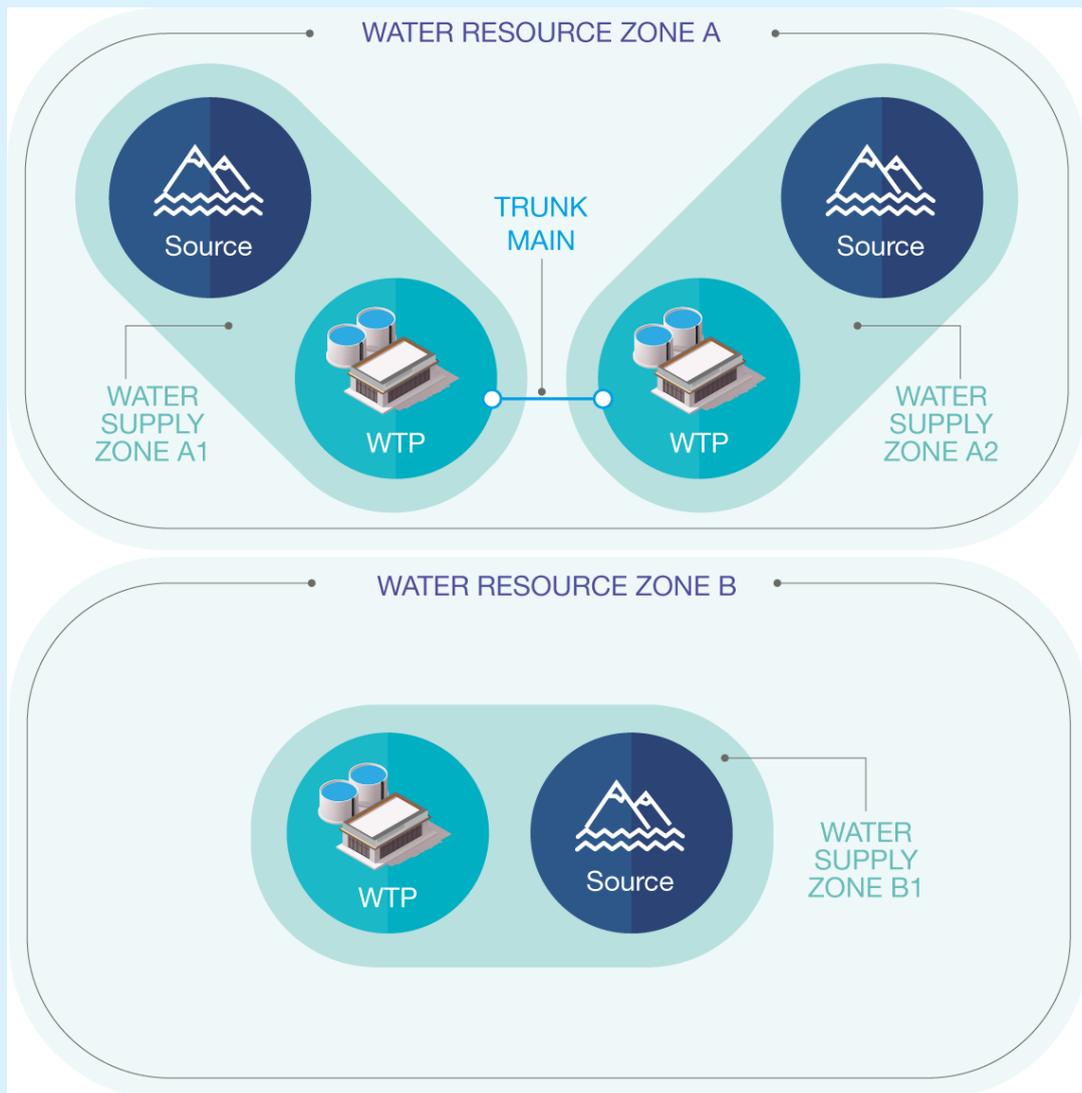
All of these spatial units relate to each other, with DMAs being the smallest component part of our supply.

Groups of DMAs form WSZs, groups of WSZs form WRZs and groups of WRZs ~~form the NWRP~~ Regional Water Resource Plan Group Areas are considered in the RWRPs. As there can be multiple water sources and water supply zones in a complex network, WRZs are the management units at which water resource planning is undertaken.

WRZs represent an area where the supply and demand are largely self-contained. It is where the resources, supply infrastructure such as the water treatment plants, and the customers are interconnected. As part of this ~~draft~~ Framework Plan, the Supply Demand Balance is calculated for each WRZ.

Examples of WRZs and WSZs are shown in Boxes 2.1 and 2.2.

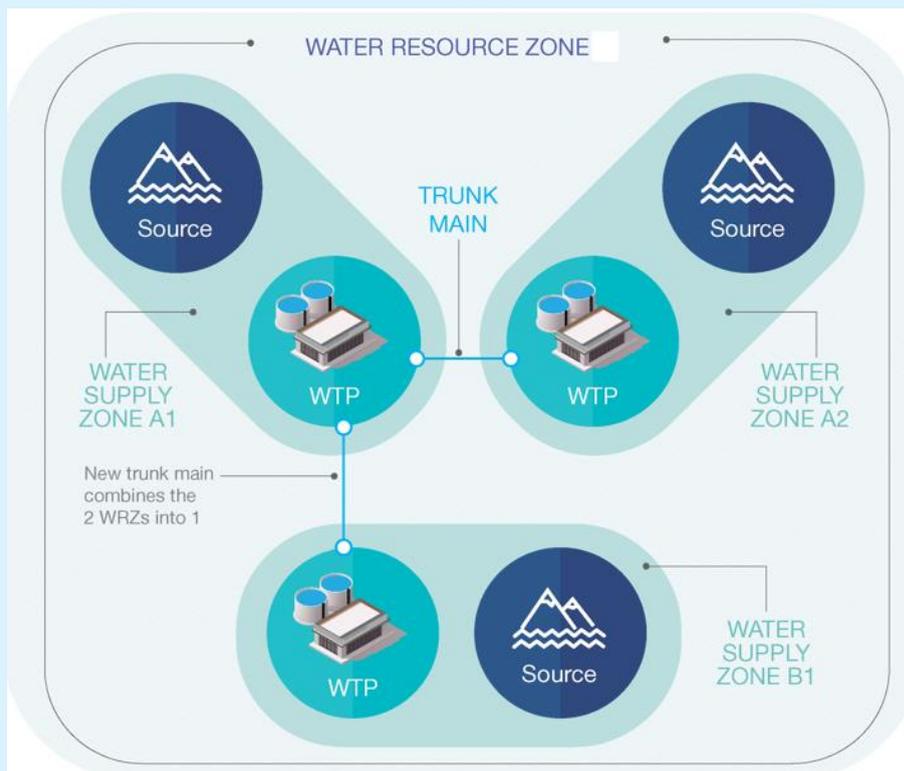
Box 2.1 – Example WRZ and WSZs



In this example, there are two WRZs and three WSZs. WRZ “A” contains two WSZs, which are connected by a trunk main. If there was an outage at the water treatment plant in WSZ A1, the area could continue to be supplied from the water treatment plant located in WSZ A2 (should sufficient spare capacity be available).

WRZ B contains just one WSZ and is not connected to any other WSZs. If an outage occurred at the source, treatment plant or trunk main network in this supply, the majority of customers could be impacted.

Box 2.2 – Example Water Resource and Supply Zones 2



In this example there is one WRZ and three WSZs. A trunk main connects WSZs A1 and A2 with B1 to form a single WRZ. This arrangement offers greater resilience as, if there is an issue at the water treatment plant or with a source in WSZ B1, customer supply could be maintained from WSZ A1 or A2 (should spare capacity be available).

As part of ~~the draft~~ [this](#) Framework Plan, all of the WRZs that make up the national public water supply have been delineated [in accordance with the process set out in Boxes 1.1 and 1.2](#). We have also associated the DMAs and WSZs to each WRZ, allowing us to monitor quality, quantity, capital maintenance need and risk across all of our supplies.

WRZ boundaries are dynamic and can change over time, for example, if we construct new trunk mains to connect separate water supplies (see Box 2.2). To establish a measurable baseline for the NWRP, we have defined our WRZs as they will be in 2021, which includes planned and ongoing improvement to our water supply networks, as set out in our current Capital Investment Cycle.

There are 539 WRZs in Ireland. Each zone varies in size from small rural systems with populations of less than 30 to the GDA with a population of ~~4.6~~ [1.7](#) million.

A comparison with the WRZs from a number of UK water utilities is shown in Table 2.3 and Figure 2.4.

Similar sized populations served with fewer WRZs with more connectivity can achieve economies of scale and bring resilience and reliability of supply to customers. Our current model presents challenges of efficiency, consistent maintenance and service performance. A secondary effect is that in many WRZs, we have fewer connections per unit length of pipe, a factor that impacts leakage statistics and comparisons.

Table 2.3 - UK water utilities WRZ comparison

Water Utility	Number of WRZs	Total number of customers
Northern Ireland Water	7	1.7 million
Welsh Water	24	3 million
United Utilities	4	7 million
Southern Water	10	3 million
Scottish Water	approx. 220	5 million
Irish Water	539	4.2 million

Figure 2.4 shows that we have significantly more WRZs than our UK counterparts, which reflects the dispersed population in Ireland and the way that water services has developed over time.

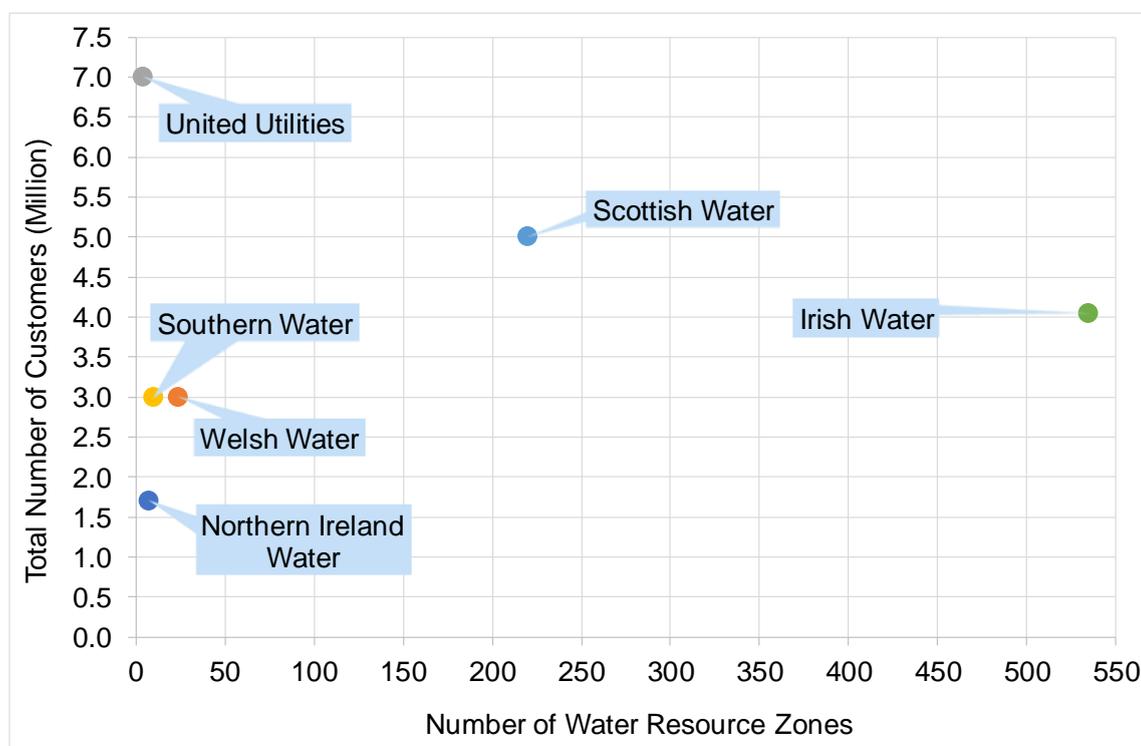


Figure 2.4 - UK water company WRZ comparison

We expect the number of WRZs in Ireland to reduce as we invest in providing strategic infrastructure throughout the country. This process will be driven by the requirement to deliver the required quality and quantity of water in the most efficient manner. This rationalisation journey will require both new sources and substantial provision of trunk mains and reservoirs, with an associated need for investment. However, it is likely that we will have to continue to operate a substantial number of WRZs for the foreseeable future, particularly in low density and remote areas. ~~A staged~~ As explained above, a phased approach to the development of a ~~National Plan~~ national water resources plan is needed in light of the fact that we are at an early stage of this process and have a far greater number of diverse WRZs than our UK counterparts.

2.3.2 Weather Event Planning Scenarios

As access to a good quality uninterrupted water supply is essential for public health, we must ensure that our water supplies can withstand changes in climatic conditions.

Although we live in a temperate climate, as global temperatures continue to rise, Ireland may experience more frequent extreme weather events, such as droughts and storms. Irish Water must plan for these events and develop a resilient water supply system to limit the impacts of extreme events on our customers.

During certain years, the water supply systems in Ireland have experienced major stress. For example, during Storm Emma (2018), there was an increase in burst water mains due to periods of sub-zero temperatures followed by relatively rapid warming. In contrast, summer 2018 and spring 2020 saw prolonged warm dry weather resulting in low flows and decreased water levels in our rivers and lakes. This resulted in reduced water availability for our public water supplies which also coincided with an increase in customer demand.

Table 2.4 outlines the four Weather Event Planning Scenarios considered in this **draft** Framework Plan. More information on these scenarios is contained within Appendix B.

Table 2.4 – Weather Event Planning Scenarios

Scenario	Scenario Description and Weather Type	Feels like
NYAA	Normal Year Annual Average: The normal year scenario describes the demand and supply available to Irish Water in a typically average weather year	
DYAA	Dry Year Annual Average: The dry year scenario is when there is low rainfall but no constraints on demand. Demands are based on the average daily demands experienced over the year under “dry” year weather conditions. Demands would be higher than in normal years	
DYCP	Dry Year Critical Period: This occurs within the dry year, generally a few weeks during the summer where demands can be significantly above the annual average	
WCP	Winter Critical Period – The WCP generally occurs as a result of Freeze–Thaw incidents such as Storm Emma in 2018. High demands during these periods are driven by an increase in leaks from burst of pipes as a result of the very low temperatures	

Supply availability for a WRZ varies for each Planning Scenario. For example, when we consider surface water sources such as rivers or lakes, more water is naturally available for abstraction during winter months than summer months. Therefore, in a WRZ supplied by surface water sources, more water will be available during the Winter Critical Period (WCP) than during other planning scenarios, and the limiting factor on supply availability is usually water treatment capacity or network capacity. Whereas, in the same WRZ, during a Dry Year Critical Period, the water source tends to be the limiting factor.

Demand also fluctuates under the four Weather Event Planning Scenarios. Figure 2.5 illustrates that during a prolonged period of warm dry weather typically associated with a Dry Year Critical Period (DYCP), our customers can use significantly more water than during other scenarios, particularly if temperatures are high.

During a WCP, the demand is even higher due to water lost from the extremities of the network. Cold weather makes pipes more prone to bursts and impacts shallow private connection pipes that feed individual properties from our distribution mains. Connection pipes are a particular problem as historically many of these were laid at very shallow depths, leaving them prone to frost damage.

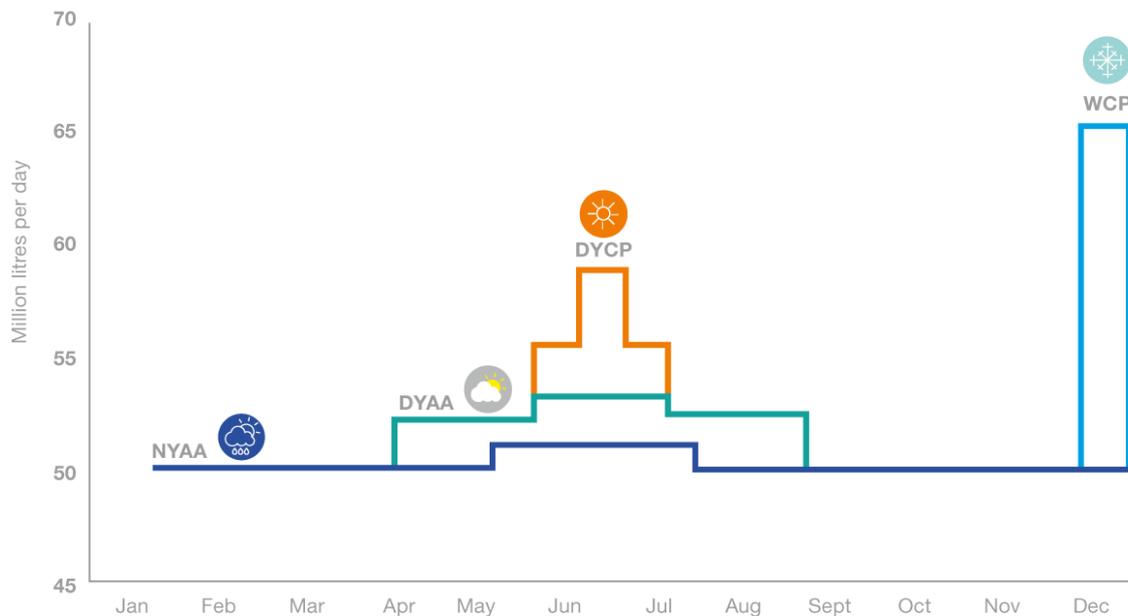


Figure 2.5 – Demand profiles for Weather Event Planning Scenarios

We use ‘peaking factors’ to calculate how demand changes for each Planning Scenario. Ideally, peaking factors would be based on historical data of water use during the planning scenarios. However, country-wide reliable historical data is not presently available, so we have used data from other water utilities with similar characteristics. Further information on peaking factors and how they are applied is provided in Chapters 3 and 4. Box 2.3 provides context of the weather conditions in Ireland.

Box 2.3 – Drought Conditions in Ireland

Ireland is known for its rain, so it’s easy to assume there’s plenty of water available. But historical records show that in the past Ireland experienced extreme weather conditions and droughts more frequently than we have done in recent years. [Appendix E Figure 1.1 shows a heatmap of drought severity from 1850 to 2020 using rainfall gauge data from 10 Met Éireann synoptic stations chosen for drought monitoring as part of this plan.](#)

Historic data indicates that Ireland experienced significant drought conditions approximately once every 10 years between the 1850’s and 1970’s. However, as the majority of our supplies have been developed and expanded since the 1970’s they have never been tested against these types of historical extreme weather conditions. Therefore, our asset base may be vulnerable to changes in weather patterns as a result of climate change.

2.3.3 Level of Service

Level of Service (LoS) refers to the reliability of the supply that our customers can expect to receive and is expressed as a frequency or return period of supply failure (refer to Appendix D Level of Service). For example, if the LoS is stated as 1 in 50, as a consumer, you would only ever expect to experience a water outage or severe limitations to your supply, on average, once every 50 years. This standard of service is particularly important in larger supplies, where the social and economic consequences of failure to supply are significant and where mitigation measures such as tankered supplies are not feasible due to scale of demand.

The LoS in Ireland varies according to location, ranging from lower than 1 in 10 to better than 1 in 50. As summarised in Figure 2.6, approximately 50% of the population are at risk of receiving a LoS of lower than 1 in 50 during normal conditions (NYAA).

In this ~~draft~~ Framework Plan, Supply Demand Balance assessments have been developed for each WRZ based on a 1 in 50 Year LoS. This means Irish Water will aim to provide a uniform minimum of 1 in 50-year LoS across the entire public water supply over time. However, it should be noted that while customers within a WRZ with this LoS should not expect a major disruption to supply, they may experience some infrequent water use restrictions such as water conservation orders. The identification of and response to drought conditions that exceed these return periods is described in Appendix E Drought Planning.

Given that the current LoS in Ireland is low compared to international norms, the minimum of 1 in 50 LoS was set as a comparatively achievable target until our data and understanding of our water supplies improves. In comparison, in the UK, current best practice is to provide a 1 in 100-year LoS. This may take multiple investment cycles to realise and is not considered to be realistic for this first iteration of the NWRP.

The drought during June and July 2018 was a short but significant weather event, which had a major impact on Ireland's water bodies and the public water supply, in particular in the south, east and midlands of the country. During this event we did not experience a loss of supply to all of the areas identified as having a LoS of less than 1 in 50 years, as outlined in Figure 2.6. This was due to the emergency measures implemented by Irish Water in conjunction with our Local Authority partners.

These measures included: operating treatment facilities beyond their design capacities, tankering water to local communities, network management, implementing water conservation orders, and in extreme cases creating temporary obstructions in water bodies to maintain flow into our treatment plants. All of these measures represent undesirable and high-risk operations, potentially compromising the natural environment, impacting our ability to provide compliant drinking water and risking damage to our supply assets.

Normal LoS considerations in water resource planning place the focus on ensuring that our supplies are robust enough to produce enough water to meet demand across all Weather Event Planning Scenarios, thus reducing or removing the need for high risk operations.

Due to the condition of our asset base, Irish Water also needs to consider maintenance requirements when assessing Levels of Service. The condition of our distribution networks or treated water storage availability also has an impact on interruptions to our customer's supplies. Therefore, as part of Irish Water's water resources planning process, we will also identify key needs in relation to asset renewal and network requirements.

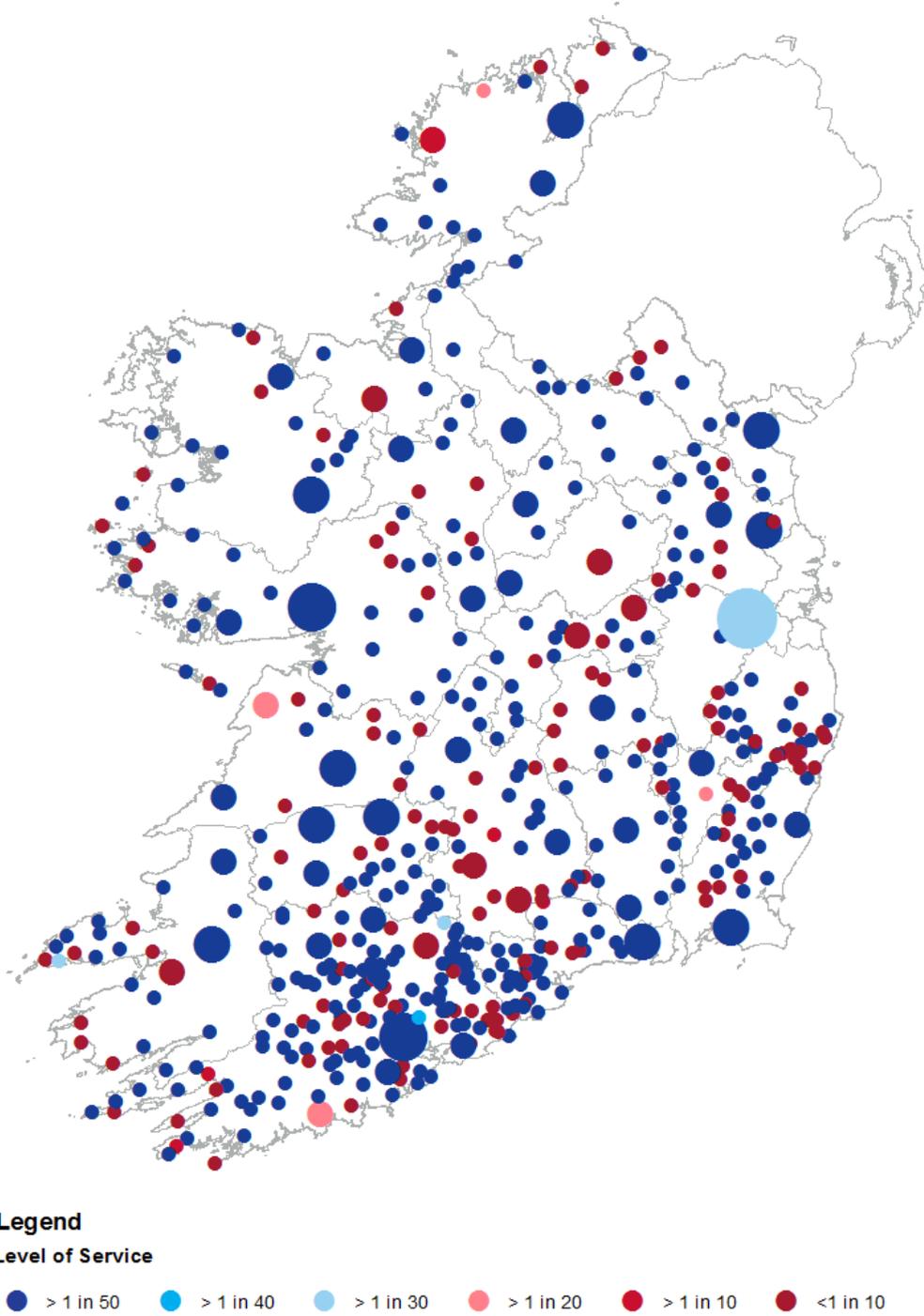


Figure 2.6 - LoS in each WRZ for a normal year (NYAA)

2.3.4 Supply Demand Balance

The Supply Demand Balance (SDB) is the difference between the water we have available in our supplies compared to the demand for water under each Weather Event Planning Scenario.

In terms of supply availability, the SDB considers water availability in the natural environment, current abstractions, water treatment capacity, process losses, trunk main constraints, and required allowances to ensure continuity of supply during planned and unplanned events.

When all of these factors have been considered, we can develop a Water Available for Use (WAFU) for each water resource zone. As part of our supply forecasts we must consider reducing supply availability due to climate change and risks in relation to sustainability driven reductions in allowable abstraction from waterbodies.

We must produce enough water supply at the top of our distribution networks to ensure that customers receive the volume of water they require at the extremities of a complex distribution network. The demand for water must therefore account for network efficiency and losses across the network during distribution.

When we assess demand for water as part of the Supply Demand Balance, we assess the current water balance which includes; domestic demand, non-domestic demand, operational usage (such as flushing water mains and fire hydrants), apparent losses and leakage. As part of demand forecasting, we must consider, leakage reduction, growth in demand, and allow for uncertainties (provision of headroom).

A deficit in the SDB means that the demand for water is higher than the available supply. In the event of an identified deficit, we consider what actions could be taken in response, e.g. reduce future demand, increase supply or a combination of both.

Figure 2.7 identifies the components of the SDB. In Chapters 3 and 4 of the ~~draft~~ Framework Plan, we outline how each of these components is calculated. Box 2.4 shows an example SDB projection over 25 years.

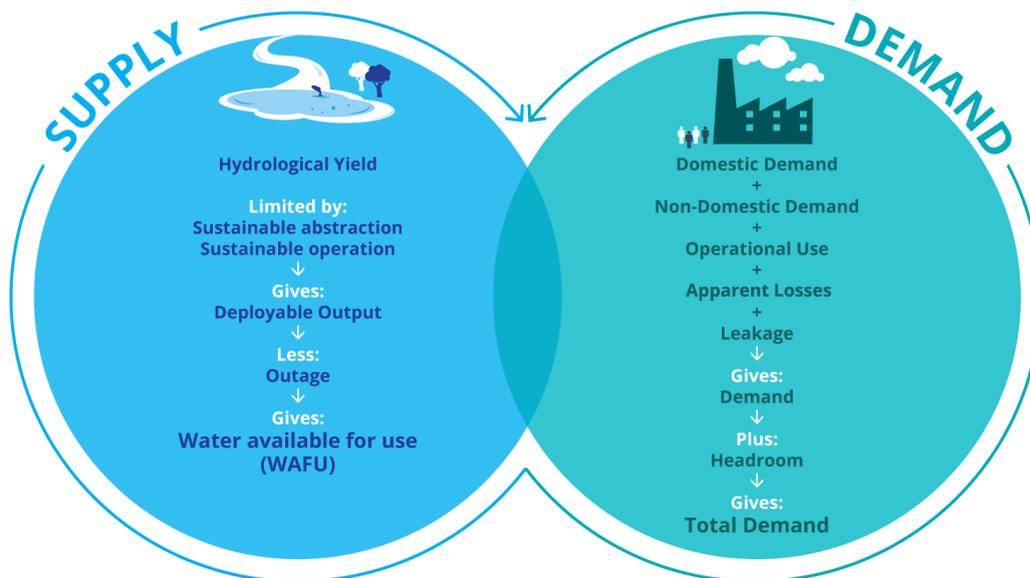
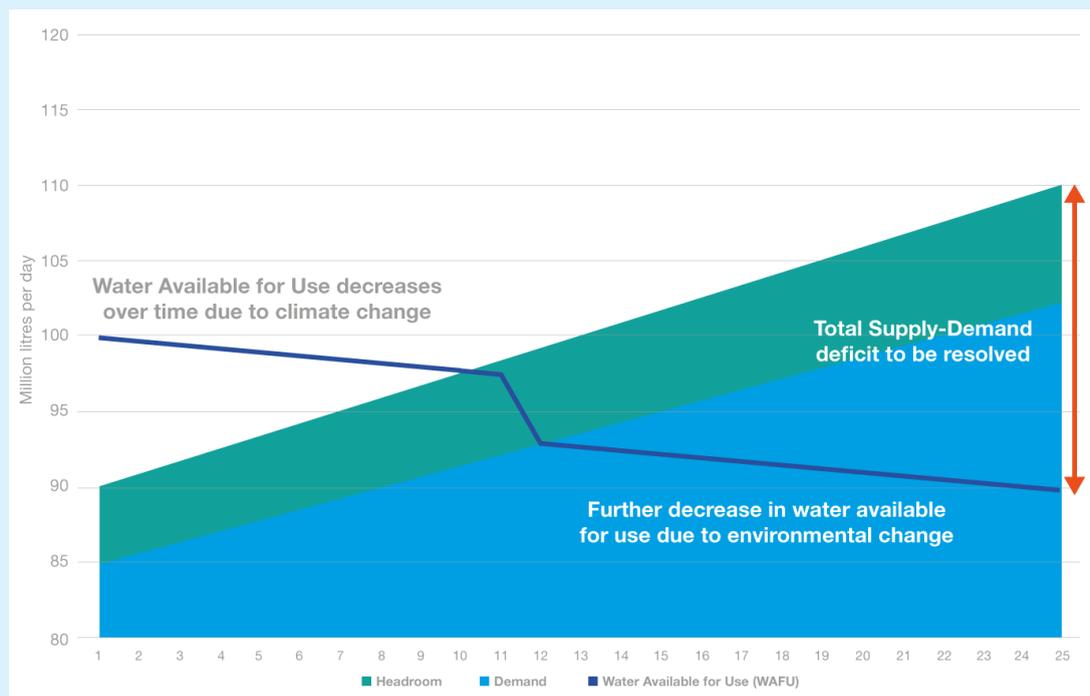


Figure 2.7 - Components of the SDB

Box 2.4 – Example SDB



This Figure demonstrates the demand for water increasing over time, which is typical of a growing population and economy. Our forecasts and assessments of demand require assumptions, including data accuracy and the reliability of our future projections.

The available water supply, WAFU is anticipated to reduce over the 25-year period due to climate change impacts. There is also a risk that in some locations that our WAFU will need to reduce over time, in order to meet the requirements of the [then current](#) River Basin Management [Plans Plan](#) or abstraction licensing, where the current level of abstraction is considered to be causing environmental damage.

Headroom is the term given to a buffer in the SDB. It accounts for the uncertainty with data and the assumptions used in the supply and demand estimates and forecasts. The headroom allowance is added to the demand forecast (as set out in Chapter 4).

In this example, the SDB is in surplus from Years 1 to 9. The WAFU is decreasing due to climate change and a deficit occurs in the SDB from Year 10. This deficit increases through to Year 25 reaching 20 million litres per day (Ml/d). In this example, there is a sudden drop in the WAFU in Year 11 due to potential licensing constraints affecting abstraction. Interventions would be required to reduce demand or increase supply to address the deficit shown in this example.

2.4 Summary

As Irish Water is at the start of the water resources planning journey, we have had to adapt best international practice to suit the constraints and condition of our existing asset base. We have also had to amend our approach to the resource planning process to reflect the data and information systems that we have available to us at present.

In this section of the [Framework](#) Plan we have summarised:

- The Resource Planning process that we have adopted for this ~~draft~~ Framework Plan including the use of DWSP to monitor and assess risk;

We have also summarised some of the key concepts in water resources planning, that are necessary to understand the methodologies outlined in the subsequent Chapters, including:

- Water Resource Zones;
- Weather Event Planning Scenarios;
- Levels of Service; and
- Supply Demand Balance.

In the next three Chapters of this document, we provide an overview of how we assess our current and future supply availability and demand requirements. We also identify our current needs in relation to quality and performance across the existing water supply asset base.



3

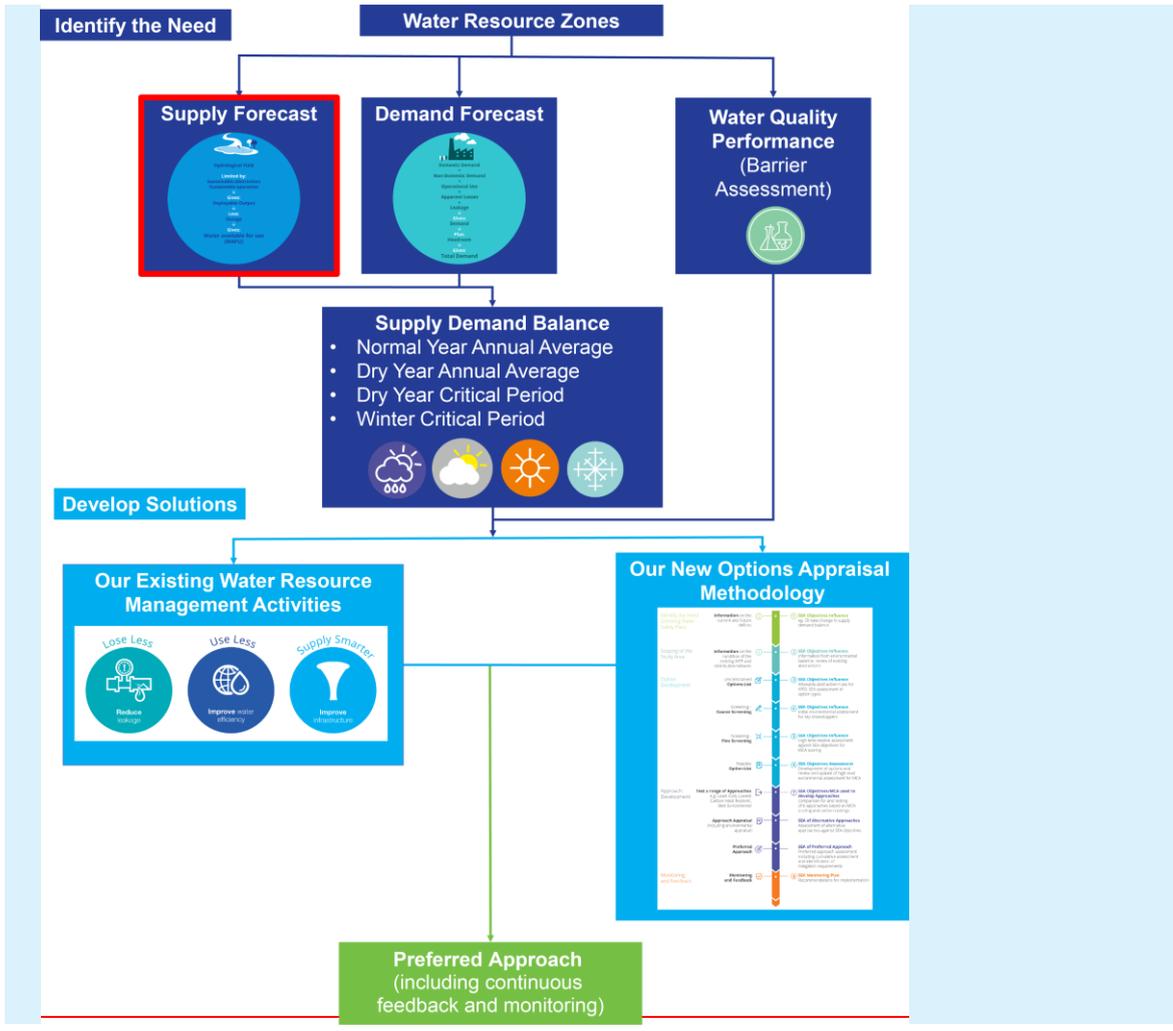
**Identify the
Need – Public
Water Supply**

3

Key Points

In this Chapter we:

- **Outline and describe how we estimate the components of Supply**
- **Set out the current Water Available for Use (WAFU) and how we expect this to change over the next 25 years**



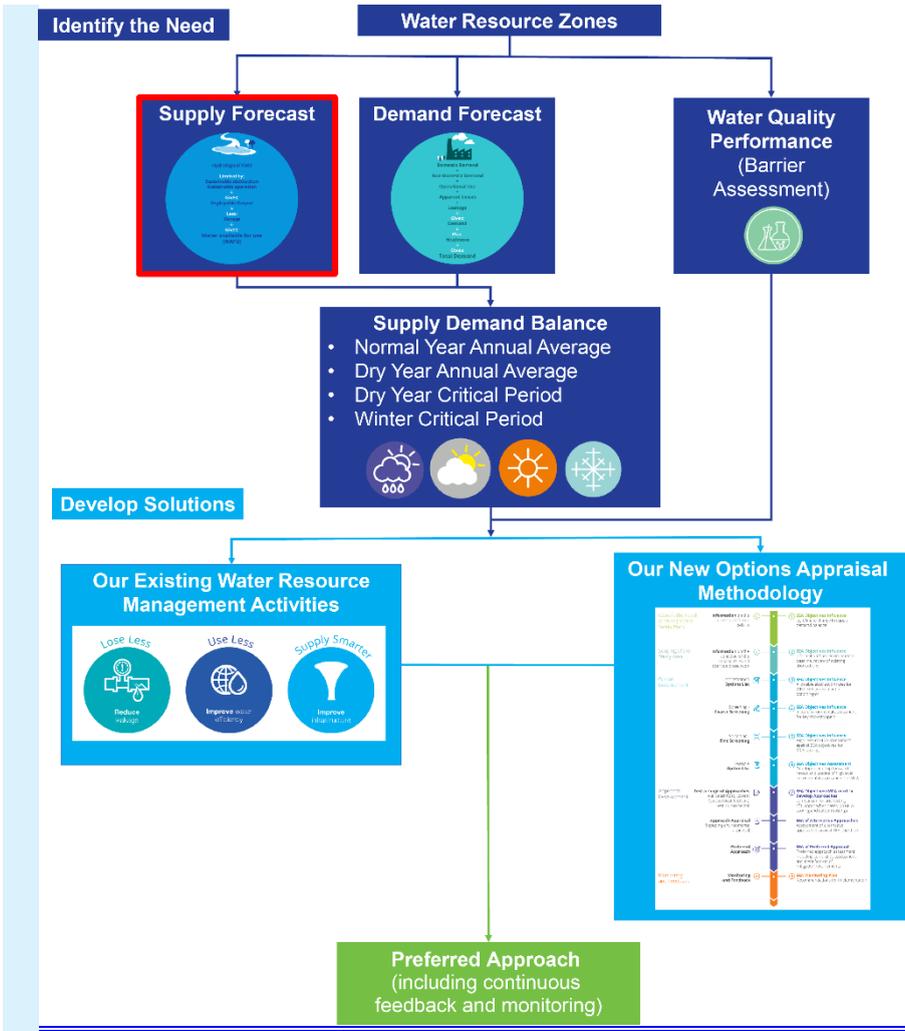


Figure 3.1 – NWRP Process – Supply Forecast

3.1 Introduction to Supply

To plan for future water availability, Irish Water must determine the amount of water that we can currently supply to our customers and then forecast how this might change over the next 25 years (Figure 3.1).

The amount of water we can currently supply depends on a number of factors including:

- The quantity of “raw water” we can safely abstract from the natural environment, when considering the Level of Service, we strive to achieve;
- The amount of this water we can convert to drinking water using our existing treatment facilities; and
- How much of this treated drinking water we can send into our distribution systems via our bulk distribution networks (trunk mains).



Figure 3.2 - Summary of Supply Components

By considering all of these factors we can properly identify the constraints in our water supply systems. In some cases, we may have an abundance of natural raw water, however, we are constrained by the capacity of our current treatment facilities. Conversely, in other areas, we may have appropriate treatment capacity, but our existing natural supplies are at risk, particularly during drought conditions. Our treatment processes can also come under pressure when raw water quality deteriorates following storm events.

In order to ensure that water customers receive safe and secure supplies, we must also consider reliability and risk to supply in our assessments. This is due to the fact that ~~no~~ water sources, treatment facilities and bulk distribution networks ~~can~~ cannot operate at 100% capacity all of the time.

When we account for availability, capacity in production, capacity in transfer mains, reliability and risk within our existing supplies, we call the amount of water we have available to supply our customers Water Available for Use (WAFU).

This section outlines how we calculate the current WAFU in each Water Resource Zone (WRZ) and how we forecast that this will change over time.

Figures 3.2 and 3.3 illustrate the steps involved:

- Step 1:** Calculate the Hydrological Yield
- Step 2:** Allow for Sustainable Operation
- Step 3:** Calculate the Deployable Output (DO)
- Step 4:** Allow for Outage
- Step 5:** Calculate the Current WAFU
- Step 6:** Forecast the components of supply to derive the Future WAFU

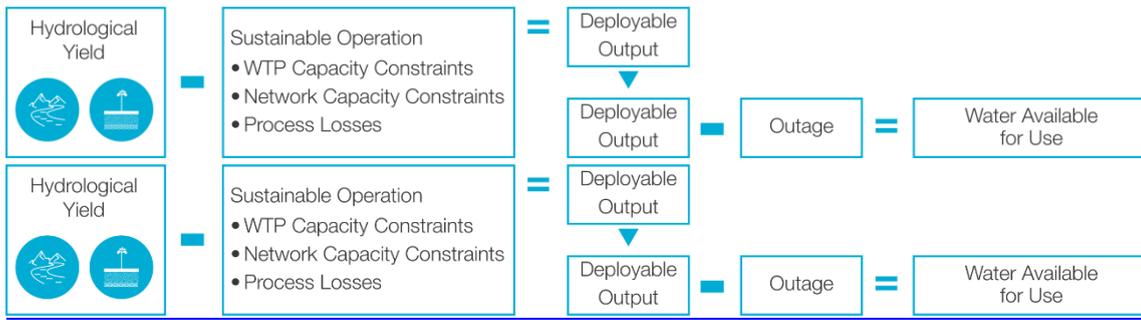


Figure 3.3 - WAFU Calculation Process

Further details on each of these steps are provided in the sections below.

3.2 Step 1 – Calculate the Hydrological Yield

To determine the WAFU we must understand the Hydrological Yield, which is the amount of water that is available from a source, be it a river, lake or groundwater body. The Hydrological Yield is dependent on the size, location and hydrological properties of the catchment from which we abstract and the Level of Service we aim to provide.

At present, we abstract more water from surface water sources (rivers and lakes) than from groundwater sources (boreholes and springs) for the provision of public water supply. This is illustrated in Figure 3.4 which shows that although we have 293 surface water sources and 797 groundwater sources, our surface water sources provide 83% of our total supply, whilst groundwater sources provide only 17% of the supply.

This is driven by a number of factors, including the historical development of public water supplies, complexity in assessing the availability of groundwater as a water source, and the natural geological conditions in Ireland. Whilst most of Ireland’s bedrock is classified as an aquifer, it is relatively poor at storing and transmitting groundwater, thus limiting the volumes available for abstraction and in some cases resilience during dry periods. Furthermore, 7.5% of the total national supply abstracts from vulnerable groundwater sources pumped from karstified and fissured limestone bedrock, which may be susceptible to surface contamination.

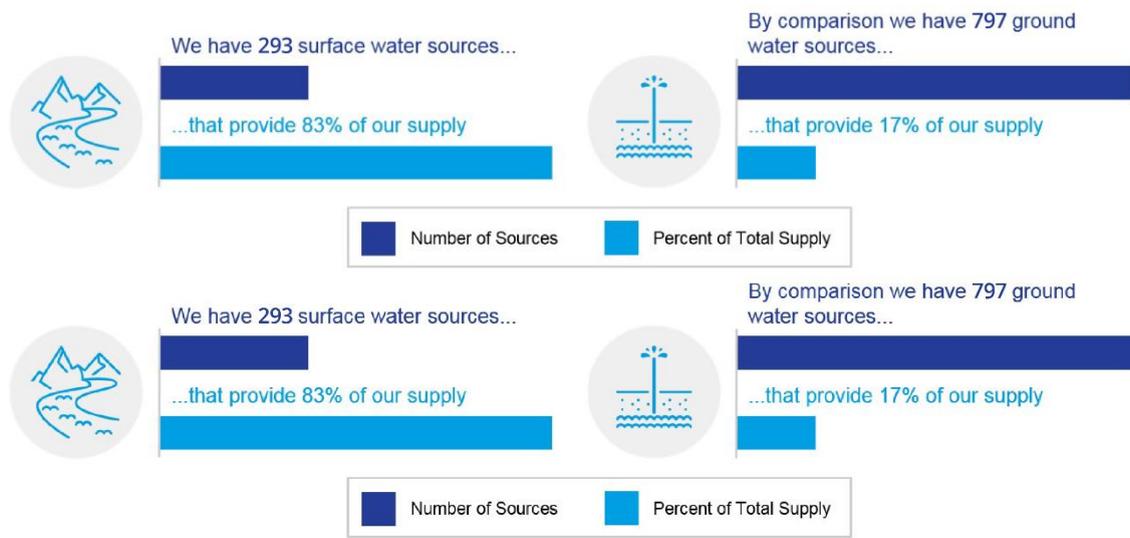


Figure 3.4 – Supply Summary

3.2.1 Surface Water Sources

The volume of water available to us from our surface water sources naturally varies throughout the year. Less water is typically available from April to September, and significantly less if we experience a drought. Our method for calculating the Hydrological Yield from River and Lake sources is summarised below. A more detailed outline of how the hydrological yield is calculated is provided in Appendix C.

River Sources

We consider the following information is required to determine the hydrological yield for a river source:

- Catchment area;
- The standard annual average rainfall for the catchment;
- Q95, the river flow which is equalled or exceeded 95% of the time;
- Qmean; the river flow which is equalled or exceeded 50% of the time, and
- Slope of the Flow Duration Curve (FDC) see Box 3.1.

Where possible, data has been taken from nearby river gauging stations to produce FDCs for our abstraction sites. However, in Ireland many river sources are ungauged, and to ensure a nationally consistent approach across the plan, a “transposition method” has been used.

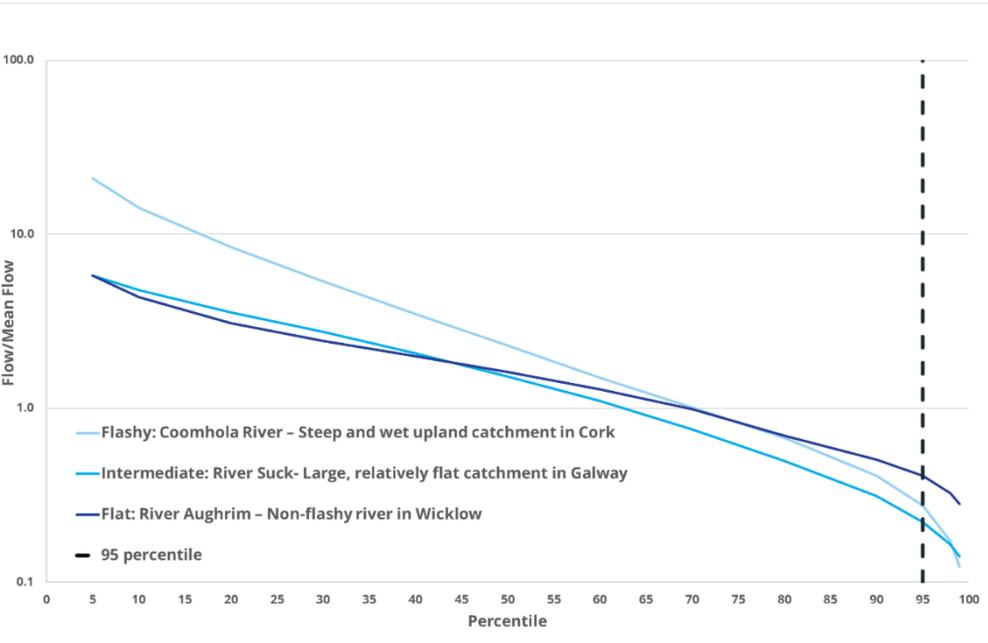
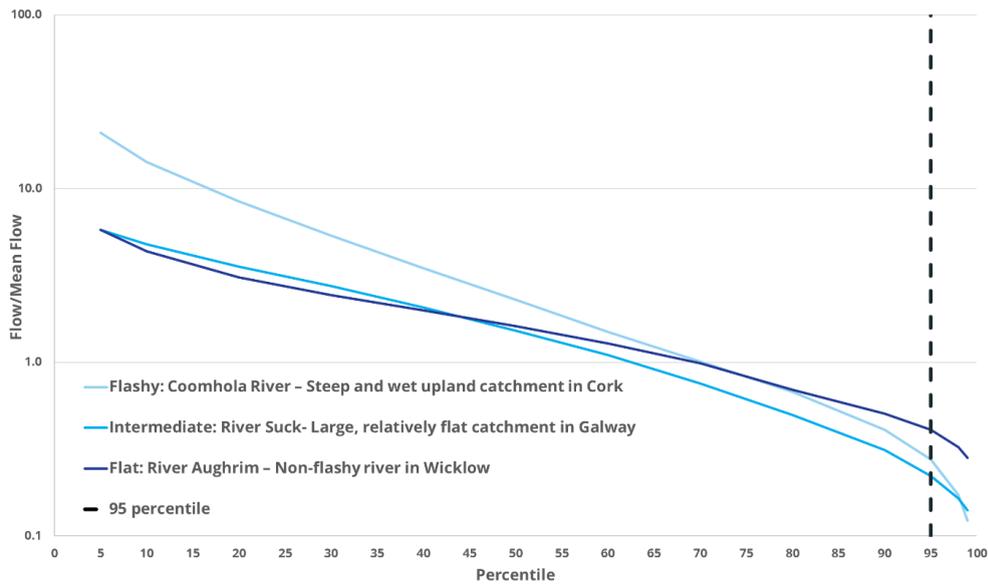
Using this method, data is taken from a gauging station with a similar catchment and used as a “donor gauge” to produce the FDC for an ungauged river abstraction source. Based on discussions with the EPA, for the ~~draft~~ Framework Plan, we developed a list of over 100 “donor catchments” that were used to produce FDCs for all our ungauged abstraction sites. Further information on the “transposition method” is provided in Appendix C.

Box 3.1 – Example of an FDC

The interaction between a river catchment and the prevailing weather conditions means flows can vary between different rivers. We summarise this variation in flows through Flow Duration Curves (FDCs).

An FDC describes the amount of time that the flow in a river is likely to equal or exceed a particular rate at a specific location. The time period is stated as a percentage so, for example, the 95th percentile flow, which is known as the Q95 flow, is the flow that is equalled or exceeded 95% of the time.

FDCs for three example river catchments in Ireland are shown in the graph below.



An FDC is shown for the Coomhola River. This is a small, steep upland catchment, which is referred to as being a ‘flashy’ river catchment type, as it will respond quickly to rainfall. This FDC is compared to the River Aughrim which is a larger, lowland river and is a ‘flatter’ river catchment type that takes longer to respond to rainfall. The graph shows that the ‘flashy’ Coomhola River experiences a wider range of flows and would be expected to have a comparatively smaller Q95 or low flow compared to the ‘flatter’ River Aughrim. The River Suck, which is a large, moderately sloped catchment in Galway, has an FDC which lies between the flashy and flat river catchment types.

To calculate the Hydrological Yield, we then input the FDC and other information for each source including rainfall data into the Institute of Hydrology Report No.108 Low flow estimation in the United Kingdom Method. We then use this method to calculate the Hydrological Yield for a given source based on maintaining a 1 in 50 Year LoS.

As presently no suitable equivalent techniques have been developed specifically for Irish rivers, we have adopted this method from the UK. The climatic and physical similarities between Irish and UK river

catchments facilitates the application of this method with an acceptable degree of accuracy until an Irish specific technique is developed.

Lakes and Reservoirs

A similar approach is used to determine the Hydrological Yield for lakes and impounding reservoir sources. In addition to the information used to assess river sources, in order to determine the Hydrological Yield in the lake or impounding reservoir we also need to consider the water storage available. The following information is required:

- The surface area of the lake or reservoir;
- The potential rate of evaporation; and
- The usable storage which is the volume between the highest and the lowest potential water levels. Any water that is stored below the lowest potential lake or impounding reservoir level is known as “emergency” or “dead storage” and is not considered to be available for use in our hydrological yield calculations.



Example of a lake water source

For most of our lakes and impounding reservoirs all of this information is not available. Therefore, the potential storage has been estimated based on the surface area with an assumed a storage depth of 1 metre. ~~Where operational information is available, it has been used as part of our assessments within the draft Framework Plan~~ This is conservative in terms of likely infrastructure but aligns with WFD standards for lakes that consider the impacts of water level fluctuations on lake margin ecology. There is a need to undertake a significant exercise to collate depth and intake data for all lake sites. Refer to section 7.3.4.1 for a summary of the activities we will carry out in terms of supply side data improvements.

We then calculate the Hydrological Yield using the available storage, FDC, rainfall data and other information using the Institute of Hydrology Report No.108 Low flow estimation in the United Kingdom Method. The Hydrological Yield is also based on maintaining a 1 in 50 Year LoS.

3.2.2 Groundwater Sources

Groundwater resources are important to Irish Water, currently providing 17% of our total supply by volume. This percentage increases significantly in certain counties, with groundwater being the main source, for example, in Laois, Offaly, Roscommon and North Cork. Furthermore, Irish Water have almost 800 individual groundwater abstractions, many of which have proven to be a dependable water supply both in terms of yield and natural water quality.

Ground water sources have been considered in tandem with surface water sources for the purposes of identifying potential new water sources within this Plan.

Though there are a few exceptions, the volume that is obtained from an abstraction, e.g. a borehole, is generally less than 1 Ml/d. This is largely dependent on the inherent hydrogeology and Appendix C provides further information on the aquifer categories and the expected yields. Yields of wells and boreholes are assessed from sustained pump tests with monitoring of boreholes required to help confirm hydrogeological yields. The information is variable, from well documented, comprehensive and reliable tests and data, to a paucity of information on yield.

~~Due to the potential for large variations in sub-surface geology, even over short distances, producing robust desktop assessments of water availability from our existing groundwater abstractions is very difficult (Figure 3.5). Ideally, yield estimates would be based on a three-dimensional assessment of the geology within the vicinity of the supply, supplemented with long term records on pumping and drawdown of water levels over many years. Irish Water does not have this type of information available for most of our groundwater supplies. Irish Water will aim to complete site-specific studies of groundwater availability. However, as we have 797 groundwater abstractions, this may take many years.~~ Irish Water will aim to complete site-specific studies of groundwater availability. This activity will also be driven by the requirements of the pending legislation and regulations on abstraction from the natural environment. This will also be important to understand the impacts of climate change. Groundwater as a resource may be more resilient than surface water in different parts of the country. Irish Water are committed to improving hydrogeological data collection to better understand and characterise our groundwater resources and to be able to work collaboratively with Geological Survey Ireland and the Environmental Protection Agency, particularly in relation to their respective groundwater monitoring programmes. Irish Water monitor water levels on individual supplies for operational reasons and it is Irish Waters intention to feed this information into the national groundwater monitoring programmes.

As information becomes available, we will feed this into our supply demand balance assessments, in accordance with the process set out in Chapter 8, of this ~~draft~~ Framework Plan.

Groundwater potential is assessed from historical data on wells and boreholes, and used in the hydrogeological categorisation of aquifers, informing potential for abstraction. In general, groundwater potential is constrained by geological factors primarily: glacial till, shallow aquifers with surface connectivity and limestone bedrock with open fissures and surface interface (as well as high levels hardness, iron and manganese) as frequent constraints.

Due to variable existing information on some of our supplies, the potential for large variations in sub-surface geology, even over short distances, producing robust desktop assessments of water availability from our existing groundwater abstractions is difficult (Figure 3.5). Ideally, yield estimates would be based on a three-dimensional assessment of the geology within the vicinity of the supply, supplemented with long term records on pumping and drawdown of water levels over many years.

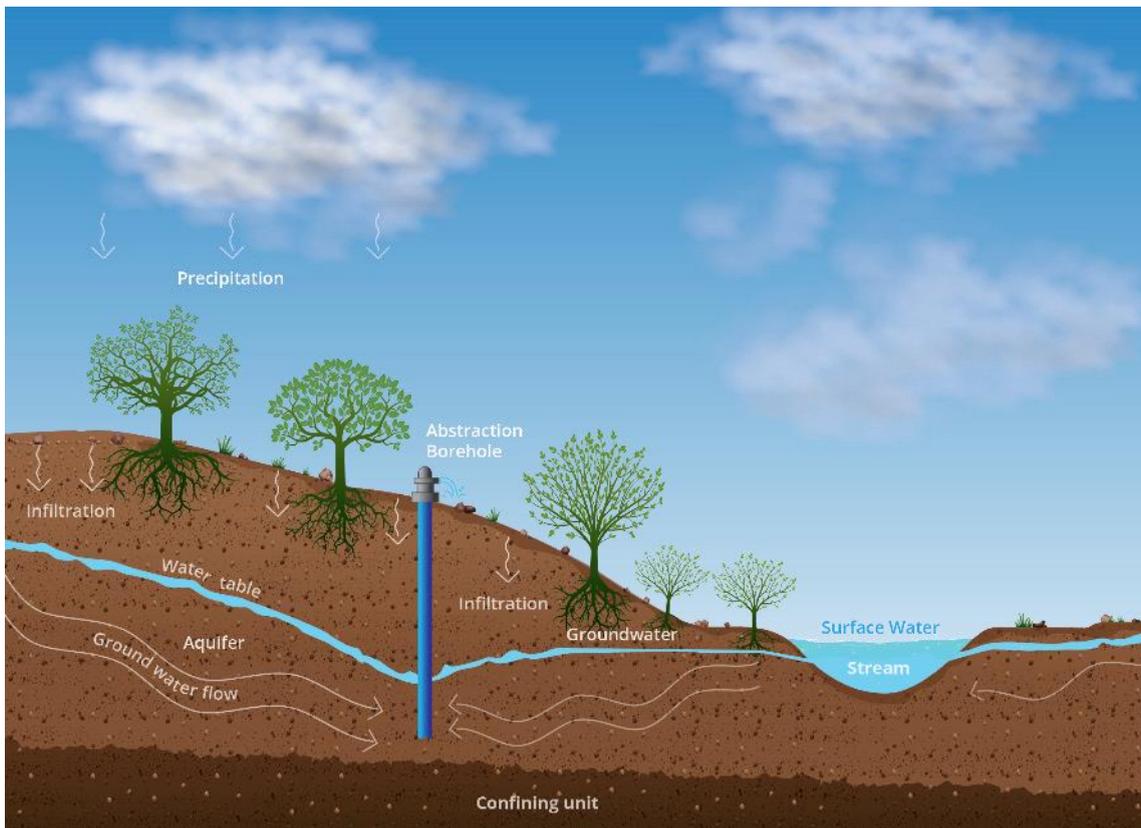


Figure 3.5 - Conceptual Model of a Groundwater Abstraction

For the purposes of the [Framework](#) Plan a simple methodology has been developed for assessing the Hydrological Yield of our groundwater sites. This is carried out by:

[Collecting and collating site-specific data, this may include more reliable information on the yield for the source;](#)

[Location, abstraction rate\(s\) and site configuration are often the minimum information available. The operational data provides useful information on the yield, and assumptions can be made around the average production from each site. It can be assumed the average abstraction value is an initial estimate of the yield. Most local authorities in the case of boreholes, would have drilled and sought the maximum yield possible through 72-hour pumping tests. This provides an initial yield. Additional information on performance in prolonged dry weather periods is providing supporting information on yields. Irish Water are continuously improving data acquisition and integration and this will be used to improve the yield estimates;](#)

~~•Defining-~~ [Additionally, to assist in a desk top assessment of the yield where we have limited information, a preliminary indicative check is done by defining](#) the Zone of Contribution (ZOC), or the land area that contributes water to the well or spring; and ~~•Calculating-~~ [calculating](#) a water balance for the source using the [average](#) abstraction rate and the [annual average](#) recharge rate as estimated from the Geological Survey Ireland (GSI) recharge maps. The water balance [shows estimates](#) the area needed to supply the yield and is then compared to the delineated ZOC. ~~The water balance needs to be larger than the ZOC for a safe yield, which would not be expected to impact the ecological status.-~~ [\(Appendix C\).](#)

[As further assessments are made and relevant data collected, iterative improvements will be made to the yield estimates.](#)

~~Yields of wells and boreholes are assessed from sustained pump tests with monitoring of boreholes required to help confirm hydrogeological yields. With a few exceptions, groundwater yields in Ireland-~~

~~have proven to be disappointing for larger abstraction volumes (in excess of 1 Ml/d). Groundwater potential is assessed from historical data on wells and boreholes, and used in the hydrogeological categorisation of aquifers, informing potential for abstraction. In general, groundwater potential is constrained by geological factors primarily: glacial till, shallow aquifers with surface connectivity and limestone bedrock with open fissures and surface interface (as well as high hardness, iron and manganese) as frequent constraints.—~~

3.3 Step 2 – Allow for Sustainable Operation

Sustainable Operation reflects the amount of water we can supply based on the capacity of our water treatment plants and bulk distribution network. It also accounts for unavoidable water losses that occur during treatment (known as Process Losses).

3.3.1 WTP and Network Capacity

Our water treatment plants (WTPs) and the distribution networks transferring treated drinking water from these WTPs to homes and businesses have maximum capacities. This maximum capacity can limit the volume of water that can be obtained from a source, regardless of the hydrological yield or raw water availability. We assess capacity of the WTPs and network supplying each WRZ to see if this is the factor limiting water available for use.

3.3.2 Process Losses

All production processes from manufacturing to energy production to construction involve losses. This is difference between the amount of raw materials required at the start of a process to deliver the amount of product produced at the end of a process. For example, in furniture manufacturing, some pieces of wood end up as saw dust or offcuts, in energy generation some output is lost through efficiency of turbines. For water treatment it is the same, there is a difference between the volume of raw water we transfer to our treatment facilities and the volume of drinking water that is produced. This loss is known as Process Loss. It is an unavoidable element of water supply and is generally a function of the raw water quality and the amount of treatment required to bring this water up to the standards required by the drinking water regulations. The amount of water 'lost' as Process Losses depends on the type of water treatment plant.

There are three main types of water treatment plants operated by Irish Water, summarised as follows:

- WTPs which include some type of chemical coagulation and filtration process, where losses would be moderate to high. These types of treatment plants are usually at surface water or ground water sites where there is a potential for contamination of the water source;
- WTPs which include filtration plus disinfection processes, where losses would be moderate to low. These treatment plants are usually required at well protected sources with high raw water quality, and moderate to low potential for contamination;
- WTPs which involve disinfection only, where losses would also be moderate to low. This type of treatment process is usually only applied to well protected and constructed groundwater abstractions, where there is no potential for contamination and continuous monitoring is in place. [The losses are associated with small quantities used for chlorine residual monitoring, which can account for 1-2% of small output plants.](#)

Other Treatment Processes, such as Desalination or Effluent reuse involve significant process losses, due to the quality, for example, it can take over two litres of saline water to produce 1 litre of drinking water in a desalination process.

Table 3.1 summarises the Process Loss percentages that are applied to the three treatment plant types in our supply assessments, when we have no site specific WTP data available. These losses are consistent with industry standards.



Filtration of water

In some of our larger WTPs, where raw water quality is very good, coupled with performing assets and careful operational practice, process losses can be significantly less than these amounts. For example, at the largest water treatment plant in Ireland, Ballymore Eustace, although a Coagulation, Flocculation, Clarification and Filtration process is used, process losses are typically less than 2%. Where site specific information has been made available, it has been used within the [draft Framework Plan](#) [Framework Plan](#). [It is the aim of Irish Water to collate site specific data on process losses for all WTPs which will account for variability in raw water quality and incorporate this data into its water resource planning as it becomes available.](#)

As part of our Options Appraisal Methodology, we will consider the possibility of plant upgrades to reduce process losses as an option to address supply demand balance deficits, where feasible.

Table 3.1 - Percentage Process Losses Accounted for the different treatment types

WTP treatment type	Process Losses (%)
Coagulation, flocculation, clarification and filtration (includes waste residuals)	- 8
Filtration and disinfection	- 3
Disinfection only	- 1

3.4 Step 3 – Calculate the Deployable Output

The Deployable Output (DO) is the total amount of water that we can supply to our customers from our water treatment plants and through our distribution networks before we account for risk and reliability in terms of planned and unplanned events across our supply asset base.

The DO calculation for a simple WRZ consisting of a single source, feeding a WTP that in turn feeds a bulk distribution network is determined as:

- The hydrological yield of the water source minus process losses, where the Hydrological Yield is the constraining factor; or
- The ~~water treatment plant~~ [WTP](#) output and/or bulk distribution network capacity where the hydrological yield is not the constraining factor.

For more complex WRZs where there are multiple raw water sources, supplying multiple WTPs with complex bulk distribution networks, we use an industry standard water resource simulation model called Aquator to calculate DO. Using Aquator, the DO is developed based on a behavioural modelling analysis of the supply system, using long-term inflow time series that have been derived for each of the sources. The model is tested to failure at a daily time step to support increasing levels of demand in a series of iterations, allowing a DO to be generated for a given LoS.

The DO for each of our water supplies, where the DO is not constrained by WTP capacity, is a function of hydrological yield and can vary considerably over the course of the year. In winter conditions, when precipitation and water availability in the natural environment is high, treatment capacity and bulk transfer capacity tend to be the limiting factor in DO. In contrast in summer periods or drought conditions, water availability in the natural environment tends to be the limiting factor.

As Irish Water must supply water in all conditions, we calculate DO for each WRZ for the following Weather Event Planning Scenarios (as described in Chapter 2).

- Normal Weather (NYAA);
- Dry Conditions (DYAA);
- Drought Conditions (DYCP); and
- Winter Conditions (WCP).

The DO calculation considers the variability in the natural environment and the design parameters around our WTPs and bulk transfer networks. It does not consider reliability of our assets or the planned or unplanned activities that form part of normal water services operations.

3.5 Step 4 – Allowance for Outage

An Outage is a planned or unplanned event that results in a short-term reduction in DO. An outage might occur when quality in our water sources deteriorates, when a piece of equipment fails at a source or treatment plant, or when we need to carry out planned maintenance. For our larger supplies we apply an Outage factor to account for this within our calculation of the WAFU.

~~All of our~~ [Our](#) assets do not operate at 100% output all of the time; therefore, it is necessary to cater for the planned and unplanned activities that take place across our asset base throughout the year. ~~Fluctuations~~ [Also, fluctuations](#) in raw water quality [or pollution events](#) may occur which will reduce the

volume of water which can be sustainably produced at our treatment plants [for a period of time](#), or maintenance activities may need to be carried out on a continuous programme.

Unplanned events such as the failure of a component of one of our WTPs, a break along one of our raw water intake mains or bulk distribution mains must be considered. These are normal characteristics of a water supply system that result in an “outage”.

In water supplies where raw water sources are well protected and sustainable, coupled with high performance, appropriately designed and well-maintained assets, the frequency and duration of an outage will be low compared to a poorly planned, designed and maintained supply. However, there is always a risk of outage, and as part of water resource planning, outage allowances are applied to DO calculations.

Outage allowances are usually calculated for each WRZ individually based on a history of planned and unplanned outage events, severe weather interruptions, water quality issues- [pollution events](#) and an analysis of cause to determine future allowances. At present, due to limited availability of historical operational records, an individual analysis is not possible for the majority of our supplies.

In other jurisdictions, outage allowances range from 2% to 9%. Further to a review of other water utilities [planning assumptions in similar types of WRZs](#) and our own experience, for this ~~draft~~ [Framework Plan](#) we have applied a 5% outage allowance to Large and Very Large WRZs only. [This provides a reasonable average allowance in loss of deployable output but data collection to capture actual outage events is a key data gathering requirement.](#)

For ~~Medium-medium~~ and ~~Small-small~~ sized WRZs where there is often only one source of water, there is no benefit of applying an ~~Outage-outage~~ allowance, as in these cases, any significant incident will result in the total loss of supply.

Table 3.2 summarises the outage allowances included in the SDB assessment, in our ~~draft~~ [Framework Plan](#).

Table 3.2 - NWRP Outage Allowance

WRZ	Outage allowance
Very Large zones (> 200MI/d)	5%
Large zones (10–200MI/d)	5%
Medium zones (1–10MI/d)	0%
Small zones (<1MI/d)	0%

3.6 Step 5 – Calculate the Baseline WAFU

When considering supply availability as part of water resources planning, all the component parts of the individual water supplies that have the potential to impact on our ability to produce and distribute water to our customers are considered. This allows us to identify the limiting factors in our current supplies, and the interventions which may be required. It also allows us to identify the components of our supplies that have unacceptable risks associated with them in terms of maintaining a safe, secure and reliable water supply.

As shown in Figure 3.6, an analysis of each WRZ considers all the factors outlined in Steps 1 to 4, including hydrological yield, sustainable operation and outage allowance. Step 5 is to calculate the WAFU. As outlined previously, this is estimated as:

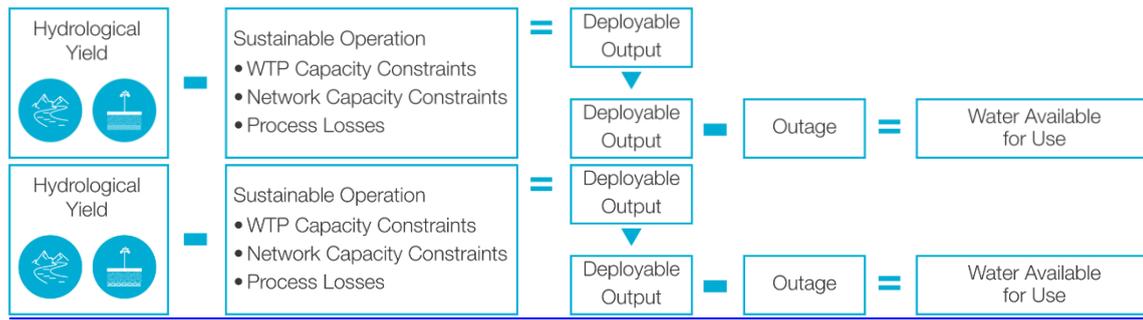


Figure 3.6 – WAFU Calculation Process

The WAFU is estimated for each of the Weather Event Planning Scenarios described in Chapter 2 of the Plan.

3.7 Step 6 – Forecast the components of supply to derive the Future WAFU

As the purpose of water resources planning is to ensure that we have sufficient water supplies in place for our customers now and into the future, we take the baseline WAFU developed for each WRZ and forecast how it may change over the next 25 years.

Many of the current challenges with existing water supplies relate to asset performance, characterised by undersized WTPs or inadequate treatment processes. Across our groundwater supplies, uncertainties around sustainable yield are also an issue. These deficiencies are largely within our control and, although the scale of funding required to address them will be significant, they can be addressed over time through investment, improved operation, maintenance and site investigations.

However, in the coming years the emerging issues which have the greatest potential to impact on our ability to supply water will relate to the natural environment and will largely be outside of our control.

As noted in Chapter 1, our water supply network developed over time, usually based on the need in the immediate vicinity. Some of our 1,090 abstractions are at risk of not meeting the requirements of pending abstraction legislation which will be based on environmental sustainability. In addition to this, the majority of our supplies were developed during a relatively consistent climatic period in Ireland over the past 50 years, with comparatively few dry periods compared to the long-term historical record. The forecasts for future WAFU must consider how climate change impacts may affect the hydrological yield of our sources, which may not be resilient to more extreme weather conditions.

Due to the condition of our existing supply asset base, particularly in relation to compliance with drinking water regulations, there will be competing needs for limited financial resources in the coming years. This means essential funding requirements to improve compliance and the condition of our asset base will limit the amount of funding available to move towards a more sustainable supply model in the short to medium term.

As part of the ~~draft~~ Framework Plan, the impact of climate change and ~~pending~~ anticipated abstraction legislation on water supply forecasts have been considered.

3.7.1 Climate Change

Our WAFU forecast considers the impact of climate change on our existing sources by adjusting the future hydrological yield of each source using Ireland-specific climate change factors, which were developed by the ICARUS (Irish Climate Analysis and Research Unit) Department of NUI Maynooth in 2008. The work involved assessing nine catchment types across Ireland to develop seasonal adjustment factors that could be applied to hydrological yield.

The central estimate of the impact of climate change on water availability has been included within the SDB for each WRZ. The uncertainty around the central estimate has been included in the headroom calculations in line with UK guidance.

In 2018, Irish Water commissioned further research with the ICARUS Department in NUI Maynooth under the Climate Sensitive Catchments Project. This project has used the latest climate change projections and a best practice risk-based approach to assess the impacts of climate change on flows in 206 catchments in Ireland.

The Climate Sensitive Catchments Project is not included in this ~~draft~~ Framework Plan, as we must develop an operational means of applying the research outputs into our Hydrological Yield assessments. Based on our work to date, it is clear that the full application of the techniques presented in the study to all our surface water sources will require a multi-year programme of work including:

- Hydrological measurements;
- The development of additional rainfall-runoff models;
- Groundwater studies; and
- An assessment of the significance of reservoir and lake storage on a catchment's runoff response.

In addition to this, as part of the TRANSLATE project, Met Éireann, are developing standardised national climate projections for Ireland and climate services support. This will provide the necessary information requirements for sectoral adaptation planning. Irish Water will work with Met Éireann to adopt these projections when they become available, in order to ensure that our NWRP is always aligned with national policy.

[Geological Survey Ireland have embarked on a groundwater monitoring and modelling project that seeks to understand the impact of climate change on the groundwater resources in Ireland. This will assist in the sustainable yield assessments and help monitor and understand operational data. It will help indicate susceptible supplies and enable Irish Water adapt resource management. This data will be factored into assessments when available.](#) As our understanding of the impacts of climate change improves, incremental improvements will be incorporated into the SDB calculations, in accordance with the process set out in Chapter 8 of this ~~draft~~ Framework Plan.

Additional information on Irish Water's approach to considering the effects of future climate change and the Climate Sensitive Catchments Project is provided in Appendix F.

3.7.2 Abstraction Legislation

Most of our abstractions ~~were~~ [have been](#) in operation long before any modern environmental legislation. Historically, when new supplies were developed, the emphasis was placed on the capacity of the WTPs or the capacity of the bulk transfer mains.

Although some consideration was given to the sustainability of water bodies, through the requirements for environmental assessment in compliance with the Planning and Development Acts as amended, many water supplies pre-dated this. Most surface abstractions in recent decades, apart from those from ESB hydroelectric schemes, were approved under the Water Supplies Act 1942, which included some level of hydrological assessment. However, many of our smaller supplies were never formally permitted.

More stringent environmental standards may mean that [surface water and groundwater](#) abstractions that were once regarded as acceptable may now be considered to be unsustainable, particularly in dry

weather conditions, in the context of new legislation. These abstractions may in the future be subject to modifications to meet the requirements of the WFD. These more stringent environmental standards may generate uncertainty in some of our current estimates of deployable output but we will work with the EPA through the expected abstraction licencing process to understand any potential impacts, and these will then be integrated back into the assessments, and options updated. Coarse screening and fine screening assessments carried out as part of the development of feasible options considered in the NWRP, have incorporated theoretically conservative standards and limits, in order to mitigate this uncertainty.

In summer 2018, ~~a draft Bill was published proposing~~ the Government published a General Scheme for the Water Environment (Abstractions) Bill (Abstractions Bill), which proposed alignment of abstraction licencing with the requirements of the Water Framework Directive. ~~We have assessed our~~ The Government approved an amended General Scheme of the Abstractions Bill in September 2020. We are assessing existing abstractions, ~~and taken taking~~ a precautionary approach, based on our current understanding of how proposed abstraction legislation might be applied, as outlined in Appendix C. This assessment suggests that certain schemes may be subject to ~~reduction~~ reductions in abstraction. Figure 3.7 shows how the anticipated abstraction legislation could change the way that we calculate the WAFU.

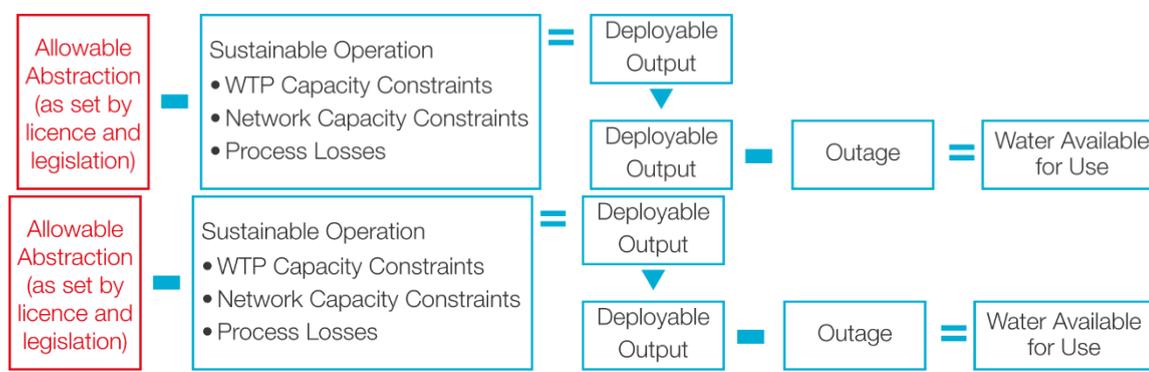


Figure 3.7 – Potential Impact of the Abstraction Legislation on the WAFU Calculation Process

As the Abstractions Bill is still being developed, we do not have full visibility of the future regulatory regime ~~and~~. We have therefore not progressed through ~~the a theoretical~~ licencing process on a site by site basis, ~~we have not included our~~ and cannot reliably include an estimation of sustainable abstraction within the SDB calculations. Instead, we use the hydrological yield, water treatment capacity and bulk transfer limitations in our calculation of DO. We also use the sustainable abstraction assessment to assess the sensitivity of the Preferred Approaches (solutions) we develop as part of the NWRP.

Therefore, our ~~draft~~ Framework Plan assumes that existing abstractions can continue on a transitional basis, subject to the registration and/or licencing requirements as outlined in the General Scheme of ~~a Water Environmental (the Abstractions) Bill published approved~~ by the Government in ~~December 2017~~ September 2020.

For these abstractions, further studies will be undertaken in conjunction with the EPA and appropriate stakeholders. Following investigation, if an abstraction is confirmed to be affecting a waterbody status the Supply Demand Balance will be updated and solutions will be delivered through ~~the~~ future cycles of ~~RBMPs the RBMP~~ and/or ~~Regional Water Resources Plans~~ RWRPs.

In parallel, IW will also consider other hydro morphological impacts, such as barriers to fish migration, as part of this process.

As the objective of our NWRP is to achieve, ~~safe, secure, reliable and sustainable supplies~~, ~~all any~~ new abstractions proposed to be developed by Irish Water as part of our ~~Regional Water Resources Plans~~ RWRPs will be based on conservative assessments of sustainable abstraction. This will ensure that our

water supplies continually improve in terms of environmental sustainability ~~over time~~. More information on Regulatory and Licensing Constraints can be found in Appendix G.

[Irish Water has been an active participant in the characterisation process for the 3rd cycle River Basin Management Plan 2022-2027 and has liaised closely with the EPA during the development of this Framework Plan. Therefore, although the proposed Abstractions Bill is still under development and there may be some uncertainty in our calculations of sustainable abstraction, the assessments used as part of the development of the Framework Plan have followed the same principles as those that will likely be used by the regulatory authorities \(based on the legislation as currently envisaged\).](#)

3.8 Baseline and Forecast Supply

When we apply the WAFU assessment methodology set out in this Chapter to our existing supplies, and forecast the change in these supplies, we can assess how our supplies might perform now and into the future.

Figure 3.8 shows our calculation for the WAFU nationally for our weather event planning scenarios between 2019 to 2044. A summary of this information is also provided in Table 3.3.

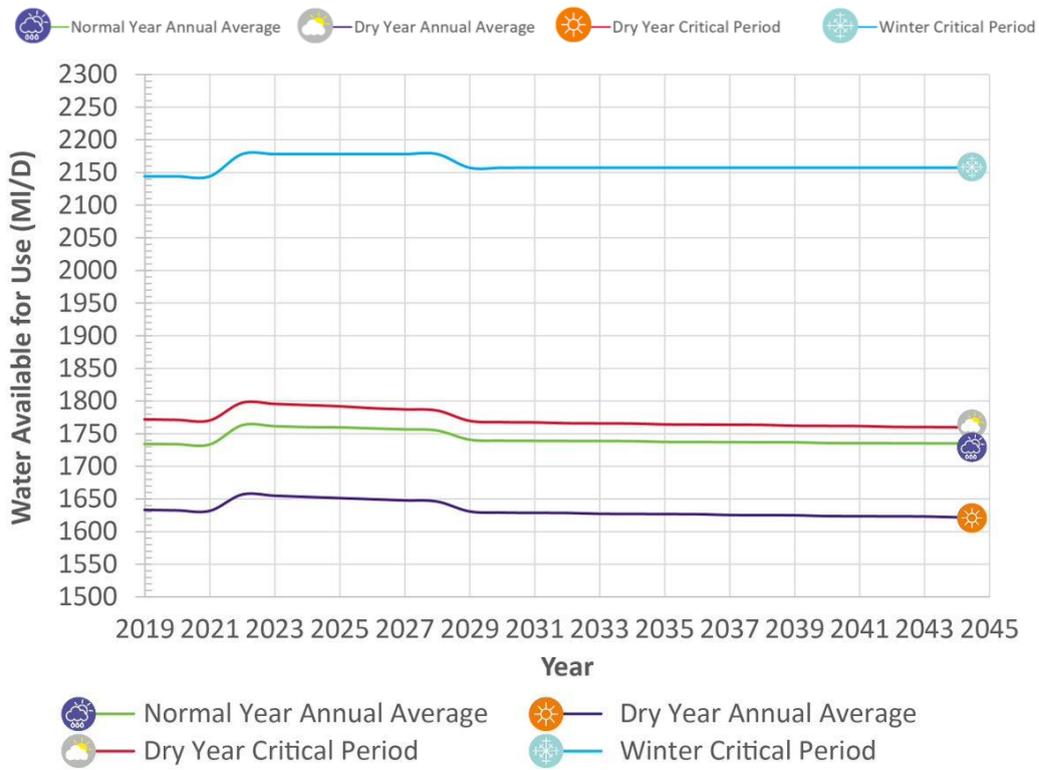
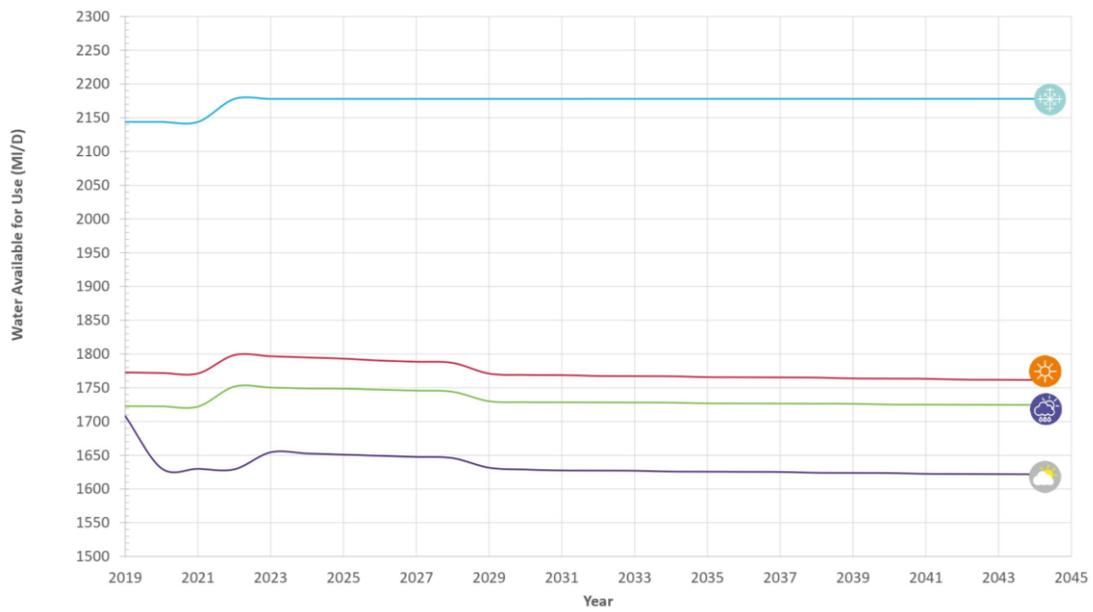


Figure 3.8 – National Summary of WAFU, 2019 to 2044

Table 3.3 - Change in WAFU, 2019 to 2044

Weather Planning Scenario	WAFU (MI/d)		Change in WAFU from 2019 to 2044	
	2019	2044	Total (MI/d)	(%)
NYAA	1,723	1,725	2	0

DYAA	4,708 <u>1,631</u>	1,622	-86 <u>-14</u> ↓	-0.5 <u>0</u> ↓
DYCP	1,773	1,762	-12 ↓	-1 ↓
WCP	2,139	2,173 <u>2,152</u>	+34 <u>-13</u> ↑	+2 <u>-1</u> ↑

↑ = ~~Increased~~ Increase in WAFU

↓ = Decrease in WAFU

Presently, for a normal year (NYAA) the maximum WAFU is 1,723MI/d. This will increase in the short term to ~~4,761MI/d~~ 1,751MI/d as a result of delivery of projects to increase WAFU during the current investment cycle. By 2044 however, the maximum WAFU is reduced back to 1,725MI/d, due to the impacts of climate change. For a dry year (Dry Year Annual Average) the maximum WAFU is ~~4,708MI/d~~ 1,631MI/d, rising to 1,654 MI/d in 2023. This reduces to 1,622MI/d in 2044. The WAFU is less in a dry year than in a normal year as dry weather conditions reduce the amount of raw water (Hydrological Yield) that we can abstract from our sources.

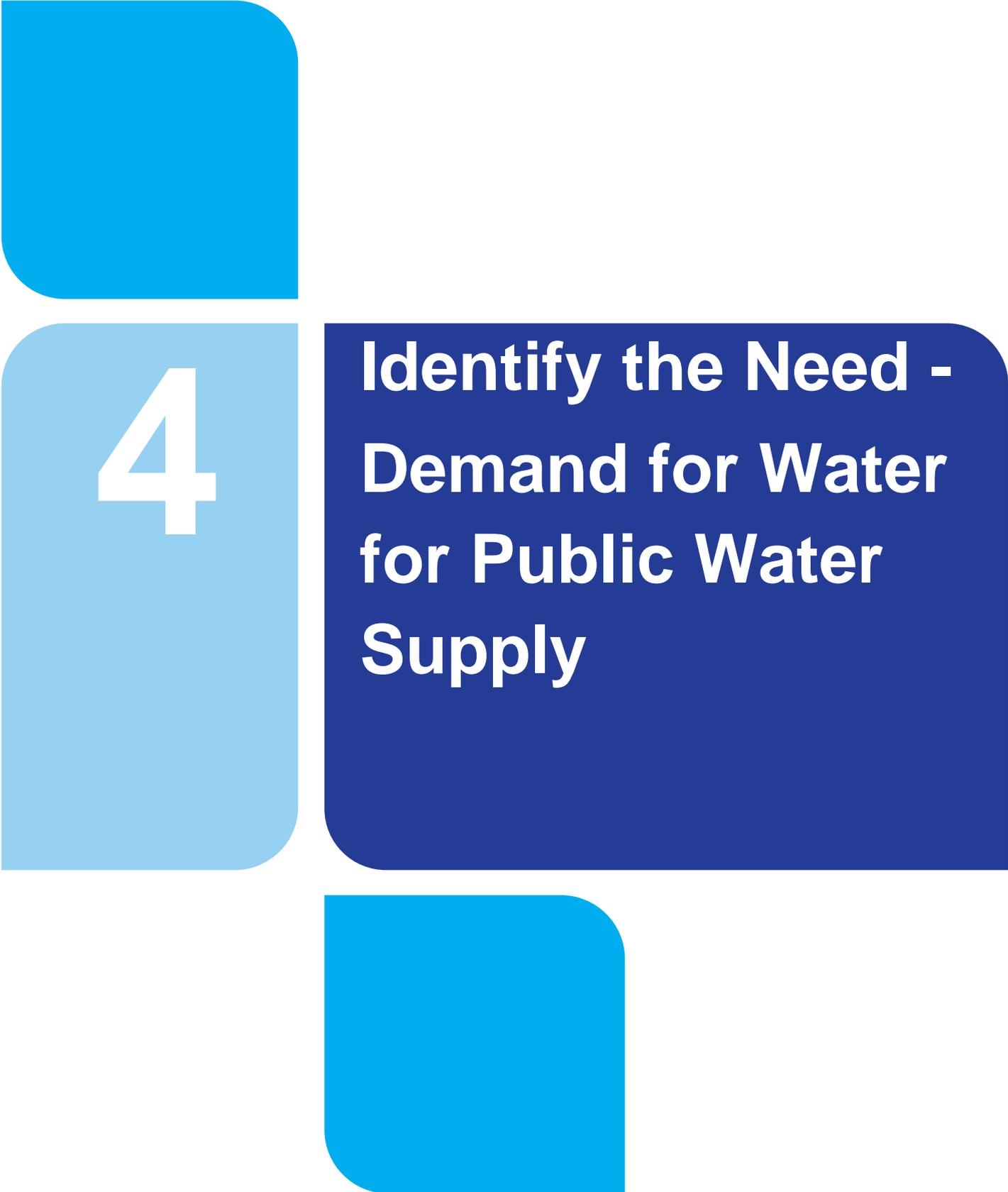
Although there is less raw water availability from water sources, during a DYCP we allow our ~~WTP's~~ WTPs to operate at peak output over 22 hours. This ~~means that in~~ represents an increase in operational time (usually 20 hours) to meet demand with a reduction in time for routine maintenance. This means that for water supplies where hydrological yield is not a limiting factor, we allow a peak deployable output from these sites. The WAFU is higher during the WCP. This type of event tends to be short in duration and in some cases, we may be able to increase the operating period of our ~~treatment plants~~ WTPs to address demand increase. Raw water availability is not normally a constraint during the WCP, which usually occurs when river and lake levels are at their highest. ~~Between 2019 and 2044~~ During the planning period we are predicting ~~5a 2% and 1% decrease in the WAFU during the DYAA and DYCP respectively. This is~~ reduction in WAFU due to climate change, which is expected to reduce the amount of water that we can abstract from our surface water sources. At present, our forecast WAFU does not include the potential effects of the ~~Abstraction Legislation, which are likely to~~ anticipated abstraction legislation, which will likely further reduce the amount of water we are able to abstract from our sources. The effects of the anticipated abstraction legislation are too wide ranging and uncertain to be assessed at this stage- with a more detailed site-by-site assessment required when the legislation is enacted. However, as part of our Options Assessment Methodology (see Chapter 8) we include a Sensitivity Assessment to ensure we understand how the abstraction legislation could impact our preferred options and programmes for each WRZ.

3.9 Summary

In this Chapter we have:

- Outlined and described how we estimate the components of supply.
- Set out the current WAFU and how we expect this to change over the next 25 years.
- We have also applied the baseline and forecast WAFU assessment methodology to our existing supplies.

The output of this assessment will be used in our Supply Demand Balance Calculations.



4

Identify the Need - Demand for Water for Public Water Supply

4 Key Points

In this Chapter we will:

- Outline the components of demand;
- Describe how we estimate current demand and forecast future demand for domestic and non-domestic purposes;
- Explain how we estimate leakage and leakage forecasts;
- Outline operational water use;
- Explain the concept of headroom and how this is used to provide for uncertainty in our estimates;
- Describe our approach to calculate peaks in demand under the Weather Event Planning Scenarios; and
- Set out the overall demand forecast for the next 25 years.

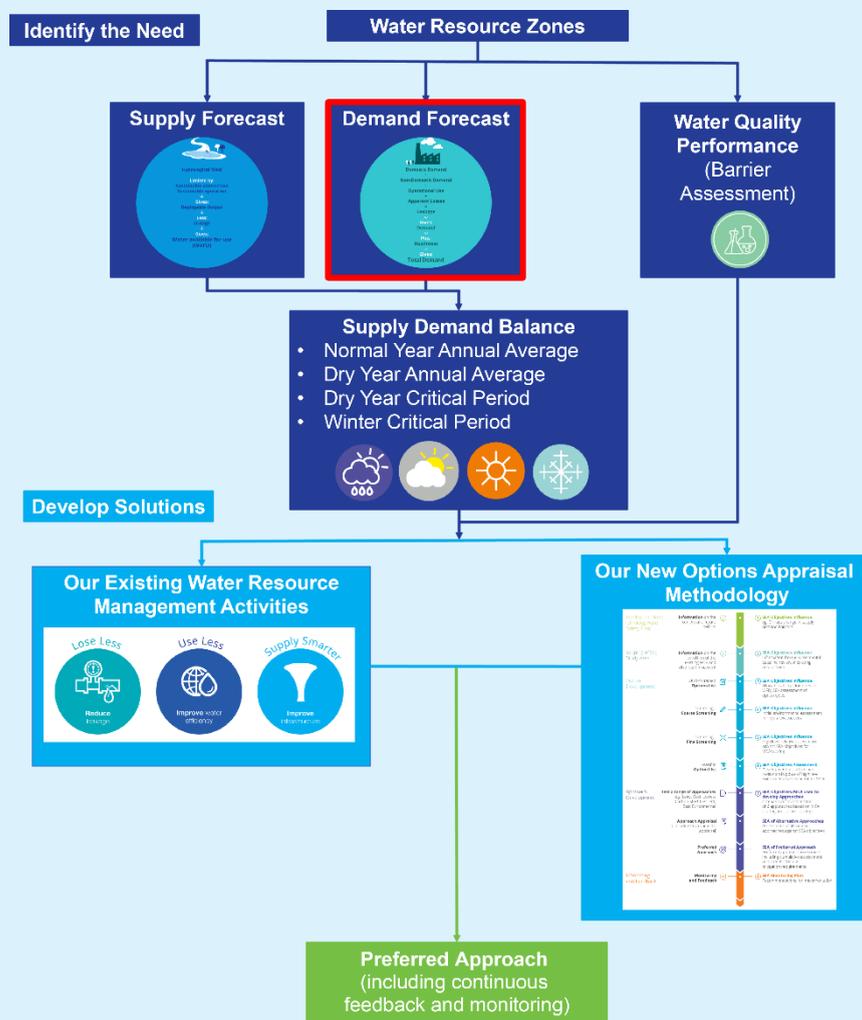


Figure 4.1 – NWRP Framework Process – Demand Forecast

4.1 Introduction to Demand

To plan for future water demand, Irish Water must understand the current demand for water, and then forecast how this might change over the next 25 years (Figure 4.1).

The term ‘demand’ refers to the amount of water we need to input into our distribution networks at water treatment plants to ensure that we can meet our customer’s water requirements in the homes and businesses at the boundaries of our networks.

Our water distribution networks are extensive, for example the distribution network for Clonakilty in County Cork contains approximately 450 kilometres of water mains (approximately the distance between Cork and Letterkenny). As our water supplies travel through large networks before they reach our customers, the network performance or leakage needs to be considered in our demand calculations.

Figure 4.2 shows the baseline components of demand. The components are assessed separately as they each involve different patterns of use and are subject to different drivers for change over the next 25 years.



Figure 4.2 - Deriving forecasts of total demand

The following demand components have been assessed:

- Domestic water use – water used in homes. It is often calculated by multiplying the population served by the average Per Capita Consumption rate (PCC);
- Non-domestic water use – water used in metered or unmetered non-domestic premises;
- Operational use – water used by Irish Water in carrying out its operations and hydrant use;
- Apparent Losses – water use from connections that are not recorded on our systems; and
- Leakage from pipes and joints in the supply network, or from overflows at storage tanks.

The total amount of water supplied into the distribution network (from our treatment works) is known as “distribution input”. Therefore, for each WRZ, the demand components combine to give distribution input, i.e.



Demand for water in any WRZ fluctuates daily, seasonally and during critical periods such as drought or freeze thaw conditions. The fluctuations occur for a variety of reasons, including:

- Changing weather affects the way water is used. For example, watering of gardens can increase demand significantly during a dry spring or summer;
- Movement of people during holiday times or at weekends can result in increases in water demand in some WRZs and decreases in others;
- Non-domestic demand, for example in schools, offices and other places of work, may be lower during weekends or holiday times;
- Some non-domestic customers, such as the agricultural sector, may increase their demand during hot or dry weather; and
- Leakage from the distribution network and our customers supply pipes tends to increase during very cold weather. Ireland experienced very large increases in leakage following severe cold weather in the winters of 2009/10, 2010/11 and Storm Emma in 2018.

We consider these factors as part of our Weather Event Planning Scenarios, as outlined in Chapter 2.

To forecast demand over the next 25 years, we first need to develop an understanding of how water is currently used once it enters the distribution system. This section outlines our understanding of current water usage in 2019 (this is the base year from which we start our forecasts of demand) and sets out how this forecast will change over time.

We describe the steps to derive the demand forecast:

Step 1: Calculate base year demand (the water balance)

Step 2: Calculate forecasts for each component of demand

Step 3: Calculate headroom

Step 4: Calculate the total demand forecast

Step 5: Derive and apply factors to convert demand to Weather Event Scenarios.

Water demand forecasts for the period 2019 to 2044 have been developed for each of the 539 WRZs that Irish Water supplies water to.



4.2 Step 1 – Calculate Base Year Demand

4.2.1 Overview of Base Year Water Balance

Irish Water currently supplies about 1,730 million litres per day (Ml/d) of water to approximately 4.2 million people. This represents about 87% of the total population of Ireland (the remainder receive water from private supplies or Group Water Schemes). The public water supply serves approximately 1.6 million domestic and 0.2 million non-domestic properties. A summary of Irish Water's current supply is provided in Table 4.1.

Table 4.1 - Summary of Irish Water's water supply

Item	Number in 2019
Total population served	4.2 million
Number of domestic properties served	1.6 million
Number of non-domestic properties served	0.2 million
Total quantity of water supplied	1,732 MI/d
Number of WRZs	539

Table 4.2 highlights how our WRZs vary significantly in size. In most zones, the population served is less than 1000. The five largest WRZs account for 57% of the total population served by Irish water and account for 50% of the total volume of water put into distribution.

Table 4.2 - Summary of Irish Water's WRZs

WRZ category	Population served category	Number of WRZs in category	Population in 2019 (million) (% of total)	Average Demand in 2019 (MI/d) (% of total)
Very large WRZs:				
• GDA	over 100,000	5	1.72 (41%)	572 (33%)
• Cork City			0.29 (7%)	132 (8%)
• Galway City			0.15 (4%)	75 (4%)
• Limerick City			0.12 (3%)	44 (3%)
• South Louth / East Meath			0.11 (3%)	34 (2%)
Large WRZs	25,000 to 100,000	14	0.62 (15%)	276 (16%)
Medium WRZs	5000 to 25,000	72	0.79 (19%)	387 (22%)
Small WRZs	1000 to 5000	133	0.33 (8%)	167 (10%)
Very small WRZs	0 to 1000	315	0.08 (2%)	44 (3%)
Total		539	4.2 million (100%)	1732 MI/d (100%)

**Due to rounding the percentage figures may not add to 100%*

Since Irish Water was established **in 2014**, we have been collating all data held by Local Authorities into our centralised systems in order to understand how water is used once it is put into supply.

In late 2018, a Leakage Management System (LMS) which draws together a range of live data including numbers of customers, metered customer usage and water put into supply, was developed. The key features of the LMS allow us to assess leakage trends in a uniform way across our supplies, and to manage active leakage control activities.

Although the LMS is in its early stages and will take a number of years to fully calibrate, we are continuously improving our knowledge of leakage across our distribution networks. Our estimation methodologies are based on best international practice, and the LMS provides us with a platform for analysis of data. We have used the first full year of output from LMS to develop the baseline demand and water balance for the ~~draft~~ Framework Plan.

The components of national distribution input for 2019, national public water supply, are shown in Table 4.3.

Table 4.3 - National Water Balance for 2019

Water balance component	Volume in 2019	% of total in 2019
Domestic consumption	556 MI/d	32%
Non-domestic consumption	407 MI/d	23%
Operational use	17 MI/d	1%
Apparent Losses	12MI/d	1%
Leakage	741 MI/d	43%
Distribution input (i.e. total water supplied)	1,732 MI/d	100%

4.2.2 Demand Components

4.2.2.1 Base year population

The estimated population currently living in each WRZ has been based on the 2016 Census data. Forecasts for future populations have been based on draft growth projections from the National Planning Framework (NPF), and updated information from the Regional Spatial and Economic Strategies (RSES) and Local Authority Planning sections (where available).

The 2016 population was assigned to District Metering Areas (DMAs) by mapping the Central Statistics Office (CSO) data to DMA boundaries.

We have projected the 2016 population forward to 2019 using the growth projections in the NPF to establish our base year populations. Our approach to forecasting population growth is described in Section 4.3

4.2.2.2 Base year domestic demand

We measure domestic demand as Per Household Consumption (PHC) or Per Capita Consumption (PCC) in litres per household per day or litres per person per day based on a combination of metered data and estimates for unmetered properties.

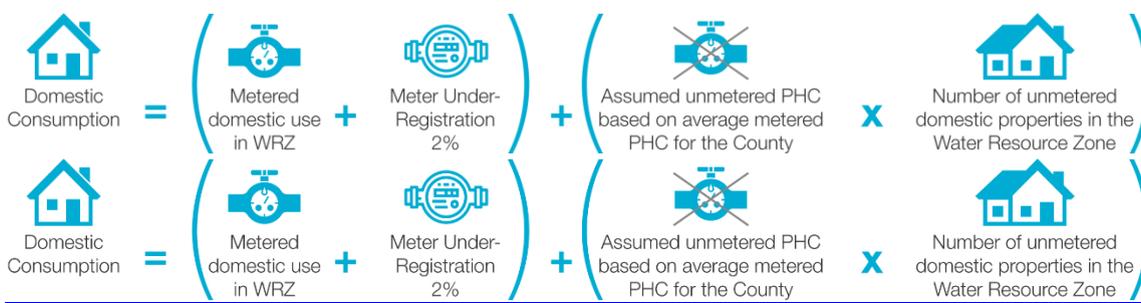
PHC and PCC are made up of micro-components of use such as: toilet flushing, personal washing, clothes washing, dishwashing and outdoor use. The demand associated with these micro-components relates to either individual use or shared use. Individual use covers activities such as toilet-flushing and personal washing and is largely independent of the number of people living in a property. Shared use includes activities like washing clothes in a machine and is dependent on the number of people living in a property. Understanding this breakdown of usage in the base year helps forecast changes in demand. In

Ireland we do not currently have detailed information about water-using behaviour and a breakdown by micro-component.

Currently, the percentage of metered properties varies by WRZ but, on average 57% of domestic properties in Ireland are fitted with meters. For these properties we have good data on the demand for water.

For each WRZ the average metered PHC for those properties has been taken within the WRZ. An allowance of 2% for Meter Under Registration (MUR) has then been applied. This reflects that meters do not record usage to 100% accuracy and that the accuracy deteriorates with age of meter. The allowance we apply is based on evidence from the UK WRc report 'CP360 Commercial Meter Under-Registration' taking into account age and type of meter. The evidence for small commercial meters has been applied to our domestic meters. For the unmetered domestic properties, we have assumed that we can extrapolate the metered data and then apply it to the unmetered properties.

The average PHC is calculated for each county using data from metered domestic properties within that particular county. This county-wide PHC value was assigned to unmeasured properties in all WRZs in that county. This allows us to account for significant deviations from average use in small WRZs.



The results summarised in Table 4.4, show that the average PHC across Ireland was 354 litres/household/day and the average PCC was 133 litres/person/day in 2019.

In our supply demand balance calculations, we use PCC calculated for the specific water resource zone based on the data we have. So for example in the GDA we use 122 l/p/d, while in Cork City we use 143 l/p/d. The assumption that metered properties are representative of all domestic properties in Ireland may not be correct. In ~~order to understand this~~other jurisdictions, higher allowances for PCC are applied to un-metered properties as part of demand calculations and leakage estimation. In order to improve our understanding over time, we need to identify appropriate domestic characteristics that influence water use. We can then use this information to classify our households and examine the representativeness of the metered data. This exercise will require a number of pilot studies across our supplies over the coming years. In the interim, for this ~~draft~~ Framework Plan, we have assumed that the metered data is applicable to the entire domestic customer base. This may initially result in an underestimate of PHC and domestic demand, and an overestimation of leakage in our distribution networks.

It should also be noted that in England, the National Infrastructure Commission⁶ is advocating a reduction in PCC from 141 l/p/d nationally to 118 l/p/d in the future. For comparison, PCC used within this Framework Plan for some of our larger WRZs such as GDA, and Limerick City are set at 122 l/p/d and 125 l/p/d.

⁶ [Preparing for a Drier Future, National Infrastructure Commission, 2018.](#)

Table 4.4 - Comparison of PHC and PCC across Ireland

WRZ	PHC in 2019 (l/h/d)	PCC in 2019 (l/p/d)
GDA	354	122
Cork City	382	143
Galway City	383	147
Limerick City	330	125
South Louth & East Meath	369	122
Other 534 WRZs	348	143
Average for all 539 WRZs	354	133

Domestic meters are generally fitted in the footpath meaning any water losses from the customer connection supplying the house, or internal plumbing leaks is included in the metered data. In the UK, water utilities report leakage as “Total Leakage” to their regulators. Total Leakage is the combined water losses across the public distribution networks in addition to leakage in private customer supply pipes and private plumbing systems (based on estimated values for customer side leakage).

At present, Irish Water reports leakage as Distribution Network Leakage to our [economic](#) regulator the CRU and does not include Customer Side Leakage (CSL) within this assessment. However, due to the potential underestimation of PCC in non-metered households, our Distribution Network Leakage may be overestimated, and in reality, closer to a Total Leakage assessment.

Due to our current treatment of CSL, the PCC for Irish Water may not be directly comparable with the PCC as reported in the UK.

As Customer supply pipes are not part of the public water distribution network, leaks from these pipes are the responsibility of the property owner. However, Irish Water proactively promotes water conservation and encourages customers to repair leaks. We also offer a free repair under our First Fix Free scheme, where such leaks are identified.

The First Fix Free scheme was initially very successful, but uptake has reduced to relatively low levels since the domestic charges were abolished. The savings associated with the First Fix Free scheme to date are estimated to be 120MI/d (gross leakage savings). However, it must be noted that gross leakage savings do not translate directly into reductions in overall demand for the following reasons:

- Savings are continuously offset by Natural Rate of Rise (NRR) (the rate at which leakage would increase if it is not managed) and new leaks within properties or on other supply pipes
- CSL Savings are at the ends of long distribution network, and water saved results in small increases in service to other customers who may have low water pressure in their supplies.

We will continue to monitor take up rates with the First Fix Free scheme when the excessive use charge is implemented (see Chapter 7).

For this iteration of the NWRP, the CSL element of domestic demand is considered to remain static, based on empirical data trends from the “First Fix” scheme to date, and based on the assumption that domestic charges will not be introduced.

Across all WRZs the base year average PCC is 133 litres per person per day (l/p/d). The total domestic demand in Ireland for 2019 was calculated to be 556Ml/d.

4.2.2.3 Base year non-domestic demand

Non-domestic demand includes manufacturing and non-manufacturing industries, agriculture, utility companies, commercial businesses, retailers, hotels, leisure businesses, local authorities, communal establishments, schools and hospitals. They use water in a variety of ways, including industrial processes, site washing, catering and office facilities. Most non-domestic customers have meters fitted and pay for water based on the volumes they use.



Non-domestic usage in Hospitals and Healthcare Facilities

Base year water use in non-domestic properties in each WRZ has been estimated based on the available metered data. Where current metered data is not available, we have used estimated consumption data based on previous meter readings where these are available or an assumed average usage per property. We have applied an allowance of 5% for MUR. This reflects that meters do not record usage to 100% accuracy and that the accuracy deteriorates with age of meter. The allowance is based on evidence from the UK WRc report ‘CP360 Commercial Meter Under-Registration’ taking into

account age and type of meter. We have a small number of non-domestic customers that are not metered. The consumption for these properties is calculated based on the same assumed average usage per property.

We calculated the non-domestic water use for 2019 to be 407Ml/d.

4.2.2.4 Base year operational use

Operational use includes water used by Irish Water at our sites, for mains cleaning in operating the distribution network, at hydrants for firefighting, and by local authorities for road and gully cleaning. We do not have data which allows us to make a direct estimate of the quantity of operational use in each WRZ. We have therefore assumed that the operational use of water is 1% of distribution input, based on data from the other water utilities in other jurisdictions with similar characteristics.

We estimate that the operational use of water is 1% of distribution input for 2019.

4.2.2.5 Apparent Losses

Apparent Losses include water that is used in properties (both domestic and non-domestic) through permanent and temporary connections that are currently unknown to us. We do not have data which allows us to make a direct estimate of the quantity of apparent losses in each WRZ. Therefore, we have assumed that this amounts to 1% of distribution input in urban areas, based on data from UK water utilities with similar characteristics. We have reduced the allowance to 0.5% in rural areas reflecting the lower density of connections. [However during our consultation period it was raised by a number of our Local Authority Water Services partners that this figure could be a gross underestimate of apparent losses. As we progress optimisation of our District Metered Area's we will refine data in relation to this.](#)

We estimate that apparent losses amount to 1% of overall demand for 2019 in urban areas and 0.5% in rural areas.

4.2.2.6 Leakage Forecasting

Leakage comprises losses from the distribution network through bursts and seeps. The volume is not measured directly but can be estimated as the amount of water that is put into supply but cannot be accounted for as water that is used by our domestic and non-domestic customers, apparent losses or in our operations. This is calculated as:

$$\begin{array}{cccccc}
 \text{Leakage} & = & \text{Distribution Input} & - & \text{Domestic Consumption} & - & \text{Non-Domestic Consumption} & - & \text{Operational Use} & - & \text{Apparent Losses}
 \end{array}$$

Managing leakage is important in the context of the NWRP as leakage reduction can create greater headroom between Demand and the amount of Water Available for Use (Supply). As a result, leakage reduction is an integral part of managing the Supply Demand Balance now and into the future, and is one of our Three Pillar solution types, Lose Less, as outlined in Chapters 1 and 7.



Example of leakage

4.2.2.7 Base year leakage

The process of developing the LMS and migrating DMAs from the different Local Authority areas into this intelligence system started in late 2018. All Local Authorities were fully operable in LMS in October 2019, and work continues in order to achieve the complete data configuration. When the LMS has been calibrated, we will be able to fully adopt best practice methodologies in estimating leakage.

For base year demand, based on best available data, leakage has been calculated as 741MI/d nationally.

Due to the potential variation around our estimates of domestic and non-domestic water use, it is likely that some customer consumption (which we are not aware of and are unable to quantify) may be included in our current estimates of leakage. As our data around customer consumption improves, we will be able to reassess our estimates of leakage and will do so.

Another key area of future data improvement is on the assumption that unmetered household properties use water in proportion to metered household properties. Further pilot studies are planned in order to understand whether this is an appropriate assumption. As we improve our data and understanding of the differences between metered and unmetered usage, we will adjust our estimate for domestic demand and leakage. We will then update our SDB calculations via the monitoring and feedback loop described in Chapter 8 of this ~~draft~~ Framework Plan.

In 2019, baseline leakage was estimated to be 741MI/d.

4.3 Step 2 – Calculate Forecasts for Components of Demand

4.3.1 Overview of demand forecasts

Over the next 25-years, it is forecasted that:

- Water use by domestic customers will increase due to the significant population growth;
- Non-domestic water use is expected to increase due to economic growth; and
- Large reductions in leakage are planned.

Further details of our approach are provided in the following sections.

4.3.2 Demand component forecasts

4.3.2.1 Population forecasts

The NPF “Project Ireland 2040 – Our Plan” has enabled Irish Water to estimate the change in population over the next 25 years. It predicts that at least 50% of future population growth will be focused in the five cities of Dublin, Cork, Galway, Limerick and Waterford and their suburbs.

The growth rates from the NPF and Regional Spatial and Economic Strategy (RSES) have been used to forecast populations in each WRZ. The NPF sets target population numbers and our growth rates are based on these targets. As some WRZs comprise a mix of different settlement types, and can serve both urban and rural areas, we have proportionally allocated different growth rates for these mixed WRZs.

The NPF ends in 2040 and our forecasts extend to 2044. We have continued the growth rates from the end of the NPF and RSES to 2044 to cover the whole 25-year period of our [draft Framework Plan](#).

Table 4.5 - Population growth rate of settlements based on the draft NPF

Settlement/type of settlement	Percentage population growth 2019 to 2044 (%)	Comment
Dublin City and suburbs	26%	Growth from 1,208,841 in 2019 to 1,523,230 in 2044
Cork City and suburbs	54%	Growth from 211,933 in 2019 to 325,838 in 2044
Galway City and suburbs	53%	Growth from 80,615 in 2019 to 123,662 in 2044
Limerick City and suburbs	61%	Growth from 98,465 in 2019 to 158,886 in 2044
Waterford City and suburbs	56%	Growth from 53,661 in 2019 to 83,764 in 2044
Towns with population over 10,000 in 2016	On average 29%	41 settlements across three regions
Towns with population between 1,500 and 10,000	11 specific towns	31% growth assumed for Carrick-on-Shannon, Monaghan, Nenagh and Roscommon. 15% growth assumed for other towns
Settlements with population <1,500	16%	15% growth assumed for all settlements with population <1,500

Further details of the population forecasts are provided in Table 4.5. These figures will be further developed when Local Authority Development Plans are adopted.

The NPF envisages 26% growth in ~~the~~ Dublin City and suburbs between now and 2040 with various rates for the remainder of the country ranging from 16% to 61% based on settlement type and size. The Water Resource Zone that covers the Greater Dublin Area, ~~–~~ includes Dublin City and suburbs and parts of Meath, Kildare, Wicklow and county Dublin. Therefore, the anticipated growth in this WRZ is a weighted combination of Dublin City and ~~Suburbs~~suburbs, and applicable growth rates for the other areas. The domestic demand forecasting used by Irish Water for the Greater Dublin Area front loads the growth to 1.3% between 2020 and 2030, to reflect observed patterns, then reduces the rate to meet the same NPF end point. The growth rate is extrapolated from the end of the NPF to 2044. The growth rate across the rest of Ireland is linear over the 25-year period within our ~~draft~~ Framework Plan.

Growth projections are set out under the NPF and the RSES. The Planning and Development Act 2000 (as amended) requires that all City & County Development Plans and variations are consistent with the RSES and relevant national policy (NPF). The Office of the Planning Regulator (OPR) evaluates and assesses these Plans to ensure they comply with the relevant planning policy and are in accordance with the principles of proper planning and sustainable development. As the City and County Development Plans are finalised, Irish Water will incorporate and take account of the growth rates set out in these Plans into our demand projections. There is a defined mechanism for these to be provided through our Forward Planning team.

4.3.2.2 Domestic demand forecasts

To calculate future domestic demand, it is important to consider how PCC will change over time. We can then multiply forecast PCC by the population forecast, to estimate future domestic demand. Some factors that may drive change are shown in Figure 4.3

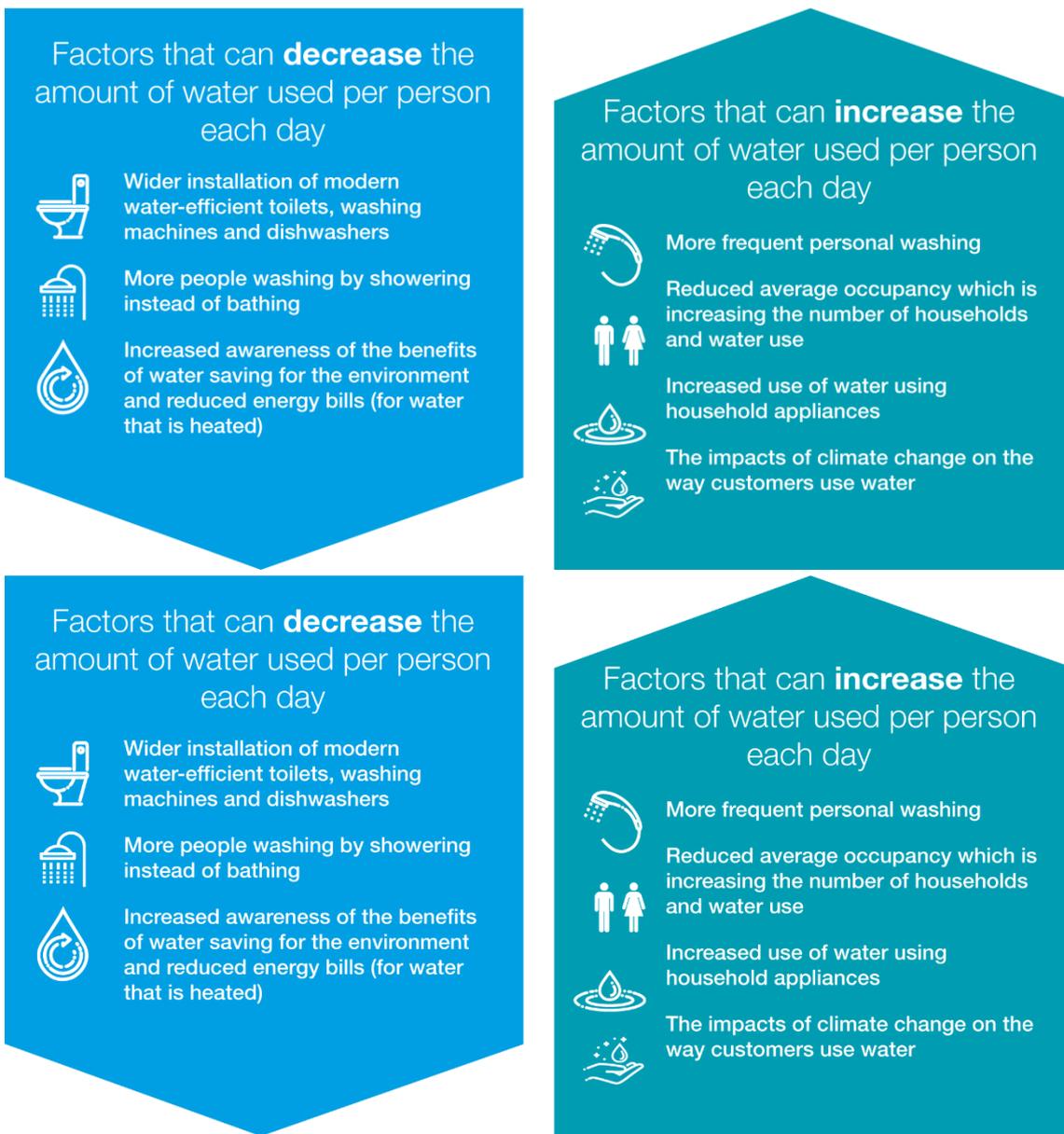


Figure 4.3 - Factors that drive change in PCC

It is expected that the occupancy rate of homes in Ireland will decrease in the future meaning the average household will be smaller. This will tend to increase PCC levels as the components of water use which are shared amongst the household, will be spread across fewer occupants. However, recent models of appliances such as washing machines and dishwashers use less water per cycle, which can off-set increases from lower occupancy rates.

Due to current data limitations in Ireland, data from the UK was used in our ~~draft~~ Framework Plan to assess potential changes to PCC for the period of the [Framework Plan](#). We have considered how the improvement in appliance efficiency combined with falling occupancy (based on the NPF) would impact PCC over the next 25-years. This work has indicated that in Ireland, PCC would be expected to increase by 1l/p/d by 2044, largely driven by reduced household occupancy rates.

By comparison UK water companies are, in some cases, forecasting significant reductions in PCC due to active customer engagement to change water using behaviour. Domestic customers in the UK pay for

water services-based household usage and have an incentive to reduce water use if they are metered. As the level of household metering in the UK resulted from a combination of customer choice (Opt-in) and supply demand need (with associated water efficiency initiatives), UK companies use higher demand estimates for unmetered connections (whereas in our ~~plan~~ [Framework Plan](#) we have assumed that metered and unmetered connections have the same PHC).

On a conservative basis for the purposes of this ~~draft~~ Framework Plan, we have taken the view that we should not allow PCC to increase by 1l/p/d from current levels. Therefore, our domestic demand forecasts are based on no change in PCC over the 25-year period of the Plan.

We have forecast there will be no change in PCC over the 25-year period of this plan.

For each WRZ, the domestic demand has been estimated for annually, by multiplying the forecast WRZ populations by the estimated PCC values for each year.

The domestic consumption forecast is summarised in Table 4.6 for all areas served by Irish Water, and in Table 4.7 for the 5 largest WRZs supplied by Irish Water.



Table 4.6 - Summary of domestic consumption forecast for the total population served by Irish Water

	2019	2024	2034	2044
Population served by Irish Water (millions)	4.2	4.4	4.8	5.3
Average PCC (l/head/day)	133	133	133	133
Domestic consumption (MI/d)	556	586	645	700

Table 4.7 Summary of domestic consumption forecast by WRZ (MI/d)

	2019	2024	2034	2044
GDA	207	218	240	257
Cork City	41	44	52	60
Galway City	22	23	27	30
Limerick City	15	17	20	23
South Louth & East Meath	13	14	15	16
Other 534 WRZs	258	270	292	313
Total (all 539 WRZs)	556	586	645	700

*Note: Values may not sum exactly due to rounding

Based on forecast population growth it is estimated that domestic water demand will increase from 556MI/d (in 2019) to 700MI/d in 2044. We are not allowing for any increase in PCC over the period of the plan.

4.3.2.3 Non-domestic demand forecast

Overview of non-domestic demand forecast

There are significant differences in water use trends amongst non-domestic customers across our WRZs. This is because water use at non-domestic properties varies enormously from sector to sector, and from property to property. The consumption volumes are primarily related to economic factors, water-use intensity and how this is changing, rather than to numbers of business customers.

Therefore, an allowance for non-domestic growth will be required for towns and cities identified as strong growth areas in Project 2040. For other areas, it is assumed that there will be no significant increase in non-domestic demand, as shown in Table 4.8.

Table 4.8 - Summary of non-domestic consumption forecast

	2019	2024	2034	2044
GDA	139	178	215	232
Cork City	33	34	35	36
Galway City	15	16	16	17
Limerick City	12	13	13	14
South Louth & East Meath	6	6	6	7
Other 528 WRZs	201	201	202	203
Total (all 539 WRZs)	407	448	487	508

We have estimated the non-domestic water use for 2019 to be 407MI/d. Across the national public water supply, this is projected to increase to 508MI/d by 2044.

Further details of our approach to different areas are provided below.

Greater Dublin Area

Due to its size and complexity, the non-domestic demand forecast for the GDA was developed by independent economic analysts. This assessment considered:

- Customer water usage data provided by Irish Water;
- Census of Industrial Production and other CSO data on output on a sector-by-sector basis;
- Position papers on development in the Greater Dublin Area;

- Government strategies on key industries and activities (for example Data Centres);
- Findings from econometric modelling of the likely future water intensity output; and
- Long-term economic forecasts for the Irish Economy.

Low, medium and high non-domestic demand scenarios were developed for the GDA, based on the potential performance of the Irish economy through to 2060 allowing for variable growth rates.

The medium demand scenario, which assumes the economy performs in line with the baseline long-term forecasts, has been used to forecast non-domestic demand for GDA in this plan. We have also allowed for specific identified increases in contracted demand, for example, where customers have notified us of expected increases in water use.

Regional Growth Cities

The NPF identified Athlone, Cork City, Drogheda, Dundalk, Galway City, Letterkenny, Limerick City, Sligo and Waterford as strong growth areas. We have considered the following data to derive an appropriate demand forecast for these WRZs:

- Intelligence from Local Authorities regarding any specific known expansions;
- New Connection Applications; and
- Growth rates from the NPF.

For these regional cities the NPF identified an expected population growth of 50% by 2040. We have taken a view that a significant increase in population will also drive an increase in non-domestic demand. However non-domestic growth trends in these areas may be lower than the growth in domestic demand, as our non-domestic customers are incentivised to use less water through volumetric tariffs. It is therefore assumed that there will be a 10% growth in non-domestic demand for these regional centres over 25 years.

Rest of Ireland

A review has been undertaken of the non-domestic demand forecasts in the UK. On the basis of trends, we have concluded that there will be no increase in non-domestic demand in areas outside of the GDA and Regional Growth Cities as the growth in non-domestic demand is assumed to be offset by water efficiency.

However, Irish Water continually assesses the potential for non-domestic activity through our interface with the Local Authority Planning Sections and the Connection Developer Services Function in Irish Water. Therefore, where data on significant non-domestic growth emerges, we will update the SDB.

While it is noted that farming production is expected to increase significantly over the coming years (Food Wise 2025), the impact this will have on the volume of treated water required is uncertain. Therefore, we have not allowed for growth for agricultural demand in our forecasts. We will engage with the agricultural sector to understand their water requirements over the coming years. However, existing agricultural demand is accounted for in our 2019 baseline demand.

This will be monitored as per the process described in Chapter 8, monitoring and feedback into the [planNWRP](#).

Box 4.1: 10-year Capacity Register

The purpose of the National Water Resources Plan is to ensure that the Public Water Supply in Ireland evolves over time in a planned manner to meet best international standards, and to eradicate the current issues within our supplies. It will also be used to identify areas where investment must be prioritized, based on critical need.

However, it is recognised that it will take a significant period of time and investment over many years to achieve these standards, and that the public water supply must be able to ensure both continuity of supply to existing customers and to meet Irish Water's objective to support sustainable growth and economic development in Ireland during this journey.

Therefore, the supply demand balance and barrier standards in the National Water Resources [Plan – Framework](#) Plan are not intended to be used as a deterrent to new connections to the network, or as an indicator of where growth and economic development can progress within areas of supply.

In many cases we will be able to support growth whilst delivering our strategic plan, even in critical or high-risk areas by:

- Addressing availability through improving our knowledge of our supplies and improved operation of existing supplies;
- Reducing leakage within our existing supplies;
- Progressing interim upgrades to existing supplies;
- Progressing medium to long term investments.

In addition to this [Framework](#) Plan, Irish Water has developed a 10-year capacity register based on an amended Supply Demand Balance to provide the LAs with an indication of settlements with potential capacity constraints. This allows Irish Water to both inform the next review of Regional Planning Strategies, the preparation of Local Authority Development Plans and also to respond to growth and development needs.

It is envisaged that the majority of Growth and Development needs within the next ten years will be facilitated through leakage reduction which will initially be targeted at settlements towards the upper end of regional and county settlement hierarchies. However, this will be an interim measure as leakage reduction alone will be insufficient to address all of the supply demand balance issues and will not address existing Level of Service issues within the current supplies. [There is a specific funding mechanism for small supplies within the current investment plan known as the Small Towns and Villages Growth Programme or additional programmes as required.](#)

Monitoring and Feedback

The Irish Water Forward Planning team interfaces directly with the Regional Assemblies and the Local Authority Planning Departments during the preparation of the regional growth strategies and the County Development Plans. As these strategies and plans are completed, the information at settlement level will be updated in the Supply Demand Balance. The Supply Demand Balance will be formally updated as per the process set out in Chapter 8.

4.3.2.4 Operational use forecast

We have kept our assumption that the operational use of water is 1% of distribution input and will remain flat throughout the forecast period based on standard practice.

4.3.2.5 Apparent Losses

In the base year apparent losses are estimated as 1% of distribution input. We have kept this element of demand flat at this volume throughout the forecast period i.e. the volume in MI/d of apparent losses remains constant but the percentage of distribution input varies across the period.

4.3.3 Leakage – Approach to Leakage Reduction Forecast

In addition to the consideration of leakage as a solution to some supply demand balance issues across our water supplies, leakage reduction is also driven by the “value” of the water lost across our distribution networks.

By value of water, we do not just mean the operating costs of the water produced for supply (including power, chemical and treatment costs) but also the social and environmental costs of producing water (abstraction from the natural environment), and the cost of managing the efficiency of our distribution networks (the costs involved in continuously addressing leakage, disruption to water supplies, the impacts of the construction works required to reduce leakage).

When the total costs of producing water (including environmental and social) are greater than the cost of reducing leakage, there is a natural driver to further reduce leakage to achieve equilibrium. This is known as the Sustainable Economic Level of Leakage (SELL).

In the UK, the industry regulators for water supply set leakage reduction targets for the individual water utilities based on SELL. ~~As our Framework Plan has been developed based on UK water resources planning guidelines (see Chapter 2),~~ for the first iterations of their water resources plans and capital investment cycles. As the utilities have progressed along their leakage reduction glide paths, and have achieved or are approaching SELL, the UK regulators are now setting the challenge for some to go beyond SELL. As this is Irelands first NWRP, the forecast for leakage reduction within the Supply Demand Balance or as a solution to address SDB deficits within this iteration of the Framework Plan, has been set as SELL for the public water supply in Ireland. As per the UK, as we progress towards SELL targets, Irish Water will continually review and push towards further leakage reductions. These targets will be continually reviewed through the five-year resources planning cycles.

It should also be noted that utilising SELL methodologies also has the benefit in driving data improvement, which in turn optimises the ability to deliver leakage savings. Developing SELL calculations requires us to increase our understanding of zonal pressures, meter performance, customer use, background leakage and the night lines for our supplies.

In other words by utilising SELL to transform our understanding of our water supplies, we can focus our investments and therefore reduce leakage at a faster rate with the benefit of the enhanced data from the network.

The SELL forecasts have been calculated using the latest available data from the LMS for 2019, using best practice methodologies for calculating SELL within the UK. Whilst there remain a number of areas where the data used for our calculations will improve significantly over the coming few years, the SELL targets in this Framework Plan have made best use of all data improvements that Irish Water has achieved to date. As part of the Framework Plan, ~~we~~ we have estimated SELL for:

- Irish Water overall;
- The GDA; and
- The remainder of Irish Water as the residual of Irish Water minus the GDA

The calculation of SELL uses a model that collates data inputs. The detail around the estimation of SELL is included in the report contained in Technical Appendix H: SELL – 2019 update.

For the purposes of calculating the SELL, the baseline position for 2019 is taken as the 2019 target.

There are two options for assessing SELL, summarised as follows:

- **Short Run SELL** which identifies the leakage reduction to be achieved over the coming years based on the value of water compared to the cost of water losses through leakage
- **Long run SELL** which identifies the leakage reduction to be achieved over a longer planning horizon allowing for investment in further pressure management, asset renewal, district metering and telemetry, smart metering, smart networks and measures to control customer side losses where possible.

In WRZs where the SDB is in deficit, the Long Run SELL can be used to evaluate further leakage reduction options alongside water conservation measures and supply side measures to make more water available.

At present due to data availability, and the need to understand the delivery and response of our networks to Short Run SELL targets, it is not possible to calculate Long Run SELL. Therefore, within this iteration of the NWRP, we consider the Short Run SELL targets. However, as part of the Options Assessment Methodology within this Framework Plan, we test all Preferred Approaches (solutions to address identified need) to sensitivities in leakage reduction, including the possibility of exceeding targets for leakage reduction. The ~~draft~~ Framework Plan also includes a feedback and monitoring process, whereby data improvements are continually fed into our SDB assessments and fed into the Regional Water Resources Plans. Further reference to SELL within this document is in relation to the Short Run SELL unless otherwise stated.

4.3.3.1 Main data inputs to SELL

In estimating the Short Run SELL there are a number of key data inputs:

- The estimation of background leakage/policy minimum formulae for estimating background leakage are also considered in the SELL
- The Marginal Cost of Water (MCW) is the cost of water saved if demand is reduced by 1 MI/d
- Analysis of steady state repair data is used to determine how much effort is required to maintain leakage levels
- The variable cost element of Active Leakage Control (ALC) costs is required and used in the SELL
- Externalities (external costs), of which the most significant is related to the cost of carbon, based on forecasts of the shadow price of carbon

The derivation of these data inputs for SELL calculation are based on best available information and are detailed in Appendix H: SELL – 2019 update.

4.3.3.2 SELL Assessment

The assessment of SELL as part of this ~~draft~~ Framework Plan is fully described in Appendix H, and includes:

- The methodology used and basis for selecting the methodology;
- An estimation of SELL for the GDA and the rest of Irish Water's supplies;
- A sensitivity analysis of SELL;
- The factors influencing the transition to SELL;

- The SELL ~~glidepaths~~[glide paths](#), or annual leakage reductions over time to achieve the SELL target, for the GDA and rest of Ireland; and
- Consideration of Data improvements

Based on the analysis of SELL used in this ~~draft~~ Framework Plan, a summary of the calculated GDA and National SELL targets using different scenarios is summarised in Table 4.9.

Table 4.9 - Summary of Potential SELL scenarios forecast for GDA and Nationally (MI/d)

GDA (MI/d)	National (MI/d)	Remainder (non-GDA) (MI/d)	Description of scenario
119	539	420	Estimate using best 2019 data available
127	576	449	Upper bound
113	509	396	Lower bound
114	534	420	Estimate using best 2019 data available plus additional economic pressure management in GDA
130	534	404	Estimate using Managing Leakage 2011 estimate for background leakage and a less optimistic view of ALC efficiency plus additional economic pressure reduction in GDA.

For the purposes of this ~~draft~~ Framework Plan, the SELL targets we have used in the SELL scenario are based on the methodology identified in the UKWIR Report – Managing Leakage 2011^{6Z}, as highlighted in red in Table 4.9.

The associated ~~glidepaths~~[glide paths](#) to achieve these leakage targets for the GDA are summarised in Table 4.10 and Figure 4.4. As can be seen, the target SELL target in the GDA is calculated as being 130 MI/d by 2034. This SELL ~~glidepath~~[glide path](#) has been built into the Supply Demand Balance assessment for the GDA within the ~~draft~~ Framework Plan. Figure 4.4 illustrates the ~~Glidepath~~[Glide path](#) to achieving SELL outside the GDA (extract from Appendix H 2019 SELL report).

Table 4.10 - GDA leakage level included in demand forecast (MI/d)

	2019	2024	2033	2034
GDA leakage level	215	185	131	130

^{6Z} UKWIR Managing Leakage 2011 (ref. 10/WM08/42 www.ukwir.org)

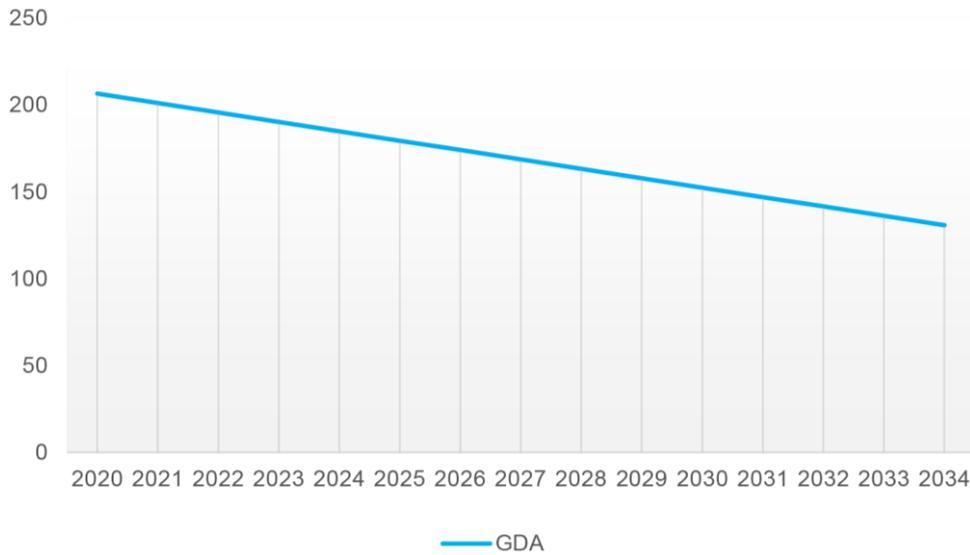


Figure 4.4 – Leakage ~~glidepath~~ glide path to achieving SELL in the GDA (MI/d) (extract from Appendix H - 2019 SELL report)

The SELL for the rest of Ireland is estimated as 404MI/d, as summarised in Table 4.11 and Figure 4.6, or a net leakage reduction of 120 MI/d by 2034.

Table 4.11 - Leakage level included in demand forecast (MI/d)

	2019	2024	2033	2034
Leakage level outside GDA	524	513	404	404
Irish Water leakage level	739	698	534	534

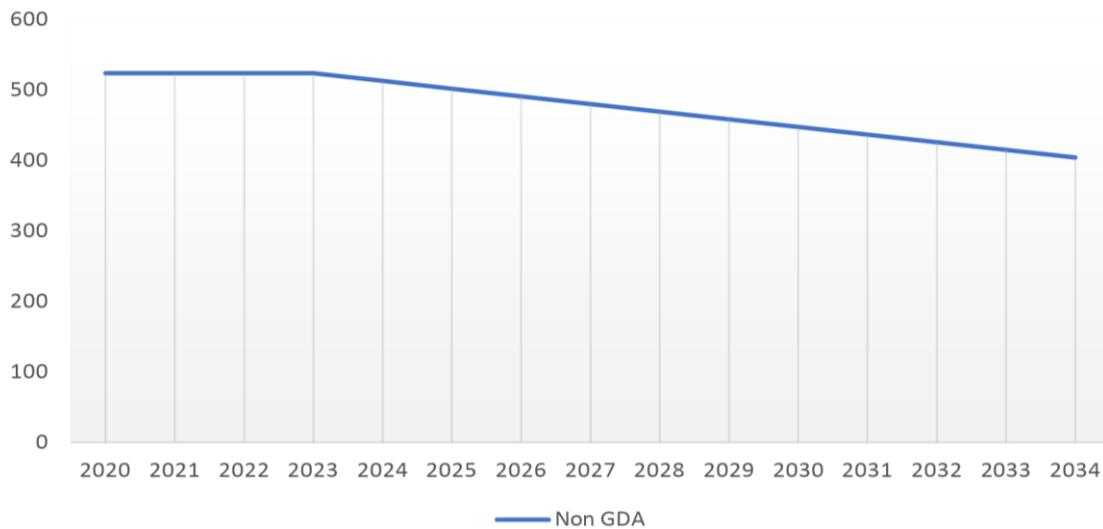


Figure 4.5 – ~~Glidepath~~ Glide path to achieving SELL outside the GDA (MI/d) (extract from Appendix H 2019 SELL report)

At present we have focussed the SELL for the rest of Ireland on priority WRZs based on

- Supply demand deficit;
- Existing abstractions with sustainability issues; and
- Drought impacts.

As the net leakage reduction targets are prioritised on an annual basis, for the WRZs outside of the GDA, SELL targets have not been automatically assigned to the SDB assessments within this [plan Framework Plan](#). Instead they have been prioritized based on key deficits and are applied to the identified SDB deficits within the WRZs as part of the Preferred Approach. We will continue to focus operational efforts to off-set the natural rate of rise of leakage in all other areas.

We have explored the sensitivity of our forecasts in Appendix H.

4.3.4 Climate Change

Research shows that climate change has an impact on water use. We have applied factors for climate change to our demand forecasts. These factors are based on the UKWIR 2013 study 'Impact of Climate Change on Demand'. We have used a single change factor, shown in Table 4.12 for peak and average conditions as the changes are small, and our local data series does not cover a long enough period to develop Ireland specific values for peak and average conditions. We anticipate using different values for peak and average events in the future, as data permits.

Table 4.12 Climate change factors

	2019	2024	2034	2044
Change factor for peak and average conditions	1.0017	1.0029	1.0052	1.0073

These change factors are applied to the demand peaking factors in the Dry Year Critical Period Weather Planning Scenario (see Chapter 2).

4.3.5 Water Conservation Initiatives

The NWRP introduces three solution pillars (Lose Less, Use Less, Supply Smarter), to address identified SDB deficits.



The middle pillar of 'Use Less' – relates to demand side interventions. The Use Less pillar focuses on activities to help understand water use habits, influence behaviour, to encourage change and promote water efficient devices and appliances for domestic and non-domestic customers.

The ability to reduce demand based on technology, behaviour and metering is uncertain and sensitive to the situational context and the awareness of need. For example, in England and Wales there have been significant reductions in demand related to increased metering in the south east of the country, facilitated by the designation by the Environment Agency of the area as a water scarce region. In contrast, in the

northwest and northeast of England where water scarcity is not as prevalent, there is less metering and less impetus to reduce demand.

Technology offers benefits, but the changeover rates to new technologies are uncertain. Monitoring regimes need to be designed and maintained to understand significant changes that have been made and their result on water use. It is therefore difficult to assess at this time the potential benefit of water conservation activity in Ireland. Also, due to the funding mechanisms for water services, findings from water efficiency measures developed in the UK cannot be directly applied to Ireland.

Within this [first](#) iteration of the NWRP, we have considered water conservation within our Domestic and Non-Domestic forecasts in the following ways:

Domestic Demand Forecasts: Even though occupancy rates are falling within households, which normally results in increased demand, we have held our per-capita consumption rates as static across our supplies. This means that increased per capita consumption growth will need to be addressed through water efficiency. [For example, in the GDA even though falling occupancy rates will result in an upward pressure on PCC, we have kept the PCC values as 122 l/p/d over the 25-year duration of the forecast.](#)

Non-Domestic Demand Forecasts: [One of Ireland's great economic success over the past thirty years has been its ability to attract foreign direct investment and promote strong indigenous growth, thus supporting job creation. This has meant that some of our trends in relation to non-domestic use are not aligned with areas of the UK or some European jurisdictions where heavy industry and manufacturing activity has significantly declined over time.](#)

Non-Domestic Demand Forecasts: ~~Even~~ [Within our Framework Plan we recognise that growth does not always result in an increase in non-domestic demand, and even](#) though the population and economy are forecast to grow considerably over the coming years, we have limited non-domestic water demand to ~~relatively low levels within~~ the regional Cities ~~and~~. [We](#) have [also](#) capped non-domestic growth within other settlements, ~~on the basis that~~. [In these areas we will try to facilitate](#) growth in non-domestic water use ~~will be offset by~~ [via](#) efficiency [improvements](#) and water conservation. Further studies will be required to improve our understanding of the extent to which water conservation can influence the SDB.

4.3.6 Excessive Use Charge

Recent government policy has allowed for the Household Water Conservation Charge or Excess Use Charges to highlight high usage to our customers. The revised policy sets an allowance per household including a higher limit for large families. Once this is exceeded, they incur a charge. The policy came into effect in late 2019 and the earliest date for customers to receive a charge is January 2021. As there is limited data relating to the water saving benefits of this approach, at present it has not been factored into the demand forecasts.

When this charge has been in place for a period of time, we will be able to assess the benefits and include any potential water savings within the SDB forecasts using the monitoring and feedback process described in Chapter 8.

4.3.7 Non-domestic Tariff Framework

The Commission for Regulation of Utilities (CRU) published a decision paper on the non-domestic tariff framework and developing harmonised charging arrangements.

This paper considered;

- Geographic basis of charging;
- Customer classification into tariff bands;

- How tariffs will be structured; and
- Cost of providing water/wastewater to each customer class.

Irish Water do not yet have the required base data to overlay the impact of this tariff model in order to assess the subsequent impact those tariffs may have on water use in the non-domestic sector.

Upon completion of our data improvement/acquisition programme, it will be possible to undertake this next level of modelling to acquire greater understanding of the customer categories and differences by region and we will [then](#) update our demand forecasts, as described in Chapter 8.

4.4 Step 3: Calculate Headroom

When developing forecasts and assessments, assumptions need to be made on the accuracy of existing data and how likely our future projections will be. Headroom is the safety margin which is applied to demand forecasts to allow for uncertainties in our calculations on both the demand side and the supply side. The allowance is calculated and added to demand to provide a buffer in the SDB. Typically, headroom includes uncertainty associated with:

- The assessment of the hydrological yield at surface water sources associated with the limited gauged data available; and
- Future population projections, which are demonstrated, for example, by the range of projections produced by the CSO.

Using best practice, headroom is calculated for each WRZ individually by quantifying the supply-side and demand-side uncertainties based on available data. The UK Water Industry Research Ltd (UKWIR's) Improved Methodology for Assessing Headroom (2002) is the method used by the UK water utilities to calculate headroom (see Figure 4.6).

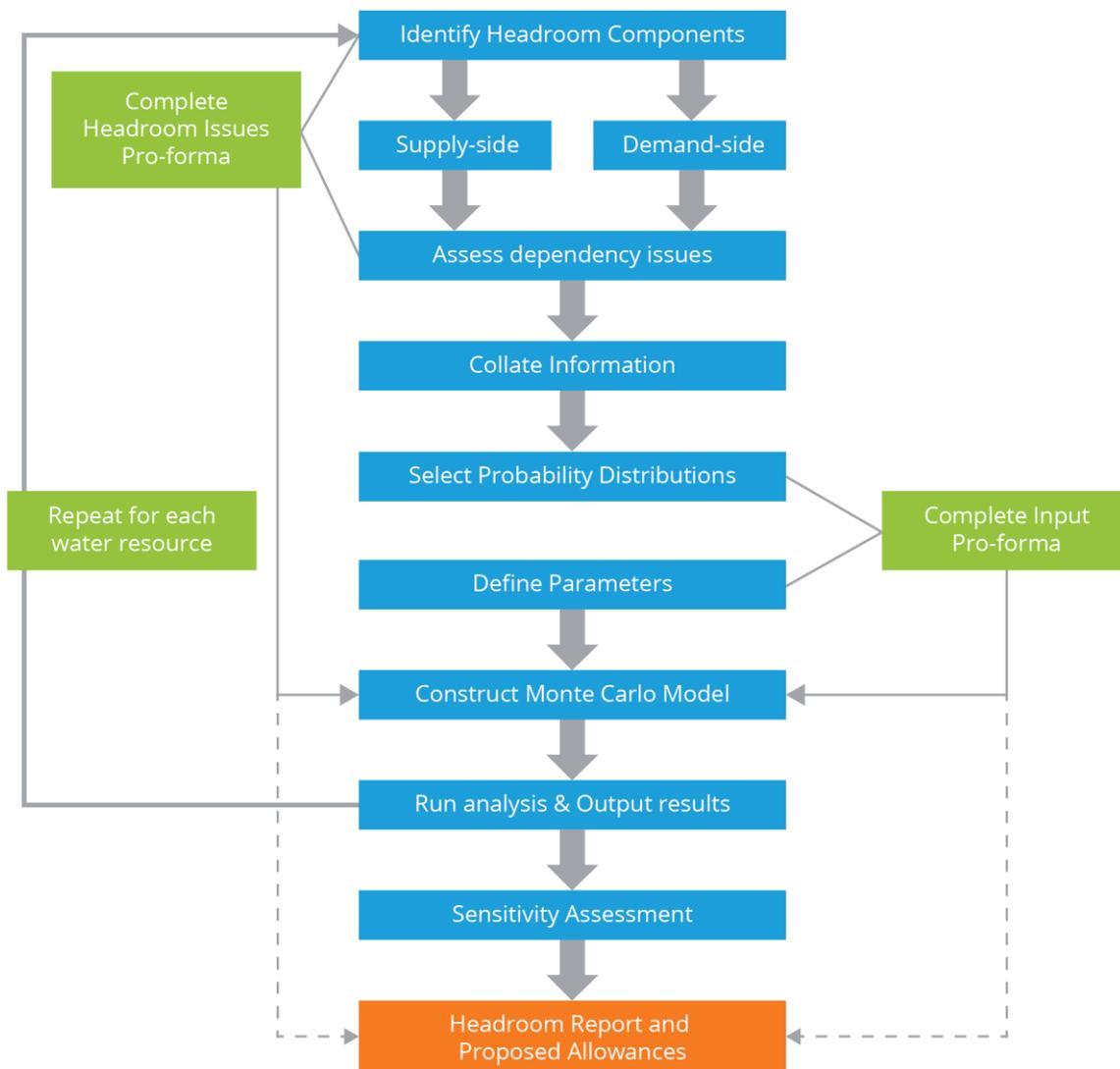


Figure 4.6 - Overview of Headroom Calculation Methodology for the Plan

(Adapted from Figure 1.3 in The UKWIR Improved Methodology for Assessing Headroom 2002)

Whilst the ~~required~~necessary data was ~~obtained~~available to apply the UKWIR methodology to the GDA WRZ, at present there is insufficient data to apply this methodology across public water supplies nationally, therefore: As part of the water resources planning process, Irish Water will over time develop peaking, and headroom allowances, specific to each water resource zone. Whilst the necessary data was available to apply the UKWIR methodology to the GDA WRZ for this iteration of the NWRP, at present there is insufficient data to apply this methodology across public water supplies nationally. Therefore, as part of this plan we have applied the full methodology to the GDA. This has allowed us to test the methodology and understand the data requirements. In the remaining WRZs surrogate data has been applied on an interim basis. As our data improves over the coming years, we will replace surrogate data with site specific data on a WRZ by WRZ basis, as it becomes available.

- Outside of the GDA, best available information from similar WRZ types in the UK has been used as surrogate data-

As our data and understanding of our water supply network improves, we will move towards delivering full headroom calculations for each individual WRZ.

A review of the UK has identified that water utilities' average headroom percentages vary between 3% and 8%. However, in some of the smaller, rural areas, headroom can be over 15% where there is greater uncertainty due to limited data.

Our WRZs generally experience a greater level of uncertainty in comparison to typical UK water utilities because we have fewer years of asset data available. We are continuously working on improving [our](#) understanding of our asset base to reduce our level of uncertainty and achieve a better understanding of our headroom requirements.

Table 4.13 shows the headroom figures we used for the various WRZs. Headroom factors are applied to the Supply Demand Balance for each Weather Event Planning Scenarios described in section 2.3.2, in order to derive the Total Demand.

Table 4.13 - NWRP headroom allowance

WRZ	Headroom Allowance	Comment
GDA	8%	Based on UKWIR methodology as Figure 4.4
Large zones (10–100MI/d)	10%	Large urban centres not significantly different to GDA
Medium zones (1–10MI/d)	15%	Mostly WRZs with small number of sources or lots of small sources leading to significant uncertainty
Small zones (<1MI/d)	20%	Mostly small, isolated rural WRZs, where uncertainty is a large percentage but a small quantity

More details on the uncertainties that headroom allows for and a description of how headroom is calculated can be found in Appendix I.

4.5 Step 4: Calculate Total Demand Forecast

Total demand is the sum of the components of water use plus headroom for each Weather Event Planning Scenario. This represents the amount of water we need to have available for supply to meet the needs of our customers allowing for our operational use, apparent losses and leakage.

4.6 Step 5: Calculate Peaking Factors

In Steps 1 to 4 we calculate total demand during normal conditions (the NYAA) including the impacts of climate change on demand. We also calculate total demand for the different Weather Event Planning Scenarios (described in section 2.3.2). Ideally, calculations would be based on historical data for water use during these scenarios to derive peaking factors that describe the scale of the increase in total demand for each scenario. These factors are then applied to normal year total demand.

However, country-wide reliable historical data is not presently available for all WRZs. ~~Therefore~~ [Where we have available data we have used that in our plan. Where we do not](#), we have used data from ~~other-water utilities~~ [Northern Ireland Water, our closest neighbour](#) with similar characteristics and checked this against best available data for our supplies. This data has been used to derive peaking factors depending on the size of the WRZ. For the DYAA and DYCP scenarios we multiply the peaking factor by the annual climate change factor and this is applied to total demand.

The peaking factors we have calculated for 2019 are outlined in Table 4.14.

Table 4.14 - Peaking factors for WRZs during summer and winter planning scenarios

Size of WRZ	DYAA	Summer planning scenario (DYCP)	Winter planning scenario (WCP)
Small WRZ (up to 1 MI/d)	2%	20%	50%
Medium WRZ (up to 10 MI/d)	2%	20%	40%
Large WRZ (up to 100 MI/d)	2%	20%	30%
GDA (> 100 MI/d)	2%	13%	20%

Tables 4.15, 4.16 and 4.17 show the impact of applying these factors to the total demand for each WRZ.

Table 4.15 - DYAA Total Demand

WRZ	2019 (MI/d)	2024 (MI/d)	2034 (MI/d)	2044 (MI/d)
GDA WRZ	630	654	659	699
Cork City WRZ	148	151	161	172
Galway City WRZ	84	85	90	94
Limerick City WRZ	50	51	55	59
South Louth & East Meath WRZ	38	40	41	43
All other WRZs	1,010	1,017	1,046	1,074
Total (all 539 WRZs)	1,960	1,997	2,052	2,141

Table 4.16 - DYCP Total Demand

WRZ	2019 (MI/d)	2024 (MI/d)	2034 (MI/d)	2044 (MI/d)
GDA WRZ	697	723	729	774
Cork City WRZ	174	178	190	203
Galway City WRZ	99	100	106	111
Limerick City WRZ	59	60	65	70
South Louth & East Meath WRZ	45	47	49	51
All other WRZs	1,192	1,200	1,235	1,268
Total (all 539 WRZs)	2,266	2,308	2,373	2,476

Table 4.17 - WCP Total Demand

WRZ	2019 (MI/d)	2024 (MI/d)	2034 (MI/d)	2044 (MI/d)
GDA WRZ	742	769	773	819
Cork City WRZ	188	192	205	218
Galway City WRZ	107	108	114	120
Limerick City WRZ	63	65	70	76
South Louth & East Meath WRZ	49	50	52	54
All other WRZs	1,359	1,367	1,402	1,437
Total (all 539 WRZs)	2,508	2,551	2,617	2,724

4.6.1 Tourist demand

Some WRZs including those located by the coast will experience influx of tourists particularly during summer months. This can result in elevated water demands. In cases where the holiday population is high relative to the resident population these demand peaks may be very pronounced during hot, dry weather periods in the summer holidays.

Reports published by Bord Fáilte and Fáilte Ireland have been examined. However, they only provide generalised information about the location of tourist sites. They identify that major cities and towns receive the largest numbers of tourist visitors. These areas are usually supplied from large WRZs where the extra demands are small relative to the baseline demand.

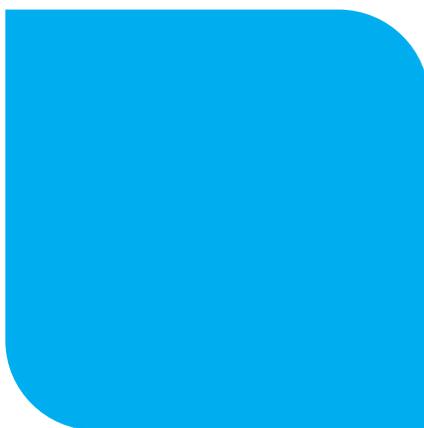
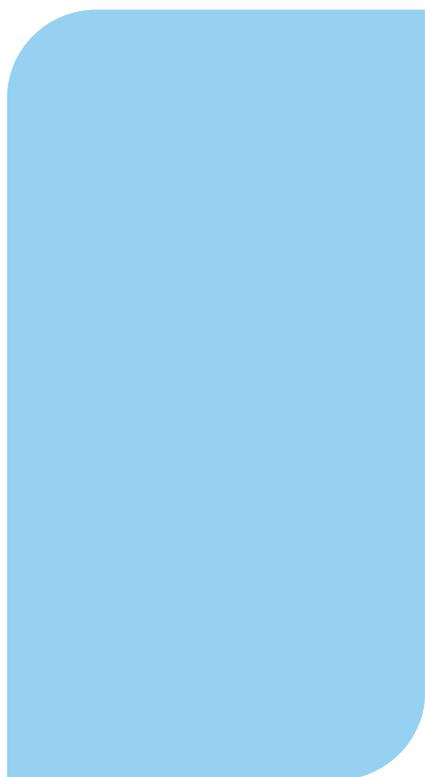
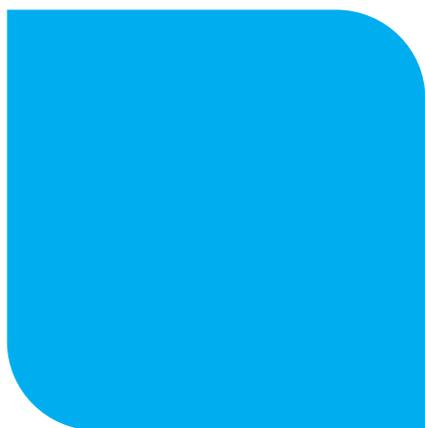
At early development stages of our ~~draft~~ Framework Plan, variations in monthly distribution input for each WRZ were investigated to identify whether WRZs with the largest peaks in demand were tourist destinations. However, based on available data the findings were inconclusive. Therefore, whilst it is recognised that tourism may significantly affect peak demand in some WRZs, no reliable means of identifying this or quantifying the effects was found. It is likely that some of this demand is covered by the peaking factors we use for scenario planning in the ~~draft~~ Framework Plan. This is a factor of uncertainty in the demand forecasts and is currently covered by the headroom allowance rather than being allowed for separately.

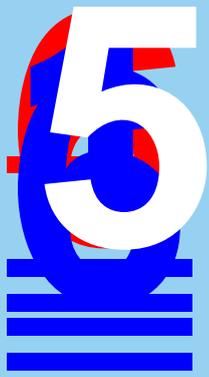
4.7 Summary

In this section we have explained how we calculate the total demand for water which includes the needs of our customers, ~~and~~ and our own operations, ~~and~~ and losses due to leakage. It also includes a 'headroom allowance' to allow for potential variations in our calculations.

More details on the potential variation that headroom allows for and a description of how headroom is calculated can be found in Appendix I. The Demand methodology described in this Chapter ~~has been~~

~~incorporated into our draft~~ [is part of this](#) Framework Plan and the associated Supply Demand Balance Calculations for each water supply can be found in Appendix L.





Identify the Need - Barrier Assessment

5 Key Points

In this Chapter we will:

- Outline Water Quality Risk and Need across our existing asset base;
- Describe the Barrier Assessment Process; and
- Summarise our Critical Maintenance Process.

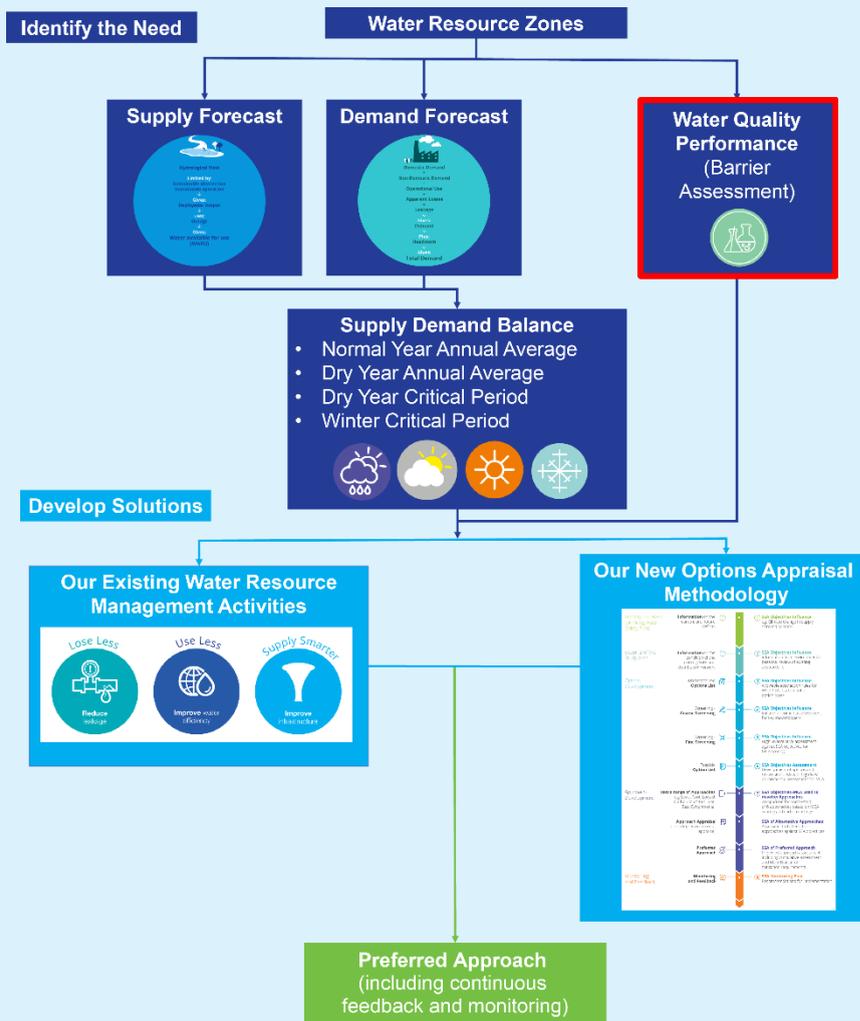


Figure 5.1 - NWRP Process – Barrier Assessment Water Quality and Reliability

5.1 Introduction

Irish Water has a statutory obligation to produce safe drinking water that complies with regulatory standards, and this is overseen by the Environmental Protection Agency ([EPA](#)). Irish Water has put in place the necessary structures to support sampling, testing and reporting from source to tap and puts in place the necessary actions should a risk to the safety of a supply be identified from our monitoring programmes.

We are now going further and looking to ensure that public water supplies are also secure and sustainable. This requires us to identify and appropriately manage risk to our water supplies. Risk is the possibility of an adverse event occurring (e.g. *Cryptosporidium* contamination of the source, failure of a dosing pump) that could impact on our ability to provide safe water. Risk cannot be eliminated, but by quantifying, categorising, and managing risk, we are taking a proactive approach to ensuring our supplies are safe, secure and sustainable. Our risk management approach is based on the World Health Organisation's Drinking Water Safety Plan (DWSP) approach.

The DWSP approach involves assessing a comprehensive range of hazardous events that could potentially occur in ~~a~~ [every single](#) drinking water supply from source ([catchment](#)) to tap ([consumer](#)). These assessments are then used to inform the required operational, maintenance, or capital interventions that will manage / mitigate the likelihood of these hazardous events from occurring. These hazard assessments from the DWSPs are converted into "identified need" within the ~~draft~~ Framework Plan.

In this Chapter, we provide an overview of Irish Water's current Drinking Water Safety Plan approach to risk assessment in more detail and show how the live hazard assessments from the DWSP feed into this and future cycles of the ~~National Water Resources Plan~~ [NWRP](#) (Figure 5.1).

5.2 Drinking Water Regulation

The current European Union (Drinking Water) Regulations 2014 was transposed into Irish law by S.I. 122 of 2014 and amended by S.I. 464 of 2017 to give effect to the Drinking Water Directive (Council Directive 98/83/EC of 3 November 1998). The Regulations set the standards that drinking water supplies must meet to safeguard public health. These standards set out the water parameters to be tested, how often they are to be tested for, and the acceptable limits for each water quality parameter.

The European Union (Drinking Water Regulations) 2014, transposed into Irish law by S.I. 122 of 2014 as amended set the standards that water supplied to the public must adhere to.

~~The EU is currently reviewing the Drinking Water Directive (the parent EU Directive of Ireland's Drinking Water Regulations). It is expected that this new recast Directive will be adopted by the European Union in 2020 and transposed into Irish Law by 2022.~~

5.3 Upcoming Legislative Context

On the 1st [of](#) February 2018, the Commission submitted its recast proposal for a Directive of the European Parliament and of the Council on the quality of water intended for human consumption, more commonly referred to as the Drinking Water Directive (DWD). The overarching objective of the recast proposal ~~was~~ [is](#) to ensure a high level of protection of the environment and of human health from the adverse effects of contaminated drinking water. ~~Current timelines for this recast suggest December 2020 for formal ratification followed by December 2022 for national transposition and entry into Irish law. The recast~~ [The European Parliament adopted the Recast DWD on 16 December 2020, it entered into force on the 12th of January 2021 and member states have 2 years to transpose it](#) [The Recast](#) DWD proposes a risk-based approach to the supply of safe and secure drinking water.

The risk-based approach comprises three elements:

1. Catchment – catchment area up to abstraction point (or zone of contribution in the case of groundwater)
2. Supply system – from abstraction point to point of supply; and
3. Domestic system – from point of supply to tap.

The first risk assessment and risk management of elements are to be completed within six years of transposition of the [recast DWD](#) into the statute book. Thereafter, it is to be reviewed at regular intervals no longer than six years. For catchment and domestic supply, member states are required to ensure that risk assessment and risk management is performed. For the supply system, member states are to ensure that risk assessment and risk management is performed by the Water Authority. This approach is effectively illustrated in Figure 5.2.

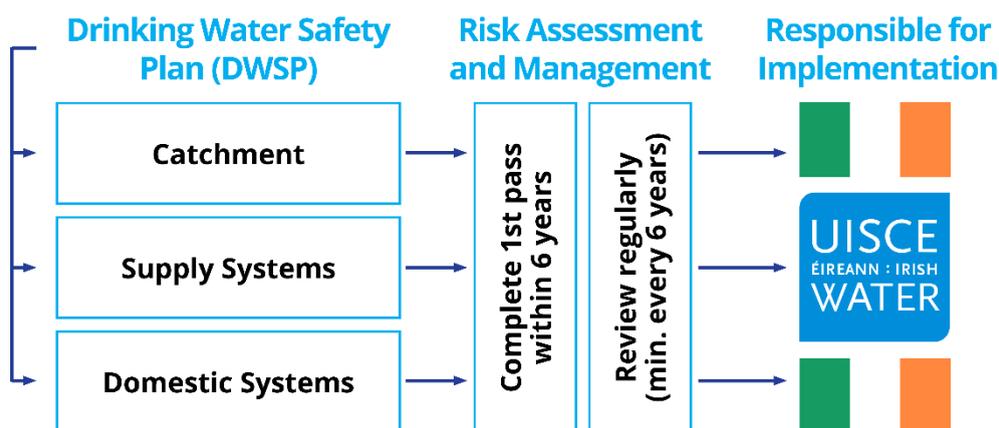


Figure 5.2 – Illustration of how IW’s DWSP approach will meet the proposed DWD Recast requirements

Under ~~this revised Directive~~ [recast DWD](#), ~~it is proposed to update~~ quality standards for water intended for human consumption [have been updated](#), and ~~to introduce~~ minimum hygiene requirements for materials in contact with drinking water (e.g. pipes, taps) [have been introduced](#). A watch-list mechanism ~~is also proposed to will~~ allow for the monitoring of substances or compounds of public or scientific concern to health, such as endocrine disruptors, pharmaceuticals and microplastics. Furthermore, the ~~draft recast~~ DWD ~~proposes~~ [requires](#) that EU Members ensure the safety of a drinking water supply through the comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to consumer. Greater transparency of water quality information for customers is also proposed.

Parameters in the Drinking Water Regulations are grouped into three categories, ‘Microbiological’, ‘Chemical’ and ‘Indicator’, and summarised as follows:

5.3.1 Microbiological

This category refers to the two main types of bacteria that pose a risk to public health if present in drinking water – *E.coli* and Enterococci. These bacteria usually end up in raw water sources (i.e. rivers, lakes, springs, etc.) following contamination by human and/or animal faeces. Monitoring of our public water supplies for *E.coli* and Enterococci is essential to verify the water is safe to drink, and that the disinfection process is working correctly.

5.3.2 Chemical

Water is an excellent solvent and most source waters contain mineral concentrations derived from the underlying catchment geology and runoff from land. Chemicals and metals are tested in drinking water to determine if they are present and, if so, are they within acceptable limits.

Chemical parameters that are present in drinking water can be caused by a number of different issues. These include chemicals dissolving into water from pipes and chemicals carrying over from the treatment process. They can also be due to chemical reactions occurring between different materials in the water or even runoff from the environment.

Some chemicals, such as metals, occur naturally in the environment and some are essential for life and are available naturally in our food. Others, such as lead and mercury, can have negative effects on health. Copper is an example of a metal that is essential in our diet but is toxic at high concentrations. Furthermore, metals such as lead, copper, and nickel can dissolve into drinking water from the supply pipe connecting your property to the public mains and from pipes and fittings within the plumbing systems domestic or non-domestic properties.

5.3.3 Indicator

This parameter group includes all other tests not including 'Microbiological' or 'Chemical' parameters, (e.g. total organic carbon, colour and turbidity). Testing for these 'Indicator' parameters is required to monitor if there is a potential problem with the source, treatment process, or distribution network of a water supply that requires investigation, or that may point to a more serious problem requiring remedial operational and/or maintenance action.

5.3.4 Cryptosporidium

Cryptosporidium is a protozoan, i.e. a very small single celled organism. It is pathogenic, meaning it can cause infection, disease or illness in other living things, but it is also parasitic, meaning it lives off other living things. Whilst *Cryptosporidium* is not specifically named in the Drinking Water Regulations, public water supplies must be free from parasites. Irish Water therefore monitors our water supplies for the presence of *Cryptosporidium*, where the risk of finding it is highest.



The European Union (Drinking Water Regulations) 2014, transposed into Irish law by S.I. 122 of 2014 set the standards that water supplied to the public must adhere to.

5.4 Monitoring of Our Existing Supplies

Irish Water monitors all public water supplies in accordance with the requirements of the European Drinking Water Regulations and the results of these tests are reported to the EPA (Irish Water's environmental regulator). Irish Water publishes the results from the regulatory monitoring programme on its website at www.water.ie/waterquality. This website provides information on the Drinking Water

regulatory standards and allows users of public water schemes to check the results for their water supply by using their home address and/or Eircode.

If a drinking water sample shows a result above a specified water quality standard, Irish Water reports it immediately (where applicable) to the EPA. If there is a concern about a possible health risk, we also consult the Health Service Executive (HSE). If a water sample has a result above a regulatory limit, this does not automatically mean there is an immediate risk to health. Therefore, Irish Water undertakes a water quality risk assessment and discusses this risk assessment with the HSE as part of a consultative process. If the consultation concludes that the risk to public health is of such significance that the affected consumers must be notified immediately, Irish Water takes prompt action to do so.

The EPA, as regulator, supervises the investigation Irish Water undertakes following notification of water quality failures, including the effectiveness and timeliness of corrective and preventative actions. The EPA has a hierarchy of further enforcement actions available to them, including undertaking an Audit, placing the supply on the Remedial Action List (RAL), or imposing a Direction.

The EPA updates and publishes their Remedial Action List every three months and can be viewed at www.epa.ie/water/dw/ral.

The EPA also publishes its annual review of the quality of drinking water in public water supplies for the previous year. Box 5.1 includes an excerpt from the EPA’s latest published Drinking Water Quality in Public Supplies 2019 Report Table 5.1, setting out the current status of our supplies with respect to compliance with Microbiological, Chemical and Indicator parameters in the Regulations.

Box 5.1 Water Quality in 2019

Water quality across each of the three parameter categories has remained consistent since Irish Water became responsible for public water supplies in 2014.

Table 5.1 - Overall percentage compliance of samples taken for public water supplies

Parameter Categories	2014	2015	2016	2017	2018	2019
Microbiological (%)	99.9	99.9	99.9	99.9	99.9	99.9
Chemical (%)	99.4	99.4	99.5	99.6	99.6	99.6
Indicator (%)	99.3	99.1	99.8	98.9	98.8	99.1

5.5 Risk Assessment of Our Existing Supplies – The Drinking Water Safety Plan Approach

As can be seen in Box 5.1, in general our supplies show good compliance with the Regulations, and most compliance trends have improved over time.

In line with the requirements of the Drinking Water Regulations, Irish Water take samples from the point of compliance, which is the customer tap. While compliance sampling is robust and is necessary to monitor regulatory compliance, it is retrospective in nature (i.e. a lagging indicator) and does not assess all of the wider risks in our water supplies. Irish Water requires a methodology that allows us to proactively assess risk in our water supplies from “source to tap” as a way to identify and prevent possible future non-compliance, rather than react to a non-compliance after it has occurred.

The Drinking Water Safety Plan (DWSP) approach, developed by the World Health Organisation and endorsed by the EPA, is best practice in terms of a ‘source to tap’ risk assessment for water supplies as outlined in Figure 5.3.

The DWSP approach aims to achieve the following:

- To provide a comprehensive risk assessment and risk management approach that encompasses all steps in water supply provision from catchment to consumer;
- A risk management strategy that influences a water utilities whole way of working towards the continuing supply of safe and secure water; and
- A source to tap risk assessment and risk management system to inform the effective controls or barriers required to consistently supply safe and sustainable drinking water.

The DWSP model critically and objectively determines the component risk associated with the source(s), treatment processes, process controls, alarm and plant shutdown settings, and finally the robustness of these processes. It also allows for consideration of occurrences that fall outside of normal operating conditions e.g. weekend events, weather issues, failed monitors etc.

Risk scores from the DWSP assessment will be used to identify need, to develop operational or maintenance solutions, and to prioritise remedial works for supplies that pose potential a-risk to public health. This process will drive improvements in the provision of consistently safe and secure drinking water nationally. The DWSP approach involves assessing hazards that can occur in a drinking water supply from source to tap, assessing the Barriers that are in place to mitigate against these risks and guiding the management plans, operational monitoring and surveillance required for each supply (summarised in Figure 5.3).

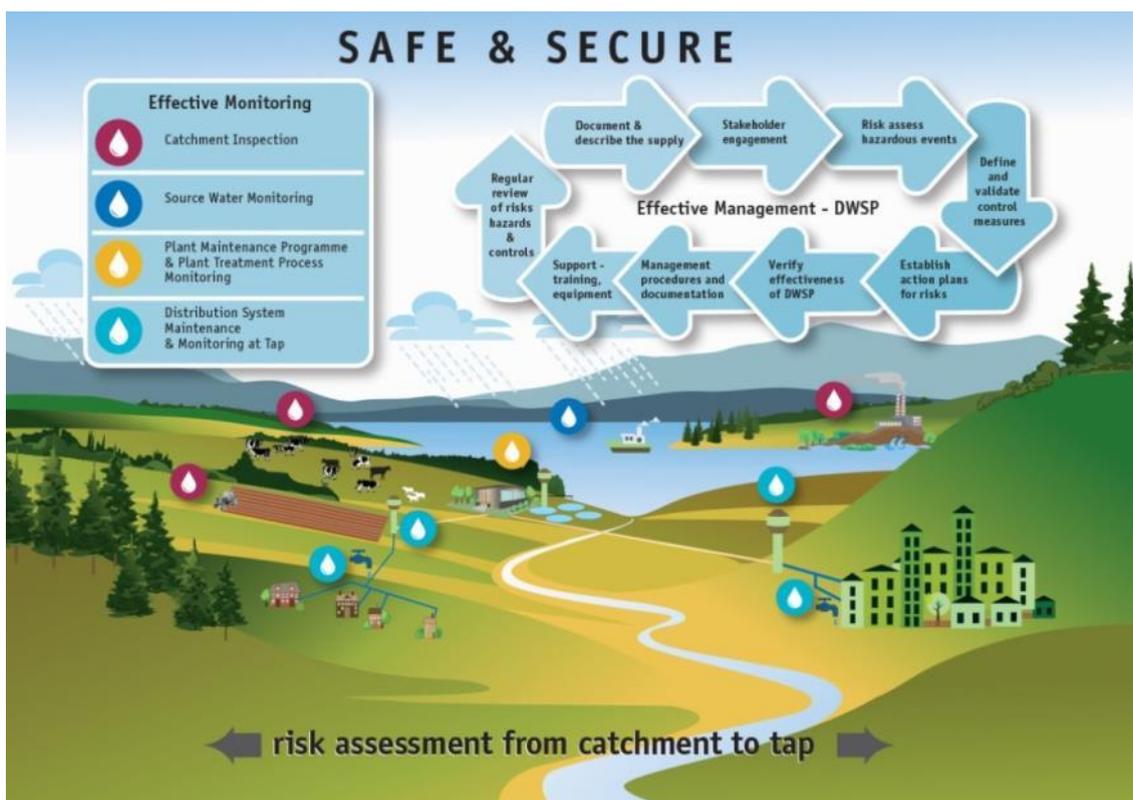
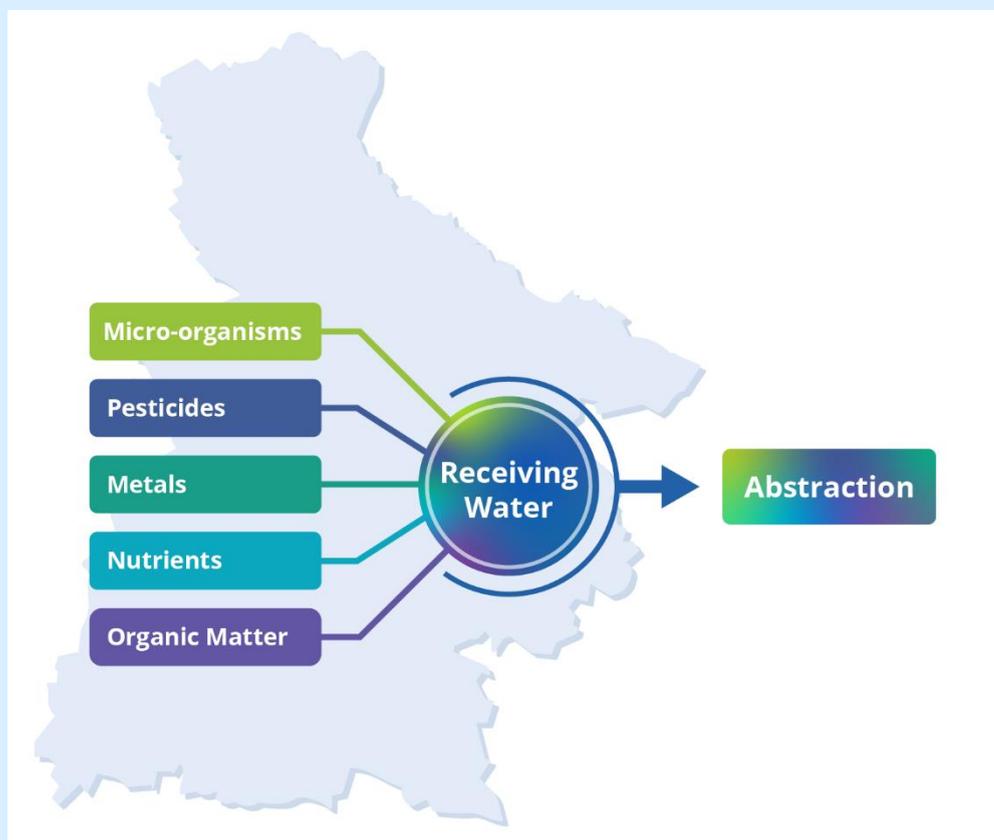


Figure 5.3 - An overview of the DWSP approach, as provided by the EPA

Hazards are biological, chemical, physical or radiological sources that have the potential to cause contamination of a drinking water source; and Hazardous Events are considered incidents or situations that can lead to the presence of a hazard (e.g. the failure of a slurry lagoon allowing cattle waste to flow into a river). Risk is interpreted as the likelihood of identified hazards causing harm in exposed populations in a specified time frame; and Risk Assessment is the measure of magnitude of harm and / or the consequences of a hazard reaching a drinking water source.

Box 5.2 Source Risk Assessment



Irish Water have begun the process of source risk assessing all surface water and groundwater sources through the development of a suite of tools which utilise surface water catchment boundaries and Source Protection Zone boundaries published by the GSI (Department of Environment, Community and Local Government, GSI and EPA, 1999⁸; EPA, 2011⁹), where they exist, but ZOC boundaries in their absence, to characterise land use in the catchments, illustrate stakeholders for collaboration, and identify diffuse and points source pollution and contaminant derivatives to inform source water risk. Theoretical contaminant loadings, i.e. *Cryptosporidium*, *E. coli*, pesticides, chemicals and metals – anthropogenic and naturally occurring and nutrients are being estimated at the catchment scale using the source – pathway – receptor approach and this will inform risk management via the National Water Resources Plan, i.e. raw water monitoring programmes, areas for catchment interventions and treatment requirements.

To realise Irish Water’s objective in providing a safe and wholesome water supply to our customers, Irish Water has identified 174 potential hazards (also referred to a hazardous events) that may pose a risk in our ability to produce safe and secure drinking water.

⁸ https://www.gsi.ie/documents/Groundwater_Protection_Schemes_report.pdf

⁹ <https://www.epa.ie/pubs/advice/drinkingwater/Advice%20Note%20No7.pdf>

Table 5.2 shows the number of potential hazards associated with the various stages (1-6) involved in a water supply.

Irish Water has developed a set of specifically customised methodologies for the assessment of risk for each hazard as opposed to a rigid singular process. Where available, data is used to determine risk via predictive modelling and, where appropriate, bespoke failure-based review is also used to ascertain risk. In some cases, Irish Water uses a combination of the two.

Table 5.2 - Numbers and grouping of DWSP Hazardous Events across the 6 categories of water supply

Core list of hazards																		
	General Catchment	Surface water catchment	Groundwater catchment	Intake	Storage	Line	Other	CFC	Filtration	Disinfection	Residuals	Design	Membrane filtration	Network	Service reservoir	Premises	System	Training
Source	22	12	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Raw water	1	1	1	9	6	3	1	1	1	1	1	1	1	1	1	1	1	1
Treatment	1	1	1	1	1	1	22	21	16	14	6	5	2	1	1	1	1	1
Distribution	1	1	1	1	1	1	1	1	1	1	1	1	22	9	1	1	1	1
Consumer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1
Management	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1

As part of the DWSP approach, Irish Water is developing scientifically robust datasets to assign risk. For the ‘source’ component of DWSPs, a greater emphasis will be placed on the source-pathway-receptor concept for contaminant delivery and utilisation of existing national scale catchment related datasets published by the EPA and Geological Survey Ireland.

For the ‘treatment’ and ‘distribution’ component of DWSPs, Irish Water are utilising the well-established ‘Failure Mode Effect Analysis’ which provides a step-by-step approach for identifying all possible failure modes that can result in a hazardous event.

Once identified, we assess risk against the existing controls (Barriers), which we have in place for source protection or within our water treatment plants and networks. This Barrier Assessment process highlights where there is a deficit in these controls or treatment process elements. The process is not static, but rather ‘living’ in that it will continuously be open to review and receive regular updates and upgrades as requirements evolve.

5.6 The Barrier Approach to Safe and Secure Drinking Water

Irish Water’s multi barrier approach, in terms of water treatment, is summarised in Figure 5.4. The multi barrier approach takes a source to tap approach by seeking to reduce the level of contamination entering water sources, applying robust multiple treatment barriers at the water treatment plants based on source risk assessment, and having appropriate temporal and spatially distributed monitoring programmes at each stage of the source to tap process to validate performance [\(Box 5.2\)](#). Barrier components consist of any actions, processes, procedures, standards or assets (treatment plants, water mains, pumping stations etc.) put in place across the entire system, from catchment to tap, to achieve water of sufficient quality and quantity. The Barrier standards should be able to sufficiently address the potential hazards identified in the DWSP assessments. Currently, there are eight key Barriers, and associated control measures (set out in Figure 5.4).

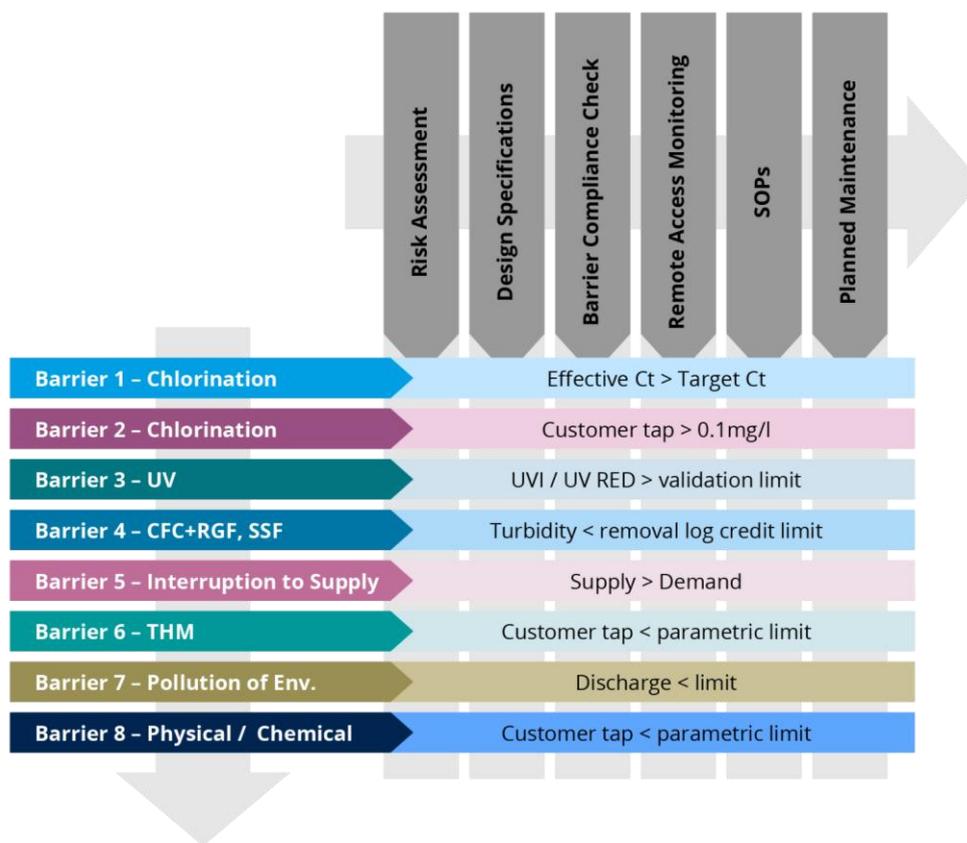


Figure 5.4 - Irish Water's Barriers for achieving Safe & Secure Drinking Water

The eight barriers and eight sub-barriers are:

Barrier 1: Inactivation of bacteria and viruses, as determined from a calculation of the chlorine contact time (generally referred to as 'Ct').

Barrier 2: Maintenance of a microbiological barrier in the distribution network

Barrier 3: Inactivation of protozoa (i.e. *Cryptosporidium* and *Giardia*) by UV radiation with reference to a determination of the *Cryptosporidium* risk score

Barrier 4: Removal of protozoa (i.e. *Cryptosporidium* and *Giardia*) by coagulation, flocculation and clarification (CFC) and filtration, slow sand filtration or membrane filtration with reference to a determination of the *Cryptosporidium* risk score

Barrier 5: Prevention of supply interruptions

Barrier 6: Prevention of the formation of trihalomethanes (THMs)

Barrier 7: Prevention of pollution of the environment

Barrier 8: Minimising the level of other physical / chemical parameters such as:

- a. Lead
- b. Pesticides
- c. Nitrates
- d. Aluminium
- e. Iron
- f. Manganese
- g. Taste and odour
- h. Others

Of these, the first five barriers (Barriers 1 – 5) are the most critical, as failure of one or more of these could present an immediate health risk or loss of water supply to our customers.

The Barriers and their control measures are aligned with water quality requirements to achieve a safe and secure water supply and are further detailed in Appendix J.

Where the existing barriers are not sufficient to address potential hazards, the component and severity of the associated failure mode is identified within a DWSP and this identified need will require an associated mitigation in the form of either an operational intervention or a capital investment in our asset base.

The relationship between the DWSP, the Barrier Assessment and the National Water Resources Plan is summarised in Figure 5.5.

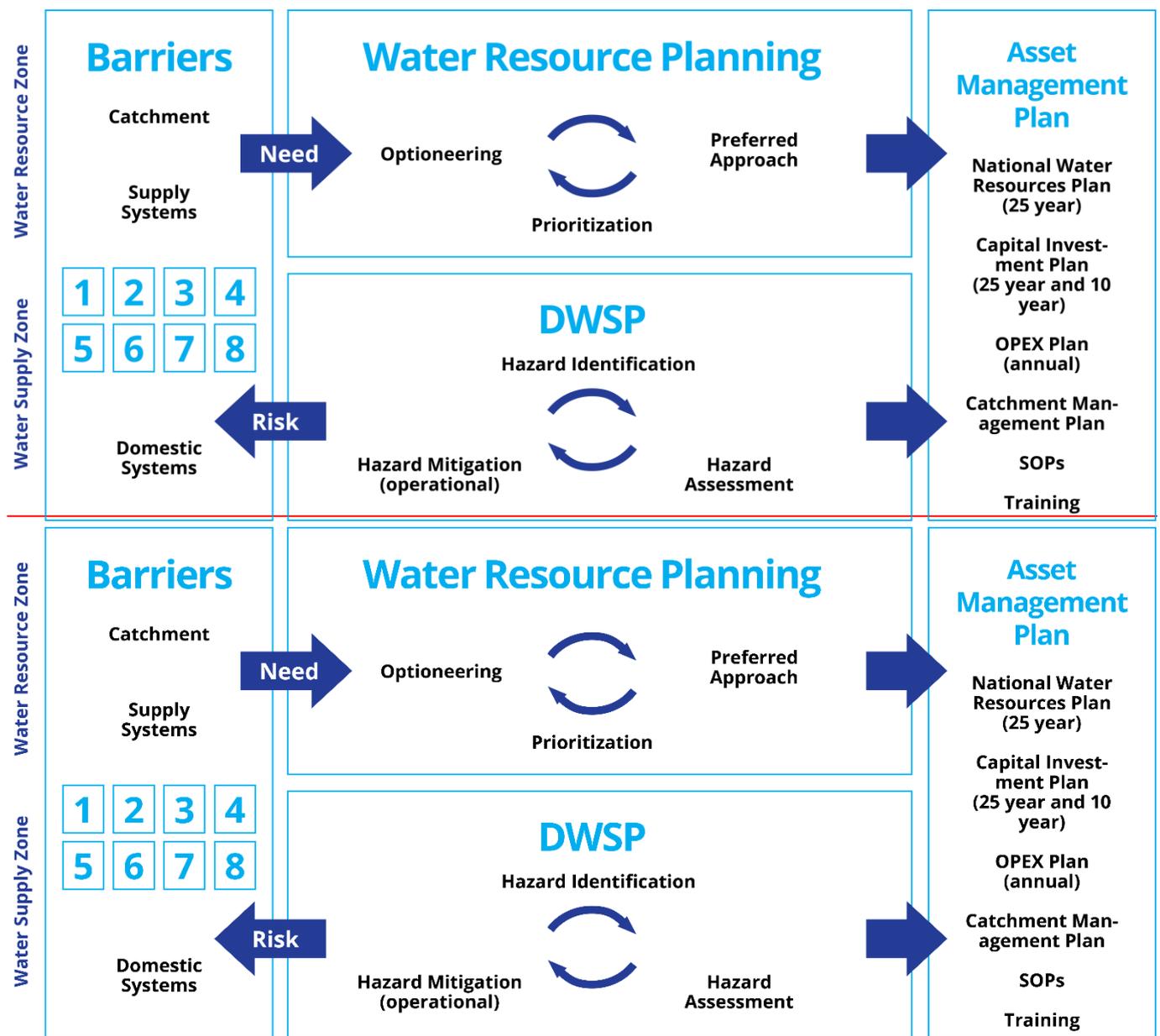


Figure 5.5 - Relationship between the DWSP, the Barrier Assessment and the National Water Resources Plan

The ~~proposed~~ Recast DWD breaks the water supply scheme into 3 parts: catchment, supply systems and domestic systems. Requirements for risk assessment and risk management vary across the three component parts. The eight barriers considered within this plan relate to supply systems. ~~When~~ Now

that the recast DWR ~~is enacted~~ has been adopted, further/alternative barriers will be developed for catchment and domestic systems.

Methodologies for risk assessment are currently being refined and enhanced with the availability of improved datasets and in line with the Recast DWD and the DWSP approach and our barrier assessments will also be continuously updated to ensure that the revised methodologies are captured in the reporting. As a result, there may be uncertainty and confliction in inter-annual reporting metrics. However this will be a reflection of the improved risk identification process.

5.7 Interim Barrier Assessment Review

In the enduring model, as shown in in Figure 5.6, the hazard assessments completed as part of the DWSPs will be used as the base data for the Barrier Assessments, which will in turn inform water quality driven need within our NWRP.

However, as Irish Water currently operates 539 individual water supplies, and each site specific DWSP requires 174 individual assessments, it will likely take many years to fully complete the DWSP assessments across our entire water supply asset base.

In order to understand potential water quality driven need, for the purposes of the ~~draft~~ Framework Plan, we have evaluated on an interim basis the capability of our existing Barriers to meet the stringent asset standards we wish to achieve. We are undertaking this by applying a risk hierarchy based on lagging and (some) leading analysis. This Interim Barrier Assessment has allowed us to identify need for the purposes of the Framework Plan which will in turn be used to inform the Preferred Approaches (capital interventions and associated level of investment) required within the Regional Water Resources Plans.

Whilst this interim approach provides a data-based analysis of need within water resource zones, it does not fully evaluate the risk associated with the individual elements related to a supply. Therefore, while the interim Barrier Assessment is sufficient at a Plan level to understand potential solution types and capital investment need within the catchment and for our treatment assets, the more granular DWSP hazard assessments are required to fully understand and manage the component (failure modes) of risk.

Within ~~the draft~~ this Framework Plan, we represent the Interim Barrier Assessment for each Water Resource Zone as per the graphic shown Figure 5.6. The “speedometer” chart illustrates the scale of investment (or intervention) we need to plan for in order to meet our stringent asset capability standards. We have used a scale of 1 to 5, where 1 indicates that little intervention or investment is required and 5 indicates that significant intervention may be required to meet capability standards.

By transforming our asset base to achieve these standards over the future capital investment cycles, we will ensure that we are “best in class” in terms of safe, secure, reliable, and sustainable water supplies.

As the Drinking Water Safety Plans are completed for each of the individual supplies, the Interim Barrier Assessments will be updated to include any additional information available, as per the monitoring and feedback process described in Chapter 8.

However, it should be noted that the “quality need” identified through the Barrier Assessment is **not** an indicator of compliance with the Drinking Water Regulations. It is an assessment of the need to invest in areas of our asset base (human and structural) through resource planning, to ensure that we can address potential risks or emerging risks to our supplies.

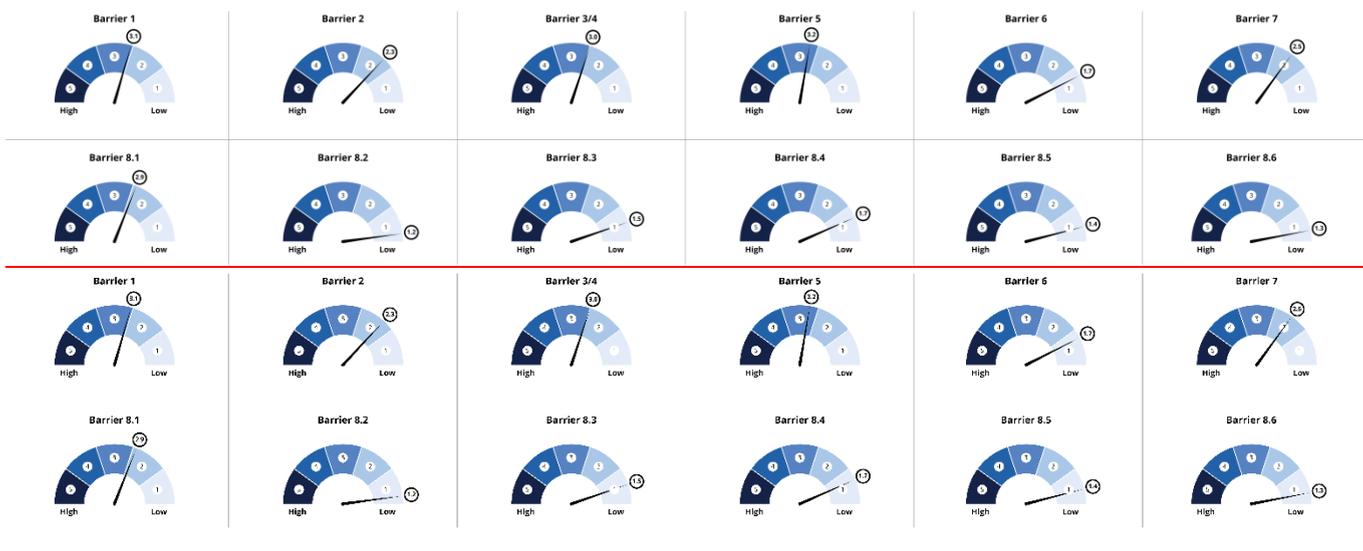


Figure 5.6- Speedometer type Barrier Status Analysis

5.8 Managing Risk in Drinking Water Supplies

Our individual water sources have different raw water characteristics. Some of our abstractions are situated in relatively secure upland catchments or are from well protected groundwater sources. Others abstract from lower down in catchments or from poorly protected groundwater sources which are more vulnerable to contamination from human or agricultural activities. Therefore, the Barrier, or indeed combination of Barriers is specific to each supply.

5.9 Managing Risk in Drinking Water Abstraction Catchments

Irish Water has been working with a range of stakeholders in recent years to develop action plans for managing risks within catchments such as pesticides. As part of the development of the DWSP approach, Irish Water will continue to work in collaboration with relevant bodies in order to develop drinking water catchment action plans [and to manage risks associated with other contaminants as highlighted by the source risk assessments \(Box 5.2\)](#)

The drinking water catchment action plans will include the identification of the main risks to raw water quality, the actions required to address those risks [and the relevant geographical areas where those actions should be focused](#). Those responsible for actions will be identified and target dates for implementation will be established through existing and new working groups or structures.

In Chapter 7 we have summarised some of the catchment and risk management activities that are ongoing at present.

5.10 Future Asset Planning Across our Existing Supplies

As summarised in Section 5.1, Irish Water's regulated sampling results for 2019 [shows \(EPA report Drinking Water Quality in Public Supplies 2019, issued 30th June 2020 show](#) a high degree of compliance at our customer's taps.

However, in many cases, the controls and Barriers that we currently have in place may be insufficient to address the potential hazardous events that could occur at these supplies. As a result, we are developing programmes to install the required equipment and controls at all of our water supply sites, on a prioritised basis.

These programmes include the [Disinfection Programme](#), the [Source Protection Programme](#) and the [Pesticides Pilot Projects](#) described previously. These initiatives (specifically for works at the

abstraction site and borehole upgrades) are currently funded and being delivered as part of our regulated Capital Investment Plan 2020-2024.

However, due to the condition of our existing asset base and the large number of sites to be addressed, it may take several investment cycles before we have the appropriate risk controls in place across all our supplies.

Due to the range of treatment Barrier issues across our asset base, we must consider addressing these water quality issues as part of water resources planning, alongside supply demand balance issues.

As regulatory non-compliance drives capital investment requirements in our existing asset base, we must ensure to limit investment in supplies / sites that have long term viability issues. However, we must also balance this with immediate public health risk and ensure any short-term interventions to reduce / manage such risk are implemented ~~en route to establishing in the meantime so as to establish~~ permanent long-term sustainable supplies. This includes the continuance of so called "in-flight" projects discussed further at Section 7 below.

Our long-term approach will increasingly include catchment management for drinking water source protection in partnership with key stakeholders. Catchment management can take many years to yield a benefit but is a sustainable solution by preventing contaminants entering the watercourses in the first place rather than putting in end of pipe treatment solutions.

This approach to managing the risk to our drinking water sources is in accordance with Article 7(3) of the Water Framework Directive, which specifically requires countries to protect drinking water sources: *"Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water."* Irish Water's approach will be to collaborate with all relevant stakeholders who seek to deliver a common goal of protecting drinking water ~~sources~~sources, to understand risks in the catchment-s and reduce these risks.

In order to appropriately consider water quality issues as part of the Options Assessment Methodology within the Regional Water Resources Plans, in any supplies that have Interim Barrier Assessment scores of 3 and above, the Deployable Output from these water treatment plants is reduced to zero. This will drive upgrade or alternative source solutions for these supplies within the Regional Water Resources Plans.

5.11 Reliability – Capital Maintenance and Critical Assets

To ensure the ongoing security and reliability of our treatment and water distribution assets, we need to ensure that they are appropriately maintained. Capital Maintenance is defined as the replacement or refurbishment of existing capital assets to provide continuing service to the customer and to protect the environment in accordance with current regulatory obligations.

Maintenance includes the following activities:

- The refurbishment of an existing asset;
- The replacement of an existing asset with a similar asset;
- The replacement of an existing asset with an asset of different type or design, that is fit for purpose; and
- The reconfiguration of the system to provide the required service by another means.

Irish Water has processes in place to ensure the appropriate delivery of maintenance works including:

- A Working Group to monitor the delivery of works;
- A comprehensive approvals process for requests;

- Alignment of funding requests with Irish Water Service Measures;
- Capture of estimates of expected efficiencies resulting from the replacement or refurbishment of an asset; and
- Monthly reporting summarising of works delivered.

This Asset Management approach is best practice to maintain serviceability (the capacity to maintain desired level of service) through the normal life cycle of an asset. This approach manages risk, protects assets from accelerated deterioration and reduces whole life cost by extending asset life.

Across our water supplies, we also have a subset of assets known as critical assets. In a water supply, critical assets are the single points of failure that have the potential to significantly impact on our ability to provide water to our customers. Critical assets include abstraction points, large water treatment plants, and our bulk transfer or trunk mains (including any pumping stations associated with these). As a failure of one of these assets would result in a large-scale interruption to supply, they need to be maintained at a higher condition and performance grade and should be subject to more stringent maintenance programmes than non-critical assets. However, as these assets can be in continuous use, maintenance programmes can be difficult to implement.

At water treatment plants we can design for additional capacity in the form of an outage allowance, which allows us to carry out planned and emergency maintenance or upgrades. However, trunk mains need to be taken out of service to allow for maintenance and repairs. As these mains are often running continuously at or close to full capacity, it can be difficult to take them out of service for the length of time required for appropriate maintenance unless we have sufficient reserves of treated water in storage. In addition, trunk mains can be extremely expensive to repair and replace.

As critical assets have the potential to significantly impact our ability to supply water to our customers, we consider the capital maintenance requirements of these asset classes within our resource planning process. This means we include this aspect in the Needs Assessment workshops with our Local Authority partners, drawing on operational experience and referring to operating performance data.

Impacts on water supply due to critical asset failure are assessed as part of Barrier 5 – Interruptions to Supply. As part of this barrier, we examine our assets for ‘source to tap’ security, including treated water storage requirements to mitigate against supply interruptions.

5.12 Summary

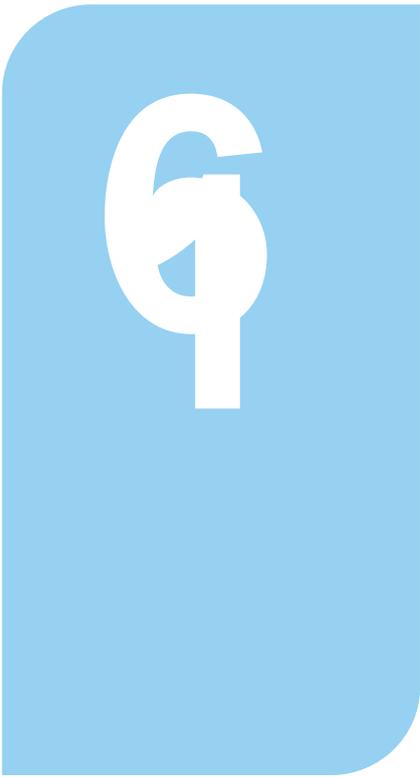
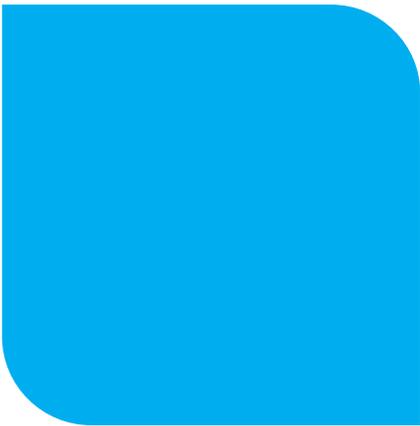
In this section we have outlined the Drinking Water Safety Plan and Barrier Assessment approaches that we will use to manage potential risks and emerging risks to our water supplies. We have also summarised how these processes interface with Irish Water’s resource planning and capital investment planning processes.

For the purposes of this cycle of the National Water Resources Plan, we have used an Interim Barrier Assessment to identify water quality and reliability driven need for the purposes of the Framework Plan.

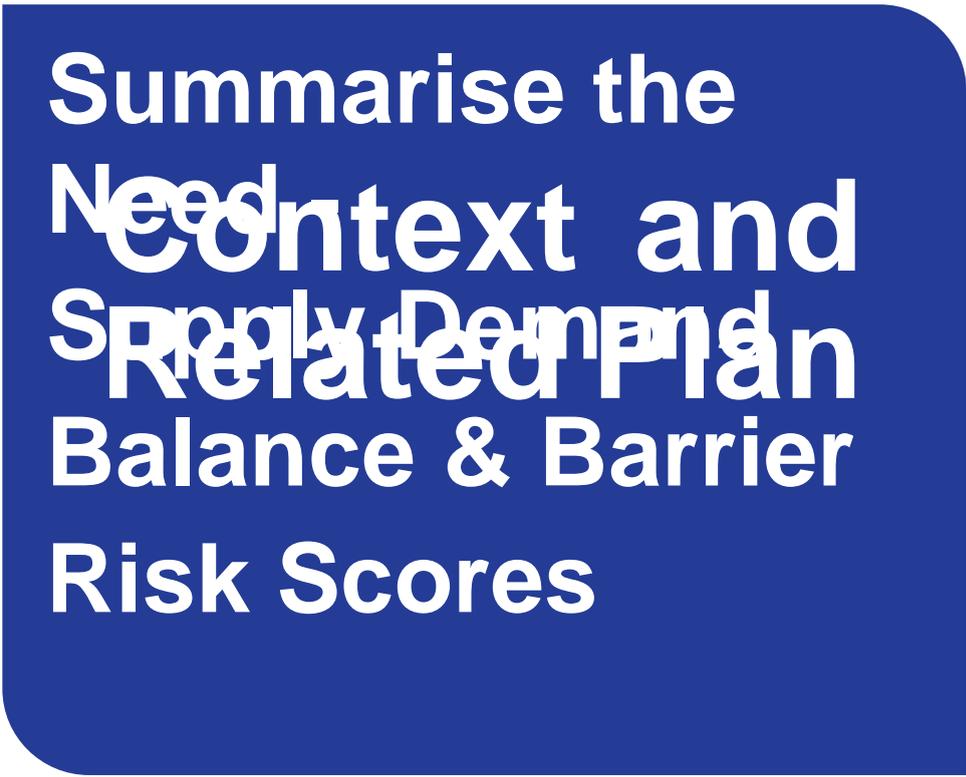
As Part of Phase 2 of the NWRP, we will develop Preferred Approaches (solutions) to address this identified need as part of the Regional Water Resources Plans.



The European Union (Drinking Water Regulations) set out the water parameters to be tested, how often and the acceptable limits to ensure public health



6



**Summarise the
Need Context and
Supply Demand
Related Plan
Balance & Barrier
Risk Scores**



6 Key Points

In this Chapter of the ~~draft~~ Framework Plan we:

- Summarise the results of the Supply Demand Balance Assessment and the Barrier Performance Assessment

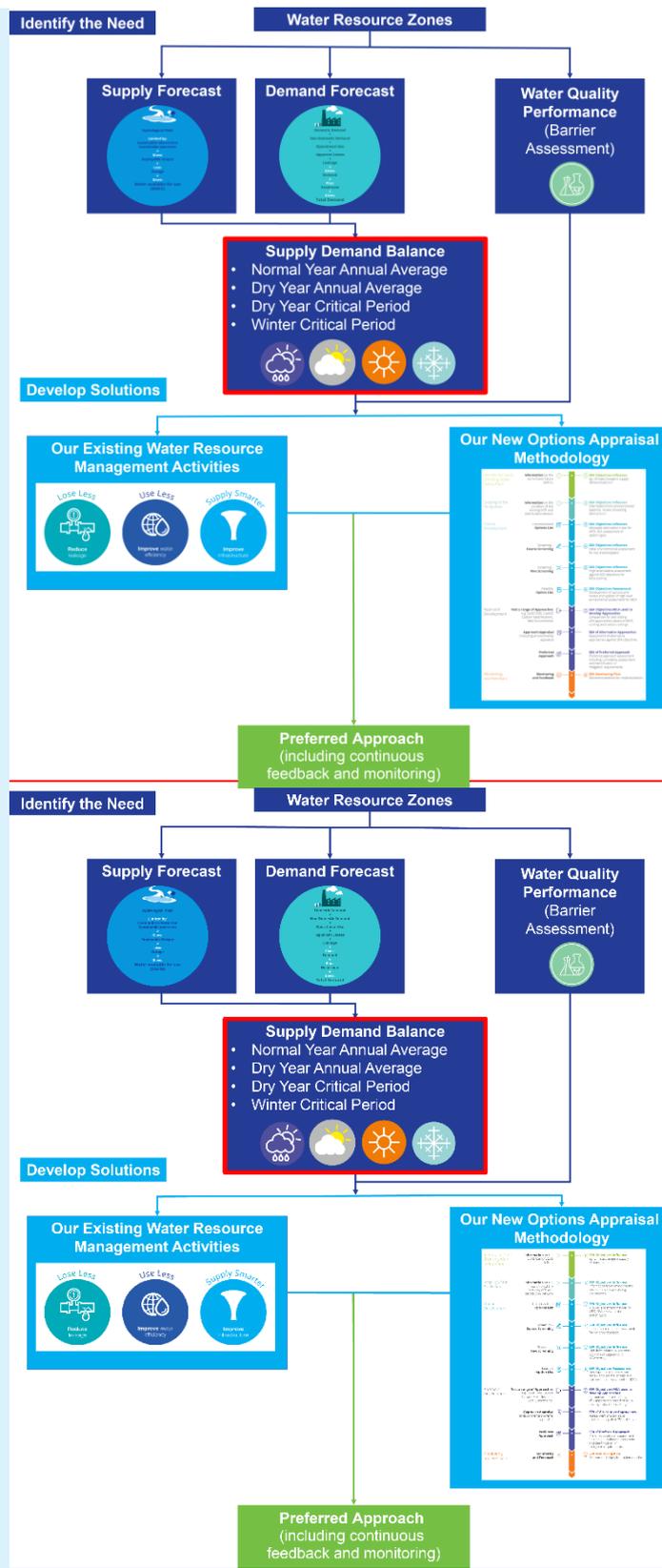


Figure 6.1 – NWRP Plan Process- Supply Demand Balance

6.1 Introduction

In Chapters 3 and 4 of ~~the draft~~ [this](#) Framework Plan, we identified how we assess our baseline supplies and the demand for water in each of our Water Resources Zones. We also summarised how we forecast our supplies and future demand for water across the 25-year horizon of our [National Water Resources Plan](#).

In Chapter 5 we identified how we assess the risks to our water supplies from the hazards that may affect them and the existing barriers and controls that are in place to mitigate these risks. Chapters 4, 5 and 6 broadly describe our current water supplies in terms of:

- The **Water Quantity** that we can supply;
- The **Water Quality** that we can supply; and
- The **Reliability** of our asset base to maintain supply.

These three aspects of our supplies need to be managed and planned for collectively to ensure that interventions to resolve one area of risk do not adversely impact on another (Figure 6.1). We must also consider whether our water supplies are sustainable and, if not, how we can ensure that the short, medium and long term plans we put in place will be sustainable in the future.

6.2 Summary Results Water Quantity – Supply Demand Balance

To identify need in terms of the current and future ability of our water supplies to meet demand and to support growth and economic development, we compare our supply calculations against our demand forecasts to derive the Supply Demand Balance (SDB). This is shown graphically in Figure 6.2.

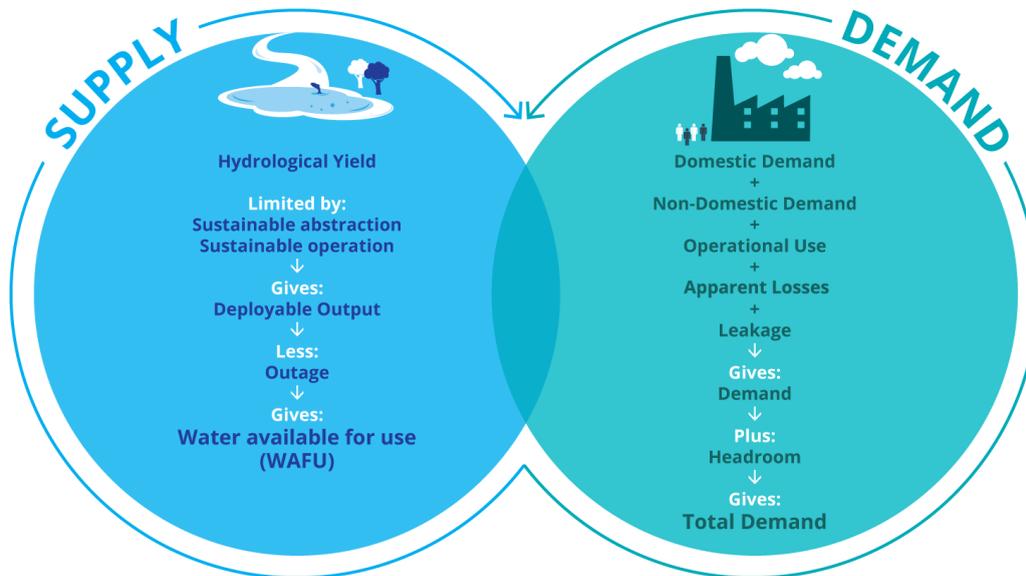


Figure 6.2 – The Supply Demand Balance

The SDB calculation compares the WAFU (i.e. the amount of water we can supply) to the Total Demand for water. Where the WAFU is less than the Total Demand, this is known as a deficit (or need) meaning there would be a risk maintaining supplies to our customers.

Both the WAFU and Total Demand change for different weather conditions. As we identified in Chapter 2, an uninterrupted water supply is essential for public health, so we must ensure that our water supplies can withstand variations in climatic conditions. Four iterations of the SDB calculations were completed for each WRZ, to cover Weather Event Planning Scenarios:

- Normal Conditions (Normal Year Annual Average – NYAA);

- Dry Years (Dry Year Annual Average – DYAA);
- Drought Periods (Dry Year Critical Period – DYCP); and
- Winter Freeze Thaw Conditions (Winter Critical Period – WCP).

Further details of the Weather Planning Scenarios are provided in Chapter 2.

Our SDB calculations have been adjusted to include the following assumptions:

- All Irish Water plans and projects that are planned to be completed by 2021 are delivered;
- Target leakage savings ~~to the end of 2020 and~~ which have secured funding, ~~are delivered~~ [have been met](#);
- The baseline SDB for the GDA WRZ includes the SELL glide path (as described in Chapter 5 and Appendix H); and
- The baseline SDB for the other WRZs does not include the applicable SELL. We calculated the SELL nationally, however, the glide path to achieve SELL cannot be included until we have further information on the delivery mechanisms. The leakage saving may also have to be concentrated into specific areas depending on the outcomes of abstraction legislation, to support growth and economic development, or used within the Preferred Approach for the WRZs.

The SDB Calculations do not consider any projects or interventions that will be delivered after 2021, as one of the purposes of the NWRP is to assess and then identify the most appropriate interventions.

SDB Calculations have been developed for our 539 WRZs. The calculations cover the period from 2019 to 2044 to correspond with our 25-year NWRP ~~–~~ [comprising this](#) Framework Plan and [the four](#) Regional Water Resources Plans [currently being developed](#).

The SDB calculations for each WRZ are included in Appendix L. For ease of review, these have been categorised by Region and County.

A national summary of our SDB calculations is provided in the sections below.

6.2.1 National Summary

6.2.1.1 Baseline and Future Supply

Figure 6.3 shows our calculation for the WAFU nationally for our Weather Event Planning Scenarios from 2019 to 2044. A summary of this information is also provided in Table 6.1.

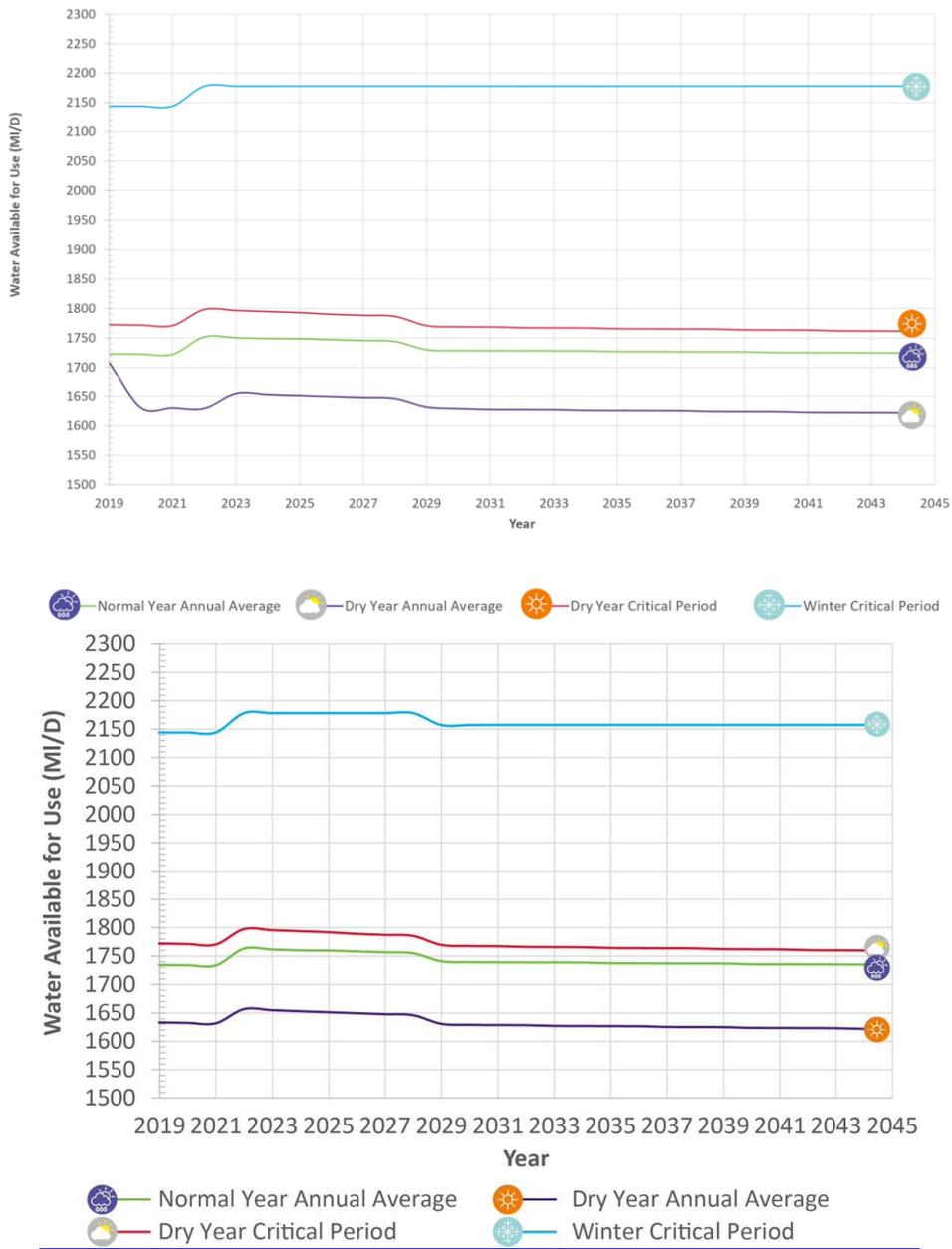


Figure 6.3 - National Summary of WAFU, 2019 to 2044

Table 6.1 - Change in WAFU, 2019 to 2044

Weather Scenario	Planning	WAFU Megaliter (MI/d)		Change in WAFU from 2019 to 2044	
		2019	2044	Total (MI/d)	(%)
NYAA		1,723	1,725	2 ↑	0
DYAA		1,708 <u>1,631</u>	1,622	-86 <u>-14</u> ↓	-0.5 <u>-0.5</u> ↓
DYCP		1,773	1,762	-12 ↓	-1 ↓
WCP		2,139	2,173 <u>2,152</u>	+34 <u>-13</u> ↓	+2 <u>-1</u> ↓

↑ = Increased Increase in WAFU

U = Decrease in WAFU

Further detail on the calculation of baseline WAFU and forecast supply can be found in Chapter 3. Figure 6.4 illustrates the Limiting Factor for the WAFU produced at our water treatment plants

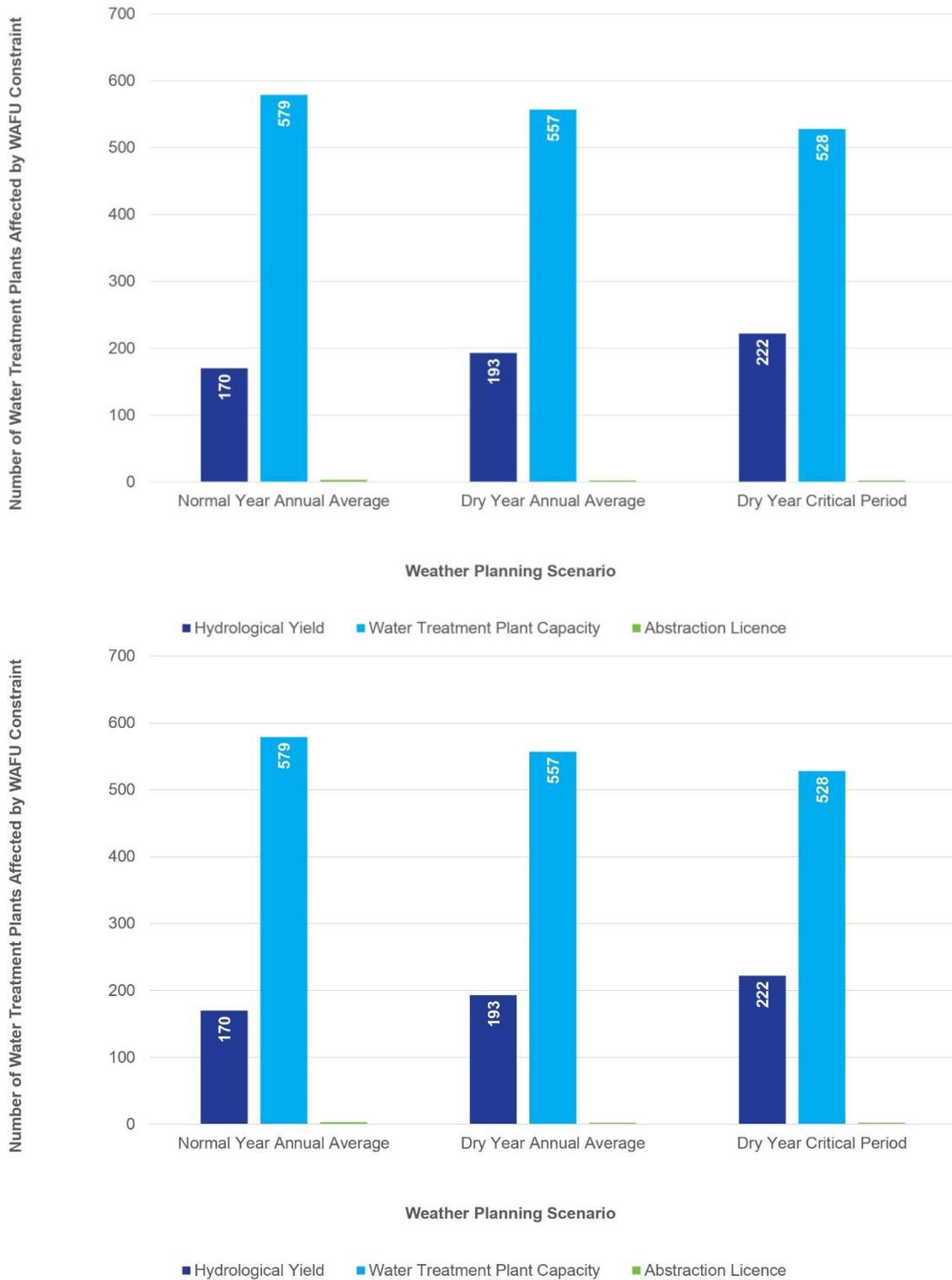


Figure 6.4 - Limiting Factor for the WAFU produced at our water treatment plants

Our current forecast for the WAFU does not include the pending-anticipated abstraction legislation. The new regulatory regime, which is required to meet the requirements of the WFD (2000/60/EC), will inevitably result in modifications to the way that we currently abstract from our individual water sources.

However, as our water supplies have evolved based on these existing water sources, it will take numerous investment cycles before we have an integrated supply system that is truly environmentally sustainable.

The effects of the [future-anticipated](#) abstraction legislation are likely to be wide ranging, such that it is not possible to assess them fully at this stage, with a more detailed site by site assessment required, when the legislation is published in its final form.

Figure 6.5 shows the potential long-term impact on the WAFU under a WFD compliant new abstraction regime. As can be seen, our available water supplies could reduce from 1,723 MLD to 1,478MLD in a normal year as outlined in Appendix L.

This will represent one of the key challenges for Irish Water over the coming years. It also has broader implications that need to be considered in relation to the growth and economic wellbeing of the country.

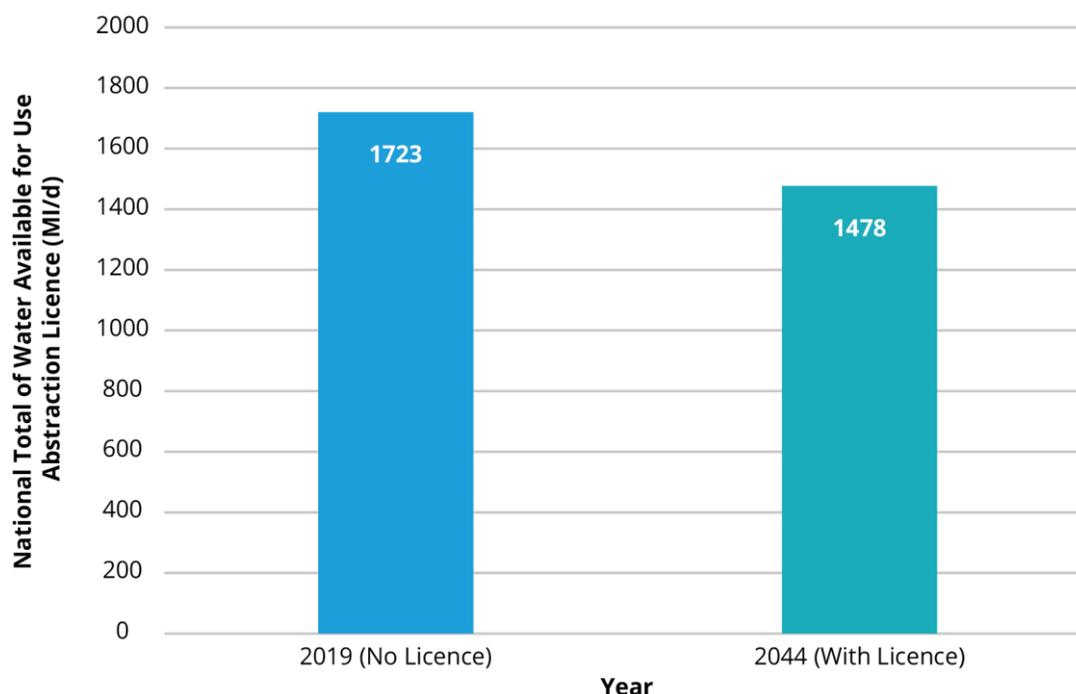


Figure 6.5– Potential Impact of Abstraction Legislation on WAFU, 2019 to 2044

6.2.1.2 Baseline and Future Demand

Figure 6.6 and Table 6.2 show the Total Demand (i.e. with headroom) for water from our supply networks. Presently, in a Normal Year, the Total Demand is 1,924MI/d and in a Dry Average Year is 1,960MI/d.

Our requirements for water in a drought or severe winter period can increase the Total Demand by up to 30%. For the DYCP (drought), the current Total Demand is 2,266MI/d. The Total Demand is higher still for the WCP at 2,508MI/d, due to the effect of pipe bursts.

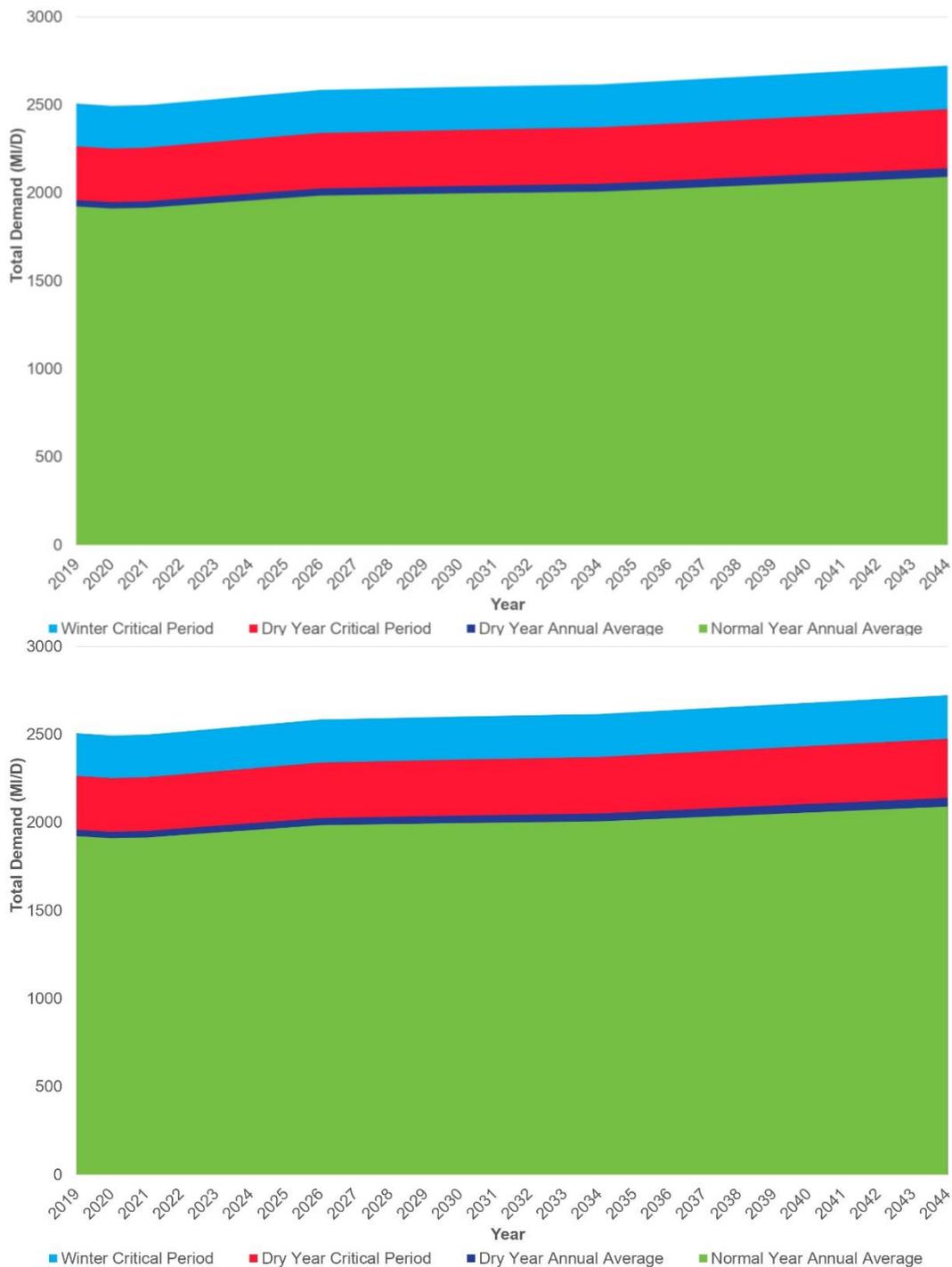


Figure 6.6 – National Summary of Total Demand, 2019 to 2044

Table 6.2 – National Summary of Total Demand

Weather Planning Scenario	Total Demand (MI/d)		Change	
	2019	2044	Total (MI/d)	(%)
NYAA	1,924	2,091	168 ⬆️	9% ⬆️
DYAA	1,960	2,141	182 ⬆️	9% ⬆️

DYCP	2,266	2,476	211 ↑	9% ↑
WCP	2,508	2,724	215 ↑	9% ↑

↓ = Reduced Demand

↑ = Increased Demand

Figure 6.6 and Table 6.2 also show that although our population is forecast to grow by over 20% by 2044 along with significant economic growth, Total Demand is only forecast to increase by around 10% across the different Weather Planning Scenarios.

This comparatively small increase in Total Demand is attributed to:

- The ambitious leakage reduction targets we have set ourselves as a country; and
- The fact that significant high-water demand growth is confined within a small number of WRZs, which mitigates the effect of such increases, when using national averages.

Supply Demand Balance

We combine our baseline and forecast calculations for supply and demand over the next 25 years, to understand the deficits (need) in the SDB that we will need to address. For the purposes of this summary, we have presented this information as:

- The national net surplus or deficit across our Weather Planning Scenarios; and
- The number of WRZs that would be in deficit i.e. where there would be a risk of disruption to our customers.

Net Surplus & Deficit

Figure 6.7 and Table 6.3 show the national summary of the net surplus or deficit across our Weather Planning Scenarios for 2019 and 2044.

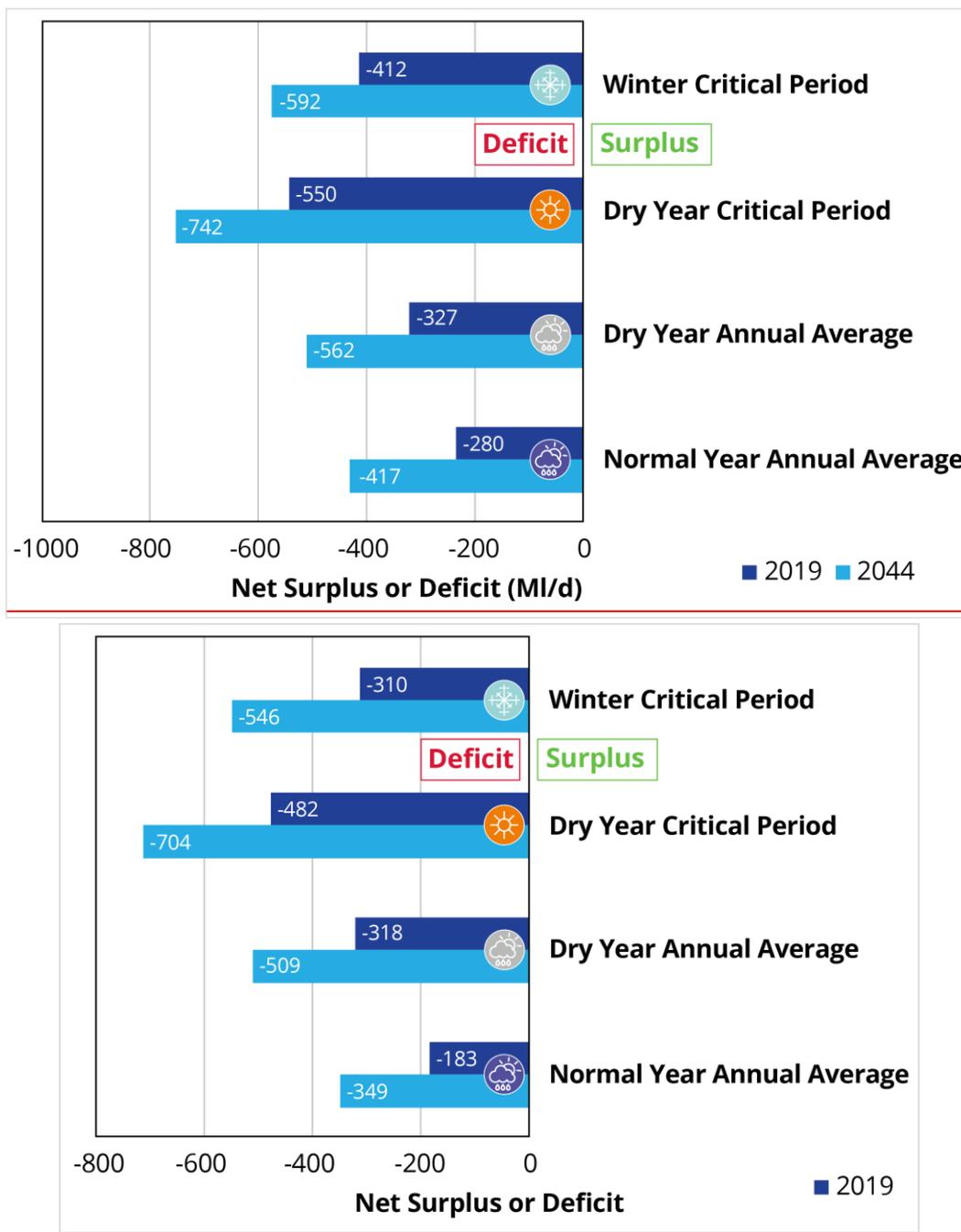


Figure 6.7 – National Summary of the SDB for 2019 to 2044

Table 6.3 – National SDB Summary

Weather Planning Scenario	SDB (MI/d)		Change	
	2019	2044	Total (MI/d)	(%)
NYAA	-280183	-417349	137166 ↓	91% ↓
DYAA	-327318	-562509	236191 ↓	60% ↓
DYCP	-550482	-742704	192222 ↓	3946% ↓
WCP	-412310	-591546	180263 ↓	5176% ↓

 = Increased Deficit⁷¹⁰

At present, Total Demand exceeds the Water Available for all Weather Event Planning Scenarios.

The largest deficit in the SDB is for the DYCP, with a net deficit nationally of 550MI/d. This is because raw water sources are impacted during extreme warm periods such as drought which typically coincides with increases in demand.

The net deficit nationally for the WCP is 412MI/d. There are normally no restrictions to the amount of water we can abstract during the WCP. This deficit is predominantly driven by the ability of our water treatment plants and distribution networks to cater for the increased demand during this Weather Event Planning Scenario.

By 2044, our SDB deficit will increase across all Weather Planning Scenarios. This is primarily due to a growth in demand, combined with a forecast reduction in water availability due to climate change.

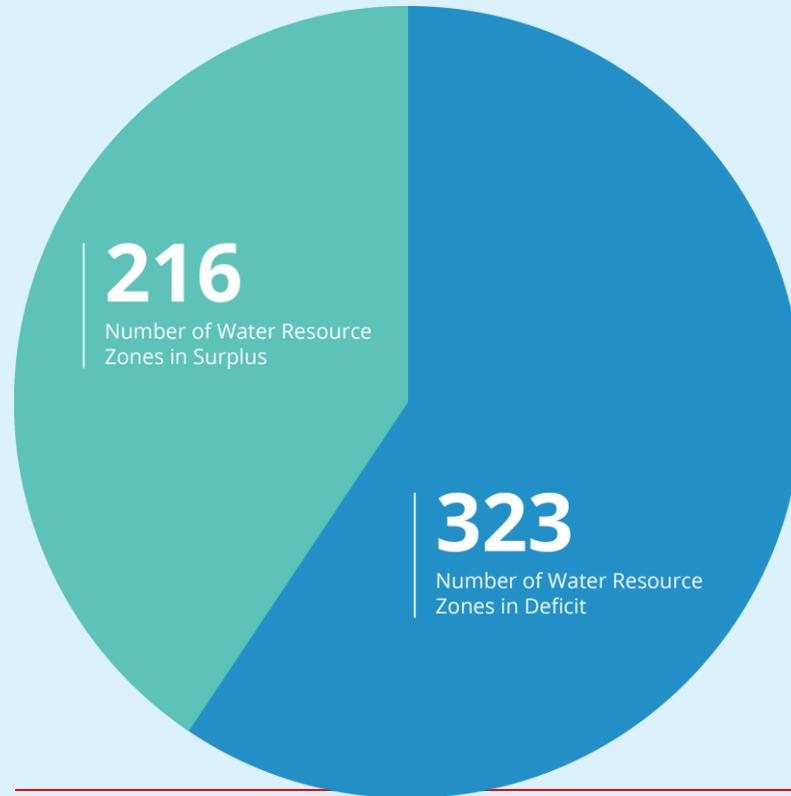
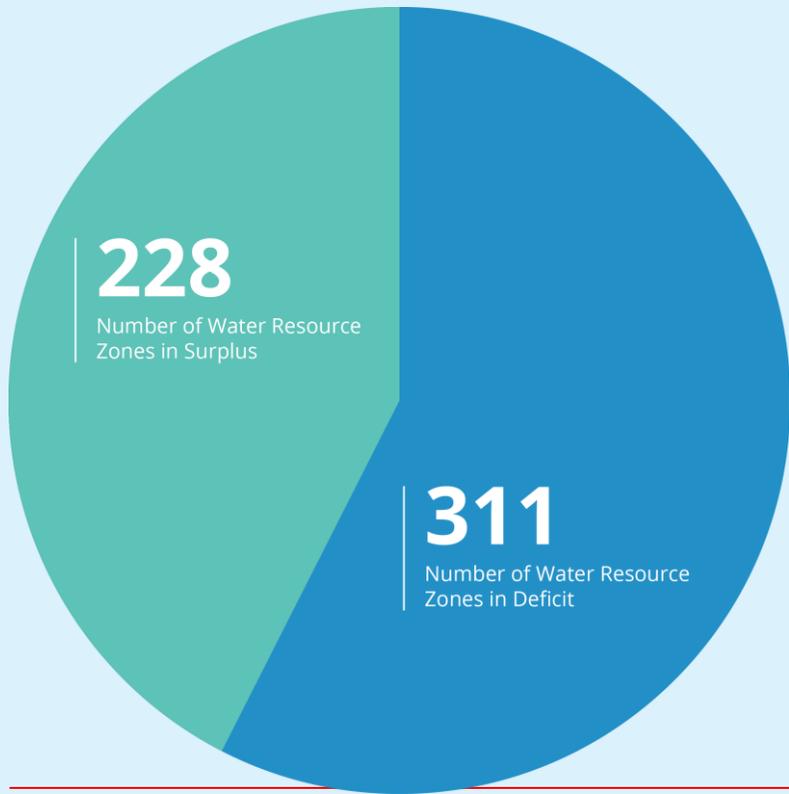
The SDB does not include the impacts of the pending abstraction regulations and reform. When implemented, these new Regulations will have the potential to significantly increase the deficits by reducing the amount of water, which we can abstract from our sources.

WRZ Impacts

Figures 6.8 to 6.11 show the number of Water Resources Zones which are currently in surplus or deficit across our four Weather Event Planning Scenarios. These figures show:

- During the NYAA Planning Scenario, 311 (58%) of our WRZs- supplying 3,518,000 customers. are in deficit whilst 228 (42%) are in ~~surplus~~surplus.
- During the DYAA Planning Scenario, 323 (60%) of our WRZs- supplying 3,595,000 customers. are in deficit whilst 216 (40%) are in ~~surplus~~surplus.
- During the DYCP Planning Scenario, 355 (66%) of our WRZs- supplying 3,660,000 customers. are in deficit whilst 184 (34%) are in surplus; ~~and~~and.
- During the WCP Planning Scenario, 362 (67%) of our WRZs- supplying 3,584,000 customers. are in deficit whilst 117 (33%) are in surplus.

⁷¹⁰ The national deficit is not equal to the total WAFU – Demand as this would assume all WRZ's are interconnected. The national deficit is the sum of all the individual deficits per WRZ.



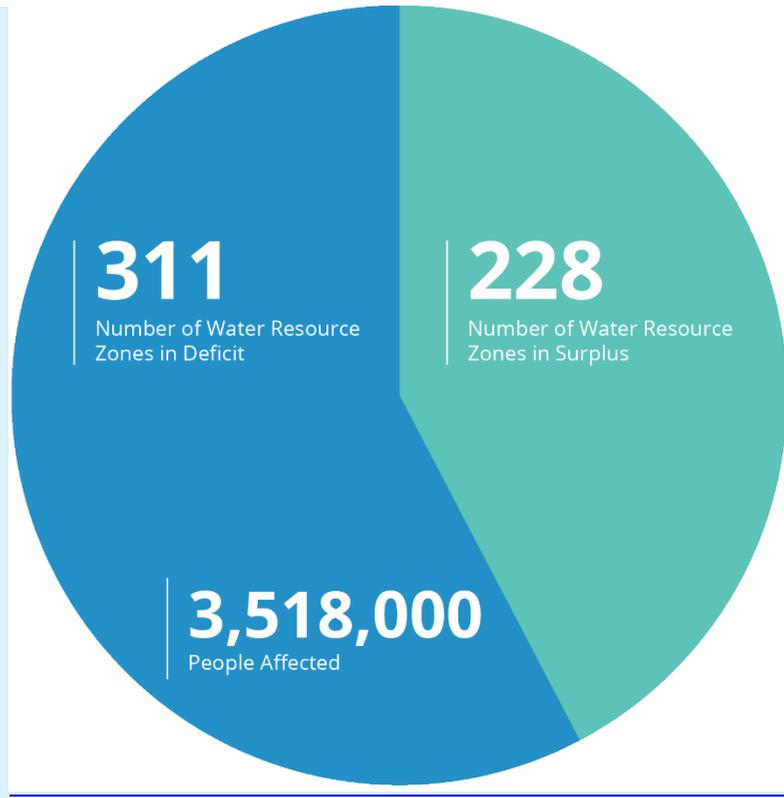


Figure 6.8 – Numbers of WRZs in Surplus or Deficit in 2019 for the NYAA Planning Scenario

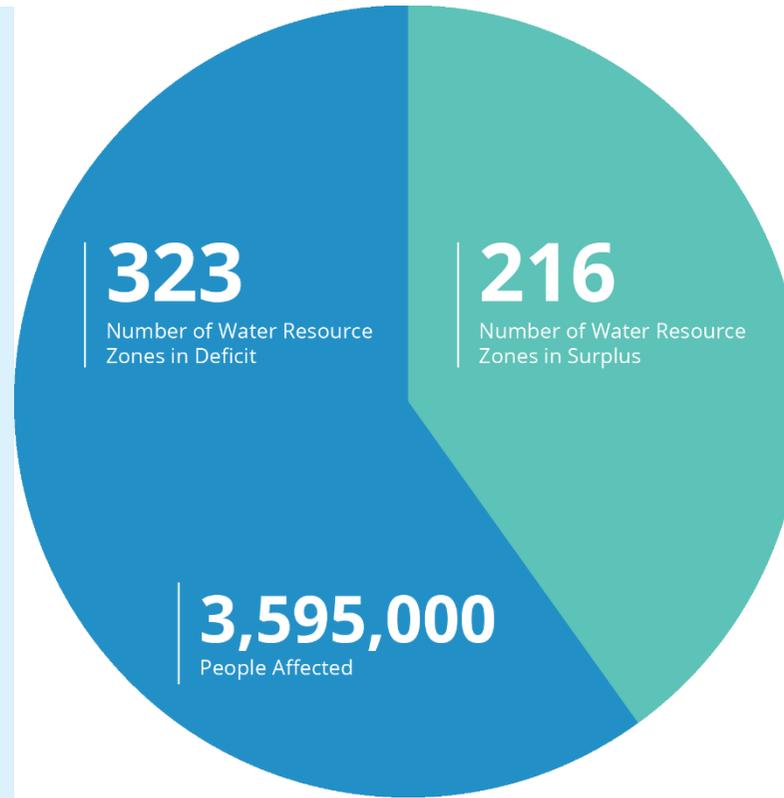
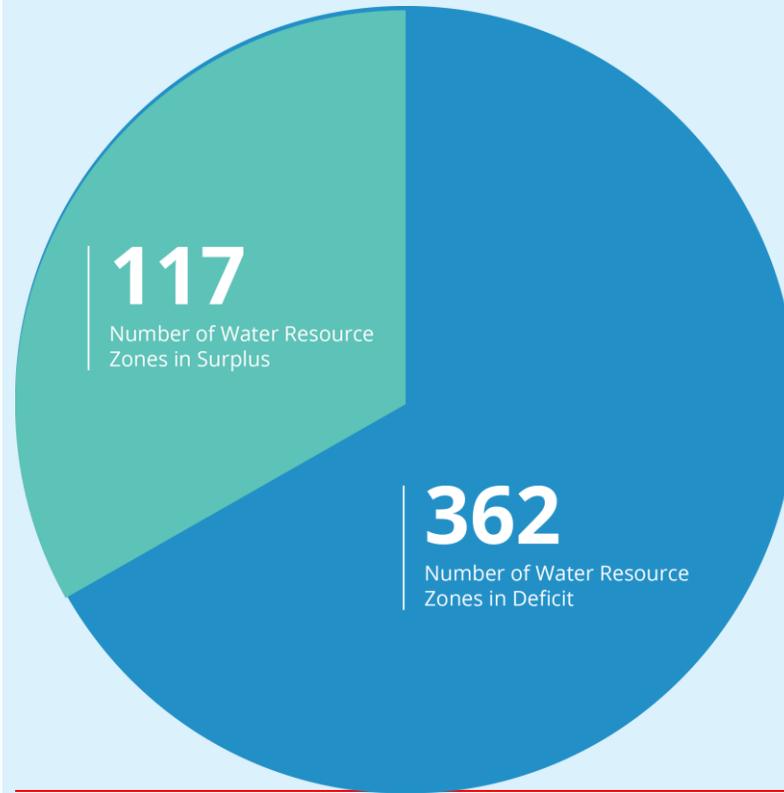
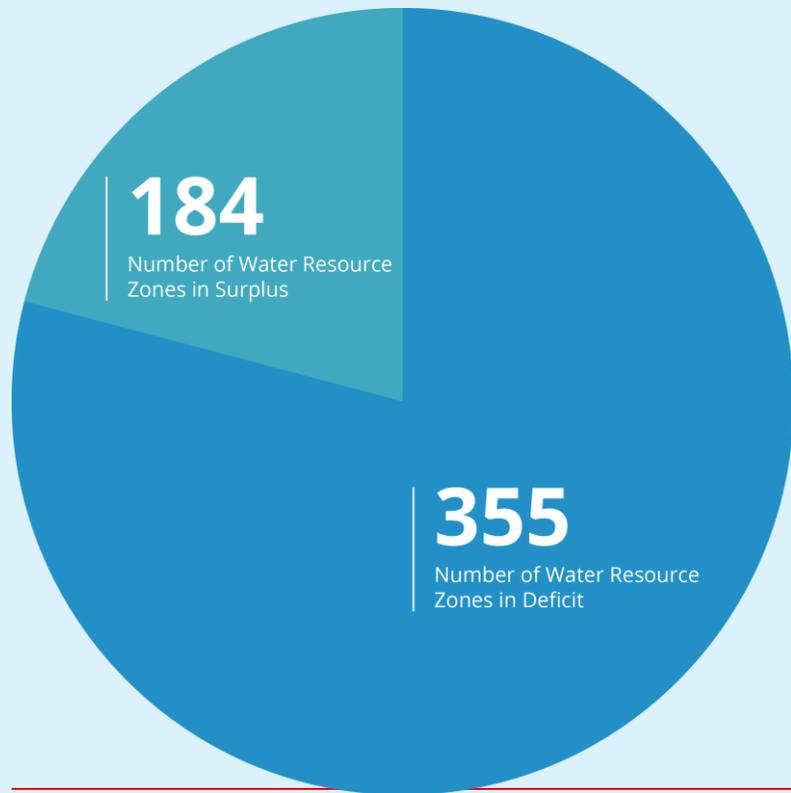


Figure 6.9 – Numbers of WRZs in Surplus or Deficit in 2019 for the DYAA Planning Scenario



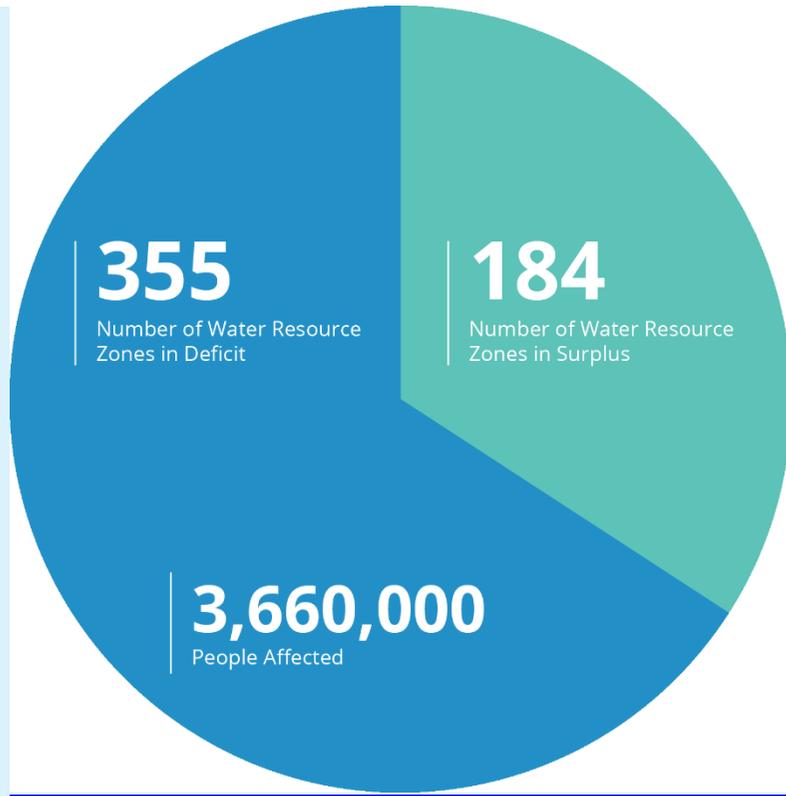


Figure 6.10 – Numbers of WRZs in Surplus or Deficit in 2019 for the DYCP Planning Scenario

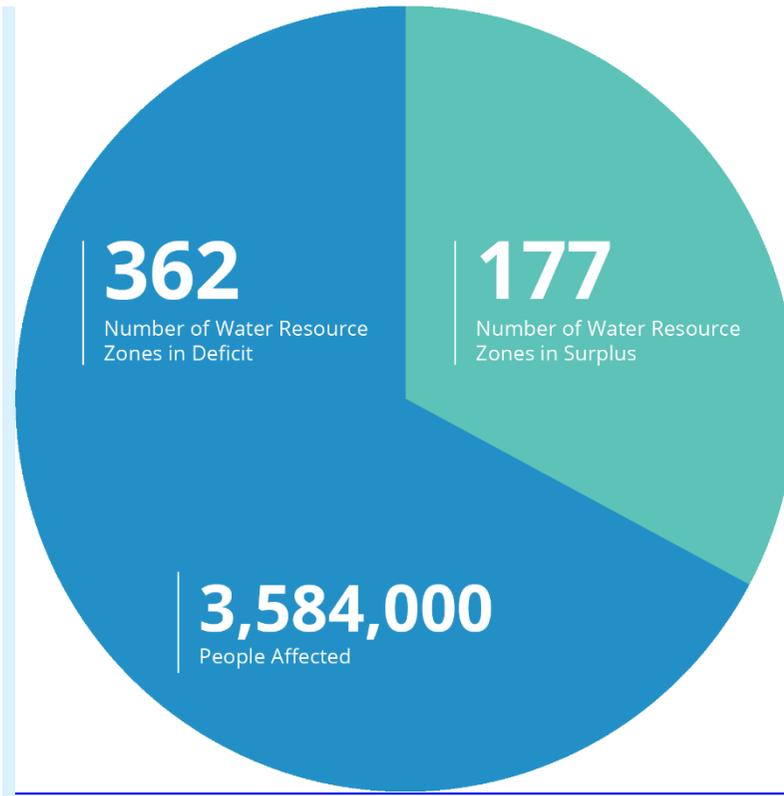


Figure 6.11 – Numbers of WRZs in Surplus or Deficit in 2019 for the WCP Planning Scenario

Figure 6.12 and Table 6.4 highlight that between 2019 and 2044 there will be an increase in the number of WRZs in deficit. The largest change occurs for the DYCP and DYAA Planning Scenarios with 27 and 30 more WRZs respectively in deficit.

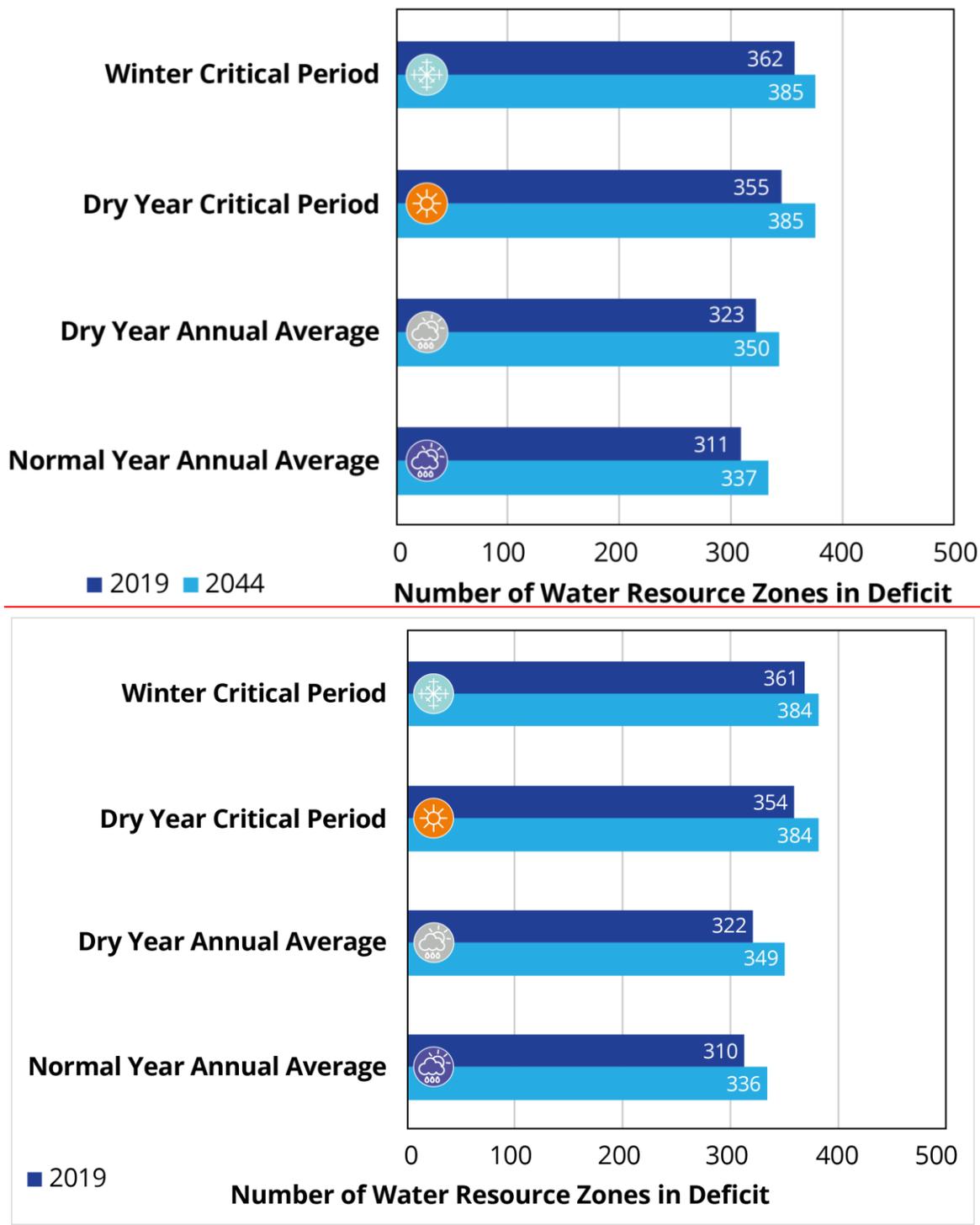


Figure 6.12 – Number of Water Resources ~~on~~ Zones in Deficit 2019 ~~vs~~ 2044

Table 6.4 – Number of ~~WRZs~~ Water Resource Zones in Deficit in 2019 and 2044

Planning Scenario	Number of WRZs in Deficit		Change from 2019 to 2044	
	2019	2044	Count	(%)
Winter Critical Period	362	385	23	6.35%
Dry Year Critical Period	355	385	30	8.45%
Dry Year Annual Average	323	350	27	8.36%
Normal Year Annual Average	311	337	26	8.36%

NYAA	307 <u>310</u>	332 <u>336</u>	25 <u>26</u>	8%
DYAA	317 <u>322</u>	343 <u>349</u>	26 <u>27</u>	8%
DYCP	421 <u>354</u>	438 <u>384</u>	17 <u>30</u>	4%
WCP	356 <u>361</u>	376 <u>384</u>	20 <u>23</u>	6%

Based on this analysis, it is clear that our baseline position is challenging, and that many of our supplies currently experience significant SDB deficits particularly during dry periods. However, Ireland has good natural water resources and when these issues are addressed through capital investment, the SDB will stabilise over time. We do not anticipate a significant increase in the overall SDB deficit nationally over the timeframe of the Plan, due to planned investment and leakage reduction. However, the SDB may increase significantly within certain Water Resource Zones, and abstraction legislation may impact on others.

The current position reflects the condition and performance of our existing asset base particularly in relation to WAFU constraints.

6.2.2 How we are presenting the SDB information

The SDB calculation for each WRZ is provided in Appendix L. Figure 6.13 gives further details of the information provided for each WRZ.

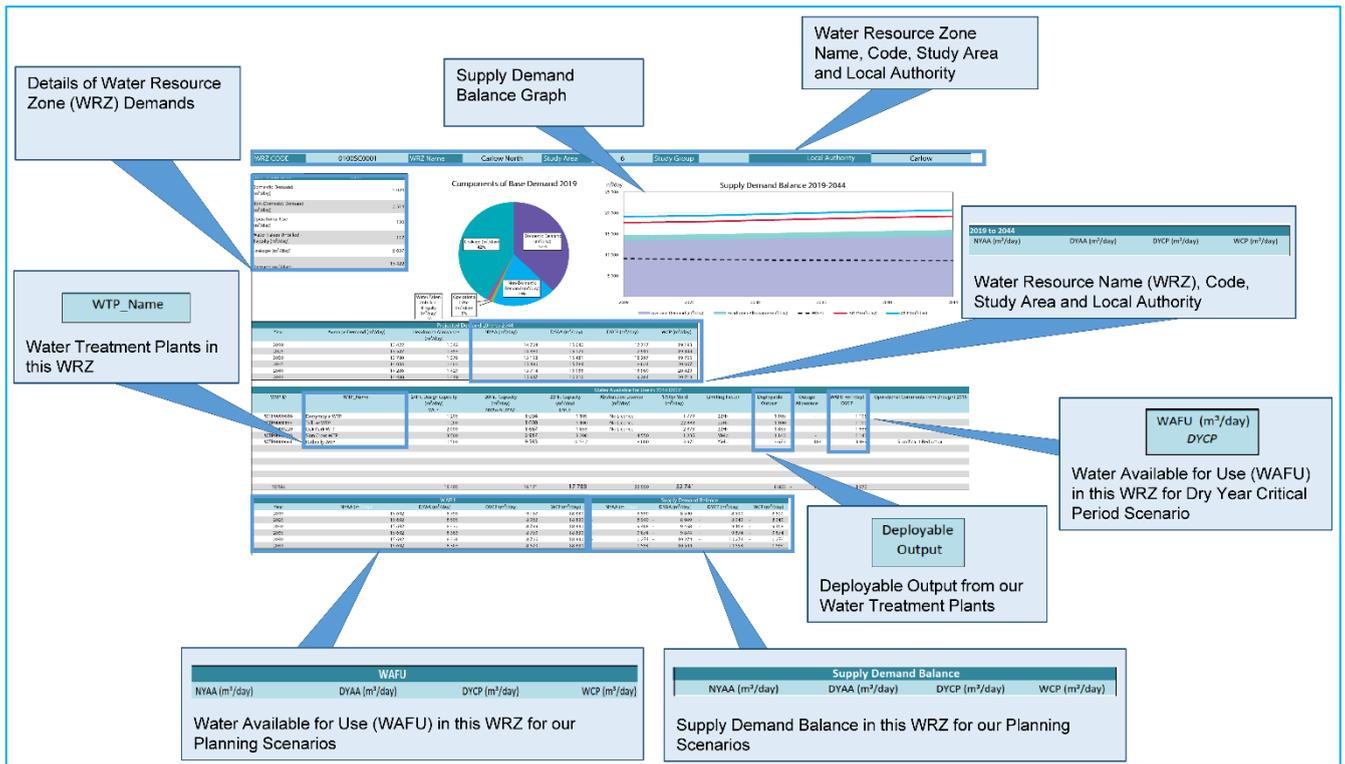
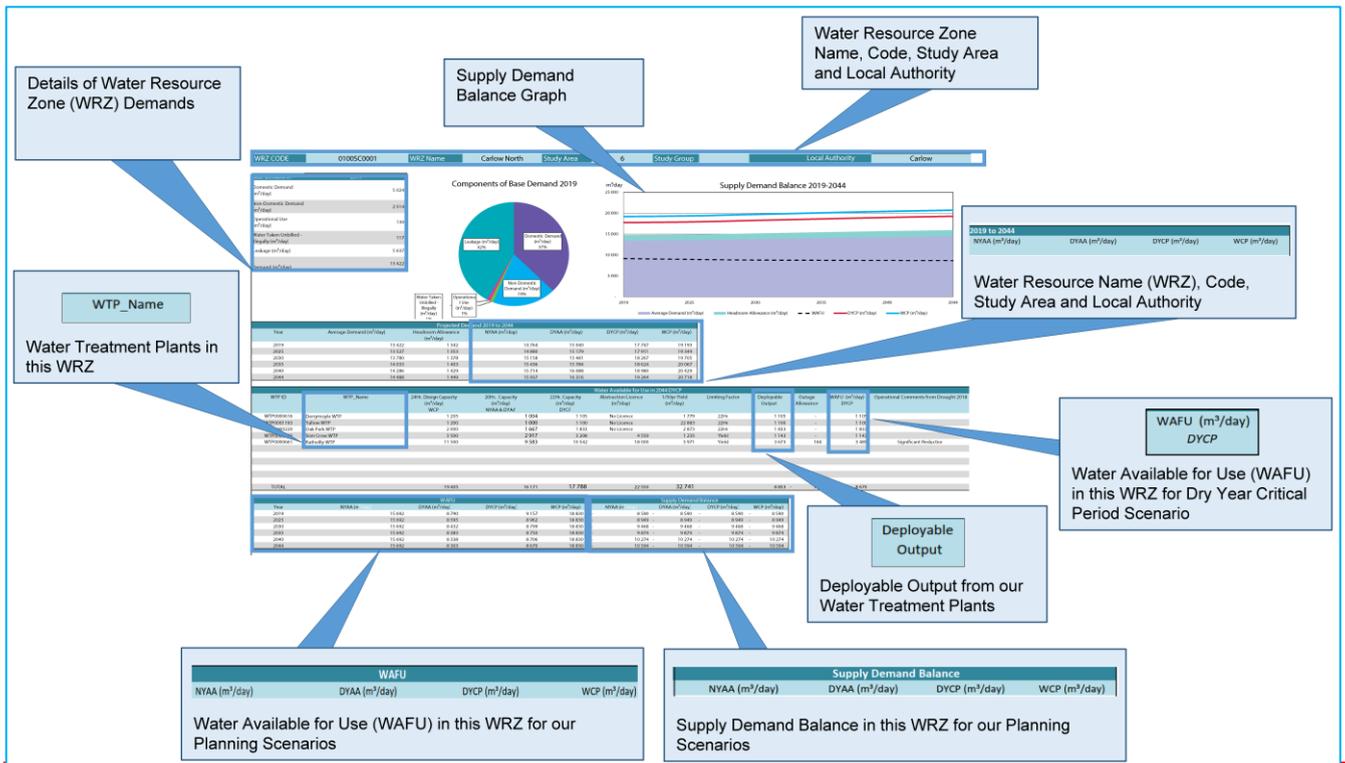


Figure 6.13 – WRZ SDB Information

6.2.2.1 SDB Summary

The key findings from our SDB calculations are as follows:

- The WAFU from our existing supplies is not sufficient to balance the current demand for water, across all weather event planning scenarios whilst ensuring the correct levels of service to our customers;
- This situation will deteriorate over time, because of climate change, leading to an increased frequency of prolonged droughts lowering river and lake levels;

- Changes to legislation and the regulatory process around abstractions has the potential to significantly impact water availability at our existing supplies;
- Although population and economic growth are forecast the Supply Demand Balance deficit is not expected to increase significantly at a national level, although there may be some WRZs with significant demand increase;
- 58% of our WRZs are in deficit at present and do not provide the correct reliability to our customers in normal conditions based on the standards for reliability and Level of Service that we have set in this ~~draft~~ Framework Plan. This increases to 67% of resource zones in winter conditions and 79% in drought conditions.

The SDB assessments show considerable vulnerability across the public water supply both now and into the future, if no course of action is taken. This vulnerability has the potential to limit socio-economic development and cause real losses to customers at times.

However, whilst the purpose of this ~~draft~~ Framework Plan is to ~~identify~~ set out the methodology that will be used to develop short, medium and long-term solutions to address the risks to our supplies (in terms of quantity, quality and reliability), it should be noted that we have a range of interventions in train. These include critical maintenance investments, leakage reduction, new supply interventions, and operational interventions, which will help deliver more from our existing asset base.

6.3 Quality and Reliability

6.3.1 Quality and Reliability – Summary Results

In Chapter 5, we described how Irish Water monitors water quality in line with the requirements of the Drinking Water Regulations, and how drinking water compliance across public water supplies has remained high.

We also detailed how Irish Water is adopting the Drinking Water Safety Plan (DWSP) approach to managing risk, in order to ensure that our water supplies are also secure, sustainable and reliable. Under this approach we have commenced the process of assessing our supplies against an identified list of hazardous events, in accordance with the World Health Organisation’s DWSP approach. This hazard assessment process allows us to understand current and future risks across our supplies from source abstraction to the consumer tap, which is the point of compliance in the Drinking Water Regulations.

We also described how Irish Water assesses the capability of our current water supply asset base to deal with existing and future potential risks. This is called the Barrier Assessment, and it allows Irish Water to:

- Understand the scale of potential “Quality and Reliability” need and the associated long-term investments we will need to plan for in order to meet the asset capability standards that we have set for ourselves, and
- Transform our asset base over time through the NWRP and the future capital investment cycles

Although we have commenced the process for completion of the DWSPs, they will likely take a number of years to complete across all of our water supplies. Therefore, for the purposes of this Framework Plan, and the ~~subsequent~~ four Regional Water Resources Plans being developed, we have used an Interim Barrier Assessment, as described in Chapter 5. These Barrier Assessments will be continually updated as we complete the DWSP hazard assessments over the coming years.

6.3.2 Water Security – The Barrier Approach to Asset Management

While we continue to make progress in the development of the DWSPs for all of our supplies, Irish Water has used an Interim Barrier Assessment to identify “Water Quality and Reliability” need for the purposes of the ~~draft~~ Framework Plan.

The Barrier Assessment is not a measure of compliance with the Drinking Water Regulations, however it is an assessment of our existing asset capability to meet the standards we have set for ourselves as a business. Meeting these asset standards will ensure that our asset base transforms over time, and that all of our supplies evolve to become secure, reliable and sustainable. The function of the Interim Barrier Assessment within this iteration of the NWRP is to allow Irish Water to understand the scale of the transformation required across our entire water supply asset base in the short, medium and long term.

It also allows us to plan for the transformation of the asset base through the [four](#) Regional Water Resources Plans and the future capital investment cycles [which will consider those four Plans on a holistic basis](#).

In the following paragraphs, we provide a summary of Interim Barrier Assessment across our supplies, under the individual Barrier headings. The scale of 1 to 5 indicates the level of transformation and investment required across our existing asset base to achieve the stringent asset capability standards we have set for our supplies under this category.

The Pie Charts below represents our 539 Water Resource zones and the portion of these that fall in to the 1 to 5 scale categories. This simple representation does not indicate the size of the supplies, which vary considerably across the country. The information for water resource ~~zone~~ [zones](#) will be included within the [four](#) Regional Water Resources Plans, as part of Phase 2 of the NWRP.

As shown in Figures 6.14 to 6.20, the barrier assessments under all eight categories indicate that there is some investment required across our water resource zones to ensure that our assets are **secure**, **reliable** and **sustainable**, both now and in the future.

The average asset capability and scale of transformation and investment required is contextualised using the “speedometer diagrams” under each category.

6.3.2.1 Barrier 1 - Ensuring Primary Disinfection

We verify compliance with the Drinking Water Regulations by sampling and testing the stipulated parameters in accordance with the required sampling frequency. Our regulatory compliance for microbiological standards was 99.9% in 2019. Therefore, our water supplies are considered to be **safe**. Figure 6.14 summarises the performance of our water resource zones in relation to Barrier 1.

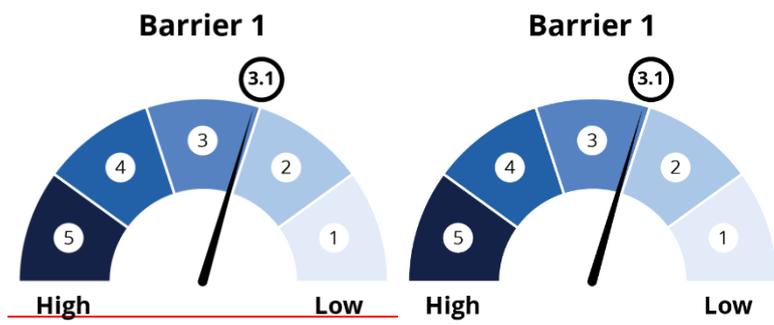


Figure 6.14 – Barrier 1 Average Asset Capability: Scale of Transformation and Investment Required (High to Low)

6.3.2.2 Barrier 2 – Ensuring Secondary Disinfection

Figure 6.15 summarises the asset capability of the distribution networks within our water resource zones to meet the asset standards Irish Water has set in relation to Barrier 2.

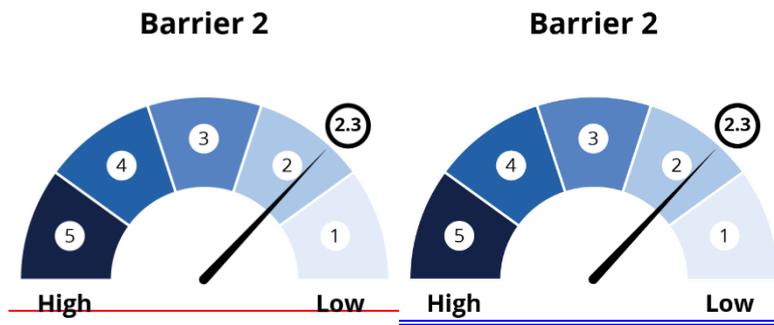


Figure 6.15 – Barrier 2 Average Asset Capability: Scale of Transformation and Investment Required (High to Low)

6.3.2.3 Barrier 3 and 4 - Ensuring Physical removal and/or inactivation of Protozoa

Figure 6.16 summarises the performance of our water resource zones in relation to Barrier 3 & 4 performance. ~~Two assessments have been undertaken on Barriers 3 & 4 to reflect the two risk-assessment methodologies (simple assessment and SCRAM) currently being undertaken by Irish Water (See Chapter 5 and Appendix J).~~

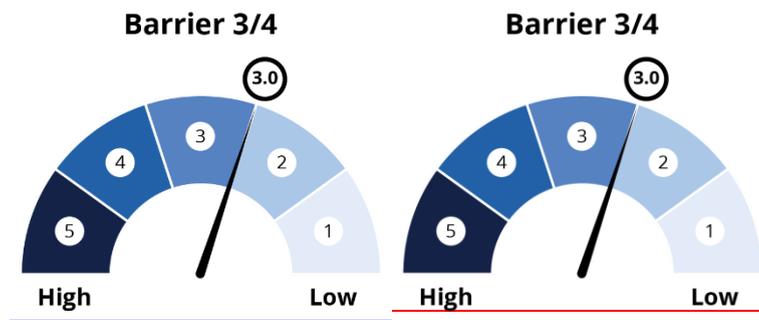


Figure 6.16 – Barrier 3&4 Average Asset Capability: Scale of Transformation and Investment Required (High to Low)

6.3.2.4 Barrier 5 - Ensuring security and continuity of supply

Barrier 5 conformity includes our ongoing risk assessment and management of the following range of water supply and distribution issues:

- The Supply Demand Balance (see Chapters 4, 5 and 6.3 above),
- The management of treatment process alarms and their effect on downstream water storage supplying our distribution networks,
- The management of risks associated with critical infrastructural assets, such as abstraction works, large water treatment plants, pumping stations and trunk mains used for bulk transfer of water, as discussed in Chapter 6.4; and
- The management of distribution network resilience encompassing reduction of leakage and the adequacy of storage to manage short term operational interruptions to the treatment and pumping of drinking water

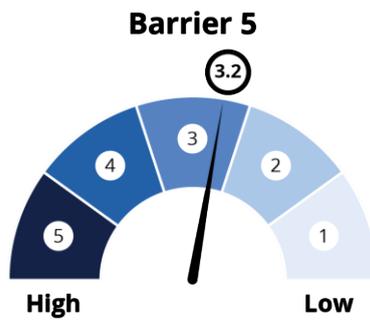


Figure 6.17 – Barrier 5 Average Asset Capability: Scale of Transformation and Investment Required (High to Low)

6.3.2.5 Barrier 6 – Minimising THM formation potential

Figure 6.18 summarises the asset capability of our water sources, water treatment plants and distribution networks to meet the standards Irish Water has set in relation to Barrier 6.

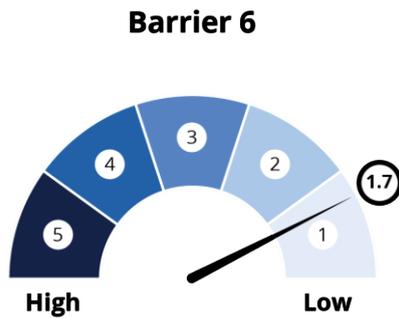


Figure 6.18 – Barrier 6 Average Asset Capability: Scale of Transformation and Investment Required (High to Low)

6.3.2.6 Barrier 7 Minimising discharges to the receiving environment

Figure 6.19 summarises the performance of our Water Resource Zones in relation to Barrier 7 performance.

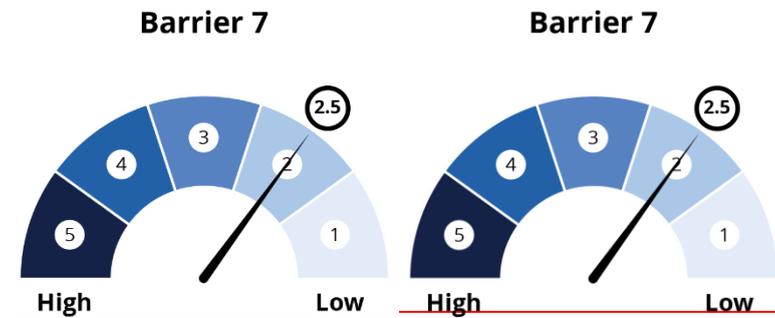


Figure 6.19 – Barrier 7 Average Asset Capability: Scale of Transformation and Investment Required (High to Low)

6.3.2.7 Barrier 8 - Minimising presence of Chemical and Physical Parameters

Figure 6.20 summarises the performance of our Water Resource Zones in relation to Barrier 8 performance. Barrier 8 includes a number of physical and chemical parameters. As can be seen, the barrier assessment under this category indicates that there is some investment required across our asset base.

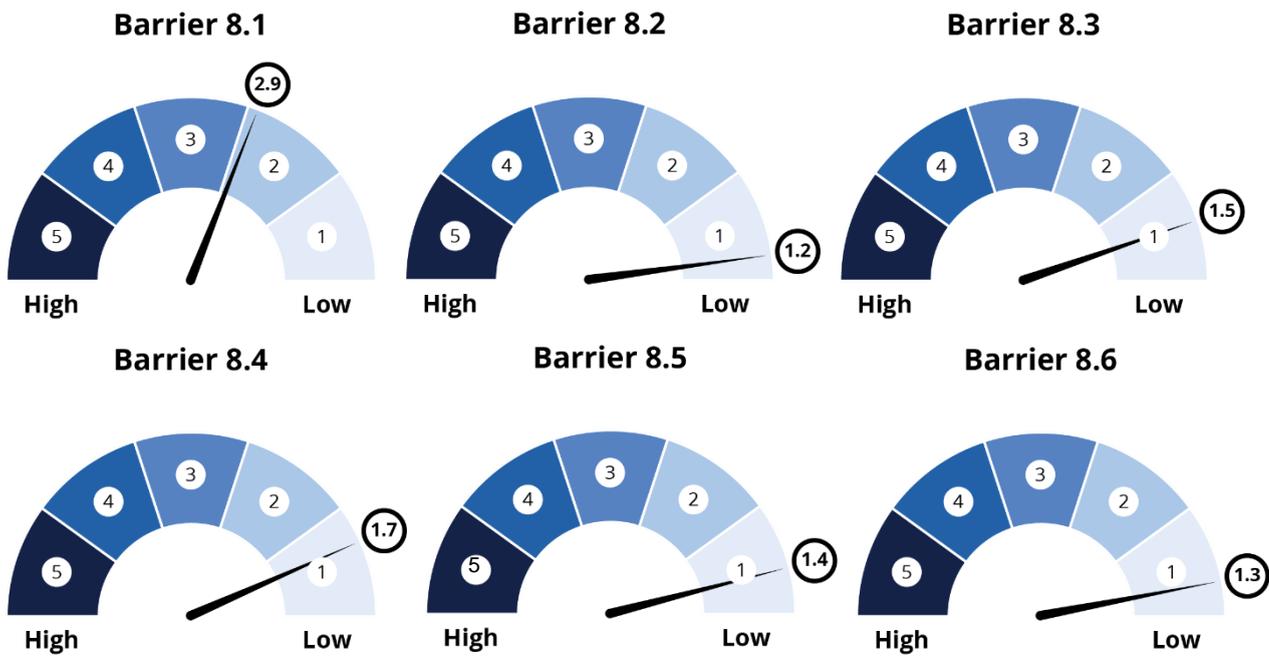
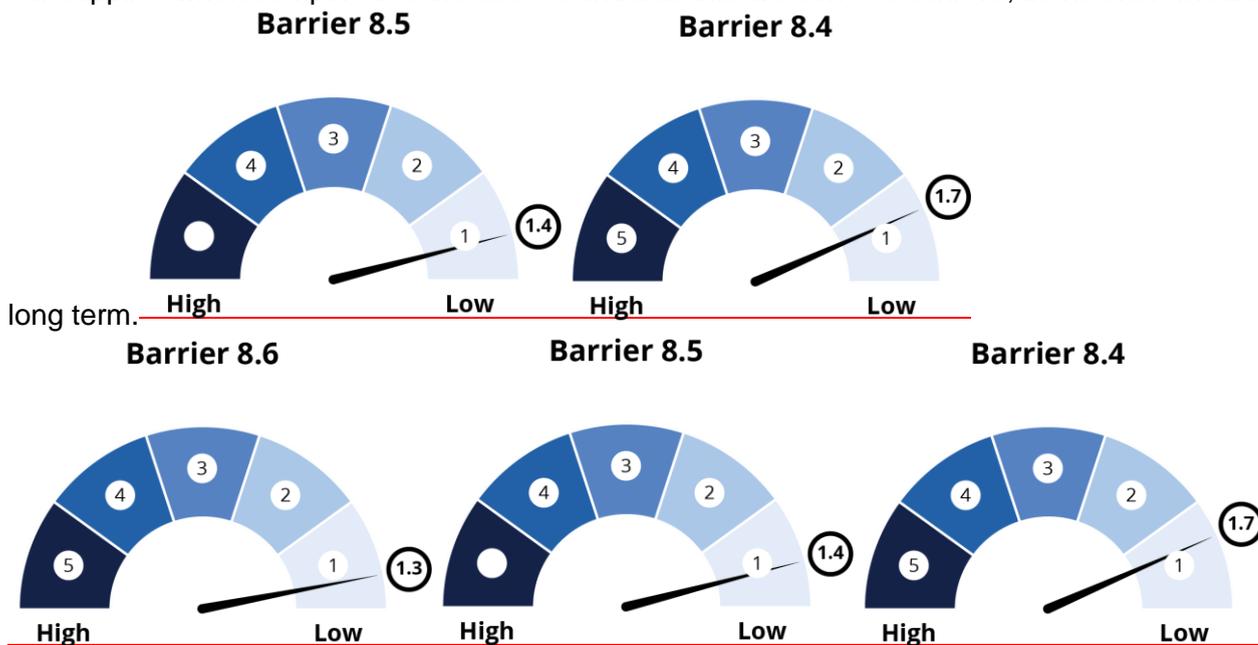
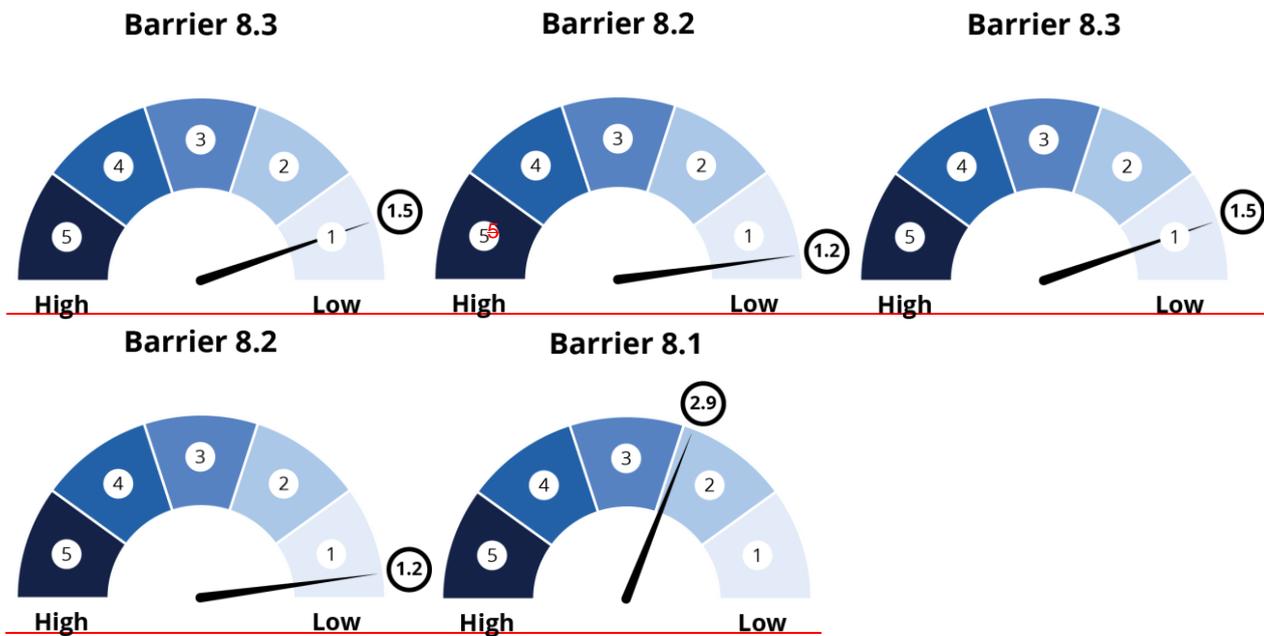


Figure 6.20 – Barrier 8 Average Asset Capability: Scale of Transformation and Investment Required (High to Low)

6.4 Summary

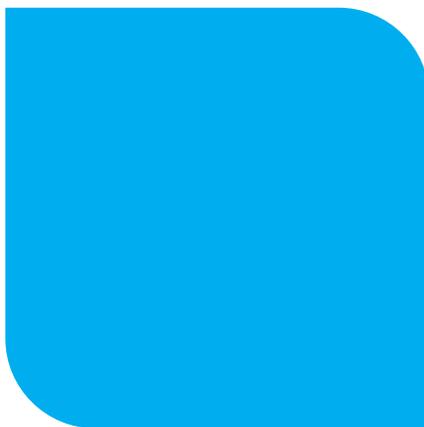
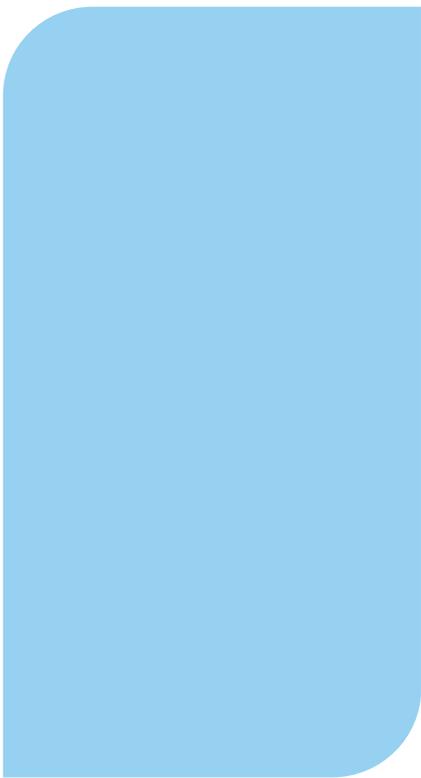
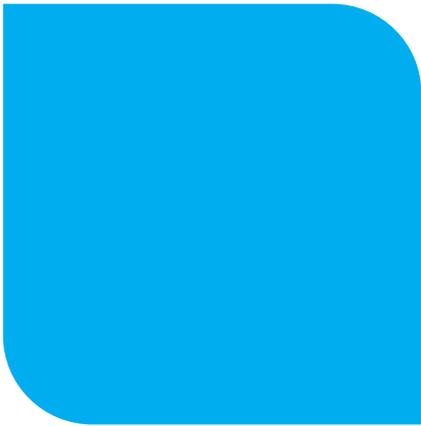
In this section, we have summarised at a national scale the potential asset capability issues across all our supplies when compared to the asset standards that we strive to achieve, in the short medium and





In this iteration of the National Water Resources Plan, the information from the Supply Demand Balance and the Interim Barrier Assessment, will form the basis of “Identified Need”, and will be brought through to the [four](#) Regional Water Resources Plans (~~RWRPs~~) as part of Phase 2 of the NWRP.

Development of Preferred Approaches (solutions) for each supply, to address identified need as part of ~~RWRPs~~ [the four Regional Water Resources Plans](#), will allow Irish Water to strategically plan for the transformation of our asset base [on a holistic basis](#) over future investment cycles, ~~and~~ [it](#) will ensure that our supplies are safe, **secure, reliable and sustainable**. It will also allow us to understand the overall scale of investment required to transform our asset base.



7 Key Points

In this Chapter we will:

- Outline our ‘three-pillar’ approach to managing supply and demand; and
- Discuss our existing Resource Planning Activities.

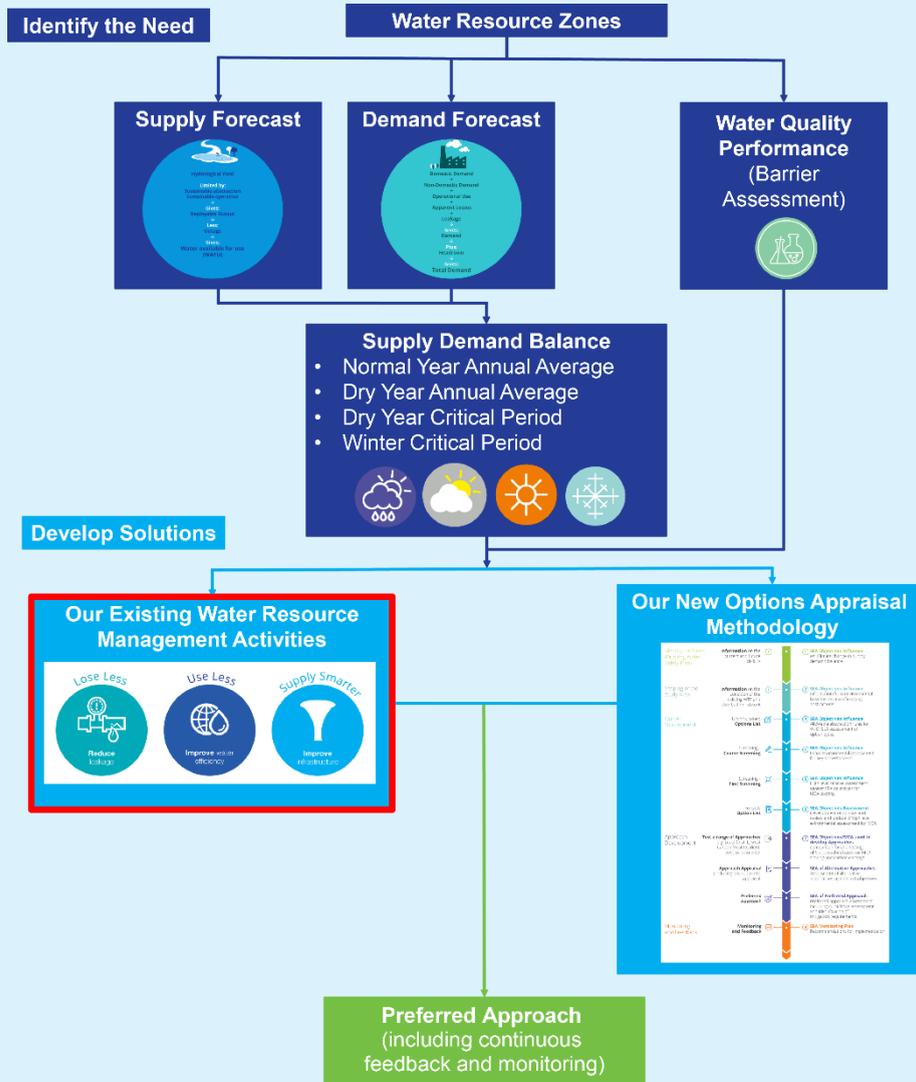


Figure 7.1 – NWRP Process – Our Existing Water Resource Management Activities

7.1 Introduction

Irish Water faces significant challenges in terms of the quantity, quality, reliability and sustainability of the public supplies across the country. Primary risks identified with over 50% of our supplies include insufficient water available for supply, water quality/compliance, and insufficient Levels of Service to meet our customers' requirements.

We must ensure that our water supplies become more sustainable over time, therefore we need to ensure that solutions to our supply issues consider the broader environment within which we operate. This means:

- Where feasible we must cater for increased growth requirements in the first instance by driving an aggressive leakage reduction programme combined with strong promotion of water conservation measures in homes and businesses, as we cannot continue to abstract more and more water from sensitive sources to meet this demand; and
- We fully adhere to the WHO principle that the starting point for good clean drinking water is source protection, rather than relying on ever more complex and costly treatment. We will achieve this by developing and implementing DWSPs across all our supplies.

In developing appropriate interventions in a sustainable manner, we have compiled the range of available solutions into three pillars; lose less, use less and supply smarter.



Lose Less: reducing water lost through leakage and improving the efficiency of our distribution networks

Use Less: reducing water use through efficiency measures

Supply Smarter: improving the quality, resilience and security of our supply through infrastructure improvements, operational improvements and developing new sustainable sources of water

Together these pillars will enable us to optimise our capital and operational interventions to achieve the best outcomes and react to emerging issues (Figure 7.1).

7.2 The Three Pillars

In this Section we describe the “three pillars” in more detail.



Lose Less

Leakage is the loss of water from the distribution network. This includes fractures and bursts, smaller holes and pinholes in pipe walls, leakage at joints, leakage at service connections and leakage at valves and other fittings and overflows at storage reservoirs. Only a tiny proportion of leaks within our distribution networks come to the surface as visible leaks.

Most water leakage is absorbed into the ground or escapes into sewers and drains, so cannot be seen at ground level. The **Lose Less** pillar includes the actions which will improve our understanding of leakage, ways to reduce it and the tools required to help us to find and fix leaks.



Use Less

There is potential for us all to use less water in our everyday lives, and for businesses to save money by using water more efficiently. Irish Water is committed to developing and testing new initiatives to inform policy and enable customers to become more efficient in their water use.

The **Use Less** pillar focuses on activities to help us to understand water use habits, influence behaviour, encourage change and to promote the use of water efficient devices and appliances.



Surface Water



Reservoirs



Groundwater



Effluent Reuse



Desalination



Water Transfers



WTP



Network Improvements



Catchment Management

Figure 7.2 - Option types



Supply Smarter

Our water supply network consists of 1,090 individual sources. The **Supply Smarter** pillar includes actions to proactively engage in the protection our natural water resources, improve the performance and resilience of existing supplies, improve interconnectivity within our supply networks, increase the amount of water available for use, improve compliance, address the environmental impacts of existing abstractions and mitigate the impacts of climate change. We also support this through asset maintenance, operations and by delivering process optimisation and training.

The key option types for infrastructure improvements under the **Supply Smarter** pillar are listed in Figure 7.2.

7.3 Our Current Actions

Irish Water is already implementing measures across our three pillars of **Lose Less**, **Use Less** and **Supply Smarter** to maintain and improve the LoS to our customers. This section outlines the measures we are already taking and how we have accounted for them in this **draft** Framework Plan.



7.3.1 Lose Less: Leakage Reduction

Activity to reduce leakage from the public distribution network was historically undertaken by Local Authorities and is now managed by Irish Water. As our water mains network ages, leakage will increase if we do not continue to invest in fixing leaks. We focus on finding and fixing the leaks which account for most of the water lost from our supply network.

Our supply network is built from a variety of pipe materials of different ages and quality control during construction. Good network and water-use information, expert knowledge, specialist equipment and rigorous management is therefore required to reduce and control leakage.



Example of an aged pipe

To reduce leakage, Irish Water has committed to a planned and proactive campaign of high intensity leak detection and repair, reinforced by pressure management and replacement of mains which are prone to frequent bursts. To be effective, the effort must be sustained with new leaks detected and addressed promptly through active leakage control.

We recognise that our current leakage levels are unacceptably high, and we are working hard to reduce the amount of treated water lost within our distribution networks. We have developed and are implementing our National Leakage Reduction Programme which includes:

- Establishing over 4,500 district meter areas to enable us to identify faults;
- Establishing our Find and Fix activities to deliver active leakage control;
- Undertaking large-scale [targeted](#) water mains replacements;
- Valve and control replacement;
- Implementing pressure management controls; and
- Delivering the 'First Fix Free' initiative to address leaks on pipes, within the boundary where the customer has responsibility.

Our National Leakage Reduction Programme targets a net saving of 50 million litres per day by the end of 2021, which we have included in our Supply-Demand Balance forecasts. In order to achieve this net saving, we must achieve a gross saving estimated at 166 million litres per day, when account is taken of the Natural Rate of Rise of Leakage. In line with best practice, our long-term objective will be to reduce leakage nationally to SELL. We have summarised our SELL in Chapter 5 of this ~~draft~~ Framework Plan with further details provided in Appendix H.

[Developing SELL analysis for our distribution networks facilitates auditable and measurable medium-term targets. In addition, as the SELL methodology requires the granular development of data and intelligence on our distribution networks, including zonal pressures, DMA optimisation, meter accuracy improvement, it provides the information to allow us to understand and deliver further leakage reduction. As we progress towards SELL, we will recalculate further target leakage savings for all of our WRZs.](#)

We know that this target presents a major challenge, but we are committed to meeting it. Within this ~~draft~~ Framework Plan, our initial objective is to achieve ~~Sustainable Economic Levels of Leakage~~ SELL in the Greater Dublin Area where the current need is the greatest.



An image from our recent national water conservation campaign



7.3.2 Use Less: Water Conservation & Stewardship

Successfully encouraging water conservation requires continued commitment to a long-term behavioural change campaign that educates and informs the end user about their individual water consumption along with the challenges faced in providing a sustainable treated water supply. This requires investment and ongoing research.

In many countries water conservation activities are also aligned to economic incentives or other means of encouraging a reduction in water use. Research commissioned by Irish Water has shown that the broad perception among the general public is that we have an abundant water supply and that the need for water conservation is confined only to periods of extreme dry weather, as we have seen in recent years. We also know that low understanding of personal individual consumption, combined with high levels of leakage within the water supply network, and the misconception that Irish Water is not addressing the significant and complex leakage challenge, are further barriers to behavioural change.

Many stakeholders have a role in educating the public about the importance of water conservation and Irish Water has an ongoing active programme of promoting water conservation in schools, businesses and communities. Our current activities include supporting the Green Schools Programme, water conservation public information campaigns and our certified Water Stewardship Programme.

7.3.2.1 Green Schools

Since 2014, Irish Water has supported An Taisce's Green Schools Programme which provides a highly effective ongoing environmental education for primary and secondary schools. In 2018 the Green Schools programme, which is in its 6th year of the Water Theme, saved over 389 million litres of water, the equivalent of over 450 million cups of coffee, thanks to participation in this programme.

7.3.2.2 Water Conservation Public Information Campaigns

Irish Water conducted a number of Public Information Campaigns on Water Conservation, between 2018 and 2020, summarised as follows:

Drought 2018: During the drought of 2018 Irish Water undertook an extensive national and local integrated public awareness campaign to educate the public about their personal water use. This initiative combined media, advertising and online information campaigns, with stakeholder and customer engagement to focus on the daily estimated water consumption, with a view to encouraging simple steps to reduce it.

Daily water demand, especially in the Greater Dublin area reduced significantly during the period of the campaign (July and August) and while it is difficult to directly attribute this reduction in demand solely to the campaign, the widespread media coverage and associated advertising across all channels, along with direct engagement with large water users was very likely to have positively impacted behaviour and encouraged water conservation. Research undertaken after the campaign confirmed that household water users thought more about their individual use based on the campaign. However, the research also highlighted that their perception was that the extent of the drought may have been exaggerated.

Water Conservation and Leakage Reduction 2019: In 2019 the focus of Irish Water's public information campaign was broadened to inform the public and stakeholders about the work we are doing to reduce leakage. As with the drought campaign in 2018, the approach to water conservation and leakage messaging was integrated across multiple channels including national and regional media engagement, advertising, social media, website and direct stakeholder engagement with business, communities, local authorities and elected representatives.

The return was reasonably effective, given the low understanding of the challenge of reducing leakage prior to the campaign. Post campaign research showed that understanding of key messages and stakeholder understanding improved. The campaign results underlined the need for continued activity ongoing investment in awareness campaigns on key issues.

Drought Spring 2020: In 2020, due to an historically dry spring, some of our more vulnerable supplies started to come under stress. Therefore, a public information campaign on water conservation needed to begin earlier than in previous years. During this same period the impact of changed water use due to Covid-19 was also significant, with an increase in domestic water consumption due to increased home hygiene and hand washing. As a result, Irish Water's water conservation messaging had to take account of critical public health messaging related to hand washing in particular, while still encouraging households to reduce non-essential use at the time a National Water Conservation Order was being imposed.

As in previous years an integrated campaign approach was adopted to maximise the impact. Direct dedicated stakeholder engagement was also undertaken with key stakeholders including An Fóram Uisce, the Irish Water National Stakeholder Forum and each Local Authority through the Local Government Management Agency. Local Authorities across the country supported and amplified the water conservation campaign by sharing key campaign messages and collateral on their own online channels broadening the reach and impact of the campaign messages.

While media coverage and stakeholder feedback on water conservation messaging was positive, it is difficult to accurately quantify the direct impact of the 2020 water conservation campaign given the wider context of the Covid-19 pandemic and its impact on personal behaviour, including water use.

Water conservation public information campaigns continue to be an important part of Irish Water's overall communications approach and they will require continued sustained research, investment and stakeholder engagement. Due to limitations in data, we have not quantified the savings from these activities within our demand forecasts. As we develop our understanding of how we can influence water

use behaviour in Ireland and how to accurately quantify the water saving benefits we will update our demand forecasts.

We continuously review all relevant available data to develop our understanding of customer behaviours and household water usage. Further studies will be required to improve our understanding of the extent to which water conservation can influence the SDB.

Irish Water will continue to actively promote water conservation in schools, businesses and communities through activities including:

- National and Local Media Campaigns
- Targeted Sectoral campaigns
- Green Schools
- Water Stewardship Scheme
- First Fix Free Scheme
- [Development of an online water conservation application which will provide tips on how to conserve water in the home](#)

Recent government policy has also allowed for the introduction of the Household Water Conservation Charge or Excess Use Charges to highlight high usage to our customers. This may also encourage further uptake of our First Fix Free Scheme, where customer side leakage is the main cause of excessive use.

More detail of our current activities can be found in section Chapter 4 and on our website: <https://www.water.ie/conservation/>.

Box 7.1 provides specific details on our Water Stewardship scheme which aims to support Irish businesses in reducing their water use.

Box 7.1 – Water Stewardship Programme

In partnership with Lean & Green Skillnet and Central Solutions, we have launched our Water Stewardship programme. This programme is open to business customers seeking to reduce water consumption and operating costs while protecting the environment.

Stewardship takes a holistic approach to safeguarding our water supplies. This is a step further than water conservation which typically focuses on water efficiency and reducing water consumption, as it also supports and educates our business customers on quality and environmental impact to become Custodians of Water.

Participating businesses prepare a Water Charter capturing the business case for action, their site's current state, water saving opportunities and an agreed action plan. Successful businesses receive Certification that is accredited by International Water Stewardship Standards (EWS/AWS), and supports meeting corporate sustainability commitments including for Ireland's pioneering food and sustainability programme, Origin Green (sponsored by Bord Bia). In addition, it is fully supported by the EPA, SEAI, IDA, Enterprise Ireland, IBEC, Chambers Ireland, and BIM.

The leading-edge initiative in water stewardship is the first of its kind globally and funded by Irish Water & Skillnet (Department of Education and Skills).



We have set up a new connections management system to ensure sufficient control of new connections to our water supplies. This allows us to facilitate new developments whilst ensuring that there are no reductions to Levels of Service across our existing customer base. We work with developers and large

non-domestic water users who require significant volumes of water to understand their actual needs, including details such total annual and daily demand and timing of peak demands. This allows us to control and set efficiency stipulations within new connection agreements, including reduced peak water requirements.

Methods for driving down demand from large water users such as data centres includes limiting peak flows to the development and ensuring the developer provides adequate storage to manage needs during periods of peak demand.

7.3.3 Supply Smarter: Capital Investment and Improved Operations



We are currently implementing an investment programme in our water supply infrastructure which includes water treatment plant upgrades to improve the LoS we can provide to our customers.

We have numerous water supply improvement projects and programmes in progress, to improve both the quality and quantity of drinking water. Findings of the yield and demand assessments (in Chapters 4, 5 and 6) are being fed into our current projects to ensure we are delivering the most appropriate solutions.

We publish details of planned, live and recently completed projects on our website. For more information please visit www.water.ie

Box 7.2 – Impact of the [Framework Plan](#) on In-Flight Projects

Ireland's first ever National Water Resources Plan has been under development since 2017. As our ~~draft~~ Framework Plan has evolved there has been a requirement to continue to design and deliver projects within our capital investment plans, particularly in relation to critical water quality issues with potential to impact on human health (e.g. for projects required to remove 'boil water' notices). This section sets how the [Framework Plan](#) will apply to projects identified in Irish Water's RC3 Capital Investment Plan 2020 to 2024, which we call "in-flight projects".

At present Irish Water has commenced implementing its regulated Capital Investment Plan "RC3", which runs from 2020 to 2024. As a general rule the Regional Water Resources Plans will apply the methodology ~~adopted in the~~ [in this](#) Framework Plan to all in-flight projects, other than those that [already](#) have planning permission as at the date of adoption of the Framework Plan.

To mitigate against any potential sustainability or capacity issues with new assets as they are designed and delivered, we have applied the Supply Demand Balance standards set out in the ~~draft~~ Framework Plan to water resource zones with "in-flights projects" in them. These projects were initiated before the Preferred Approach Methodology set out in ~~the draft~~ [this](#) Framework Plan was developed and refined. ~~Once Now that this draft Framework plan has been subjected to public consultation and after it~~ [Plan](#) has been adopted, we will apply the Supply Demand Balance and Preferred Approach Methodology ~~in the adopted plan~~ to all water resource zones with these in-flight projects in them, unless there are exceptional circumstances for not doing so.

For the next regulated investment cycle "RC 4", the preferred approaches identified in the ~~adopted~~ [four](#) Regional Water Resources Plans [once consulted on, finalized and adopted](#) will normally be used to form the basis of all water supply projects in the investment plan.

Source Protection and Catchment Management Activities

Catchment Management and source protection approaches, in partnership with key stakeholders, are an essential and increasingly important component in ensuring the security and sustainability of our water

supplies. This type of approach to managing risks to our drinking water sources is in accordance with Article 7(3) of the Water Framework Directive.

Irish Water is actively involved in pilot source protection projects in Ireland to trial catchment scale interventions to reduce the risk of pesticides causing exceedances in water supplies. The two key projects are described below:

A. Source to Tap Project: is a cross-border partnership project that focuses on the River Erne and the River Derg catchments which cross the border between Ireland and Northern Ireland. Irish Water is a project partner on this project which is funded by INTERREG and match-funding has been provided by the Department of Agriculture, Environment and Rural Affairs in Northern Ireland and the DHPLG in Ireland. The project began in 2017 and will continue until 2021.

It aims to develop sustainable, catchment-scale solutions for the protection of rivers and lakes, which are the main sources of our shared drinking water. Source to Tap also delivers a learning and outreach programme targeted at informing and empowering the public about their role in protecting our clean and healthy freshwater environment. An Agricultural Land Incentive Scheme is being delivered focused on changing land management practices for the protection of our water.

B) Pilot Drinking Water Source Protection Project: as committed to under the River Basin Management Plan (RBMP). Irish Water is coordinating a pilot drinking water source protection project to “*trial innovative monitoring and management strategies aimed at reducing the risk of pesticide contamination of drinking waters*”. Catchment management interventions to be undertaken as part of the project will involve a combination of behavioural-change initiatives and promotion of the sustainable use of pesticides. Scoping, consultation and planning of the project began in 2019 and is continuing ~~in 2020.~~

As part of Irish Water’s Water Services Strategic Plan (WSSP) we are developing a pesticide strategy for our drinking water sources. The strategy will cover our collaboration with stakeholders in order to assess and manage the risk of pesticides in the catchment. It will serve as an interim strategy whilst the pilot projects are ongoing, and we develop our long-term approach for catchment management for drinking water source protection. A summary of activities to date is included in Box 7.3.

Irish Water also engages with other key stakeholders such as the National Water Forum, ~~(An Fórum Uisce)~~, the Local Authority Water Programme (LAWPRO), [Geological Survey Ireland](#), [Department of Housing, Local Government and Heritage](#), [Department of Agriculture, Food and the Marine](#), [National Federation of Group Water Schemes](#), [Inland Fisheries Ireland](#), the EPA Catchment Science Team and the National Parks and Wildlife Service (NPWS).

Box 7.3 Managing the risk of pesticides in catchments is an area that key stakeholders, including Irish Water, have advanced through national and local groups over the past number of years, summarised as follows:

Pesticides have widespread use nationally across multiple sectors, including agriculture, horticulture, forestry, transport, local authorities, recreation, and domestic users. Pesticides can runoff into water bodies and therefore make their way into raw water sources. Irish Water is a key stakeholder within the catchment area, but it has no legal role or powers to enforce, control and limit the use of pesticides within the catchment. Their use is regulated by the Department of Agriculture, Food, and the Marine (DAFM).

Since 2015, Irish Water has been an active member of the National Pesticides and Drinking Water Action Group (NPDWAG). The NPDWAG is chaired by DAFM and was formed to provide a coordinated and collaborative approach to prevent the ongoing prevalence of pesticides in catchments used for the abstraction of drinking water. Members include Teagasc, the IFA, ICMSA, APHA and local authorities among others. When made aware of a pesticide exceedance, all group participants engage with their own network of staff and stakeholders to raise awareness on the issue in the area relevant to the supply and its catchment. Irish Water highlights priority catchments to members of the NPDWAG for escalation of collaborative efforts.

In 2019 the Pesticide Action Procedure (PAP) was prepared by Irish Water. The PAP ensures a standardised response to all drinking water failures and outlines how Irish Water endeavors to ensure compliance with the pesticide parametric values in the Drinking Water Regulations. It does this by notifying the EPA, HSE, and DAFM of pesticide failures, undertaking monthly pesticide monitoring of the supply and engaging and working collaboratively with key stakeholders of the NPDWAG.

When persistent exceedances occur at a supply a local sub-group of the NPDWAG called a Catchment Focus Group is established to identify synergies and coordinate efforts via multiple activities which support the return to compliance such as catchment risk characterisation and monitoring, awareness raising and advice and training.



NPDWAG Catchment Focus Group

7.3.4 Cross Pillar Action: Data Acquisition and Improvement Projects

The methods used to develop this ~~draft~~-[Framework Plan](#) have been adapted from best practice, particularly from the UK, where a regulated form of resource planning has been in place for over 25 years. In the UK, the datasets and business intelligence systems used to collate and interpret data have evolved over time to meet the requirements of resources planning. As we are in the initial stages of resources planning on a national scale [in Ireland](#), we are working to develop and implement a best practice approach to data and information management. In the interim we have had to rely on best available data, surrogate data and trends from neighbouring jurisdictions in developing this ~~draft~~-Framework Plan. Whilst we have identified the data improvements required to support best practice in future and invested in systems to manage it, it will take time to build the databases from operational information.

Information improvements will include additional data to reduce uncertainty in our SDB calculations. This will support our Options Assessment Methodology and inform future policies. Data improvement projects are already being progressed, such as the rollout of the National Telemetry Programme and the Leakage Management System.

In some instances, it may be that adapting an existing method to suit Irish data might be preferable to trying to develop Irish datasets. The applicability of approaches used elsewhere will be considered during our programme of data acquisition and improvement [and will be updated in accordance with the feedback and monitoring process set out in Chapter 8](#).

7.3.4.1 Supply side data improvements

Surface Water Yield Assessments

The Surface Water Yield estimates used in the ~~draft~~-Framework Plan are desktop calculations. For strategic and sensitive sites or where significant infrastructure investment is planned under the **Supply Smarter** pillar, actual field measurement will be required to confirm the estimated yields. Flow and water level data were collected at 140 abstractions during low flow conditions in summer 2018 and these have been extremely useful in defining yields. However more site-specific data will permit improved understanding of abstraction during all weather conditions over time. Surface Water Yield is a key component of the SDB.

We will continue to work with the EPA to further develop a targeted flow gauging programme to increase the confidence in our yield estimates.

Groundwater Yield Assessments

[Geological Survey Ireland are continuing to improve the knowledge and information on groundwater resources. These developments will feed into improving our yield assessments. GSI are working on regional groundwater resource assessments based on surface water catchments. These assessments will be important to Irish Water in understanding the sustainable yield of individual and regional groundwater resources and will also help understand the connection with surface water. Irish Water are committed to working collaboratively with GSI on projects, and to provide and share relevant data to contribute to and assist GSI projects.](#)

[The existing groundwater sources will be subject to further study to establish detailed geoscientifically robust zones of contribution in line with GSI's Groundwater Protection Schemes \(Department of Environment, Community and Local Government, GSI and EPA, 1999\) and the EPA Advice Note Number 7. Source Protection and Catchment Management \(EPA, 2011\). This work will provide in-depth hydrogeological information on the source that will establish reliable yields. This information will assist in abstraction licensing and the development of Drinking Water Safety Plans.](#)

Climate Change Impacts

As part of our commitment to building resilience in our water supply system, we have recently completed the Climate Sensitive Catchments Project with the Irish Climate Analysis and Research Unit (ICARUS) in Maynooth University. This project has identified the catchments in Ireland which are most sensitive to climate change and has developed and applied an innovative assessment methodology considering water resources and drought propensity.

The traditional methodology to identify catchments vulnerable to climate change considers a 'top down' approach, applying information about large-scale climate change trends to small areas. This can result in inaccurate forecasting for catchments because it does not take area-specific information into account.

The Climate Sensitive Catchments Project has taken a 'bottom up' approach, building catchment specific data catalogues, identifying stressors and vulnerabilities in each catchment. This will improve the effectiveness of our resource planning activities and allow us to develop a more resilient water service.

The project output identifies those catchments most sensitive to climate change including an assessment of their sensitivity to drought. It considers water quantity and temperature change impacts both on flow regimes and to water quality.

The next step in order to use this data, is the development of an application process for the research outputs into our Hydrological Yield assessments. As this work is happening in parallel with this ~~draft~~ Framework Plan, we intend to use the findings in our next reiteration of the ~~Plan~~[NWRP](#). We will seek to bring the findings from the Climate Sensitive Catchments Project into our SDB calculations as we update them over the coming years, as set out in Chapter 8 [re](#) Monitoring and Feedback Loops.

Environmental Impacts

The Second Cycle RBMP identified approximately 250 water bodies sensitive to increased abstractions. We will work with the relevant organisations to scope and conduct the required investigations to determine the degree of sensitivity of these water bodies to abstractions. This may lead to abstraction reductions at some sites, potentially increasing a Supply Demand deficit. We will use the outcomes from these assessments when we apply the Options Assessment Methodology and we will update the SDB calculation following the process set out in Chapter 8.

7.3.4.2 Demand side data improvements

Planning for Future Developments

Our demand forecasts include projections set out in the NPF 2040 and information from the subsequent Regional Assemblies. These demand growth forecasts, although high level, are based on government policy and are therefore appropriate for the 25-year Plan. As we roll out our Regional Water Resources Plans in phase 2, we will work with our Local Authority partners to refine short-term demand projections based on committed development and local area plans where available. We will also update the SDB calculation following the process set out in Chapter 8.

Non-Domestic Demand

Over the coming years we will analyse non-domestic consumption based on usage trends within different industry sectors and by geographic area to develop statistical models to forecast future non-domestic consumption. This will require the collection of additional data on non-domestic use, which will be further enabled by the meter replacement programme currently in progress.

Water Efficiency

We expect water efficiency will play a significant role in managing future demand (under our **Use Less** pillar) and we need to better understand the likely effectiveness of potential efficiency measures.

Internationally there is a growing body of evidence to support and understand efficiency measures which we need to translate to an Irish context.

We will undertake a series of pilot studies considering UK and international estimates of water efficiency savings and their applicability to Ireland which will be factored into the next iteration of the National Water Resources Plan.

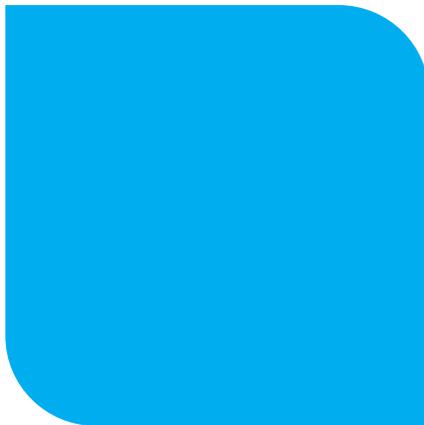
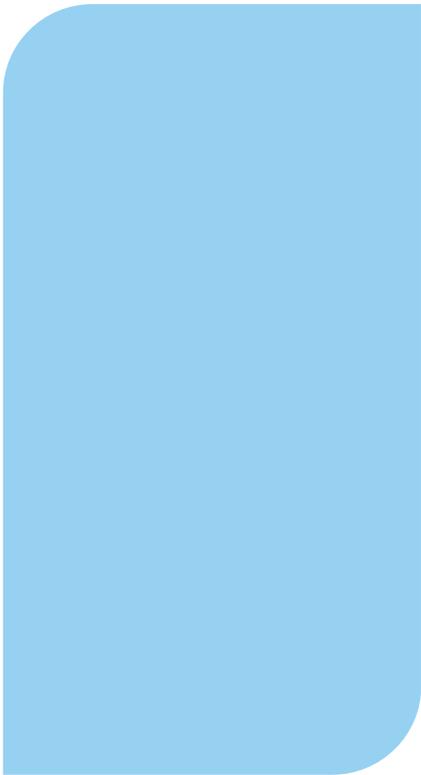
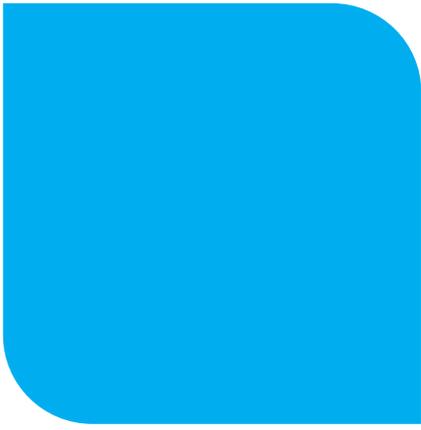
7.3.4.3 Hazard assessments as part of the development of Drinking Water Safety Plans

In order to improve our water supplies and to ensure that they can address potential hazards at present and in the future, we set standards for each of our supplies that we will strive to achieve over time through the regulated capital investment plans. The standards we need to achieve at each supply are the Barriers required to address the potential hazardous events as assessed during the development of the Drinking Water Safety Plans for each water supply. Over time DWSP assessments will further define Barrier integrity, however, it will take a number of years to complete the DWSPs for all supplies. At present DWSPs for 27 WSZs have been substantially completed with approximately 2,500 hazards reviewed. As further DWSPs are completed, the information in the barrier assessments will be updated in accordance with the feedback and monitoring process set out in Chapter 8.

7.4 Summary

In this section we have outlined the activities we are already undertaking under our three-pillar approach to Lose Less, Use Less and Supply Smarter, to reduce the Supply Demand deficits across the public water supply.

In the next Chapter we outline a new Options Assessment Methodology that we will use to identify solutions in the [four](#) Regional Water Resources Plans [being developed](#), to reduce and manage deficits across our supplies over the next 25 years.



8 Key Points

The purpose of resource planning is to identify need and then to develop solutions to address this need across our asset base over the coming years. In this Chapter we summarise the Options Appraisal Methodology we will use within our National Water Resources Plan. This involves:

- Identifying all possible solutions for each [Water Resource Zone \(WRZ-\)](#) by the application of the options assessment methodology in this **draft** Framework Plan;
- Screening out all options that are not feasible;
- Developing outline designs for feasible options; and
- Through Multi Criteria and whole life cost analysis, developing feasible options and Preferred Approaches for each WRZ in the short, medium and long term.

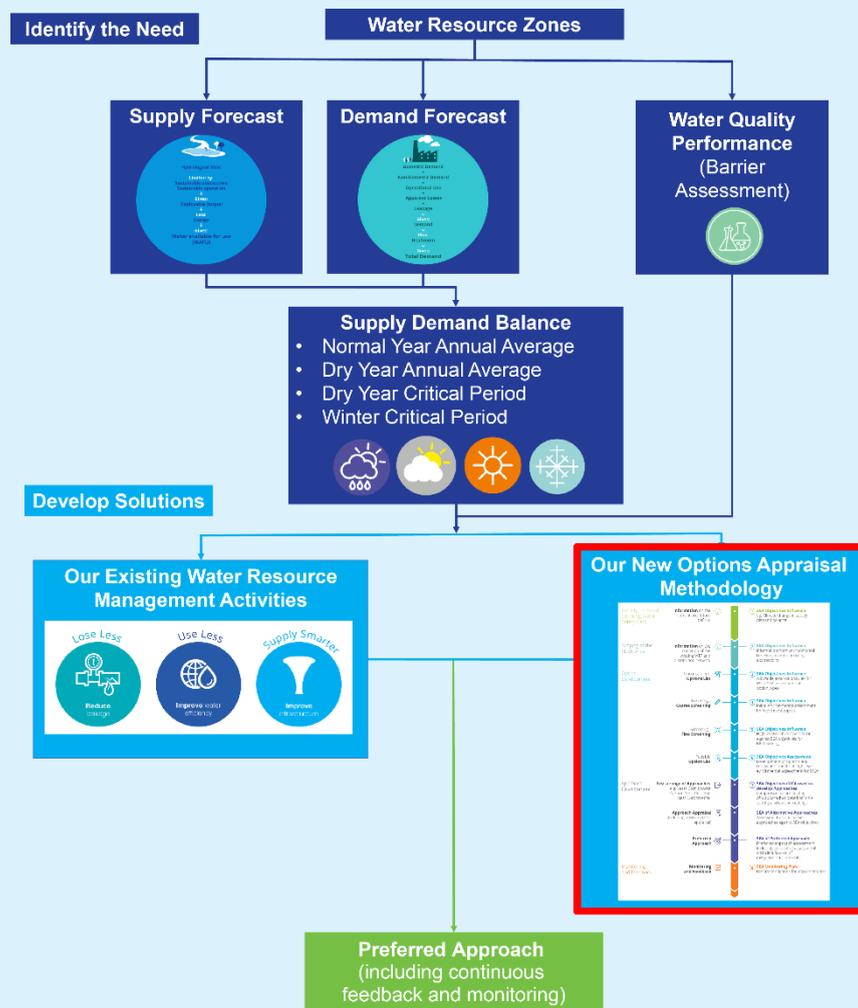


Figure 8.1 – NWRP Process – New Options Appraisal Methodology

8.1 Introduction

The primary purpose of a Water Resources Plan is to identify need and develop plan level solutions that will ensure appropriate water quality, quantity and reliability for each WRZ. This involves developing a Preferred Approach for each Water Resource Zone (WRZ) (Figure 8.1).

The Preferred Approach is the optimal Plan level solution to address an identified need within a WRZ, when all potential options have been assessed in a uniform way relative to each other. A Preferred Approach can be a single solution or combination of solutions (for example, a new water source combined with leakage savings), and can address need in a single WRZ or across multiple WRZs (for example a solution that addresses a local need or a larger solution that addresses multiple supplies).

Plan level preferred approaches are initially developed to a level of detail that allows us to complete outline design and costing. The preferred approaches which will be identified by our ~~Plan will then be~~ four Regional Water Resource Plans (RWRPs) will be considered collectively and prioritized on a

[National basis](#) and, if funded through a regulated Capital Investment Plan, taken forward to detailed design and planning, thus maintaining alignment with the [Framework](#) Plan objectives.

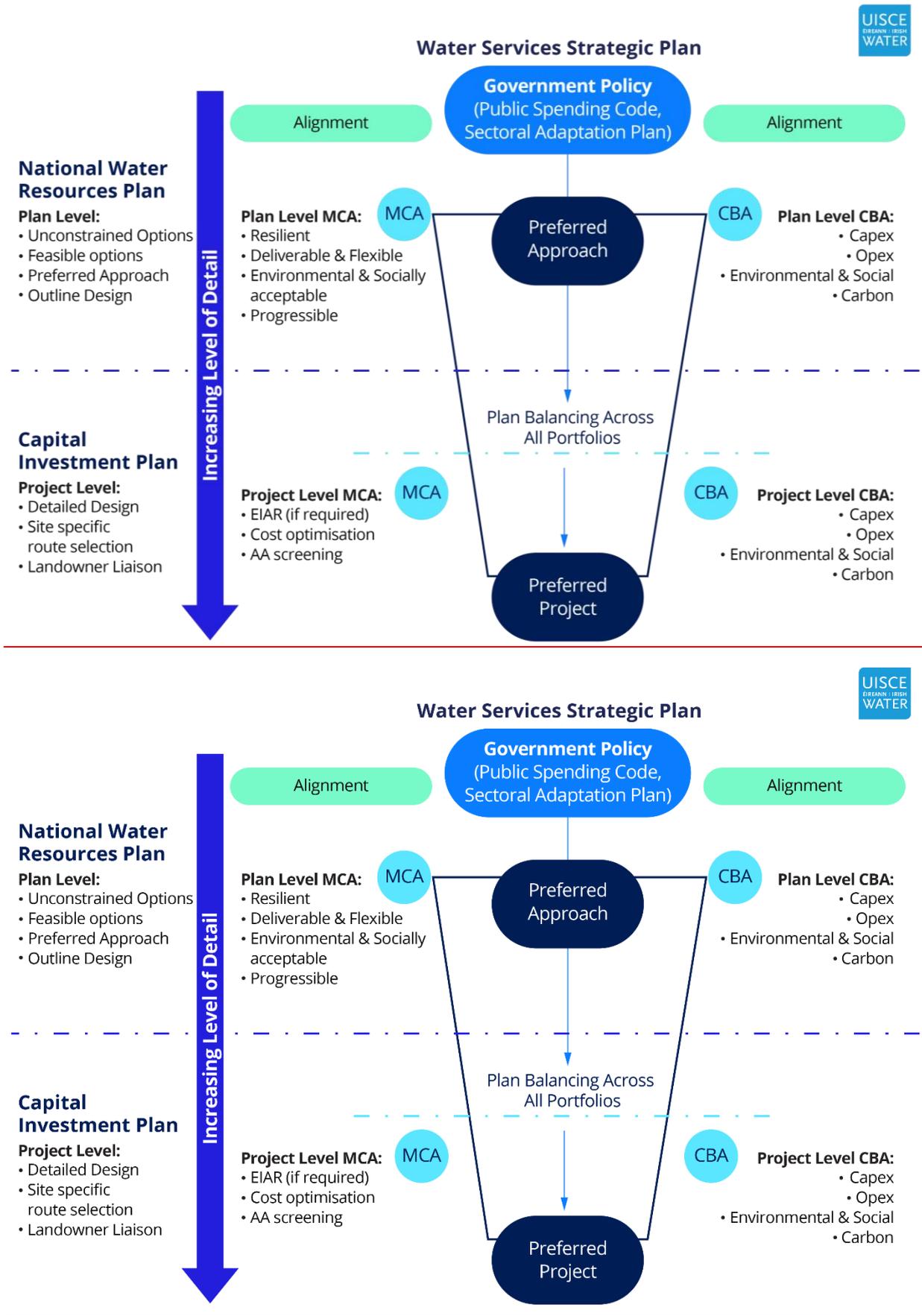


Figure 8.2 – Plan to project alignment

~~However~~As explained above, as this is the first National Water Resources Plan that Irish Water has prepared ~~it has been determined that~~ a phased approach ~~should be~~has been adopted. In this ~~draft~~ Framework Plan (Phase 1), the issues and need have been explained and assessed, and an Options Assessment Methodology is described in this Chapter.

~~Once~~ Now that this ~~draft~~ Framework Plan has been ~~finalised~~ adopted, ~~the~~ this options assessment methodology will be applied to each WRZ in the ~~Regional Water Resources Plans~~ RWRPs and possible solutions identified and consulted on (Phase 2 NWRP – RWRPs, Consultation two).

The solutions must reduce risk to our water supplies in the short, medium and long term. Each solution or Preferred Approach must consider the longer-term objectives of Irish Water, as set out in our Water Services Strategic Plan, other national policy objectives and the need to transform our existing asset base. We must comply with the Irish Government's Public Spending Code and ensure alignment with DHPLG Sectoral Adaptation Plan for Water and Water Quality. The process of project ~~&~~ and programme evolution is described in Figure 8.2.

8.2 New Options Assessment Methodology – Criteria

Since the establishment of Irish Water, there have been two regulated investment cycles completed, and a third is ongoing (Revenue Control 3). The first two cycles were focussed on closing out projects that were carried over from the DPHLG Water Services Investment Plan, with some degree of re-scoping, while also introducing for the first time a range of asset maintenance programmes in priority areas (Health & Safety, disinfection upgrade, mains replacement & leakage management).

In terms of water supply, the key focus of this regulated investment cycle Revenue Control 3 (2020-2024) is to address critical drinking water compliance and chronic leakage issues.

The ~~National Water Resources Plan~~ NWRP will inform future investment cycles by enabling risk-based prioritisation of capital investment, allowing us to address need across the entire water supply asset base. In order to align with the requirements of our regulators and Public Spending Code, the process must be transparent, robust and subject to established governance. This will ensure alignment is maintained between the objectives of the ~~National Water Resources Plan~~ NWRP and the development and delivery of projects and programmes.

Our methodology to identify approaches within the Framework Plan aligns with the seven standard steps set out in the Department of Public Expenditure and Reform guidance document "*Public Spending Code: A Guide to Evaluating, Planning and Managing Current Expenditure*". The key stages of the Options Assessment Methodology process are illustrated in Figure 8.3 and summarised below.

- a) Identify the Need based on the SDB (Chapters 3, 4 & 5) and/or DWSP Barrier Assessment (Chapters 5 & 6) and scope the study Areas (Phase 2: Regional Water Resources Plans)
- b) Option Development: Unconstrained Options Coarse Screening and Fine Screening through Multi Criteria Assessment (Options Assessment and scoring against the key criteria to verify Option Feasibility and understand key risks and constraints)
- c) Feasible Option List: Option costing encompassing Direct and Indirect Costs including Environmental and Social Costing;
- d) Test a Range of Approaches: Analyse the main feasible options;
- e) Approach Appraisal: based on risk
- f) Preferred Approach – the combination of options that present the best value approach to resolve need at Plan level.

Identify the Need
(Drinking Water
Safety Plan)

Information on the
current and future
deficits



Scoping of the
Study Area

Information on the
condition of the
existing WTP and
distribution network



Option
Development

Unconstrained
Options List



Screening -
Coarse Screening



Screening -
Fine Screening



Feasible
Option List



Approach
Development

Test a range of Approaches
e.g: Least Cost, Lowest
Carbon Most Resilient,
Best Environmental



Approach Appraisal
(including environmental
appraisal)



**Preferred
Approach**



Monitoring
and Feedback

**Monitoring
and Feedback**



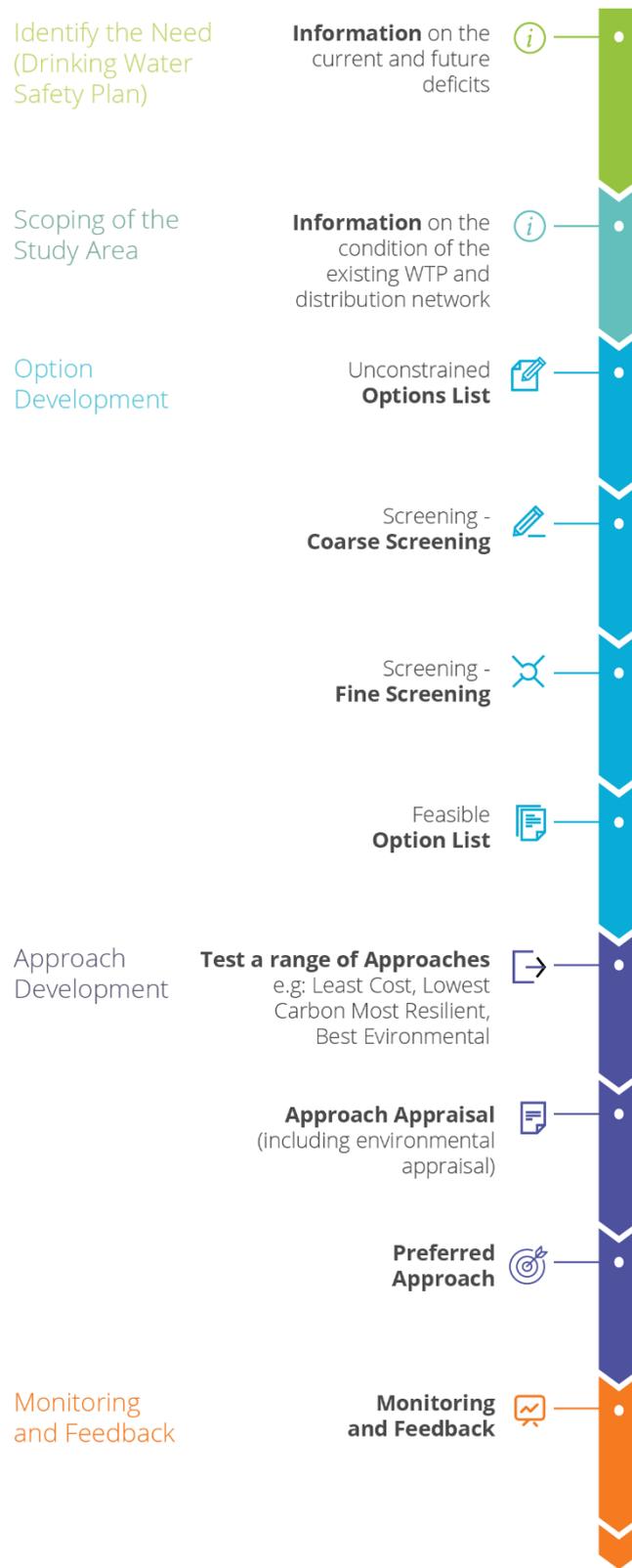


Figure 8.3 – Option Development Process

Table 8.1 shows how at a Plan level they correspond to the seven standard steps in the Public Spending Code.

Table 8.1 – Comparison between Public Expenditure and Reform Guidance and our Methodology

Department of Public Expenditure and Reform Guidance Standard Steps	Corresponding Step(s) in our Methodology	Framework Plan Section
1. Define the Objective	a) Identify the Need & Scoping the Study Area	4, 5, 6 & 7
2. Explore options taking account of constraints	b) Option Development: Unconstrained Options & Coarse Screening	9.3.3 – 9.3.4
3. Quantify the costs of Viable options and specify sources of funding	c) Feasible Option List: Plan Level Option Costing encompassing Direct & Indirect Costs (including environmental & social costs)	9.3.6
4. Analyse the main options	d) Test Range of Approaches	9.3.7.1
5. Identify the risks associated with each viable option	c) Multi Criteria Assessment	9.3.5
6. Decide on a preferred option	e) Approach Appraisal	9.3.7.2
7. Make a recommendation to the Approving Authority	f) Preferred Approach (Those that are prioritized are advanced through the regulated Capital Investment Plans)	9.3.7.3

This Chapter describes the Option Development Process (methodology) we will use to develop a preferred approach to address in each WRZ need. It sets how we will test a range of options (in isolation and combination) against a range of criteria which reflect the objectives of the NWRP and its associated Strategic Environmental Assessment ([SEA](#)).

Our proposed options assessment methodology is based around the following five criteria:

- Resilience;
- Deliverability and Flexibility;
- Progressibility;
- Sustainability (Environmental and Social Impacts); and
- Cost.

8.2.1 Resilience

A resilient water resource is one with enough capacity to mitigate the impacts to water supply when operational issues occur. These issues include:

- Unplanned outages;
- Low flows or flooding exacerbated by climate change; and
- Regulatory changes.

A resilient system is also one which does not commit us to long term operational risks, high carbon and energy intensive projects.

The key constituents of the resilience criterion are shown in Figure 8.4.

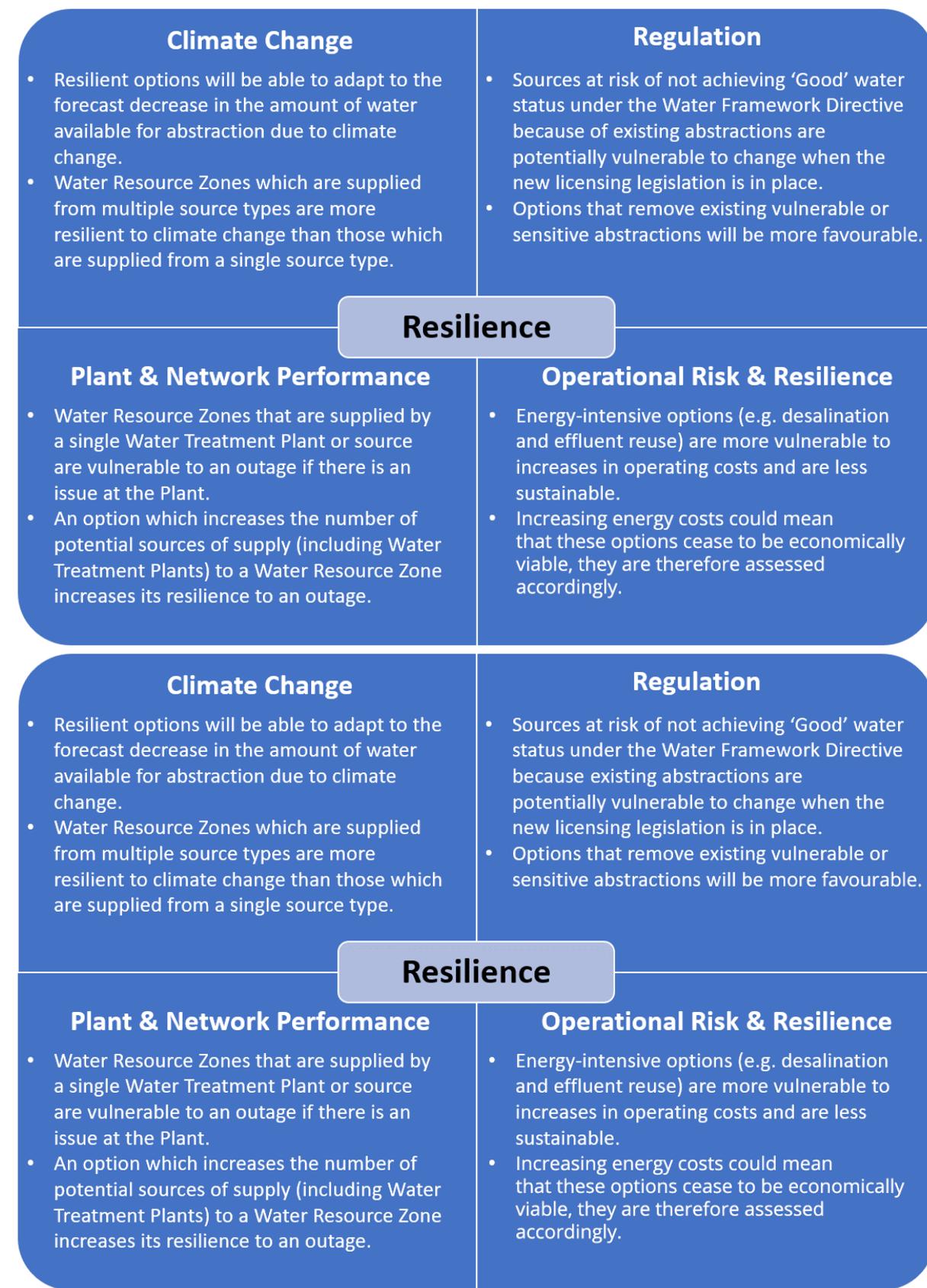


Figure 8.4 – Components of the Resilience Criterion

8.2.2 Deliverability and Flexibility

It is important that the options we promote to address a need can be implemented or constructed safely within required timeframes and are flexible to allow for future adaptation as water availability or demand changes. It includes the following two main sub-criteria:

- **Deliverability** – considers the practicality of building or implementing an option or options; and
- **Flexibility** – considers how adaptable an option will be to future changes in demand and the environment.

Further details of the Deliverability and Flexibility Criterion are provided in Figure 8.5.

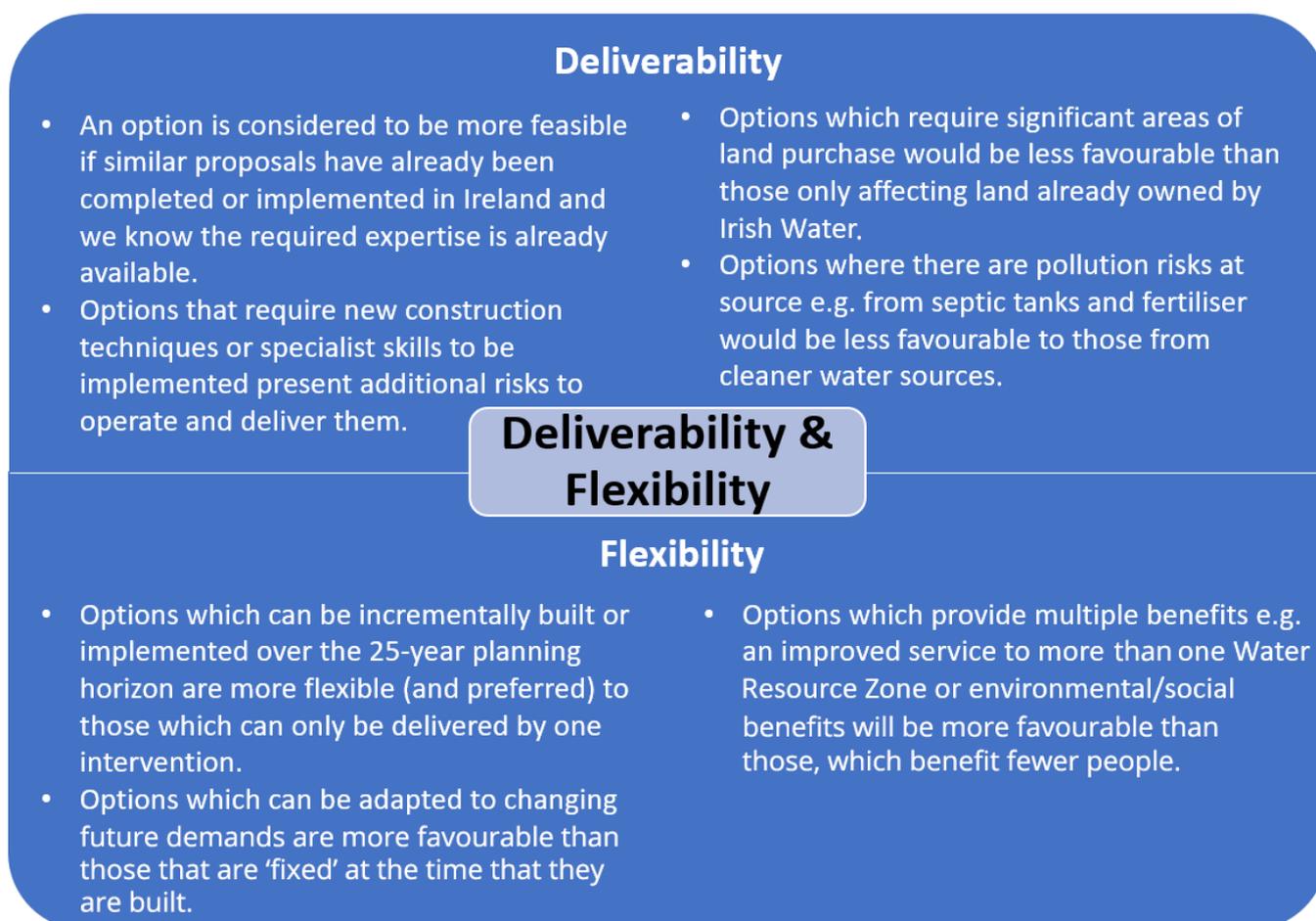


Figure 8.5 – Components of the Deliverability and Flexibility Criterion

8.2.3 Progressibility

Within resource planning, it is important that the options proposed to address need satisfy strategic, national and local planning objectives.

This criterion is to help us understand the relative difference between options, and how progressible different options may be. The purpose of this criterion is not to eliminate options, but to give maximum consideration to the potential challenges that might be encountered, should they be progressed. This also allows us to factor into our plan level delivery timeframes, complex consent submissions. Figure 8.6 shows the main component of this criterion: Planning Considerations

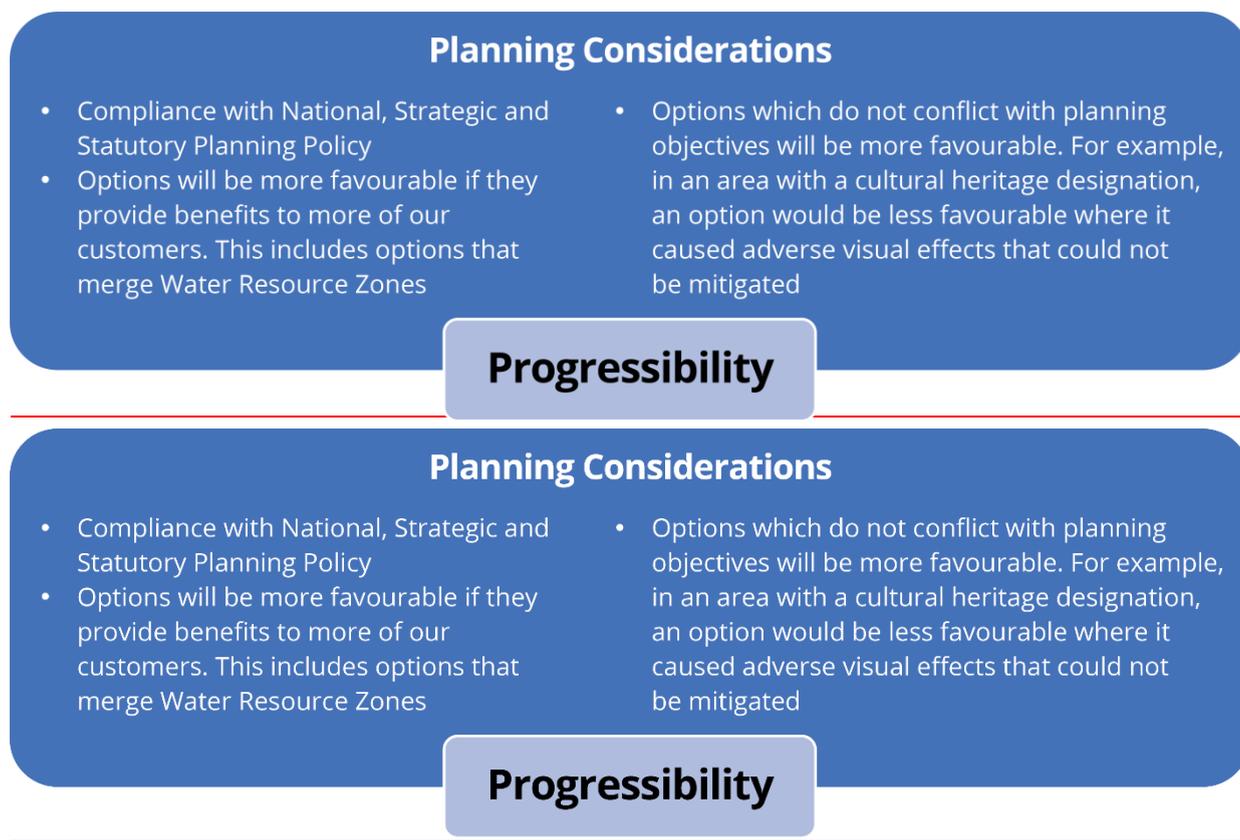


Figure 8.6 – Components of the Progressibility Criterion

8.2.4 Sustainability (Environmental and Social Impacts)

The Sustainability (Environmental and Social impacts) scoring criteria are based on the objectives defined for the SEA. AA is also integrated into the environmental assessment process. Aligning the Options Assessment process with the SEA allows the environmental assessment to be integral to and influence the assessment and eventual selection of the Preferred Approaches. This ensures that options which have a likely unacceptable environmental and social impact, particularly in relation to European and National designated sites are discounted at coarse screening.

The criteria under these objectives which the options are assessed against are:

- Population, economy, tourism and recreation, and human health;
- Water environment;
- Biodiversity (including flora and fauna);
- Material assets;
- Landscape;
- Climate change;
- Cultural heritage; and
- Geology and soils.

8.2.5 Cost

When comparing the costs of different options at a Plan level, it is important that all costs i.e. the total investment costs and monetised environmental and social impact costs are considered. Figure 8.7 shows how options appraisal approach in the NWRP considers costing.

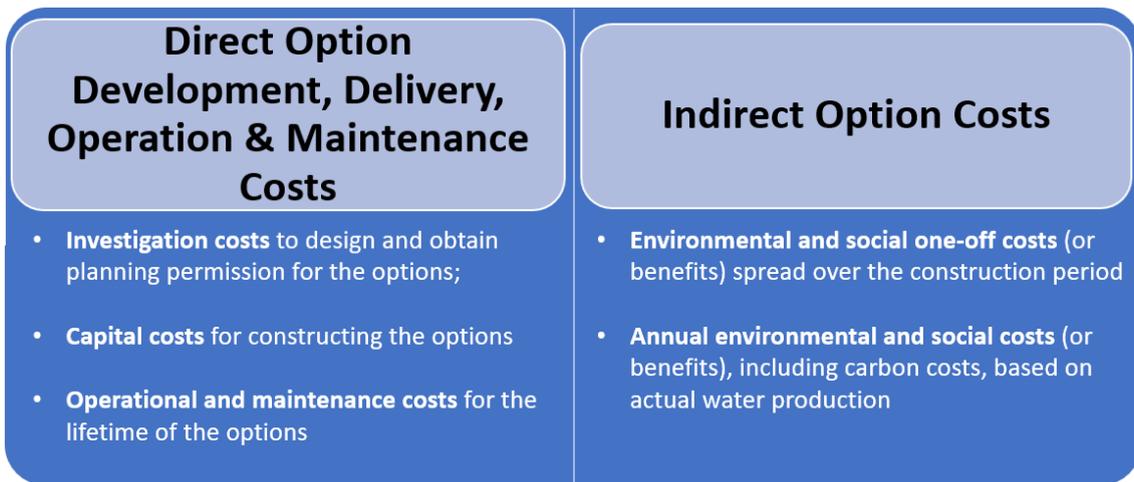


Figure 8.7 – Components of the Costing Criterion

During the assessment process, no option will be discounted on the basis of cost alone at the initial Option screening stages. This ensures that due consideration is given to all selection criteria.

Therefore, an Option with the lowest Direct Cost will not necessarily be chosen. Indirect Option Costs (Environmental and Social Costs) also influence the selection of Options. Further detail on Environmental Costing is included in Appendix M.

8.3 A New Options Assessment Methodology

As outlined in Figure 8.8, there are 8 key stages in the New Options Assessment Methodology.

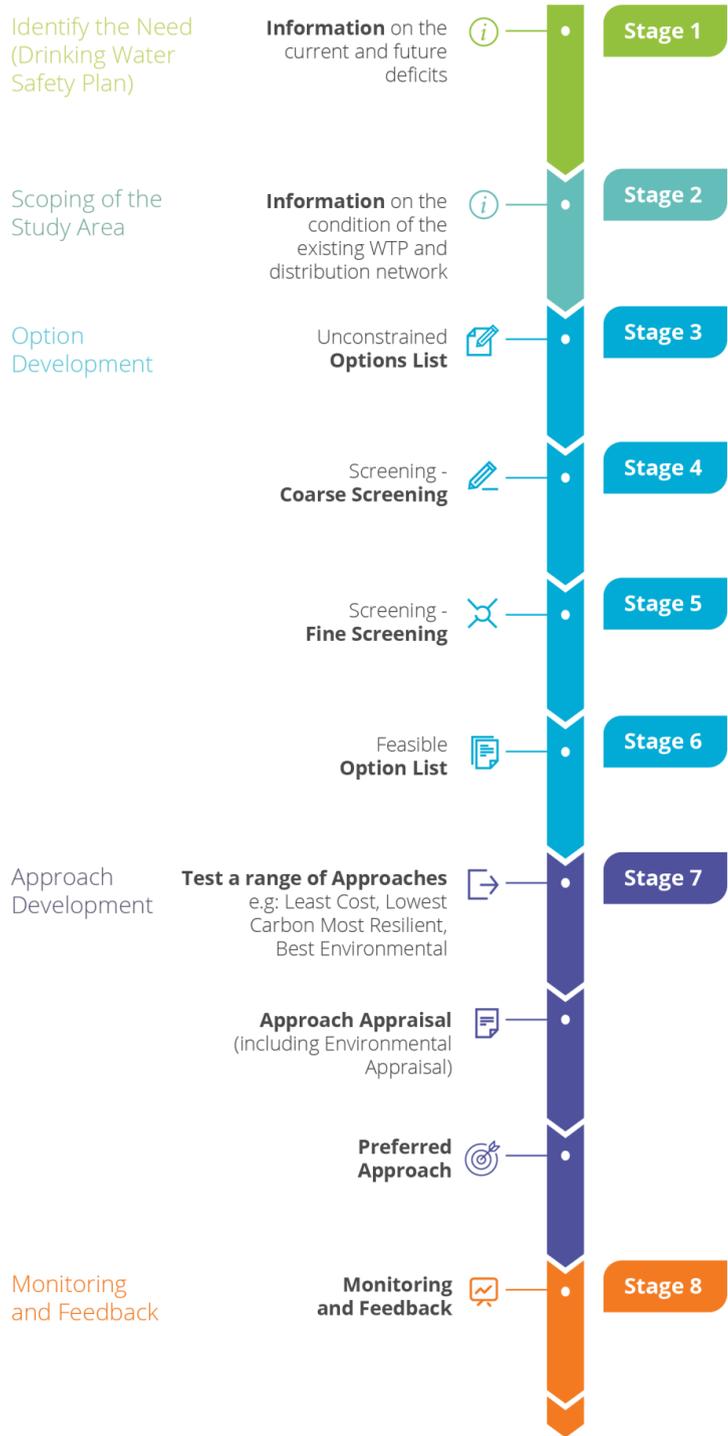


Figure 8.8 – Option Assessment Methodology

8.3.1 Stage 1: Identify the Need

The process starts with the Needs Identification Process (both quantity and quality), as described in Chapters 3 to 6 of this ~~draft~~ Framework Plan. This provides context for the Options Assessment Methodology and informs the scale of the solutions required.

8.3.2 Stage 2: Scoping of the Study Area

In order to manage the roll-out of the Options Assessment Methodology and the delivery of the ~~Regional Water Resource Plans~~, ~~we have split the public water supply into the four Group RWRPs~~, ~~we have split the public water supply into the four Regional Areas~~ shown in Figure 8.9, on the basis of the criteria described above.

These regional ~~groups~~ areas are further subdivided into Study Areas which are clusters of ~~Water Resource Zones~~ WRZs termed Study Areas. Grouping WRZs into Study Areas means that:

- Options can be developed that address multiple problematic supplies, which allows for consideration of efficient regional solutions to resolve local needs in more than one supply
- Broader strategic decisions are made when looking at multiple WRZs

The Study Area boundaries are based on WFD catchments and WRZ location and type (urban and rural). Further details on grouping WRZs into study areas are provided below.

8.3.2.1 Urban Areas

Urban WRZs are defined as those that comprise major settlements as defined by the National Planning Framework, Regional Assemblies and Local Authorities. The raw water sources used to supply these areas are identified and if neighbouring WRZs also abstract from the same water bodies, they are included in the Study Area. This allows us to assess cumulative impact on water bodies and ensures that all abstractions from the one source are coordinated. For example, if there are multiple abstractions from the same river supplying different WRZs, the combined effect of these abstractions might be missed if they were considered on a single WRZ basis.

8.3.2.2 Rural Areas

In rural areas we strive to develop geographical groups of small to form Study Areas. This approach allows us to consider regional solutions for these water supplies. The geographical groups can be within an individual county or cross multiple county boundaries.

8.3.2.3 Identify Needs for the Study Area



Figure 8.9—Regional Groups

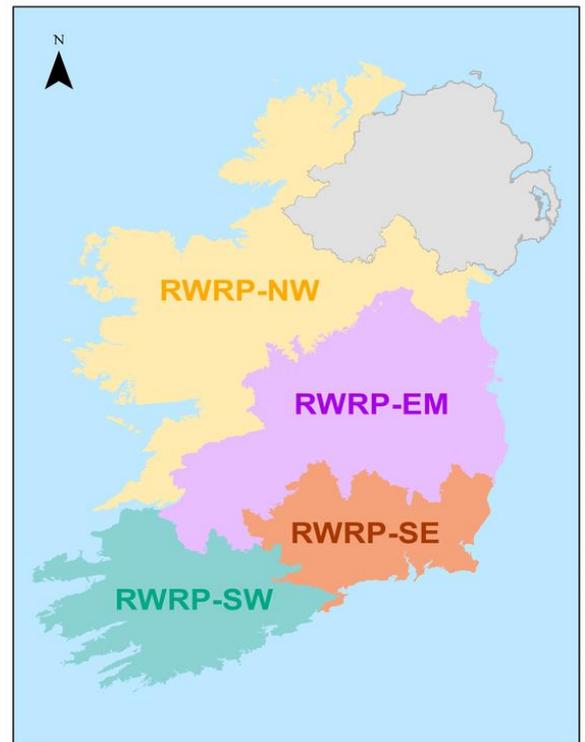


Figure 8.9 – Regional Areas WRZs

Data is gathered for each individual study area including, but not limited to:

- The **Water Quality** that can be supplied;
- The **Water Quantity** that can be supplied;
- The **Sustainability** of our sources or infrastructure; and
- The **Reliability** of our assets.

A detailed programme of consultation and Workshops is then conducted with Local Authority operators and stakeholders, to ensure a full and comprehensive understanding of need across the given Study Area. Further details on the data queries considered at these workshops at each study area are summarised in Table 8.2.

Table 8.2 – Data gathering activities during consultation

Water Quality	<p>What is the performance and condition of our existing WTPs?</p> <p>Are our WTPs at risk of not treating water to the required quality standards?</p> <p>Are there any distribution network challenges contributing to water quality issues?</p>
Water Quantity	<p>What is the quantity of water that our WTPs and networks currently provide?</p> <p>Can the output from our WTPs be increased without affecting water quality?</p> <p>Is the condition of our WTPs or network affecting the quantity of water we can supply?</p>
Sustainability	<p>Is a source sustainable for the long term or is there a risk our abstraction will be reduced by future legislation?</p> <p>Are our WTPs sustainable or are they too costly and/or risky to operate and maintain?</p> <p>Is the WTP sustainable in terms of energy use and carbon and climate change visibility?</p>
Reliability	<p>Are any critical assets at risk of failure which could impact supplies?</p> <p>Is asset performance reliable or are quality outputs variable?</p>

This allows us to include any essential maintenance or refurbishment work required within a WRZ to be considered at the Options Stage. If a water treatment plant in the study area is coming to the end of its operating life and will require a complete refurbishment within the next 10 years, the capital cost of this needs to be considered in the proposed Options. The methodology also assumes that we will continue to invest in Capital Maintenance in order to ensure that viable plants are maintained at full serviceability. These requirements are identified through the Asset Management Process underpinning the Capital Maintenance Investment.

At this stage we also consider the reliability and environmental impact of our existing abstractions. This will allow us to identify sites where capacity required is not likely to be reliably available. This will also allow us to identify situations where we must reduce or remove our existing abstractions within the coming years.

8.3.3 Stage 3: Option Development: Unconstrained Options List

The SDB and the Barrier Assessment inform the type and scale of options that we must consider. These Options will be taken from the generic water resource types that are shown in Figure 8.10 and Table 8.3. Sub-variants of each Option type are also considered.

Whilst Options are considered individually, an approach to meet identified need may be provided from a combination of these Options. For example, to meet a deficit of 10 million litres per day, the Preferred Approach could be achieved by increasing an abstraction from an existing source by 6 million litres per day, reducing leakage by 3 million litres per day and reducing consumption through demand management measures by 1 million litres per day (aligned with our Three Pillar approach).

An “Unconstrained Options” list is developed from our Generic Option types.

The Unconstrained Options constitute all of the **possible solutions**, which either fully or partly resolve a water supply deficit, regardless of any cost, environmental or social constraints. In developing the Unconstrained List, we identify options that are applicable to meet the needs of the study area. This includes:

- A review of any options identified by Irish Water that have not been committed to in the current Investment Plan;
- A review of options previously considered by Local Authorities;
- A review of options identified in other strategy documents, approaches and projects; and
- Ideas generated at Workshops with regional operational staff drawing on their knowledge and experience of the supply system and the geographical area.

We do not generally include Options that we know will not be practicable to implement or suitable to address need.

The Unconstrained Options list can include solutions at a WRZ, Study Area, Regional ~~Group~~ Area or even National level.

[The water abstraction standards used to assess the impact of new options are based on UKTAG guidance for achieving Good or High Status, depending on current waterbody status. The application of UKTAG represents the best available scientific information and guidance. Where a waterbody status is unassigned, the use of standards for Good Status will ensure the proposed abstraction options will not prevent the achievement of Good Status when a status is subsequently assigned. Where an option that impacts a waterbody with unassigned status is chosen as part of the preferred approach, additional data collection to inform the assignation of a status will be identified for the project level studies. That data will be used to seek to ensure that the EPA assigns a waterbody its status prior to consent for the specific project being sought.](#)



[Figure 8.10 – Option Types](#)

Figure 8.10—Option Types

Table 8.3 – Option types

NWRP category	NWRP sub-category	Summary
Lose Less		
Leakage Reduction		<p>Reducing leakage from our network is a priority for Irish Water. This can involve a range of measures for actively detecting and repairing leaks such as the installation of meters to better identify customer leakage activity and advanced monitoring tools and techniques to better identify leaks.</p> <p>Leakage reduction will focus on Active Leakage Control, targeted replacement of ageing pipes, pressure management to minimise fluctuations and excessive pressures, providing more constant pressures to our customers whilst reducing bursts and the application of different leak repair approaches to minimise cost and disruption.</p>
Use Less		
Water Efficiency	Education & Awareness	Educational awareness campaigns and partnerships to raise awareness of water shortages and encourage water conservation and efficiency.
	Water Efficiency Measures	<p>Use of water efficient products and processes in new and refurbished housing developments and working with building standards to ensure that water efficiency measures are included in standards and regulations as mandatory. Encouraging take up of water efficiency measures by domestic and non-domestic customers such as more efficient appliances, repair of leaking toilets, use of water audits.</p> <p>Actively pursue business customers and industry for partnerships that involve water efficiency goals.</p> <p>Investigate how to use water within Irish Water’s existing assets more efficiently through improved treatment processes and recycling of effluent water for appropriate uses.</p>
	Recycling and Reuse	The recycling of treated wastewater or grey water provides a critical supplementary water source for non-potable activities therefore alleviating stress on primary water sources. Grey water refers to the water used in baths, sinks, washing machines, and other kitchen appliances. In periods of drought, when potable water is in short supply, grey water can be a potential alternative water source for activities such as agricultural and landscape irrigation, industrial process, and toilet flushing.
	Metering	<p>Domestic water metering can build a better understanding of water use and network pressures to improve water efficiency and therefore water security and identify leaks.</p> <p>Water meters with advanced analytics to undertake flow balances across the network can allow Irish Water to gain a better understanding of the whole network from the abstraction point to the customers</p>

NWRP category	NWRP sub-category	Summary
Supply Smarter – resource supply options		
Surface Water	Surface Water Abstraction	Increasing the abstraction at an existing river or lake source or developing a new river or lake source from which water can be sustainably abstracted. These options would be subject to an abstraction licence.
Groundwater	Groundwater Abstraction	Increasing the abstraction at an existing groundwater source or developing a new groundwater source from which water can be sustainably abstracted. These options would be subject to an abstraction licence.
	Aquifer Storage Recovery	Storage of treated or raw water in suitable aquifers. During times of plentiful water supply, excess water withdrawn from a river, lake or another groundwater source is injected and stored within an aquifer. This supplementary stored water can be extracted from the aquifer during periods of dry weather and/or increased demand when the primary supply sources are running low. This requires aquifers with suitable characteristics to be available as the risks of losses can be high.
Reservoirs	Storage Reservoirs	Provision of storage reservoirs which can be filled with untreated water abstracted during high flow conditions from surface waters to be drawn on during low flow periods or to provide additional resilience during droughts as a back-up supply source.
Catchment Management	Catchment management for ground or surface water sources	Activities such as agriculture, forestry, industry and waste management all have an impact on the retention of water in the catchment and the quality of the water within rivers and lakes. Pollutants in the water can lead to ecological deterioration, increased flood risk and can also create issues for water treatment. There may be scope for changes to land management through working in partnership with landowners, farmers and regulators to develop agreements and share information and resources to provide long term improvements with wide benefits including water suitable for supply from surface or groundwaters.
Effluent Reuse	Effluent Reuse	Recycling of wastewater effluent from treatment plants can produce a new supply source from wastewater which is otherwise discharged to rivers or the sea. This involves treating wastewater to a sufficiently high standard to meet supply standards relevant for the intended use for example for agricultural/horticulture/industry or for release to rivers to compensate for an abstraction upstream.
Desalination	Desalination: Coastal or Brackish	This involves the process of removing salt and other minerals from seawater or brackish water from river estuaries to make it suitable for human consumption and/or industrial use. The level of treatment required is related to the salt concentration of the water and variability of raw water characteristics.
Water Transfers	Transfers	Water transfer is the physical movement of water from one area to another usually via pipelines. These generally refer to the transfer of treated water and can vary considerably in scale in terms of size and length from local transfers from one WRZ to another, to regional transfers and inter-utility transfers (from Northern Ireland Water).

NWRP category	NWRP sub-category	Summary
	Tankering	Delivery of treated water to customers via road tanker to alleviate temporary short-term water shortages in certain localised situations.
Network Improvements	Network Improvements (general)	Network improvement involves works such as upgrade, replacement or operational improvements. They are undertaken to facilitate better water distribution and avoid network limitations. Therefore, strategic network reinforcement improving connections between different sources and customer supply can significantly improve security and resilience.
	Service Reservoir Expansion	Service reservoirs store treated water. They are used to balance out the steady supply of treated water they receive from WTPs and the fluctuating variations in customer demand during a 24-hour period. They can also be used to store a backup supply in low flow events but for a limited period of time.
WTPs	WTP Expansion/Rationalisation	Expansion of existing WTPs to facilitate the treatment of a higher volume of water. This option would be considered in combination with an increase of a surface water or ground water abstraction or the provision of a new surface water or ground water source. Expansion of existing WTPs may be carried out as part of a rationalisation process which involves the merging of WTPs. Rationalisation is carried out to reduce water supply costs, take a malfunctioning WTP out of service or to cease abstraction from an unsustainable source.
	WTP Process Losses	For every litre of untreated water extracted from a source and fed through a WTP to the supply distribution network, a small fraction of the water will be lost from the system as a result of the treatment losses. Generally, WTPs are designed to recover, treat and recycle as much of the waste stream as economically feasible. However, there can be opportunities to improve efficiency through the upgrading and installation of more complex treatment processes to reduce these process losses and therefore increase the WAFU.

8.3.4 Stage 4: Coarse Screening

The Unconstrained Options list is refined using a Coarse Screening assessment, which enables us to rule out any non-viable options. The remaining options, known as “Constrained Options” can then be carried forward for more detailed Multi Criteria Assessment at the Fine Screening Stage.

The Coarse Screening assessment uses the criteria listed in Table 8.4, with Options scored against a red, amber or green traffic light system shown in Table 8.5.

Any Option which scores “red” against a question has a fundamental issue that would be difficult to mitigate and is discounted on the basis that it is unlikely to ever be delivered.

An amber rating across any of the coarse screening criteria will not rule out an option, however, it will highlight that this option may require mitigation. For example, a surface water abstraction from a source which is designated as a European site will obtain an amber rating (assuming that it meets the allowable abstraction limit) against the Deliverability and Flexibility criterion and Sustainability (Environmental and Social Impacts) criterion. However, such an Option will most likely require mitigation which will take time to develop. Therefore, we must allow for consideration of the likely environmental site assessments and studies that will need to be carried out within the [Framework](#) Plan level costing for an Option.

A ‘Rejected Options Register’ is produced to record and explain all Options that are screened out on the basis of a red rating.

Table 8.4 – Unconstrained Options Assessment criteria

Criteria	Unconstrained Option Assessment questions		Assessment Score
Resilience	Q1	Does the Option address the supply-demand problem?	Yes / Maybe / No
Deliverability and Flexibility	Q2	Is the Option technically feasible?	Yes / Maybe / No
	Q3	Can the risks and uncertainties associated with the Option be mitigated to avoid failure of the Option?	Yes / Maybe / No
Sustainability (Environmental and Social Impacts)	Q4	Can the impacts on known high level environmental constraints including at internationally designated sites be avoided?	Yes / Maybe / No

Table 8.5 – Red, Amber and Green decision matrix

RAG matrix	Red	Amber	Green
Resilience	Does not address the supply-demand problem at all.	May address part of the supply-demand problem (with due consideration on the size of the deficit).	Fully addresses the supply-demand problem.
Deliverability & Flexibility	Option is not technically feasible. Associated risks and uncertainties are unacceptable and will result in a failure of the option.	There are some risks and uncertainties associated with the Option but are not considered to be insurmountable at this stage.	Option is technically feasible. There are no associated risks or uncertainties which are unacceptable.

RAG matrix	Red	Amber	Green
Sustainability (Environmental and Social Impacts)	<p>Likely unacceptable impacts on European designated sites or WFD objectives* which cannot be avoided through design or mitigation.</p> <p>* Options that cannot meet sustainable abstraction limits are removed/red rating</p>	<p>There are some impacts identified. However, they are not considered to be prohibitive at this stage due to the potential for improved design and/or mitigation.</p>	<p>No major issues or sensitivities identified at this stage.</p>

8.3.5 Stage 5: Fine Screening

Fine screening involves an analysis of the Constrained Options against a range of detailed assessment criteria, through a process known as Multi Criteria Assessment (MCA). The objective of the MCA and the fine screening process is to determine the potential benefits and impacts of the Options across a range of key criteria. It involves dividing the decision into smaller, more understandable parts and analysing each part before integrating those parts to produce a meaningful assessment.

The MCA process allows a combination of issues to be considered together. This can help indicate if one Option will be more: cost effective, environmentally acceptable, promotable, resilient or feasible when compared to other Options. This process requires a more detailed analysis of the Options and their potential benefits and impacts against the key criteria. This allows us to highlight issues with Options which were considered to be feasible at the coarse screening stage but on further review are not considered viable.

The MCA methodology has been tailored to provide a structured and transparent approach to inform the decision-making process and to remove subjectivity, as far as reasonably possible. It also recognises that both monetary and non-monetary objectives may influence decisions.

The MCA approach applies a common set of questions to determine the relative merits of each option across the key criteria. The questions are developed by dividing the criteria from the coarse screening stage into detailed sub-criteria against which options can be assessed. Table 8.6 lists the criteria, sub-criteria and questions that are applied at the Fine Screening Stage.

Table 8.6 – Fine Screening Questions

MCA criteria	Sub-criteria	Fine screening questions
Resilience	Outages	<p>Is there vulnerability due to failure/outages caused by, for example, flooding, pollution, damage, freeze-thaw, loss of power supply?</p> <p>Is there provision of additional resilience (from new Option) to outage events at existing sources?</p>
	Financial uncertainty	Is there vulnerability due to increasing energy or commodity prices?
	Regulatory changes	Is there vulnerability to future regulatory and legislation changes including changes to environmental legislation?
	Climate change	Is there improved resilience for Irish Water due to climate change and / or drought conditions?
	Flexibility	<p>Are there benefits due to short lead in time to deliver the Option?</p> <p>Is there phased or incremental delivery of the Option?</p>

MCA criteria	Sub-criteria	Fine screening questions
Feasibility and Deliverability & Flexibility		<p>Is it possible to adapt the option once delivered, to meet any future changes?</p> <p>Are there benefits due to a short ramp-up time for the Option to deliver potable water into supply?</p>
	Deliverability	<p>Is there experience in delivering similar solutions (technology or construction methodology known to Irish Water)?</p> <p>Is there deliverability uncertainty due to land ownership or suitable land availability?</p> <p>Are there construction uncertainties due to land stability or contamination risk?</p> <p>Is there dependency on existing assets for successful delivery?</p> <p>Are there any major issues with the Safety, Health and Welfare at Work (Construction) Regulations, 2013 that could change the scope or put at risk the successful delivery of the option?</p> <p>Is the required technology tried and tested with Operations Department?</p> <p>Is there quality and confidence of design information?</p>
Progressibility	Sustainability	<p>Are there any major local planning issues that could change the scope or put at risk the successful delivery of the Option?</p> <p>Are there any major issues with regulatory consents or permissions that could change the scope or put at risk the successful delivery of the Option?</p>
	Synergies	<p>Are there synergies with other WRZs, other water companies on the island of Ireland, in the UK, or third parties?</p>
Sustainability (Environmental and Social Impacts)	Population, health, economy & recreation	<p>Will the Option impact public health and quality of life, during construction?</p> <p>Will the Option impact public health and quality of life, during operation?</p> <p>What is the impact on recreational amenities?</p>
	Water environment: quality & resources	<p>Would the option or associated construction activities affect WFD Status of water body, in terms of quantity and quality for surface water?</p> <p>Would the option or associated construction activities affect WFD Status of water body, in terms of quantity and quality for groundwater?</p> <p>Would the option or associated construction activities affect WFD Status of water body, in terms of hydro morphology?</p> <p>Would this Option reduce pressure on water environment through water savings?</p> <p>Is there a potential for this option to increase flood risk – e.g. increase base flow or result in loss of flood plain?</p> <p>Will Navigation be affected?</p>
	Biodiversity, flora and fauna	<p>Is there potential to result in adverse effects on the integrity of a European site?</p>

MCA criteria	Sub-criteria	Fine screening questions
		<p>Is there potential to impact on an Annex species outside European designated areas?</p> <p>Is there potential to impact on National designated sites?</p> <p>Is there potential to impact on Biodiversity in all other areas?</p> <p>Is there a risk of spreading Invasive Non-Native Species (INNS)?</p>
	Material assets	<p>Will the Option make effective use of existing assets?</p> <p>Will this Option conflict with critical infrastructure, or does the option conflict with existing business, planned land use or valuable agricultural land?</p>
	Landscape and visual amenity	<p>Could this Option impact the landscape character areas, townscape character areas or important views (detract or improve)?</p>
	Climate change	<p>What is the level of construction and operational carbon emissions associated with the Option (tonnes)?</p>
	Cultural heritage and archaeology	<p>Does this option avoid direct damage to, or detract from the setting of, designated cultural heritage assets, or does this contribute to protecting them?</p>
	Geology and soils	<p>Would any designated or non-designated geological features, valuable soils, or contaminated land sites be affected?</p>

Each Option is subject to an objective assessment with uniform scoring criteria, based on best publicly available datasets. Options are scored using a seven-point Likert scale, from -3 to 3, as set out in Appendix N.

The environmental MCA criteria are linked to the SEA objectives developed from the SEA Scoping Report through consultation with environmental stakeholders. Some criteria/screening questions may be more relevant to some Options types than others, and where a criteria or sub-criteria is not relevant it is simply considered as “not-applicable” (N/A) and is discounted in the overall appraisal of the Option. Where criteria are found not to be relevant for comparing between Options within a particular study area, they can be put aside to focus the assessment.

Appropriate Assessment has been integrated into the Options Assessment Methodology in particular through the MCA/ fine screening assessment questions and scoring for the European sites (biodiversity) question (see Best AA approach, Table 8.6)

The screening process provides MCA scores for each of the Feasible Options which then pass through to the Approach Appraisal stage for further consideration.

Where there are a very large number of Options covering a range of Option types, fine screening can be used to identify poorly performing options. These can be removed or placed on a reserve list for future consideration should they be required. Options that passed through the constrained options stage might also be removed at fine screening if a more detailed assessment shows them to be unsuitable. Any Options which are discounted at this stage are recorded on the Rejected Options Register. Better performing Options are taken forward for further consideration in the feasible list. This method can be appropriate for large WRZs or study areas.

Only Options identified as clearly not feasible, unsustainable or unacceptable will be removed. Where Options perform poorly against specific sub-criteria, the potential for design or mitigation to address effects will be considered. If there is any doubt as to whether a particular Option should be classified as feasible or not, then that Option will be carried forward to the feasible list with risks identified.

8.3.6 Stage 6: Feasible Options List – Option Costing

The output of the Fine Screening stage is called the Feasible Options List. A Plan Level outline design and estimated cost is developed for each option on the list. “Whole life” construction and operation costs are based on Irish Water’s PCT (Project Costing Template) to ensure alignment with Irish Water’s investment processes.

It should be noted that assessments at this stage are desk based and plan level assessments. Environmental impacts and costing of projects are further reviewed at project level 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 of any option in the Regional Water Resources Plan. Any projects that are progressed following identification as Preferred Approaches in the Regional Plans, will require individual environmental assessments in support of planning applications (where a project requires planning permission) or in support of licencing applications (for example, for new abstractions).

As the [Framework](#) Plan level costing is intended to be a comparative assessment between Option types, we do not include detailed project level costing for “In-Flight Projects”. This is to ensure that the [methodology in this](#) Framework Plan ~~methodology~~ is uniformly applied in the development of ~~the~~ Preferred ~~Approach~~ [Approaches](#).

8.3.7 Stage 7: Approach Development

8.3.7.1 Test a Range of Approaches

The purpose of the ~~Regional Water Resources Plans~~ [RWRPs](#) will be to examine all potential Options that could be used to address identified need and then to eliminate those that are not feasible or that have identifiable environmental issues (at a desktop level).

After fine screening the remaining Feasible Options are assessed against a specified number of Approaches. We test the Options against six approaches which were selected to align the NWRP with all relevant Government Policy. The six approaches are summarised in Table 8.7 and discussed in further detail.

Table 8.7 – 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 difficult to mitigate. Options scoring -3 are assessed and given alternative scoring options identified where possible. harder to mitigate or require significant project level assessment.</p>	Habitats Directive

Approaches Tested	Description	Policy Driver
Quickest Delivery	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 This is particularly relevant where an option might be required to address an urgent Public Health issue.	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 MCA sub-criteria questions	SEA Directive and WFD
Most Resilient	This is the option or combination of options with the highest total score against the resilience criteria.	National Adaptation Plan
Lowest Carbon	This is the option or combination of options with the lowest embodied and operational carbon cost	Sectoral Adaptation Plan

Least Cost Approach

The Least Cost Approach is determined using a Net Present Value assessment tool which establishes the Option or combination of Options with the lowest comparative Net Present Value cost encompassing: Environmental and Social Costs, Carbon Costs, Capital Costs and Operational Costs. We consider this approach to allow our plan level assessments to align with the requirements of the Public Spending Code and the National Adaptation Framework.

Best Appropriate Assessment (Best AA) Approach

The Best AA approach gives maximum consideration to the Options with no potential for impacts on European Designated (no Likely Significant Effects or LSEs) sites or Options with LSEs that can be addressed with general/standard mitigation measures at the project level. [This can equally be described as giving maximum consideration to the Options with the Least Impact on European Sites.](#) It puts avoidance of impacts on European sites at the forefront taking account of the fact that Options with a high likelihood of significant effects which could lead to adverse effects on a European Site have already been removed at Coarse Screening stage.

Quickest Delivery Approach

The quickest delivery is based on the estimated time for an option to be brought into operation (including typical feasibility, consent, construction and commissioning durations) as identified at Fine Screening. This approach allows us to potentially optimise the Preferred Approach by minimising the time taken for an Option to become operational. This could be appropriate in a WRZ with a critical water quality issue that might impact on public health, as this approach would identify the Option that could potentially be delivered in the shortest possible timeframe.

As the NWRP does not confer funding or statutory consent for any project, and ~~on a national basis~~ the [identified](#) Needs across 539 WRZs must be prioritised [on a national basis](#), we would be unlikely to modify an approach based on Quickest Delivery, unless there is a critical driver.

Best Environmental Approach

The Best SEA Environmental Approach is the Option or combination of Options performing best overall across the 19 SEA objective-based MCA environmental criteria, assessed as part of the Fine Screening assessment described in Section 8.3.5. Positive and negative scores are summed separately.

The purpose of this approach is to ensure that the SEA objectives to minimise potential impact are considered through the Options Assessment and Approach Selection process. For each Option or combination of Options, we assess the MCA scoring in detail across all SEA assessment criteria, using the sum of positive scores as well as the sum of negative scores. We also review the scoring against individual criteria to identify where assessment reflects important differences between Options focusing on potential operational or long-term effects. This ensures that we can review the relative merits of each Option.

Most Resilient Approach

The Most Resilient Approach is the Option or combination of Options with the highest scores from the four MCA screening questions relating to Resilience criteria. This approach is aligned to the NWRP objective to ensure a safe and secure water supply in the short, medium and long term.

Lowest Carbon Approach

The Lowest Carbon Approach is the Option or combination of Options with the lowest embodied and operational carbon costs. This approach is aligned with Irish Water's carbon reduction policies and the NAP in relation to climate change.

8.3.7.2 Approach Assessment Ranking

Depending on the complexity and size of the WRZ or Study Area, the best performing Feasible Options for each of the six approaches are determined using either:

- EBSD (Economics of Balancing Supply and Demand) Lite; or
- EBSD Model

EBSD Lite

The Preferred Options to meet the need for each of the six Approaches (Least Cost, Best AA, Lowest Carbon etc.) are derived by ranking the Options in order of lowest to highest total NPV cost and with regard to their applicable MCA scores for the six Approaches.

This approach is generally better suited to smaller WRZs and Study Areas, as it allows for a simple comparison of individual Options where the entire need can be met from single Options. Where the assessment is required to consider a range of different and more complex combinations of Options to meet a need, then the more detailed, full EBSD analysis is required.

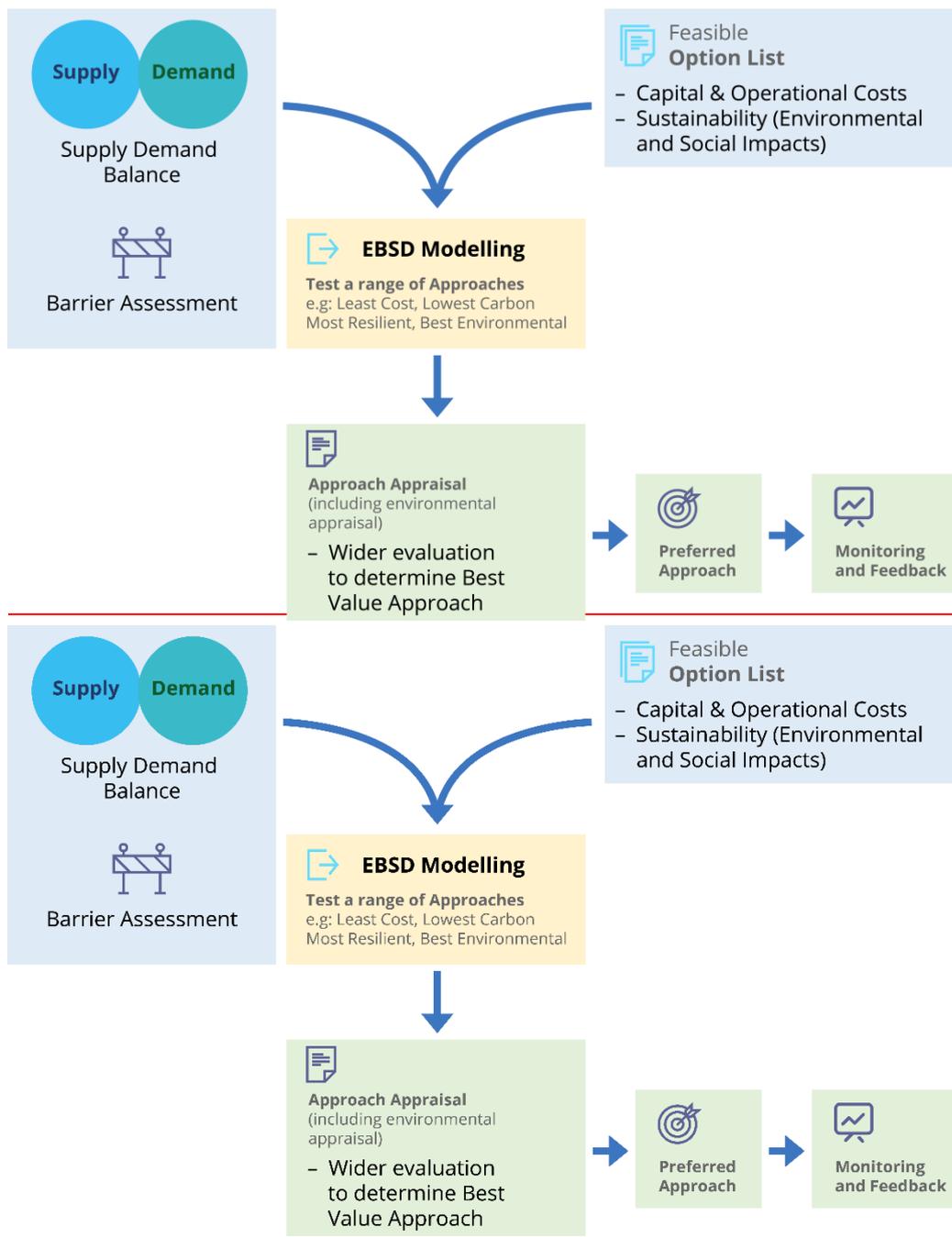


Figure 8.14-8.101 – EBSD Model Approach

EBSD Model

The full EBSD Model evaluates the range of potential Approaches comprising single or different combinations of options for a WRZ to reflect the key criteria used in the Fine Screening stage namely: resilience; deliverability and flexibility; progressibility; sustainability (environmental and social impacts) and cost. The full EBSD Model then produces an optimised programme of investment to meet the needs of a WRZ over a defined planning period (25 years in this Plan).

The model does this by evaluating the Fine Screening criteria and determining:

- **Which** Options should be selected;
- **When** the Option should be implemented; and
- **What** utilisation should be made of the Option within the planning period.

For each of the six Approaches (Least Cost, Best AA, Lowest Carbon etc.), Irish Water use the EBSD Model to derive an optimum combination of Options to address the future need based on the MCA scores.

The Approach development process is designed to determine the Best Value approach to meet the need and this is then identified as the Preferred Approach. Best value is identified as the approach that provides the best performance overall, balancing across the range of NWRP and SEA objectives.

The input data and structure of the EBSD model is shown in Figure 8.11.

8.3.7.3 Approach Appraisal

We then compare the Options identified for each of the six Approaches (Least Cost, Best AA, Lowest Carbon etc.) against each other to come up with a Preferred Approach that meets the objectives of the [Framework](#) Plan and aligns with all relevant Government Policy.

The Approach Appraisal process involves:

- Identify the Option or combination of Options that best conform with each of the six Approach descriptions, for example, the Option or combination of Options that would be classified as the Least Carbon Approach, Least Cost, Best AA etc.
- Assessing the Approaches against each other, following the 8-step process set out in Figure 8.8 in order to develop a Preferred Approach for each WRZ.
- ~~Ensuring an alternative Option that can meet the plan objectives is available for any Option that has an identified “3 Biodiversity” in relation to the European Sites sub-criteria question.~~
- Identifying interim measures that might be required in a WRZs to meet a potential immediate need.

The eight step Preferred Approach Development Process is summarised in Figure 8.8. The following principles will be used to ensure its consistent application in developing Phase 2 of the NWRP:

- If an Option is identified that meets the Objectives of the [Framework](#) Plan and is assessed as having no potential impact on a European Site (zero or neutral score based on desktop assessment), it is automatically adopted as the Preferred Approach at WRZ level.
- As all our Feasible Options have all passed the coarse and fine screening process, The Least Cost Option is used as Step 1 in the development of the Preferred Approach.
- The Preferred Approach must meet the Objectives of the [Framework](#) Plan (i.e. to address the identified need).
- Although the Preferred Approach development process starts with the Least Cost approach, it must give the highest consideration to Environmental Legislation and Government Policy on climate change adaptation and public expenditure.
- We also consider at this stage any project level information available for In-Flight Projects to sense check them against the Preferred Approach. For example, detailed project level costings might reveal that an In-Flight Project identified as a Preferred Approach is more expensive than the ~~plan~~ [Framework Plan](#) level estimates, or the progress already made for an In-Flight Project is less than a Preferred Approach that is not an In-Flight Project.
- The Preferred Approach at a Plan level does not confer any consent to develop a project, nor does it preclude other options being considered subsequently at the project Level.

8.3.7.4 Preferred Approach

The Preferred Approach to address the need for each WRZ is identified using the Approach Assessment Process set out in Figure 8.12. When we compare the various approaches as part of this process we are looking to identify where the approaches provide significantly better performance for some outcomes without incurring significantly worse performance against other outcomes.

During the development of the ~~draft~~ Framework Plan we ~~have~~ attempted to define this as a rules-based exercise ~~but given and trialled the approach. Given~~ the complexity of the considerations for each WRZ, this ~~always gave often resulted in~~ compromised solutions.

~~We~~ As a result, we have decided to maintain this as an exercise in professional judgement from the multidisciplinary teams involved, ~~which is recorded as a narrative at each stage, in order to reflect.~~ The description of options and factors influencing selection will be recorded in the options spreadsheets at each stage of the screening process. The description reflects the considerations of the ~~intricacies of the approaches~~ specific aspects and issues arising for each of the options and the outcome of the approach development.

~~This Approach Development Process will be conducted via workshops involving technical experts working on the Regional Water Resources Plans, including Engineers, Ecologists and Environmental Scientists. The decision-making process and outcomes will be documented for each Water Resource Zone.~~

The Approach Development Process will be conducted via a combination of interactive workshops supported by a process of ongoing engagement and dialogue between the technical experts, including Engineers, Hydrologists and Hydrogeologists, Ecologists and Environmental Scientists working directly on the development of the Preferred Approach selection for the Regional Water Resources Plans. Stakeholders including Local Authorities and the EPA will be consulted throughout the approach development process for their input and feedback. The preferred approach outcomes for each Study Area are signed off at the final preferred approach workshop and the expert team document the agreed outcome for each Water Resource Zone in the Preferred Approach Spreadsheets. There will be an opportunity for public submissions on the identified Preferred Approaches when the draft RWRP's and supporting material are published for consultation, following which the Preferred Approaches may be subject to further change, as appropriate.

The Approach Development process repeated at the Study Area, and Regional ~~Group~~-Area levels in order to develop the four Regional Water Resources Plans.



Figure 8.12-8.112 – Approach Assessment Process^{a11}

As part of the feedback loop from the NIS for the Framework Plan, a better approach to options with LSEs i.e. -1 to -3 score for biodiversity at Fine Screening are identified where possible. As per the Approach Development process (see Step 0 in Figure 8.12) if there is an option that meets the objectives of the Plan and is assessed as having no potential impact on a European site i.e. no LSEs (based on desktop assessment) it is automatically adopted as the Preferred Approach. Furthermore, because it is possible that all of the potential impacts identified at Plan level can be entirely ruled out through project level investigation and analysis or avoided through project level mitigation, options with potential for LSEs (score of -1 to -3 for biodiversity) may be progressed as the Preferred Approach. If potential impacts cannot be ruled out or avoided, then mitigation in the form of avoidance is provided for within the NWRP to protect European site(s). Should potential adverse effects on European sites be identified at the project level from a given option/Preferred Approach the NWRP will have identified other options ^[1]

^{a11} Least cost includes environmental and social costs.

^[1] These options may not have progressed as the Preferred Approach initially as they may have scored significantly worse against other environmental, resilience or feasibility criteria (e.g. the best AA approach may identify an option that results in four times more carbon being produced or is twice as expensive).

that could be progressed at the project level if required. Therefore, no project arising from the NWRP, with AESI identified at the project stage would be implemented.

8.3.7.5 Sensitivity Analysis

Our supply demand forecast has been developed using the best available information and the application of best practice methods where we have the data to do so. We have identified areas where we will focus improvements in data to improve the certainty of our forecasts. However, all long-term forecasts are subject to uncertainty.

Therefore, we will incorporate a sensitivity analysis check-~~in~~ in our Approach Assessment Process-~~to~~ to allow us to stress test the sensitivity of the Preferred Approach ~~to-against~~ a range of ~~futures-possible~~ future scenarios which could alter the Supply Demand Balance and impact on ~~Need (Table 8.8)~~need. This will ensure that our decision making is robust and that the ~~approaches~~-Preferred Approaches developed are adaptable-~~to~~.

Table 8.8 sets out some examples of uncertainty factors that we will check at the end of the Preferred Approach development. In reality, a combination of these scenarios may occur together. For example, we may find growth in demand is lower ~~and~~ than forecast, and/or we achieve greater leakage reductions at the same time as the abstraction licensing regime limits our water availability. In this case reductions in demand would offset some of the increasing deficit arising due to abstraction sustainability reductions.

Should an outcome of the Sensitivity Assessment find that a preferred option will not be resilient or adaptable to changing future scenarios, we reassess it against the options identified for the six approaches during the Approach Appraisal phase and consider if an alternative should be progressed.

As data and models improve over time Irish Water will incorporate a more extensive approach to sensitivity analysis in the shape of Adaptive Planning. Adaptive Planning provides the flexibility to respond to uncertainty when it occurs (e.g. climate change impact increases).

8.3.7.6 Interim Solutions

~~Based on the scale of need across all our Water Resources zones, it is likely to take numerous investment cycles, before we can address all issues across existing water supplies. Therefore, smaller, localised upgrades may be required on an interim basis to secure priority need in existing supplies until the Preferred Approach can be delivered.~~

~~Any projects considered within the interim approach will only be progressed on the basis of urgent or priority need (such as Remedial Action List) to address critical water quality risk and supply reliability until such time as long term and permanent solutions can be delivered. In these cases, they would be considered to be required irrespective of the medium or long term SDB requirements and would be regarded as efficient use of budget.~~

As outlined above, Irish Water will develop a plan level Preferred Approach for each WRZ as part of the overall NWRP in the context of the development of the four RWRPs. However, it is likely to take multiple investment cycles before Irish Water can deliver the Preferred Approach as identified in every WRZ, due to such factors as:

- Scale of need across all WRZs;
- Likely minimum project lead-in times; and
- Irish Water's current capital funding arrangements.

With that context in mind, Irish Water also recognises the need for localised, shorter term interventions within existing supplies to address critical water quality risk and supply reliability issues, before the

Preferred Approach can be implemented in full. Accordingly, the NWRP also provides for an “interim solution” approach, which allows such interventions to be identified and prioritised.

As a general principle, this interim approach envisages shorter term, improvements to existing infrastructure and equipment (which may ultimately be decommissioned at a later date). These interventions are separate from the Preferred Approach for the relevant WRZ and are not intended to deliver a long-term solution to identified supply and water quality issues.

Any projects identified according to the interim approach will be progressed on the basis of urgent or priority need, ie critical need identified through the DWSP approach and other Irish Water programmes (see Box 8.1). These interventions will allow Irish Water to continue delivering safe, secure and reliable water supplies in the near term, subject to all appropriate regulatory consents, until Irish Water implements the Preferred Approach within the relevant WRZ.

The NWRP does not confer funding availability or statutory consent on any interim solution. If an interim option is deemed necessary, funding approval in addition to all applicable consents ~~would~~will need to be obtained for it to progress.

Box 8.1 Determining urgent priority and interim solutions



Urgent priority need is determined via the DWSP approach, the Remedial Action List and by ongoing Irish Water programmes such as the National Disinfection Programme, the Leakage Reduction Programme and the National Drought Programme. The aim of the National Disinfection Programme is to upgrade and standardise disinfection systems across the country in a two-phase approach: 1) Assess the WTPs and 2) Complete upgrade works. Through the assessment phase additional critical water quality risks may be identified and interim solutions such as delivery of prefabricated packaged WTPs and pump replacement offer temporary short-term management solutions. In-flight projects and programmes such as

the RAL and disinfection programmes will not be delayed due to the roll out of the preferred approaches identified in the four RWRPs.

Table 8.8 – Summary of our Sensitivity Assessment (non-exhaustive list)

Uncertainty Factor	Likelihood	Impact on SDB	Impact on deficit	Discussion
New abstraction legislation introducing sustainability limits on quantities to be abstracted	High (as our current abstractions are large compared to the water bodies from which they abstract)	Reduction in DO	Larger SDB deficit.	Although the likelihood of this scenario is high based on a desktop assessment of our existing abstractions, potential impacts may be mitigated against by optimising our operations on a more environmentally sustainable basis across the range of supplies.
Climate change impacts on supplies are greater than anticipated	Moderate (central climate change estimate used)	Reduction in water availability at certain times of the year	Larger SDB deficit.	Although the likelihood of this scenario is moderate based climate change allowances made in this Plan, potential impacts may be mitigated against by optimising our operations on a more environmentally sustainable basis across the range of supplies.
Domestic demand is lower than expected and/or Non-domestic demand is lower than expected.	Low/Moderate (growth has been based on policy)	Growth in demand is lower than forecast.	Smaller SDB deficit	The SDB deficit is driven by many factors including limitations in existing supplies, the reliability of the overall supply and assumptions on demand growth. If demand does not growth as significantly as we forecast there will still be a supply demand deficit in many WRZs. The required intervention to resolve the deficit may be smaller.
We achieve good levels of effectiveness and efficiency in reducing leakage	Moderate/High (Irish Water is focused on sustainability and aggressive leakage reduction)	Leakage reduces to below SELL within the period of the plan	Smaller SDB deficit	Irish Water will strive to be progressive in our leakage reduction plans. However, due to the supply and reliability issues we have this will not negate the need for other interventions to address the supply demand deficits.
Ability to reduce leakage in accordance with targets, due to, lengths of networks, access to assets, need to maintain and budget constraints.	Moderate (the distribution network is extensive)	Leakage does not reduce to SELL within the period of the plan	Larger SDB deficit	Due to the length and condition of our networks, we could potentially fail to achieve leakage targets in the timeframes set out. However, as Irish Water is committed to achieving leakage reductions, the likely scenario would be an extension in the period of time taken to achieve leakage reductions as opposed to accepting lower targets.

8.3.8 Stage 8: Monitoring and Feedback into Plan

The Public Water Supply in Ireland is a live asset base and is subject to continuous change. New assets such as water treatment plants, storage reservoirs, trunk and distribution mains are continuously developed and upgraded. Knowledge and data relating to our assets is improving and operational procedures are being standardised.

External factors can also influence the performance of our water supplies, including:

- Changes in legislation and policy that impact the way we operate our asset base or our interface with the natural 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

All of these factors influence need in terms of Quality, Quantity, Sustainability and Reliability; therefore, the Supply Demand Balance and Barrier Scores in ~~the~~ [this Framework](#) Plan represent a snapshot in time of live metrics.

Similarly, the development of Preferred Approaches as part of the forthcoming [Regional Plans four RWRPs](#) is influenced by evolving scientific data, understanding, and policy change in relation to the natural environment.

Irish Water must be able to continuously adapt to these changes, which may be minor or material in nature. As part of the implementation of ~~the~~ [this](#) Framework Plan, we are committed to the implementation of the SEA recommendations and Monitoring Plan. ~~The~~ [This](#) Framework Plan commits to undertaking continuous monitoring and ensuring that there is a feedback mechanism within the Framework Plan and [Regional Plans RWRPs](#). The [Regional Plans RWRPs](#) will be subject to formal review every five years; however, this continuous monitoring process will ensure that material amendments are assessed for significant impacts on the environment.

8.3.8.1 Monitoring and Feedback Process

The monitoring and feedback process involves:

- [Implementing the Environmental Action Plan and Monitoring Plan as described in the SEA Statement \(Chapter 4\)](#)
- Identifying the internal and external factors that may impact the [Framework](#) Plan, mapping the areas of the ~~plan~~ [Framework Plan](#) that they will influence;
- Updating needs identification by updating the Supply Demand Balance, Drinking Water Safety Plans and Barrier scores to reflect these changes;
- Assessing the impact of these changes on the [Framework](#) Plan and Preferred Approaches Developed within the [Regional Resource Plans RWRPs](#) and;
- Updating the Need in the [Regional Plans RWRPs](#) where the changes are deemed to be material.

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

As part of the screening, Irish Water will consult with the EPA and relevant Government Departments as required by Article 9(5) of the EC (Assessment of Certain Plans and Programmes) Regulations 2004 (SI 435/2004). If, following screening, Irish Water determines that the change is likely to have significant effects on the environment it will carry out SEA before adopting the change. Irish Water will also carry out an AA if it determines, following screening, that the change is not directly connected with or necessary to the management of any European site and Irish Water cannot, on the basis of objective scientific information, exclude [the possibility](#) that the change, individually or in combination with other plans and projects, will have a significant effect on European sites, as required by Article 42(6) of the EC (Birds and Natural Habitats Regulations) 2011 (SI 477/2011).

Indicative List of Factors

Tables 8.9 and 8.10 provide an indicative but non-exhaustive list of internal and external factors that may influence the Framework Plan with potential knock on effects on the four [Regional Plans RWRPs](#)*. From the tables it can be seen that the Framework [Plan](#) is largely ring-fenced once adopted, however, changes in Need have the potential to modify the [Regional Plans RWRPs](#). This table is intended to anticipate such changes to inform the design of the NWRP - Framework Plan, but Irish Water will review and screen for SEA and AA any changes as they arise and may determine that they are material where the table considers them to be minor-[_](#) and vice versa-[_](#) on the basis of the full information then available.

* Non-exhaustive list. Irish Water will review any changes, consultation feedback and identify whether they are material and update the plans where necessary

Table 8.9 – Factors that may influence the Framework Plan

Framework Plan	Area of Plan	Likelihood	Predicted Impact	Likely Action
Legislation or new Guidelines on Water Resources Planning by Irish Water’s Financial or Environmental Regulator: At present there is no regulatory framework or guidelines for water resources planning in Ireland. Should regulations or guidelines come into effect within the time frame of the plan, the framework may need to be modified to reflect this	Methodology	Low/ Moderate	Material	If material - Variation on Plan
Legislation and Regulations on the Abstraction of Water from the natural environment: At present the Irish Government is developing new legislation on abstraction of water from the natural environment, aligned with the Water Framework Directive. This legislation and subsequent regulations on abstraction may have the potential to alter the volumes of water we currently abstract at existing sites and the volumes of water we can abstract from new supplies	Need	High	Minor in terms of the methodologies used in draft Framework Plan (as we have accounted for this change both in our sustainability assessments for existing supplies, and ensure that all new options prepared as part of the plan Framework Plan conform to conservative abstraction rules)	Update SDB and assess impact on preferred approaches in the Regional Strategic Resources Plans. If material, this will not change the framework but can potentially impact the subsequent Regional Plans.
Sustainability: The 3rd Cycle of the River Basin Management Plan is currently underway. Identification of significant pressures in water bodies relating to hydromorphology, land use planning, agriculture, siltation and hazardous chemicals, have the potential to influence need in our water supplies Any outcomes from the SEA Statement and monitoring plan.	Need	High	Minor (as we have accounted for potential changes within other risk-based approach to our supplies	Update SDB, DWSP and Barrier Scores and assess impact on preferred approaches in the Regional Plans
Leakage and Network Performance: Leakage reduction is a core activity within our plan, however, leakage is dynamic and naturally increases over time as assets deteriorate. Therefore, reducing leakage is a function of continuous reduction and maintaining established leakage savings. Across a large distribution network, there can be uncertainty amount	Need	Moderate	Minor (we have included sensitivity assessments of leakage performance as part of the Preferred approach Development process)	Update SDB and assess impact on preferred approaches in the Regional Plans

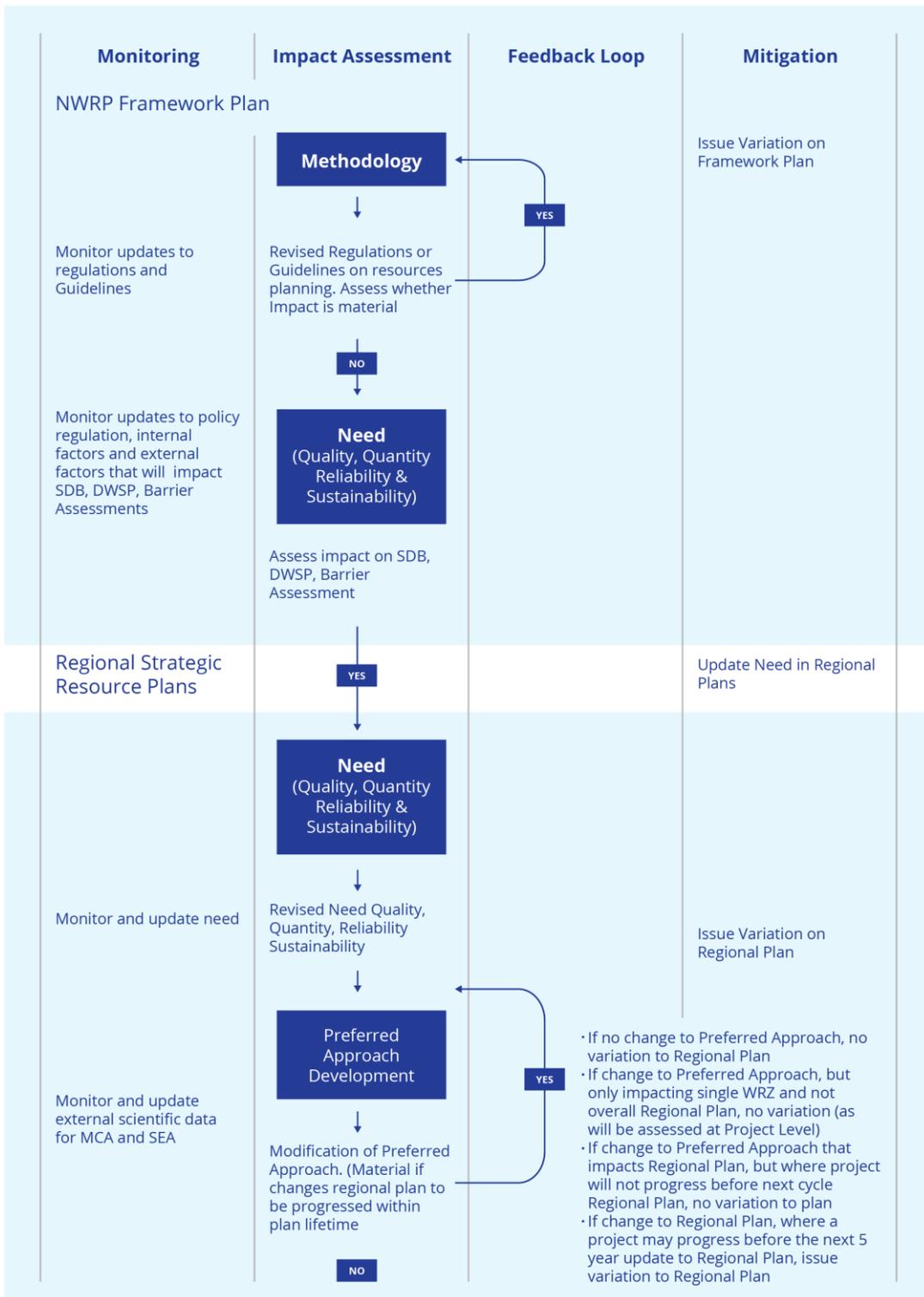
Framework Plan	Area of Plan	Likelihood	Predicted Impact	Likely Action
achieving target leakage reductions within the required timeframes, but also the potential for exceeding targets. This has the potential to modify our demand forecasts within the Plan.				
Domestic Demand Growth: The Irish Water Forward Planning team interfaces directly with the Regional Assemblies and the Local Authority Planning Departments during the preparation of the regional growth strategies and the County Development Plans. As these strategies and plans are completed, the information at settlement level will become more granular and has the potential to modify demand within the supplies.	National Water Resources Framework Plan - Need	Low/Moderate	Minor (we have continuously updated our demand figures, based on feedback from the Regional Assemblies and established interface with the Local Authority Planning and Development Sections	Update SDB, DWSP and Barrier Scores and assess impact on preferred approaches in the Regional Plans
Non-Domestic Demand Growth: Ireland has a significant and established manufacturing base across high water use sectors such as Pharmaceutical, Agri Food, Manufacturing and Hospitality. Irish water engages with key stakeholders such as the IDA and Local Authority Planners. However, it can be difficult to fully anticipate growth in high water use sectors.	National Water Resources Framework Plan - Need	Low/Moderate	Minor (we have continuously updated our demand figures, based on feedback from the Local Authority Planning and Development Sections and via the Pre-Connection Enquiry process within our Connection Developer Services function.	Update SDB and assess impact on preferred approaches in the Regional Plans
Data Improvements: Irish Water's data and intelligence systems are being continuously updated. These improvements will allow us to further develop our understanding of existing supplies, components of demand and supply specific peaking factors, outage allowances and headroom. Similarly, through catchment initiatives, monitoring of our treatment plants and distribution networks as part of the rollout of the Drinking Water Safety Plans, our understanding of Water Quality and Reliability issues is continuously improving.	National Water Resources Framework Plan - Need	Low/Moderate	Minor (we have continuously updated SDB and Barrier scores as new information becomes available)	Update SDB and assess impact on preferred approaches in the Regional Plans

Table 8.10-8.9 - Factors that may influence the Regional Water Resource Plans

Regional Water Resource Plans (4 no.)	Area of Plan	Likelihood	Predicted Impact	Likely Action
Updated Need: This could impact the Preferred Approach outcomes within the Regional Plans	Need	Low/ Moderate	Minor/ Potentially Material (in development of feasible options for each water resource zone we use conservative estimates of potential new supply availability as set out in Chapter 4)	Ensure feasible options are based on conservative estimates. Engage with Environmental Regulator on Preferred Approaches within each regional- Regional Plan . If Preferred approach is altered on a regional basis, and the Preferred Approach is to be delivered within the timeframe of the Plan, this will require variation on Plan
Improvements in available scientific and environmental datasets: This could impact the Preferred Approach outcomes within the Regional Plans	Preferred Approach Development	High	Minor/ Potentially Material (we use best available data to screen options as part of the SEA/AA processes)	Assess impact on Preferred Approach. If Preferred approach is altered on a regional basis, and the Preferred Approach is to be delivered within the timeframe of the Plan, this will require variation on Plan

* Non-exhaustive list. Irish Water will review any changes, including feedback from consultation and identify whether they are material and update the ~~plan-~~ [Framework Plan](#) where necessary

Figure 8.13 shows the feedback process in relation to the [Framework](#) Plan in terms of monitoring, impact assessment, feedback loop and actions. ~~While~~ Tables 8.9 and 8.10 show the frequency of these steps. As can be seen material changes in either the Framework Plan or the ~~Regional Strategic Resource Plans~~ [RWRPs](#) will result in variations ~~to the Plan~~, however, ~~minor~~ changes can be incorporated into the ~~plan~~ [existing Framework Plan](#) process.



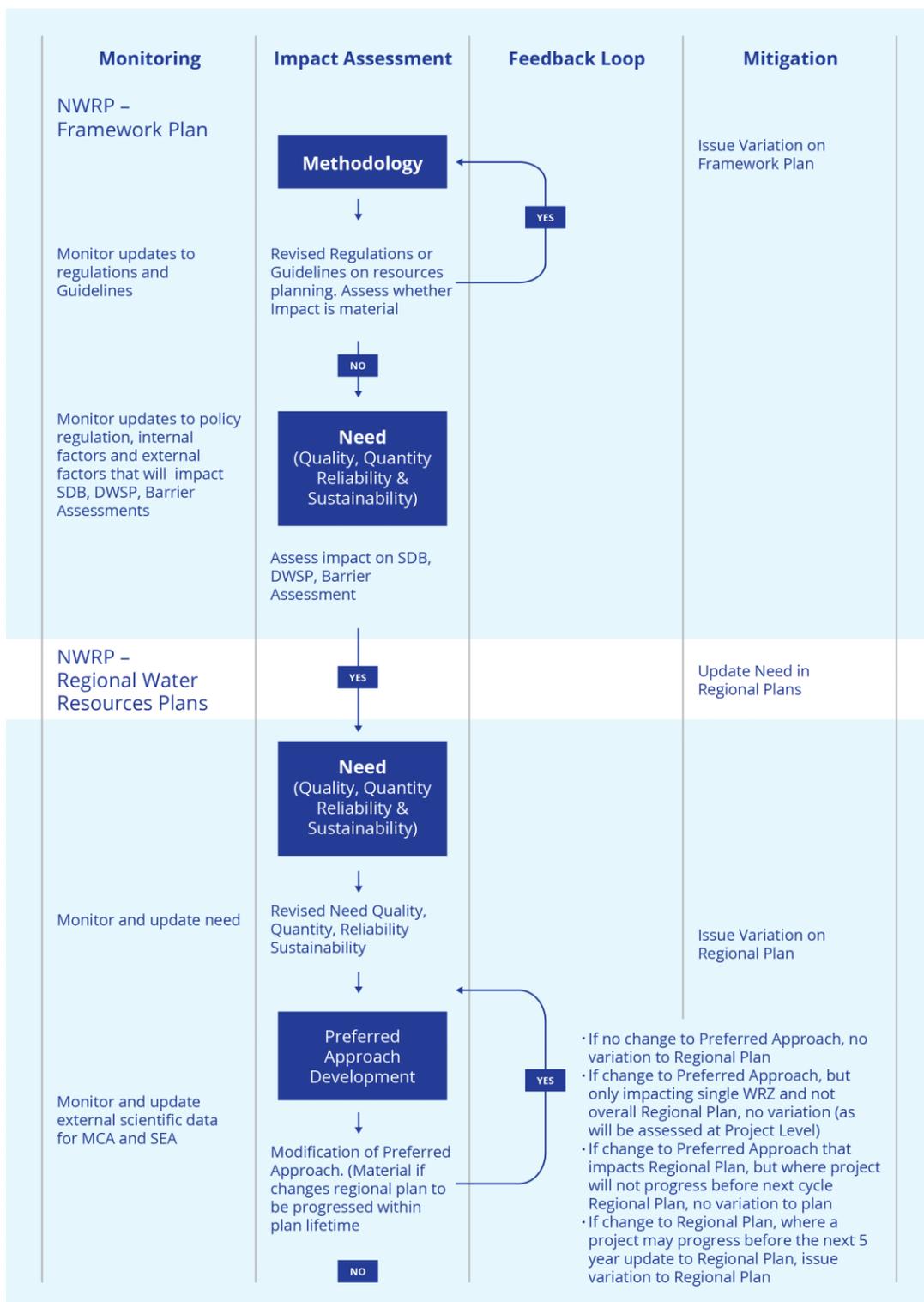


Figure 8.13 - Feedback Loop - Framework Plan

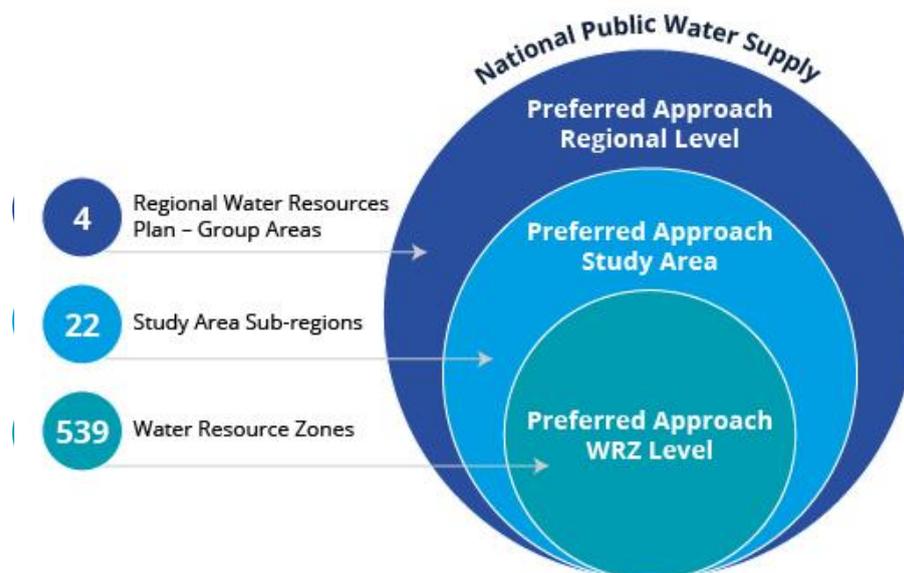


Figure 8.14 - NWRP Spatial Scale of Assessment

We apply a defined process to develop the Preferred Approach at the three spatial scales shown in Figure 8.14:

1. Assess the Feasible Options to develop a Preferred Approach for each WRZ. This would be expected to result in small local Options that can resolve need solely within all or part of the WRZ.
2. Assess the Feasible Options to see whether any Regional Options are available to meet the need across multiple WRZs. This stage can yield a modified Preferred Approach at the Study Area Level.
3. We then assess the Feasible Options at the Regional ~~Group~~-Area level to see if there are any Options that can be applied across the entire Region and, if appropriate, adjust our Preferred Approach accordingly.
4. The final stage is to assess any inter-regional options and potential cumulative or in combination effects and determine if any adjustment is required. (This will be addressed sequentially in each of the ~~RWRP Plans~~ RWRPs in turn).

8.3.8.2 SEA and AA of Preferred Approaches

Following identification of the Preferred Approaches as part of the ~~Regional Water Resources Plans~~ RWRPs (including the SEA and AA requirements considered throughout the Approach Development), SEA and AA assessments will be undertaken of the Preferred Approaches. This will include cumulative and in combination assessments. The assessments will feed back into the process where additional significant effects are identified and mitigation to address cumulative and in combination effects will be included in the overall recommendations.

The SEA Statement ~~from the Framework Plan~~ and AA Determination for the adopted Framework Plan, as well as any mitigation and monitoring recommendations identified, will also be taken into account in the ~~Regional Plans~~ RWRPs. As part of the implementation of the Framework Plan, we are committed to the implementation of the SEA recommendations and Monitoring Plan. The ~~NIS report~~ AA Determination forms the output of the AA process.

8.4 Summary

In this section we have described our proposed methodology to develop the Preferred Approach or Approaches to resolve water resource needs across our supplies. We have also described how evolving data and circumstances will be considered on an ongoing basis as part of a monitoring and feedback process.

~~This~~ The Options Assessment and Preferred Approach Development Methodology described in this Framework Plan will be applied to all of the WRZs in the four ~~Regional Water Resources Plans, once it has been adopted by Irish Water~~ RWRPs currently being developed.

9

What Happens Next

9 Key Points

In this Chapter we will provide:

- A summary of the ~~draft~~ Framework Plan
- An outline of our next steps to implement our three-pillar approach and new Options Assessment Methodology² to improve the LoS we are able to provide for our customers

9.1 Summary of the ~~Draft~~ Framework Plan

This ~~draft~~ Framework Plan describes the process that Irish Water will use to transform our asset base and move towards a sustainable, secure, reliable and sustainable drinking water supply for everyone over the next 25 years.

It describes the baseline performance of our existing asset base including:

- Current Levels of Service:
- Issues with single source supplies
- Performance issues during extreme weather events such as storms, drought period and freeze-thaw events
- Asset Performance in terms of the standards we have set for risk to water quality
- Asset Performance including high leakage
- Potential sustainability issues with our supply sources
- Funding Constraints

Box 9.1

At a national level we currently have a Dry Year Critical Peak demand of 2,266 Million litres per day with a corresponding supply available of 1,773 MI/d. This gives a deficit of 493MI/d.

If there is no change to current water efficiency or reductions in leakage, by 2044 we forecast a demand of 2,308MI/d and a supply ~~yield~~ that falls to 1,762 MI/d because of climate change. This will result in a deficit of 546MI/d.

The available supplies will reduce further when abstraction licensing regime is introduced as some of our sites may not comply with WFD Abstraction Standards.



Current Surface Water Abstractions

50% of our 293 SW abstractions may not comply with WFD Abstraction standards

9.1.1 Identify the Need

We have detailed the methods we use to estimate quantity need through the Supply Demand Balance assessment (Figure 9.1). A Supply Demand Balance Forecast has been developed for each of our 539 Water Resource Zones, for four Weather Event Planning Scenarios, including Normal Year Annual Average, Dry Year Annual Average, Dry Year Critical Period and Winter Critical Period. The supply demand balance is forecast over a 25-year period from 2019 to 2044.

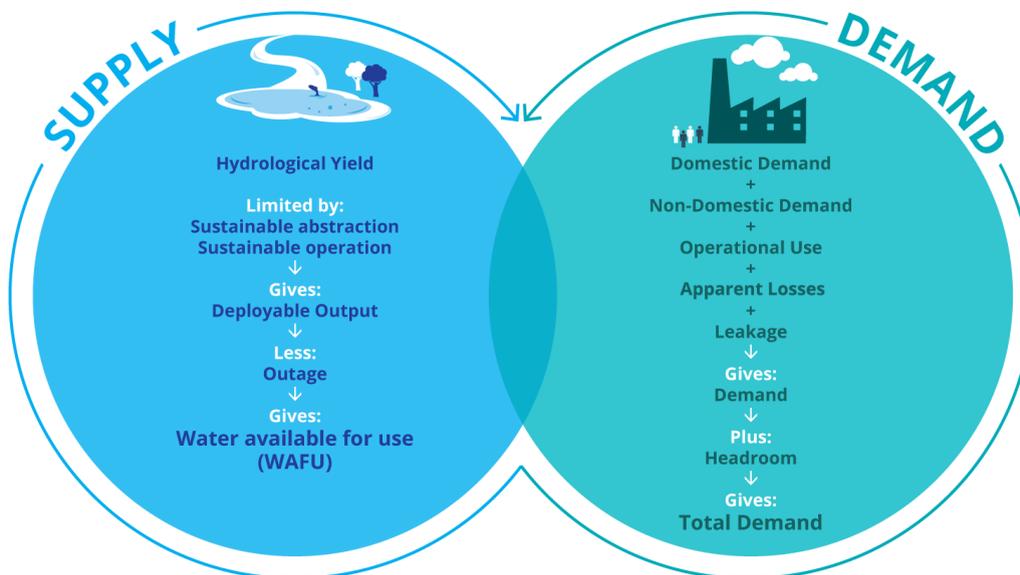


Figure 9.1 - Supply-Demand Balance

Our SDB calculations estimate that over 58% of our WRZs are at risk of being in deficit during a normal year. A deficit means that the quantity of water we can supply is exceeded by the total Demand for water. In these circumstances there is a risk of disruption to the service we provide for our customers.

During the Dry Year Critical Peak (equivalent to a summer drought), 66% of our WRZs are currently in deficit.

9.1.2 Identify the Need: Quality and Reliability

We have detailed the methods we use to estimate risk to water quality and reliability using the Drinking Water Safety Plans and the Barrier Assessments across all of our supplies (Figure 9.2).

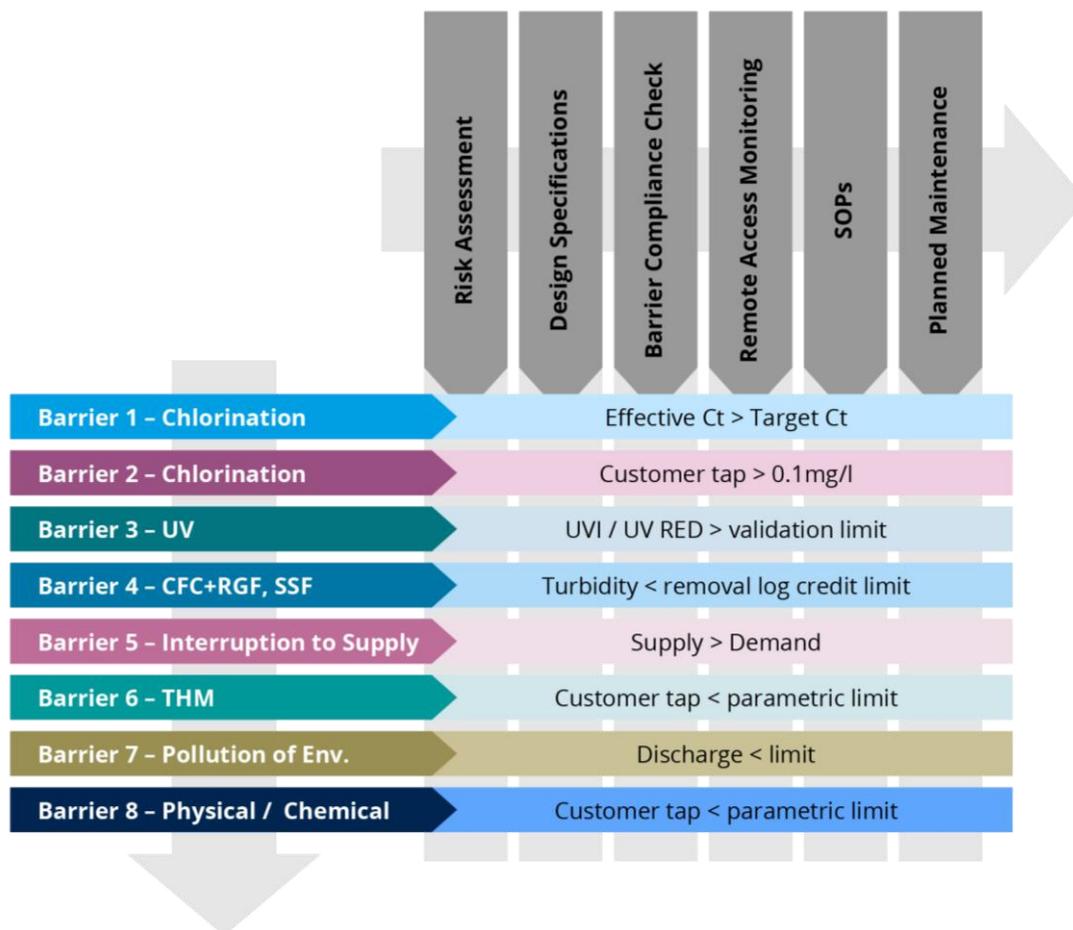


Figure 9.2 - Irish Water's Barriers for achieving Safe & Secure Drinking Water

Our Barrier Assessment of Water Resource Zones summarised in Chapter 6, shows that in some cases our current asset capability does not meet the standards we have set for ourselves. Therefore, significant asset transformation and capital investment may be required over the coming regulated investment cycles, to ensure that our supplies are secure and address risks to water quality.

9.1.3 Identifying appropriate solutions: Our Three Pillar Approach

Our **draft** Framework Plan is based on the best currently available data. It has detailed the SDB, Barrier Assessment approaches and identified need across all of our Water Resources Zones. Within this **draft Framework** Plan we have developed the methodology we will use to reduce or eliminate identified needs and bring greater resilience to the water supply network over future investment plans.

We have described our Three Pillar Approach to developing solutions based around Lose Less, Use Less and Smarter Supply which encompass both our current and future activities.

Lose Less: reducing water lost to the system through leakage

Use Less: reducing water use through efficiency measures

Supply Smarter: improving the resilience and security of our supply through infrastructure improvements.



We will implement the three-pillar approach through our current and future activities to deliver a minimum of 1 in 50-year Level of Service to all our customers and ensure the sustainability and reliability of all assets.

9.2 Options Assessment Methodology and Preferred Approach Development

The objective of the National Water Resources Plan is to incrementally improve our supply networks to provide safe, secure, reliable and sustainable sources of supply for our customers. To achieve this we must ensure that our supplies are based on:

- Consideration of Government Policy, Sectoral Adaptation Plans and the Circular Economy
- Sustainable water sources that do not impact on the environment and are resilient to climate change
- The required number and variety of water sources in each supply to allow us maintain supply continuity across a range of weather events
- Appropriate catchment protection activities and water treatment facilities that ensure compliance with Drinking Water Regulations in all weather conditions
- Innovation, new technologies and Ecosystem Services where possible
- Ability to address current and future deficits with the flexibility to manage inevitable unpredictable events.
- Reliable and interconnected distribution networks that provide the required Levels of Service to our customers
- Careful Operational Management and continued investment in capital maintenance
- Efficient and low energy networks with the continued emphasis on leakage reduction
- The principles of Water Conservation and reducing demand

In order to ensure that we achieve the objectives of our plan and that we transform the existing national public water supply, we have developed an Options Assessment and Preferred Approach methodology shown in Figure 9.3.

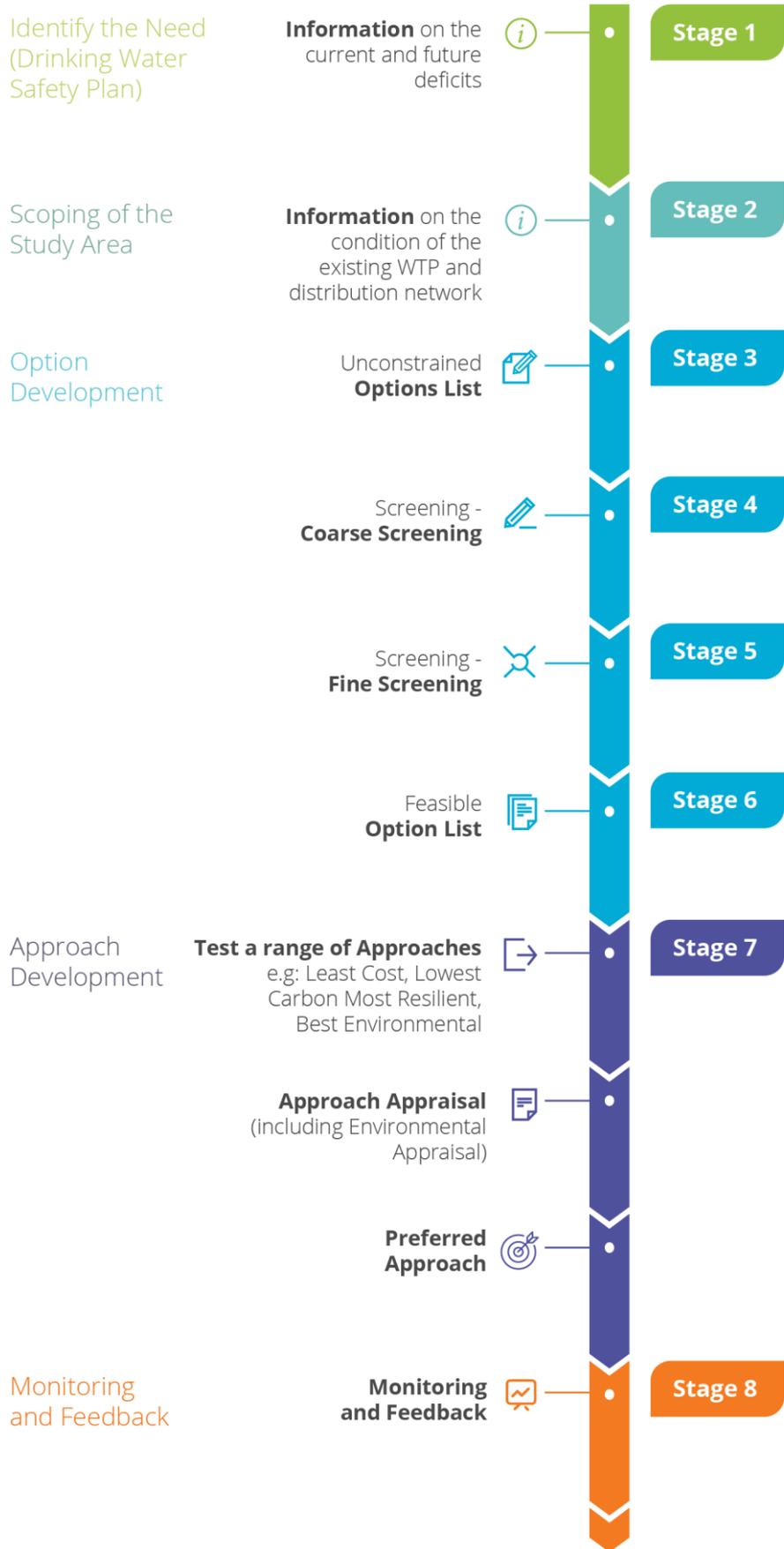


Figure 9.3 - Options Assessment and Preferred Approach Methodology

9.2.1 Delivery of the National Water Resources Plan

As this is our first National Water Resources Plan (NWRP), within this ~~draft~~ Framework Plan we have described how it has been split into two distinct Phases. ~~This is further~~ summarised as follows:

9.2.1.1 Phase 1: ~~National Water Resources Plan NWRP – Framework Plan (This Consultation)~~

Phase 1 of the ~~draft NWRP -Framework~~ Plan ~~will include~~ included:

- A screening for the NWRP
- An SEA scoping (Phase 1 NWRP Consultation one)
- The methodology ~~we will use~~ used to develop our plan including:
 - How we assess quantity need through the Supply Demand Balance
 - How we assess quality and reliability need through the Barrier Assessment
 - How we address Sustainability by ensuring that all new options for water supply must be based on conservative approaches to protecting water sources
 - Our Options Assessment Process
 - Our Preferred Approach Development Process
- An assessment of Need across our asset base in terms of Quality, Quantity, Reliability and Sustainability for all of our supplies nationally.
- A sample Case Study of the methodology in the draft Framework Plan ~~methodology~~ applied to a number of Water Resource Zones ~~(including sample environmental review information) will also be~~ provided as supporting material for the Phase 1 ~~consultation. However, this is for illustrative purposes only and does not form part of the consultation during this Phase.~~ NWRP Framework Plan – Consultation two.
- ~~Once the Framework Plan has been adopted, the~~ The options assessment and preferred approach methodology ~~will outlined in this Framework Plan, as adopted by Irish Water having considered all of the submissions received during the Phase 1 NWRP Framework Plan – Consultation two process, will now~~ be applied to all of our current water supplies ~~within in~~ Phase 2 of our ~~National Water Resources Plan NWRP~~, where we will develop the four Regional Water Resources Plans.

9.2.1.2 Phase 2 NWRP: Four Regional Water Resource Plans

In order to manage the delivery of Phase 2 of the NWRP, the public water supply ~~will be~~ has been divided into the four Regional ~~Groups~~ Areas shown in Figure 9.4.

We will ~~then~~ now:

- Apply the methodology in this Framework ~~Methodology Plan~~ to the Regional ~~Group~~ Areas of Water Supplies
- Develop Plan Level Preferred Approaches (solutions) for all water supplies within these ~~group~~ areas.

The Regional Water Resource Plans (RWRPs) will be referred to as follows:

- Regional Water Resource Plan: North West (Group Area 1)
- Regional Water Resource Plan: South West (Group Area 2)
- Regional Water Resource Plan: South East (Group Area 3)



- Regional Water Resource Plan: Eastern and Midlands (Group Area 4)

~~Figure 9.4 - Regional Water Resources Plan – Group Areas~~

~~In this consultation we are asking for feedback on the draft Framework plan, as highlighted in Figure 9.5.~~

=

[Figure 9.4 - Regional Water Resources Plan – Regional Areas](#)

National Water Resources Plan (The Plan)



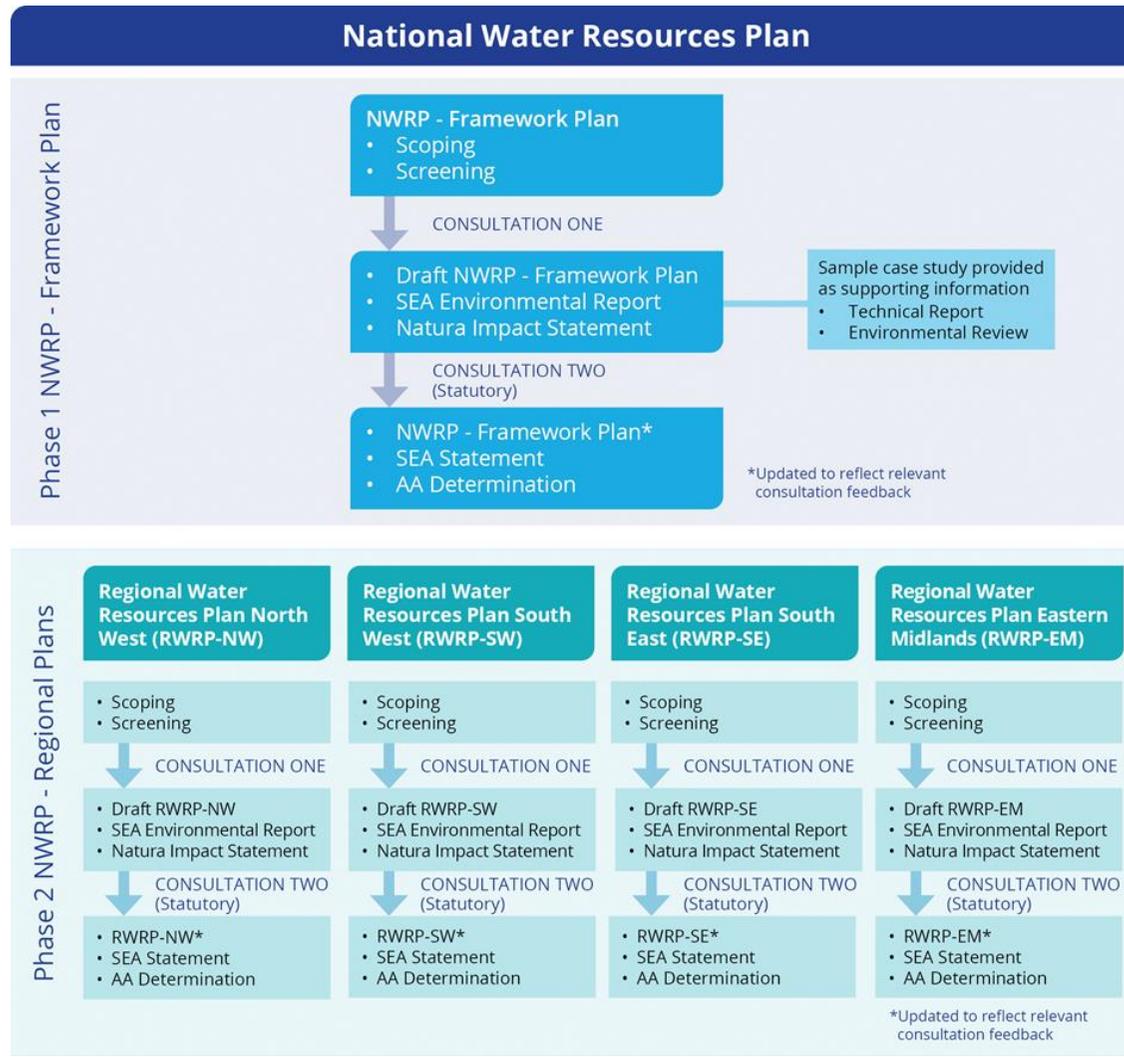


Figure 9.5 – Key elements of the NWRP and the ~~Phased~~ Phase 1 and Phase 2 Consultations

~~Subsequent to~~ Following the adoption of the Framework Plan, Irish Water will now develop and consult on the four Regional Water Resource plans, as summarised in Figure 9.5.

9.3 Tracking our Progress

Irish Water will establish clear metrics in conjunction with the relevant regulators to monitor our progress in delivering a more sustainable and robust supply system. Key metrics will be the number of customers receiving target Level of Service (LoS), and the number of unsustainable abstractions identified through the RBMP process. The first of these measures will be identified through the Security of Supply measure being developed in conjunction with the CRU. The second will be through abstraction activities identified alongside the EPA.

The objective will be to deliver a minimum of 1 in 50 LoS to all customers and remove all unsustainable abstractions. Both will require considerable investment and time to implement. Periodic targets will be established through the NWRP.

9.4 ~~What Happens Next~~

9.4 Adoption of the NWRP - Framework Plan

~~We are consulting on this draft Framework Plan during the period December 2020 to January 2021 and would like to hear your views. All feedback received will be reviewed by the NWRP team and our responses will be published.~~

~~Following the consultation, we will publish a final version of the Framework Plan.~~

We consulted on the draft Framework Plan between the 8th of December 2020 and the 12th of March 2021. This Framework Plan is an amended version of the draft Framework Plan as consulted on and has been amended in light of and following consideration of all submissions received.

The consideration given to all of the submissions received on the draft Framework Plan is contained in a Consultation Report. The Consultation Report attaches a version of the Framework Plan showing all changes made to the draft Framework Plan.

The Framework Plan is accompanied by an SEA Statement and Appropriate Assessment Determination as required by law, which were adopted with this Framework Plan.

These Phase 1 NWRP documents can be viewed at <https://www.water.ie/projects-plans/our-plans/nwrp/>

Phase 2 of the NWRP, which requires the development of and consultation on four Regional Water Resources Plans is underway. Those RWRPs are due for completion in 2022 following consideration of submissions received during the relevant consultation processes. We will ~~then commence Phase 2 of the Plan, the Drafting and Consultation for the Regional Water Resources Plans. As part of this Phase we will~~ apply the Options Assessment and Preferred Approach methodology set out in the ~~adopted~~ Framework Plan to each water supply. This will allow us to develop a nationwide programme of short, medium- and long-term options that we will present for consultation within ~~the Regional Plans~~ draft RWRPs. The ~~Regional Plans~~ RWRPs once adopted will be used to inform future regulated capital investment plans and operational plans on a national basis.

Consultation on Phase 2 of the NWRP, the Regional Water Resources Plans, including corresponding SEA Environmental Reports and Natura Impact Statements, will be undertaken during 2021 ~~(subject to adoption of the Framework Plan)~~ and 2022.

Glossary of Acronyms and Terms

Term	Description
AA	Appropriate Assessment
<u>Best AA</u>	<u>The approach that following a desktop assessment, has the least impact on a European Site (without consideration of mitigation measures)</u>
ALC	Active Leakage Control
BIM	Bord Iascaigh Mhara
BWN	Boil Water Notice
CER	Commission for Energy Regulation
CFC	Coagulation/Flocculation/Clarification
CRU	Commission for Regulation of Utilities
CSL	Customer Side Leakage
CSO	Central Statistics Office
DAFM	Department of Agriculture, Food and the Marine
DO	Deployable Output
DHLGH	Department of Housing, Local Government and Heritage
DHPLG	Department of Housing, Planning and Local Government
DMA	District Metered Area(s)
DWD	Drinking Water Directive
DWR	Drinking Water Regulations
DWSP	Drinking Water Safety Plan
DYAA	Dry Year Annual Average
DYCP	Dry Year Critical Period
EBSD	Economics of Balancing Supply and Demand
EPA	Environmental Protection Agency
FDC	Flow Duration Curve
GDA	Greater Dublin Area
GSI	Geological Survey Ireland
Headroom	Headroom is the term given to a buffer in the SDB. It accounts for the uncertainty with data and the assumptions used in the supply and demand estimates and forecasts.
HSE	Health Services Executive
IBEC	Irish Business and Employers Confederation
ICARUS	Irish Climate Analysis and Research Unit

IDA	Industrial Development Authority Ireland
INTERREG	Series of European Regional Co-Operation Programmes
LAWPRO	Local Authority Waters Programme
LMS	Leakage Management System
LoS	Level of Service
MCA	Multi-Criteria Analysis
MCW	Marginal Cost of Water
MI/d	Mega litres per day
MSSA	Midlands Strategic Study Area
MUR	Meter Under Registration
NAP	National Adaptation Plan
NCCAF	National Climate Change Adaptation Framework
NIS	Natura Impact Statement
NOM	Natural Organic Matter
NPDWAG	National Pesticides and Drinking Water Action Group
NPF	National Planning Framework
NPV	Net Present Value
NPWS	National Parks and Wildlife Service
NRR	Natural Rate of Rise of Leakage
NWRP	National Water Resources Plan
NYAA	Normal Year Annual Average
OFWAT	Economic Regulator of the Water Sector in England and Wales
PAP	Pesticide Action Procedure
PCC	Per Capita Consumption
PCT	Project Costing Template
PHC	Per Household Consumption
Progressibility	Criterion to assess relative difference between options, and how progressible different options may be
RAL	Remedial Action List
Raw Water Quality	The chemical characteristics or quality of the water in the river/lake/groundwater source before it is treated.
RBMP	River Basin Management Plan
RSES	Regional Spatial and Economic Strategy

RWRP	Regional Water Resources Plan
SDB	Supply Demand Balance
SEA	Strategic Environmental Assessment
SEAI	Sustainable Energy Authority of Ireland
SELL	Sustainable Economic Level of Leakage
SLA	Service Level Agreement
Tankering	Delivery of water supplies by water tanker
THM	Trihalomethane
TOC	Total Organic Carbon
TTHM	Total Trihalomethane
UARL	Unavoidable Annual Real Losses
UKWIR	UK Water Industry Research Ltd
WAFU	Water Available For Use
WCP	Winter Critical Period
WFD	Water Framework Directive
WHO	World Health Organisation
WRc	Water Research Centre Ltd., UK
WRZ	Water Resources Zone
WSPS	Water Services Policy Statement
WSSP	Water Services Strategic Plan
WSZ	Water Supply Zone
WTP	Water Treatment Plant
ZOC	Zone of Contribution

Comparison Details	
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Comparison Time	16.73 seconds
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Sources	
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Modified Document	NWRP Framework Plan_For Final Adoption_2021_05_25.docx

Comparison Statistics		
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