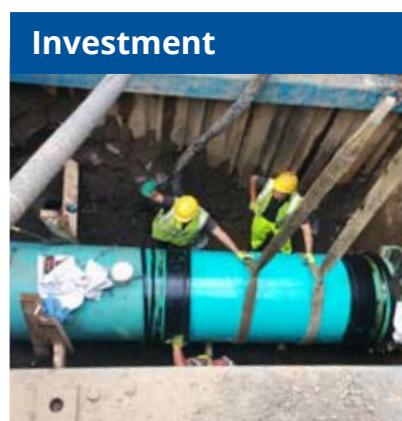
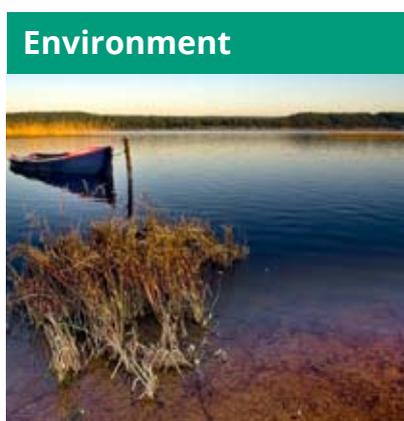
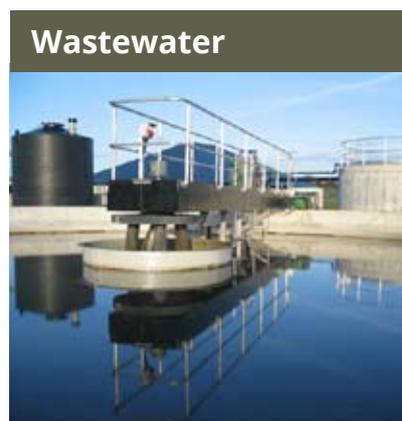


Draft Water Services Strategic Plan

A Plan for the Future of Water Services



Irish Water at a glance...

Irish Water was created in

2013 and serves

3.3 million people producing over
1.6 billion Litres

of drinking water every day and taking 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 around:

856 *water treatment plants*

which deliver water through an estimated

60,000 kilometres of pipelines

We treat wastewater in more than

1000 wastewater treatment plants

and it is collected through an estimated

25,000 kilometres of pipelines

plus numerous pumping stations and sludge treatment centres.

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Executive Summary

Our Vision

Effective water services, including the delivery of a reliable, clean water supply and safe disposal of wastewater, are essential for a modern country. This document presents the draft Water Services Strategic Plan prepared by Irish Water which provides, for the first time, an opportunity to consider, at a national level, the way that water services are delivered in Ireland. The plan takes a 25 year view towards the vision that

Through responsible stewardship, efficient management and strong partnerships, Ireland has a world-class water infrastructure that ensures secure and sustainable water services, essential for our health, our communities, the economy and the environment’.

The plan is prepared as a basis for broad public and stakeholder engagement and a glossary of technical terms used is included at the end of the document.

Overview of Irish Water

Irish Water was established as a subsidiary of the Ervia Group (formerly Bord Gáis Éireann). Ervia now has responsibility for the delivery of gas and water infrastructure and services in Ireland. Establishing Irish Water involved the creation of the required organisation, management systems and processes to manage the water services assets estimated to have a value of €11 Billion, drawing on the experience and expertise of Bord Gáis Éireann, as a modern efficient and customer focused energy utility.

Incorporated in July, 2013, Irish Water brings the water and wastewater services of the 34 local authorities together under one national service provider. From the 1st January, 2014, Irish Water became responsible for all public water services, involving the supply of drinking water and the collection, treatment and disposal of wastewater.

Irish Water took on the operation of the assets through Service Level Agreements (SLAs) with all 31 local authorities (after amalgamation of the previous 34), who continue to provide day to day operations. We also took over all of the capital investment decisions and implementation of the capital programme delivery across the country.

In discharging its role as the national water services utility, responsible for water services operations and investment, Irish Water is accountable to:

- a) The economic regulator, i.e. the Commission for Energy Regulation (CER), which is charged with protecting the interests of the customer, while approving an appropriate funding requirement sufficient to enable the utility to deliver the required services to specified standards in an efficient manner; *and*
- b) The environmental regulator, i.e. the Environmental Protection Agency (EPA), which sets standards and enforces compliance with EU and National Regulations for drinking water supply and wastewater discharge to water bodies. The EPA liaises with the HSE in matters of public health.

Our Challenges

Irish Water is responsible for the delivery of water services to approximately 80% of the population. Whilst many customers receive a good quality water supply and wastewater provision, a significant proportion are dissatisfied with these services; based on quality, capacity and reliability issues. Despite the good work of local authorities over many decades, under-investment combined with lack of planned asset management and maintenance programmes has led to a legacy of deficiencies in our treatment plants and networks. In many areas, limitations on treatment and/or network capacity urgently need to be addressed to accommodate new housing, commercial and industrial developments.

In our two largest cities of Dublin and Cork, we continue to rely for part of the daily drinking water requirement on 19th century systems which are no longer fit for purpose in their current condition. This exposes these supplies to an unacceptable risk of failure. Outside of our major urban centres, our water supply network is fragmented with many small and vulnerable water sources. Water quality does not meet European and Irish drinking water standards in many of our schemes and up to 30% of water treatment plants are considered to be “at risk” of failure in terms of

quality parameters. An estimated 23,000 customers have a current Boil Water Notice, indicating that their water is not fit for drinking due to the risk of microbiological contamination. One hundred and twenty six (126) water supply zones are on the EPA's Remedial Action List (see Appendix 2 for a list of water supply zones on the EPA RAL in Q3 2014), requiring investment and/or significant improvement in operation to reduce the risk of failure to accepted levels. We are also losing almost half of the water we produce due to leakage within our water mains and within customer properties.

Wastewater must be collected and treated before it is returned to the environment. The most recent EPA assessment of urban wastewater¹ identifies that wastewater treatment is not at the required standard in 38 of our larger urban areas and that 44 areas discharge raw sewage (sewage that is untreated or has had preliminary treatment only) (see Appendix 3 for list of these areas). As a result of Ireland's failure to meet the requirements of the EU Urban Waste Water Treatment Directive in respect of 71 agglomerations/areas in 2011 (see Appendix 4 for the list of the 71 non-compliant agglomerations) the European Commission has initiated an Infringement Case against the state. Many of our sewers in urban areas receive rainfall run-off from roads and hard surfaces in addition to wastewater. These combined sewers are frequently overloaded during periods of heavy rain resulting in the flooding of some properties and giving rise to overflows which can cause pollution within our rivers and streams.

Apart from these compliance challenges, the welcome return of economic growth brings a requirement for additional capacity to support housing development, together with offices, factories and commercial buildings supporting jobs. There are areas zoned for development which are currently constrained by limitations in system capacity for water and wastewater. This additional demand must be met without risk to existing customer service standards. Key national policy objectives for employment and increasing housing output (Construction 2020²) must be provided for. The Housing Supply Co-ordination Task Force for Dublin (established by the DECLG as an action under Construction 2020) identifies water services infrastructure deficit among the constraints to be overcome if housing needs are to be met in the Greater Dublin Area.

Substantial improvements to water supply capacity, quality and reliability are required in addition to upgrading of our wastewater infrastructure, both treatment plants and collection networks, in order to protect the environment. This will require significant capital investment over many years. Even with additional funding, the timescale to address all of the issues is likely to extend through a number of investment cycles so that we must prioritise projects which should proceed in order of criticality

What is the Water Services Strategic Plan?

This Water Services Strategic Plan sets out strategic objectives for the delivery of water services over the next 25 years up to 2040. It details current and future challenges which affect the provision of water services and identifies the priorities to be tackled in the short and medium term. The plan will be reviewed on at least a five yearly basis to ensure that it continues to be up to date with current and future needs. In developing the plan, we have considered its interaction with other national and regional strategic plans such as the National Spatial Strategy and River Basin Management Plans. This plan (Tier 1) also provides the context for subsequent detailed implementation plans (Tier 2 Plans) which will document the approach to be used for key water service areas such as water resource management, wastewater compliance and sludge management.

In addition, Irish Water will prepare Business Plans during the period setting out targets for delivery of efficiencies in operational and capital expenditure and performance targets consistent with the delivery of the objectives in this WSSP. In accordance with the Service Level Agreements with the now 31 Local Authorities, a series of transformation initiatives are being implemented in partnership with the local authorities. The most important of these will be the development of the Water Industry Operating Framework to facilitate the delivery of water services under the single utility model.

The Water Services (No. 2) Act (2013) provides for Ministerial Direction on the form and content of this WSSP and the Minister has set out the requirement for the plan to address the delivery of six strategic objectives as follows:

¹ Focus on urban wastewater treatment in 2013. Published by the EPA, December 2014.

² Construction 2020, A strategy for a renewed construction sector; May 2014; Government Publication; 2014

-
- **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.**



These are not in a particular order of priority. For each strategic objective within the plan, we outline the current situation, identify the key challenges and propose a number of aims and strategies to address the objective. We have suggested targets within the plan in order that our performance against the objectives can be monitored and assessed by our regulators, other stakeholders and our customers. It should be noted that a number of strategies are cross cutting between strategic objectives. For example, strategies for achieving effective wastewater management will also result in protecting the water environment.

An initial public consultation on the issues to be included in the plan was completed in the summer of 2014 and has informed this document. The draft plan has been subjected to Strategic Environmental Assessment and Appropriate Assessment and these documents are also published and are available at <http://www.water.ie/about-us/project-and-plans/future-plans/> along with the draft plan.

Our Current Priorities

Our priorities for the short to medium term are identified as:

- Demonstrating our commitment to the delivery of an improved quality water and wastewater service at an affordable cost for our customers.
- Remediating the drinking water quality problems where customers have a Boil Water Notice or water supplies fail other mandatory requirements of the Drinking Water Regulations. We are also prioritising high risk plants identified in the EPA Remedial Action List.
- Complying with the Urban Waste Water Treatment Directive and, in particular, addressing the lack of wastewater treatment at 44 urban centres and improving treatment at the 38 larger urban areas which do not currently meet the required treatment standards. We are also prioritising upgrades at sites of serious pollution including sites resulting in adverse impacts on Bathing Waters.
- Reducing the excessive leakage from our water mains through our water conservation programmes. Completion of the domestic metering programme in line with Government policy will create customer awareness of their water usage and support behavioural changes in water consumption. It will also identify where lead pipes exist and the location of customer side leaks which can be addressed through our “first fix policy”
- Capturing accurate information on the nature, condition and performance of all of our assets (infrastructure and equipment) into quality assured databases, especially critical assets whose failure would have significant customer impacts, in order that we can better target investment in asset maintenance/upgrades.

Our Strategic Objectives

Our six strategic objectives are highlighted in the paragraphs below.

Objective: Meet Customer Expectations

Our aim under this objective is to **establish both customer trust and a reputation for excellent service** through delivering our set of defined strategies; thereby, building the trust and confidence of our customers.

We recognise the need for the provision of high quality, reliable water services, delivered through resilient systems, at an affordable price. Our first response to ensure affordability has been to review all proposed capital investment in the water services assets to more accurately define the scope required and confirm value for money. However, even with savings identified by re-scoping and introduction of new technologies, the level of investment required remains significant and we must prioritise the required projects against the available funding.

Our economic regulator, CER, has set out the levels of service which we are required to meet in the Customer Handbook and this is supplemented by a number of Codes of Practice which we have prepared. These relate to how we will correspond with our customers, deal with requirements for billing, complaints and other matters.

We will actively communicate with our customers, particularly when we must temporarily interrupt services, giving advance notice in accordance with our Codes of Practice. When we have unplanned interruptions, for example as a result of burst mains or other emergency works, we will use national, regional and local media as well as social media and mobile notifications with particular regard to vulnerable customers.

We will fully support the work of the Public Water Forum to be established under the Water Services Act, 2014, with respect to their comments and suggestion in relation to the performance by Irish Water of its functions.



Key targets in relation to meeting customer expectations by the end of 2021 and 2040 include;

Customer Contact Handling – maintain the number of customer calls answered within 20 seconds at the current baseline of 80% and less than 5% of abandoned calls in line with best practice in utilities in Ireland and the UK.

Customer Complaint Handling – increase the percentage of customer complaints resolved (or steps taken towards resolving the complaint) within 5 working days of receiving the complaint from current baseline of 90% to 100% by the end of 2021 and maintain this rate.

Note: for all targets identified in relation to this objective – see Indicators and Targets under this Objective in the main body of the document

Objective: Ensure a Safe and Reliable Water Supply

Our aims under this objective are to:

- Manage the quality of drinking water from source to tap to protect human health.
- Manage the availability and reliability of water supply now and into the future.
- Manage the affordability of water supplies.



Safe and reliable water supplies are essential to public health, social and economic growth. Irish Water currently operates 856 water treatment plants. Water quality from some of these water treatment plants does not meet the current Drinking Water Quality Regulations due to microbiological contamination or exceedances of other water quality parameters. Many of these treatment plants take their water from small water sources which are vulnerable to contamination and the impacts of climate change. The water supply distribution networks operate as isolated systems which are not interconnected. We also estimate that, nationally, we are losing approximately 49% of the water we treat due to leakage from our water mains and within customers' properties. Some of our older water mains and our customers' service pipes are made from lead which can in itself contribute to contamination of water by dissolving into the water, particularly at times of no or low flow.

We have proposed a set of strategies to address the above challenges which include to:

- Prepare and implement a **National Water Resources Plan** for the strategic development of water supplies that comply with the water quality standards and build in security of supply through the interconnection, where practicable, of our current water supply networks and the development of new, larger and more secure water sources serving regional schemes.
- Prepare and implement **Drinking Water Safety Plans** to protect our water supplies in accordance with international best practice, eliminating Boil Water Notices other than from short term extreme events. Implement a national set of **Standard Operating Procedures** in our water treatment plants and networks to ensure their correct, efficient and safe operation.
- Implement a **Lead Strategy** to reduce the potential for water to dissolve lead from pipework and to replace our public lead water mains over a ten year period.
- Manage all our **water abstractions** to minimise their impact on the environment.
- Implement **Regional Water Conservation Strategies** to reduce leakage from our water mains by over 50% in the period of the WSSP.
- Adopt an **asset management approach** to maintenance and investment in our infrastructure and equipment so that we maximise the lifespan of our assets for consistent levels of service at least cost, utilising the capabilities and systems established in Irish Water.

Key targets in relation to ensuring a safe and reliable water supply by the end of 2021 and 2040 include;

Drinking Water Microbiological Standards – increase the percentage of samples complying with water quality standards from the current baseline of 99.82% to 99.99% by the end of 2021 and maintain that compliance rate.

Leakage of Treated Water – reduce the current leakage rate of approximately 49% to less than 38% by the end of 2021 and to an economic level of leakage (18-22%) by 2040

Note; for all targets identified in relation to this objective – see Indicators and Targets under this Objective in the main body of the document

Objective: Provide Effective Management of Wastewater

Our aims under this objective are to:

- Manage the operation of wastewater facilities in a manner that protects environmental quality.
- Manage the availability and resilience of wastewater services now and into the future.
- Manage the affordability and reliability of wastewater services.

Wastewater must be collected and treated to an acceptable standard before it is discharged back into the environment. As a minimum, discharges from our wastewater networks must comply with the standards set by the EU Urban Waste Water Treatment Directive (UWWTD). A number of our treatment plants do not meet this requirement. Some of our combined sewers (pipes which receive both wastewater and the rainfall run-off from our roads and other hard surface areas) do not have the capacity to cope with heavy rainfall and this can result in flooding of properties. During intense rainfall, combined sewer overflows (CSOs) discharge effluent into our watercourses with limited or no treatment and this can result in unacceptable levels of pollution.

We are proposing a number of strategies to tackle these issues including to:

- Prepare and implement a Wastewater Compliance Strategy to improve management of the wastewater systems. This will seek to address unacceptable discharges through improvements to treatment and remediate problems associated with combined sewers, where feasible.
- Prepare and implement national Standard Operating Procedures to ensure that all of our wastewater treatment plants and networks are operated correctly, safely and efficiently.
- Progressively meet the requirements of the UWWTD and the EPA Discharge Licences and Certificates.
- Identify and record properties at risk of flooding from combined sewers and implement measures to reduce and mitigate this risk.
- Plan and deliver measures to reduce the pollution impact from combined sewer overflows.
- Adopt an asset management approach to maintenance and capital investment, as for our water supply services, utilising the capabilities and systems established in Irish Water.

Key targets in relation to providing effective management of wastewater by the end of 2021 and 2040 include;

Compliance with UWWTD – increase the percentage of the population equivalent served by wastewater treatment plants that are compliant with the requirements of the UWWTD from the current baseline of approximately 60% to 90% by the end of 2021 and to 100% by 2040.

Pollution Incidents caused by Irish Water's Waste Water Treatment Plants – deliver a reduction in the number of Class 2 pollution incidents (localised pollution) from a current baseline of 149 incidents to 75 incidents by the end of 2021 and to 20 incidents by 2040.

Note; for all targets identified in relation to this objective – see Indicators and Targets under this Objective in the main body of the document.



Objective: Protect and Enhance the Environment

Our aims to protect and enhance the environment are to:

- Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment.
- Operate our infrastructure to support the achievement of water body objectives under the Water Framework Directive.
- Manage all our residual waste in a sustainable manner.

Protecting and improving the long term quality of the water environment enables safe, affordable water services as well as protecting human health and biodiversity. Many sectors have activities which impact on the water environment including emissions from industry, polluted run-off from agriculture, private household septic tanks as well as our water and wastewater services. A balance needs to be struck between our activities that impact on the water environment and the ability of the environment to sustain these impacts over both the short and longer term.

Climate change in Ireland is predicted to cause a greater frequency of extreme weather events which could result both in increased flooding risk and periods of drought. It is important to ensure that water services are adapted to the impacts of climate change in terms of;

- Adapting our assets to be resilient to climate change impacts;
- Mitigating our climate impact by reducing our carbon footprint; and
- Supporting the objectives of the National Energy Efficiency Action Plan through targeted investments and adapting asset operations.

There are a number of European Directives that give special protection to identified areas which are important for drinking water supply, nature conservation, bathing and fisheries. The Water Framework Directive, which is the over-arching Directive covering management of water resources in the EU, establishes a catchment based approach to the protection, improvement and sustainable use of inland and coastal waters including groundwater. It adopts the 'polluter pays' principle and seeks to develop holistic approaches to sustainable water use. Monitoring by the EPA indicates that many of our water bodies are not at 'Good Status' and discharges from wastewater treatment plants are one of the causes for this.

Water and wastewater treatment generates sludge products which require disposal or re-use where feasible. Wastewater sludge can be treated for re-use as a fertilizer and soil conditioner and also to generate renewable energy. We aim to retain and develop these outlets with full regard to all food safety and environmental considerations through quality management of all stages of the process.

We are proposing a number of strategies to achieve our environmental and sustainability aims including to:

- Implement a **Sustainability Policy and Framework**.
- Prepare and implement a **Sustainable Energy Strategy**.
- Prepare and implement a **Climate Change Adaptation and Mitigation Strategy**.
- Adopt a **green procurement approach** and review our current use of resources.
- Contribute to the delivery of the **Water Framework Directive** programmes of measures.
- Develop and implement **waste and sludge management plans**.

Key targets in relation to protecting and enhancing the environment to the end of 2021 and 2040 respectively include;

Energy Efficiency – improve the energy efficiency at Irish Water facilities over the 2009 baseline by 33% by 2020 (national policy target) and meet the targets that will be established by national energy policy to 2040.

Facilitate the achievement of water body objectives under the Water Framework Directive – achieve the key targets identified under the Effective Management of Wastewater objective with respect to wastewater treatment and effluent discharges from Irish Water's facilities.

Note; for all targets identified in relation to this objective – see Indicators and Targets under this Objective in the main body of the document.

Objective: Support Social and Economic Growth

Our aims under this objective are to:

- Support national, regional and local economic and spatial planning policy.
- Facilitate growth in line with national and regional economic and spatial planning policy.
- Ensure that water services are provided in a timely and cost effective manner.

The Central Statistics Office has published population growth forecasts at a national scale to 2046 and at a regional scale to 2031 based on the results of the 2011 census. These projections indicate that the national population will grow from 4.5 million in 2011 to between 5 million and 6.7 million by 2046, depending on the growth scenario used. Growth will vary across regions, with the Dublin/Mid East region likely to experience the greatest growth and the Western and Border Regions likely to experience the least growth.

The delivery of appropriate infrastructure to meet the required demand, where and when it is needed, supports the social and economic growth of the country. Reliable, high quality water supplies are increasingly important to attract foreign direct investment into Ireland. To achieve these objectives we must assess the demands for water services, based on national and regional spatial planning policies and plans, together with population and economic growth predictions. Our plans must ensure continuous service to all Irish Water's existing customers, whilst providing additional capacity to meet future population growth and industrial development. The objectives of the Government's strategic approach to housing identified in Construction 2020 must be provided for in terms of both treatment and network capacity.

However, there are a number of challenges in meeting this objective including the accurate prediction of the growth of the domestic population and changing demography. The demand from businesses and industry is uncertain and industrial development can have significant "one-off" demands for large water and/or wastewater capacity. This requires that our plans and implementation programmes are versatile and capable of being phased as far as possible to meet emerging needs.

To meet this strategic objective we will, in summary:

- Work with national, regional and local planning bodies to ensure that we understand and **plan for future development**.
- **Maximise the capacity of our existing assets** through effective management.
- **Invest in interconnection of networks and additional capacity** and ensure that we **maintain appropriate headroom** (spare capacity above demand) to cater for production risk and provide flexibility in capacity to meet new demands.
- **Balance investment for growth with affordability** of water services charges, having regard to available funding.
- Operate an equitable **new connections charging policy** for new customers.

A key target in relation to supporting social and economic growth to the end of 2021 and 2040 respectively includes;

The availability of capacity, "Headroom", at water and wastewater treatment plants to meet "core strategies" identified in development plans. The percentage of treatment plants meeting the target capacity headroom to increase from a current baseline of "unknown" to 60% of plants meeting their target by the end of 2021 and 100% of plants meeting their target by 2040.

Note: for all targets identified in relation to this objective – see Indicators and Targets under this Objective in the main body of the document.

Objective: Invest in Our Future

Our aims under this objective are to:

- Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality, secure and sustainable service at lowest cost.
- Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.
- Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.
- Promote research and utilise proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.

The historic under-investment in our water and wastewater networks and treatment facilities means that we now need to secure significantly increased levels of funding (approximately €600M capital investment each year) in order to achieve adequate standards of drinking water and wastewater compliance and to support the growth of the country. Because of the very high levels of investment required and also the significant constraints on Government borrowing, the Irish Water funding model must enable us to raise finance from other sources.

In order for Irish Water to be able to raise significant finance at favourable interest rates, it will be necessary for it to demonstrate that it is an efficient water utility company, operating within a stable regulatory framework, with secure revenue streams.

We need to achieve a sustainable balance between the level of investment and affordability working with our regulators and stakeholders. This will require that we operate efficient systems and processes in both operations and capital delivery.

Our proposals for achieving this strategic objective are to:

- Overcome the deficit in **knowledge of our current asset base** through the development of accurate databases linked to Geographical Information Systems and installing modern asset monitoring and reporting systems to support automation and process control.
- Maintain our infrastructure and plan for its replacement through adopting an **asset management approach** in line with international best practice.
- Develop a **sustainable funding model**. Irish Water is taking a 25 year perspective in relation to investment in water services.
- Engage collaboratively with our customers, stakeholders and regulators to deliver optimum investment outcomes at least cost using **clear and transparent investment criteria**.
- Raise **public and stakeholder awareness** of the value of water services and the requirements to deliver them to the required standards.
- Engage with organisations conducting **research and development** in water services, including Irish third level colleges and institutes, and use proven innovation to maximise benefits for our customers and the environment.

A key target in relation to investing in our future to the end of 2021 and 2040 respectively includes;

Operational and capital efficiency – meet 100% of the requirements identified by the CER with respect to operational and capital efficiency by end of 2021 and maintain this percentage.

Note; for all targets identified in relation to this objective – see Indicators and Targets under this Objective in the main body of the document.

Summary of Strategic Objectives and Aims

A table summarising our strategic objectives and aims is presented below.

CE	Meet Customer Expectations
CE1	Establish both Customer Trust and a Reputation for Excellent Service.
WS	Ensure a Safe and Reliable Water Supply
WS1	Manage the quality of drinking water from source to tap to protect human health.
WS2	Manage the availability and reliability of water supply now and into the future.
WS3	Manage the affordability of water supplies.
WW	Provide Effective Management of Wastewater
WW1	Manage the operation of wastewater facilities in a manner that protects environmental quality.
WW2	Manage the availability and resilience of wastewater services now and into the future.
WW3	Manage the affordability and reliability of wastewater services.
EN	Protect and Enhance the Environment
EN1	Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment.
EN2	Operate our infrastructure to support the achievement of water body objectives under the Water Framework Directive.
EN3	Manage all our residual waste in a sustainable manner.
SG	Support Social and Economic Growth
SG1	Support national, regional and local economic and spatial planning policy.
SG2	Facilitate growth in line with national and regional economic and spatial planning policy.
SG3	Ensure that water services are provided in a timely and cost effective manner.
IF	Invest in Our Future
IF1	Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.
IF2	Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.
IF3	Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.
IF4	Promote research and develop proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.

Your Views

In preparing this Draft Water Services Strategic Plan we have taken on board the views we received from both statutory bodies and the public following consultation on our Issues Paper and draft SEA Scoping Report carried out during the summer of 2014.

We are now seeking your views on our Draft Water Services Strategic Plan which will help to inform the preparation of the final plan which will be brought to the Minister for the Environment, Community and Local Government to be adopted in 2015.

We have included a number of questions inviting feedback on specific issues relating to each chapter at the end of the document (Appendix 1). However, we welcome your views on any aspects of the draft plan.

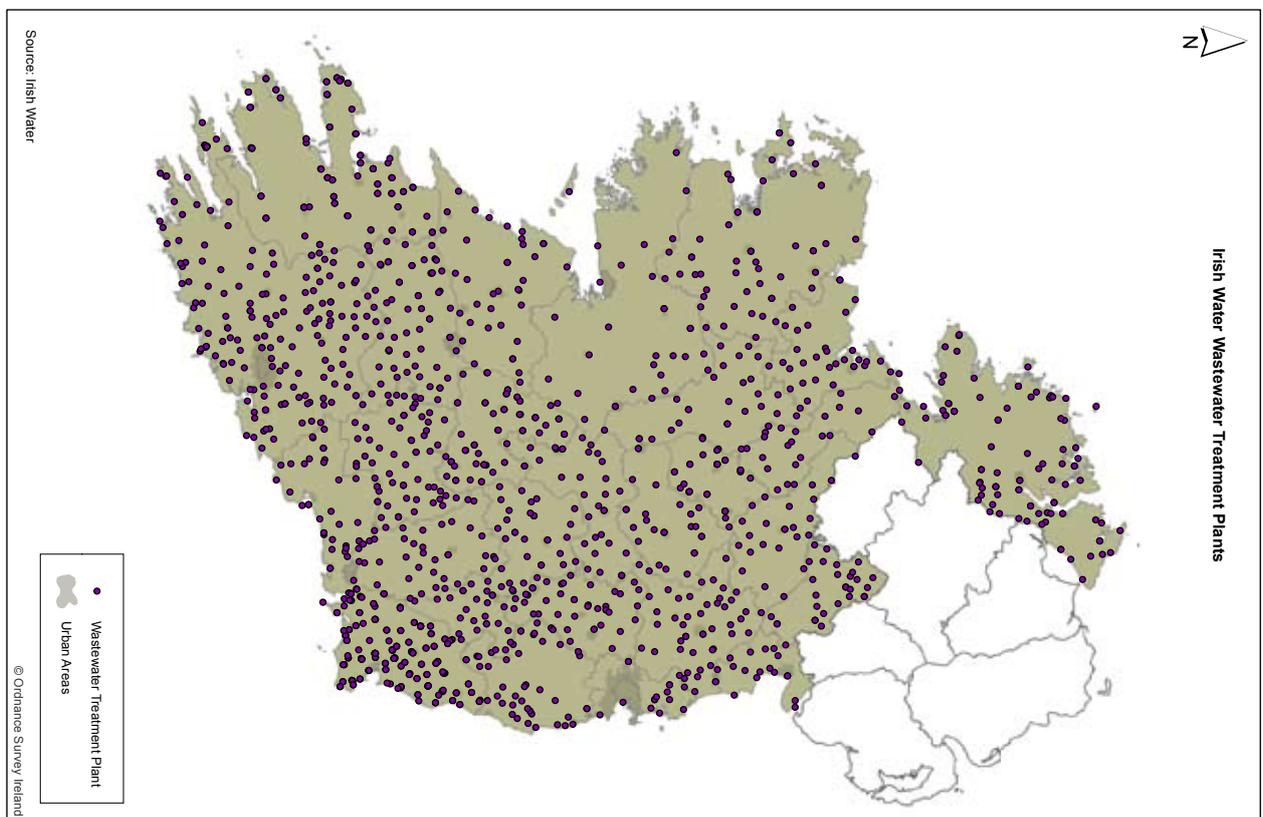
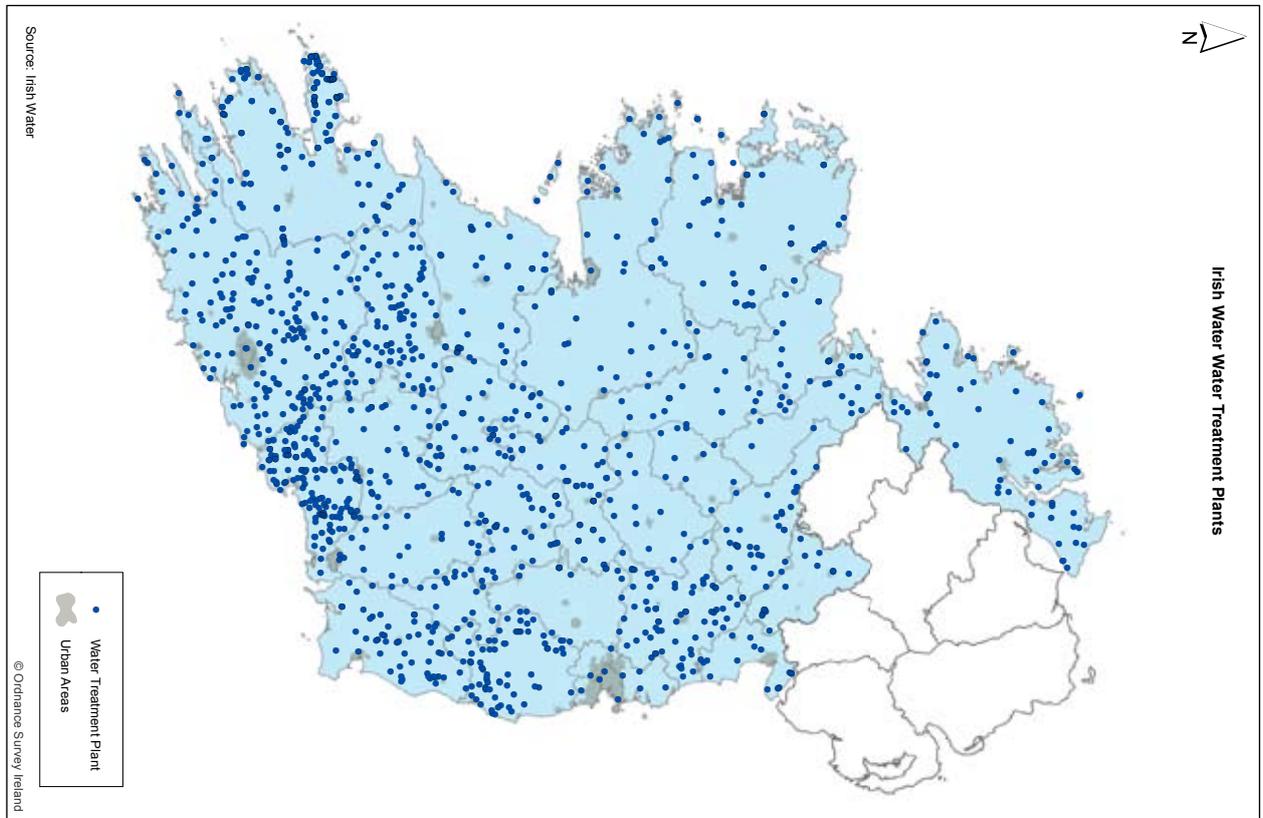
Responses to the consultation can be made online at <http://www.water.ie/about-us/project-and-plans/future-plans/> by email to wssp@water.ie or posted to the address below:

Irish Water
P.O. Box 860
South City Delivery Office
Cork.

The closing date for receiving responses is **Friday 17th April 2015**.



Map 1 & 2 Irish Water Water Treatment Plants & Wastewater Treatment Plants



Chapter 1 Introduction

Irish Water's vision

Through responsible stewardship, efficient management and strong partnerships, Ireland has a world-class water infrastructure that ensures secure and sustainable water services, essential for our health, our communities, the economy and the environment.

Transforming the Delivery of Water Services

Water is one of our most valuable resources and essential for sustaining life. Water circulates through the landscape influencing the locations of our towns and cities and fuelling our social and economic growth. Access to clean water and effective management of wastewater is a requirement for a modern society. However, clean water is expensive to produce and deliver. It is a complex process to turn water from our rivers, lakes and groundwater into clean drinking water and deliver it safely to each customer's tap. Wastewater must then be collected and treated before it can be reintroduced safely back into our environment.

The water services which each customer receives require significant funding for both the operation of the existing treatment plants and networks and for investment in maintaining and providing new infrastructure. Irish Water, as a new national utility, must promote an understanding and acceptance of the need for a new fully funded entity to deliver the water services of this country in the 21st century.

The creation of Irish Water has, for the first time, enabled a transformation of the way that water services are delivered in Ireland. A national utility has the scale to effectively and efficiently address the many issues and risks of delivering water services. Despite the work of the local authorities over 130 years, substantially more investment is needed across the country to address weaknesses in the current systems, including high leakage rates, varying drinking water quality standards, disruptions to supply and unacceptable wastewater discharges.

This Water Services Strategic Plan provides an opportunity to take, for the first time, a high level view of how water services should be provided, taking a national rather than local perspective and looking at a 25 year time frame as well as considering priorities for short term investment. The plan sets out the framework for future implementation plans and projects. It has been subjected to a Strategic Environmental Assessment and an Appropriate Assessment and these documents are also published and are available at <http://www.water.ie/about-us/project-and-plans/future-plans/>.

Supporting Social and Economic Development

Reliable water services with the capacity for expansion will enable business and industry to grow and attract investment. Within the lifetime of this strategic plan, the emerging problems of water stress around the world will become more acute and sustainably planned water supplies in Ireland will be a key global competitive advantage. Future development of water services must be in line with agreed national and regional development plans. We will therefore work with regional planning authorities and other agencies in the forward planning of water services infrastructure to meet social and economic growth. Importantly, we will be an active consultee in the preparation of the revised National Spatial Strategy and will continue to support national and regional spatial planning policy as it evolves.

Our Responsibilities

Irish Water is responsible for the public supply of drinking water to over 80% of the population. Our water supply responsibilities extend from the abstraction of water from wells, rivers, lakes and reservoirs, to treatment of this water such that it is suitable for human consumption and onward delivery to our customers' homes and business premises.

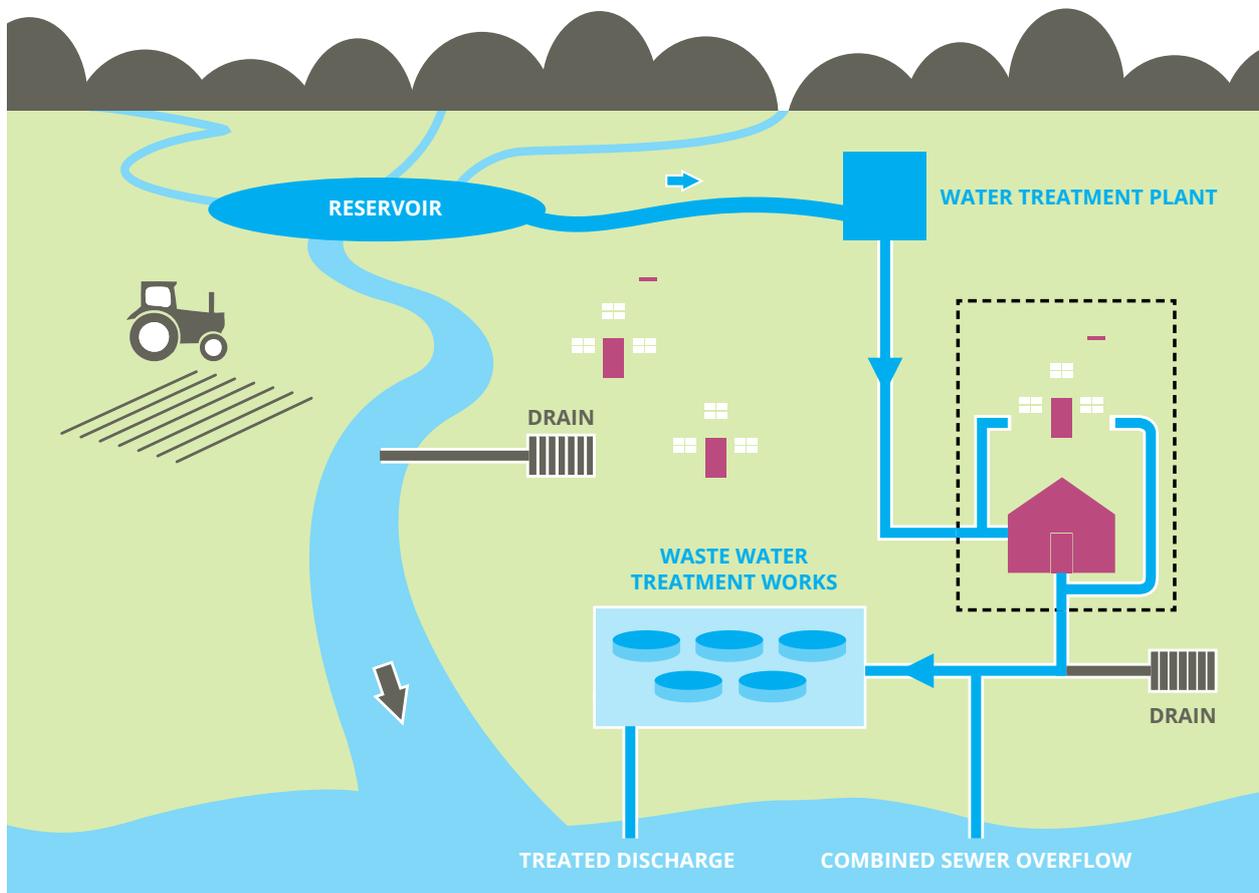
Our responsibilities for wastewater commence when effluent reaches the public wastewater network. We are responsible for its transfer to wastewater treatment plants, its treatment and the subsequent discharge of the treated effluent back into the water environment. We are also responsible for the treatment and disposal of the sludge that is generated from both our water and wastewater treatment plants.

Our environmental responsibilities are to ensure that the quantities of water that we abstract are sustainable and that sufficient water remains in water bodies to support the needs of the ecology and other water users. Our discharges to surface water and emissions to the atmosphere must comply with current legislation, including meeting our discharge license requirements in relation to the EU Water Framework Directive objective to achieve "Good" water quality status for all water bodies. We must also meet national targets for energy efficiency set by the Government.

We are not responsible for Group Water Schemes or private water schemes. While we do provide water to those Group Water Schemes which are supplied from the public network, we are not responsible for their distribution networks and other infrastructure such as reservoirs and pumping stations. We are also not responsible for private wells or septic tanks. The surface water drainage network and flood prevention works remain the responsibility of the relevant local authority or the Office of Public Works. Our responsibility in this area relates only to flooding from our combined sewers (foul sewers receiving stormwater flows), that are generally found in older urban areas. We intend to establish a memorandum of understanding with both the Office of Public Works and local authorities to reflect the complex nature of urban flood management and the responsibilities of each of the parties.

The extent of our responsibilities is illustrated in dark blue in the graphic below.

Figure 1 Extent of Irish Water's Responsibilities



Our Assets

Control of water services assets, with a value of more than €11 Billion, transferred from 34 local authorities to Irish Water in January 2014. This large portfolio includes several thousand reservoirs, water and wastewater treatment plants, pumping stations, approximately 60,000 km of water pipelines and 25,000 km of wastewater pipelines. At present, we supply drinking water to 3.3 million people through 856 water treatment plants as well as the collection and treatment of wastewater from over 1,000 separate agglomerations. Due to the fragmented nature of water services, previously managed across the local authorities, the level and quality of data and records vary widely. Consequently, we will be carrying out detailed asset surveys to increasing levels of detail, prioritising critical assets.

We do know that the condition of our assets varies from very good to 'at risk of failure' or in some cases the asset has actually failed. The scale of the remedial works required has not yet been fully quantified. Of particular importance, is the fact that a significant number of water supply zones are vulnerable to microbiological contamination. Leakage from our water supply networks is at unacceptable levels and well above international norms. Many of our wastewater treatment plants do not meet the legal limits for discharge back to the water environment. Infiltration of groundwater into our wastewater collection network also presents difficulties for the adequate treatment of effluent prior to its discharge.

Our Strategic Plan for 25 years

The preparation of this Water Services Strategic Plan is required under Section 33 of the Water Services (No. 2) Act 2013, with the purpose of stating the objectives for Irish Water in the provision of water services and the means to achieve those objectives over the next 25 years. As a public plan, it has been subjected to Strategic Environmental Assessment (SEA) in accordance with the European Union (EU) SEA Directive (2001/42/EC) and Appropriate Assessment (under the EU Habitats Directive) and these documents are also published for review.

This is the first Water Services Strategic Plan of Irish Water and it will be reviewed on at least a five yearly basis to ensure that the plan continues to be appropriate and captures the strategic objectives needed to provide efficient and effective water services for Ireland. The reviews will also be informed by changes in legislation and better information, especially on asset performance, demographics and climate change. Future reviews will also benchmark our performance against the targets set out in this plan and allow for revision of these targets to achieve our long term objectives.

An interim review is also planned to ensure alignment with the new National Spatial Strategy, the new Regional Spatial and Economic Strategies and River Basin Management Plans which will be developed in the next few years.

Our Commitment

"We believe that all of our customers should receive a safe and reliable supply of drinking water and have their wastewater collected and safely returned to the environment.

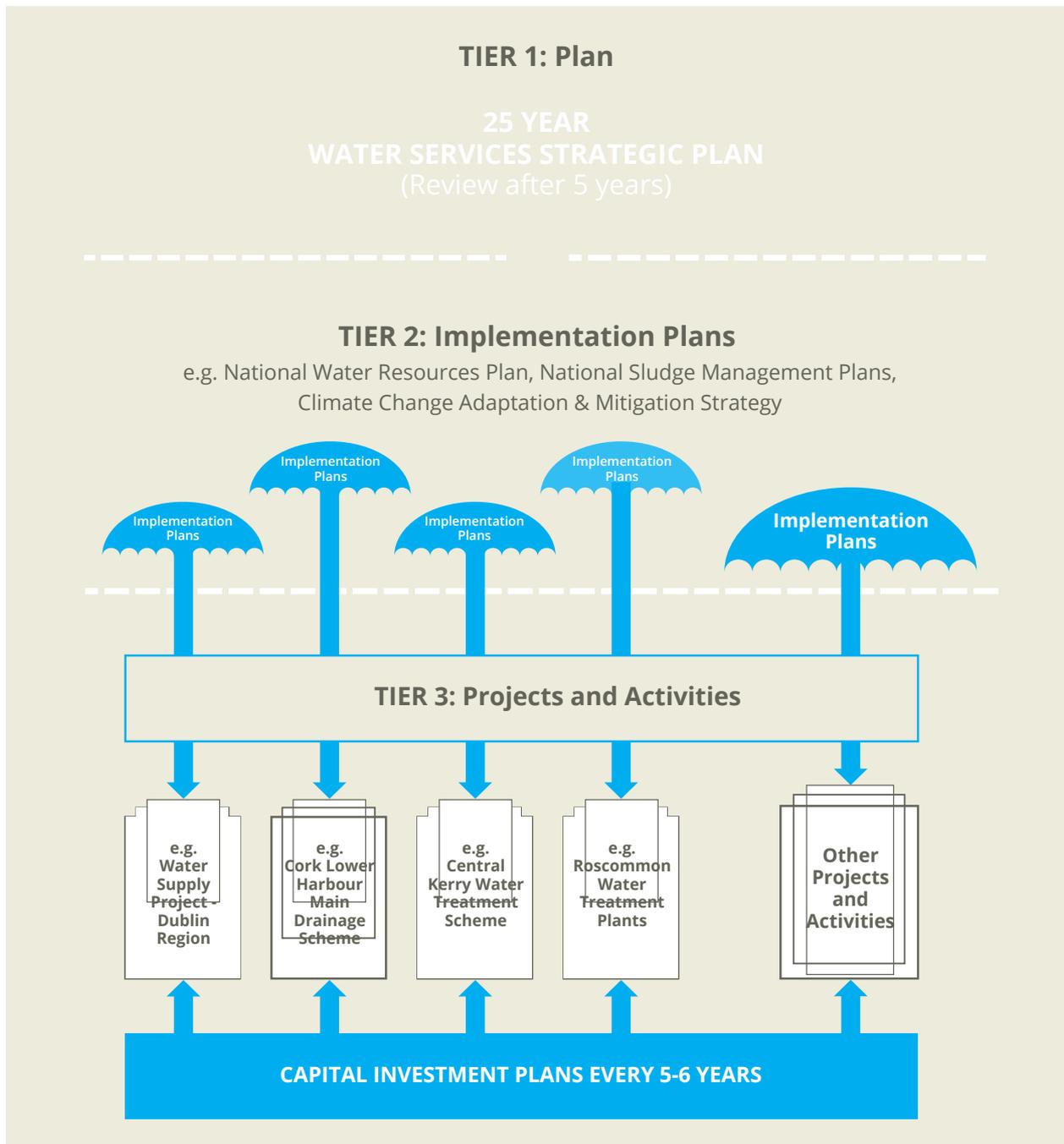
We will protect the environment in discharging our responsibilities and support Ireland's social and economic growth through appropriate investment in water services."

Planning for the Future

This Water Services Strategic Plan sets the context for subsequent implementation plans. These implementation plans will detail the programmes of works to be completed in specific water service areas, for example, water resource planning, sludge management planning, climate change adaptation and mitigation and wastewater compliance. Each implementation plan will ensure that we comply with our legal obligations, meet the objectives of this Water Services Strategic Plan and our performance targets. The implementation plans will also take into account the findings of other relevant national, regional and local plans (e.g. river basin management plans and regional development plans).

The relationship of this (Tier 1) Water Services Strategic Plan to the (Tier 2) implementation plans and the future (Tier 3) projects is illustrated in the graphic below.

Figure 2 Relationship of this Tier 1 WSSP to the Tier 2 plans and Tier 3 projects



Our Strategic Objectives and Aims

The Minister for Environment, Community and Local Government has issued a Ministerial Direction (Water Services Strategic Plan Direction 2014) which sets out the form that this plan shall take and directs the plan to follow a customer-focussed approach with identifiable time-bound and measureable objectives. The direction also states that the plan should address the following seven thematic headings:

- **Challenges and Strategic Priorities;**
- **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.**

The latter six headings form our strategic objectives whilst not being in any particular order of priority. We will address these strategic objectives in partnership with our customers, our economic and environmental regulators, industry and other stakeholders to develop innovative, holistic, sustainable solutions whilst providing value for money:

How this Document is Laid Out

The document presents the challenges and strategic priorities in the next chapter. This highlights the current and future challenges which we face in the provision of water services to customers and for the protection and enhancement of the environment. Our current priorities are also identified.

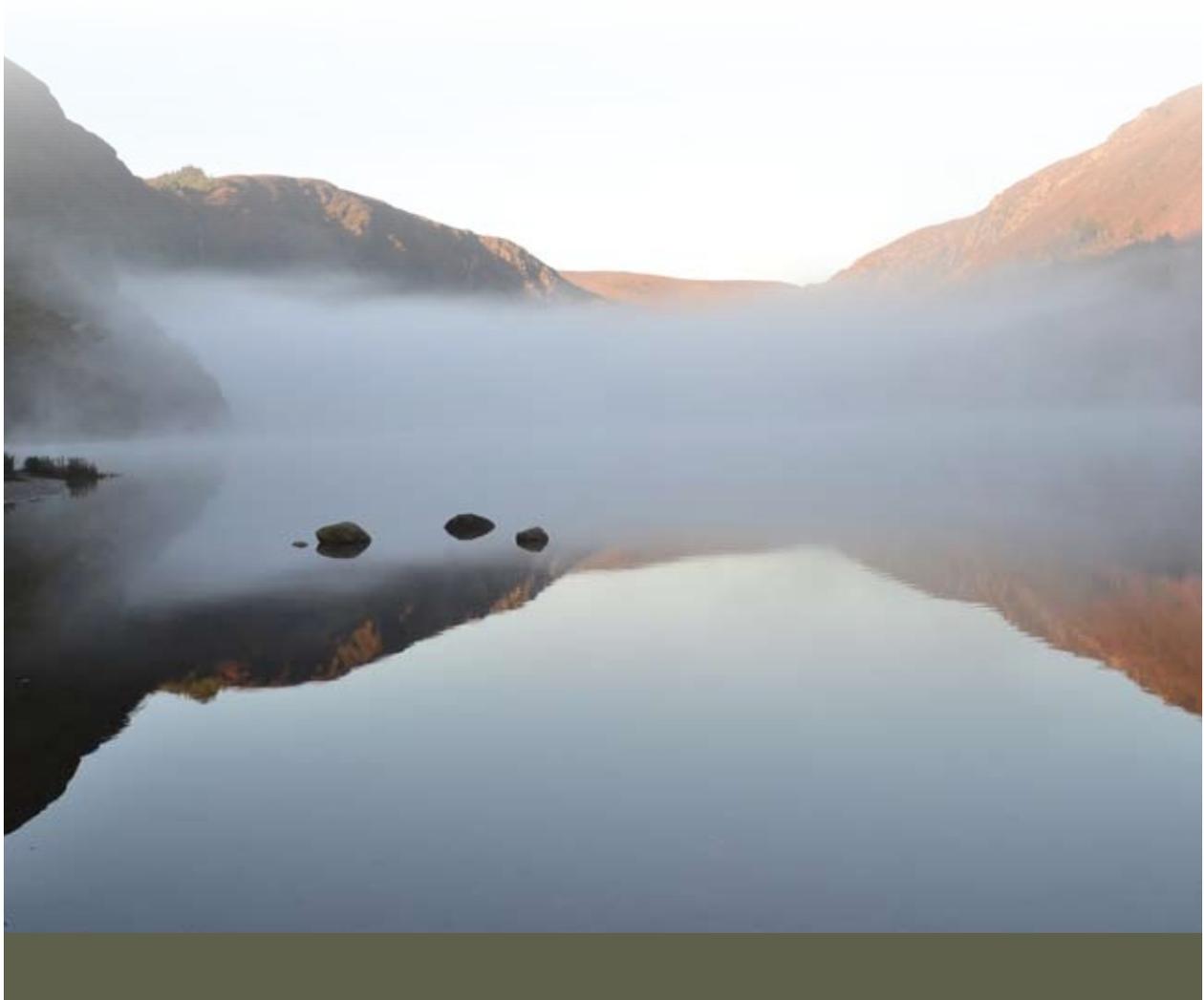
The six strategic objectives are presented in separate chapters. For each objective, we detail our understanding of the current situation, key challenges, what our customers can expect from us in the future and our high level strategies to address the challenges. Indicators and targets, against which our performance can be assessed, complete each chapter.



A 25 Year Strategic Plan

The challenges which face the provision of water services are identified as:

- Meeting Customer Needs at an Affordable Cost
- Providing Safe Water Supplies
- Managing Wastewater
- Protecting the Environment
- Becoming more efficient in Energy use
- Providing water services for future population and economic growth



Chapter 2 Challenges and Strategic Priorities

The Current State of Water Services

Irish Water currently operates many fragmented and disjointed networks of water and wastewater systems. The origins of this position lie in the dispersed and rural nature of a significant part of the Irish population and the development of water and wastewater services within individual local authority boundaries. The services also reflect the historic development of our assets dating from the 19th Century up to the most recent investments.

The majority of Ireland's drinking water is of excellent quality. However, in some of our water supply zones, water quality does not meet European Union (EU) Directive and Irish Drinking Water Regulations due to microbiological contamination or exceedances of other water quality parameters. This can be due to the quality of the water source, the performance of the treatment plant or the condition of the distribution network.

Water abstractions have in many areas been sourced from smaller water bodies (lakes, rivers or groundwater) which are not capable of meeting future growth in demand without adversely affecting the surrounding environment. Likewise, smaller water bodies have a lower capacity to accept discharges from wastewater treatment plants without significant impact to the ecology (e.g. mammals, fish, invertebrates and plants).

The security of supply of water services is weak in many areas of the country with networks reliant on a single source, treatment plant or storage reservoir and low available headroom (spare capacity above normal demand) to cater for emergencies, planned maintenance or equipment failures. For example, there is frequently just 2% headroom available to supply water to the Greater Dublin Area. The vulnerability of this supply was seen in 2013 when water restrictions impacted many areas of Dublin due to a production problem at the Ballymore Eustace water treatment plant which delivers over 50% of the supply to Dublin.

A comparison with water services in Scotland is instructive. Scottish Water operates around a quarter of the number of water treatment plants as Irish Water to serve 2.4 million domestic households. The higher number of smaller water treatment plants controlled by Irish Water (many of which rely on small vulnerable sources) are more difficult and expensive to operate and we need to reduce this number through rationalisation where funding permits.

Local authorities were reliant on the exchequer for the bulk of their capital and operational funding. Capital funding rarely met the levels required especially over the last 30 years when EU standards drove the need for massive investment in upgraded treatment of drinking water and to an even greater extent in wastewater treatment. More seriously, operational budgets made only very limited provision for asset maintenance and even less for planned maintenance to preserve design capacity. The absence of an asset management approach meant that assets deteriorated over time and this is now reflected in the performance deficits giving rise to compliance failures and excessive leakage in water and wastewater networks.

Challenges over a 25 year Period

This Water Services Strategic Plan challenges us to think holistically about water, and commit ourselves to what that means for the delivery of water services to our customers, so that we provide a strong policy-driven framework for our implementation plans and projects.

Looking beyond the current transitional challenges and immediate priorities to enable service delivery, the strategic challenges that face the provision of effective and efficient water services are:

- **Meeting Customer Needs at an Affordable Cost;**
- **Providing Safe Water Supplies;**
- **Managing Wastewater;**
- **Protecting the Environment;**
- **Becoming more efficient in Energy use; and**
- **Providing water services for future population and economic growth.**

Within each of the later chapters on the Strategic Objectives we propose strategies to address these challenges. At the end of this chapter we identify our current, short term priorities. But first it is necessary to define their context.

Meeting Customer Needs at an Affordable Cost

Meeting compliance standards and providing capacity for new development requires significant capital investment in our water services assets, particularly our treatment plants and networks. This capital investment must be delivered within efficiency targets set by CER, our economic regulator.

We must meet the service commitments to which we have agreed in the Customer Handbook, particularly in relation to accuracy of customer billing, reaction time to service requests and our relationships with customers whilst carrying out our operations. Our overall challenge is to meet the required level of customer satisfaction consistent with other utility companies within a short timescale.

Providing Safe Water Supplies

Meeting the EU and Irish drinking water quality standards for all of our water supplies is a significant challenge. Pollution of water sources, groundwater and surface water, poses a significant risk of contamination to drinking water supplies and increases the cost of producing high quality potable water. Groundwater, in many areas of the country, is highly vulnerable due to the local geology and is susceptible to pollution from agricultural activities, septic tanks and other discharges to ground. Surface water sources are vulnerable to runoff of pollution from adjacent land and properties.

Leakage of water from supply networks is a serious problem on a national scale. 'Unaccounted for Water' (UFW), both in Irish Water's networks and within customer properties, is estimated nationally at approximately 49% of the water produced for supply. This is twice the level of that in the UK and several times the typical figures in Germany, Denmark and the Netherlands, indicating that significant investment will be needed over a number of investment cycles to catch up with international norms in the water utility sector. High levels of leakage result in more raw water being abstracted and treated. This uses more energy and chemicals, requires larger treatment plants and pipelines, and leaves less water in our natural environment.

Water supply within our cities and large towns does not meet international standards for available headroom. Headroom is the spare capacity of all infrastructure (abstractions, treatment plants, pumps and networks). This spare capacity is used in the event of adverse weather conditions or during unplanned incidents such as breaks in trunk mains or problems at a water treatment plant. Planning for resilient water supplies must also take place, independently of any progress in water conservation or success in reducing leakage, because loss of a key water source, treatment plant, or pipeline remains a separate risk to be managed.

Adapting to the impact of climate change places additional challenges in providing safe and reliable water supplies. Periods of drought and greater frequencies of high intensity rainfall events are predicted to result from climate change. These events will affect the reliability and quality of smaller water sources which may become unavailable or suffer deterioration in water quality for periods of the year.

Managing Wastewater

The European Commission reported adversely in 2013 on Ireland's implementation of the Urban Waste Water Treatment Directive (UWWTD) and has initiated an Infringement Case against Ireland in relation to 71 wastewater agglomerations. The UWWTD sets minimum standards for collection systems, wastewater treatment plants and their discharges back to watercourses. The most recently available Environmental Protection Agency (EPA) publication on wastewater compliance reported that 38 of the 162 larger urban (>10,000 population equivalent) agglomerations in the country are not meeting the wastewater treatment standards set by the Directive. Meeting compliance with the Directive for all of our wastewater treatment plants and discharges is a priority for Irish Water.

Historically, combined sewer systems have been constructed in many urban areas. During periods of heavy rainfall, surface drainage from roads and other impermeable areas combines with household and business wastewater in a 'combined' sewer. This places a large stress and capacity requirement on our wastewater networks and treatment plants. In a few cases flows from combined sewers also result in the periodic flooding of nearby properties with sewage effluent. Network modelling is required to identify the level of risk and the appropriate investment needed to manage such flows.

Additionally, periods of drought impact on the ability of smaller water bodies to dilute wastewater discharges to acceptable levels. Greater frequencies of drought, as a result of climate change, will result in the requirement for increased treatment of wastewater prior to its discharge.

Protecting the Environment

Irish Water is faced with a major challenge in meeting EU and national environmental obligations.

The EU Water Framework Directive (WFD) focuses on the environmental quality of inland and coastal water bodies, under all influencing factors, water abstractions and treated wastewater discharges being a part. The WFD is implemented through river basin management plans, which contain programmes of measures needed to deliver the water quality targets. The UWWTD is one of a number of basic measures that must be implemented as part of an overall WFD programme of measures. The EPA, in licensing municipal wastewater discharges, has regard to the Environmental Objectives set under the WFD and the timelines set out in the river basin management plans to achieve these objectives. The key objective of the WFD is to preserve existing 'High' status waters and to return all other water bodies to at least 'Good' status.

On the forthcoming review of the river basin management plans by the EPA, Irish Water will seek to agree effective and affordable measures that will have the greatest impact in terms of water quality improvement, recognising that other water users must also play their part in achieving water quality objectives.

Irish Water recognises the significant environmental compliance challenges that must be met. The range of issues across which progress must be made is broad and we must seek agreement with our environmental and financial regulators on the balance of priorities and necessary phasing of investments.

Becoming More Efficient in Energy Use

Inefficient use of energy results in higher emissions of carbon dioxide, a contributor to climate change, and higher costs. As one of the largest single users of energy in Ireland, it is important that we optimise our energy use and seek to reduce it where possible.

We will seek to optimise our daily use of energy to take advantage of cheaper, off-peak and night time energy through, for example, running pumps and treatment plants to top-up reservoirs during these periods, when feasible and without compromising service levels. We will improve energy efficiency through effective operation and replacement of inefficient plant and through energy recovery.

As a major energy user on a national scale we need to develop our use of renewable energy sources through working with the energy utility companies and to maximise generation of renewable energy from wastewater sludge where feasible.

Providing for Future Population and Economic Growth

The challenge of providing for population and economic growth is one of making careful, timely and cost-effective investments in new plants and upgrades, with due regard to the uncertainty in growth forecasts. This will require close interaction with the preparation of spatial planning policy at the national level and with regional and local development planning.

Irish Water needs to plan across a range of growth and demographic scenarios and to ensure that plans are in alignment with National Spatial Planning policy. The planned population growth may not be where water and wastewater services are available. As a national utility we must regularly update our strategic planning to ensure that we provide water services where and when they are needed and that water supplies and wastewater treatment capacity are not limiting constraints to the economic development of the country.

Building Our Capacity to Address these Challenges

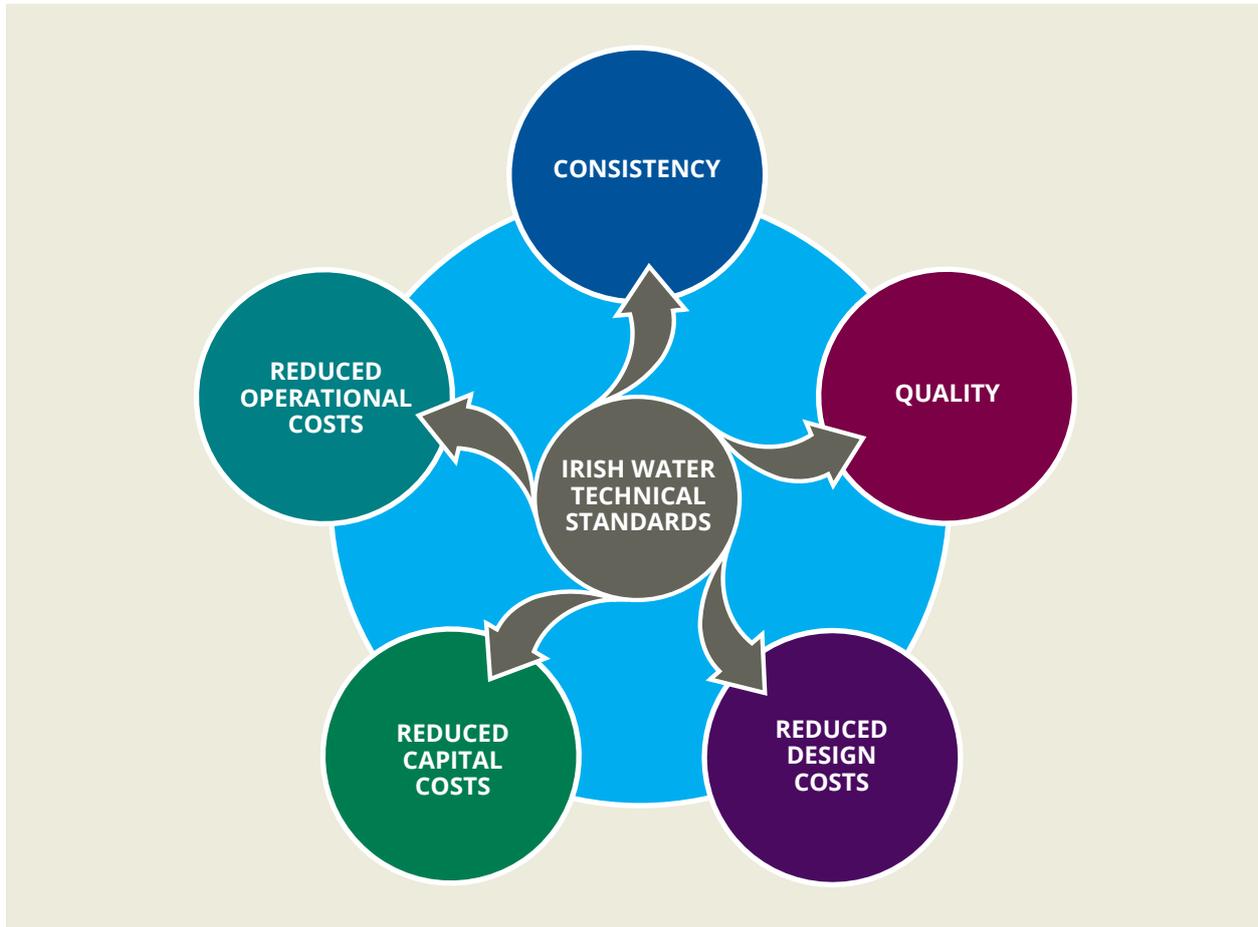
Irish Water was established to bring a consistent and efficient approach to the provision of water services. A key part of this approach is the development of our systems and processes, drawing on international best practice, where appropriate.

We will apply an asset management approach to achieve the optimum capacity from our existing infrastructure on a national basis. This will require the development of IT systems, including databases and Geographical Information Systems, to collate and display the location, condition and performance of our assets. These decision support systems will enable us to plan future maintenance and planned replacement of our asset base at least cost.

Prior to the creation of Irish Water, each local authority used its own standards based on local experience. We have begun the process of introducing Standard Operational Procedures across plants and networks. We are also introducing standardisation for spare parts, improved health and safety procedures for operatives and planned maintenance schedules. This planning and standardisation will in time improve safety and reduce the cost to operate and maintain our assets.

We will develop national approaches and specifications for the design and construction of new treatment plants and networks. This will ensure that our new infrastructure achieves the required performance in operation, that it maximises its design life and that it can be operated in a safe and efficient manner for the lowest whole life cost. The benefits from the above approaches are represented in Figure 3.

Figure 3 Benefits of Standardisation



Working With Our Regulators and Other Stakeholders

To improve provision of water services, enable future growth and protect the environment, we will work closely and collaboratively with our regulators, customers and other stakeholders in all our planning, development and operational activities.

Irish Water is regulated by both the Commission for Energy Regulation (CER) for economic matters and the Environmental Protection Agency (EPA) for environmental matters and drinking water quality standards. The Health and Safety Authority (HSA) is responsible for Health and Safety whilst the Health Service Executive (HSE) is responsible for public health.

Irish Water's financial responsibilities (under the regulatory supervision of CER) extend to:

- The need to ensure that we perform our functions whilst maintaining a balance between commercial viability and affordability to customers.

Our environmental responsibilities (under the regulation of the EPA) relate to;

- The quality of the drinking water we supply.
- The quality of the effluent we discharge to the environment.

Our Current Priorities

In this first strategic plan, we need to address urgent issues in the quality of our water services and in the integrity of our infrastructure, subject to adequate funding being available to us. We have therefore prioritised the following five areas:

1. Our Customers

Demonstrating that we are committed to the delivery of a quality water and wastewater service at an affordable cost and within our approved budgets.

2. Reducing Drinking Water Quality Problems

Where water supplies are subject to Boil Water Notices, due to microbiological contamination, or have other drinking water quality problems, these must be resolved as key priorities through capital investment in infrastructure or changes to operational procedures where appropriate.

3. Achieving Compliance with the Urban Waste Water Treatment Directive

Bringing Ireland into compliance with the Urban Waste Water Treatment Directive must be an immediate priority. The European Commission's Infringement Case against Ireland for the 71 non-compliant agglomerations is likely to be progressed in 2015 and will require committed plans to meet the compliance limits on these schemes within a prescribed period.

4. Reducing Leakage in Water Supply Networks

We are currently utilising the early returns from the water metering programme to help us refine estimates of legitimate usage and levels of leakage within customers' properties. This will better define the size of the leakage problem, the optimum solutions and help us to determine where the largest leaks are. Works can then be prioritised which bring the largest water savings with targeted deployment of repair teams. We will also seek to reduce overall leakage within a network through better management of water pressure. We are determined to achieve the lowest level of leakage which is technically sustainable and affordable, taking account of the state of the networks.

5. Addressing Inadequate Asset Condition Information

Gathering accurate information on all of our assets into a quality assured database is a strategic priority. It is an essential tool for asset management over the lifetime of this plan and we cannot function effectively without it. We have currently drawn together all asset records onto a common national database (Geographical Information System) and are improving the accuracy and quality of these records on an on-going basis.

Monitoring Our Performance

This Water Services Strategic Plan proposes a suite of targets and indicators for each Strategic Objective presented in the later chapters. Our performance against these targets will be monitored and reported by us within each revision of the plan. This performance will therefore be available for scrutiny by our regulators (CER and EPA), other stakeholders and the general public. However, our progress against these targets is subject to adequate funding being available.

Our economic regulator, CER, has published and will maintain, *'The Customer Handbook'*, which is primarily concerned with customer billing and communication. In accordance with this, we have published a set of Codes of Practice for the delivery of customer operations which will be subject to periodic revision and approval by CER.

As part of our regulatory framework, and in line with our commitment to customer care, we also operate a Customer Charter relating to our provision of water services for network operations and Terms and Conditions for both domestic and non-domestic customers. These will be published and periodically updated throughout the life of this plan.



Chapter 3

Objective:

Meet Customer Expectations



Our Strategic Aim

- Establish both Customer Trust and a Reputation for Excellent Service

Introduction

Irish Water's first strategic objective is to meet our customers' expectations through the provision of high quality, reliable water services, delivered through resilient systems, at an affordable price, reflecting the customer service levels expected in a modern economy.

We must ensure that the need to meet higher standards for compliance in drinking water quality and wastewater discharges to the water environment is balanced against the affordability of water services that we provide to our customers.

Our first response to ensuring affordability has been to review all proposed capital investment in the water services assets, for which we took over responsibility in January 2014, to more accurately define the scope required to address short and medium term needs and ensure value for money invested. Even with this revised scope of projects, the capital investment need remains large (€5-6 Billion estimated needed by 2022).

The Current Situation

As a new utility, we are in a period of transformation from the provision of water services by 34 (now 31) local authorities to operation and management of these services by Irish Water. Local authorities are presently working under service level agreements with Irish Water to ensure a continuity of service and a smooth transition. Our customers will continue to be served on the ground by local authority staff, operating the local treatment plants and networks. Irish Water staff will have an increasingly important role in planning and managing the provision of water and wastewater services, defining both the operational and investment strategies.

We are, therefore, in a period of transformation into a more centralised and cost effective customer operation. We will develop a new water industry operating framework to deliver more services regionally, with shared cross boundary working, centres of excellence and increased specialisation. This will enable transition to a leaner customer support team with a nationally consistent approach.

Key Challenges

There is presently a lack of detailed knowledge of the cost and technical challenges that Irish Water face in the provision of water and wastewater services to the standards expected in a modern economy. This is because of uncertain information on the condition and performance of the assets, especially underground water distribution and sewage collection networks. Despite these limitations, Irish Water recognises that customer expectations of the quality of the service they will receive will increase following the introduction of charges.

Key challenges facing Irish Water in relation to meeting customer expectations are summarised below:

Identifying our customer base

Water services for part of the population are provided by Group Water Schemes or private supplies, while wastewater treatment for much of the rural population is served by septic tanks. As a result, one of our earliest activities is to identify and obtain correct contact and scope of services information for all of our customers. A primary function of the domestic customer application campaign is to identify who receives their water and/or wastewater services from Irish Water and who doesn't. This will ensure efficient delivery of services to each customer, together with accurate billing information.

Delivering reliable water services

Our water and wastewater assets have suffered from significant under-investment over an extended period of years. Consequently, water and wastewater services can be variable and inconsistent. We will prioritise investment to firstly ensure universal, basic service availability and beyond that to deliver consistent service quality equivalent to that provided by high performing utilities in other sectors.

Meeting our customer service commitments and Codes of Practice

We are committed to achieving the service standards set out in the Customer Handbook. These standards are approved by the Commission for Energy Regulation (CER) and are the basis of the content of Irish Water's Customer Charter, Terms and Conditions and Codes of Practice.

Delivering customer satisfaction

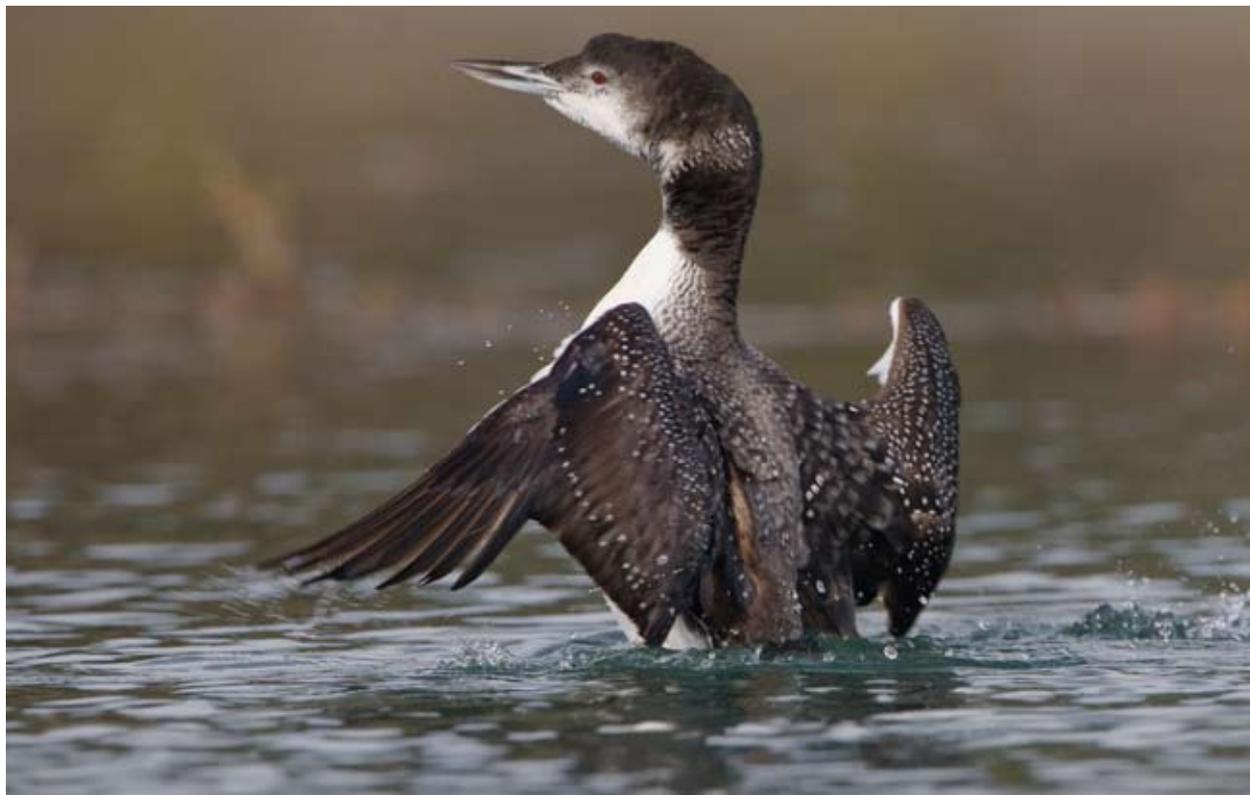
We anticipate a high level of communication with our customers by letter, email, phone, digital channels and through the media. We are committed to handling all customer communication in the manner expected of a modern professional utility. We aspire to deliver a consistent, functional and ultimately satisfying customer communication experience in relation to operational and billing queries, complaints, service requests, new connections services and all other interactions with Irish Water staff and contractors.

Establishing sustainable customer funding

We are in a period of transition from water services being funded primarily through general taxation to one where direct charging of the end user provides part of the funding. As a utility increasingly dependent on the payment of water charges, it is essential that our customers recognise the importance of good water services provided efficiently.

Balancing key customer objectives

Irish Water must work with our economic regulator to ensure that the costs incurred to deliver necessary improvements in infrastructure, services and standards is based on efficient working (both capital and operational).



Objectives and Strategies

The proposed strategies to meet the above challenges and to achieve this objective are summarised in the table below and are detailed in the remaining sections of this chapter

Strategy		Purpose
Aim CE1 – Establish both Customer Trust and a Reputation for Excellent Service		
CE1a	Create and operate a lean and effective Customer Operation.	Deliver best practice and value for money in customer operations.
CE1b	Build and maintain accurate customer databases.	To ensure accurate customer services and billing.
CE1c	Establish sustainable customer revenue.	To secure funding necessary to deliver efficient and effective water services.
CE1d	Establish effective communication channels with customers.	To ensure that customers can communicate with us when they need to in a manner that suits them and can be promptly informed of changes to services.
CE1e	Establish national customer service standards and robust customer protection measures.	Set appropriate customer expectations and deliver to these.
CE1f	Fully support the work of the Public Water Forum	To address the comments and suggestions of the Public Water Forum in relation to the performance by Irish Water of its functions.

CE1: ESTABLISH BOTH CUSTOMER TRUST AND A REPUTATION FOR EXCELLENT SERVICE

[CE1a] Create and operate a lean and effective customer operation.

The employment of an effective workforce is an important part of delivering a competent customer service operation. This also requires Irish Water to establish the structure and governance procedures needed to deliver effective customer services. To ensure that the customer service operations are efficient, flexible long term service contracts with our suppliers will be required which will incorporate strict contract management systems. Irish Water is working with each local authority to ensure that effective structures, work practices, management and training of water services employees under the service level agreements is in place. It is working actively with the sector to achieve cross boundary working by local authority personnel to drive efficiency and improve service quality.

[CE1b] Build and maintain accurate customer databases.

Collating an accurate database of customers is critical to efficient delivery of services to each customer as well as Irish Water's revenue generation capability and customer acceptance of water charges. Irish Water is currently validating its domestic customer lists whilst simultaneously working with local authorities to transfer all non-domestic customers. This will provide Irish Water with the capability to communicate with, and provide quality water services to, customers effectively into the future and to implement accurate billing. Maintenance of an accurate database is crucial to Irish Water to enable delivery of an effective water service to all customers.

[CE1c] Establish sustainable customer revenue.

To be willing to pay for the water and wastewater services that they are receiving, customers need to be satisfied that they are paying a fair amount for a defined service level. It is essential that Irish Water has a clear and transparent tariff structure and that we explain this clearly. We are working closely with our economic regulator (the CER) and other stakeholders on tariffs and customer protection consultations in order to achieve this objective. Customers expect to be able to pay in a way that best suits their needs. Irish Water will provide payment methods and frequency of payments that meet with customer demand.

[CE1d] Establish effective communication channels with customers.

Our Codes of Practice set out our commitments for effective communication with our customers as agreed with our regulator (CER). In addition, we will develop a Customer and Stakeholder Communication Strategy which will set out a roadmap towards a full and open two way engagement with our customers, stakeholders, businesses and other interested parties. We will ensure that our Customer and Stakeholder Communication Strategy is available and accessible to everyone through a variety of media.

We will actively engage with our customers, particularly when we must disrupt services, giving advance notice in accordance with our Codes of Practice. Our customer communications team will keep customers informed of planned interruptions and when we have unplanned interruptions, for example as a result of burst mains or other emergency works, we will use national and social media and mobile notifications for anyone registered to receive them with particular regard to vulnerable customers.

When we propose undertaking infrastructure works that may, for whatever reason, disrupt our customers and the public, we will communicate why the work is being carried out and the ultimate customer benefits that this work will bring.

Our communications are intended to reach all of our customers and other interested parties and include the use of:

- **Our website;**
- **Social media;**
- **SMS messages (texts, used in clusters to communicate local operational problems);**
- **Telephone;**
- **Letter; and**
- **Face to face.**

Irrespective of the form of communication used we will always listen to feedback from our customers.

[CE1e] Establish national customer service standards and robust customer protection measures.

Irish Water is committed to providing a satisfactory standard of water services to our customers with robust customer protection measures in place.

Our service standards outlined in our Codes of Practice and Customer Charter (for both domestic and non-domestic customers) are approved by the CER. Our Customer Charter published on the 30 September 2014 (<http://www.water.ie/docs/Irish-Water-Customer-Charter.pdf>) commits us to engage with customers through a range of communication channels. It also offers a process for the resolution of Customer Complaints and sets out six Guaranteed Service Standards relating to Customer Complaints, Billing, Water Meter Installation, Damage to Property, Payment Difficulties and the Application of Discounts/Rebates.

We operate under a range of Codes of Practice which comply with the requirements of the Water Handbook relating to:

- **Domestic Customer Communications Code of Practice**
- **Domestic Metering Code of Practice**
- **Domestic Billing Code of Practice**
- **Domestic Vulnerable Customer Code of Practice**
- **Domestic Network Operations Code of Practice**
- **Domestic Complaint Handling Code of Practice**
- **Business Customer Codes of Practice**

These are available from our Customer Communications team or on our website (<http://www.water.ie/our-customer-commitment/>). We expect our published codes and charter commitments to expand and evolve over time.

[CE1f] Fully support the work of the public water forum.

Irish Water will fully support the work of the Public Water Forum to be established under the Water Services Act 2014. We will work with this customer consultative forum which represents the interests of Irish Water's customers to fully understand the expectation of our customers in relation to how we perform our statutory functions. We will listen to and address the comments and suggestions of the forum in relation the performance of our functions.



Indicators and Targets

Indicators and targets to demonstrate that we meet this objective are presented in the table below.

Strategic Objective	MEET CUSTOMER EXPECTATIONS			
	Definition	Current Baseline (Based on Current Knowledge)	End of 2021 Target	2040 Target
AIM CE1	Establish both Customer Trust and a Reputation for Excellent Service			
Contact Handling	Call answering and call abandonment	80% of calls answered in less than 20 seconds. Less than 5% of calls abandoned	80% of calls answered in less than 20 seconds. Less than 5% of calls abandoned	80% of calls answered in less than 20 seconds. Less than 5% of calls abandoned
Complaint Handling	Time based	90% resolution or understood steps to resolution within 5 working days	100% resolution or understood steps to resolution within 5 working days	100% resolution or understood steps to resolution within 5 working days
Supply Interruption	Advanced Notice	Not established	Minimum 2 day advanced notice of planned interruption	Minimum 2 day advanced notice of planned interruption
Billing & Payments	Meet CER's requirements	Accurate quarterly bills based on actual reads (for metered customers) - no "planned estimated" bills (99% of customers). Sympathetic handling of payment difficulty cases. Range of customer focussed payment options available		



Chapter 4

Objective:

Ensure a Safe and Reliable Water Supply



Our Strategic Aims

- Manage the Quality of Drinking Water from Source to Tap to Protect Human Health.
- Manage the Availability and Reliability of Water Supply Now and into the Future.
- Manage the Affordability of Water Supplies.

Introduction

Safe and reliable water supplies are essential to public health and to social and economic progress. The water we need must be abstracted from surface or groundwater sources and treated to a high standard before it is distributed through an extensive network of water mains to households and businesses. The water quality standards which our treated water supplies must meet are set by a European Directive and set into law in Ireland through Drinking Water Regulations.

This chapter details the current situation in regard to water supply, the challenges that Irish Water faces and our strategies for tackling these challenges. These strategies are arranged around three key requirements of:

- **Quality;**
- **Reliability;** and
- **Affordability.**

Performance targets against these key requirements are also presented.

The Current Situation

Delivering a safe and reliable drinking water supply to over 80% of the population requires the abstraction, treatment and delivery of over 1,600 million litres of water each day. Water is delivered to each tap from a water supply zone. This is a defined supply area served by a single source or group of connected sources. Treated water is processed and transported from the water source through to each tap. The system serving the water supply zone includes one or more abstractions (the source where water is taken from - lake, river or groundwater), treatment plants to purify and disinfect the water, storage in a tank or reservoir and distribution through pipes. A graphical representation of a water supply zone is presented overleaf. There are currently 856 separate water treatment plants and approximately 60,000 km of pipelines delivering water in Ireland.

Water supply zones were historically developed within local authority boundaries rather than on a river basin or regional level. This fragmentation has resulted in a large number of small water treatment plants and water supply zones and a highly variable performance ranging from good operation in newer treatment and distribution infrastructure (e.g. pumps, plant and pipes) to periods of unacceptable performance in older systems. Smaller water sources are also susceptible to sporadic and seasonal variations in water quality and availability.

Key Challenges

The challenges which face Irish Water to ensure a safe and reliable water supply to all its present and future customers are summarised in the paragraphs below.

There are currently many water supply zones which fail to meet the European and Irish Drinking Water standards for microbiological and chemical parameters or have significant operational, maintenance or capacity problems at individual treatment plants, giving rise to water quality risks. This includes customers who have a Boil Water Notice due to microbiological contamination in their water supplies (approximately 23,000 customers in January 2014). This situation is unacceptable to us and addressing it is our top priority.

Protection of water sources from contamination ensures safe water supply and reduces treatment costs. However, the protection of individual water supply sources has to date been variable and risk based assessments to determine and prioritise protective measures have not been completed for all water supply sources.

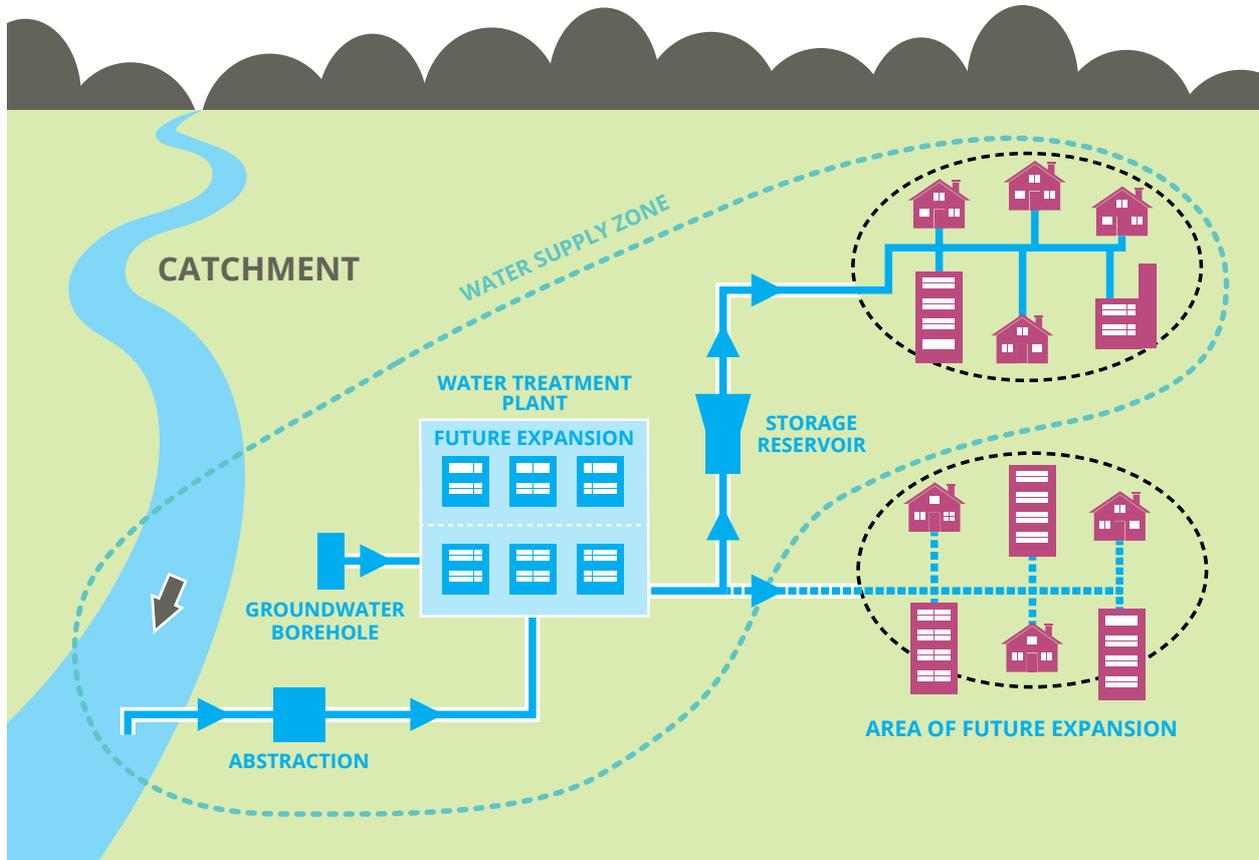
Water resources for supply have not, previously, been managed on a catchment, regional or national basis. Therefore, we have urban regions such as Dublin where there is a potential shortage of future water resources whilst in the west of Ireland there are catchments with a surplus of potential available resources but a deficit in treatment provision.

No national rules are in place to ensure correct, safe and efficient operation of our treatment plants, storage and distribution network. In some areas there is limited knowledge of the condition, lifespan and location of our above and below ground assets (e.g. treatment plants, pipes, valves and other infrastructure).

Water flows through pipes at pressure from the treatment works to each household tap. We currently estimate that nationally we are losing approximately 49% of our treated water to leakage from the distribution network and in customer properties. This is unacceptable and reducing this is a priority. However, with an underground network of ageing pipes and with a pressurised system including thousands of joints vulnerable to ground conditions and traffic vibrations it will never be possible to reduce water leakage to zero. Instead, our intention is to apply a best practice asset management approach in order to achieve the optimum water savings at affordable cost to achieve a sustainable and economic level of leakage.

Water supplies also face a range of challenges from external factors outside of Irish Water's control such as climate change and the need to maintain sustainable resources by balancing abstraction against environmental needs.

Figure 4 Graphical Representation of a Water Supply Zone



Case Study

Vartry Water Supply, a City Perspective

Prior to the 1860's in Dublin, most drinking water was sourced from the Royal and Grand Canals. The canals were poor water sources, offering limited supplies of low pressure, filthy water.

"Drink the canal water as it is and you swallow filth and animal nature; boil it and you drink a decoction of poison" wrote one Dubliner of the day, Walter Thomas Meyler. The poor quality of drinking water in the city, resulted in large scale outbreaks of cholera and in the 1860's over a thousand deaths were traced directly to a single public water tap in Dublin which was contaminated with sewage. In 1852, an eminent doctor John Gray, was elected to Dublin City Council where he gained a reputation for his interest in improving the lot of the impoverished. In 1853 he was elected to the Waterworks Committee, and began work on improving the water supply for Dublin. He identified the River Vartry rising below the Sugar Loaf Mountain in County Wicklow, as the best potential source for the city. He sought to have a Parliamentary Bill passed to empower Dublin Corporation to advance the works, however, he faced wide scale objections from the private owners of the canals and there was outcry in the media at the high cost of the works and the volumes of water proposed. The Bill was debated for nearly five weeks and the first stones were turned on site in 1862. The Vartry Supply involved building two

major reservoirs to the south of Roundwood in Co. Wicklow, a water treatment plant, a 2.45 mile long tunnel under Callowhill, and forty miles of trunk water mains to deliver water to the city. The project was an amazing feat of engineering, with the works completed by men using picks and shovels, horses and carts.

The new supply project resulted in significant improvements in the quality of life for the inhabitants of Dublin. In terms of public health, the last major outbreak of dysentery was recorded in the late 1860's and the Vartry scheme dramatically reduced the scourge of waterborne disease in the city.

As a testimony to the success of the project, the original Vartry supply still provides drinking water for 200,000 people or 15% of the population of the Greater Dublin Area. However, the treatment plant and infrastructure has had no major upgrade since it was first built over 150 years ago, and the supply is now in decline. The water treatment plant does not conform to modern drinking water regulations, the tunnel is in danger of collapse, and the reservoir draw-off facilities need to be re-built to ensure the safety of the structure. The upgrading of the Vartry Water Supply is likely to be addressed in Irish Water's NWRP and future Capital Investment Plans.



What our customers can expect from us

We will develop and implement strategies underpinned by 'on the ground' measures to meet water quality standards, ensure water availability and provide an acceptable level of service to our customers. We will monitor and report our compliance with these strategies.

Objectives and Strategies

The proposed strategies and performance targets to achieve this objective are summarised in the table below and are detailed in the remaining sections of this chapter.

Strategy	Purpose
Aim WS1 - Manage the quality of drinking water from source to tap to protect human health	
WS1a	Prepare a National Water Resources Plan and implement on a phased basis.
WS1b	Prepare and implement Drinking Water Safety Plans for all Water Supply Zones.
WS1c	Implement Standard Operational Procedures for all water treatment plants, water storage facilities and distribution networks.
WS1d	Develop and implement Capital Investment Plans to improve drinking water quality.
WS1e	Prepare and implement a "Lead Compliance Strategy".
WS1f	Prepare and implement strategies to manage other quality issues in water supplies.

Strategy		Purpose
Aim WS 2 – Manage the availability and reliability of water supply now and into the future		
WS2a	Implement risk assessments for all water supply areas in terms of short, medium and long term risks to customer supply.	To ensure that water supply areas have quantified risk assessments and appropriate mitigation measures are in place.
WS2b	Manage existing water resources and plan for new resources taking a regional view of needs and having regard to the objectives of the Water Framework Directive (WFD).	To ensure long term sustainability of yields is considered in the management of existing and new water sources to meet predicted needs while being aligned with the requirements of the WFD.
WS2c	Develop long-term sustainable water sources with resilience to climate change.	To ensure all new sources are able to cope with the potential impacts and risks from climate change.
WS2d	Develop methodologies to build strategic resilience and network connectivity into resource planning.	To ensure that all water supply zones have built in security and reliability, by developing larger scale regional solutions which offer better governance, economies of scale in operation and can be monitored effectively
WS2e	Manage future regulatory requirements for abstraction licencing, headroom in treatment facilities and population growth.	To ensure security in Levels of Service for all customers which take account of impacts from future regulation and population growth.
WS2f	Match water abstraction to availability and quality using surface water and groundwater sources. This is known as Conjunctive Use.	To ensure Levels of Service for all customers accounting for seasonal and climate change variations, maximising source resilience.
WS2g	Prepare Regional Water Conservation Strategies and implement on a phased basis.	To reduce water leakage to a sustainable economic level in stages through a systematic work programme over a reasonable period.



Strategy	Purpose
Aim WS3 – Manage the affordability of water supplies	
WS3a	Adopt an asset management based approach to capital maintenance and capital investment. To maximise the lifespan of assets and their performance for consistent levels of service at least cost.
WS3b	Optimise the unit cost of water supply through proper water resource and treatment planning. To minimise the unit costs of water treatment for all our customers taking advantage of scale and efficient processes.
WS3c	Prepare and implement water conservation strategies including demand management. To reduce the volume of water abstraction and treatment and therefore cost to the customer.
WS3d	Optimise capital and operational investments in water supply. To ensure the maximum return and customer benefit from investments through delivery of services in the least cost manner.

WS1: MANAGE THE QUALITY OF DRINKING WATER FROM SOURCE TO TAP TO PROTECT HUMAN HEALTH

[WS1a] Prepare a National Water Resources Plan and implement on a phased basis.

A National Water Resources Plan is a country wide assessment of water resource availability and water supply demand. The plan will assess the likely future demands of our customers and balance these needs against availability of water for supply on a catchment and river basin scale. The plan will then make strategic level recommendations for the development of water supply infrastructure to meet the demands of population and economic growth. The plan will take a regional perspective supporting balanced regional development and will include for inter-region or inter-catchment water transfers where required to ensure adequate water provision into the future. Any such transfers must be environmentally sustainable and therefore cannot compromise the needs of the local catchment or region.

Our National Water Resources Plan will focus on efficient, environmentally sustainable use of water and providing for reliability and security of supply (system resilience). We will improve or decommission water sources which are at risk from contamination or low flows or are causing avoidable environmental impacts.

The plan will include cost-effective measures to transfer water from areas that have plentiful water resources to those which have insufficient supplies to meet current demand and to support growth, ensuring that this approach meets sustainability criteria and supports balanced regional development in line with national and regional planning policy.

We will also target a rationalised approach towards fewer larger water supply zones based on sustainable water sources to provide effective, consistent service, quality and value for money to our customers.

[WS1b] Prepare and implement Drinking Water Safety Plans for all of our Water Supply Zones.

Drinking Water Safety Plans (DWSP) seek to protect human health by managing risks to water quality taking a whole catchment approach to manage risks from source through to the tap. The plans assess the risks of contamination of water sources and propose mitigation measures to minimise these risks. They then propose appropriate treatment processes and preventative measures for contamination risks in the water distribution system. Both the World Health

Organisation (WHO) and the EPA strongly endorse the Drinking Water Safety Plan approach to managing drinking water supplies effectively in the interests of public health.

Irish Water will prepare DWSPs for all water supply zones (WSZs). All DWSPs will use an approach which is in accordance with the WHO guidelines and will ensure that protection and controls are put in place to meet health based standards. DWSPs will also consider the longer term impacts of climate change on the water sources.

We will categorise each WSZ on the basis of risk, focusing on those with the greatest risk of water quality failure. We have created data capture and management systems to assess risk and support DWSP development. We expect that these pro-active plans will take over from the reactive 'Remedial Action Lists' used successfully by the EPA up to now as the key drivers of investment in and operational management of our water supplies.

We will engage with stakeholders in the development and implementation of measures aimed at delivering effective improvements in the quality of raw water within each catchment supporting good quality raw water sources. This approach will contribute towards sustainability and environmental gains, and potentially have a positive impact on both the cost of treating water and sustainability of yields from the catchment.

The categorisation of the water supply sources nationally using DWSP's will support the phased implementation of the National Water Resources Plan and inform where water sources should be abandoned or combined and also where treatment must be upgraded and centralised to meet water quality standards.

All WSZs will have DWSPs completed and implemented by the end of 2021.

[WS1c] Implement Standard Operating Procedures for water treatment facilities, water storage facilities and distribution networks.

Standard Operational Procedures (SOPs) are written rules and processes for the correct operation of water treatment plants to ensure safe water supply and efficient operation. The procedures will be prepared by reference to best international practice, tailored for Irish conditions and will include staff training and maintenance regimes for all of our treatment plants, water storage facilities and distribution networks.

Irish Water will develop 'Asset Needs' briefs for each plant which will detail the improvements required to meet the SOPs. These documents will then inform the Capital Investment Plans. We will immediately address those failures which can be removed by implementing changes to plant operations or through our minor capital programmes.

We will update and maintain Drinking Water Incident Response Plans. These plans document the procedures, processes and information to support the management of a drinking water incident (unexpected event). The plans assess the risks and assign responsibilities in the event of an incident. They identify the correct communication channels and enable site and event specific arrangements to be made efficiently and effectively.

We will also work with relevant statutory bodies in support of 'A Framework for Major Emergency Management' as published by the Inter-Departmental Committee on Major Emergencies. We will develop and maintain an Emergency Response Plan, in accordance with the framework, so that Irish Water can respond when called upon in the support of the principal response agencies in reacting to and managing major emergencies.

[WS1d] Develop and implement Capital Investment Plans to improve drinking water quality.

As we improve our knowledge of our assets, collect and interrogate data we will build up a greater understanding of our abstractions, treatment plants and distribution systems and how inadequacies in their operation, maintenance and condition contribute to water supply quality problems. We will then be able to prioritise our investment plans on the basis of risk.

We are presently implementing solutions to urgently address immediate inadequacies in water supply provision and Irish Water has developed a work plan for all schemes which are currently failing to comply with microbiological or chemical quality standards.

[WS1e] Prepare and implement a Lead Compliance Strategy.

The use of lead pipes and conduits in water supplies have been documented from Roman times. In Ireland water service pipes and storage tanks made of lead and lead pipes were used in construction up until the early 1970s. Therefore, it must be assumed that the majority of older houses and public buildings have lead plumbing, except where it has been replaced.

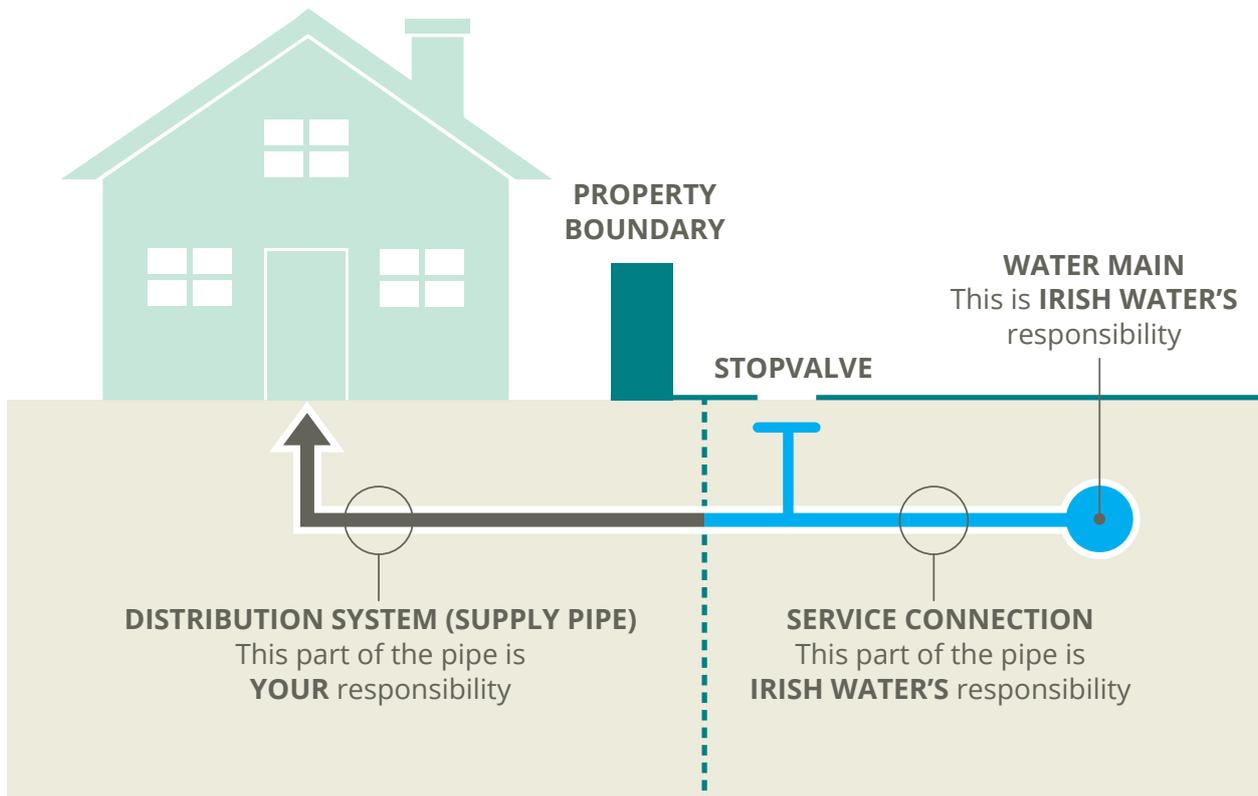
Lead is absorbed into solution in water and the solubility (plumbosolvency) is a function of the water chemistry. Drinking water treatment usually includes pH adjustment (typically using lime) in order to reduce lead solubility, but this is only partially successful. Internationally, other chemical treatments are used including dosing with ortho-phosphate which deposits a coating on the pipe wall inhibiting the solution of lead into the water.

The acceptable concentration of lead in drinking water is 10 µg/litre, based on standards set by the EU Drinking Water Directive, with effect from December, 2013. Prior to that date, the standard was 25µg/l, down from 50µg/l in 2003. The general health advice, echoed by both the EPA and HSE, is that the preferred option is full removal of lead from the distribution network (both public supply pipes and private plumbing), but achieving this will inevitably take a considerable period of time.

Irish Water has a programme of sampling for lead at customer points of use and we are optimising our treatment plants to condition water (through pH correction and introducing ortho-phosphate dosing on a risk based approach) to minimise the potential for lead absorption. We are currently surveying the extent of lead pipework in our system and mapping it into our Geographic Information System (GIS) using data from the metering project and local authority surveys of backyard supply pipes. The Irish Water website provides advice to customers on lead, including the HSE and EPA Joint Position Paper – Lead (Pb) in Drinking Water, December 2013 which is available from the following link (<http://www.water.ie/help-centre/questions-and-answers/where-does-lead-in-water/>).

Irish Water is responsible for public service pipes up to 225mm from the property boundary as shown on the graphic below. Householders are responsible for the service pipe from the site boundary and internally in the property.

Figure 5 Extent of Responsibility for Household Water Supply Connection Pipe



We estimate that at least 100,000 properties have public lead service pipes and that between 30,000 and 40,000 properties have shared or looped mains serving them. Where a customer decides to replace private side lead pipe, we will commit to replace the public supply pipe at the same time, if this is not already done. Our lead pipe replacement programme is targeting removal of lead from public communication pipes over a 10 year period. We will notify households of lead exceedances in their water supply and advise households with private lead piping on flushing and replacement. In the meantime, we will continue to roll out our treatment optimisation programme to help minimise the risk to customers.

We will also advise our customers on the appropriate Domestic Plumbing Standards Policy based on international best practice.

[WS1f] Prepare and implement strategies to manage other quality issues in water supplies.

We will identify water supplies that suffer from water quality issues that are not covered under drinking water standards such as water hardness and discolouration due to natural sources. These problems can cause concern to customers and excessive hardness in particular can cause damage to hot water appliances. However, neither hard water nor the substances associated with hard water, such as lime, calcium and magnesium, require the restriction of a supply nor do they make water unfit for human consumption.

We will continue to review our treatment processes to ensure optimum removal of colour, iron and manganese compounds and dissolved solids leading to colour. We also recognise that colour and turbidity often arises from changes in flow in old mains (notably iron pipes) and we will work to minimise this, recognising that relining or replacement of these is a long term objective. While treatment to reduce hardness in water supply is not currently a priority, it may be considered in severe cases by the CER when priority compliance issues have been addressed.

WS2: MANAGE THE AVAILABILITY AND RELIABILITY OF WATER SUPPLIES NOW AND INTO THE FUTURE

[WS2a] Implement risk assessments for all water supply zones in terms of short, medium and long term risks to customer supply.

Water sources can be susceptible to changes in river flows or lake and groundwater levels. We will prepare risk assessments for all water supply sources to determine short, medium and long term risks to water supply capacity. Based on these risk assessments, we will identify and develop our plans for sustainable water sources nationally. Measures to achieve this will include rationalisation of water supply zones to utilise larger sources and interconnection of networks to ensure security of supply.

Risk assessments of all water supply zones will be completed by the end of 2017.

[WS2b] Manage existing water resources and plan for new resources taking a regional view of needs and having regard to the objectives of the Water Framework Directive (WFD).

The WFD promotes a holistic approach to the management of the water environment where all stakeholders work together. Working with the EPA, we will seek to balance the volume of our abstractions and the locations where we abstract water with the needs of the ecology supported by the water environment. We will identify opportunities for co-operation on the development of catchment management initiatives that will increase protection of drinking water sources.

This will form a key part of the National Water Resources Plan and Drinking Water Safety Plans with the initial identification of appropriate measures aligned with the requirements of the WFD being completed by the end of 2017.

[WS2c] Develop long-term sustainable sources with resilience to climate change.

It is important that our water treatment and distribution systems are able to cope with impacts from both short term extreme weather events and longer term changes to water resources.

Climate change studies indicate that extreme weather events such as droughts and flooding resulting from intense or prolonged rainfall could become more common in the future.

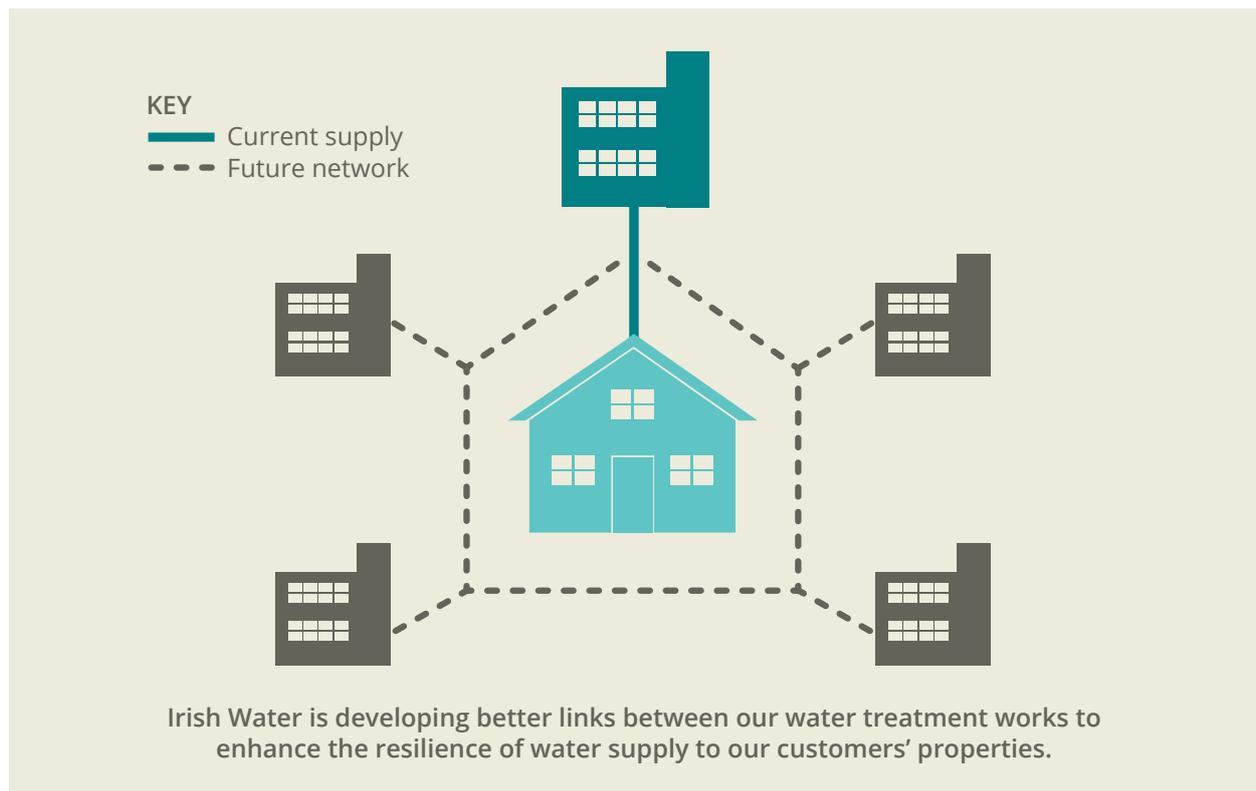
Irish Water will seek to develop new water sources and mobilise additional sources to support those at risk, in order to make our supplies resilient to potential climate change impacts.

[WS2d] Develop methodologies to build strategic resilience and network connectivity into resource planning.

Water supply zones that are reliant on a single source, water treatment plant or storage, are more vulnerable to short or longer term service interruptions due to contamination of a source or failure in a treatment process.

We will seek to interconnect water supply zones, where possible, or to develop back-up sources and treatment and storage facilities to ensure reliability and resilience in water supply. This will take account of the risk and impacts of supply failure and its mitigation will be a function of criticality and cost, taking account of funding available.

Figure 6 Graphical Representation of a Strategic Water Supply Network



[WS2e] Manage future regulatory requirements for abstraction licencing, headroom in treatment facilities and population growth.

We will work with the EPA and the Department of the Environment, Community and Local Government to manage the regulation of our water abstractions, on the assumption that new national regulations for abstractions are likely to be introduced in the near term. In respect of any new regulations, our paramount consideration will be to ensure that Irish Water can maintain supplies to its present and future customers.

The headroom capacity in some water treatment facilities, particularly in the Dublin area, is at critical levels. Irish Water has a target to maintain headroom capacity in the 10-20% range to ensure resilience of supply to meet peak demands, population growth and other demand increases. Where the scale and economic impact of supply failure is high, or the consequences to vulnerable customers would be significant, we believe that the available headroom should be at the upper end of this range, 20% over current daily need in large urban areas, 15% in regional gateway towns and 10% elsewhere.

[WS2f] Match water abstraction to availability and quality using surface water and groundwater sources. This is known as conjunctive use.

Irish Water will take a full part in the process of developing river basin management plans and related programmes of measures to protect water sources from catchment impacts. These can include runoff from agriculture, forestry, tourism or other activities. Drinking water supplies are particularly vulnerable to organic pollution (leading to algal blooms) but also to other compounds such as metals, chemical or pharmaceutical residues.

Within our water safety plans, we will include consideration of these risks and their mitigation. Depending on the level of risk, this may require consideration of mitigation measures such as temporary shut-down or interconnection of multiple sources, where practicable.

[WS2g] Prepare Regional Water Conservation Strategies and implement on a phased basis.

Leakage is an immediate priority for Irish Water. Irish Water currently estimates that, nationally, 49% of water produced is lost to leakage, with the leakage lowest in the Greater Dublin Area and greatest in rural schemes with relatively long pipeline lengths per customer served.

We are currently carrying out detailed audits across the country and validation of the local area metering and valve controls forming District Meter Areas (DMAs) which have been installed since 2000 in most local authorities at a cost of over €100M. In many cases, the integrity of DMA boundaries has been compromised for local operational reasons so that accurate leakage calculations and leak targeting are not currently possible. We are working to re-establish the DMA infrastructure as a pre-requisite to a large scale programme of water conservation measures, which we plan to deliver on a regional basis.

We will prepare Regional Water Conservation Strategies that will deliver a targeted programme of leakage detection, leakage control, pressure management and leakage repair. This work will be implemented in a continuous programme over a number of investment cycles to bring leakage down and maintain it at sustainable economic levels. We will introduce pressure management measures and replace or rehabilitate water pipelines as required.

The water metering programme and our related 'first fix' policy seek to reduce customer side leakage. We will analyse domestic metering data returns to build up a better picture of water usage and review estimates for Unaccounted for Water (UFW), including leakage in all water supply zones during 2015 and 2016.

We plan on reducing leakage across all schemes to less than 38% by the end of 2021 and will work to achieve a sustainable economic level of leakage, estimated to be in the range of 18-22%, by 2040.

WS3: MANAGE THE AFFORDABILITY OF WATER SUPPLIES

[WS3a] Adopt an asset management based approach to capital maintenance and capital investment.

Irish Water assets comprise our water resources (in particular our rights of abstraction), our extensive pipe networks, pumping and storage systems, treatment plants, buildings and other equipment. We recognise that robust and reliable information on the condition of our water assets, capacity and their future lifespan is vital to inform future investment plans and to ensure that assets are replaced or upgraded when necessary.

We have developed a national Geographic Information System (GIS) into which all of the available water network information from the local authorities has been mapped. This is reasonably comprehensive for the public water mains following major surveys as part of water conservation studies over the past 10 years. Where data is available, it is not always complete with regard to the size, material, condition or age of assets, all of which is useful information. The presence and location of fittings (valves, hydrants, manholes) and connections is also very important. Ongoing surveys will be needed to upgrade and increase the reliability and value of these asset datasets.

[WS3b] Optimise the unit cost of water supply through proper water resource and treatment planning.

Minimising the unit cost of delivering water to the customer whilst meeting environmental compliance will result in the rationalisation of water supply areas over time and, subject to funding ability, will focus on a smaller number of high quality, sustainable sources with standardised treatment processes. This rationalisation approach will be developed within the National Water Resources Plan by the end of 2017.

[WS3c] Prepare and implement water conservation strategies including demand management.

Water conservation encompasses activities to manage the use of water as a sustainable resource whilst protecting the environment.

As the Regional Water Conservation Strategies referred to in [WS2g] are implemented, the focus on customer demand management in combination with less leakage will ensure costs for water abstraction, treatment and distribution are reduced. Demand management will be facilitated through the domestic metering programme, with water use figures provided on quarterly bills and the potential for customer savings for low water use. We estimate that 10% of our domestic customers have significant leaks, divided between internal leaks on fittings or plumbing and leaks on the external service pipes. Our 'First fix' programme will assist in repairing the external leaks but will also encourage the repair of internal leaks by customers.

We will support education on water usage to encourage reduced water demand across both domestic and commercial water users. This will focus on the 'value of water' and how our actions and activities impact on our water demand and the implications for the environment, levels of service and costs to customers. The introduction of meters to measure domestic water usage at individual properties will facilitate this.

We will promote the reuse of grey water and water efficient domestic appliances. We will also provide specific advice to our commercial and industrial customers on how to reduce water usage, thereby assisting our drive towards minimising abstraction.

[WS3d] Optimise capital and operational investments in water supply.

We will develop detailed cost benefit analysis and prioritisation models for all strategies and projects that deliver best value for our customers and satisfy our regulators (CER and EPA). The assessment of capital investment projects will follow a process with key decision points and detailed options assessment to ensure that the most cost effective alternatives are selected.

Within the project planning and development process, we will engage with all stakeholders including regulators, planning authorities, landowners, fisheries, our customers and other interested parties and work with all concerned in a collaborative basis. This will assist towards delivering our projects and programmes in a timely and efficient manner, minimising add-on costs.

Indicators and Targets

Indicators and targets for ensuring a safe and reliable water supply are presented in the table below.

Strategic Objective	ENSURE A SAFE AND RELIABLE WATER SUPPLY			
	Definition	Current Baseline (Based on Current Knowledge)	End of 2021 Target	2040 Target
AIM WS1	Manage the quality of water supply from source to tap to protect human health			
Drinking Water Microbiological Standards	% of national samples meeting microbiological compliance standards	 99.82%	 99.99%	 99.99%
Boil Water Notices	Notices in place for more than 200 days	 23,000 people on a boil water notice	 0 people on a boil water notice	0 people on a boil water notice
Drinking Water Lead Standards	% of national samples meeting Lead Compliance Standards sampled in the public network	 Estimated 95% meeting standard of 10µg/l	 98% meeting standard of 10µg/l	 99.5% meeting standard of 10µg/l
Drinking Water Chemical Standards	% of national samples meeting chemical compliance standards	 99.51% (based on EPA report for 2013)	 99.75%	 99.9%
Drinking Water Trihalomethane Standards	% of national samples meeting THM compliance standards	 90.3%	 93%	 99.5%

Strategic Objective	ENSURE A SAFE AND RELIABLE WATER SUPPLY			
	Definition	Current Baseline (Based on Current Knowledge)	End of 2021 Target	2040 Target
AIM WS2	Manage the Availability and Reliability of Water Supplies Now and Into the Future			
Water Supply Interruptions	Average hours of supply interruption per property served (per year) - hours lost due to water supply interruption for 3 hours or longer (planned or unplanned)	 Not currently available. To be defined by end of 2016	 Transition from unplanned to planned with targeted reduction in number of interruptions	 0.13 hours lost per annum - planned and unplanned interruptions
Water Pressure	% of properties at or above reference pressure level 15 metre pressure head	 Not currently available. To be determined by end of 2016	 From 2019, 2% increase in properties at or above pressure reference level	 99.9% receiving appropriate pressure
AIM WS3	Manage the affordability of Water Supplies			
Leakage	Leakage expressed as a % of treated water put in to the distribution system	 Approx 49% of treated water	 Less than 38% of treated water	 Achieve Sustainable Economic Level of leakage (18-22%)
National Water Resources Planning (NWRP)	Implement National Water Resources Plan	Large number of small unsustainable WTPs (Circa 856 in total). (Define the appropriate number of WTPs based on NWRP to be developed and implemented by 2018)	Rationalisation of WTPs and water supply zones. Target reduction to 780 WTPs	Fully implement NWRP target for optimum number and scale of water treatment plants



Chapter 5

Objective:

Provide Effective Management of Wastewater



Our Strategic Aims

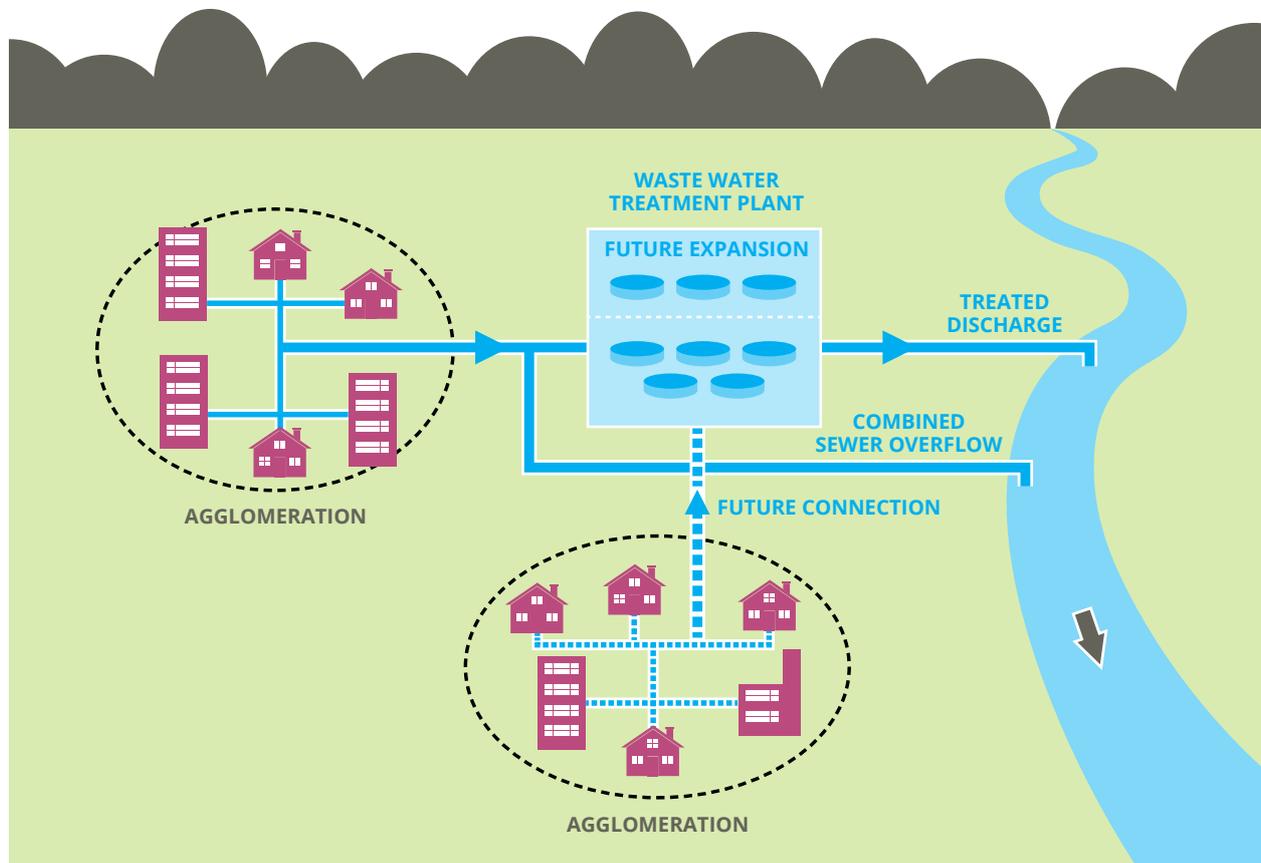
- Manage the operation of wastewater facilities in a manner that protects environmental quality.
- Manage the availability and resilience of wastewater services now and into the future.
- Manage the affordability and reliability of wastewater services.

Introduction

Providing an effective wastewater management system for the collection and treatment of effluent is essential to protect the environment and public health. The treatment of wastewater to appropriate standards prior to its discharge to watercourses safeguards water used for drinking water abstraction, bathing, fishing and other recreational activities. A graphic illustrating the elements of a wastewater treatment system is presented below.

This chapter details the current situation in terms of wastewater management, the challenges that Irish Water faces and our strategies for tackling these challenges. Performance targets against which our future progress can be assessed are also presented.

Figure 7 Wastewater Treatment System



The Current Situation

Over 1,000 separate wastewater treatment plants and collection networks currently process our wastewater in Ireland. While some of our wastewater treatment plants have enough capacity to cope with their effluent loads, others do not. We have many smaller communities and a number of large coastal urban centres without any effective wastewater treatment. In addition, many communities are served by individual septic tanks or private plants that are outside the scope of Irish Water's remit.

The legislative context for provision and licencing of appropriate wastewater treatment infrastructure in Ireland is governed by the Urban Wastewater Treatment Regulations (SI 245 of 2001) and the Wastewater Discharge (Authorisation) Regulations (SI 684 of 2007). All discharges from wastewater collection systems and treatment plants throughout the country which serve an agglomeration of greater than 500 PE (population equivalent) are required to be issued with a Wastewater Discharge Licence from the Environmental Protection Agency (EPA). Discharge licences set out the monitoring and compliance requirements in respect of treated effluent discharges to the receiving watercourse. All discharges from wastewater collection systems and treatment plants which serve an agglomeration of less than 500 PE (population equivalent) are required to be issued with a Wastewater Discharge Certificate from the Environmental Protection Agency (EPA).

Under the previous funding model, investment in wastewater collection and treatment was the responsibility of the local authorities. This approach did not encourage strategic investment planning at a regional or national level. One consequence was that investment was concentrated in larger urban centres to address legislative requirements, at the expense of smaller development centres where a rapid expansion of housing had led to increased pressures and demands on outdated treatment systems. This has resulted in a large number of small schemes with either no treatment or unacceptable treatment which does not meet the requirements of the legislation.

At the same time, collection systems have developed in an ad-hoc manner. Older urban areas are served by combined systems which accept stormwater run-off and foul flows. Such systems present a risk of flooding and to offset this risk, many are provided with overflows which discharge excess flows to rivers and streams in times of heavy rainfall. These are referred to as Combined Sewer Overflows (CSO's) and where the overflows spill too frequently, or where the receiving stream is too small, they can be a source of pollution.

Key Challenges

As a minimum, discharges from wastewater treatment plants are required to comply with the standards of treated effluent quality stated in the Urban Waste Water Treatment Directive (UWWTD) and any further standards as licenced by the EPA. Many of the discharges from our wastewater treatment plants do not comply with standards specified (either in the Directive or in the Wastewater Discharge Licences) due to overloading, lack of investment and in some cases poor operational procedures. As a consequence, an Infringement Case has been initiated by the European Commission on 71 agglomerations which did not meet the requirements of the Directive in 2011. A key challenge is to ensure that compliance is achieved in a timely and cost effective manner through operational improvements and upgrading and replacement of assets. Investment must be prioritised to where the environmental benefit is greatest and growth is occurring.

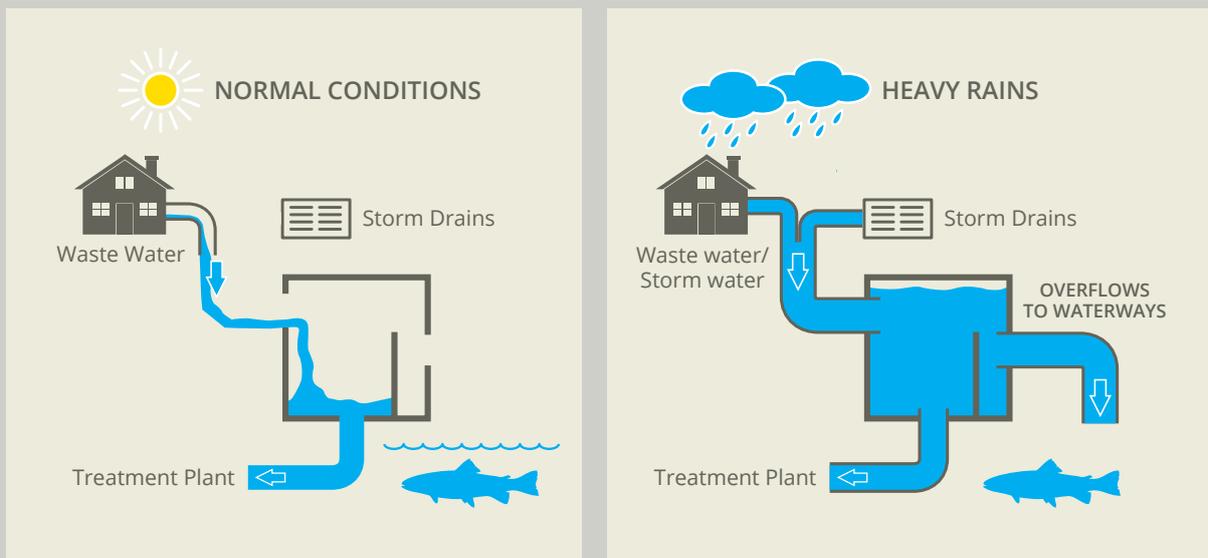
A large proportion of our urban sewer networks function as combined systems carrying both wastewater and surface water runoff from impermeable hard-standings (e.g. roads, pavements, roofs of buildings, car parks). During periods of heavy rain, excess surface water run-off mixes with effluent and this can result in discharges through combined sewer overflows (CSOs) directly into watercourses. Such discharges can cause serious pollution from intermittent wastewater spills. Our challenge is to understand how these systems are operating and to design and implement appropriate interventions to mitigate the impact of discharges on the environment.

Currently, we have high volumes of infiltration of groundwater entering the wastewater collection networks due to leaky sewer pipes. This infiltration, together with peak flows in high rainfall and the variability of loads, represents a significant challenge to the efficient operation and performance of collection and treatment systems. In coastal areas, salt water intrusion has further adverse impacts in terms of plant corrosion and inhibition of the biological treatment process. The challenge of infiltration to sewers mirrors the leakage issue in water mains in that it is extremely difficult to quantify and resolve.

Combined Sewer Overflows (CSOs)

CSOs are an inherent and necessary part of our sewer network as constructed. They act as relief valves to the network during periods of heavy rainfall without which foul effluent would back-up the pipelines causing blockages and flooding of properties. While these discharges should only occur during heavy rainfall which results in dilution of the foul effluent prior to overflow many of the existing CSOs are inadequately designed to retain solid waste resulting in a threat to environmental standards.

A graphic of the operation of a CSO is presented below.



No national Standard Operating Procedures (SOPs) are in place for the collection and treatment of wastewater and their development and implementation is a high priority.

In many areas, there is limited knowledge of the location and condition of below ground assets. This requires significant surveys and upgrading of the GIS records, development of the system models and a process for keeping them up to date. Knowledge of networks is a pre-requisite for the efficient prioritisation of network improvements to deliver environmental improvement and to enable new development in a cost effective way.

What Our Customers Can Expect from Us

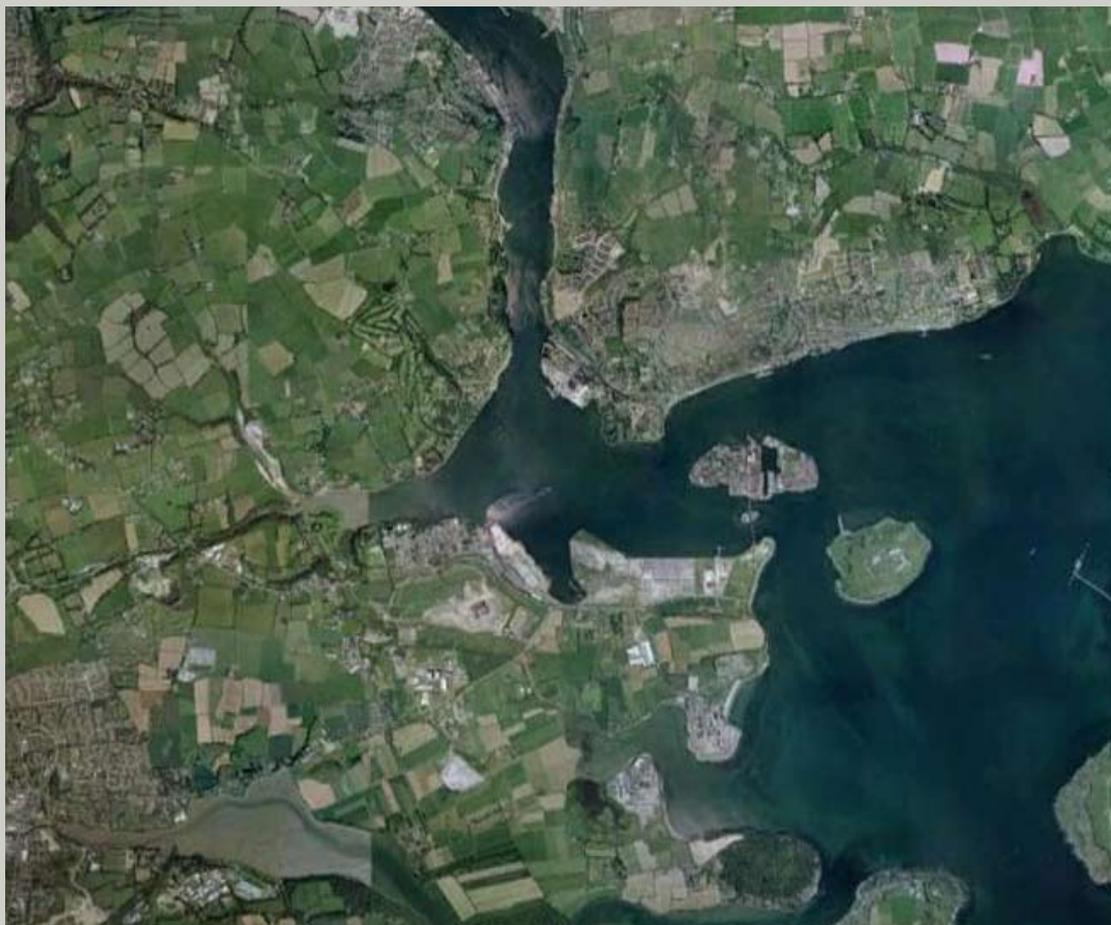
In the future our customers can expect us to provide an effective wastewater collection, treatment and disposal system, which protects human health and the environment whilst providing capacity for social and economic growth. Our objective is to ensure compliance with our discharge licences, with the Urban Wastewater Treatment Regulations and other relevant legislation for all of our wastewater discharges. Recognising that the scale of the challenge will require a number of investment cycles and will involve major investment, we must ensure that the solutions are appropriate and cost effective.

Case Study

Lower Cork Harbour Main Drainage Scheme

The Cork Lower Harbour Main Drainage Scheme (Cork LHMS) includes the population/industrial centres of Cobh, Carrigaline, Crosshaven, Passage West, Monkstown, Glenbrook, Ringaskiddy Shanbally and Coolmore. The existing sewer network serving the Lower Cork Harbour area comprises mainly combined sewer systems. Wastewater from Cobh, Carrigaline, Passage West/Monkstown and Ringaskiddy is currently discharged following preliminary screening or untreated into the Harbour. This is in breach of the Urban Wastewater Treatment Directive

Wastewater from the Cork Lower Harbour area will now be transferred to a new wastewater treatment plant at Shanbally (north west of Carrigaline) and treated effluent discharged utilising the existing IDA outfall discharging to the Harbour at Dognose Bank. The scheme includes the construction of associated pumping stations and new/upgraded sewers, rehabilitation of existing sewers and surface water separation where economically viable. The scheme has been approved by An Bord Pleanála and construction is due to commence in 2015.



Objectives and Strategies

The proposed strategies and performance targets to achieve this objective are summarised in the table below and are detailed in the remaining sections of this chapter.

Strategy	Purpose
Aim WW1 - Manage the operation of wastewater facilities in a manner that protects environmental quality	
WW1a	Prepare and implement a Wastewater Compliance Strategy.
WW1b	Produce appropriate guidance documentation and Standard Operating Procedures.
WW1c	Develop and implement Capital Investment Plans on a prioritised basis to progressively achieve compliance.
WW1d	Manage the wider potential environmental impacts associated with the construction and operation of wastewater systems.
Aim WW2 - Manage the availability and resilience of wastewater services now and into the future	
WW2a	Implement risk assessments for all agglomerations in terms of short, medium and long term risks to customer service.
WW2b	Manage existing wastewater assets and plan for new assets based on short, medium and long term sustainability.
WW2c	Identify properties at risk of flooding from combined sewers, and implement measures to reduce risk on a phased basis.
WW2d	Identify and manage critical wastewater assets.

Strategy	Purpose
Aim WW3 - Manage the Affordability and Reliability of Wastewater Services	
WW3a	Adopt an asset management based approach to capital maintenance and capital investment. To optimise the lifecycle of assets, extend asset life and reduce operating costs.
WW3b	Develop and implement strategies and standards to minimise the unit costs of wastewater treatment including standardising treatment processes. To optimise costs and meet the various appropriate discharge requirements by availing of the best technologies and extending the usage of standardisation, automation and control systems.
WW3c	Optimise energy consumption in wastewater treatment plants and collection systems. To reduce energy consumption across all installations thereby reducing operating costs through efficient plant and process selection and maximising energy recovery opportunities.
WW3d	Ensure adequate governance and control of discharges to the sewer network, having regard for best practice and value. To ensure that discharges from the trade sector are controlled and managed to minimise loads at source, thereby reducing loads to treatment.
WW3e	Engage with regulators and stakeholders. To give certainty with regard to customer charges and to develop strategies for future growth and investment in infrastructure.
WW3f	Optimise capital and operational investments in wastewater services. To minimise costs while maintaining a compliant and sustainable level of service.

WW1: MANAGE THE OPERATION OF WASTEWATER FACILITIES IN A MANNER THAT PROTECTS ENVIRONMENTAL QUALITY.

[WW1a] Prepare and implement a Wastewater Compliance Strategy.

We will develop a Wastewater Compliance Strategy setting out a pathway to ensure that the discharges from the wastewater treatment systems that we manage comply with the water quality standards required by the Urban Waste Water Treatment Directive (UWWTD) and to support the objectives of the Water Framework Directive. We will continue to investigate all wastewater treatment plants that are failing or at risk of failing to meet the UWWTD and prioritise these for remedial work or upgrades.

Combined sewer overflows (CSOs) will be addressed as a component of the Wastewater Compliance Strategy. We will look to international best practice to guide us in the development of design standards and will use network modelling simulation where appropriate to determine the performance and operation of CSO structures. We will then develop plans for remedial measures where required. Waste Water Discharge Licences control all discharge points from the agglomeration including CSOs. We recognise the challenge of achieving compliance at an affordable cost and the need to prioritise in the early investment periods to secure the maximum environmental benefit from the available funds.

In our priority programme for short term investment, we are developing solutions to address the requirements highlighted in the Infringement Case taken by the European Commission on the 71 agglomerations, together with the full list of urban centres currently without treatment and a number of high priority sites identified by EPA where serious pollution is noted and where designated bathing areas are affected by wastewater discharges.

[WW1b] Produce appropriate guidance documentation and Standard Operating Procedures.

There are currently no national Standard Operational Procedures (SOPs) to carry out maintenance, inspection and operational duties on wastewater treatment plants. This has led to inconsistencies in treatment plant performance and variations in operational costs due to the different approaches used previously by local authorities. We will develop national rules for effective wastewater system management in accordance with international best practice and will prepare SOPs including staff training and maintenance regimes across the range and scale of our wastewater treatment plants and collection networks. In developing these, we are drawing on proven processes developed in other high performing water utilities which we will adapt for Irish conditions during 2015.

We will initiate public education and information campaigns in order to inform customers of the impacts of fats, oils and greases and inappropriate material such as pharmaceuticals, baby wipes, nappies and sanitary towels being discharged into the wastewater system.

Unexpected wastewater incidents (for example blockages, pollution, public complaints) require planned management to correct and minimise the impact of an event. We will develop, update and maintain Wastewater Incident Response Plans for all our wastewater systems which will be managed locally through the service level agreements with local authority staff. These plans will document the procedures, processes and information to support the management of an incident. We will develop and maintain an Emergency Response Plan with regard to provision of wastewater services, in accordance with 'A Framework for Major Emergency Management' published by the Inter-Departmental Committee on Major Emergencies, so that we can respond when called upon to support the principal response agencies in reacting to and managing major emergencies.

[WW1c] Develop and implement Capital Investment Plans on a prioritised basis to progressively achieve compliance.

Where non-compliance arises from inadequate treatment processes or capacity constraints we will need to plan the necessary capital works to increase capacity and efficiency of treatment plants. Where feasible, minor capital investments focusing on process upgrades and bolt on solutions will be deployed as permanent or interim measures. Where larger capital works are required, we must have regard to the priority of compliance with the UWWTD standards, growth, available funding and the need to achieve optimum environmental benefit.

We recognise that we cannot address all of the compliance issues in the short term due to funding constraints and the need for a much greater understanding of the wastewater asset base and receiving environments on which they impact. This will require major surveys of our assets and the development of models of both the networks and the receiving water bodies. By adopting this approach future investments will be targeted and efficient and will deliver optimum benefit.

We will also rehabilitate, upgrade and replace wastewater collection pipelines that have significant structural and service defects which can be identified through surveys and investigations. This will be a long term programme having regard to the scale of the works, the lack of data on sewer condition and the need to prioritise critical infrastructure.

[WW1d] Manage the wider potential environmental impacts associated with the construction and operation of wastewater systems.

The construction and operation of our wastewater treatment plants and networks can result in environmental impacts due to noise, dust, odour and other factors. These can be mitigated by utilising appropriate design, construction and operational standards. Irish Water will follow a best practise standardised approach to the planning and execution of our works, including a high level of public engagement at key stages in the process.

The planning and construction of all new wastewater infrastructure will undergo appropriate environmental assessment as part of the relevant statutory processes. These studies will optimise site selection, identify site specific constraints associated with sensitive receptors (for example plants, animals, built heritage and humans) and develop mitigation measure to be adopted during the construction and operation of the new plant. Robust and well-engineered solutions which are sensitive to the environmental context will enable Irish Water to develop wastewater systems that can be built and operated without excessive adverse impact on communities and the wider environment.

WW2: MANAGE THE AVAILABILITY AND RESILIENCE OF WASTEWATER SERVICES NOW AND INTO THE FUTURE.

[WW2a] Implement risk assessments for all agglomerations in terms of short, medium and long term risks to customer service.

We will prepare risk assessments for all agglomerations served by our wastewater treatment systems to determine short, medium and long term risks to the effective provision of wastewater services. Risks include the flooding of properties, equipment failure, non-compliance of discharges, environmental pollution and capacity constraints. These risk assessments will be used to plan investment and mitigation measures.

As we obtain data regarding our below ground assets, we will develop hydraulic models of all our networks so that we can simulate high flow conditions and identify bottlenecks within the system which need to be addressed. We will supplement these with internal CCTV surveys and other investigations to identify critical defects.

The most persistent risks to disruption of wastewater services, particularly in urban areas, are blockages due to the accumulation of grease or non-biodegradable material. We are developing a national fats, oils and greases (FOG) strategy to effectively manage these discharges and seek to eradicate them at source.

[WW2b] Manage existing wastewater assets and plan for new assets based on short, medium and long term sustainability.

We will work with the EPA and other stakeholders in a catchment based approach to ensure sustainable wastewater management. This approach will consider all effluent discharges into each catchment's water bodies (both from our wastewater discharges and from others) and the ability of the water body to receive treated effluent whilst achieving the water body objectives under the WFD.

This approach recognises that water quality in catchment is impacted by multiple pressures, from various sources. Our objective will be for a balanced approach between the sectors, with impacts from wastewater services being addressed as part of a coordinated approach in each catchment, towards the achievement of agreed water body objectives.

[WW2c] Identify properties at risk of flooding from combined sewers, and implement measures to reduce risk on a phased basis.

Rain falling on roads, roofs and other impermeable surfaces, runs down gutters and drain pipes and into the storm drainage system. In older urban areas, developed pre 1970s, it was common to combine all drainage (foul and rainfall runoff) into a single combined sewerage system. Even where separate storm drainage is provided, it is common that a proportion of runoff is connected to the foul sewer, so that all sewerage systems have increased flows in times of rainfall.

Increasing urbanisation combined with more frequent and intense rain storms (due to climate change) can result in the capacity of some combined sewers being exceeded. This can cause flooding of properties causing distress to some customers.

Irish Water is committed to implementing mitigation measures to either reduce the probability that a combined sewer will flood or reduce the severity of the flooding where long term protection solutions aren't economically feasible.

We are putting in place a register to record and gather information on flooding events from combined sewers caused by inadequate capacity and due to other causes (blockages, collapses and equipment failures). The register will catalogue the extent, frequency and cause of flooding. It will inform our investment to enable us to prioritise areas that flood more frequently and to reduce the number of incidents of flooding caused by blockages, collapses and equipment failures.

Irish Water is committed to working with the key stakeholders (planners, land managers and developers) in developing long term sustainable solutions.

In the longer term, Irish Water will focus on research and development, improve sewer network models and investigate (in collaboration with local authorities) the use of sustainable urban drainage systems in combined sewer areas. These measures will enable Irish Water to promote an integrated urban drainage approach and to provide a more cost effective and more sustainable wastewater collection system.

This work will be carried out in close collaboration with local authorities and the OPW with whom Memoranda of Understanding are being developed. This will recognise that the operational response to flood events must be coordinated, to be led generally by the local authority, with Irish Water support. We will work with the CER to agree investment in flood risk abatement measures with a view to systematically reducing the numbers of properties at risk of flooding from our systems through each investment cycle. We will cooperate with other authorities when flood relief schemes are being developed to ensure that solutions are coordinated for effective relief for urban communities.

[WW2d] Identify and manage critical wastewater assets.

Sustained environmental performance depends on the reliability and robustness of each treatment plant and its associated network. Critical elements of both plants and networks have the potential to cause major impacts on services and the environment if they fail. We will identify these critical assets and prioritise their maintenance and management.

WW3: MANAGE THE AFFORDABILITY AND RELIABILITY OF WASTEWATER SERVICES

[WW3a] Adopt an asset management based approach to capital maintenance and capital investment.

We recognise that robust and reliable information on wastewater infrastructure is vital to inform future investment plans and target improvements where they are most needed. Having inherited the wastewater services infrastructure from the local authorities, we have commenced the integration of wastewater asset records to our GIS system and we are in the process of collating existing hydraulic models and other records (CCTV files) where they exist. These are being assessed for reliability and we are scoping the on-going studies which will gradually improve the extent and accuracy of these vital data and analysis systems.

As we develop our data systems, we will collect workflow data from the field, in conjunction with our operational and maintenance activities, which will inform the system data to enable a whole life asset management approach to strategic planning and investment decisions.

[WW3b] Develop and implement strategies and standards to minimise the unit costs of wastewater treatment including standardising treatment processes.

We will develop a number of cost reduction strategies as part of our focus on minimising the unit cost of delivering wastewater services whilst meeting environmental standards.

We will strive to standardise treatment processes countrywide using best-in-class, value-for-money technology and control systems. Standardisation will support our strategy of modular development of treatment plants in sync with growth of demand.

This will also enable more cost effective planned maintenance, use of spare parts and skills requirements in their operation. We will combine this approach with remote monitoring of all plants, recording critical parameters, flows, energy consumption and process indicators, enabling us to target where interventions are required and minimise plant downtime.

[WW3c] Optimise energy consumption in wastewater treatment plants and collection systems.

We will prepare and implement a Sustainable Energy Strategy, as outlined in under Aim EN1b of this document. Due to the energy intensive nature of pumping and wastewater treatment, we intend to implement measures to reduce power costs and carbon emissions including the delivery of “greener” technologies where possible. We will target replacement of older inefficient plant (pumps, air blowers), include variable speed controls and look to optimise energy recovery from wastewater sludge digestion.

[WW3d] Ensure adequate governance and control of discharges to the sewer network, having regard for best practice and value.

We will develop a Wastewater Source Control and Licencing Strategy to regulate and licence the volume and quality of wastewater that commercial customers discharge into our collection network. We will work with local authorities and the EPA in relation to granting and approval of industrial discharge licence applications to ensure that the discharged load is within the capacity of the network and treatment plant and that, where necessary, additional capacity can be planned and implemented.

We will survey the wastewater treatment loads and operational practices of our industrial customers and will provide advice on initial treatment of effluent and the means of meeting their operational wastewater requirements. We recognise the need for greater control of waste loads to our sewers and plants to prevent corrosion of our assets, failure of our treatment processes and issues with extreme odour generation.

We will also develop and implement a management system for the regulation of discharges of Fats, Oils and Greases (FOGs) to our networks.

[WW3e] Engage with regulators and stakeholders.

Through our project planning and development processes we will engage with all stakeholders including our regulators, planning authorities, landowners, our customers and other interested parties.

We must balance the requirements set by both of our regulators: meeting our requirements under the UWWTD and WFD for the EPA and ensuring that our customers are receiving a quality of service at an affordable cost as prescribed by the CER. To achieve these we will work together in a collaborative manner. We will agree a balanced approach to the delivery of services to both protect the customer and meet environmental objectives. This will be set out in our Wastewater Compliance Strategy.

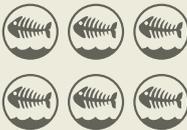
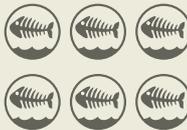
[WW3f] Optimise capital and operational investments in wastewater services.

We will develop detailed cost benefit analysis and prioritisation models for all works and strategies agreed with our regulators. We will promote the use of the most cost effective measures, and timing, in planning to achieve required wastewater discharge quality, with investments benefiting from best combination of capital and operational responses.

In the first instance, we will seek to maximise the capacity of existing assets through operational improvements supported by targeted capital investment.

Indicators and Targets

Indicators and targets for the effective management of wastewater are presented in the table below.

Strategic Objective	PROVIDE EFFECTIVE MANAGEMENT OF WASTE WATER			
	Definition	Current Baseline (Based on Current Knowledge)	End of 2021 Target	2040 Target
AIM WW1	Manage the operation of wastewater facilities in a manner that protects environmental quality			
Waste Water Treatment - Compliance with the Urban Wastewater Treatment Directive requirements	% of total population equivalent served by WWTP compliant with the UWWTD	 60%	 90%	 100%
Waste Water Treatment - Compliance with discharge Emission Limit Values (ELVs) to achieve WFD objectives	% of WWTP serving > 500 PE compliant with the EPA Discharge Licence ELVs	 35%	 60%	 100%
Pollution Incidents caused by Irish Water Waste Water Treatment Systems	Number of Category 2 (localised pollution) incidents reported to the EPA	 149	 75	 20
AIM WW2	Manage the availability and resilience of waste water services now and into the future			
Sewer Flooding; flooding which occurs when capacity of below ground assets is exceeded due to heavy rainfall, resulting in flooding inside and outside of buildings	Number of incidents of sewer flooding of properties	 Not available. Develop register to record number, cause, extent of flooding	 Accurate register of number of properties at risk of flooding from sewers. Historic high priority flood sites addressed	 80% reduction in number of properties which flood frequently (more than once in 10 years)
AIM WW3	Manage the affordability and reliability of waste water services			
Licensed Discharges to Sewers	% of national licensable trade effluent load discharged to sewers under conditions determined by Irish Water in accordance with polluter pays principle	 Not available. Commence establishment of register to trade effluents producers and apply a risk weighting to each	 50% of trade effluent load licensed covering priority classes of discharges	 > 95% of trade effluent load licensed (allowing for turnover of small businesses)

Chapter 6

Objective:

Protect and Enhance the Environment



Our Strategic Aims

- Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment.
- Operate our water services infrastructure in a manner that supports the achievement of water body objectives under the Water Framework Directive.
- Manage all our residual waste in a sustainable manner.

Introduction

Protecting and improving the future, long term quality of the water environment is fundamental to providing safe water services and for the protection of human health and biodiversity. The water environment is inextricably linked to the wider environment and it is important to consider protection of the environment in a holistic way. Irish Water protects the water environment in its role in delivering water services, but also the broader environment in terms of the impacts of our activities, for example in our use of energy and our carbon footprint.

An enhanced water environment results in a reduced requirement for water treatment and supports recreational activities, biodiversity, tourism and the natural character of our countryside.

The need to protect and improve the water environment and the environment generally has been recognised in a number of European Directives that afford special protection to identified areas that are important for drinking water supply, nature conservation, bathing and fisheries. Examples include the Birds Directive, Habitats Directive, Bathing Water Directive and the Water Framework Directive (WFD). The WFD is the overarching Directive within which all matters impacting the water environment are managed.

This chapter will consider the implementation of sustainable strategies and measures to support our objectives in protecting and enhancing the environment.

Water Framework Directive

The Water Framework Directive (WFD) establishes a catchment based approach to the protection, improvement and sustainable use of rivers, lakes, transitional waters (estuaries), coastal waters and groundwater. It adopts the 'polluter pays' principle and will, over time, integrate the requirements of a number of existing directives for the protection of the water environment. It seeks to develop a holistic approach to sustainable water use, balancing social and economic factors with the need to protect and improve our water environment.

The WFD is implemented through river basin management plans which assess the current status of our inland and coastal water bodies (known as characterisation and classification). Where the status of a water body is less than Good (for example from pollution or over-abstraction), remedial actions or measures must be proposed and implemented to achieve the objectives set for each water body. Collectively, these are known as programmes of measures. The river basin management plans are currently being updated and will be published in 2017.

The Current Situation

The current State of the Environment Report published by the EPA (2012) reports that 29% of rivers and canals and 53% of lakes were not Good or High status under the WFD and therefore required improvement. The recent trend in river water quality indicates an overall increase in the length of river channel which is slightly polluted which is mainly due to eutrophication (over-enrichment of nutrients resulting from agriculture and other land use). However, the number of seriously polluted river sites has decreased significantly since monitoring began, reflecting investment in basic wastewater treatment and improved environmental management of agriculture and other land use activities. The number of High status water bodies with sensitive and rare ecology like the Freshwater Pearl Mussel has declined in recent years and site specific, targeted work is required to remediate these and prevent further loss.

Groundwater is faring better with 85% of groundwater bodies being at good status. The principal reasons for failing groundwater bodies resulted from nutrient loading resulting from agricultural practices. A small number of water bodies failed due to site specific contamination from historical mining or other sources. There has been a general reduction in nitrate concentration in groundwater since monitoring commenced, attributed to reductions in the use of inorganic fertilisers and restrictions on land spreading in agriculture.

The EPA is responsible for licensing wastewater discharges from treatment plants for large towns, and for certification of discharges from treatment plants for smaller agglomerations (under 500 Population Equivalent). Currently, water abstractions are not licenced or regulated by the EPA. Compliance with wastewater discharge licences and certificates will continue to drive improvements in treatment and water quality. The current status of wastewater compliance is outlined in Chapter 5 (Provide Effective Management of Wastewater).

Irish Water is a high energy user with an annual cost estimated at €60M. In general, energy efficiency has not been a primary consideration in the construction and operation of water and wastewater treatment infrastructure in the past.



What our Customers can Expect from Us

Our Customers should expect that in the future, following a period of sustained increased investment, all of our operations will meet their statutory compliance requirements, in particular our wastewater discharges. We will work closely with our environmental regulator, the EPA, and other environmental stakeholders and the general public to participate fully in the process of developing river basin management plans and the associated programmes of measures in the implementation of the WFD in Ireland.

Key Challenges

A balance needs to be struck between our activities that impact on the environment and the ability of the environment to sustain these impacts over both the short and longer terms. Meeting the requirements of the WFD programmes of measures with regard to the sustainability of our abstractions, discharge licences and input to catchment management planning will be a significant challenge to our new organisation.

There are risks to water ecosystems outside our control from invasive alien species and from climate change which need to be considered in the future planning of our infrastructure.

With water and wastewater services delivered across 34 local authorities there was previously no national sustainability policy or guidance on operations. Each local authority had its own policy with regard to works design and procurement. Irish Water will develop national sustainability and green procurement strategies for the sector.

With an ageing infrastructure, meeting our obligations for energy efficiency will require significant investment, in both the upgrade and replacement of inefficient systems whilst ensuring the best whole life options are selected for new capital investments.

The provision of water and wastewater services generates a significant volume of both water and wastewater sludge which is dispersed around the many water and wastewater treatment plants and other sites we operate. Effective and safe management of this sludge, utilising its potential for energy generation or reuse where feasible, is a key challenge.

Objectives and Strategies

The proposed strategies to achieve this objective of protecting and enhancing the environment are summarised in the table below and are detailed in the remaining sections of this chapter.

Strategy		Purpose
Aim EN1 – Ensure that Irish Water services are delivered in a sustainable manner which contributes to the protection of the environment		
EN1a	Implement a Sustainability Policy and Sustainability Framework	To ensure that Irish Water services are delivered in a sustainable manner balancing the need to support the social and economic development of the country with the need to protect water resources and the water environment.
EN1b	Prepare and implement a Sustainable Energy Strategy.	To meet our obligations under the National Energy Efficiency Plan (2009-20).
EN1c	Prepare and implement a Climate Change Adaptation and Mitigation Strategy.	To support national objectives for climate change mitigation and to meet our obligations under the National Climate Change Adaptation Framework to ensure the resilience and sustainability of water services.
EN1d	Adopt a Green Procurement Approach and drive efficient use of all our resources.	To ensure that we utilise resources efficiently in our management of water and wastewater services.
EN1e	Adhere to environmental and planning legislation when planning and developing water services assets.	To ensure that all future Irish Water infrastructure meets national planning and environmental legislation and to protect sites of natural and cultural importance.



Strategy		Purpose
<p>Aim EN2 - Operate our water services infrastructure in a manner that supports the achievement of water body objectives under the Water Framework Directive</p>		
EN2a	Work effectively with other stakeholders to support a catchment based approach.	To contribute to the achievement of water body objectives under the Water Framework Directive.
EN2b	Manage the operation of our water and wastewater infrastructure towards the achievement of water body objectives.	To ensure that the operation of our water and wastewater infrastructure assists the achievement of water body objectives under the WFD.
<p>Aim EN3 – Manage all our Residual Waste in a Sustainable Manner</p>		
EN3a	Develop and implement a Corporate Waste Management Strategy.	To ensure Irish Water meets its corporate sustainability responsibilities.
EN3b	Develop and implement a National Wastewater Sludge Management Plan.	To reduce the environmental impacts from wastewater treatment by re-use and renewable energy generation, where feasible.
EN3c	Develop and implement a National Water Sludge Management Plan.	To reduce the environmental impacts from water treatment processes.

EN1: ENSURE THAT IRISH WATER SERVICES ARE DELIVERED IN A SUSTAINABLE MANNER WHICH CONTRIBUTES TO THE PROTECTION OF THE ENVIRONMENT.

[EN1a] Implement a Sustainability Policy and Sustainability Framework

Water services face a range of environmental challenges from changing climate and extreme weather events, escalating energy costs and the impacts of demands of other stakeholders on water resources. It is important that Irish Water implements all of its operations in a way that enables long term sustainability.

Irish Water will prepare and implement a Sustainability Policy and a Framework to support the policy. These documents will represent our long term commitment to protecting and enhancing of the environment. The eight key framework components are Resource Efficiency, Climate Change, Habitats & Wildlife, Equity & Economic Development, Health, Amenity, Social Impact and Culture & Heritage. Our commitments under each of these headings will be established and documented. We aim to continually improve our environmental performance and will ensure that its requirements are communicated to all our employees and those working on our behalf.

[EN1b] Prepare and implement a Sustainable Energy Strategy

The National Energy Efficiency Action Plan (NEEAP) is the Government policy setting out plans and actions to achieve energy efficiency savings across the economy. The action plan was updated in 2014 (NEEAP3) to take account of the Communication from the European Commission setting out its ambition for a 2030 Climate and Energy Policy Framework. The Commission's proposals for 2030 include a reduction in greenhouse gas emissions (GHG) by 40% below the 1990 level, an EU-wide binding target for renewable energy of at least 27% and renewed ambitions for energy efficiency policies. The review of the Energy Efficiency Directive, published in July 2014, calls for an efficiency target of 30% in 2030.

Irish Water is the largest single public user of electricity in Ireland. Our sustainable energy strategy will document how Irish Water will achieve energy efficiency through the use of technologies and initiatives designed to improve energy efficiency and use of renewable energy sources where appropriate and economically viable. We intend to target asset investment and operational changes to meet targets for energy use, consumption and efficiency.

Irish Water's target is an improvement in energy efficiency by 33% by 2020 from the 2009 baseline. Irish Water has entered into an energy partnership with SEAI to avail of their support, resources and expertise in meeting this target.

[EN1c] Prepare and implement a Climate Change Adaptation and Mitigation Strategy

Climate change impacts in Ireland are expected to include more intense rainfall events as well as periods of increased drought along with a rise in sea level. These events will impact on water services through increased risk of sewer flooding, possible inundation of treatment plants and other assets; deterioration in water quality in our rivers and lower dry weather river flows reducing the water available for abstraction or for diluting treated effluent.

Adapting to climate change will require careful planning, preparation, investment and management. Our strategy will address the vulnerability of water services to climate change events and identify actions to modify our infrastructure or operations. This could include, for example, the relocation of abstractions to larger more sustainable water sources, the blending of multiple sources and the implementation of flood protection measures.

[EN1d] Adopt a green procurement approach and drive efficient use of all of our resources.

We will implement a 'green procurement' approach and seek to reduce and remove wastage in our investment and operations decisions. We will work with the Sustainable Energy Authority of Ireland (SEAI) to ensure all goods and services are procured in accordance with the Green Procurement Guidelines. We will adopt a low carbon approach and consider the whole life carbon cost of all new investments. We will implement annual reporting of the actions being taken to improve energy efficiency.

Irish Water will optimise use of chemicals in our treatment processes and review the use of chemicals that have the potential to impact negatively on the environment. We will strive to support the purchase of energy-efficient products and services, where possible and applicable. We will ensure that significant new capital projects are designed and optimised for energy performance as far as possible.

[EN1e] Adhere to environmental and planning legislation when planning and developing water services assets.

All Irish Water projects follow a systematic process to determine the appropriate strategy, option, design and method of implementation prior to construction and operation of new assets. This approach includes extensive consultation, where appropriate, with relevant planning authorities (local authorities, regional planning agencies, An Bord Pleanála) and our regulators (the Commission for Energy Regulation and the Environmental Protection Agency) in addition to key stakeholders such as Government departments, non-governmental organisations, special interest groups and the general public.

All our projects are designed and developed in accordance with planning guidelines and environmental regulations from the outset. We will comply with the statutory processes relevant to our programmes and projects, including Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) under the Habitat's Directive.

EN2: OPERATE OUR WATER SERVICES INFRASTRUCTURE IN A MANNER THAT SUPPORTS THE ACHIEVEMENT OF WATER BODY OBJECTIVES UNDER THE WATER FRAMEWORK DIRECTIVE.

[EN2a] Work effectively with other stakeholders to support a catchment based approach.

We will participate in river basin management planning at a national and river basin level for the development and implementation of programmes of measures in relation to water services in support of the WFD. We consider that each programme of measures should be proportionate to each sector, based on the polluter pays principle, and planned over a timescale which is affordable.

We will work with the EPA and other relevant stakeholders to identify 'on-the-ground' measures to be implemented. Our approach will focus on holistic solutions for the management of the catchment which will consider impacts from all catchment land uses including water services, tourism, agriculture and industry.

We will develop, collaboratively where feasible, catchment based assessments of receiving waters, identifying the impact of our operations and other impacts on water status and assess the environmental benefit of options available to us.

[EN2b] Manage the operation of our water and wastewater infrastructure towards the achievement of water body objectives.

Delivery of water services, particularly the abstraction of water for supply and discharges from our wastewater and water treatment plants, directly interact with the water environment, which the Water Framework Directive (WFD) seeks to protect and enhance. We will target investment to meet the agreed Programmes of Measures related to treated effluent discharges set for specific water body objectives under the WFD, prioritising the greatest environmental benefit from the funding available.

We intend that our water abstractions will be managed sustainably to minimise impact on water body status or use by other stakeholders (for example, maintaining minimum environmental and navigation flows).

We will work towards meeting the requirements of the Priority Substances Directive which sets environmental quality standards (EQS) for the specified substances (i.e. pollutant chemicals) in surface waters (river, lake, transitional and coastal) and will include for targeted monitoring and compliance (where applicable) in our detailed plans and programmes. We will, where appropriate, regulate the discharge of such priority substances under our trade effluent licences.

EN3: MANAGE ALL OUR RESIDUAL WASTE IN A SUSTAINABLE MANNER

[EN3a] Develop and implement a Corporate Waste Management Strategy.

Irish Water will develop and implement a Corporate Waste Management Policy and Plan as part of the resource efficiency element of our Sustainability Framework [Strategy EN1a].

We will manage waste generation and waste streams within the organisation to promote reduction, reuse and recycling of materials. Our plans will propose suitable transportation and disposal routes for waste and require annual reporting of the waste generated and recycled onsite with ongoing targets for reduction.

[EN3b] Develop and implement a National Wastewater Sludge Management Plan.

The wastewater treatment process generates sludges which require further treatment prior to re-use or disposal. There is a deficit of sludge management facilities nationally and additional facilities are required to manage wastewater sludge.

We aim to treat all wastewater sludges to meet the requirements of the DECLG Code of Practice for re-use where possible as fertilizer and soil conditioner. This requires a stable pasteurised product, complying with chemical standards for safe use in agriculture or equivalent use.

Transport and re-use/disposal of all wastewater sludges will be managed by Irish Water to ensure compliance with our standards for treatment and disposal by registered Contractors with full traceability. Re-use in agriculture or forestry will be managed in accordance with Nutrient Management Plans to ensure compliance with nitrogen and phosphorus controls.

Irish Water will work with industry to develop alternatives for the beneficial re-use of wastewater sludge and the possible recovery of energy and/or constituents in a sustainable and economically viable manner. Anaerobic digestion plants reduce the organic solids and create biogas which can be used to generate electricity for use in the treatment plant or for sale to the electricity grid. These will be developed where feasible and economically viable

[EN3c] Develop and implement a National Water Sludge Management Plan.

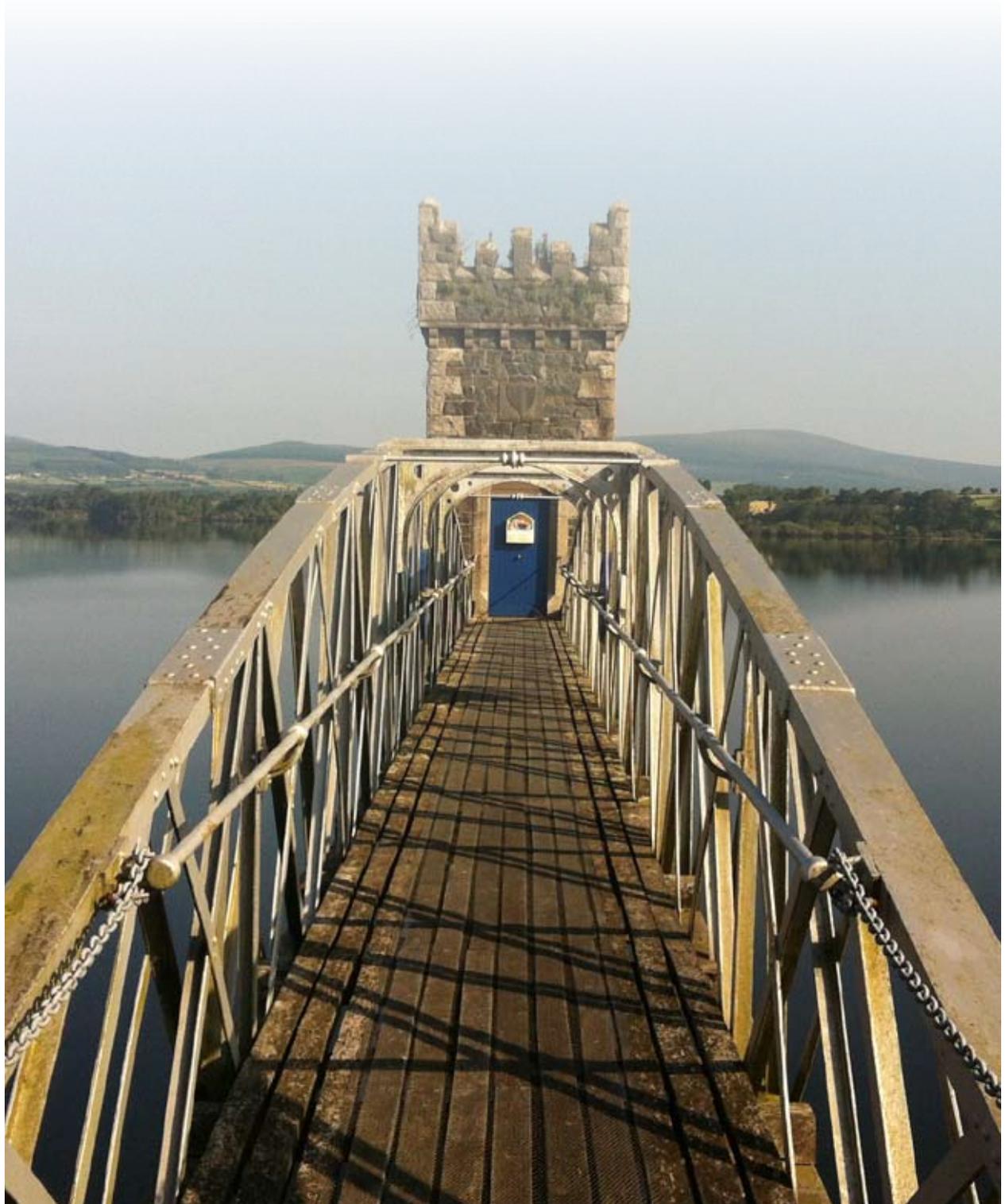
Sludges are also generated from the water treatment process through the removal of colour and fine sediments from the abstracted water using chemicals. These sludges contain aluminium, ferric salts or other chemical residues from the purification process and require dewatering prior to disposal. To date the sludges have limited re-use and have principally been disposed at landfill.

Irish Water will work with industry to develop alternatives for the beneficial re-use of water treatment residual sludge and the possible recovery of constituents in a sustainable and economically viable manner. Landfill disposal will continue to play a major role in managing these sludges. We will ensure that transport and disposal of these wastes are carried out in compliance with waste legislation and with least environmental impact.

Indicators and Targets

Indicators and targets for Irish Water to protect and enhance the environment are presented in the table below.

Strategic Objective	PROTECT AND ENHANCE THE ENVIRONMENT			
	Definition	Current Baseline (Based on Current Knowledge)	End of 2021 Target	2040 Target
AIM EN1	Ensure that Irish Water services are delivered in a sustainable manner that contributes to the protection of the environment			
Water and Wastewater Residual Sludge Disposal	% compliance of treatment and disposal of sludges with Irish Standards	 96%	 99%	 100%
Energy Efficiency	% increase in overall energy efficiency at Irish Water facilities	 2009 Baseline	 33% energy efficiency improvement over baseline by (2020)	 Meet relevant targets that will be established by national energy policy
AIM EN2	Operate our water services infrastructure in a manner that supports the achievement of water body objectives under the WFD			
Waste Water Compliance	Aim WW1 target			
Sustainable Water Supply	Aim WS3 Target: Reduced leakage of treated water supply. Implement National Water Resources Plan.			



Chapter 7

Objective:

Support Social and Economic Growth



Our Strategic Aims

- Support National, Regional and Local Economic and Spatial Planning Policy.
- Facilitate growth in line with national and regional economic and spatial planning policy.
- Ensure that water services are provided in a timely and cost effective manner.

Introduction

The delivery of appropriate infrastructure to meet the required demand where and when it is needed is fundamental to supporting social and economic growth. Water and wastewater capacity is an important factor in maintaining Ireland's competitiveness for industry and commercial activity and as a destination for foreign direct investment. Water stress is an increasingly critical issue in many parts of the world, whereas Ireland has an abundance of water resources, provided we manage them appropriately.

Irish Water must assess where the demands for water services are most likely to arise based on national and regional spatial planning policies and plans, together with population and economic growth predictions. We will plan to ensure continuous service to all Irish Water's existing customers whilst providing additional capacity to meet future population growth and industrial development.

The Current Situation

Some 62% of Ireland's population currently live in urban areas, with Dublin and the Mid-East being the most urbanised regions in the country. The Greater Dublin Area is the most significant area in terms of population concentration. However, in line with the objective of the current national spatial planning policy (National Spatial Strategy) for balanced regional development, economic development and growth is promoted across all regions. The NSS identifies a settlement hierarchy strategy of gateways, hubs and other towns for focused development and growth with appropriate infrastructure services.

In rural areas away, from these settlements, the population is dispersed resulting in a large number of water supply zones and wastewater networks serving small populations. Many rural households are served by small private individual water and wastewater systems (wells and septic tanks respectively for the most part). Private Group Water Schemes have also been developed in rural areas. These private systems (individual or group) are outside the scope of Irish Water.

Population growth targets for each of the state's 8 regions under the National Spatial Strategy (NSS) were set by the Department of Environment, Community and Local Government (DECLG) in 2010, based on a balanced regional development policy. Each of the regional authorities subsequently set population targets to 2022 for each county within their region through their Regional Planning Guidelines (RPGs). All County Development Plans prepared since 2011 have based population growth targets for their settlement strategies on the relevant RPG.

The Central Statistics Office has published population growth forecasts at a national scale to 2046 and at a regional scale to 2031 based on the results of the 2011 census. These projections indicate that the national population will grow from 4.5 million in 2011 to between 5 million and 6.7 million by 2046, depending on the growth scenario used. Growth will vary across regions, with the Dublin/Mid East region likely to experience the greatest growth and the Western and Border Regions likely to experience the least growth. These forecasts indicate that in some areas, RPG targets to 2022 are unlikely to be achieved, while in other areas, targets will be surpassed. This indicates a degree of disconnect between our national policy of balanced regional growth and actual growth achieved and the need for some flexibility in terms of planning for new infrastructure.

The Department of Environment, Community and Local Government (DECLG) will be preparing a new National Planning Framework to replace the NSS in the near future and the 3 new regional authorities (identified in “Putting People First”) will subsequently prepare Regional Economic and Spatial Planning Guidelines to replace the existing RPGs by 2016. In addition, the results of the next national census, due to be carried out in 2016, will provide an indication of current accuracy of population growth forecasts. Irish Water will regularly review and update its Water Services Strategic Plan to take account of future policy development and demographic data as it becomes available.

In the meantime, we will adopt a balanced perspective of development plans and demographic data to ensure water services are available to meet new demand as far as possible across all regions.

Key Challenges

The key challenges and uncertainties in the provision of water and wastewater services to support social and economic growth are:

- Uncertainty in the rate of population (domestic) growth and changing demography.
- Uncertainty in non-domestic demand, from general commercial development which usually follows domestic growth, from agriculture and from industrial development which can have significant “one-off” demands for large water and/or wastewater capacity.
- Balancing investment for growth with investment priorities for compliance, security of supply and operational efficiency.
- The extended timetable required for the planning and implementation of new strategic water and wastewater capacity.
- Funding availability and affordability of strategic capacity provision.
- Impacts of climate change and socio-economic factors on the demand for water services.



What our Customers can Expect from us

Our primary objective is to support population and economic growth in line with national and regional spatial planning policies and objectives. Our approach to planning and providing water services for growth will be evidence based. We will focus on utilising the capacities of our existing treatment facilities and networks to best effect while matching delivery of new capacity with realistic projections of demand based on appropriate planning horizons. We will aim to provide adequate spare capacity (headroom) in strategic level infrastructure to cater for variability in demand arising from factors such as weather and operational risk and some upward variation around projected development demand. We will seek to ensure that the standard of water services to our existing customers is maintained.

Case Study

Supporting Dublin's Growth

Over the past decade, water supply availability has regularly exceeded demand requirements in the Greater Dublin Area by just 1%-2% (20% excess over seasonal peak would constitute normal best practice for a large urban area).

There have been three significant disruption 'events' in the past four years which have highlighted how finely balanced the supply-demand position is; the exceptional water demand at the time of severe cold weather in the winter of 2010, the algal bloom experienced on the Vartry Reservoir in May of 2013, and the operational problems experienced with raw water chemistry at the Ballymore Eustace plant in late October 2013 (at the time the Web Summit was hosted in Dublin). Each of these events resulted in supply interruptions and restrictions across the supply area, with negative economic and reputational impacts for the area and the country.

Over 84% of Dublin's water treatment capacity is now dependent upon the River Liffey, and this fact illustrates the vulnerability of the service, with negligible headroom, and the need for new long term sources in planning to manage risks such as unexpected population growth or migration, economic growth or risks from climate change and pollution.

Population in the Greater Dublin Area is projected to reach 1.64m by 2021, from 1.52m in the 2011 Census, and is forecast to grow to 2.15m by 2050. Despite expected reductions in leakage and developing existing sources to their sustainable limits, increasing population and economic growth and security of supply will result in a need for a new source by the early 2020's. Similar considerations apply to wastewater capacity provision in the Greater Dublin Area.



Leixlip Water Treatment Plant on the River Liffey

Objectives and Strategies

The proposed strategies to meet the above challenges and to achieve this objective are summarised in the table below and are detailed in the remaining sections of this chapter.

Strategy	Purpose
Aim SG1 - Support National, Regional and Local Economic and Spatial Planning Policy	
SG1a	<p>Work with national, regional and local bodies and potential customers to anticipate and plan water services for growth in line with the statutory planning process.</p> <p>To ensure that we understand, plan and advise coherently on future development and that our infrastructure development strategies are in line with agreed strategic plans and development proposals.</p>
Aim SG2 – Facilitate growth in line with national and regional economic and spatial planning policy	
SG2a	<p>Maximise capacity of existing assets through effective asset management and optimised operation.</p> <p>Minimise requirement for additional infrastructure.</p>
SG2b	<p>Plan water service infrastructure at national, regional and river basin level.</p> <p>To ensure water services are planned at a strategic level and can be provided where needed in line with development plans.</p>
SG2c	<p>Invest in the development of strategic networks and treatment works.</p> <p>To meet projected demand for our water services.</p>
SG2d	<p>Maintain appropriate headroom in strategic water services infrastructure.</p> <p>To facilitate growth between investment periods.</p>
SG2e	<p>Provide a high quality customer service for new customers.</p> <p>To promote Irish Water as a modern utility meeting published service standards to its new customers.</p>

Strategy	Purpose
Aim SG3 - Ensure that water services are provided in a timely and cost effective manner	
SG3a	Plan for water services infrastructure development to meet projected demand facilitating delivery on a phased basis.
SG3b	Ensure that new assets are constructed to match demand and that assets are proportionate in size to the short and medium term demand projections.
SG3c	Balance investment for growth in demand with affordability.
SG3c	Operate an equitable New Connections Charging Policy that ensures efficient service provision to new customers with full cost recovery on a least cost basis.
	To ensure that the cost of connecting new developments to Irish Water's networks is efficient and is not a burden on existing customers.

SG1: SUPPORT NATIONAL, REGIONAL AND LOCAL ECONOMIC AND SPATIAL PLANNING POLICY

[SG1a] Work with national, regional and local bodies and potential customers to anticipate and plan for water services for growth in line with the statutory planning process.

We will support a collaborative approach with national, regional and local planning bodies to promote proper planning and co-ordinated development which is environmentally and economically sustainable. Water is a valuable asset necessary for the life, wellbeing and wealth of our nation. With the creation of Irish Water, we provide a coherent national focus in the discussions regarding regional and national spatial planning and in the provision of critical national water infrastructure to underpin the economy and support growth. We are committed to fulfilling our role as a statutory consultee in the preparation of regional, county and local development plans.

We will support the objectives of the Government's strategic approach to housing identified in Construction 2020 and will continue our participation in the Housing Supply Co-ordination Task Force for Dublin (established by the DECLG as an action under Construction 2020).

We will engage with potential new industrial and commercial customers and key stakeholders such as the IDA and Enterprise Ireland to anticipate and deliver water services infrastructure to support industrial development and job creation. We will engage directly with all inquiries for possible development and will seek to provide accurate and timely information on the capacity and likely cost of meeting requirements for water services. We recognise the need to build confidence in our ability to cater for such development, responding efficiently to opportunity, as it arises.

SG2: FACILITATE GROWTH IN LINE WITH NATIONAL AND REGIONAL ECONOMIC AND SPATIAL PLANNING POLICY.

[SG2a] Maximise capacity of existing assets through effective asset management and optimised operation.

Irish Water has established an asset management approach to water services investment planning, which involves mapping and modelling our existing systems in the first instance and implementing management and operational policies to ensure that they operate effectively to their design capacity. This forms the basis on which all capacity planning is carried out, with scenarios examined which take full account of how existing assets can be utilised to their optimum and how they might be cost effectively upgraded to meet the capacity need and maintain a safe headroom.

[SG2b] Plan water service infrastructure at national, regional and river basin level.

We are committed to providing strategic capacity to cater for domestic demand arising from population growth and non-domestic demand associated with this growth (e.g. demand from education, hospital and commercial facilities serving these populations). The objectives of the Government's strategic approach to housing identified in Construction 2020 must be provided for in terms of both treatment and network capacity. In addition, we are committed to facilitating the requirements of commercial and industrial development for water services on the basis of full cost recovery, based on the least cost principle (lowest cost of available options to meet the capacity need).

In order to deliver on this commitment we will take a national, regional and river basin perspective on the development and management of water services to meet existing and planned for demand. Through the preparation of national implementation plans such as the National Water Resources Plan we will ensure that the strategies identified in this Water Services Strategic Plan are implemented through a programme of works and subsequently through individual projects identified in our Capital Investment Plans.

In the development of the National Water Resources Plan we will target a rationalised approach towards fewer schemes based on larger and more sustainable sources to provide reliability of service, network resilience and value for money to our customers. Our objective is to optimise the resources available to us, including consideration of sustainable catchment transfers, where necessary, for adequacy and security of service.

Our Wastewater Compliance Strategy will focus on ensuring that wastewater treatment is provided where and when it is required and that our treatment plants achieve compliance with the requirements of the Urban Wastewater Treatment Directive and support the achievement of the quality objectives of the Water Framework Directive on a prioritised phased basis. Where investment in infrastructure is necessary in order to achieve water quality standards and wastewater compliance, we will include additional capacity to meet future planned demand where there is evidence that this demand is likely to be realised.

[SG2c] Invest in the development of strategic networks and treatment works.

We will adopt a strategic planning perspective in respect of the delivery of strategic infrastructure. Strategic water and wastewater service plans will be prepared to quantify existing asset capacity and utilisation and assess how future demands will impact on our assets. This assessment will be completed under various growth scenarios, based on development plan projections. The scenarios will include short, medium and long term growth horizons. Appropriate design solution options to address these impacts will be generated, evaluated and costed, based on asset management principles.

A key element will be active engagement with planning authorities at an early stage in their planning process to facilitate appropriate consideration of water services and, in particular, to ensure awareness of water service related constraints that might impact on size, scale, cost and location of proposed development centres, including environmental impact.

[SG2d] Maintain appropriate headroom in strategic water services infrastructure.

A key element of Irish Water's strategy for meeting demand is the maintenance of an acceptable level of headroom (available capacity over current demand) in our systems to allow for growth potential and capacity risks. This is a key parameter in managing risks to service and takes account of the likelihood and consequences of failure from scheme to scheme. Once this headroom falls below the specified level, it acts as a trigger to provide a further increment of capacity.

Many water supply schemes currently have insufficient headroom to provide an acceptable protection against occasional loss of supply. For example, the Greater Dublin Area has regularly operated historically at headroom levels of 1-2%. Appropriate and timely investments are required to keep capacity abreast of demand and to maintain headroom for security of supply.

The capacity of most systems can be increased by extending existing treatment works and upsizing key pipelines and pumping stations. It is our long-term objective to provide for and maintain capacity headroom based on the size of the settlement served, the economic and social impact of failure and likely growth potential in line with the settlement hierarchy identified in the NSS and its successors as follows:

- Large urban settlements (Dublin, Cork, Limerick/Shannon, Galway and Waterford); 20% headroom.
- Regional Gateways; (Dundalk, Sligo, Letterkenny/Derry and Athlone/Tullamore/ Mullingar); 15% headroom.
- Other towns; 10% headroom.

If new industries require large one-off demands, then this would be provided for by utilising available reserves coupled with upsizing of treatment plants and networks to restore system capacity. The actual cost incurred in restoring the headroom would be recovered in full from that industry in accordance with provisions of our New Connections Charging Policy.

For water and wastewater networks we will develop hydraulic models to enable us to establish available capacity for growth. We will also prepare strategic network development plans to support anticipated growth in line with the "core strategies" in local authority development plans.



[SG2e] Provide a high quality customer service for new customers.

Irish Water will provide a high quality service to new customers through our Connections and Developer Services Team which will have representatives located in each of our regional offices. Our team will consult with the developer/new customer to provide a detailed connection offer and will sign a connection agreement with the customer should the offer be acceptable. We will provide a clear set of design standards for water services infrastructure which must be implemented by the developer and inspected by Irish Water, where not directly provided by our contractors under the agreement, prior to any connection taking place.

Where we receive requests for connections from beyond our networks for existing developments served by private treatment facilities (for example ribbon development served by septic tanks) we will consider these with the CER based on the costs of service and the willingness of the property owners to sign development agreements and meet the costs involved. We will work with Group Sewerage Schemes to avail of grant support from the DECLG Rural Water Programme where relevant and will cooperate in 'Taking in Charge' connections infrastructure constructed to our requirements and meeting all prescribed tests on completion.

SG3: ENSURE THAT WATER SERVICES ARE PROVIDED IN A TIMELY AND COST EFFECTIVE MANNER

[SG3a] Plan for water services infrastructure development to meet projected demand facilitating delivery on a phased basis.

All Irish Water's assets are targeted to provide an appropriate return on investment to ensure that charges to our customer base are kept as low as possible. A balanced and timely approach to meeting existing and emerging demands is required to ensure that investment is not wasted on the development of premature and oversized water services. This requires that our forward planning is comprehensive and based on accurate knowledge of our system capacity across all of our schemes.

When planning strategic infrastructure we must take an appropriate view of the cost of future upsizing of major infrastructure. Therefore, when planning for certain "one-off" infrastructure such as long distance pipelines, outfalls or strategic crossings (rail, motorway) we will take a long term view of likely future demands based on the fact that its future upsizing is not practical or economical.

Where possible, Irish Water will develop infrastructure assets, including critical national infrastructure, according to the following principles:

- We will develop water services demand forecasts taking cognisance of population/growth projections and national spatial and economic planning policies. Some large scale assets, which are 'one off' in nature, will be delivered on the basis of long term growth forecasts.
- We will review headroom in strategic infrastructure on a regular basis and consider upgrading the infrastructure if capacity has fallen below the target headroom for that facility. We will include a planned upgrade of the facility in our next Capital Investment Plan to cater for a projected growth for 5-10 years from the planned completion date of the upgrade.
- Treatment plants and major pumping facilities will be planned based on a modular design and a phased approach to construction. Capacity for growth would be added in time to support development. This has the benefit that our capital is used to best advantage and provides better value for money to our customers. The land requirement to accommodate the ultimate capacity of the plant will be considered such that land availability will not compromise the development of the plant to full capacity.
- New major pipelines need to be of sufficient size (diameter) so that they do not require to be augmented in the short to medium term.
- Outfalls from treatment plants and combined sewer overflows may be required to be constructed on a 'one-off' basis, similar to major pipelines.
- Crossings of major infrastructure, such as motorways, railways, or canals may also be sized for long term capacity, to avoid repeated and socially expensive disruption.

[SG3b] Balance investment for growth in demand with affordability.

Irish Water faces many challenges in providing an appropriate level of water services to our customers, in achieving compliance with statutory standards and legislation and in facilitating growth while ensuring that our services are affordable to existing and new customers.

We are required to operate in a commercially viable manner and must take this into consideration when considering priorities for investment.

As a national body we have the opportunity to align our capital investment in a national context and to balance our investment priorities to ensure the best outcome for our existing customers while facilitating future growth as far as is practicable.

To achieve this balance we will engage with the EPA and CER to create alignment and agree priorities based on affordability of our services to our customers whilst supporting national planning policy.

[SG3c] Operate an equitable New Connections Charging Policy that ensures efficient service provision to new customers with full cost recovery.

Prior to the establishment of Irish Water, each local authority set their own connection charging policy in terms of a Connection Fee and Planning Levies. Irish Water will operate a New Connection Charging Policy at a national level which clearly sets out our charges for all new customers based on full recovery of the cost to Irish Water of connecting customers to a public water/wastewater system. Our New Connection Charging Policy will be fully approved by the CER and we expect a uniform approach across the country.

Irish Water will ensure, through our New Connection Charging Policy that the cost of developing and connecting to an Irish Water network is equitably apportioned and that existing customers of Irish Water are required to pay only for strategic infrastructure, with the cost of local infrastructure recovered from the developer as far as practicable.

Indicators and Targets

Indicators and targets for the objective to support social and economic growth are presented in the table below.

Strategic Objective	SUPPORT SOCIAL AND ECONOMIC GROWTH			
	Definition	Current Baseline (Based on Current Knowledge)	End of 2021 Target	2040 Target
AIM SG2	Facilitate Growth in line with national and regional economic and spatial planning policy			
Availability of Headroom at water and wastewater treatment plants to meet core strategies	% of treatment plants with: 20% headroom in large Urban Areas 15% headroom in Gateway Towns 10% headroom in all other plants	 Establish a register of current available headroom against required headroom by 2016	 60% of plants meet targets	 100% of plants meet targets
Capacity in Strategic Networks to support growth	Availability of headroom in Strategic Networks	 Establish a register of strategic mains and current available headroom against required headroom by 2016	 Have fully verified capacity models of 90% of strategic water networks. Have models in place for 90% of strategic wastewater networks	 100% of strategic networks meet headroom targets

Chapter 8

Objective:

Invest in Our Future



Our Strategic Aims

- Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.
- Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.
- Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.
- Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.

The Current Situation

An historic under-investment in our water and wastewater networks and treatment facilities means that we now have to secure significantly increased levels of funding in order to achieve adequate standards of drinking water and wastewater compliance, to provide for renewal of assets and to support the growth of the country. A particular challenge is the lack of knowledge of the condition and risk of failure of critical assets in the system. Examples of such assets which pose a threat to service reliability and standards are:

- Nineteenth century water treatment plants such as those at Roundwood (Vartry) and Cork City (Lee Road) where the original assets remain in service.
- Strategic water supply pipelines in cast iron, asbestos cement and concrete construction are in service beyond the normal design life and critical to customer service.
- Combined sewers in large urban centres of brick or masonry construction are known to be leaking, admitting fresh and salt water ingress, and structurally unsound (for example, Limerick and Cork City centre sewers).

Irish Water has been established as a customer focussed and asset management driven organisation, in line with best international practice in the water utility sector. In developing its capability, a key focus is an asset management approach to provide a radical transformation in the water services planning and delivery model in Ireland. On the basis of a sustainable funding model, Irish Water will target the necessary levels of investment to secure the condition of our critical assets to enable the required standard of quality and reliability in water services for our customers and the national economy. An informed evidence based approach to asset management will deliver the benefits of this investment, at lowest cost.

Key Challenges

Our key challenges are:

- Overcoming a deficit in knowledge of our assets location, condition, performance and life expectancy.
- Implementing an asset management strategy, with a detailed asset register and clearly defined critical assets.
- Investing in fixing current issues with water supply and wastewater service, targeting minor capital and improved operating programmes to overcome shortfalls and remove risks.
- Engaging with our customers, regulators and other stakeholders to ensure there is a sustainable balance between the interests of our customers, the environment and the need to support the economic development and growth of the country.
- Establishing a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes for our customers, the environment and the national economy.
- Implementation of innovation, research and development in support of better asset performance and least costs new infrastructure.



What our Customers Can Expect from Us

In the future, our customers can expect us to manage and obtain the best value from our existing assets and to deliver our commitments to safe water supply, environmental compliance, resilient capacity and energy efficiency. We will utilise best international practice in the delivery of our water and wastewater services, applying innovative and state of the art solutions to upgrade our assets and provide new infrastructure where these have been proven to deliver.

Objectives and Strategies

The proposed strategies to meet the above challenges and achieve this objective are summarised in the table below and are detailed in the remaining sections of this chapter.

Strategy	Purpose
<p>IF1 – Asset Management - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.</p>	
IF1a	<p>Implement asset management systems including comprehensive asset data collection and modelling tools.</p> <p>To enable the optimisation of asset performance through the optimum balance of operational, maintenance and capital investment for delivery of services at lowest long term costs.</p>
IF1b	<p>Develop long term asset strategies and implementation plans (Tier 2 Plans).</p> <p>To deliver operational cost efficiencies, meet capacity and performance needs and improve system resilience, through rationalisation and strategic forward planning.</p>
IF1c	<p>Development of initiatives such as asset standards and improved supply chain management.</p> <p>To deliver continuous improvement in value for money and reduce the cost of future investment to customers from standardisation of approach.</p>
<p>IF1 – Asset Management - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality secure and sustainable service at lowest cost.</p>	
IF2a	<p>Engage with our customers, including households, commercial and industrial customers.</p> <p>To develop a balanced picture of customer concerns, issues and priorities to inform our strategy and deliver optimal outcomes which meet customer needs.</p>
IF2b	<p>Engage collaboratively with key stakeholders including CER, EPA, DECLG, HSE, regional and local authorities.</p> <p>To achieve optimum investment outcomes for customers, the environment and the national economy which satisfy national policy and growth projections.</p>
IF2c	<p>Apply clear and transparent investment prioritisation criteria.</p> <p>To ensure an appropriate balance between the interests of our customers, the environment and the need to support balanced regional development.</p>

Strategy	Purpose	
<p>IF3 - Sustainable Funding Model - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.</p>		
IF3a	Transform the water industry in Ireland to an efficient water utility model within a regulated framework.	To deliver a sustainable funding model including off balance sheet funding as required, while achieving efficient capital and operational delivery.
IF3b	Work with regulators to achieve optimum balance of affordability and service standards taking into account regulatory requirements.	To ensure that funding and investment plans deliver the best possible outcomes taking account of affordability to customers and the state as a key issue.
IF3c	Deliver on Irish Water's commitments to raise public awareness of the value of water and achievements delivered.	To raise public awareness of the value of water resources and the benefits to customers, the environment and the national economy which Irish Water delivers.
<p>IF4 - Research and Innovation - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.</p>		
IF4a	Actively pursue research and development in water services and track opportunities to develop and adopt new technologies.	To adopt new technologies and innovation which will improve quality of service and/or reduce cost and carbon footprint.
IF4b	Engage effectively with universities, Institutes of Further Education, colleges and industry.	To ensure that opportunities for innovation through existing and on-going research and development are fully exploited.
IF4c	Develop knowledge management capability and implementation processes.	To maximise the benefits from innovative solutions.

IF1: ASSET MANAGEMENT - Manage our assets and investments in accordance with best practice asset management principles to deliver a high quality, secure and sustainable service at lowest cost.

[IF1a] Implement Asset Management Systems including comprehensive asset data collection and modelling tools.

Asset management is the internationally accepted basis for cost effective management of extensive and spatially distributed assets in order to deliver a consistent and adequate level of service to all connected customers.

Asset management is based on robust and reliable information on infrastructure which is vital to inform critical maintenance and future investment plans and to target improvements where they are most needed. Irish Water has developed a national spatially referenced asset database in GIS format drawing together, for the first time, all available records from each of the 34 local authorities. To bring this knowledge up to the level required for asset planning and modelling, and combine this into consistent, accurate databases, we commenced a National Asset Data Gathering and Asset Condition Exercise in 2014 and it is to be completed by 2018.

In addition, the asset management function will develop consistent standards, specifications, operation and maintenance programmes to manage the asset base. This has commenced with review of relevant international practise documents from high performing water companies, which are being adapted for Irish application. We are similarly developing the technologies required for remote monitoring of critical plants and network service indicators in order to support operating staff and response to incidents.

We are seeking to implement a strategy that optimises the life of our assets; balancing capital investment with maintenance and operation of the assets and thereby improving the life and safety of the assets and reducing performance risk.

[IF1b] Develop long term asset strategies and implementation plans (Tier 2 plans).

In order to deliver on the objectives of this WSSP, Irish Water will develop a series of implementation plans defining the programmes of work to be implemented. These plans will develop the range of scenarios and options from which the optimum approaches and prioritisation will be determined. The plans will take full account of the asset standards and policies adopted by Irish Water in shaping the strategic solutions. Where required, the plans will be subjected to Strategic Environmental Assessment and Appropriate Assessment, including public consultation. The plans will include:

- National Water Resources Plan, to assess present and future needs and resources at a regional level, taking account of resource constraints, and including sustainable inter-catchment or inter-regional transfers where required for secure resilient water supplies.
- Wastewater Compliance Plan, to determine the optimum strategies towards meeting compliance with license requirements while catering for future needs.
- Wastewater Sludge Management Plan to define the optimum strategy for the re-use of sewage sludge, recovery of energy and disposal of waste residues.
- Water Supply Sludge Management Plan to develop an optimum national approach to water treatment process sludge disposal, in a sustainable cost effective manner.

All of these Implementation (Tier 2) Plans will require collection of relevant data, consideration of all relevant EU and National standards and policies, development of models and consideration of all technical, environmental and economic parameters.

[IF1c] Development of initiatives such as asset standards and improved supply chain management.

Asset standards are the technical standards used in the design and operation of water and wastewater infrastructure, which aim to ensure that the best solutions are adopted for new assets.

We will develop and adopt a single set of national asset standards that will be periodically updated to reflect new innovative technology and changes in legislation. The benefits of having Irish Water asset standards will include standardisation, the selection of optimum solutions for new investment, reduced design costs and lower maintenance costs.

Irish Water has established central procurement for all goods and services required in the operation and investment in the services. We will use our national buying power to procure goods and services, standardising what we buy and ensuring that our supply chain is aligned to our requirements, particularly our adopted standards for quality, reliability and energy efficiency. We will procure goods and services in the competitive market place based on international best practice complying with procurement legislation. We will purchase goods and services using frameworks (longer term relationships), call off contracts (purchasing one item at a time) or discrete one off contracts where it is commercially beneficial to do so.

Case Study

Asset Management

Irish Water is responsible for operation and maintenance of several hundred thousand individual mechanical and electrical pieces of equipment across around 7,000 sites required to deliver water and wastewater services. Best practice asset management involves the care and maintenance of the assets based on comprehensive asset data so that the best value is obtained from the assets and water services are delivered at least cost.

Irish Water has developed an assets register down to individual component level, against which individual standards will be put in place. Our immediate priority is the identification of Critical Assets, being those assets whose failure would give rise to high customer impact on a large scale. The priority is to address the condition and likelihood of failure and its consequences. Investment plans must address the management of these key risks.



IF2: BALANCED SUSTAINABLE INVESTMENT - Invest in our assets while maintaining a sustainable balance between meeting customer standards, protecting the environment and supporting the economic development and growth of the country.

[IF2a] Engage with our customers, including households, commercial and industrial customers.

We will consult regularly with our customers and stakeholders and provide information so that all interested parties will be informed of our activities. As we develop our strategies and plans, these will be subject to consultation as appropriate, including the preparation of Strategic Environmental Assessments and Appropriate Assessments as required.

Our approach to investment in infrastructure, operations and maintenance, will be directed to achieving our key objectives which are based on delivery of services to our customers. We will engage with our customers to outline the issues, explain the options and ascertain feedback and input to assist us to determine preferences.

[IF2b] Engage collaboratively with key stakeholders including CER, EPA, DECLG, HSE, regional and local authorities.

Our operations are regulated by both CER for economic matters and the EPA for environmental matters and water quality standards. We will liaise closely with the DECLG in relation to matters of national policy and with the Health Service Executive (HSE) in regard to public health issues. Other key statutory consultees will include the National Parks and Wildlife Service, the regional and local authorities, IDA and the Health and Safety Authority (HSA). Consultation with special interest groups and the general public will be undertaken where they are affected.

[IF2c] Apply clear and transparent investment prioritisation criteria.

When the level of available funding is less than the investment needed, then prioritisation criteria are required to decide which capital projects can proceed and which must be deferred until funding becomes available. We will develop clear and transparent prioritisation criteria for agreement with CER, EPA and DECLG. This should ensure that the best affordable outcomes are delivered for our customers, the environment and the national economy.

IF3: SUSTAINABLE FUNDING MODEL - Establish a sustainable funding model to ensure that Irish Water can deliver the required capital investment in order to achieve the required outcomes.

[IF3a] Transform the water industry in Ireland based on an efficient water utility model within a regulated framework

There has been a significant under-investment in water services infrastructure in Ireland over many decades which has resulted in current problems with water quality and reliability, high levels of leakage and below standard wastewater management across many parts of the country. From the first National Public Health Acts in 1878, to the setup of Irish Water, the responsibility for water services rested with Ireland's local authorities. In that period, the requirements evolved from a low technology, labour intensive enterprise to a modern, high technology industry. The need for a national approach with central and regional structures is evident from:

- The need for an integrated national set of asset data, technical models and development strategies on which all operational and investment decisions can be based.

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- The need to integrate capital and operational investment decision making within an asset management framework, supported by high technology analytical systems to ensure the best service outcomes at the least cost.
 - Developing the required technical competencies and specialisations (asset planning, process control, leakage reduction, trade discharge control, new connections and energy management) by combining local resources at central and regional sites.
 - Delivering economies of scale by combining procurement of both goods and services and capital delivery. We expect that this approach will enable much more effective performance in areas such as leakage reduction and energy management.
 - Achieving better outcomes from existing assets by introducing standard ways of working and maintaining assets and resolving customer problems.
 - Using detailed workflow data (capturing all operational activity onto the asset database) to transition from reactive maintenance (in response to failure) towards greater planned maintenance, which ultimately greatly reduces asset risk and therefore improves outcomes.
 - Deliver maximum savings in operation based on the best balance of staffing, technologies and asset maintenance, assuming that the critical investment needs are provided and the organisational transformation is completed.

To address the acknowledged infrastructure deficit, capital investment of around €600M per year will be required for a sustained period, probably several decades. One of the main elements of the Government's Water Sector Reform Programme was the establishment of a sustainable funding model which would enable this necessary capital investment to be put in place over the coming years. The main components included the establishment of Irish Water as an independent state-owned water utility, the introduction of a sustainable funding model including domestic water charges and independent regulation of water services by the CER.

Because of the very high levels of investment required in water services infrastructure and also the significant constraints on Government borrowing, the Water Sector Reform Programme had at its core a sustainable funding model whereby Irish Water would be able to raise finance and this would not be counted as part of the national debt.

In order for Irish Water to be able to raise significant finance at favourable interest rates, it will be necessary for Irish Water to demonstrate that it is an efficient water utility company operating within a stable regulatory framework with secure revenue streams. It is a core objective of Irish Water to deliver continuous improvement in water services delivery combined with cost efficiency to match international benchmark levels when the necessary structural reforms supported by investment in systems are in place. This should facilitate raising finance at favourable rates while ensuring that the overall cost is minimised.

[IF3b] Work with regulators to achieve optimum balance of affordability and service standards taking into account regulatory requirements

For Irish Water's investment plans to be sustainable they must be efficiently delivered at the least cost of service on a whole life basis. This consideration has to be balanced with ensuring sufficient funding to deliver the service levels required, taking account of the state of the assets and the committed costs inherited from the local authorities.

To this end, Irish Water will work closely and collaboratively with our regulators, CER and EPA, to agree priorities for the available funds from time to time to enable us to deliver the best possible outcomes in terms of drinking water quality, water services reliability, environmental protection and provision for growth. We are committed to continuing to work with the local authorities under the Service Level Agreements (SLA's) to continue the industry transformation, including regional shared working across county boundaries and implementation of those initiatives required for service improvement and cost reduction.

[IF3c] Deliver on Irish Water's commitments to customers and the country and raise public awareness of the value of water and achievements delivered.

Ireland's plentiful water resources are one of our most valuable national assets which provide tremendous economic, environmental and amenity value to our citizens and visitors. This natural resource, provided it is effectively managed, can also give us a significant advantage as we compete internationally for investment and job creation particularly in water dependant sectors of the economy.

Provision of safe, secure drinking water and effective wastewater management and treatment involves complex processes and requires significant investment in capital works as well as operation and maintenance. For a modern water utility, this requires the use of modern technologies in treatment, network management and energy efficiency. It also requires an asset management capability driving workflow activity, tracking outcomes and targeting all investments with the benefit of full asset data supporting decision making.

It is an objective of Irish Water to achieve public awareness of the value of water and the complexity of water services delivery. This will identify, over time, the benefits which Irish Water delivers in terms of drinking water safety and security, environmental protection and support for economic growth and development. This requires a secure revenue stream from customers which will in turn support the sustainable funding model to deliver the required levels of investment in our water services infrastructure.

IF4: RESEARCH AND INNOVATION - Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency.

[IF4a] Actively pursue research and development in water services and track opportunities to develop and adopt new technologies.

Innovation in the provision of water services will be integral to delivering benefits in efficiency, customer service and water and environmental quality. This will enable the application of the most appropriate and sustainable solutions, drawing on best international practice and the required automation and instrumentation for central monitoring and control of asset condition and performance.

In addition to constant review of international practice, we will support local research and development to achieve the best of:

- Collaboration with academic institutions and other organisations to pursue research and innovation opportunities in solving technical challenges;
- Research and pilot innovative technologies, processes and systems for local application to meet specific quality needs and deliver cost effectiveness; and
- Collaboration with other water utilities and become a “fast follower” (i.e. learn best practices).

We will investigate alternative and innovative solutions in relation to both new projects and for the upgrading of existing plants and networks. Investment decisions will be based on solutions that provide the lowest whole life cost whilst also meeting our energy and carbon commitments.

[IF4b] Engage effectively with universities, Institutes of Further Education, colleges and industry.

We intend to engage actively with universities, colleges and industry to ensure that new technologies and innovative techniques are given due consideration on all our projects. We will work to achieve enduring relationships with the universities and technical colleges around shared objectives.

Innovation developed by industry for water services both here in Ireland and internationally can accelerate efficiencies in the delivery of our water services. Examples of this might be improvements to pump design resulting in energy efficiency, development of new wastewater treatment techniques or the reuse of chemicals to reduce our use of resources. We will work to ensure that our procurement approach is open to proven innovative options.

Case Study

Ringsend Wastewater Treatment Plant

The Ringsend Wastewater Treatment Works was designed for a capacity of 1.64 million Population Equivalent (PE) but is now operating just slightly over that capacity. To cater for the existing load and accommodate growth in the region, it is necessary to upgrade and expand the treatment works to its maximum capacity, which is estimated to be c. 2.1 million PE. The proposed upgrade must also achieve improved treated effluent quality in terms of nitrogen and phosphorus standards in order to conserve good water quality in the Liffey Estuary and Dublin Bay, based on their current designations. A scheme to expand and upgrade the treatment works has been approved by An Bord Pleanála.

Expansion and upgrading of the Ringsend Wastewater Treatment Plant is an urgent priority for Irish Water and a revision to the approved scheme to achieve required outcomes at least cost is currently being evaluated in partnership with Dublin City Council. Irish Water is proposing innovative wastewater treatment technology for the upgrade and this innovative solution can result in a higher treatment standard to the benefit of Dublin Bay and a cost saving of €170 million compared to previous project proposals. Any proposed revisions to the approved scheme will be subject to environmental/planning approvals as appropriate.



[IF4c] Develop knowledge management capability and implementation processes.

Knowledge management is the process of capturing, developing, sharing, and effectively using organisational knowledge. It refers to a multi-disciplined approach to achieving organisational objectives by making the best use of knowledge by all parts of the organisation, including the local authority staff working under the SLAs.

The management and sharing of the combined knowledge and expertise within Irish Water and the local authorities is a key objective that it will lead to improved performance, innovation, the sharing of lessons learned, integration and continuous improvement of the delivery of water services.

The use of knowledge management within Irish Water will mean that the benefits from innovative solutions will be adopted across the country and this will generate efficiencies and value for water customers.

Indicators and Targets

Indicators and targets for this Objective to Invest in Our Future are presented in the graphic below.

Strategic Objective	INVEST IN OUR FUTURE			
	Definition	Current Baseline (Based on Current Knowledge)	End of 2021 Target	2040 Target
AIM IF2	Balanced Sustainable Investment			
Outcomes of Capital Investment Plans	Capital Investment Plans delivered (on time and budget) within the Investment Period	 <p>Establish baseline condition of critical assets by 2018</p>	 <p>100% Delivery of Outcomes identified in Capital Investment Plan 2017-2022 as agreed with CER</p>	 <p>Deliver IW objectives through balanced investment at least cost within approved funding model</p>
AIM IF3	Sustainable Funding Model			
Operational and Capital Efficiency	Meet CER's requirements for operational and capital efficiency	 <p>Develop Best Practice Management Principles and Systems</p>	 <p>Meet 100% of CER Requirements</p>	 <p>Meet 100% of CER Requirements</p>

Glossary and Abbreviations

Glossary and Abbreviations

Abbreviations	
CER	Commission for Energy Regulation
DECLG	Department of Environment, Community and Local Government
EPA	Environmental Protection Agency
RBMPs	River Basin Management Plans
RBD	River Basin District
UFW	Unaccounted for Water
UWWTD	Urban Wastewater Treatment Directive
WFD	Water Framework Directive
WSZ	Water Supply Zone

Glossary	
Abstraction	The removal of water from a river, lake or groundwater usually with the use of a pump.
Agglomeration	An urban settlement (village, town or city area) which is connected through a pipe network to a wastewater treatment plant. Agglomeration areas are defined on maps and used to plan wastewater services infrastructure.
Asset	Infrastructure (e.g. buildings, treatment plants) and equipment (e.g. pumps, screens, treatment units, disinfection systems and control panels) controlled and operated by Irish water to deliver water and wastewater services. We divide these into Below Ground Assets such as pipework and valves and Above Ground Assets such as treatment plants.
Borehole	A vertically drilled hole into the subsoils and/or bedrock which is used to monitor or abstract groundwater. A borehole is usually lined with a casing and/or screen to prevent it from collapse.
Biodiversity	The variety of all living things.
Catchment	The area of land where surface water from rainfall converges to a single point at a lower elevation, usually a point in a river, lake or an estuary. The catchment includes all drainage channels, tributaries (smaller streams) and floodplains.
Catchment Boundary or Watershed	The topographic line defining the catchment.
Discharge	Treated effluent from a wastewater treatment plant which is returned to the water environment. This is usually from a pipe and outflow structure into a river or the sea.
Drinking Water Regulations	European Union (Drinking Water) Regulations 2014 - S.I. No. 122 of 2014.
European Directive	A legal act of the European Union which requires member states to achieve a particular result. Examples are the Drinking Water Directive, Urban Wastewater Treatment Directive and the Water Framework Directive.
Groundwater	Water located beneath the ground surface in soil and rock pore spaces and fractures within rock formations.
Headroom	Spare capacity in water and wastewater infrastructure (treatment plants and networks) to cope with adverse weather conditions or unplanned incidents such as a break in a trunk main or equipment failures at a treatment plant.

Glossary

Network	The interconnection of pipes and pumping stations used for the distribution of treated water and the collection of wastewater.
Plumbosolvency	The ability of water to dissolve lead into water supplies from lead pipes.
Population Equivalent (PE)	Wastewater treatment plants are described in terms of their designed treatment capacity, which is generally expressed as population equivalents (PE). This is a measurement of total organic biodegradable load, including industrial, institutional, commercial and domestic organic load, on a wastewater treatment plant, converted to the equivalent number of population equivalents (PE). One person is considered to generate 60g of BOD per day (BOD is the 5 day biochemical oxygen demand); and 1 PE is defined as being equivalent to 60g of BOD per day.
Raw Water	Water abstracted for drinking water purposes before treatment.
Regional Planning Guidelines	Regional Planning Guidelines are policy documents which aim to direct the future growth of a region over the medium to long term. They appraise the critical elements involved in ensuring sustainable and good planning in the right places, and though the protection of sensitive or environmentally important locations. The Guidelines inform and direct the City and County Development Plans of each of the Councils. The 2000 Planning and Sustainable Development Act requires that all Regional Authorities shall at the direction of the Minister make Regional Planning Guidelines. There are 8 Regional Authorities in Ireland, which were set up in 1994 under the Local Government Act 1991 (Regional Authorities) Establishment Order 1993.
Resilience	The ability of a system (e.g. water supply zone or wastewater network) to cope with change or stress. In a water services context stress to the system or network could result from increased demand, partial failure of operating plant, climate change or local contamination of water sources.
River Basin District	A group of catchments which are defined within River Basin Management Plans prepared under the Water Framework Directive.
River Basin Management Plans	A plan for a group of catchments which contains a range of measures (proposals) aims at protecting and improving the use of the water environment.
Standard Operating Procedures	Detailed, written instructions and rules for managing and operating assets.
Sustainable Economic Level of Leakage	The level of leakage from underground pipes where it becomes economically and environmentally unsustainable to invest in further reductions in leakage. The cost (financially and environmentally) to fix the leakage is greater than the cost of water being lost.

Glossary

Unaccounted for Water	Water that is lost through leakage or unaccounted use from our water supply network.
Water Body	A defined section of river, lake or groundwater identified in the water body characterisation of the River Basin Management Plans developed under the Water Framework Directive.
Water Body Objectives	Environmental objectives set for each water body assessed within the River Basin Management Plans. The objectives could relate to achieving Good Status for the water body (requiring improvements to water quality, ecology, channelisation or other factors) or to no deterioration in status.
Water Supply Zone	The area supplied by an individual water supply scheme. This typically includes one or more abstractions (from a river, lake or groundwater), a treatment plant, storage in reservoirs and the distribution pipe network to deliver the water to each household or business.

Appendix 1 - Feedback

This Consultation: Please Give Us Your Views

We would welcome your views on the following questions, or any other aspects of the Draft Water Services Strategic Plan:

Introduction

1. This Draft Water Services Strategic Plan is a roadmap for managing our water services for the next 25 years. Do you have any general views on the need for long range planning and our commitment to ensure that everyone has their say about water services?

Challenges and Strategic Priorities

2. Do you agree with our evaluation of the current state of water services in Ireland? Is there any further aspect of current water services that you think we should consider in identifying challenges and priorities in providing water services?
3. Do you think the Draft Plan has identified the most important challenges in providing water services to serve current and future populations over the next 25 years (listed on page 8)?
Has the Draft Plan missed any other challenges to the provision of water services that you would consider important?
4. We have identified five proposed current priority areas (listed on pages 11 and 12) in order of importance. Do you agree with the order, and if not how would you rank them?
5. Are there any other priorities you feel should be considered and where would they rank in the list?

Meet our Customer Expectations

6. The key aim that Irish Water has identified is to establish customer trust and a reputation for excellent service through providing high quality and reliable water services delivered through resilient systems at an affordable price. Do you have any comments about this aim? Should other aims be considered?
7. Do you agree that balancing the level of services to customers against the cost of those services is a key challenge for Irish Water? Do you think that service, quality and environmental standards should be met irrespective of cost?
8. How do you think a utility like Irish Water should best communicate with its customers?
9. What are your views on how we propose to measure our performance in meeting customer expectations?

Ensure a Safe and Reliable Water Supply

10. Irish Water has identified the top priority in terms of water supply as ensuring that water supplies meet Drinking Water Regulations (and removal of boil water notices from public supplies). Do you agree? Are there any other priorities in terms of water supply that you would see as more important?
11. Do you agree that we should plan to deal with the impact of climate change on our water supply sources and our networks for delivering water across the country? Is there anything missing from any aspect of these plans to deal with climate change?
12. To help ensure that customers can get a consistent and secure water supply, Irish Water would like to manage water services on a national basis, increasing the amount of connectivity in the network and strengthening the source of water to supply areas (in a similar way to how the electricity network is managed). Do you believe this is a good approach? Are there any issues in relation to this approach?

Appendix 1 - Feedback continued

13. We need to reduce leakage from our network through pipeline replacement and pressure management. Our approach is to reduce leakage wherever possible as long as it is cost effective to do so. There will always be some leakage that it will not be economic to fix. Do you have any comments on this approach?
14. While Irish Water fixes leaks in external pipes it remains the property owner's responsibility to fix leaks on their property. Would you be willing to fix internal leaks on your property?
15. Would you participate in or support initiatives that would reduce your water consumption in an effort to reduce waste and use of water? E.g. changing tap fittings, installing water butts etc?
16. What are your views on how we propose to measure our performance in ensuring a safe and reliable water supply?

Provide Effective Management of Wastewater

17. Significant investment is needed in wastewater infrastructure to ensure that human health is protected and that discharges from our treatment plants and collection networks comply with environmental legislation. This investment will take time to deliver. Do you agree with our short term priority as set out on page 12?

How should we prioritise our investment in this area? For example; should we prioritise our investment to enhance bathing waters or shellfish waters or areas of nature conservation?
18. Do you agree with our strategies to reduce the risk of flooding from sewer overflows in light of the increasing impact of climate change?
19. Do you agree with our proposals to actively manage discharges from industry and businesses to our wastewater collection networks through customer engagement and licensing of trade effluent discharged to our sewers?
20. What are your views on how we propose to measure our performance in managing wastewater?

Protect and Enhance the Environment

21. Do you agree with our strategies to deliver water services while protecting and minimising harm to the environment? Are there other strategies that you think we should consider to reduce impact on the environment?
22. Do you think that our proposed strategies do enough to address potential impacts of climate change in so far as protecting the environment is concerned?
23. Our continuing demands as a nation for high quality water services that comply with environmental and quality standards will require significant investment, operational/running costs and energy use. What are your views on balancing the cost of water services that meet environmental objectives with affordability of supply?
24. Do you think that indirect benefits of water services investment should be considered in prioritising investment, such as tourism and people's enjoyment of the environment?
25. What are your views on how we propose to measure our performance in protecting and enhancing the environment?

Appendix 1 - Feedback continued

Support Social and Economic Growth

26. Do you think it is important that Irish Water balances the requirement of future customers and current customers when planning our investment or should we concentrate on meeting our current challenges?
27. Do you agree that we should work with national, regional and local planning authorities/policy makers to ensure that cost effective water services can be delivered to support social and economic growth?
28. Do you agree with our strategies for supporting growth in a timely and cost effective manner? For example; building additional capacity in our systems to allow for growth based on the economic outlook in the medium term.
29. Do you agree that the cost of new customers and developments connecting to Irish Water networks should be borne by the new customer or developer and should not be a burden to existing customers?
30. What are your views on how we propose to measure our performance in supporting social and economic growth?

Invest in Our Future

31. Do you agree that a national approach to managing water service infrastructure such as standardisation and centralised procurement has both cost and operational benefits and is a correct strategy for Irish Water to pursue?
32. Do you have any comments on the model for funding outlined in our strategy on Page 68?
33. Do you agree with our proposal to raise public awareness of the value of water and the complexity of the system in bringing water and removing wastewater to our homes and businesses? What is the best way to do this in your view?
34. What are your views on how we propose to measure our performance in this strategic objective?

Overall

35. Do you think that the Draft Water Services Strategic Plan has identified the correct strategic objectives? If not, what other strategic objectives would you add, and why?
36. Do you have any other comments on the Draft Plan?

Please provide comments on or before the 17th April 2015.

There are **three ways** you can give us your comments on the Draft Plan:

By **email** to wssp@water.ie

Online at <http://www.water.ie/about-us/project-and-plans/future-plans/>

Post: Water Services Strategic Plan, Irish Water, P.O. Box 860, South City Delivery Office, Cork

Appendix 2 - EPA Remedial Action List - WATER SUPPLY

Local Authority		Name of Water Supply	Scheme Code
1.	Cavan Co.Co	Kingscourt	0200PUB1015
2.	Cork (West) Co.Co	Castletownbere New	0500PUB4205
3.	Cork (West) Co.Co	Drimoleague	0500PUB4103
4.	Cork (West) Co.Co	Kealkill	0500PUB4105
5.	Cork (West) Co.Co	Schull	050PUB4503
6.	Cork City Co.	Cork City Water Supply	0400PUB1001
7.	Donegal Co.Co	Cashilard	0600PUB1106
8.	Donegal Co.Co	Cresslough	0600PUB1075
9.	Donegal Co.Co	Fintown	0600PUB1065
10.	Donegal Co.Co	Glenties-Ardara	0600PUB1070
11.	Donegal Co.Co	Gortahork-Falcarragh	0600PUB1059
12.	Donegal Co.Co	Greencastle	0600PUB1015
13.	Donegal Co.Co	Owenteskna/Kilcar	0600PUB1091
14.	Donegal Co.Co	Letterkenny	0600PUB1110
15.	Donegal Co.Co	Portnoo-Narin	0600PUB1068
16.	Donegal Co.Co	Rathmullen	0600PUB1053
17.	Dublin City Co.	Ballyboden	0700PUB1002
18.	Dublin City Co.	Ballymore Eustace-Leixlip & Vartry/Ballymore Eustace	0700PUB1006
19.	Dublin City Co.	Vartry-Ballymore Eustace	0700PUB1007
20.	Dunlaoghre Rathdown Co.Co	Stillorgan	1000PUB1001
21.	Dunlaoghre Rathdown Co.Co	Roundwood	1000PUB1006
22.	Dunlaoghre Rathdown Co.Co	Church Road	1000PUB1007

Appendix 2 - EPA Remedial Action List - WATER SUPPLY continued

Local Authority		Name of Water Supply	Scheme Code
23.	Galway Co.Co	Ballinasloe Rws	1200PUB1004
24.	Galway Co.Co	Ballyconneely P.S	1200PUB1005
25.	Galway Co.Co	Carraroe PWS	1200PUB1009
26.	Galway Co.Co	Glenamaddy	1200PUB1021
27.	Galway Co.Co	Inishere P.S	1200PUB1025
28.	Galway Co.Co	Kilmor PWS	1200PUB1032
29.	Galway Co.Co	Kilkerrin/Moylough	1200PUB1031
30.	Galway Co.Co	Leenane P.S	1200PUB1035
31.	Galway Co.Co	Mid Galway	1200PUB1038
32.	Galway Co.Co	Portumna PS	1200PUB1042
33.	Galway Co.Co	Williamstown PS	1200PUB1049
34.	Kerry Co.Co	An Clochan 028D	1300PUB1027
35.	Kerry Co.Co	Ballinaskelligs 008H	1300PUB1049
36.	Kerry Co.Co	Ballymacadam 402F	1300PUB1102
37.	Kerry Co.Co	Barraduff 014A	1300PUB1015
38.	Kerry Co.Co	Caherdaniel 019H	1300PUB1051
39.	Kerry Co.Co	Caherciveen 017H	1300PUB1050
40.	Kerry Co.Co	Caragh Lake 022A	1300PUB1046
41.	Kerry Co.Co	Castlecove 023H	1300PUB1052
42.	Kerry Co.Co	Castlegregory 024D	1300PUB1026
43.	Kerry Co.Co	Cill Maolcheadair 047D	1300PUB1112
44.	Kerry Co.Co	Dingle 030D	1300PUB1034

Appendix 2 - EPA Remedial Action List - WATER SUPPLY continued

Local Authority		Name of Water Supply	Scheme Code
45.	Kerry Co.Co	Dun Chaoin 034D	1300PUB1035
46.	Kerry Co.Co	Glen 039H	1300PUB1098
47.	Kerry Co.Co	Inch Pws 044D	1300PUB1040
48.	Kerry Co.Co	Kenmare 045A	1300PUB1058
49.	Kerry Co.Co	Kilgarvan 046A	1300PUB1059
50.	Kerry Co.Co	Kilsarkin 403F	1300PUB1103
51.	Kerry Co.Co	Lauragh 051A	1300PUB1060
52.	Kerry Co.Co	Lisarboola 404F	1300PUB1105
53.	Kerry Co.Co	Lisloose Reservoir	1300PUB1106
54.	Kerry Co.Co	Lough Guitane 400F	1300PUB1016
55.	Kerry Co.Co	Maulin 066H	1300PUB1115
56.	Kerry Co.Co	Milltown (Poulgorum)	1300PUB1118
57.	Kerry Co.Co	Minard No.1 (Puck Island)	1300PUB1042
58.	Kerry Co.Co	Mountain Stage 062A	1300PUB1119
59.	Kerry Co.Co	Murreigh Ballydavid 063D	1300PUB1044
60.	Kerry Co.Co	Portmagee 064H	1300PUB1055
61.	Kerry Co.Co	Shrone 078A	1300PUB1121
62.	Kerry Co.Co	Templenoë 073A	1300PUB1062
63.	Kerry Co.Co	Ventry 074D	1300PUB1045
64.	Kerry Co.Co	Waterville 075H	1300PUB1057
65.	Kilkenny Co.Co	Inistioge WS	1500PUB1009
66.	Kilkenny Co.Co	Kilkenny City (Radestown) WS	1500PUB1010

Appendix 2 - EPA Remedial Action List - WATER SUPPLY continued

Local Authority		Name of Water Supply	Scheme Code
67.	Laois Co.Co	Portlaoise	1600PUB1004
68.	Leitrim Co.Co	South Leitrim Regional	1700PUB1100
69.	Longford Co.Co	Newtown Cashel	2000PUB1012
70.	Louth Co.Co	Omeath	2100PUB1012
71.	Louth Co.Co	Staleen	2100PUB1019
72.	Mayo Co.Co	Inishurk	2200PUB1031
73.	Mayo Co.Co	Kilmaine PS	2200PUB1016
74.	Mayo Co.Co	Kiltimagh	2200PUB1032
75.	Mayo Co.Co	Lough Mask	2200PUB1032
76.	Meath Co.Co	Ballinaclose	2300PUB2005
77.	Meath Co.Co	East Meath	2300PUB1008
78.	Meath Co.Co	Kells-Oldcastle	2300PUB1011
79.	Meath Co.Co	Navan & MidMeath PWS	2300PUB1016
80.	Meath Co.Co	Trim PWS	2300PUB1009
81.	Monaghan Co.Co	Carrickmacross	2400PUB1005
82.	Monaghan Co. Co	Lough Egish RWSS	2400PUB1001
83.	Roscommon Co.Co	Ballyfarnan	2600PUB1009
84.	Roscommon Co.Co	Ballinlough/Loughglynn	2600PUB1014
85.	Roscommon Co.Co	Boyle/Ardcarne	2600PUB1011
86.	Roscommon Co.Co	Boyle	2600PUB1023
87.	Roscommon Co.Co.	Castlerea Urban	2600PUB1016
88.	Roscommon Co.Co	Castlerea Regional	2600PUB1015

Appendix 2 - EPA Remedial Action List - WATER SUPPLY continued

Local Authority		Name of Water Supply	Scheme Code
89.	Roscommon Co.Co	North East RWSS	2600PUB1007
90.	Roscommon Co.Co	Roscommon Central	2600PUB1002
91.	Roscommon Co.Co	SRRWSS – Killeglan	2600PUB1004
92.	Roscommon Co.Co	SRRWSS - Lisbrock	2600PUB1022
93.	Roscommon Co.Co	North Roscommon Regional Water Supply Scheme	2600PUB1012
94.	Sligo Co.Co	Kilaraght Public Water Supply	2700PUB2714
95.	Sligo Co.Co	Lough Gill Regional Water Supply	2700PUB2710
96.	Sligo Co.Co	Lough Talt Regional Water Supply	2700PUB2702
97.	Sligo Co.Co	South Sligo Regional Water Supply	2700PUB2709
98.	South Tipperary Co.Co.	Burncourt	2900PUB0104
99.	South Tipperary Co.Co.	Carrick-on-Suir (Crotty's Lake)	2900PUB0118
100.	South Tipperary Co.Co	Carrick-on-Suir (Lingaun River)	2900PUB0150
101.	South Tipperary Co.Co	Clonmel Poulavanogue	2900PUB0109
102.	South Tipperary Co.Co	Cloran Regional	2900PUB0110
103.	South Tipperary Co.Co	Gortnapisha	2900PUB0137
104.	South Tipperary Co.Co	Graigue	2900PUB0205
105.	South Tipperary Co.Co	Mullenbawn	2900PUB0149
106.	Waterford Co.Co	Ballyhane	3100PUB1089
107.	Waterford Co.Co	Colligan	3100PUB1032
108.	Waterford Co.Co	Croan Upper	3100PUB1035
109.	Waterford Co.Co	Inchinleamy	3100PUB1054
110.	Waterford Co.Co	Ring/Helvick	3100PUB1084

Appendix 2 - EPA Remedial Action List - WATER SUPPLY continued

Local Authority		Name of Water Supply	Scheme Code
111.	Waterford Co.Co	Smoorebeg	3100PUB1092
112.	Waterford Co.Co	Tallow	3100PUB1095
113.	Wexford Co.Co	Sow Regional	3300PUB1641
114.	Wicklow Co.Co	Arklow Public Supply	3400PUB1004
115.	Wicklow Co.Co.	Aughrim/Annacurra	3400PUB1023
116.	Wicklow Co.Co	Avoca/Ballinaclash Public Supply	3400PUB1024
117.	Wicklow Co.Co	Enniskerry Public Supply	3400PUB1024
118.	Wicklow Co.Co	Glenealy Public Supply	3400PUB1021
119.	Wicklow Co.Co	Wicklow Regional Public Supply	3400PUB1005
120.	Wicklow Co.Co	Windgates/Tempolecarrig	3400PUB1036
121.	Wicklow Co.Co	Bray Direct	3400PUB1001
122.	Wicklow Co.Co	Bray Reservoir	3400PUB1002
123.	Wicklow Co.Co	Greystones	3400PUB1003
124.	Wicklow Co.Co	Kilcoole	3400PUB1008
125.	Wicklow Co.Co	Kilmacanogue	3400PUB1009
126.	Wicklow Co.Co	Newtown Newcastle	3400PUB1010

Appendix 3 - List of Areas from which raw sewage is discharged

7 LARGER URBAN AREAS, ABOVE THE DIRECTIVE THRESHOLDS, WITH NO TREATMENT OR PRELIMINARY TREATMENT ONLY AT THE END OF 2013

1.	Cork	Cobh	D0054-01
2.	Cork	Passage West/Monkstown	D0129-01
3.	Cork	Ringaskiddy/Crosshaven/Carrigaline	D0057-01
4.	Cork	Youghal	D0139-01
5.	Donegal	Bundoran	D0130-01
6.	Donegal	Killybegs	D0011-01
7.	Wicklow	Arklow	D0006-01

28 SMALLER URBAN AREAS, IN THE SIZE RANGE 500 P.E. UP TO THE DIRECTIVE THRESHOLDS, WITH NO TREATMENT OR PRELIMINARY TREATMENT ONLY IN 2013

	County/ Region	Urban Area	Licence Number
8.	Clare	Ballyvaughan	D0327-01
9.	Clare	Clarecastle	D0322-01
10.	Clare	Kilkee	D0078-01
11.	Clare	Kilrush	D0075-01
12.	Clare	Liscannor	D0430-01
13.	Cork	Ballycotton	D0516-01
14.	Cork	Castletownbere	D0297-01
15.	Cork	Castletownshend	D0468-01
16.	Cork	Ringaskiddy Village	D0436-01
17.	Cork	Timoleague	D0466-01
18.	Cork	Whitegate/Aghada	D0423-01
19.	Donegal	Falcarragh	D0343-01

Appendix 3 - List of Areas from which raw sewage is discharged continued

20.	Donegal	Kilcar	D0520-01
21.	Donegal	Moville	D0212-01
22.	Donegal	Ramelton	D0341-01
23.	Donegal	St.Johnston	D0538-01
24.	Fingal	Rush	D0119-01
25.	Galway	Ahascragh	D0372-01
26.	Galway	Carraroe	D0388-01
27.	Galway	Kinvara	D0276-01
28.	Galway	Spiddal	D0396-01
29.	Kerry	Ballylongford	D0459-01
30.	Mayo	Bellmullet	D0074-01
31.	Mayo	Killala	D0067-01
32.	Waterford	Ardmore	D0162-01
33.	Waterford	Dunmore East	D0170-01
34.	Wexford	Duncannon	D0245-01
35.	Wexford	Kilmore Quay	D0232-01

Appendix 3 - List of Areas from which raw sewage is discharged continued

9 CERTIFICATE OF AUTHORISATION AREAS (<500 P.E) WHERE WASTE WATER WAS DISCHARGED WITH NO TREATMENT

County/ Region		Certificate of Authorisation Site	Certificate Number
36.	Cork	Inchigeelagh	A0349-01
37.	Cork	Kilmacsimon	A0360-01
38.	Donegal	Burtonport	A0446-01
39.	Donegal	Coolatee Housing Scheme	A0525-01
40.	Donegal	Kerrykeel	A0445-01
41.	Galway	Roundstone	A0115-01
42.	Louth	Omeath	A0072-01
43.	Wexford	Arthurstown	A0243-01
44.	Wexford	Ballyhack	A0242-01

Appendix 4 - Agglomerations identified in the European Commission Infringement Case against Ireland in respect of the Urban Waste Water Treatment Directive

1.	Abbeyfeale	23.	Cobh
2.	Abbeyleix	24.	Cork City
3.	Arklow	25.	Courtown/Gorey
4.	Athlone	26.	Dundalk
5.	Athy	27.	Dunmanway
6.	Ballincollig New	28.	Enfield
7.	Ballybofey/Stranorlar	29.	Enniscorthy
8.	Ballyragget	30.	Fermoy
9.	Blarney	31.	Kildare Town
10.	Borrisoleigh	32.	Kilkenny City and environs
11.	Callan	33.	Killarney
12.	Carlow	34.	Killybegs
13.	Carrickmacross	35.	Kingscourt
14.	Carrick-on-Suir	36.	Kinsale
15.	Carrigtwohill and environs	37.	Letterkenny
16.	Castlebar	38.	Lower Liffey Valley Regional Sewerage Scheme
17.	Castlebridge	39.	Lusk
18.	Castlecomer	40.	Mallow
19.	Castletroy	41.	Manorhamilton
20.	Cavan	42.	Midleton
21.	Clifden	43.	Monaghan
22.	Clonakilty and Environs	44.	Monksland Wastewater Treatment Works

Appendix 4 - Agglomerations identified in the European Commission Infringement Case against Ireland in respect of the Urban Waste Water Treatment Directive

45.	Mountmellick	59.	Skibbereen
46.	Mountrath	60.	Swords
47.	Navan	61.	Templemore
48.	Nenagh	62.	Thomastown
49.	Passage/Monkstown	63.	Thurles
50.	Piltown	64.	Tralee
51.	Portarlinton	65.	Tubbercurry
52.	Rathcormac	66.	Tullamore
53.	Rathdowney	67.	Tullow Wastewater Treatment Plant
54.	Ringaskiddy	68.	Upper Liffey Valley Sewerage Scheme
55.	Ringsend	69.	Urlingford
56.	Roscommon	70.	Waterford
57.	Roscrea	71.	Youghal
58.	Shannon Town		

