

# Story of Belfast Lough



**A Document to Inform Engagement  
between LWWP Partners  
(DfI, DAERA, NIEA, UR, BCC & NI Water)**

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# Executive Summary

## **The Story of Belfast Lough**

The story of Belfast Lough is one of a vital natural resource under strain. It is a story of the need for urgent action to preserve its ecological health, support recreational activities, and enable sustainable economic growth. The path forward requires significant investment, regulatory compliance, and a commitment to restoring and protecting this invaluable asset.

NI Water is poised to deliver about £1.9 billion of wastewater improvement schemes in the Greater Belfast area over at least 12 years. The funding is under severe threat which means we risk losing the prize that Belfast Lough will once again become a beautiful resource for people and wildlife to enjoy boosting economic prosperity to the region and achieving compliance with environmental legislative standards.

## **Belfast Lough: A Vital Resource Facing Environmental Challenges**

Belfast Lough, a large sea inlet on Northern Ireland's east coast, is more than just a picturesque body of water connecting Belfast to the Irish Sea. It is a vital natural resource that has shaped the region's history, economy, and way of life. The lough is known for its deep outer waters with rocky shores and sandy bays, and a shallow inner section rich in mudflats and lagoons. Surrounding towns like Bangor and Carrickfergus thrive on the lough's shores, and the area has been recognised for its environmental significance, being designated an Area of Special Scientific Interest (ASSI) in 1987 and a Ramsar site in 1998. These designations highlight its importance for bird species and its popularity for recreational activities like walking and sailing.

However, the story of Belfast Lough is also one of growing environmental challenges. Despite its ecological and recreational significance, the lough is experiencing a decline in water quality. This deterioration stems largely from issues related to the drainage system of Greater Belfast, which has long relied on discharging water into the River Lagan and the lough itself. As the city expanded, so did the burden on its combined sewers, which handle both sewage and rainwater. Although wastewater treatment facilities have been upgraded over the years, they struggle to keep pace with the demands placed on them. During heavy rainfall, combined sewer overflows (CSOs) become necessary to prevent flooding, but their overuse contributes significantly to pollution, making CSOs and treatment works responsible for over 90% of the bacteria and 50% of the nutrients polluting the lough.

## **The Urgent Need for Investment: Living with Water**

The need for investment in drainage and wastewater treatment is critical. Before 2014, many of Northern Ireland's wastewater facilities were outdated and struggling with capacity issues. The creation of NI Water in 2007 aimed to address these challenges, but funding constraints have slowed progress, particularly in Greater Belfast. A stormwater tunnel, partially completed in 2010, exemplifies the challenges faced due to limited budgets.

In response, the Northern Ireland Executive approved the Strategic Drainage Infrastructure Plan (SDIP) in 2014, leading to the establishment of the Living With Water Programme (LWWP). After being endorsed by the NI Executive, the plan was published in November 2021. It focuses on fixing years of underinvestment in our water and wastewater systems, which is crucial for strong economic and social growth. The plan also aims to support our

environmental, sustainability, and decarbonization goals. However, ongoing financial shortfalls threaten the programme's objectives.

### **Belfast Lough's Ongoing Struggles: Environment, Economy and Legislation**

The decline in Belfast Lough's health is not new. As early as 1903, a report by Dr. Thomas J. Browne highlighted the collapse of the oyster industry in the lough due to severe sewage contamination. This issue led to health crises and prompted early investments in wastewater treatment. Today, despite designations like the Shellfish Water Protected Area (SWPA) covering 40% of Inner Belfast Lough, water quality continues to decline. The mussel industry, which acts as a natural nutrient filter, is under threat from excess bacteria, excess nutrients leading to algae blooms and contamination by sewage related debris. The challenges facing this industry underscore the broader environmental and economic risks posed by inadequate wastewater management.

Land reclamation efforts, particularly in the arc between Holywood and the Abbey Shopping Centre, have further complicated matters. These projects, aimed at expanding transport infrastructure and commercial developments, have disrupted the natural processes that once diluted and dispersed wastewater discharges. The consequences include blocked sea outfalls, septic wildlife lagoons, and increased pollution. Examples such as the partially blocked Belfast wastewater treatment works sea outfall and the outdated Whitehouse WWTW headwall illustrate the urgent need for comprehensive infrastructure upgrades under the LWWP.

The recreational value of Belfast Lough is also at stake. Coastal walks near Whitehouse are marred by sewage-related debris, rivers in parks like Connswater Community Greenway and Victoria Park are contaminated, and swimming in Belfast Harbour and the beaches of the Inner Lough has been restricted due to poor water quality. Sailing clubs near Holywood face similar challenges, with polluted waters at times posing health risks to participants. In response, organisations like the Royal Yachting Association have formed the Clean Water Sport Alliance to advocate for better water quality and protect recreational users.

Economically, the effective treatment and management of sewage are essential for Belfast's growth. The city's 2035 vision aims to add 66,000 residents, 33,000 homes, and significant infrastructure. However, the current drainage and wastewater infrastructure are inadequate to support this growth. NI Water has already had to deny planning applications due to capacity issues, affecting 19,000 proposed units nationally. Without necessary investments, these constraints will worsen, threatening further development and economic progress.

Legislation, such as the EU Water Framework Directive (WFD) and the Urban Waste Water Treatment Regulations, sets ambitious environmental goals, including achieving "Good Status" for water bodies by 2027. However, surveys indicate that pollution from CSOs and wastewater treatment works are major barriers to achieving these goals, particularly in sensitive areas like Belfast Lough. The declining water quality has prompted considerations for additional protections, but failure to deliver necessary infrastructure improvements could lead to non-compliance, risking further environmental deterioration.

Key government documents, including the 2020 New Decade New Approach agreement and the 2021 Draft 3rd Cycle NI River Basin Management Plan, emphasise the critical need for investment in Northern Ireland's water infrastructure. The 2021 Living With Water in Belfast plan outlines how such investments can manage flood risks, improve water quality, and support economic growth. Recent actions by the UK Government and regulatory bodies like

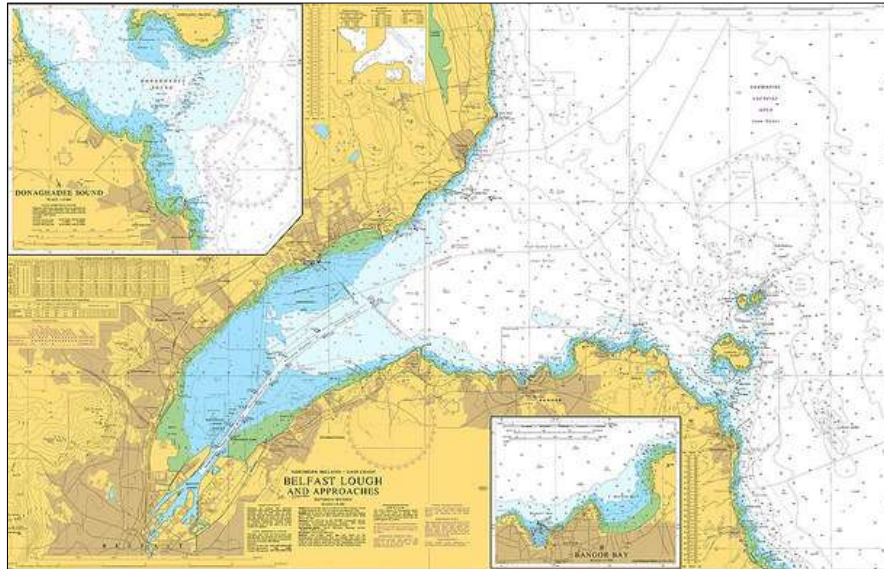
OFWAT highlight the importance of legislative compliance and proper investment - a challenge that NI Water continues to face due to underfunding.

In September 2024 the Office of Environmental Protection (OEP) issued a report that found that the critical River Basin Management Plan (RBMP) that is required under law to protect and improve Northern Ireland's waters, needs to be strengthened and implemented without further delay. Delivery of the LWWP is central to the draft RBMP for improving Belfast Lough. The OEP report makes 16 recommendations to the Northern Ireland Executive, Northern Ireland Assembly and DAERA, designed to increase the prospects of protecting and improving the water environment.

The Northern Ireland Executive has an opportunity, within its response to the OEP report, to set out how the LWWP will play a key role in next chapters of the story of Belfast Lough.

## 1. Introduction

Belfast Lough is a large sea inlet on the east coast of Northern Ireland. At its head is the city and port of Belfast, which sits at the mouth of the River Lagan. The lough opens into the North Channel and connects Belfast to the Irish Sea.



**Figure 1: Marine Chart of Belfast Lough**

Belfast Lough is a long and wide expanse of water, virtually free of strong tides. The outer boundary of the lough is a line joining Orlock Point and Blackhead. The deeper outer lough is restricted to mainly rocky shores with some small sandy bays. The inner part of the lough is shallow, comprising a series of mudflats and lagoons bisected by a central dredged navigation channel. The main coastal towns are Bangor on the southern shore (County Down) and Carrickfergus on the northern shore (County Antrim). Other coastal settlements include Holywood, Helen's Bay, Greenisland and Whitehead.

The inner lough was made an Area of Special Scientific Interest (ASSI) in 1987. The Belfast Lough Ramsar site (wetlands of international importance under the Ramsar Convention) was designated in 1998. The Ramsar boundary entirely coincides with that of the Belfast Lough Special Protection Area (SPA). The area regularly supports internationally important numbers of common redshank, common shelduck, Eurasian oystercatcher, purple sandpiper, dunlin, black-tailed godwit, bar-tailed godwit, Eurasian curlew and ruddy turnstone.

The lough is popular for a wide range of recreational activities, including walking through coastal parks and shoreline paths and sailing. Within Belfast Lough there are designated bathing waters at Helens Bay, Crawfordsburn, Ballyholme, Groomsport, with Brompton (Bangor West) being a candidate site.

Belfast has grown rapidly and today over one third of the entire population of Northern Ireland lives in the parts of Greater Belfast and the nearby settlements that drain into Inner Belfast Lough.

This document sets out how and why:

- Belfast Lough has been shaped by drainage and land reclamation;
- it is important for wildlife, recreation and as a source of food;

- its water quality is declining, despite legislation being in place to protect it; and
- an investment plan has been developed to comply with legislation, enhance Belfast Lough, and facilitate economic growth.

## **2. Drainage of Greater Belfast**

### **2.1 Overview**

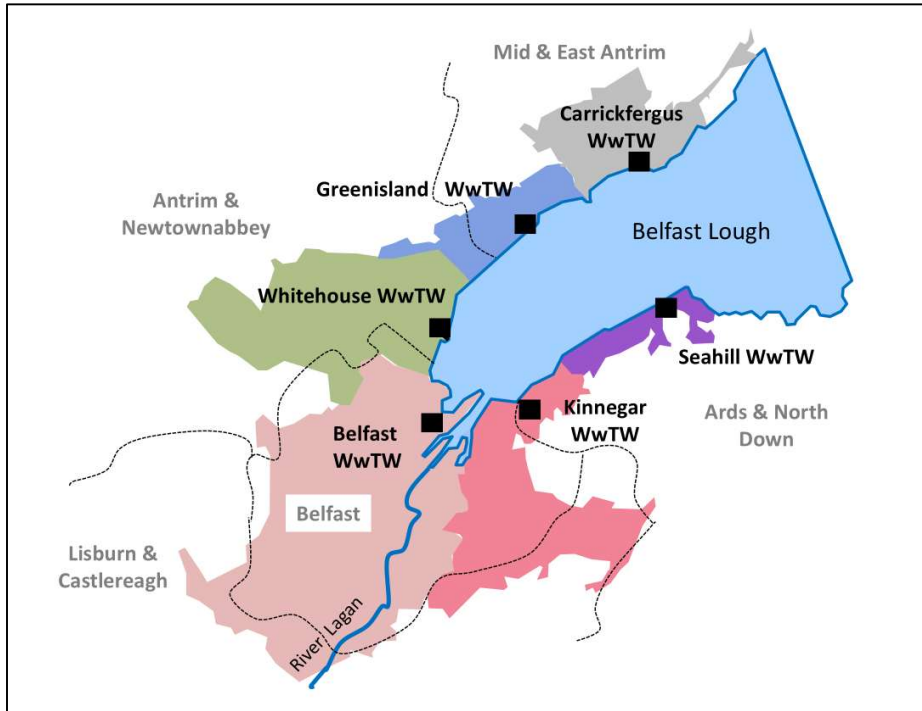
Originally all watercourses and the drains built across Greater Belfast discharged into the River Lagan and Belfast Lough. As the city and surrounding settlements grew it became necessary for new sewers to be built to transfer sewage to locations where it could be screened and discharged through sea outfalls to assist natural dilution and dispersion. Because these sewers collected both foul sewage and water from hard surfaces, such as roads and roofs, they are called 'combined sewers'.

As the pollutant load collected in sewers increased to a point where the discharges were causing odours and the contamination of shellfish, the first wastewater treatment works (WwTW) were built over 100 years ago. Through investment programmes, often driven by environmental legislation, these facilities have had to become more complex to be able to effectively treat the increasing volumes of sewage to adequately mitigate the impact on the environment, for example:

- In 1997 the current Belfast WwTW was extended to include a biological secondary treatment stage
- In 1999 a 25-year Public Private Partnership (PPP) contract was awarded to facilitate the upgrade of Kinnegar WwTW (this contract ended in April 2024)
- In 2005 Whitehouse WwTW was partially improved

Each of these investment projects provided the minimum standard of treated effluent necessary to comply with legislation that was applicable at that time and to provide for growth for up to 25 years. However the discharge standards set at that time were not based on environmental needs of Belfast Lough, as that was intended to follow by 2015.

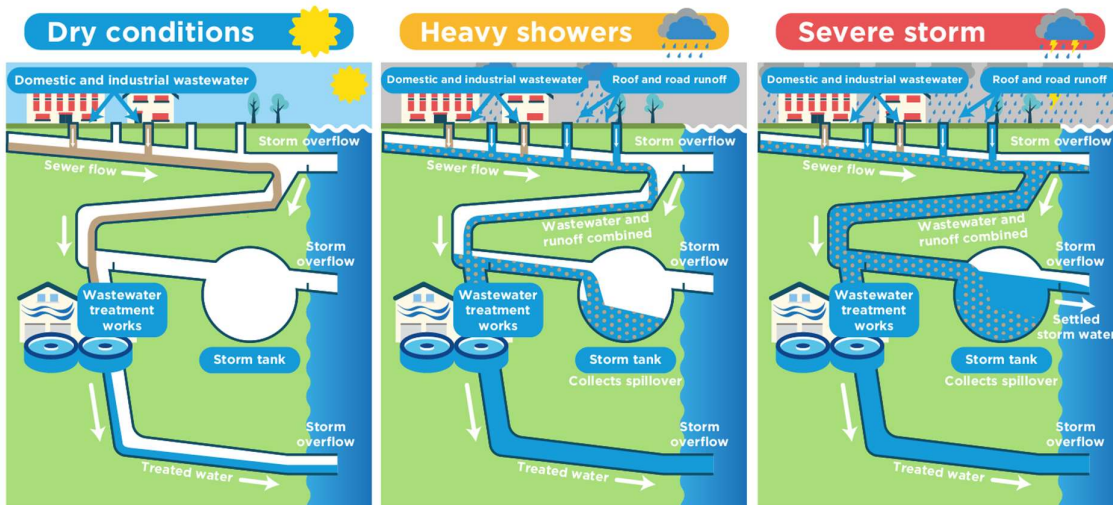
Today when it rains across Greater Belfast, some of the water naturally seeps into the earth or makes its way directly to a watercourse. The rest finds its way via a network of underground pipes, into rivers and estuaries and finally into Belfast Lough. Some of this water is carried by separate storm drains and pipes and some flows into the combined sewers and is carried along with sewage to one of six WwTW that discharge into or beside Inner Belfast Lough. The diagram below in Figure 2 illustrates the drainage catchments of these six WwTW, which are within the areas of five local councils: Belfast City Council, Lisburn & Castlereagh City, Antrim & Newtownabbey Borough, Mid & East Antrim Borough and Ards & North Down Borough.



**Figure 2: WwTW Catchments that Discharge into / close to Inner Belfast Lough**

## 2.2 Combined Sewer Overflows

Excessive rainfall can also overload the combined sewerage systems, which can result in flooding and pollution; this is why storm overflows (sometimes known as combined sewer overflows - CSOs) are needed. Storm overflows prevent overloading of sewers by allowing surface water that has been mixed with sewage to rise inside the combined sewer and eventually enter a separate pipe, which discharges directly to a river or coastal water with minimal treatment, as shown in Figure 3 below. If there was no overflow in place, this sewage would force its way out of the network of pipes to the surface, causing flooding. These overflows should, however, only operate during heavy rainfall when the discharge is diluted. Where they spill too frequently and cause pollution these are categorised as unsatisfactory and must be rectified.



**Figure 3: Storm Overflows**



In March 2024 NI Water published the document 'Northern Ireland's Wastewater System' on its website which can be accessed from the storm overflow page Storm Overflows (niwater.com).

### 3.3 Sources of Pollution

There are many sources of pollution of Belfast Lough, with the majority (including over 90% of bacteria and over 50% of nutrients) being from storm overflows and WwTW. This is illustrated on the diagram in Figure 4 below.

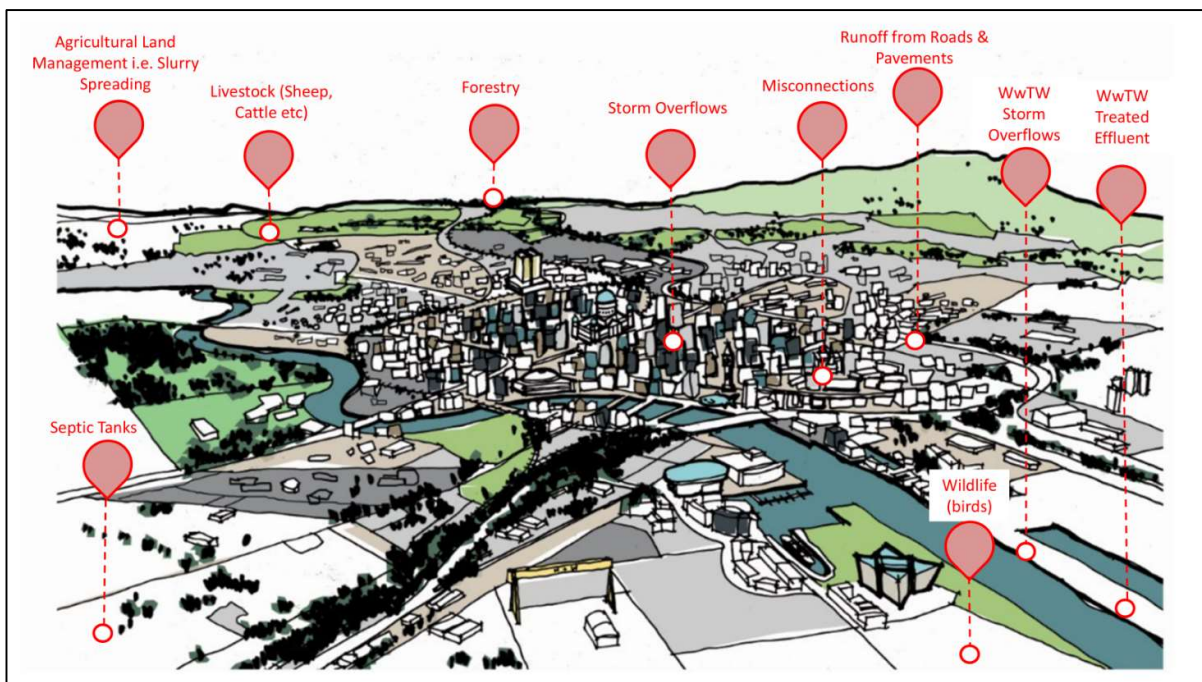


Figure 4: Sources of Pollution of Belfast Lough

## 3. Investment in Drainage and Wastewater Treatment

### 3.1 Period Leading to 2014

Many of the key facilities that provide essential wastewater services were last upgraded decades ago, now have inadequate capacity, are struggling to comply with their existing discharge consents. For example, Sydenham WwPS is the largest pumping station in NI and serves 6% of the population. However, it is over 40 years old and is prone to failures and blockages resulting in the internal flooding of houses due to the type of materials commonly found in today's sewage, such as wet wipes.

One of the key reasons that NI Water was created in 2007 was to allow a significant and sustained increase in the level of capital investment to be made available for drainage and wastewater treatment to comply with new legislation and provide the increased capacity needed to support economic growth.

Due to the severity of flooding in central Belfast and pollution of the River Lagan from storm overflows located in the city centre, a 9.4km long and 40m deep stormwater tunnel was built

and commissioned in 2010 to store and convey stormwater to Belfast WwTW. However, due to funding constraints it was not then possible to complete the tunnel by extending it to Musgrave Park to serve West Belfast. This was deferred and has since become one of the LWWP Major Projects.

As the sustained level of investment in drainage and wastewater foreseen as being necessary across NI 20 years ago has not occurred, the scale of the backlog has steadily increased since 2007, and most severely in Greater Belfast due to the complexity, number and scale of major projects required. The limited capital available has been used to invest in smaller drainage and WwTW projects, most of which have been outside of the Greater Belfast area.

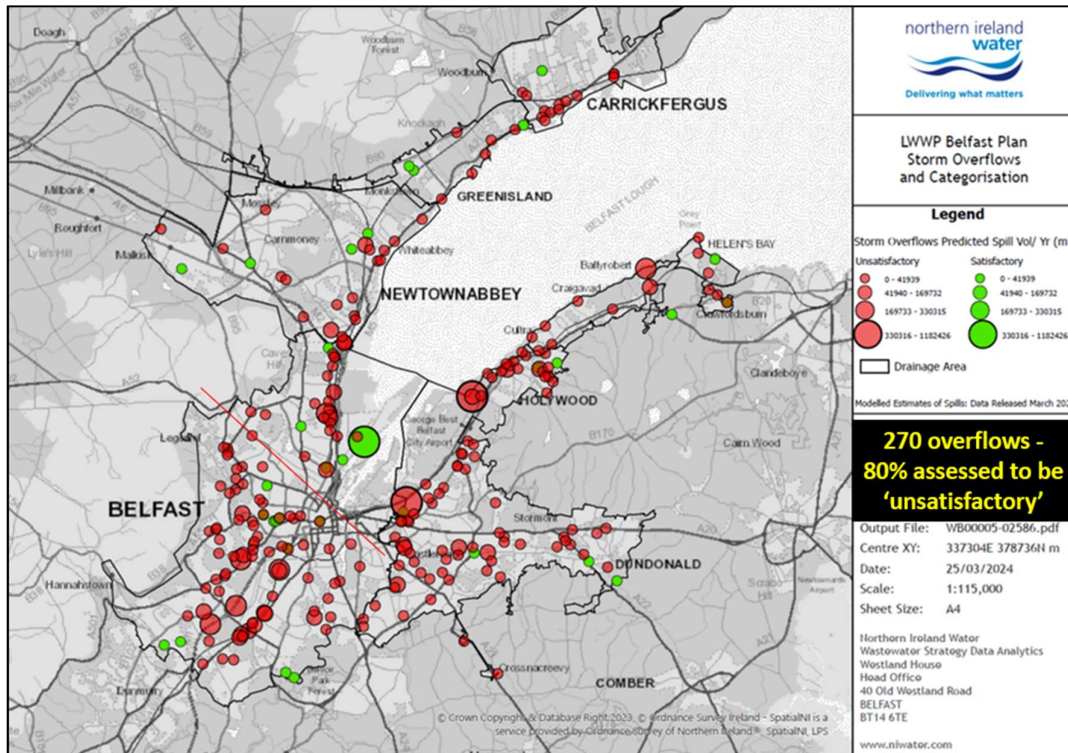
### **3.2 Period From 2014**

In 2014 it was clear that the drainage infrastructure across Greater Belfast was unable to meet the requirements expected of it and that a plan was required to develop the most cost-effective programme of projects to address this. The Northern Ireland Executive approved the development of a Strategic Drainage Infrastructure Plan (SDIP) for Belfast to:

- protect against flooding by managing the flow of water through a catchment from source to sea;
- enhance the environment through effective wastewater management and the provision of enhanced blue/green spaces to benefit local communities; and
- grow the economy by providing the necessary capacity in our drainage and wastewater management systems to facilitate new development projects including house building.

To develop and deliver this Plan, an interdepartmental group, called the Living With Water Programme (LWWP), was established. The Plan, "Living With Water in Belfast" is the Strategic Drainage Infrastructure Plan for Belfast and was developed by this group and published by DfI in 2021, having been endorsed by the NI Executive. Work is underway to develop a similar plan for Derry / Londonderry.

The Plan sets out how its implementation over a 12-year period is central to the delivery of the Floods Directive, the Water Framework Directive, the United Nations Sustainable Development Goals (SDG), the Regional Development Strategy (RDS) and development plans prepared by local councils. In February 2020 the Northern Ireland Assembly declared a climate emergency. This Plan will help Belfast to adapt to changing rainfall patterns and mitigate against increased greenhouse gas emissions.



**Figure 5: LWWP Area CSOs – Location, Volume, Classification**

Today there are 270 storm overflows in the LWWP catchment area, of which over 80% have been assessed to be unsatisfactory and causing pollution. This large number of overflows is the result of overflows being made to reduce the risk of flooding, because investment was not available to increase sewerage capacity. Every time one of these overflows discharges prematurely, before heavy rainfall, it results in a loss of load to the water environment. This lost load cannot be returned to the WwTW for treatment. Some of these storm overflows are unsatisfactory because they do not have screens to retain sewage related debris (SRD) in the wastewater, or because key wastewater pumping stations do not have adequate capacity to pump the required level of flow forward to the WwTW for treatment.

This rate of loss of load is high in parts of Belfast as they have large relatively flat lower sections, including long syphons, that cause the flow to slow during dry periods, resulting in solids being deposited in the bottom of the sewers, and fats oils and grease (FOG) to mix with wet wipes to create fatbergs that then float and cover the surface. When it rains these settled deposits and fatbergs, if they have not already caused a blockage and / or constrained the volume of flow that can be passed forward, are rapidly mobilised by the increased flow to create a 'first flush' that contains a significant pollutant load. In a wastewater network that provides effectual drainage this 'first flush' would be captured in storm tanks located at overflows, pumping stations and the WwTW, before being later returned for full treatment after the rainstorm has passed. However, the combination of inadequate treatment capacity at the WwTW, too many unsatisfactory overflows, and inadequate storm tanks means that most of the first flush from rain events is being discharged into the River Lagan and Belfast Lough.

The latest EU wastewater environmental legislation<sup>1</sup> proposes that to provide effectual drainage, the future target for total losses from overflows should be <2% of the annual load

<sup>1</sup> UWWTD Recast 2022 'Article 5 – Integrated urban wastewater management plans'

that arises in the catchment. In contrast the LWWP Belfast SDIP catchments are each estimated to be leaking >20% of their annual load due to overflows from CSOs and WwTW.

On 6 August 2024 OFWAT, the UK Government appointed economic regulator of water companies in England and Wales, set out its proposed decision<sup>2</sup> to impose a financial penalty on Northumbrian Water, Thames Water and Yorkshire Water totalling £168m. A key reason given for the level of fine is that they are breaching their UWWTR duties by failing to effectually provide drainage and deal with the contents of their sewers. However Greater Belfast has three times more overflows per number of properties served compared to the number that exist across these companies (or five times, if compared to the whole of England).

If each of the wastewater networks in the LWWP were to be significantly upgraded first to provide 'effectual drainage', the largest five WwTW would be unable to operate effectively due to the increased load arriving to treatment exceeding their capacity, resulting in further pollution.

### 3.3 LWWP Belfast Plan WwTW Upgrades

Integrated Environmental Modelling (IEM) carried out to inform the LWWP has confirmed NIEA's 2013 assessment that most pollutants that are causing the deterioration of water quality in Belfast Lough are from the WwTW final effluent. The LWWP modelling has determined that to arrest the decline and then improve the water quality in Belfast Lough, the final effluent WwTW must achieve:

- reduced amount of nutrients (specifically nitrogen) to reduce the risk of eutrophication in Belfast Lough (which leads to a range of detrimental impacts, including algae blooms);
- reduced amount of bacterial content to reduce the level of bacteria at the shellfish farms (which is resulting in shellfish farms falling to class C); and
- reductions in the frequency and volume of storm overflows at WwTW to Belfast Lough that occur during wet weather, through the provision of increased storm storage.

In 2013 NIEA had advised DfI and NI Water that new more stringent 'environmental needs' based discharge standards would have to apply to each WwTW from April 2021 to address the pollution from WwTW. In 2016 NIEA agreed to provide time for the LWWP to develop the most appropriate environmental needs standards using IEM and specified a revised compliance date of end Feb 2025. In 2017 it was assumed that the necessary step increase in the level of capital investment would be provided from April 2021, accordingly the beneficial use date was slipped for a third time to the end Feb 2027 to provide time to efficiently build and commission the upgrades. This deferral was noted by the NI Water Framework Directive Inter-Departmental Board. NIEA has warned that environmental enforcement action may be taken by NIEA and / or the Office for Environmental Protection (OEP) if the beneficial use date of the key WwTW upgrades is again deferred, particularly as DAERA has assessed that water quality in Belfast Lough has deteriorated since 2013.

IEM has successfully been used to determine the future WwTW discharge standards based on the environmental needs of Belfast Lough, in accordance with regulatory targets. These include for reducing:

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<sup>2</sup> [Thames, Yorkshire and Northumbrian Water face £168 million penalty following sewage investigation - Ofwat](#)

- the discharge of nutrients to prevent eutrophication and algae blooms that can have a highly detrimental impact on the eco-system.
- the levels of bacteria by including UV disinfection at Whitehouse WwTW and Belfast WwTW
- the levels of a range of pollutants by reducing the frequency and volume of storm spills from WwTW overflows, achieved by increasing the treatment capacity and volume of storm tanks

When the new environmentally based consents are applied by the end of February 2027 Kinnegar WwTW, Belfast WwTW and Whitehouse WwTW will each be formally deemed to be 'non-compliant' if they have not been upgraded by then.

To smooth the capital investment profile for Belfast WwTW it was agreed in 2020 that the WwTW would be upgraded in two phases, as follows:

- Phase 1: increase biological and hydraulic capacity and achieve the new nutrients operational target
- Phase 2: storm storage, achieve the new bacteria standard and any new odour control standard

This phasing was written into the plan 'Living With Water in Belfast' published in 2021.

### **3.4 Estimated Level of Investment and Funding Status**

Detailed surveys, engineering studies, modelling and investment appraisals were carried out to inform this Plan. In 2020 it was estimated that delivery of NI Water's elements of the plan would cost £1.2bn<sup>3</sup>. In 2023, with most of the surveys completed, and after a period of construction industry hyper-cost inflation due to the global covid pandemic and war in Ukraine, the cost estimate of NI Water's elements was increased to £1.9bn.

NI Water's elements of the first 6 years of the 12-year LWWP Plan were independently reviewed and then endorsed by the UR in its Final Determination of the PC21 Business Plan.

Since 2021 NI Water has awarded contracts to the integrated design and construction teams necessary to deliver the first four LWWP Major Projects<sup>4</sup> (each with a value >£100m), with business cases being developed and submitted in accordance with the programme.

At this stage DfI has informed NI Water that it unlikely to be able to provide the full funding identified in the PC21 Business Plan and LWWP for 2024/25 and that funding is also likely to be constrained for following two years. The consequences for LWWP is that none of the LWWP Major Projects would be able to proceed to the delivery stage, with only minor projects being able to proceed.

NI Water awaits the outcome of the Utility Regulars PC21 Mid-Term Review and a review of the LWWP that DfI commenced in September 2023.

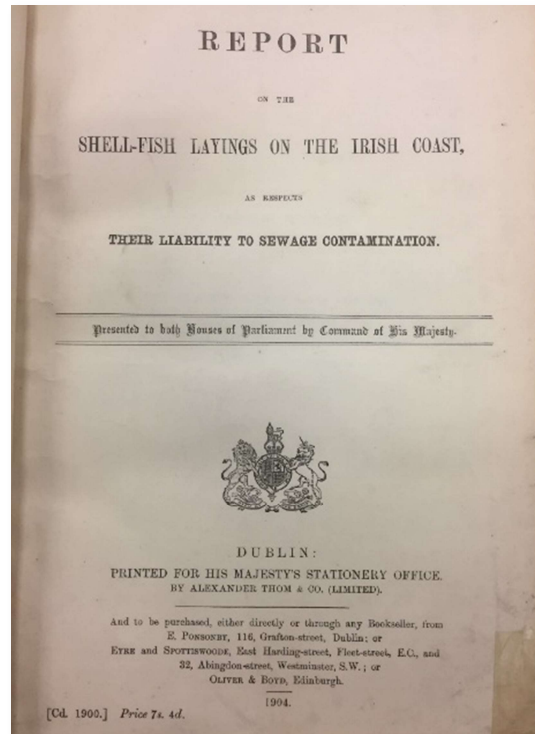
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<sup>3</sup> In addition to NI Water's elements, DfI has estimated that £200m is required to deliver flood resilience and blue-green infrastructure type projects.

<sup>4</sup> First 4 LWWP Major Projects are Belfast WwTW, Kinnegar WwTW, Whitehouse WwTW, Sydenham WwPS.

#### 4. Shellfish Industry

In 1903 Local Government Board for Ireland presented a report by its Medical Inspector Dr Thomas J Browne on the 'Shell-fish Layings on the Irish Coast as respects their Liability to Sewage Contamination' to both Houses of Parliament.



**Figure 6: Cover of Report on the Shell-fish Layings on the Irish Coast as respects their Liability to Sewage Contamination**

This report set out the collapse in the Belfast Lough oyster harvesting industry, which occurred between 1891 & 1903, with the output declining by over 90%. It sets out that mussels were collected by hand at low water from beds located along the shore, with the harvest being 2,600<sup>5</sup>.

The report notes that 'the chief pollution of Belfast Lough is the sewage of Belfast City', and that 'almost the whole volume of sewage is discharged in its crude state into the Lough'. It states, 'Enteric fever<sup>6</sup> has been very prevalent in Belfast for several years past, and it seems probable that the consumption of shellfish, particularly among the working classes, may have to some extent been accountable.'

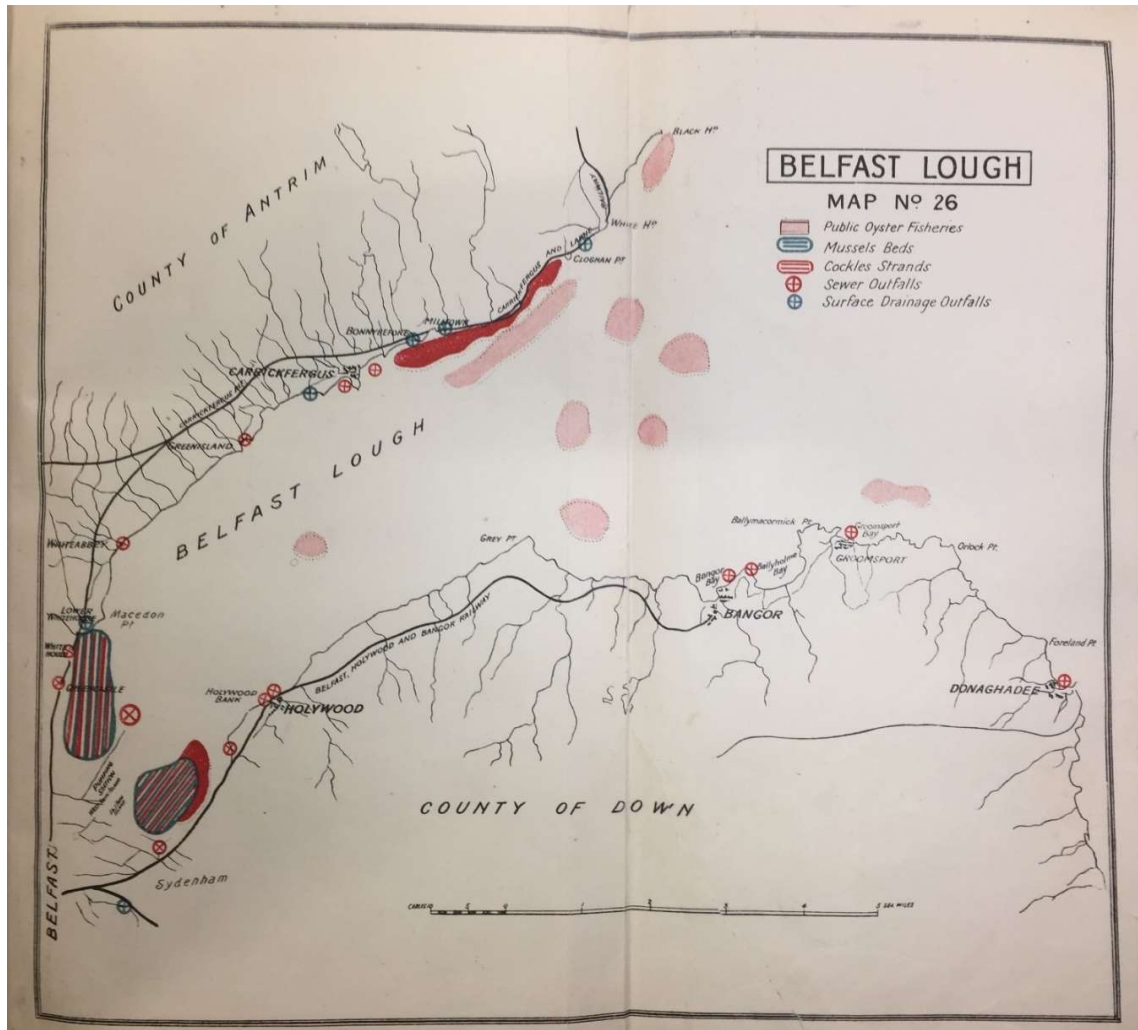
The report notes that the year 1898 was the year of the greatest prevalence of enteric fever in Belfast with 5,136 cases and that in the year 1902 there were 1,044 cases. It states: 'Several of these cases were attributed to the eating of shellfish collected on the shores of Belfast Lough'.

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<sup>5</sup>In 2018 DAERA assessed that the overall production of Belfast Lough was 3,458 tonnes.

<sup>6</sup>Enteric fever (also known simply as typhoid) is a bacterial infection. It is spread by eating or drinking food or water contaminated with the faeces of an infected person. Risk factors include poor sanitation and poor hygiene. The risk of death may be as high as 20% without treatment.

As those eating mussels were generally poor, a conservative assumption is that at least 4% of those that contracted typhoid died of the infection; in 1898 is it likely that over 200 residents of Belfast died due to eating mussels contaminated by raw sewage.



**Figure 7: Report on the Shell-fish Layings on the Irish Coast – Map 26 ‘Belfast Lough’**

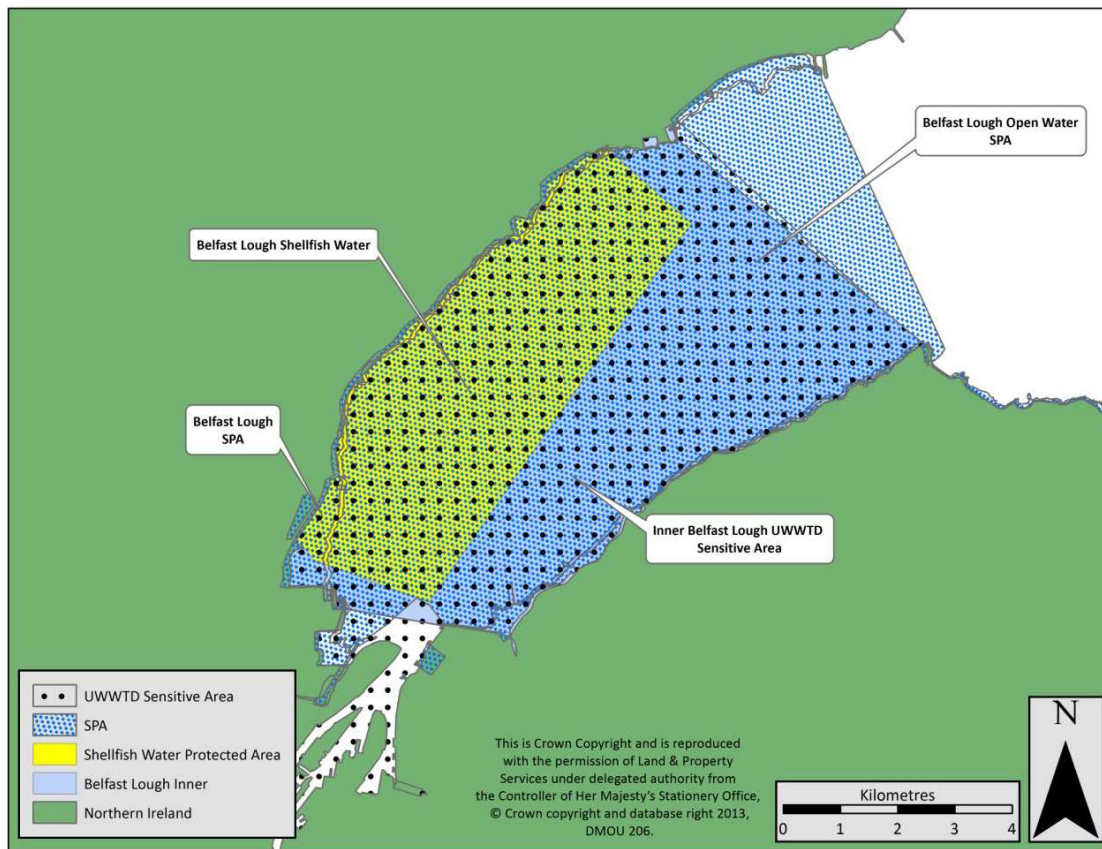
The report by Browne in 1903 contributed to the Royal Commission on Sewage Disposal, which had been established by the British government in 1898 to report on:

- The methods of treating and disposing of sewage that may be adopted for the protection of the public health; and
- How the method of treatment and disposal should be determined for each location.

The commission published nine reports. The seventh report was published in 1911 and dealt with the proliferation of green seaweed in polluted estuaries, and particularly Belfast Lough. This is of historical significance because it first established the link between the proliferation of green algae and sewage pollution.

The findings of these reports will have been factors that supported investment in the long sea outfall that serves Belfast WwTW, the construction of which commenced in 1913.

Today around 40% of the area of Inner Belfast Lough is a designated 'Shellfish Water Protected Area' (SWPA) under the Water Framework Directive (WFD), as illustrated in Figure 8 below.



**Figure 8: Belfast Lough Designations and Shellfish Water Protected Area**

This designation is meant to provide special protection of water quality for the shellfish industry, with the target being that they meet at least Class B criteria<sup>7</sup> in accordance with the EU Hygiene Regulations. Within Belfast Lough there are over 20 leased shellfish beds as illustrated in Figure 9 below.

<sup>7</sup> Class A permits mussels to be collected for direct human consumption. Class B requires that mussels are only sold for human consumption after purification treatment or relaying for one month in a Class A area. C permits requires that mussels are only sold for human consumption after relaying for two months in a Class A or Class B area, with the latter requiring additional purification.





**Figure 9: Classification of Shellfish Beds in Belfast Lough (Sept 2024)**

**Figure 9** illustrates that water quality in most of the designated area is failing to meet the target B classification, with most beds at Class C or Class B/C. In 2024 DAERA advised NI Water that the sample analysis statistics continue to show decline. This deterioration is making it uneconomic to continue to be farm, as the contamination of shellfish require expensive relaying or purification treatment before sale for human consumption.

Whilst the levels of nutrients in Belfast Lough are elevated at ‘moderate status’ and deteriorating further, analysis carried out by AFBI to inform the LWWP has confirmed that the presence of farmed mussels act as a natural nutrient filter to keep chlorophyll (blue green algae) levels under control, with the status of chlorophyll being assessed as ‘good’ due to the shellfish. It is predicted that without the shellfish the levels of chlorophyll will increase and push this category into ‘moderate’, so demonstrating the helpful sustainable ‘ecosystem service’ provided by the shellfish.

However, a key difficulty for future viability of the Belfast Lough shellfish industry is that the quality of shellfish waters is deteriorating, as confirmed by the DAERA 2019 Sensitive Area Review and Belfast Lough Action Plan. DAERA has since advised that, during 2024, the phytoplankton species *Dinophysis* has been detected, which is associated with Diarrhetic Shellfish Poisoning (DSP), and shellfish closures. Consequently, DAERA have advised DfI that additional sensitive area designations will be made for Belfast Lough to ensure further protections are added to the waterbody due to its deteriorating condition. The industry is concerned at this deterioration, the risk of poisoning, and about the quantity of sewage related debris (SRD) that is caught in its bottom dredge nets.

When the lower classification beds stop being farmed, the ecosystem service provided by shellfish will reduce, this will mean that the level of bacteria and chlorophyll in rest of Belfast Lough will increase, leading to a negative spiral. To address this would require significantly less sustainable investment be made in wastewater treatment, over and above that already included in the LWWP Belfast Plan.

## 5. Land Reclamation

### 5.1 Overview

Between the town of Holywood and the Abbey Shopping Centre much of the land between the railway lines and the sea has been reclaimed, making it low lying and flat. This can be seen from viewpoints around the city, such as Cave Hill.



**Figure 10: Belfast Harbour viewed from Cave Hill**

This land reclamation has been for transport infrastructure, the extension of Belfast Harbour, commercial developments and waste disposal. Because the necessary aligned investments in wastewater and drainage infrastructure have been deferred, this land reclamation has detrimentally impacted the ability of nature to dilute and disperse discharges from NI Water's WWTW and CSOs. This has resulted in bacteria laden discharges flowing across beaches, blocked sea outfalls, and the wildlife lagoons created becoming septic resulting in odours. Three examples are provided below to illustrate this.

## 5.2 Land Reclamation Impact on Belfast WwTW Sea Outfall

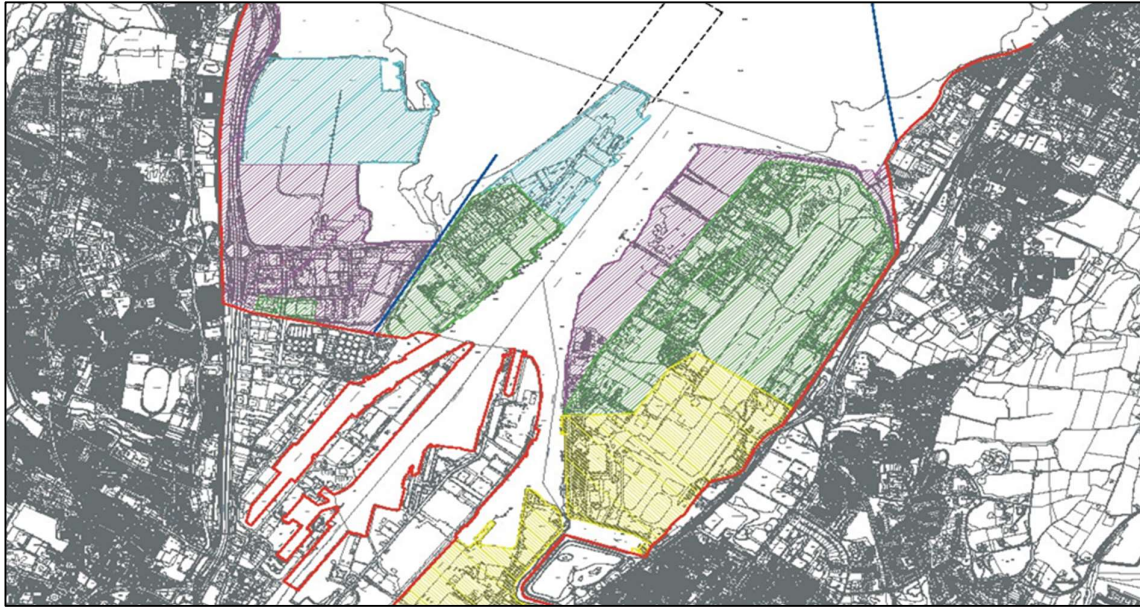


**Figure 11: Belfast WwTW Sea Outfall During Construction (1913 to 1933)**  
*Photo sourced by NI Water from National Museums Northern Ireland (NMNI)*

Belfast WwTW sea outfall is 1.6km long and was constructed between 1913 and 1933, parts of this asset are now over 100 years old. This photo in Figure 11 shows the temporary frame within which the circa 7m wide x 2m deep concrete culvert structure was built. This outfall was originally constructed in an open area of the sea and discharging well beyond the current shoreline.



**Figure 12: Seaward end of the 7m wide Belfast WwTW Sea Outfall Culvert**



**Figure 13: Belfast Land Reclamation Since 1901**

The map in **Figure 13** shows the sea outfall as the dark blue line that now discharges into a small, enclosed bay between Giant's Park and Belfast Harbour's Victoria Terminal (the other blue line is the outfall from Kinnegar WwTW, near Holywood). The coloured areas between the sea and the red line have been reclaimed since around 1901. This land reclamation has resulted in the level of the seabed at the end of the outfall increasing due to siltation, with a new stable equilibrium not yet reached.

As a result of this the seaward end of the outfall has become partially blocked by around 5,000 tons of silt. The partial blockage now means most of the discharge is now through openings in the top slab up to 500m from the end, openings that were designed to provide access for inspection and were originally sealed. There is however little point in removing this silt as this would cost in excess of £1m and would quickly re-block. Until then there is a visible plume of effluent, and a risk that the outfall will become further constrained resulting in flooding. A permanent solution must be implemented under the LWWP Belfast SDIP.

Belfast Harbour has developed Victoria Terminal 4 to the East of the outfall and intends to further invest by extending Victoria Terminal 4 to the north-east by around 800m, meaning that the bay in which the outfall is located will become further enclosed.

### **5.3 Land Reclamation Impact on Whitehouse WwTW Sea Outfall**

Whitehouse WwTW is located near the Abbey Centre in Newtownabbey and recycles the wastewater for over 100,000 people and businesses in the Newtownabbey and Mallusk areas. The treated effluent and storm water from this is discharged to the sea via a headwall at the top of a small beach on the shore of Belfast Lough, where it flows over the beach before reaching the water.



**Figure 14: Whitehouse WwTW Location**

This headwall was built in 1977 when the adjacent M5 motorway was built on reclaimed land that covered the old sea outfall. The construction drawings state that it is 'temporary', intended to be in use only until a new long sea outfall was built. However, this essential investment was deferred.

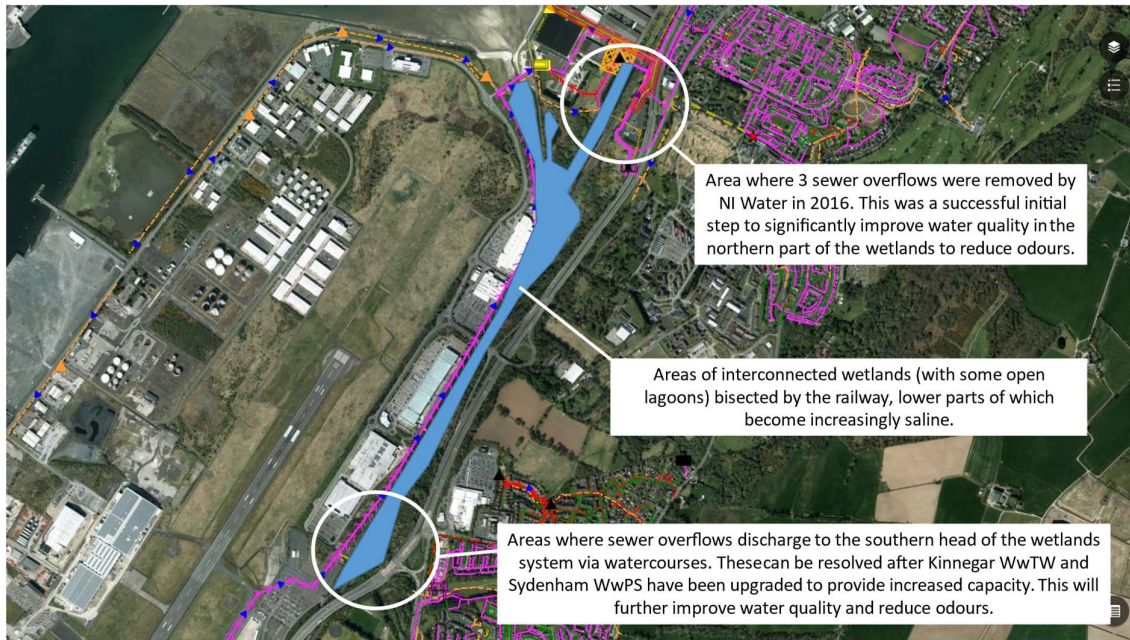


**Figure 15: Whitehouse WwTW Discharge Headwall (temporary in 1977)**

Nearly 50 years later this temporary headwall is still in use, a practice that is contrary to legislative requirements. The LWWP Belfast SDIP includes plans to build a long sea outfall to comply with environmental legislation.

## 5.4 Land Reclamation Impact on Holywood

Between Holywood and Knocknagoney land reclamation trapped an intertidal area between what used to be the shoreline and is now a retail estate and Belfast City Airport. This has since become a wetland haven for flora and fauna. However, at the time of this land reclamation, there was no investment made to divert the many combined sewer overflows discharged into the sea along this section of coast. As commercial and residential development continued in the area to the east, the discharges from these overflows have increased and progressively overcame nature's ability to break down the pollutants, resulting in septicity and severe odours.



**Figure 16: Kinnegar Lagoons and Odour**

In 2016 a small interim investment was completed to remove three of the sewer overflow discharges from the northern area. Until the LWWP Belfast SDIP is implemented these odours will not be permanently resolved, impacting on road users, train customers, shoppers and local residents.

## 6. Recreation

### 6.1 Overview

The lough is popular for a wide range of recreational activities, including walking through coastal parks and shoreline paths, swimming and sailing. However the recreational potential of the rivers that drain into Belfast Lough, and the Lough itself are being severely impacted by sewage related pollution.

This is illustrated in the following examples.

## 6.2 Impact on Coastal Walks - Whitehouse



**Figure 17: Sewage Related Debris and a Deceased Common Guillemot collected from Beach beside Whitehouse WwTW on 27 March 2024**

The over 200 unsatisfactory overflows in the LWWP catchment contain high levels of Sewage Related Debris (SRD), which is mostly plastic that does not biodegrade. The image above in **Figure 17** shows a sample of SRD collected from the beach beside Whitehouse WwTW on 27 March 2024. Previously NI Water removed over 100t of SRD from this beach and had to stop when the removal was changing the shape of the beach, threatening coastal erosion. This sample includes condoms, tampon applicators, sanitary towels, gloves, face masks, cotton bud cores, nursing home type incontinence pads, wet wipes, toilet fresheners, a toothbrush, a razor blade, a green pot scrubber, pharmaceutical tablet packaging and baby soothers. This is only a fraction of what will have found its way into the sea, becoming a hazard for flora and fauna. Whilst an autopsy was not carried out, this debris may have resulted in the death of the common guillemot found on the beach, as when seabirds ingest SRD it can block their digestive system. When this sample was being collected, a couple walking their dogs asked how such a mess could be allowed to happen anywhere so naturally beautiful in 2024.

In 2022 NI Water installed a storm screen to hold back SRD in part of the storm overflows that discharge to this beach. This was an interim upgrade, until the wastewater networks and WwTW have been upgraded under the LWWP. Although it has greatly reduced the amount of SRD that accumulates at the beach, the discharge of stormwater containing SRD can still occur during heavy rain. Most of this SRD should never have been flushed. NI Water's message to customers is clear; do not put rubbish down your toilet, flushing inappropriate items can block your sewers and end up on our beaches. Remember to only ever flush the three Ps: Pee, Pooh and Paper - for anything else, bag it and bin it.

### 6.3 Impact on Parks - Connswater Community Greenway and Victoria Park

The Connswater Community Greenway (CCG) is a 9km linear park through east Belfast. It follows the course of the Connswater, Knock and Loop Rivers, connecting open and green spaces and creating conditions in which a long-neglected and polluted ecosystem can revive and thrive. The CCG is connected to the Victoria Park through a path below the Sydenham Bypass, and from a new footbridge, across into the Titanic Quarter. The park includes wetlands that have become home to birds such as swans, geese, ducks, herons and migrant waders. There are two walking trails around the wetlands. The playing fields have soccer pitches, a bowling green and a cycling and BMX track.

CCG's most important purpose is to reconnect the communities of east Belfast and bring the area's rivers 'back to life' as focal points and community assets, by creating vibrant, attractive, safe and accessible parkland for leisure, recreation, events and activities. Construction and environmental work on the CCG was completed in April 2017. What was an underappreciated landscape has been transformed and people in east Belfast and beyond can now use and enjoy a valuable community asset.



**Figure 18: Connswater Community Greenway**

Over 5km of rivers flow through the CCG. Whilst the project to create it included a range of works to reduce flood risk, there was no funding made available to address the 10 unscreened unsatisfactory storm overflows that discharge into it, with these only able to be improved after Sydenham WwPS has been replaced under the LWWP as one of the 'Major Projects'. Sydenham WwPS is located beside where the CCG meets Victoria Park. Sydenham WwPS is the largest unsatisfactory storm overflow in NI, discharging virtually every time it rains. As a result of these unsatisfactory overflows, the rivers that flow through the CCG and the waters that surround Victoria Park become contaminated with bacteria and SRD after rainfall, resulting in odours. Whilst no one likes to look at used wet wipes, sanitary towels and condoms, it will be particularly unpleasant for parents walking their children to school to see these hanging from branches along the river. This diminishes the recreational value of these wonderful community assets.



## 6.4 Impact on Swimming

Designated Bathing Waters are sites that are popular for swimming and paddling and have been designated under the Bathing Water Regulations 2013. They have been put in place thanks to the EU Bathing Waters Directive that was first introduced in 1976. Within Belfast Lough there are designated bathing waters at Helen’s Bay, Crawfordsburn, Ballyholme, Groomsport, with Brompton being a candidate site. DAERA is responsible for monitoring and making sure that coastal waters are of high enough quality to bathe in. The figure below in Figure 19 illustrates recent quality assessments, and how there is a declining trend.

Bathing Water	2019	2020	2021	2022	2023
Helen’s Bay	Excellent	Excellent	Excellent	Good	Good
Crawfordsburn	Good	Excellent	Excellent	Excellent	Good
Ballyholme	Sufficient	Sufficient	Sufficient	Poor	Poor
Groomsport	Excellent	Excellent	Excellent	Excellent	Excellent

Key: ● Excellent ● Good ● Sufficient ● Poor

**Figure 19: Bathing Water Compliance 2019 - 2023**

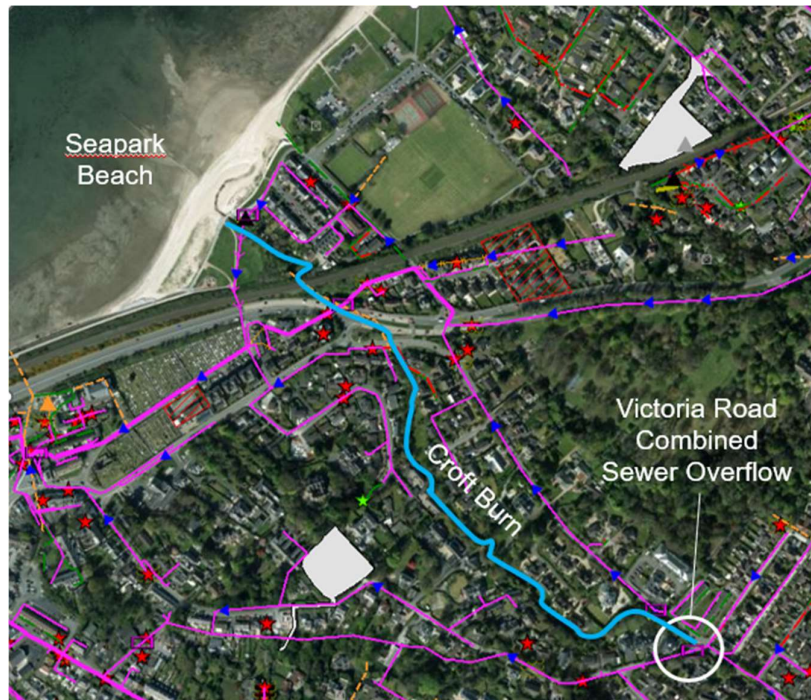


**Figure 20: A swimming event in Belfast Harbour in 2017**

Whilst Belfast harbour is not a designated bathing water, Belfast Harbour (BHC) used to promote that the swimming stage of triathlons was held in the harbour, with photos used in its annual reports. However, when NI Water received the water quality sampling data on the harbour and Inner Belfast Lough from the surveys commissioned to inform the LWWP, it identified that the water quality is frequently unsuitable for bathing and advised Belfast Harbour. Since then, BHC has ceased to permit access to the waters within the Belfast Harbour estate for swimming due to the risk that water quality poses to the health of swimmers. Although it is not intended that Belfast Harbour become a designated bathing water under the

LWWP, the scale of the investment that Paris put into holding the swimming stage of the 2024 Olympics triathlons in the River Seine illustrates how having improved water quality in rivers enhances the perception and appearance of a city to tourists, which have become an increasingly important part of the Northern Ireland economy.

### 6.5 Impact on Recreational Beaches – Seapark, Holywood



**Figure 21: Seapark Beach, Holywood**

On 14 March 2024 NI Water released data that the Victoria Road Combined Sewer Overflow is predicted to spill 153 times per annum (70,506 cubic meters). This discharges into the Croft Burn, which flows across Seapark Beach before it enters Belfast Lough. Whilst this is not a designated bathing water, visitors to the beach would expect a certain level of sanitation, and it is a popular beach for families to bring children to play during warm weather. NI Water has advised North Down and Ards Borough Council about the high level of spills from this UID, and that sampling carried out to inform the LWWP has found that the Croft Burn also appears to suffer from elevated levels of bacterial during dry weather from other upstream sources, such as cross connections from foul sources to surface water sewers and diffused pollution from agriculture. This pollution is greatly reducing the potential amenity value of this beach. The Local Council has a key role to play in advising the public about the risks to health.

## 6.6 Impact on Sailing – Hollywood Yacht Club (HYC) and Royal North of Ireland Yacht Club (RNIYC)



**Figure 22: Children sailing at RNIYC**

These clubs are located near Hollywood, and each has active programmes, supported by the Royal Yachting Association (RYA), aimed at introducing children and young people to sailing and watersports. They mostly sail in the waters around their clubs, which are not designated as bathing waters.

When NI Water received the water quality sampling data on Inner Belfast Lough from the surveys commissioned to inform the LWWP, it assessed that the water quality is frequently unsuitable for bathing and advised HYC, RNIYC and the RYA in late 2021. Officials from NI Water and DAERA subsequently met these organisations in early 2022 and provided data and a briefing on water quality, how it can rapidly vary due to many adjacent unsatisfactory storm overflows operating, and on the importance of assessing the risks posed by poor water quality when planning activities, particularly those involving children and swimming. Each organisation is concerned about how poor water quality is a risk to the health of their members and guests, and how this has the potential to adversely impact their ongoing activities.

In April 2024 the RYA has announced nationally that it and a number of other UK water related organisations have created the 'Clean Water Sport Alliance', which the RYA's CEO stated 'represents the interests of millions of recreational water users whose experiences are impacted by substandard water quality and pollution every day' and that "they have joined forces to call for change to protect those they represent and the natural world in which they participate".

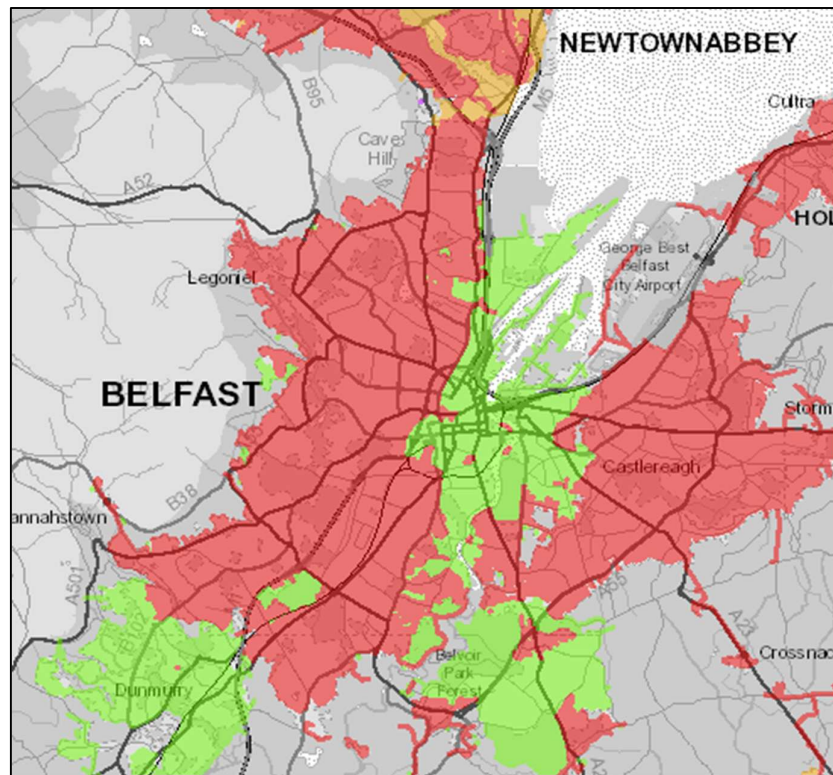
## 7. Economy

The effective treatment and management of sewage is essential to support development of homes, schools, hospitals and businesses. However, new connections should not be made if it knowingly either increases the risk of properties being flooded internally by sewage or pollution.

In 2017 Belfast City Council (BCC) published The Belfast Agenda setting out a vision for Belfast in 2035 – “Belfast will be a city reimagined and resurgent. A great place to live and work for everyone.” To help achieve this, BCC has published growth plans for the city, with a growth aspiration of 66,000 additional population by 2035, targets to deliver 33,000 new homes, including 1,800 social housing units, 46,000 additional jobs, 1.5 million square feet of Grade A office accommodation and at least 3,000 new hotel bed spaces.

Today much of the drainage and wastewater infrastructure serving the greater Belfast area requires significant levels of investment to facilitate such future growth and development, which is evidenced by the high number of unsatisfactory overflows, the number of properties at risk of internal flooding, the rate of loss of load from the wastewater networks, that the WwTW are not currently having to comply with discharge standards based on environmental needs, and the deteriorating water quality in Inner Belfast Lough. NI Water has already had to provide negative responses to planning application consultations, and applications for new trade effluent discharges, due to these capacity related issues, and has indicated that this is likely to become more frequent without the necessary investment.

This is illustrated on the map in Figure 23 below.



**Figure 23: Development Constraints in Belfast**

On this map, red areas have issues with wastewater capacity, green areas currently have some available capacity, and amber areas are close to reaching maximum capacity. The map shows that most of the area covered by the Belfast SDIP is currently red due to capacity issues in the sewage network. It should be noted that some new connections in the red area still can proceed on a “like for like” basis or through a zero-detriment developer funded solution such as storm water offsetting. Other new connections for greenfield developments will not be able to proceed if they are close to extremely high polluting assets which are not suitable for developer funded solutions and require a full capital upgrade.

The extent of capacity constraints across the LWWP area will significantly increase if NIEA determines that Belfast WwTW, Kinnegar WwTW and Whitehouse WwTW will be deemed to be non-compliant from 2027 if they have not been upgraded to achieve their new environmental needs-based discharge standards.

The Utility Regulators PC21 Final Determination allowed for the connection of a total of 44,400 domestic and non-domestic properties across Northern Ireland during the PC21 period covering 2021-22 to 2026-27.

In July 2024, based upon enquiries from its customers and discussions with stakeholders, NI Water was aware of approximately 37,000 units across Northern Ireland that may want to connect to the wastewater system over the next number of years. It had completed an assessment of the 37,000 units and estimated that approaching 18,000 units may still be able to connect to the wastewater system, with the majority requiring a developer funded zero detriment solution such as storm water offsetting, as long as this option remains viable. The remaining 19,000 units were constrained by existing NI Water assets that are currently highly polluting. These units are also currently outside the scope of developer funded solutions and would require a full capital upgrade before further new connections can be made to the wastewater system. These units include homes in private and social ownership schemes, commercial and public buildings. NI Water advised Local Councils that the current budget allocation means that, at July 2024, NI Water is not able to make the necessary investments to enable connections for these units. In a scenario where NI Water’s Price Control 2021 (PC21) programme was fully funded, it would still only be possible to address 4,500 of these 19,000 units, as the solution to the capacity constraints will take several fully funded Price Control periods to resolve.

NI Water has advised that across NI it will continue to work closely with the Council Planning and LDP teams to provide the councils with as much information as possible regarding these constraints and the effect on proposed investments.

## 8. Legislation and Compliance

### 8.1 EU Water Framework Directive

The Water Framework Directive (2000/60/EC) was established in law in Northern Ireland on 22 December 2003 through the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003 (SR 2003 No. 544) and later revised by the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017 (WFD).<sup>8</sup> This legislation sets environmental objectives for surface water bodies to prevent deterioration of the body's status, restore each surface water body to good ecological and chemical status, progressively reduce pollution from priority substances, and other objectives that are necessary to protect the shellfish water protected area, article 13. The deadline for environmental objectives can be extended for reasons of technical feasibility, disproportionate cost, or the natural conditions do not allow timely improvement, article 16.

The Water Framework Directive (Priority Substances and Classification) (Amendment) Regulations (Northern Ireland) 2015<sup>9</sup> transposed the existing shellfish waters into Shellfish Water Protected Areas (SWPA). This was for the protection of economically significant aquatic species and created three objectives for the improvement, and for the prevention of deterioration of, individual water bodies:

- SWPAs must be managed to ensure they meet the objectives assigned to the water body under the WFD (through the RBMP process).<sup>10</sup>
- SWPAs must meet the faecal indicator standard that ensures that they meet at least Class B criterion as per the EU Hygiene Regulations.
- Must endeavour to meet guideline microbiological standards
- Where sampling does not comply, the department shall adopt measures to prevent deterioration, article 3.

Additionally, the Water (Amendment) (Northern Ireland) (EU Exit) Regulations 2019, ensures that the requirements of this legislation was carried over once the UK left the EU.

On 3 September 2024 the Office for Environmental Protection (OEP) issued a report<sup>11</sup> that found that the WDF River Basin Management Plan, the critical plan designed to protect and improve Northern Ireland's waters, needs to be strengthened and implemented without further delay. The OEP report makes 16 recommendations to the Northern Ireland Executive, Northern Ireland Assembly and DAERA, designed to increase the prospects of protecting and improving the water environment. These include recommendations in relation to DAERA's 2027 objectives, and to strengthen the legislative framework and its governance and application in the longer term. The Northern Ireland Executive and Northern Ireland Assembly have, within its response to the OEP report, and opportunity to set out how the LWWP will play a key role in next chapters of the story of Belfast Lough.

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<sup>8</sup> [The Water Environment \(Water Framework Directive\) \(England and Wales\) Regulations 2017 \(legislation.gov.uk\)](#) accessed 24 August 2022.

<sup>9</sup> [The Water Framework Directive \(Priority Substances and Classification\) \(Amendment\) Regulations \(Northern Ireland\) 2015 \(legislation.gov.uk\)](#) accessed 24 August 2022.

<sup>10</sup> Regulation 13(4) of the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017.

<sup>11</sup> OEP Report 'A review of implementation of the Water Framework Directive Regulations and River Basin Management Planning in Northern Ireland', 3 Sept 2024

## 8.2 Water Quality Compliance

The WFD water quality objective is to achieve overall 'Good Status' by 2027. However, the current overall status of the Inner Lough is 'Moderate Status', and is deteriorating.

Surveys progressed to inform development of the LWWP Belfast Strategic Drainage Infrastructure Plan (Belfast SDIP) have confirmed that diffused pollution from a range of sources and discharges from sewerage network overflows and wastewater treatment works (WwTW) are significant contributory factors for Inner Belfast Lough failing to achieve the necessary EU Water Framework Directive 'Good Status' for nutrients and bacteria. In 2022 the LWWP Integrated Environmental Modelling (IEM) confirmed that NI Water assets are a significant bacterial contributor (over 90%) and that these loads are detrimentally impacting bacterial water quality within areas of the SWPA that are closest to Belfast WwTW and Whitehouse WwTW.

In 2016, NIEA defined that NI Water's investments necessary to achieve Water Framework Directive 'Good Status' for Inner Belfast Lough should be completed in February 2025. In 2017 this date was deferred by 2 years to Feb 2027 to allow increased time for modelling and investment appraisal to drive down the implementation costs and develop more sustainable solutions.

In 2018, DAERA advised the Belfast Lough shellfish industry that it had assessed that water quality within the Belfast Lough SWPA had deteriorated in recent years, and that unsatisfactory combined sewer overflows were the primary source of Sewage Related Debris (SRD) that is being reported in watercourses, the River Lagan, the SWPA and along the coastline of Belfast Lough.

In 2019 DAERA published the Belfast Lough Shellfish Action Plan<sup>12</sup>. This states on page 4 'In 2019 a statistical assessment confirmed an increase in *E. coli* in shellfish flesh, which indicates a decline in water quality in the SWPA in Belfast Lough Inner'. The DAERA action plan explains how implementation of the LWWP Belfast SDIP will help address this decline. In 2024 DAERA advised that analysis of the most recent shellfish quality samples to 2023 shows a sustained deterioration of quality in the Inner Lough.

DAERA has advised that, as well as failing to meet good status, nutrients have been increasing throughout the Lough (deteriorating further). This is most dramatic in the inner Lough area and less dramatic moving seaward. High levels of nutrients cause harmful algal blooms, as has been seen in Lough Neagh. During 2024, the phytoplankton species *Dinophysis* has been detected, which is associated with Diarrhoetic Shellfish Poisoning (DSP), and shellfish closures. There have also been concerns in other elements of the ecology, with increased siltiness impacting both plants and benthic habitats intermittently in recent years, particularly in the inner lough.

That water quality is declining is a significant concern as the Water Framework Directive, and the implementing legislation in Northern Ireland (WFD),<sup>13</sup> does not permit any deterioration in water quality classification. NIEA has advised NI Water that no decision has been made to permit NI Water to adhere to less stringent standards, nor has any extension of time given beyond 2027 to facilitate that an alternative plan is put in place to meet these objectives.

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<sup>12</sup> DAERA Belfast Lough Shellfish Action Plan, December 2019

<sup>13</sup> The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003.

### **8.3 The Urban Waste Water Treatment Regulations (Northern Ireland) 2007**

These were designed to reduce the pollution of freshwater, estuarine and coastal waters by domestic sewage and industrial wastewater collectively known as urban wastewater. They set minimum standards for the collection, treatment, and discharge of urban wastewater according to the population served by the WwTW and the sensitivity of receiving waters. Additionally, Member States must assess and identify sensitive areas where further treatment over and above secondary treatment is required to reduce nutrient levels or to meet other EC Directives such as the bathing directive. The Inner Belfast Lough was designated as a 'Sensitive Area (Eutrophic)' under this directive in 2001<sup>14</sup> which resulted in those WwTW over defined size categories that discharge into the area having to comply with Total Nitrogen (TN) discharge standards.

As the latest Sensitive Area Review (SAR) completed by DAERA in 2019 identified a deterioration in water quality, and this has continued, in 2024 the Minister for Agriculture Environment and Rural Affairs instructed DAERA's Water Policy Teams to proceed with a further designation under a Sensitive Area Review (SAR), under Annex 2(a)(c), and to meet other directives. This will result in additional discharge standard parameters being included within NI Water's discharge consents, which will require investment to achieve.

In 2023/2024 NIEA wrote to DfI<sup>15</sup> and advised:

- that if the LWWP Belfast SDIP is not delivered, NI Water and DfI will not meet statutory objectives;
- DAERA / NIEA has accepted the LWWP as being a mechanism to achieve obligations under the WFD and UWWTD; and
- any further delays to LWWP outputs related to these obligations would not be acceptable.

## **9. Key Published Government Documents Relating to Belfast Lough Water Quality**

### **9.1 2020 New Decade New Approach**

In January 2020 the 'New Decade New Approach' document was published. It set out the deal which the UK Government and Irish Government endorsed as a basis for restoring the NI Executive. It stated<sup>16</sup> 'Infrastructure funding will enable the Executive to invest in a range of potential capital projects', with the Living With Water Programme being first on the list.

### **9.2 2021 Living With Water in Belfast**

This document 'Living With Water in Belfast' (An Integrated Plan for Drainage and Wastewater Management in Greater Belfast) was published by DfI in November 2021, after having been endorsed by the NI Executive. This set out how the LWWP plan would protect against flood risk, enhance water quality in rivers and Belfast Lough, and provide the increased capacity needed for economic growth.

### **9.3 2021 Draft 3<sup>rd</sup> Cycle NI River Basin Management Plan 2021 to 2027**

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<sup>14</sup> DAERA, 'Shellfish Action Plan: Belfast Lough' (DAERA, 2019) <[Belfast Lough \(qub.ac.uk\)](http://BelfastLough.qub.ac.uk)> page 4 accessed 24 August 2022.

<sup>15</sup> Letter to DfI in relation to the LWWP Review

<sup>16</sup> Page 52 under 'Turbocharging infrastructure.'



Northern Ireland's water resources are managed and protected using a catchment-based approach which includes rivers, lakes and groundwater as well as coastal and transitional water bodies. The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017 requires the production and implementation of a River Basin Management Plan (RBMP) in six yearly cycles. The River Basin Management Plan takes an integrated approach, identifying those water bodies which can be classified as being at 'good or better' status. It also sets the objectives and a programme of measures for the next six-year cycle to help improve those water bodies which are classified as below 'good' status. These include programmes of measures designed to achieve regulatory targets.

In 2021 DAERA published the draft 3rd Cycle River Basin Management Plan 2021 to 2027 for consultation. This references the moderate quality in Inner Belfast Lough and declining water quality in the SWPA and, in a number of locations, states how investment by NI Water under the Price Controls and the LWWP is planned to address this, including;

- **Page 21:** 'Price Control is the process through which NI Water reaches agreement with the Utility Regulator on the organisation's priorities and plans for the period of the Price Control. The next price control process is PC21 which will make a significant contribution to the success of this RBMP. PC21 covers the period 2021 to 2027 and includes both clean water and wastewater services. The PC21 plan shows how £2.2bn of capital funding could be allocated over a period of six years. It also identifies ways to prioritise the investment needed in the Living with Water Programme for the Greater Belfast area. The PC21 Business Plan should provide the opportunity to halt and reverse some of the impacts of underinvestment and assist with the general aim of improving water quality'
- **Page 94:** 'NI Water is the sole provider of water and sewerage services in Northern Ireland and despite major improvements both in capital investment and operating techniques significant investment is still required to make the difference on the delivery of 'Good Status' and the protection of sensitive waters. Underfunding of the PC15 business plan 2015-21 has resulted in capacity issues in over 100 locations across Northern Ireland with the sewage network and Wastewater Treatment Works at or near their full capacity. This increases the risk of flooding from sewers, especially during storm events'.
- **Page 117:** 'Diffuse and point source pollution, summary of supplementary measures to address diffuse and point source pollution of surface and groundwater from sewage during the 3rd cycle RBMP:
  - Upgrades of Wastewater Treatment Works and infrastructure as set out in the price control period PC21 (2021-2027).
  - Implement the Integrated Plan for Drainage and Wastewater Management in Greater Belfast'. (Living with Water Programme as committed in New Decade New Approach)'

#### **9.4 2023 UK Government Secretary of State for Environment, Food and Rural Affairs**

On 11 December 2023 the UK Government Secretary of State for Environment, Food and Rural Affairs wrote to water companies requesting accelerated maintenance work at sewer networks to tackle high spilling storm overflows, with the letter published on the DEFRA website<sup>17</sup>. The first paragraph of this letter states: 'Tackling storm overflow sewage discharges is a key priority for both the Prime Minister, myself and, most importantly, the public. The environmental and public health impacts of these discharges to our precious waterways, the water sector's failure to act and, in some cases, criminal behaviour, are unacceptable'. Funding implementation of the LWWP Belfast SDIP is fully aligned to the Prime Ministers key priority to addressing pollution from storm overflow sewage discharges.

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<sup>17</sup> [Water industry: letter to water companies on accelerating action on storm overflows - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/water-industry-letter-to-water-companies-on-accelerating-action-on-storm-overflows).

## 9.5 2024 Office of Environmental Protection Report on the draft River Basin Management Plan

As part of its role to monitor how environmental laws are working in practice the Office of Environmental Protection (OEP) carried out a review of the key legislation regarding water quality – the Water Framework Directive (WFD) Northern Ireland (NI) Regulations – and how they are being implemented by the Department of Agriculture, Environment and Rural Affairs (DAERA) and the Northern Ireland Environment Agency (NIEA) through River Basin Management Planning.

On 3 September 2024 the OEP issued its report ‘A review of implementation of the Water Framework Directive Regulations and River Basin Management Planning in Northern Ireland’. The report states that this critical plan designed to protect and improve Northern Ireland’s waters needs to be strengthened and implemented without further delay.

The OEP website<sup>18</sup> states:

Natalie Prosser, OEP Chief Executive Officer (CEO), said: “Our report finds that although the approach of the WFD NI Regulations is broadly sound, it is not being implemented or delivering as it should for Northern Ireland’s lakes, rivers and coastal waters. This paints a very worrying picture. “Our report identifies the urgent need for DAERA to publish the latest RBMP and put it into action. These plans are important because they set out the objectives and measures needed to protect and improve waters in Northern Ireland.”

According to the latest data some things are getting worse rather than better with just 31% of surface water bodies in Northern Ireland in a good ecological condition.

Ms Prosser said: “As things stand, we assess that the 2027 target is likely to be missed by a considerable margin. We also assess that Northern Ireland is not on track to meet the Environmental Objectives in the WFD NI Regulations.

“This failure to meet the 2027 target will then have a detrimental knock-on effect on the Northern Ireland Executive’s other environmental aims, such as the ‘excellent water quality’ goal in the draft Environment Strategy and ‘thriving, resilient and connected nature and wildlife’ goal.”

She added: “There needs to be stronger leadership from the Northern Ireland Executive in implementing the WFD NI Regulations. It must speed up and scale up its efforts to protect and improve its waters.”

The OEP makes 16 recommendations to the Northern Ireland Executive, Northern Ireland Assembly and DAERA, designed to increase the prospects of protecting and improving the water environment.

DAERA has until 3 December 2024 to lay its response to the report before the Northern Ireland Assembly.

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<sup>18</sup> [The Office for Environmental Protection Urges DAERA to Implement Overdue Plan to Help Improve Water Quality | Office for Environmental Protection \(theoep.org.uk\)](https://www.theoep.org.uk/news/2024/09/03/office-of-environmental-protection-urges-daera-to-implement-overdue-plan-to-help-improve-water-quality/)

## 9.6 2024 OFWAT Proposal to Issue Enforcement Orders and Financial Penalties

In 2021 OFWAT and the English Environment Agency launched investigations into all water and wastewater companies in England and Wales. This was after several water companies explained that they might not be treating as much sewage at their wastewater treatment works as they should be, and that this could be resulting in sewage discharges into the environment at times when this should not be happening. It now has enforcement activities underway against all 11 water and wastewater companies in England and Wales in relation to the operation of their wastewater businesses.

On 6 August 2024<sup>19</sup> set out its proposed decision to impose a financial penalty on Northumbrian Water, Thames Water and Yorkshire Water as a result of its contraventions of the Urban Waste Water Treatment (England and Wales) Regulations 1994, section 94 of the Water Industry Act 1991 and Condition P of the company's Licences. The proposed penalties total £168m. Whilst the cases against the other companies are at an earlier stage, it is thought likely that OFWAT will propose that similarly large penalties be imposed on several other companies.

In summary, the proposed enforcement order sets out that the severe penalties (ranging from 5 to 9% of turnover) relate to each company:

- contravening its duties under Regulation 4(4) UWWTR and Regulation 4(2) and Schedule 2 UWWTR. The UWWTR supplement the duty imposed on every sewerage undertaker by obliging companies to meet certain minimum standards for its WWTW and collecting systems.
- contravening its general duty by systematically breaching its UWWTR duties and thereby failing to effectually provide drainage and deal with the contents of its sewers
- contravening its Licence in relation to the adequacy of its resources and systems of planning and internal control to enable it to carry out its regulated activities

OFWAT is concerned that investment that it permitted under previous Price Reviews\* (in NI the equivalent process is called 'Price Controls') was not efficiently invested in asset maintenance, in upgrades to provide increased drainage and wastewater treatment capacity, and in collecting flow data to facilitate the effective operation of assets.

That water companies in one part of the UK are receiving financial penalties for not adequately investing in drainage and wastewater treatment illustrates the importance that the UK Government attributes to legislative compliance.

\*The situation is very different in NI. For each of the Price Controls since 2010 NI Water identified investment needs for asset maintenance, for upgrades to provide increased drainage and wastewater treatment capacity, and to collect flow data to facilitate the effective operation of assets which were much higher than public expenditure constraints would allow and so addressing the scale of the backlog in Greater Belfast was one of the key reasons that the LWWP was created in 2015. The investment necessary to implement the LWWP's major projects has been identified but the funding has not yet been committed to allow delivery to commence.

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<sup>19</sup> [Thames, Yorkshire and Northumbrian Water face £168 million penalty following sewage investigation - Ofwat](#)

## 10. Conclusion

The story of Belfast Lough is one of how economic development and investment in infrastructure have shaped how it can be used and enjoyed.

A significant backlog of investment in drainage and wastewater treatment has arisen over the past 20 years, which has contributed to water quality declining. This is a significant concern as the Water Framework Directive does not permit any deterioration in water quality classification. NIEA has advised NI Water that no decision has been made to permit NI Water to adhere to less stringent standards, nor has any extension of time given beyond 2027 to facilitate that an alternative plan is put in place to meet these objectives.

The Living With Water in Belfast Plan was created to address this to define the scope of projects necessary to protect against flooding, enhance the environment and to facilitate economic growth. Following endorsement by the NI Executive, the Plan was published in November 2021 and places a key focus on addressing the historic underinvestment in our water and wastewater infrastructure as a critical foundation for resilient economic and social development. It will also contribute to our environmental, sustainability and decarbonisation goals. Under it, NI Water will invest around £1.9bn in the Greater Belfast area over a period of at least 12 years. If the Plan is implemented Belfast Lough will be restored to being a beautiful resource for all.



**Figure 24: The benefits of investment: one of the wetland lagoons near Holywood before and after investment to remove three sewage overflows**

The next chapter of Belfast Lough's story will depend on investment decisions made today.



**Figure 25: Rainbow Over Belfast Lough on 27 March 2024**