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**Current
Status of
Infrastructure**

4.1 Introduction

Uisce Éireann are committed to continuous improvement to our water supply network. Throughout the development of the Framework Plan and the RWRP-NW there has been a requirement to continue to design and deliver projects, particularly in relation to critical water quality risks (which could have the potential to impact human health) and / or supply Reliability issues. For example, this may include projects required to remove 'boil water' notices. These critical works are addressed through our critical infrastructure projects which are completed under our capital investment plans. Critical projects and programmes to address potential public health issues are therefore on-going and are not impacted or delayed by the delivery of the NWRP.

Outside of the NWRP, Uisce Éireann's investment follows investment periods (known as Revenue Control periods) which set out how much Uisce Éireann can spend on projects and programmes for that period. These are subject to oversight by and approval of the Commission for Regulation of Utilities (CRU). Our first Capital Investment Plan covered the period 2014-2016 whilst the second investment plan covered 2017 to 2019. We are currently carrying out work which was identified in our RC3 Capital Investment Plan 2020-2024. Throughout the development of the NWRP and RWRP-NW, Uisce Éireann have continued working on a range of existing critical infrastructure projects funded by Uisce Éireann's RC3 Capital Investment Plan and we continue to identify and complete further critical infrastructure projects.

Between January 2014 and December 2019 Uisce Éireann invested €3.9 billion in public water and wastewater infrastructure, with a further projected spend of circa €5bn by 2024. We have invested in a range of water projects and programmes that will support and enable proper planning and sustainable development at a National, Regional and Local Level. The objective of this approach has been to deliver a balanced portfolio of investment across the three (3) themes of Quality, Conservation and Future Proofing.

This section provides in-sight into the current status of the infrastructure within the North West Region, critical infrastructure work that has already been completed and critical infrastructure work that is currently ongoing.

4.2 National Investment Programmes

Uisce Éireann are committed to improving the Quality of water received by our customers. In order to bring about improvements, we have identified critical water Quality requirements nationally and are currently delivering a range of national programmes to address high risk water supplies.

National programmes being implemented to address asset Reliability and water Quality issues include:

- The **Source Protection Programme** which develops or upgrades groundwater sources.
- The **Reservoir Cleaning Programme** which involves inspections of reservoirs and the development of a prioritised works (cleaning/repair) schedule for implementation. The programme aims to reduce network water Quality issues.
- The **Disinfection Programme** which consists of chlorination upgrades and/or UV installations/upgrades to help resolve network water Quality issues.
- The **Lead Mitigation Programme** which is a pilot programme that involves the addition of orthophosphate (a food additive) to the water to prevent lead in domestic pipes dissolving into drinking water. This programme will run in parallel to the Targeted Lead Services Replacement of all lead pipework on the public parts of the distribution system and the Government National Lead Strategy.
- **Trihalomethane (THMs) Reduction** works (Box 4.1).

Box 4.1 – Trihalomethanes

Trihalomethanes are a by-product that can be formed when we disinfect* water supplies that contain naturally occurring organic matter. Within the Drinking Water Regulations, the maximum permitted levels of THMs in drinking water is set at 100 mg/L. When Uisce Éireann took over the public supply in Ireland in 2014 it was estimated that 74 water supply zones (WSZs) within the public water supply were at risk of exceeding the limits for THMs. The European Court of Justice initiated an infringement case against Ireland for failing to address this issue.

Since then, Uisce Éireann has invested in our water supplies and resolved the THM issues in 65 of the 74 WSZs originally listed as part of the infringement case. The remaining nine (9) WSZs cover a population of 52,000. These remaining supplies will be permanently resolved by 2024.

* It should be noted that the potential health risks associated with THMs are much lower than the risk of serious illness that could result from drinking water that has not been properly disinfected.

Through our National Disinfection Programme, we have upgraded a total of 255 Water Treatment Plants (WTPs). Under our National Lead Programme, we have replaced a total of 38,414 lead services, which represents a significant investment in protecting public health.

We are also targeting investment to improve water Quality in order to lift Boil Water Notices (BWN). Since 2014 we have lifted 243 BWN's impacting over 1.7 million people of which over 40,000 of these people were on BWN's for a period of over a year. Through investment in water assets and infrastructure, the number of customers served by vulnerable water supplies (those on the EPA's Remedial Action (RAL) list) has reduced to its lowest ever level. Uisce Éireann has removed 87 public water schemes from the EPA's remedial action list (RAL) between 2014 and 2020 reducing the number of WTPs on the RAL.

These national programmes are currently funded and being delivered as part of our regulated Capital Investment Plan 2020-2024 however, due to the condition of our existing asset base and the large number of sites to be addressed, it may take several investment cycles before we have the appropriate risk controls in place across all our supplies. For this reason, the development of our Preferred Approaches, presented in Section 7 and Section 8 of this Plan, consider these water Quality issues alongside the supply demand balance issues. As explained in Section 2 of this Plan, our long-term approach will increasingly include catchment management for drinking water source protection in partnership with key stakeholders.

4.3 Progress in the North West Region

4.3.1 National Investment Programmes within the North West Region

The implementation status of national programmes across the North West Region is summarised in Table 4.1. Seventy (70) of the 311 BWNs that have been lifted since 2013 were located in the North West Region benefitting over 18,000 customers. Currently there are approximately 279 customers on BWN in the North West Region.

Within the RWRP-NW there are currently 19 WTPs which are listed on the EPA's remedial action list.

Table 4.1 National Investment Programmes in the North West Region

Study Area	Source Protection Programme	Reservoir Cleaning Programme	Disinfection Programme (Completed upgrade works*)
SAA	Works complete at 1 WTP	Works progressing at 40 sites	Works complete at 15 sites Works progressing at 14 sites
SAB	Scoping works commencing	Works progressing at 39 sites	Works complete at 10 sites Works progressing at 7 sites
SAC	Scoping works commencing	Works progressing at 56 sites	Works complete at 15 sites Works progressing at 4 sites
SAD	Works progressing at 1 WTP	Works progressing at 43 sites	Works complete at 7 sites Works progressing at 26 sites
SAE	Works progressing at 1 WTP	Works progressing at 15 sites	Works complete at 4 sites Works progressing at 12 sites
SAF	Scoping works commencing	Works progressing at 48 sites	Works complete at 4 sites Works progressing at 14 sites
SAG	Scoping works commencing	Works progressing at 2 sites	Works complete at 8 sites Works progressing at 2 sites

*Any other requirements within the remaining supplies will be identified via Drinking Water Safety Plans with solutions developed as part of the Regional Plan.

4.3.2 Identification of Critical Infrastructure Projects within the North West Region

Local critical infrastructure projects have and continue to be completed across the North West Region (in-flight projects). These include WTP upgrades to improve water Quality, critical mains replacements to improve supply Reliability, critical network upgrades, reservoir refurbishments, construction of new reservoirs and the installation of new boreholes. These works are important as the benefits of having sufficient water supplies in terms of Quality and Quantity are negated if we cannot distribute the water we produce effectively around our networks. We also need sufficient treated water storage to enable us to respond to planned or unplanned outages on our trunk main and distribution networks. It is likely that it may take 5-10 investment cycles before we address all issues with the existing water supplies. As a result of this, priority projects (such as those to remove sites from the RAL) have been identified.

4.3.3 Completed Critical Infrastructure Projects

Uisce Éireann have been working across the nation since 2014 to support growth by constructing new water treatment plants, upgrading existing water treatment plants, laying new water mains and rehabilitating existing water mains. Major national strategic infrastructure water projects have also been progressed. Case studies of work completed in the North West Region include:

- The National Leakage Reduction Programme addressing leakage in Galway City (SAD)¹, Drunshambo (SAF)² and Ballendine (SAD)³ (Box 4.2). In addition, the replacement of back yard water services as part of the National Leakage Reduction Programme has tackled leakage as well as improving water Quality and supply Reliability in locations such as Templemichael and Bannon Terrace⁴ and Sligo⁵.
- The completion of the €1.9 million Lough Talt Regional Water Supply Scheme (Sligo, SAC)⁶ (Box 4.3)
- Gortahork/Falcarragh Water Supply Scheme ⁷ (Box 4.4).
- Crollly Water Treatment Plant Upgrade⁸ (Box. 4.5)
- Foxford Water Treatment Plant Upgrade⁹ (Box 4.6)
- Cavanhill Water Treatment Plant Upgrade¹⁰ (Box. 4.7)
- Tuam Regional Water Supply Scheme Drinking Water Safety Plan (Box 4.8).

It should be noted that some critical infrastructure projects have been progressed to support growth as part of our current regulated investment cycle. As such these measures do not improve Levels of Service, they prevent current levels from deteriorating further. Future Need will be addressed through the Preferred Approaches discussed in Section 6 - 8.

Box 4.2 – National Leakage Reduction Programme

Everyday treated water in Ireland is lost through leaks before it reaches our taps. Leaks can be difficult to find because they happen in the vast and complex network of pipes below ground. Many of these pipes are now old and damaged and need to be repaired or replaced to improve our water Quality and supply.

To reduce drinking water lost to leaks Uisce Éireann have implemented the National Leakage Reduction Programme (investing €500 million up to the end of 2021) to provide a more reliable water supply. As part of the National Leakage Reduction Programme, we're working with Local Authorities across the country. This involves fixing or replacing old, damaged pipes and reducing high levels of leakage to provide a more reliable water supply.

Watermain replacement works have been carried out across the North West Region including:

- The replacement of approximately 310 m of problematic water mains in Forster Park in Galway City to reduce leakage levels and provide a more reliable water supply.
- The replacement of 130m of aged cast iron water mains in Hilly Road, Drumshanbo, Leitrim. The work included the replacement of lead connections on the public side. The works enabled reduced leakage, more reliable water supplies and reduced the risk of supply contamination.
- The replacement of over 1.9 km of aging water mains in Ballindine Co. Mayo. The work included the replacement of lead connections on the public side. The works enabled reduced leakage, more reliable water supplies and reduced the risk of supply contamination.

As part of the National Leakage Reduction Programme Uisce Éireann have replaced ageing back yard water mains in Templemichael and Bannon Terrace through their Backyard Service Replacement which involves the replacement of ageing water mains which run to the rear of properties on older estates. These are usually shared connections which run through multiple properties making leaks hard to detect and repair. These connections are typically made of iron or lead and are a significant source of leakage and reduced levels of service due to their deteriorating conditions. The work involved the decommissioning of approximately 330m of back yard water mains and the construction of 420m of new water mains along the public road with new service connections provided to each customers property.

Similarly ongoing work under this scheme includes Sligo's Backyard Service Replacement The ongoing works will decommission 800m of watermains running to the rear of the properties as well as 230m of watermains in the public road. The work will bring benefits of reduced leakage and higher levels of service (improved water pressures).

The National Leakage Reduction Programme provides various benefits including:

- A more reliable water supply
- Improved water Quality
- Reduced levels of leakage
- Individual water connections

Due to the implementation of this programme, we are now saving 166 million litres of drinking water daily.

In 2018 the rate of leakage nationally was 46%, but our ongoing work has reduced this to 38%.

Box 4.3– Lough Talt Regional Water Supply Scheme (Sligo)

The completion of a €1.9 million project has delivered significant improvements in network performance and customer service to customers in Sligo. The Lough Talt Water Treatment Plant (WTP) has been extensively upgraded to provide adequate treatment to Tobbercurry, Ballymote and surrounding communities including Annagh, Aclare, Bellaghy, Curry, Lavagh, Ballinacarrow, Carrownedan, Kilmacteige, Coolaney, Cloontia, Doocastle and Quarryfield. The completed upgrade works has allowed for the lifting of boil water notice and removal from the EPA's Remedial Action List (RAL), benefitting 13,000 customers. The rehabilitation and replacement of 17 km of water mains in Curry, Quarryfield, Killavel and Oldrock as well as the installation of 24 km of new polyethylene water mains has led to improvements in supply pressure and security of supply.

Box 4.4– Gortahork/Falcarragh Water Supply Scheme

A €3.8 million upgrade to Gortahork/Falcarragh Water Supply Scheme has benefitted 5,000 customers. The old water treatment plant at Ardsberg Water Treatment Plant which was listed on the Environmental Protection Agency's Remedial Action List was decommissioned. A new water treatment plant was built with a robust system of flocculation, coagulation and filtration followed by disinfection. A treated water storage reservoir was also constructed enabling storage of treated water to improve the security of the supply. The works improved drinking water quality, reduced disruptions to supplies and improved the security of the supply. The works enable compliance with the European Drinking Water directive and National Drinking Water Regulations.

Box 4.5– Crolla Water Treatment Plant Upgrade

A €1.85 million upgrade to Crolla Water Treatment Plant has provided over 12,500 customers in Crolla, Co. Donegal. The upgrades enabled the water treatment process to be automated as well as upgrading the flocculation and coagulation processes at the plant. Further work included the installation of turbidity monitors, pumps, air blowers, sand filters, upgrade of pipework, installation of chemical storage and the construction of a new control building. The works safeguarded the water supply for customers supplied by the Rosses Regional Public Supply Scheme, improved drinking water quality and enabled compliance with Drinking Water Regulations.

Box 4.6– Foxford Water Treatment Plant Upgrade

Uisce Éireann have progressed water treatment upgrades at Foxford in Mayo. The upgrades involved the installation of new water treatment processes including sand filters and pH adjustment and correction system. The works improved the reliability of supplies and enhanced water quality to residents and businesses within east Mayo. The improvements also ensure compliance with Irish and EU legislation.

Box 4.7– Cavanhill Water Treatment Plant Upgrade

Cavanhill Water Treatment Plant has been upgraded as part of the €10 million in the Dundalk Water Supply Scheme. The project included a wide range of works including the:

- Installation of pH correction
- Upgrade of coagulation, flocculation and clarification process
- Upgrade of the filtration process
- Upgrade of the chemical disinfection process
- Upgrade of the solids and liquid residual process
- Construction of a disinfection contact tank
- Provision of orthophosphate as part of the Uisce Éireann lead mitigation strategy
- Upgrade of existing solids and liquid residual process
- Replacement of pumping equipment
- Replace of the surge protection plant

The range of works improved drinking water quality standards and safeguarded water supplies for Dundalk and the surrounding area whilst also improving the energy efficiency of the plant.

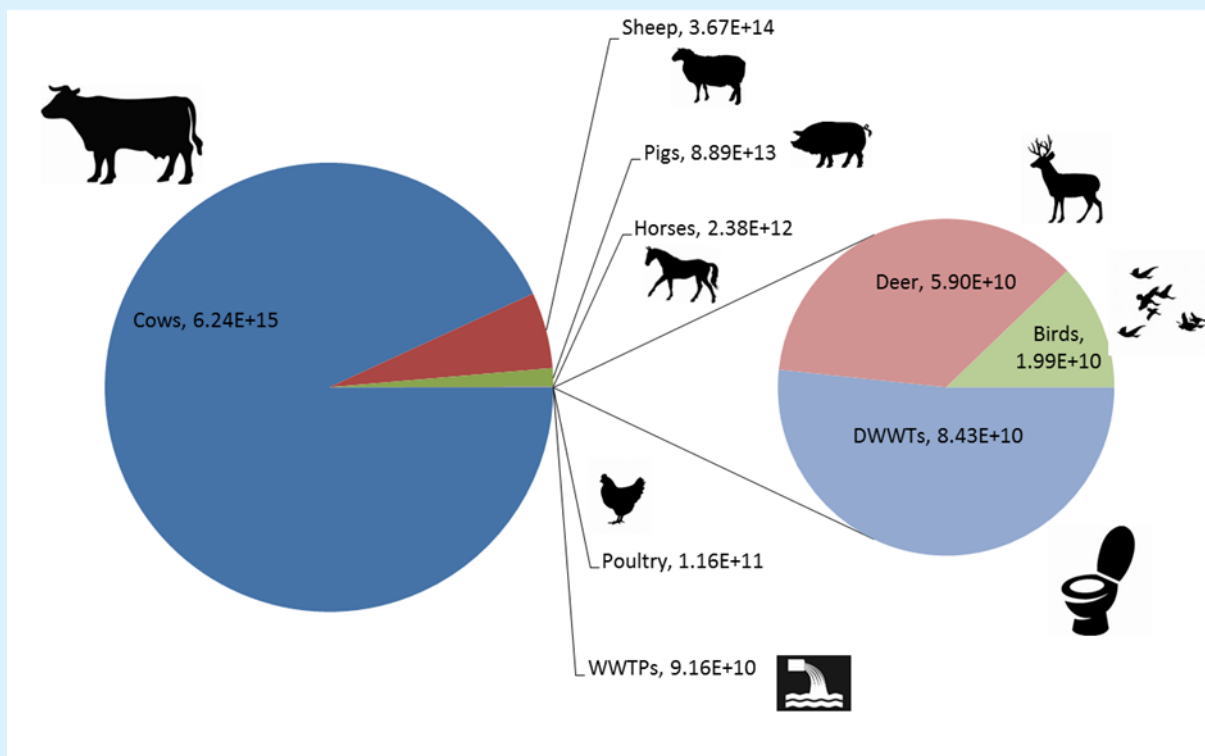
Box 4.8– Drinking Water Safety Plan Tuam Regional Water Supply Scheme (Luimnagh Water Treatment Plant)

Following an audit of Luimnagh Water Treatment Plant (WTP) it was determined that log credits could not be awarded for the filters due to the current lack of individual filter turbidity inhibits. Uisce Éireann applied the Drinking Water Safety Plan, Cryptosporidium Source Risk Assessment Methodology to understand the potential risk score to this supply and inform the appropriate treatment barrier. Luimnagh WTP receives water from Lough Corrib in the townland of Luimnagh, Co. Galway. The catchment boundary incorporates Lough Carra, Lough Mask and Lough Corrib and has a catchment area of ~310,000 hectares. The low flow volume associated with the lake at the point of abstraction is 785, 690 m³/day.

The catchment boundary encompasses 21 no. wastewater discharges representing 45, 800 PE; and ~30,000 PE associated with domestic wastewater treatment systems. Animals considered in the risk assessment include sheep (~436,000), cows (~258,000), deer (1,200), horses (5,500), pigs (~13,000) and poultry (~159,000) and birds (~31,000).

Oocyst (a thick-walled structure containing a zygote that serves to transfer parasites to a new host) loadings were calculated for all animals and subtracted from an oocyst retention factor based hydrological runoff settings, such as slope effective rainfall and near surface phosphate susceptibility within the catchment.

The relative contribution of oocyst load by input type can be seen below. The maximum Cryptosporidium oocyst concentration observed in the raw water was 330 oocysts per m³, which equates to a Log10 of 2.52. The Cryptosporidium Source Risk Assessment (CSRA) predicted a Log10 score of 2.84. In accordance with Uisce Éireann’s Barrier approach, it was determined that there was an adequate barrier in place with the UV disinfection system which provides Log 3 removal.



4.3.4 In-Flight Critical Infrastructure Projects

Some of the in-flight projects across the North West Region are presented in Table 4.2.

Uisce Éireann is replacing ageing problematic water mains across the North West Region. Replacement of water mains is currently ongoing in Castlenacor, Buncrana ¹¹, Co. Donegal to provide more reliable water supply and reduce high levels of leakage. The works involve the replacement of over 900m of water mains on Gory Hill. Whilst the works are taking place any lead pipes on the public side of the network will be replaced as part of the improvement work. Similarly, watermains are being replaced in Tullabrack/Gower ¹² to reduce leakages and provide a more reliable water supply. Approximately 1850 m of problematic water mains will be replaced on the R483 Cooraclare Road from adjacent to Tullabrack Lough towards Cooraclare.

A €12 million upgrade to Lettermacaward WTP will improve the Reliability of the water supply to local residents. The upgrade will ensure compliance with EU Drinking Water Regulations and will support economic and social development and tourism in the area whilst reducing the likelihood of supply interruptions. A further €13 million will be invested to upgrade Killybegs WTP which will also support economic and social development and tourism in the area. The investment will ensure that the WTP can meet the current water demand as well as increasing the available capacity to meet future development needs. The work will involve an upgrade to the WTP and the provision of sludge treatment facilities which will allow improvements to the local environment and surface water.

In SAD Uisce Éireann is progressing upgrade works at Tourmakeady WTP to extend the supply area of the Lough Mask Water Supply Scheme to North West Roscommon and North Galway. The project will improve the security of water supply and water Quality across these areas. These works follow on from works completed in 2018 on Lough Mask Regional Water Supply Scheme which extended supply to Ballinlough / Loughglynn and Williamstown. The project represented an investment of €10 million to ensure a clean and secure supply of drinking water for the 5,000 consumers on the two supplies. It was also responsible for the removal of the long-standing boil water notice in Ballinlough affecting 3,600 of those consumers.

Table 4.2 An Example of In-Flight Projects in the North West Region

In-Flight Project	Study Area	Progress
Buncrana Water Mains Replacement	SAA	In Progress
Lettermacaward WTP	SAA	In Progress
Killybegs WTP	SAA	In Progress
Tullabrack Water Mains Replacement	SAG	In Progress
Tourmakeady WTP upgrade	SAD	In Progress

Upon adoption of the NWRP and the RWRP-NW, “In-flight” projects will be examined in the context of the Preferred Approaches which have been identified in the Plans.

Uisce Éireann will consider in light of the Preferred Approaches and on a case by case basis, whether or not any in-flight projects, if practicable, should be adapted in any way. It should be noted that assessments, solutions and the Preferred Approaches at this stage are at a plan level, however the environmental impacts and costings of projects are further reviewed at project level. The more detailed project level information will influence and dictate what is ultimately to be included in any consent application. No statutory consent or funding consent is conferred by inclusion in the RWRP-NW. Any

projects that are progressed following this Plan will require various individual environmental assessments, in support of any planning applications or licencing applications (for example, for new abstractions). Any such applications will be subject to public consultation.

4.4 Summary

In summary, there are asset Reliability issues across the distribution network within the North West Region and works will be required over the coming years to address this Need. An overview of the Need across the area is provided in the Study Area Technical Reports (Appendix 1-7).

4.5 Conclusions

Uisce Éireann are committed to improving supply Reliability across the North West Region. This section provides in-sight into the work that has already been completed to improve our water network as well as ongoing and planned work. Critical projects and programmes to address potential public health issues are on-going and are not impacted or delayed by the delivery of the NWRP.

Between January 2014 and December 2019 Uisce Éireann invested €3.9 billion in public water and wastewater infrastructure, with a further projected spend of circa €5bn by 2024. We have invested in a range of water projects and programmes that will support and enable proper planning and sustainable development at a National, Regional and Local Level. The objective of this approach has been to deliver a balanced portfolio of investment across the three (3) themes of Quality, Conservation and Future Proofing.

Uisce Éireann are progressing National Programmes across all SAs to address asset Reliability and water Quality issues. They include the:

- Source Protection Programme – with notable works ongoing in SAD and SAE.
- Reservoir Cleaning Programme – with work ongoing/planned in each of the region’s SAs.
- Disinfection Programme – with work ongoing across the North West Region.
- Lead Mitigation Programme- planned across the North West Region in line with the Government National Lead Strategy.

Across the North West Region, works have been completed to address critical water Quality issues including the Lough Talt Water Supply Scheme and Foxford Water Supply Scheme. Ongoing works include the upgrade to Tourmakeady WTP. Leakage is being addressed across all Study Areas through the National Leakage Reduction Programme. Distribution network repairs and upgrades are continuing across all Study Areas. These projects are of vital importance and are critical to meeting Ireland’s growing water needs.

4.6 References

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