



Northern Ireland Environment Agency
Gníomhaireacht Comhshaoil Thuaisceart Éireann
Northern Ireland Environment Agency

Drinking Water Quality in Northern Ireland, 2024

A Report by the Drinking Water Inspectorate for Northern Ireland



An Agency within the Department of
**Agriculture, Environment
and Rural Affairs**
www.daera-ni.gov.uk

Gníomhaireacht de chuid na Roinne
**Talmhaíochta, Comhshaoil
agus Gnóthaí Tuaithe**

An Agency within the Department of
**Fairmin, Environment
and Kintra Matters**



Northern Ireland Environment Agency

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Foreword

I am pleased to present the 29th annual report on the quality of drinking water in Northern Ireland. The Drinking Water Inspectorate's (DWI's) primary role is to protect public health through effective drinking water regulation. This report provides an independent assessment of drinking water quality of both public and private supplies for the calendar year 2024.

In Northern Ireland over 99% of the population receive their drinking water from Northern Ireland Water Limited (NI Water). The remainder is served by private water supplies.

Overall public drinking water quality for 2024 remained high with 99.88% compliance, a slight decrease from 2023 (99.92%). Compliance at private water supplies was 99.12%, a slight increase from 2023 (99.11%).

Blue-green algal (cyanobacteria) blooms were again experienced in drinking water sources in 2024 and continued to pose a potential risk to public drinking water quality. Whilst water treatment processes are in place to manage this risk and ensure the safety of the drinking water, two Serious events occurred in September 2024 regarding the acceptability to consumers of the water supplied from Castor Bay and Moyola Water Treatment Works (WTWs), both of which abstract from Lough Neagh.

Iron was the parameter with the lowest compliance in 2024, at 99.02%, the lowest level of compliance in the last five years. The most common reason for iron contraventions is due to deterioration of cast iron mains. NI Water reduced its Water Mains Rehabilitation Programme in 2024 due to financial constraints, however, mains with water quality issues were prioritised.

DWI continues to work with all stakeholders in the PC21 process as they consider investment in maintaining drinking water quality. Engagement on the PC21 Mid-Term Review concluded in 2024.

Enforcement action is taken where necessary, and in 2024, there were three Notices in place requiring improvements at two water treatment works. During 2024, NI Water progressed their major capital investment programme (£17.5m) to improve water quality at Ballinrees WTW to comply with the regulatory limit for the herbicide, MCPA, and taste and odour. In addition, delivery of the recommendations from pilot studies continued at Drumaroad WTW to comply with a DWI Enforcement Notice for aluminium.

Although less than 1% of the population are directly served by a private water supply, many more people are exposed to them through their use in food production and as drinking water in public buildings. DWI completed 99.78% of statutory sampling requirements for private water supplies in 2024 and a total of 82 risk assessments of private water supplies were completed on the web-based application developed by DWI. I take this opportunity to recognise and thank council staff, for their contribution in achieving this target and for their ongoing work in sampling and the completion of risk assessments on behalf of DWI.

Despite the challenges to drinking water quality being faced, our focus remains on ensuring safe, clean drinking water for all. We will therefore continue to work with stakeholders, and NI Water, to support sustainable catchment management and the use of innovative, low carbon, treatment solutions to maintain and improve the quality of our drinking water.

I trust you will find this report a useful reference document on drinking water quality in Northern Ireland.



Bernadette Corr
Interim Chief Inspector of Drinking Water
February 2026

Request for Feedback on this Report

The Drinking Water Inspectorate is continually aiming to improve the standard of information provided in this report.

We are seeking the views and opinions of all stakeholders on the report itself and would greatly appreciate your feedback which can be provided online, email or post.

Online Feedback Form:

To access the short online feedback form, follow the QR code below or [link](#) (closes 31st March 2026):



or

Email: dwi@daera-ni.gov.uk

or

Post: Drinking Water Inspectorate
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Executive Summary

This is the 29th report in a series published by the Drinking Water Inspectorate (DWI), acting in our role as the drinking water quality regulator for both public and private water supplies.

The report provides an independent assessment of the quality of drinking water provided by NI Water. It also presents details of the quality of private water supplies for which we have a regulatory responsibility and undertake a monitoring programme.

Public Water Supplies

Comprehensive monitoring is undertaken by NI Water to assess public drinking water quality, and compliance is based on the results of key tests carried out throughout the water supply chain: from water treatment works; service reservoirs; and consumers' taps.

In 2024, the overall public drinking water compliance remained high at 99.88%, a slight decrease from 2023 (99.92%). The 0.12% non-compliance relates to 118 tests that failed to meet the required standard. Compliance at consumers' taps also remained high at 99.87%, a slight decrease from 2023 (99.88%). However, of the 43 regulatory parameters tested, ten did not achieve full compliance. Those parameters failing to meet full compliance were Aluminium, Bromate, Coliform bacteria, Enterococci, Iron, Manganese, Odour, Other Pesticides (MCPA), Taste, and Total Trihalomethanes.

The reoccurrence of blue-green algae (cyanobacteria) blooms in drinking water sources, such as Lough Neagh, continued to pose a potential risk to drinking water quality in 2024. To mitigate this risk the WTWs impacted by algal blooms are designed for the removal of algae and its toxins. In 2024, despite high levels of algae in the raw water, levels of the algal toxin, Microcystin-LR, in the treated water were all reported as below the World Health Organisation guideline value of 1.0 µg/l for drinking water. Therefore, no restriction on the use of the drinking water was advised by the Public Health Agency (PHA) as a consequence of the algal blooms. However, as in 2023, there were issues with the acceptability to consumers of the water supplied from Castor Bay and Moyola WTWs, both of which abstract from Lough Neagh (see details on water quality events below).

The parameter with the lowest reported compliance in 2024 was Iron at 99.02%, a decrease from the 2023 compliance figure of 99.71%, and the lowest level of iron compliance in the last five years. Corrosion of iron water mains is the most common reason for iron contraventions. In 2024, NI Water reduced the outputs of their Water Mains Rehabilitation Programme due to financial constraints, however, mains with associated water quality issues continued to be prioritised.

Contraventions of microbiological parameters may indicate a failure in the treatment process or a breach in the integrity of the water supply system. In 2024, NI Water reported 99.78% compliance for coliform bacteria at its WTWs, compared to 99.95% for 2023. This marks a decrease in coliform bacteria compliance, with 14 contraventions (at seven WTWs) in 2024 compared to three contraventions (at three WTWs) in 2023. Similarly, for service reservoirs, coliform bacteria compliance was 99.82% in 2024, a decrease compared to 99.93% recorded in 2023. Coliform bacteria were detected on 26 occasions at 26 different service reservoirs in 2024, compared to 11 occasions at ten different service reservoirs in 2023. Investigations determined that this increase in bacteriological contraventions, at WTWs and service reservoirs,

was largely due to environmental contamination of microbiological samples during analysis at NI Water's Gelvin Grange laboratory. A microbiological compliance figure at consumers' taps of 99.84% was reported in 2024, a slight improvement from the 99.81% compliance in 2023. Coliform bacteria were detected in 17 samples and Enterococci was detected in one sample.

NI Water's investigation into contraventions must determine if they are due to the internal distribution systems within domestic dwellings or public buildings. The investigations, where appropriate, should also ensure internal plumbing is compliant with The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

NI Water reported ten contraventions for 2024, due to the internal plumbing within seven domestic properties: four coliform bacteria; three odour; and three taste. The contraventions were investigated by NI Water and letters sent to the consumers advising them of the contraventions and offering appropriate advice to protect public health. There was one reported contravention related to odour in a public building.

The total number of water quality events (Annex 2) that occurred in 2024 was the same as in 2023, with 48 events reported to us by NI Water. Of these, we categorised two as Serious, 19 as Significant, three as Minor and 24 as Not Significant.

The two Serious events involved high levels of consumer contacts regarding the taste and odour of the mains water supply, described as "earthy/musty", and contraventions of the taste and odour parameters in the water supplied from Castor Bay and Moyola WTWs. These WTWs are supplied by Lough Neagh and the events occurred during an algal bloom in Lough Neagh. As a follow-up to these events, DWI issued questionnaires to consumers in the affected areas to evaluate their experience during the events and considered appropriate enforcement action. DWI issued Warning Letters to NI Water, in 2025, for Castor Bay and Moyola WTWs in relation to these events, and may take further enforcement action if required.

Seventeen of the 19 Significant events occurred at nine water treatment works and were primarily related to difficulties with the treatment process or a lack of adequate treatment. One Significant event occurred in the distribution network and the final Significant event related to the environmental contamination of microbiological samples at Gelvin Grange Laboratory which occurred between April and October 2024. DWI issued a Warning Letter to NI Water, in 2025, following the Significant event at Carmoney WTW in 2024 relating to pesticide contraventions.

To enable us to evaluate consumer confidence in the quality of drinking water, we receive information relating to consumer concerns and complaints from NI Water. The total number of consumer contacts reported in 2024 was 5,470 compared to 5,897 in 2023, a decrease of 7.24%. Of the complaints received by NI Water, 51.13% related to the visual appearance of the water, a slight decrease from 2023 (51.91%). Taste and odour complaints accounted for 27.4% of the total consumer contacts in 2024 compared to 17.6% in 2023, with an upward trend in "earthy/musty" consumer contacts since 2022. This increase was in part associated with the occurrence of algal blooms in drinking water sources in 2023 and 2024.

Where necessary, we take enforcement action (Annex 4), to secure remedial action within specified timeframes. Two of the Notices issued by DWI led to a major capital investment at Ballinrees WTW which was ongoing throughout 2024. The work, costing circa £17.5 million, should aid the removal of organics, increase pesticide and taste and odour compliance, and

improve the quality of the water supplied to over 115,000 people in the Coleraine, Ballymoney, and Limavady areas. In response to a notice we issued in 2021, relating to aluminium contraventions at Drumaroad WTW, NI Water continued, in 2024, to implement the recommendations identified through their pilot studies to improve the treatment process at the works and comply with the notice.

Private Water Supplies

The same drinking water quality standards apply for private water supplies as for the public water supply. Although less than 1% of the population receives water from a private supply, many more are exposed to them through their use in both commercial activities and public buildings. Private supplies are used as an alternative to, or in conjunction with, the public supply for a range of activities including food processing, holiday accommodation, and public buildings, including hospitals and care homes. Over 80% of the private water supplies registered with DWI are classified as commercial or public supplies, a number of which are used for economic reasons.

Our private water supply sampling programme for 2024 consisted of 176 sites. Eight new sites were registered, and five sites were removed as they were taken out of supply or no longer met the criteria for registration. Due to maintenance and temporary use of the mains water network, two sites had reduced, or no sampling undertaken. In 2024, 99.78% of the regulatory monitoring programme was delivered. Samples at private water supplies are collected by local councils' Environmental Health staff, acting on our behalf.

Overall compliance for 2024 is reported as 99.12%, a slight increase from 99.11% reported for 2023. The regulatory requirements were not met on 112 occasions for 15 parameters, namely: Coliform bacteria; *E. coli*; Enterococci; *Clostridium perfringens*; Manganese; Sulphate; Hydrogen Ion (pH); Iron; Ammonium; Trihalomethanes; Turbidity; Pesticides, individual (Clopyralid); Sodium; Bromate and Radon.

Full compliance was achieved for 64% (112 sites) of the private water supplies tested in 2024. Of the 64 sites which did not comply with the regulatory standards, 44% (28 sites) contravened only microbiological standards; 50% (32 sites) chemical standards; and 6% (4 sites) failed to comply with both microbiological and chemical standards.

Microbiological compliance increased in 2024 to 94.17%, up from 93.44% in 2023. The presence of micro-organisms in a private water supply is indicative of contamination of the water either at source or at some point within the distribution system. In particular, the detection of *E. coli* or Enterococci bacteria specifically indicates faecal contamination of a water supply and can be a risk to public health. These faecal indicators were found to be present in 15 supplies during 2024: nine small shared domestic supplies, three of which had disinfection treatment in place at the time of sampling; and six commercial / public supplies, four of which had disinfection treatment in place at the time of sampling.

Overall, the number of chemical contraventions increased to 55 in 2024, which is up seven from 2023. Hydrogen ion (pH), Iron, Manganese and Sodium contraventions were the chemical parameters with the most contraventions in 2024. Chemical compliance decreased slightly in 2024 to 99.53%, down from 99.58% in 2023.

Any contraventions at supplies, where the water is used as an ingredient in food production or as drinking water, and that are considered as a potential risk to human health, are reported to the Public Health Agency (PHA) for appropriate health advice. Where necessary, the Regulations contain a provision to issue Notices which can be used to restrict or prohibit the use of a supply.

Out of the 64 sites with contraventions identified in 2024, 60 were notified to PHA for advice: 41 microbiological and 19 chemical. Consequently, restrictions on the use of the private water supply were put in place at 15 sites to protect public health. Following the completion of corrective actions and satisfactory resamples, the restrictions were removed at five sites.

We continue to work with owners and users of private water supplies and Environmental Health staff in local councils to ensure the risk assessment of private water supply sites is progressed to bring the remaining supplies into compliance. Priority is given to advancing improvements in water quality through provision of advice and guidance; agreeing action plans (particularly at the larger commercial / public sites); and promotion of Drinking Water Safety Plans for the ongoing management of these supplies. However, where necessary we may take formal enforcement action to secure compliance and ensure a safe, clean supply of drinking water from private supplies.

DWI routinely provides advice and guidance to the owners / users of all private water supplies across Northern Ireland, responding to 200 requests for information in 2024. In addition, formal training was delivered to Environmental Health staff throughout 2024, with 30 staff trained in sampling of a private water supply and 21 staff trained in the risk assessment process. DWI continue to engage with a range of stakeholders in relation to private water supplies to promote the protection of source water catchments, investigate new and emerging contaminants of concern, and support the sustainable use of groundwater resources.

Looking Forward

A key priority for the Department and NIEA is improved water quality. Protecting the catchments from which drinking water is abstracted not only improves the raw water quality and reduces potential contamination risks, but it can also reduce the need for additional or enhanced water treatment processes. We will continue to work with colleagues in NIEA and NI Water, in support of the Third River Basin Management Plan for Northern Ireland, promoting sustainable catchment management of drinking water protected areas and contributing to the delivery of the Lough Neagh Action Plan.

However, where work is required to address current water quality issues, we will continue to engage with all stakeholders as they identify the capital investment needs for the next Price Control process, PC28, supporting innovative, low carbon, water treatment solutions to secure the provision of a resilient public water supply. The provision of safe, clean drinking water must remain a key priority for NI Water.

Climate change factors, such as extreme dry weather or heavy rainfall, can impact the quality and sufficiency of water supplies, especially private supplies in rural areas. Going forward we will commence a project to look at the resilience of such water supplies where they are the only supply of drinking water for rural dwellers in Northern Ireland.

**Section 1
Public Water Supplies**

**Part 1
Drinking Water Quality**

BALLYSTRONE
(CALVINS)
SERVICE RESERVOIR

Sample Point
Minimum Flush Time: 2 Minutes

PARID: S00965
S CODE: V1715



Image: Drinking Water Quality Sampling Point at a Service Reservoir

Public Water Supplies

2024 Key Facts

Drinking Water Sources

Rivers & Loughs - **55.4%** including
40.1% from Lough Neagh
Impounding Reservoirs
- **44.5%**

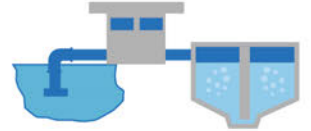
Boreholes - **0.1%**



There are **27,215 km** of drinking water distribution pipes.

Supply System

25 Water Treatment Works & **25** Supply Points



287 Service Reservoirs

62 Water Supply Zones



% Compliance



Consumer Tap
99.87%

Overall
99.88%

Overall Micro
99.89%

Total Trihalo-methanes
99.17%

Aluminium
99.95%

Iron
99.02%

Taste
99.46%

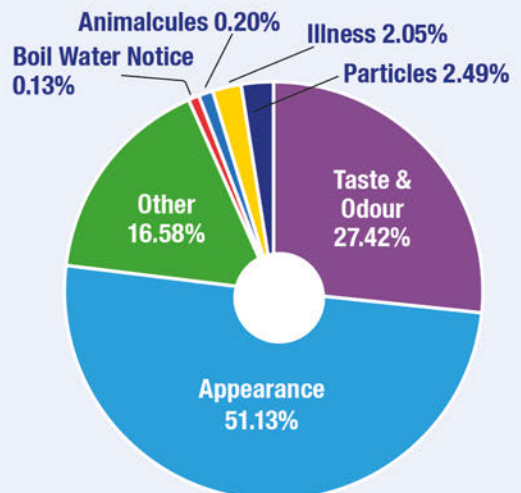
Odour
99.56%



8 Public Building Contraventions

Actions

Consumer Complaints



Down 7.24% from 2023



Discoloured water was the main issue of concern

Audits

4 technical audits of NI Water

Enforcements

3 Enforcement Notices under Regulation 31(4) ongoing
1 Warning letter issued

Events

48 Water Quality Events assessed & categorised

Product Approvals

100 Product Approvals issued under Regulation 33

Regulatory Contraventions

118 regulatory contraventions reviewed & assessed

Drinking Water Quality

NI Water is a government-owned company with sole responsibility for supplying and distributing public drinking water throughout Northern Ireland.

Drinking Water Quality Testing

During 2024, NI Water sampled drinking water across Northern Ireland to test for compliance with the standards in The Water Supply (Water Quality) Regulations (Northern Ireland) 2017. The regulations require sampling programmes to be in place to ensure that water quality is monitored at: water treatment works (WTWs); service reservoirs (SRs); supply points¹; and consumers' taps in water supply zones (WSZs). A summary of the number of sites that were in service in 2024 is shown in Table 1 - 1.

In 2024, 100,522 tests were carried out for a range of different parameters. A description of each parameter and its regulatory limit (or prescribed concentration or value [PCV]) is available on our [website](#).

Table 1 - 1 Number of Sites in Service in 2024

Sites	Number in Service
Water treatment works	25
Service reservoirs	287
Supply points ¹	25
Water supply zones	62

Sampling and Analysis Frequencies

NI Water is required to meet specified sampling frequencies in demonstrating the wholesomeness of drinking water supplies. We undertake an assessment of these requirements throughout the water supply chain: at WTWs; SRs; and WSZs.

Under the regulations, we can consent to NI Water deviating from the monitoring requirements. Any deviations must be based on historical monitoring data and a risk assessment of the treatment works and its related water supply system to confirm no likely deterioration in the water quality.

Based on evidence provided by NI Water, a Notice of Decision² not to monitor radioactivity in a number of water supply areas was issued by us to NI Water in December 2022. This Notice is for a period of five years, 2023 to 2027. The Notice may be withdrawn in the event of any change in risk.

During 2024, out of the 100,522 tests carried out, there was only a shortfall of 18 individual tests, similar to 2023 when there was a shortfall of 14 out of 100,231 tests.

¹ a point, other than a consumer's tap, authorised for the taking of samples for compliance with the Regulations

² [Notice of Decision Not to Monitor Radioactivity Parameters](#)

Overall Drinking Water Quality

Compliance with the quality standards is important as contraventions may indicate a failure in the treatment process or a breach in the integrity of the water supply system which, could pose a potential risk to human health. It also ensures that water meets aesthetic standards and is acceptable to consumers.

Of the 100,522 tests we used to assess overall compliance, 118 (0.12%) contravened the regulatory standards compared to 81 (0.08%) from 100,231 tests in 2023. Table 1 - 2 provides further information on these contraventions.

Table 1 - 2 Overall Drinking Water Quality in 2024

	Number of Tests	Number of Tests not Meeting the Standards	% Compliance
Water Leaving Water Treatment Works (WTWs)			
<i>E. coli</i>	6312	2	
Coliform bacteria	6312	14	
Microbiological Total	12624	16	99.87
Nitrite	244	0	
Turbidity	6312	9	
Chemical Total	6556	9	99.86
Total (Microbiological and Chemical)	19180	25	99.87
Water in Service Reservoirs (SRs)			
<i>E. coli</i>	14814	0	
Coliform bacteria	14814	26	
Total (Microbiological)	29628	26	99.91
Water at Consumers' Taps or Supply Points (WSZs)			
<i>E. coli</i>	5412	0	
Coliform bacteria	5412	17	
Enterococci	480	1	
<i>Clostridium perfringens</i>	244	0	
Microbiological Total	11548	18	99.84
Zone Chemical Analysis	30347	48	
Supply Point Chemical Analysis	9819	1	
Chemical Total	40166	49	99.88
Total (Microbiological and Chemical)	51714	67	99.87
Overall Water Quality			
Overall Microbiological Quality	53800	60	99.89
Overall Chemical Quality	46722	58	99.88
Overall Drinking Water Quality	100522	118	99.88

The results confirm that overall drinking water quality in 2024, for the key parameters monitored at water treatment works, service reservoirs and consumers’ taps remained high at 99.88%. This is a slight decrease in overall compliance compared to last year (99.92%). This slight decrease in overall compliance in 2024 can largely be attributed to an increase in bacteriological contraventions. Investigations determined this was due to environmental contamination of microbiological samples during analysis at NI Water’s Gelvin Grange laboratory. See ‘Drinking Water Quality Events’ (Annex 2) section for further details.

Figure 1 - 1 illustrates the percentage compliance over the last five years.

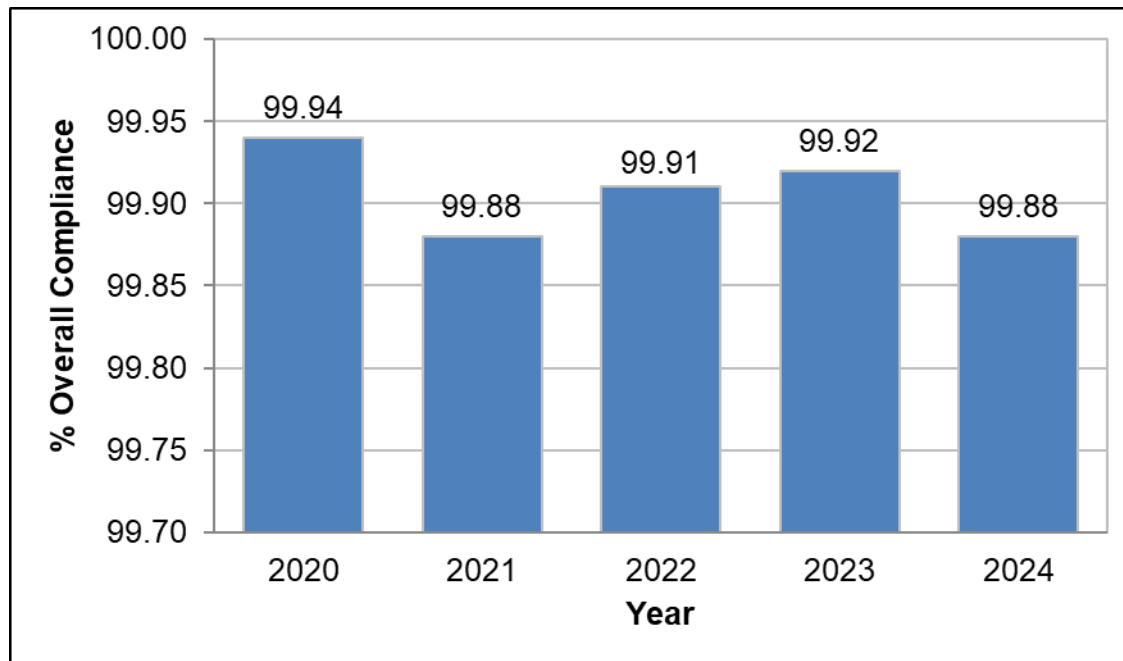


Figure 1 - 1 Overall Drinking Water Quality, 2020 - 2024

Water Quality at Consumers’ Taps

To assess the quality of water that is being supplied to consumers, we assess results of regulatory samples taken by NI Water from consumers’ taps (and, where appropriate, at authorised Supply Points). Table 1 - 3 shows the percentage compliance for 34 of the Schedule 1 (Directive and national) parameters and nine of the Schedule 2 (indicator) parameters. Drinking water quality compliance at consumers’ taps was 99.87% in 2024, slightly lower than the 99.88% compliance reported for 2023.

Ten parameters did not achieve full compliance at consumers’ taps in 2024: aluminium, bromate, coliform bacteria, enterococci, iron, manganese, odour, other pesticides (MCPA), taste, and total trihalomethanes (THMs).

Table 1 - 3 Consumer Tap Compliance 2024

Parameter	Number of Samples	Number of Tests not Meeting the Standards	% Compliance
Schedule 1 (Directive and National parameters)			
Iron	2040	20	99.02
Total Trihalomethanes	480	4	99.17
Taste	2039	11	99.46
Odour	2039	9	99.56
Bromate	479	1	99.79
Enterococci	480	1	99.79
Manganese	2040	2	99.90
Aluminium	2040	1	99.95
Other Pesticides	9272	1	99.99
1,2 dichloroethane	480	0	100
Antimony	480	0	100
Arsenic	480	0	100
Benzene	480	0	100
Benzo(a)pyrene	477	0	100
Boron	480	0	100
Cadmium	480	0	100
Chromium	480	0	100
Colour	2040	0	100
Copper	480	0	100
Cyanide	239	0	100
<i>E. coli</i>	5412	0	100
Fluoride	480	0	100
Lead	480	0	100
Mercury	480	0	100
Nickel	480	0	100
Nitrate	480	0	100
Nitrite	480	0	100
PAH - Sum of four substances	477	0	100
Pesticides - Total Substances	244	0	100
Selenium	480	0	100
Sodium	480	0	100
Tetrachloroethene & Trichloroethene Sum	480	0	100
Tetrachloromethane	480	0	100
Turbidity	2040	0	100
Total (Schedule 1)	40478	50	99.88
Schedule 2 (Indicator parameters)			
Coliform bacteria	5412	17	99.69
Ammonium	480	0	100
Chloride	480	0	100
<i>Clostridium perfringens</i>	244	0	100
Conductivity	2040	0	100
Hydrogen Ion (pH)	2036	0	100
Indicative Dose	32	0	100
Sulphate	480	0	100
Tritium	32	0	100
Total (Schedule 2)	11236	17	99.85
Overall Total	51714	67	99.87

Chemical/Physical Quality

Iron

Iron was the parameter with the lowest level of compliance in 2024. There was a decrease in iron compliance to 99.02% from the 99.71% achieved in 2023, the lowest level of iron compliance in five years. The regulatory standard for iron is set for aesthetic reasons as levels above this can give rise to discoloured water. Corrosion of iron water mains is the most common reason for contraventions.

The contraventions of the standard in 2024 were mostly due to the build-up, and subsequent disturbance, of deposits found within water mains. Where investigations determine this is the cause of iron contraventions, NI Water takes remedial action to prevent recurrences. Figure 2 - 7 in Part 2 provides iron compliance figures for the last five years.

Trihalomethanes (THMs)

In 2024, THMs compliance increased to 99.17% compared to the 97.84% compliance reported in 2023 and 99.83% compliance reported in 2022. Despite this improvement in compliance, DWI note there were 70 regulatory samples across 23 of the 62 water supply zones in 2024 that were in the 'likely to fail' category as the results exceeded 75% of the regulatory standard. Further discussion on THMs is contained in Part 2 of this section.

Aluminium

In 2024, the aluminium compliance was 99.95%, a higher level of compliance than for 2023 (99.61%). Further discussion on aluminium is contained in Part 2 of this section.

Odour & Taste

The regulatory requirement for odour and taste is "Acceptable to consumers and no abnormal change". DWI has issued guidance to NI Water on the interpretation of this regulatory requirement. When a sample has an unacceptable odour, taste analysis is not performed, and a taste contravention is recorded.

In 2024, odour compliance was 99.56% and taste compliance was 99.46%. This shows a downward trend from 2023 when compliance was 99.75% for both taste and odour, and from 2022 when odour compliance was 99.95% and taste compliance was 99.90%.

Of the nine odours detected in 2024, three were related to petrochemical contamination of the service pipes to properties. These samples were not tasted but recorded as taste contraventions. In total, seven of the 11 taste contraventions in 2024 were samples not tasted due to an unacceptable odour. Two "earthy/musty" odours and two "earthy/musty" tastes were related to an event caused by algal blooms in Lough Neagh. More information on algae can be found in Part 2 of this section.

Odour and taste compliance over the last five years is shown in Figure 1 - 2. There is further information on odour and taste in the "Consumer Contacts" section later in this part of the report.

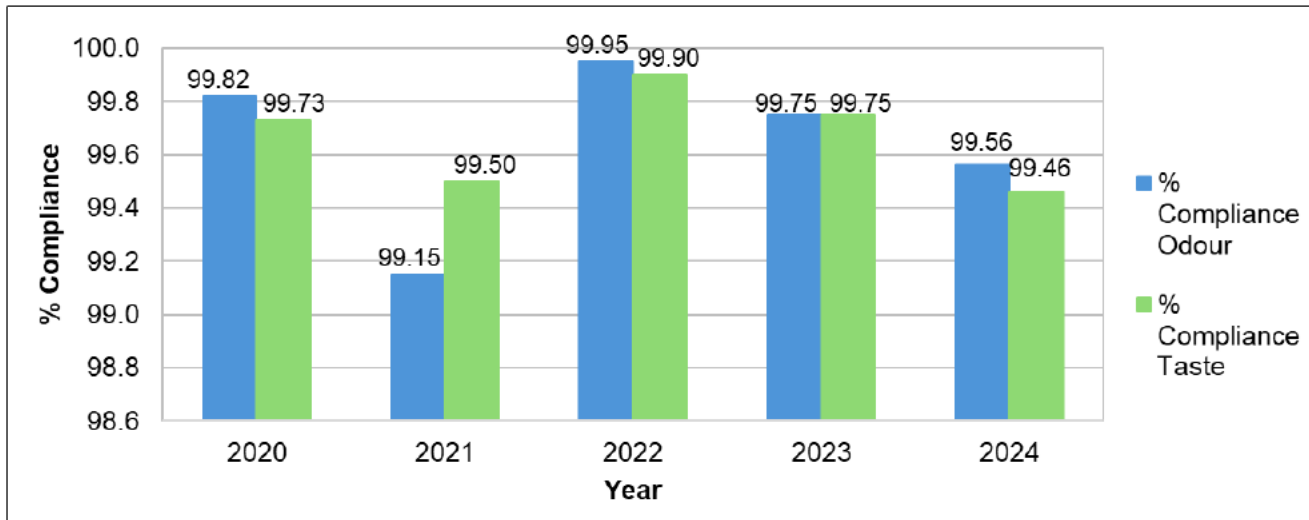


Figure 1 - 2 Percentage Compliance for Taste & Odour, 2020 - 2024

Lead

In 2024, lead compliance was 100%, an improvement from 99.78% in 2023. Fluctuations in lead compliance are related to lead having a lower sampling frequency compared to aluminium and iron. Compliance with the lead standard is still an issue in properties built before 1970, so it is important that NI Water continue to implement its lead strategy to effectively manage the risk to public health.

When a sample has contravened the lead standard and NI Water’s investigation finds the property’s service pipe contains lead; it notifies the owner of the property. It is the owner’s decision whether to replace their supply pipe and any other lead pipes within the property. Further information, including a consumer advice leaflet on “Lead in Drinking Water” (Figure 1 - 3), can be found on NI Water’s [website](#).



Figure 1 - 3 Lead Leaflet

The Regulations require NI Water to treat the water to reduce the risk of the concentration of lead being greater than 10 µg/l. NI Water has a Lead Strategy in place to deliver improved compliance for lead. Although lead compliance was 100% in 2024, and none of the 480 regulatory compliance samples contravened the regulatory standard, 34 additional lead samples at consumer taps did exceed the regulatory standard. This demonstrates further action is needed to reduce the risk to public health from lead in drinking water.

The overall trend in lead compliance is shown in Figure 1 - 4. There has been an upward trend in compliance over the last three reporting years. However, a significant amount of work is still required to ensure compliance is maintained.

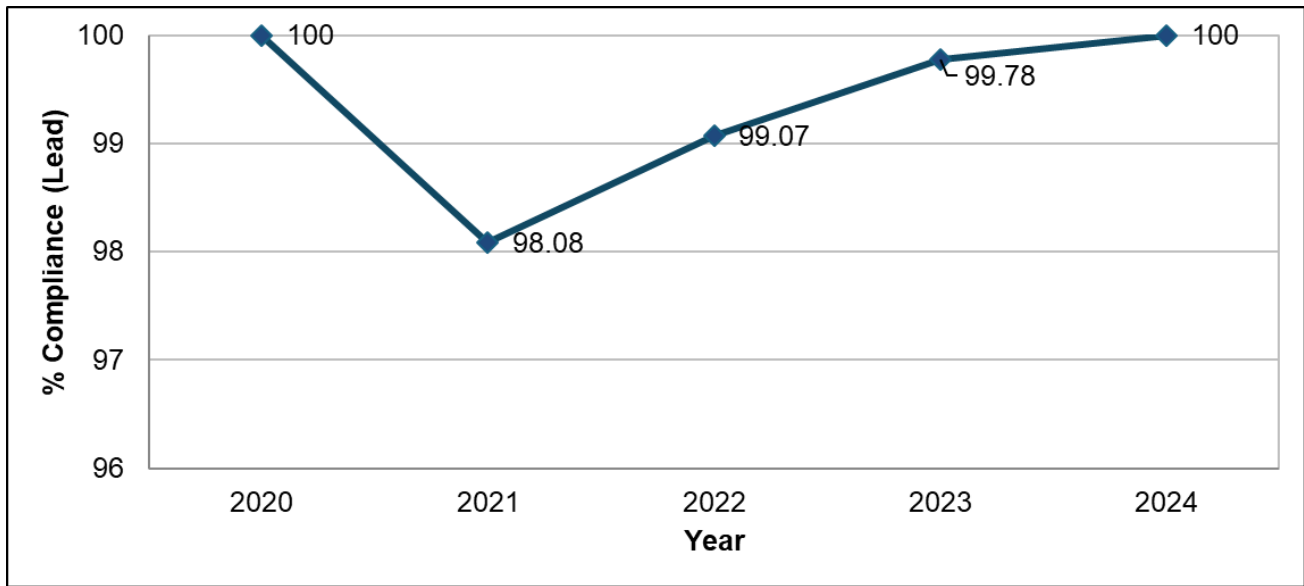


Figure 1 - 4 Percentage of Regulatory Tests Meeting the Lead Standard, 2020 – 2024

Nickel

In 2024, there was an increase in nickel compliance to 100% compared to the 99.78% achieved in 2023. Nickel may occur naturally in some ground waters but is rarely found in the mains water supply. Contraventions of the standard (20 µg/l) do occur occasionally, and the main source of nickel in drinking water is leaching from modern taps and other plumbing fittings.

Microbiological Quality

The compliance with microbiological parameters at consumers’ taps in 2024 was 99.84%, a slight improvement from the 99.81% compliance in 2023, (Table 1 - 2 refers). Coliform bacteria were detected in 17 samples taken at consumers’ taps in 2024 compared to 22 samples in 2023.

Clostridium perfringens were not found in any of the 244 samples taken in 2024 (100% compliance). This is the same as last year.

Enterococci were detected in one of the 480 samples taken at consumers’ taps in 2024 (99.79% compliance). This was similar to 2023 when enterococci were detected in one of the 464 samples taken at consumers’ taps (99.78% compliance).

Domestic Dwellings Distribution Systems

NI Water’s investigation into contraventions must determine if they are due to the internal distribution systems within domestic dwellings. Where this is identified it must inform the owner with details of the failure and provide appropriate advice in relation to actions the owner may take to rectify the contravention and protect public health. The investigations, where appropriate, should also ensure consumers’ internal plumbing is compliant with The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

In 2024, ten contraventions were reported to us, which NI Water determined were due to internal plumbing within seven domestic properties. These contraventions related to the following parameters: coliform bacteria (four); odour (three); and taste (three). NI Water investigated each contravention and issued letters to the affected consumers, advising them of the findings and providing appropriate guidance to protect public health.

Public Buildings Distribution Systems

At premises where water is made available to members of the public (such as schools, hospitals, or restaurants), 657 samples were taken during 2024. Of these, eight samples contravened the drinking water quality standard for one or more of the following parameters: aluminium; bromate; coliform bacteria; enterococci; iron; odour; and taste.

NI Water must take appropriate action to rectify any failure attributable to the water it supplies or where there is a contravention of the Water Fittings Regulations. Other failures within such premises are notified to us for follow-up with the owners under The Water Supply (Domestic Distribution Systems) Regulations (Northern Ireland) 2010.

In 2024, we received one such notification from NI Water for a public premises where the contraventions related to a “petrochemical” odour within the internal domestic distribution system collected from a sample in 2023.

In line with our enforcement policy, an advisory letter was initially issued, and remedial work is ongoing at the premises. If we assess the failure as likely to recur, or if it constitutes a potential risk to human health, a notice may be served on the owner to undertake the necessary actions to protect public health and bring the supply back into compliance.

Consumer Contacts

NI Water provides us with consumer contact information to help us assess consumers' acceptance of their drinking water quality (Table 1 - 4 refers). The total number of consumer contacts reported in 2024 was 5,470 compared to 5,897 in 2023, a decrease of 427 (7.24%). We will continue to monitor the trends in consumer concerns.

Table 1 - 4 Water Quality Contacts received by NI Water in 2024

Contact Category	Contact Sub-Category	Number of Contacts
Appearance	Colour	1958
	General	112
	Hardness	6
	Stained Washing	6
	White - Air	483
	White - chalk	232
Taste and Odour	Chlorinous	277
	Earthy/Musty	701
	Other	460
	Petrol/Diesel	34
	TCP	28
Illness		112
Particles		136
Animalcules		11
Boil Water Notice		7
Other	Water Quality Concern - Campaigns	0
	Water Quality Concern - Incident Related	149
	Water Quality Concern - Lifestyle	3
	Water Quality Concern - Pets/Animals	1
	Water Quality Concern - Sample	386
	Water Quality Concern - Lead	360
	Water Quality (No Concern) Fluoride	1
	Water Quality (No Concern) Other Information	6
	Water Quality (No Concern) Water Hardness	0
	Water Quality (No Concern) Water Quality Report	1
TOTAL		5470

The highest percentage of contacts and concerns continued to relate to the appearance of drinking water, with 51.13% in 2024 (51.91% in 2023). This is illustrated in Figure 1 - 5.

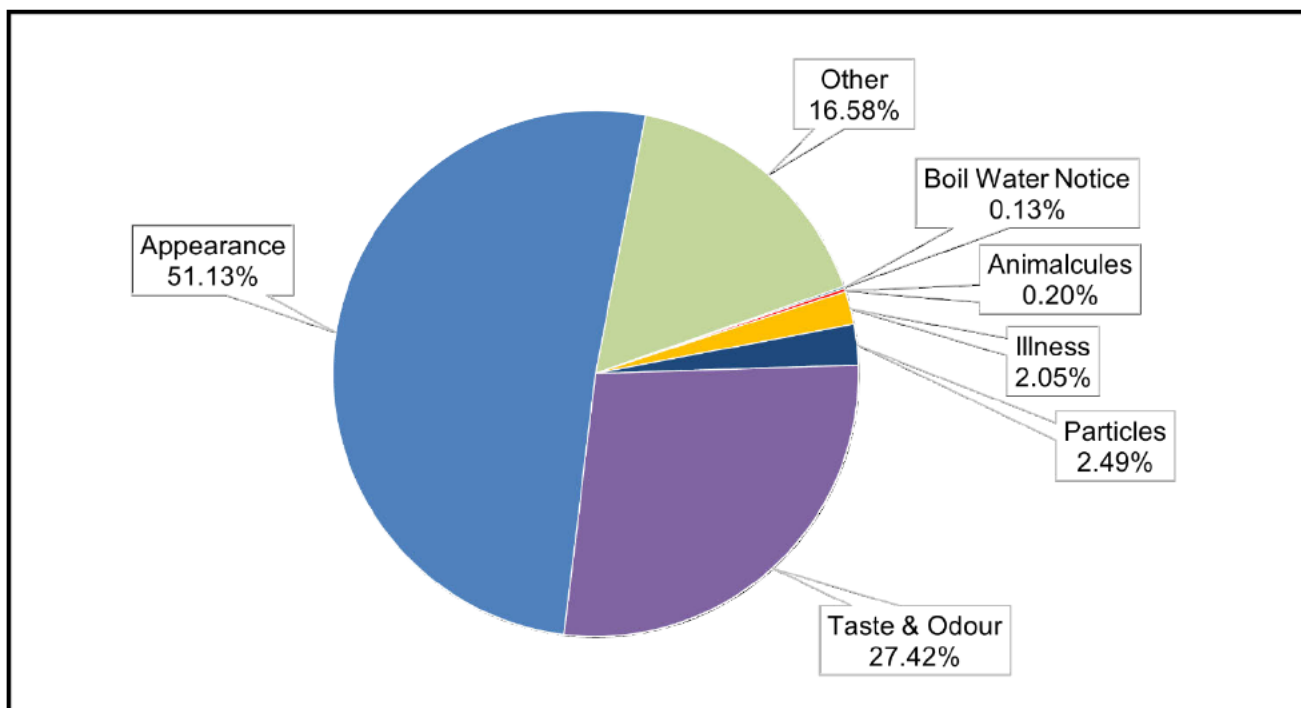


Figure 1 - 5 Water Quality Concerns received by NI Water in 2024

Appearance

Within the overall appearance categories there are several different sub-categories that are a cause of concern for consumers.

Colour

In 2024, as in every year, the majority of appearance concerns (70%) related to discoloured water. The most common cause of discoloured water concerns is an orange, brown or black discoloration caused by suspended particles of iron (orange/brown) and manganese (black).

Iron discoloration may occur through natural iron present in the raw water passing through inadequate treatment, from the treatment process, or from corrosion of cast-iron distribution mains. Manganese is naturally present in some raw waters and may not be fully removed if treatment is inadequate. See ‘Section 1 - Part 2 The Drinking Water Cycle’ section for further information on iron and manganese contraventions.

White Water

White water is mainly caused by air dissolved in the water, making it appear cloudy or milky white. It can be caused by internal plumbing, burst water mains or when NI Water has been carrying out maintenance work on pipes. Where air is the cause, the cloudy appearance will clear in a glass of water from the bottom up.

Another cause of white water may be chalk. Chalk has a white powdery appearance and is made up of natural minerals found in water which form what is known as “hardness”. A glass of water containing chalk will take up to an hour to clear from the top downwards, leaving fine white sediment in the bottom of the glass.

White water accounted for 25.56% of appearance concerns in 2024.

Taste and Odour

All water sources contain naturally occurring minerals. Water also contains dissolved gases, such as oxygen and carbon dioxide, which give tap water its characteristic taste. One substance added to drinking water for disinfection is chlorine, which can give rise to consumer complaints (as discussed in the next section, Chlorinous).

Other tastes and odours should not be present in drinking water for aesthetic reasons, for example, “TCP” or “earthy/musty” or for health reasons, for example “petrol/diesel”.

Taste and odour complaints accounted for 27.4% of the total consumer contacts in 2024 compared to 17.6% in 2023. An upward trend in “earthy/musty” consumer contacts since 2022 is illustrated in Figure 1 - 6. This increase was in part due to the elevated number of “earthy/musty” complaints associated with the occurrence of algal blooms in drinking water sources in 2023 and 2024. Further discussion on algae is contained in Part 2 of this section.

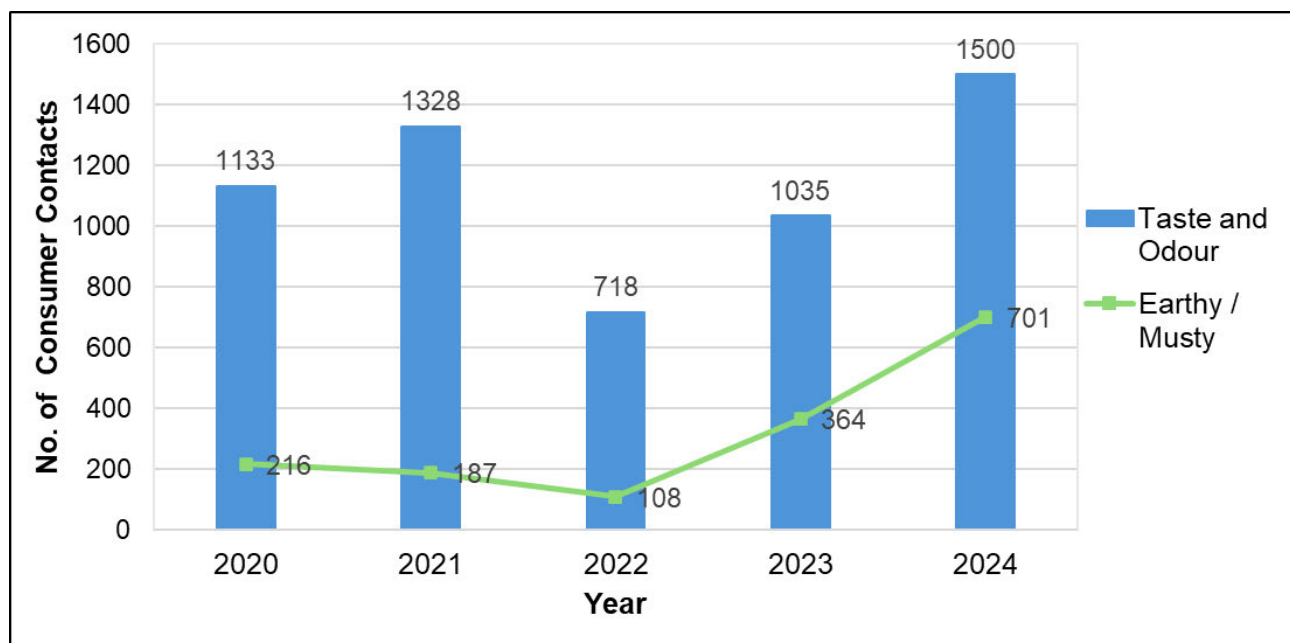


Figure 1 - 6 Taste and Odour Consumer Contacts with Earthy/Musty Descriptor, 2020 - 2024

Chlorinous

Some individuals are more sensitive than others to the taste and odour of chlorine which is used to maintain hygienic conditions within the water supply network. In 2024, 18.5% of taste and odour consumer contacts were related to a “chlorinous” taste and odour in the water (23.4% in 2023). Although this is a decrease, NI Water should continue to investigate the reasons for taste and odour complaints related to a “chlorinous” taste and odour.

Consumer Advice

A useful consumer guide, (Figure 1 - 7) '[Looking after water in your home](#)', was produced by the water industry to help you maintain and enjoy the quality of tap water once it enters your home.

It contains a number of household tips, from how to reduce unwanted taste and odours and address appearance issues, to advice on water filters and storage tanks.



Figure 1 - 7 Looking After Water in Your Home Leaflet

Section 1
Public Water Supplies

Part 2
The Drinking Water Cycle



The Drinking Water Cycle

- **Catchment:** There was an increased number of MCPA detections in 2024
- **Treatment Process Control Parameters:** In 2024, iron and THMs were the parameters with the lowest levels of compliance
- **Treatment Disinfection Parameters:** There was a decrease in coliform bacteria compliance in 2024
- **Events:** There were two Serious and 19 Significant Events reported in 2024

This part of the report details our assessment of how NI Water manages the drinking water cycle, from the **catchment** to the **treatment** processes at Water Treatment Works (WTWs), through Service Reservoirs (SRs) and into the **distribution network** to supply **consumers**. It also summarises the risk management approach adopted by NI Water in ensuring that water supplies remain safe and wholesome throughout their journey to homes and businesses.

Catchments

NI Water mainly abstracts its raw water from 39 sources including rivers and loughs (55.4%), impounding reservoirs (44.5%), and boreholes which supply a small population on Rathlin Island and in Mid Ulster (0.1%).

A risk assessment of the catchment must be completed as part of the overall 'source to tap' approach. NI Water liaises with the Northern Ireland Environment Agency (NIEA) and a range of other stakeholders through Water Catchment Partnerships to identify and put mitigations in place to manage risks within the catchment. The Catchment Management Plans developed by NI Water throughout the Price Control (PC) process for 2015-2021 (PC15) continue to be implemented in this current investment period 2021-2027 (PC21) and planning is underway for the next investment period commencing in 2028 (PC28). Where catchment solutions alone are unable to reduce the risks sufficiently, NI Water must ensure that it has appropriate treatment processes in place.

As the potential list of contaminants within catchments is diverse, NI Water must risk assess each catchment individually to determine the specific risks and identify appropriate mitigations to reduce or adequately control the risks. Where a risk is identified, NI Water must consider if water quality monitoring is required within the catchment and at its abstraction points.

This monitoring plays an important role in providing information on the risks within the catchment and for the operational management of WTWs to ensure treatment processes provide an effective barrier against the identified levels of contaminants.

Algae

The increased occurrence of algae, including blue-green algae (cyanobacteria), in raw water sources poses a potential risk to drinking water quality. This catchment risk is identified in NI Water's risk assessment of WTWs which abstract from Lough Neagh and other drinking

water sources affected by algal blooms. Therefore, to mitigate this risk, the treatment processes at these WTWs are designed and operated for the removal of algae and its toxins.

In advance of the algal blooms experienced in drinking water sources in 2024, shown in Figure 2 - 1, NI Water implemented a programme of enhanced operational monitoring of WTWs at risk from these blooms. This included testing for the algal toxin, Microcystin-LR (MC-LR). The results of this monitoring, together with operational updates and consumer contact data, were reported to DWI on a regular basis throughout the 2024 algal season. Although high levels of algae were recorded for the raw water intakes at several WTWs in 2024, including those which abstract from Lough Neagh, the levels of MC-LR in the final treated water were all reported as below the World Health Organisation guideline value for MC-LR in drinking water (1.0 µg/l). Therefore, no restriction on the use of the drinking water produced by these WTWs was advised by the Public Health Agency (PHA) as a consequence of the algal blooms.

The main impact of algae in source waters is taste and odour complaints from consumers, often described as “earthy” or “musty”. These are caused by chemicals released by the algae, such as 2-Methylisoborneol (MIB) and Geosmin, which have very low taste and odour thresholds, but no health impact upon consumers. Consequently, the presence of algae in raw water sources can sometimes affect the acceptability of drinking water to consumers. In 2024, four regulatory, and a further 69 operational, taste and odour contraventions were reported with “earthy/musty” descriptors. These were related to taste and odour drinking water quality events in 2024, see the ‘Drinking Water Quality Events’ section later in this part of the report and Annex 2.



Figure 2 - 1 Algal Bloom in Drinking Water Source

Although there are treatment processes in place for the removal of algae at WTWs affected by such blooms, DWI will continue to monitor the levels of geosmin, MIB, MC-LR and taste and odour contraventions in the final water from these works. Further information on blue-green algae is available on the DAERA [webpage](#).

Pesticides

During 2024, 38 individual pesticides were monitored by NI Water under its sampling programmes. There are two separate sampling programmes in place. The compliance programme is based on the set regulatory frequencies required to be monitored by NI Water for assessing compliance. There is also the operational programme which monitors works that have a history of contraventions.

Within the compliance programme there were 244 samples taken for pesticides giving a total of 9,272 individual determinations. There was one regulatory contravention reported for the individual pesticide MCPA (2-methyl-4-chlorophenoxyacetic acid) at Carmoney WTW in 2024.

Where contraventions arise, DWI may require NI Water to implement enhanced operational sampling to monitor an ongoing risk. During 2024, within the operational programme, NI Water reported six contraventions of the individual pesticide standard for MCPA, a widely used herbicide. Four of the operational contraventions were at Carmoney WTW and two were at Derg WTW. The raw water source for Carmoney WTW is the River Faughan. There is a known risk for pesticide use in the River Faughan catchment due to land use and high levels of MCPA

have been detected at the works intake. Although there is specific pesticide reduction treatment in place at Carmoney WTW, DWI will continue to monitor the MCPA levels in the final water from this works. DWI issued a Warning Letter to NI Water, in 2025, as a result of these MCPA contraventions at Carmoney WTW and may take further enforcement action, if required, to improve future compliance. There has been a significant level of investment at Derg WTW to improve MCPA compliance with new primary treatment and specific pesticide reduction treatment installed following an enforcement issued by DWI. Optimisation of the new treatment process is ongoing, and it is hoped this will improve future compliance at this works.

A table listing WTWs with all contraventions for pesticides from 2020 to 2024 is provided in Table 2 - 1.

Table 2 - 1 Pesticides Detected Above the Regulatory Limit, 2020 – 2024

Water Treatment Works		2024	2023	2022	2021		2020
		MCPA	MCPA	MCPA	MCPA	MCPA	MCPA
W4722	Belleek			1			
W2509	Clay Lake				3		2
W4301	Carmoney	5	1		1		2
W2802	Carran Hill		1				
W4501	Derg	2	1	4	6	1	12
W4541	Glenhordial			1	1		1
W4701	Killyhevin						1
All WTWs		7	3	6	11	1	18

Water Treatment

Water treatment processes normally include the physical removal of potential contaminants by using chemical coagulation/flocculation, clarification or DAF (Dissolved Air Flotation), and filtration. DAF cells require regular de-sludging (Figure 2 - 2) and filters require periodic backwashing to operate effectively (Figure 2 - 3). Additional treatments such as ozone dosing and GAC (Granular Activated Carbon) filtration or PAC (Powdered Activated Carbon) dosing can also be required to remove unpleasant tastes and odours, and for pesticide reduction. The final stage of treatment is disinfection.

An important measure of the effectiveness of treatment is the assessment of the water quality throughout the treatment process and the quality of the final water leaving the works.



Figure 2 - 1 DAF Cell Sludge Blanket



Figure 2 - 2 Backwashing a Filter

In Table 2 - 2, results are outlined for two sets of parameters that are used to assess the effectiveness of water treatment processes: process control parameters; and disinfection parameters.

Table 2 - 2 Water Quality at Water Treatment Works, 2024

Parameters	Place of Sampling	Number of Tests in 2024	Number of Tests not Meeting the Standards in 2024	% of Tests Meeting the Standards	
				2024	2023
Process Control Parameters					
Aluminium	WSZ	2040	1	99.95	99.61
Trihalomethanes	WSZ	480	4	99.17	97.84
Disinfection Parameters					
Coliform bacteria	WTW	6312	14	99.78	99.95
<i>E. coli</i>	WTW	6312	2	99.97	99.98
Turbidity	WTW	6312	9	99.86	99.94
Indicator Parameter					
<i>Clostridium perfringens</i>	WTW	244	0	100	100

WSZ = Water Supply Zone (consumer tap sample)

Process Control Parameters

Process control parameters are used to measure the effectiveness of treatment and are based on a selection of chemical parameters relevant to the processes in place at the WTWs.

In 2024, results from the compliance monitoring programme, shown in Table 2 - 2, reported non-compliances for both of the process control parameters; aluminium and trihalomethanes (THMs).

Aluminium

Aluminium compliance, which is measured at consumers' taps, was higher in 2024 with one regulatory contravention (0.05%) reported compared to eight (0.39%) reported in 2023. Figure 2 - 4 displays the levels of aluminium compliance over the last five years with 2024 illustrating the highest compliance within this timeframe.

Operational sample results and outputs from on-line monitors and alarms often highlight elevated aluminium levels at a WTW before the treated water enters the distribution system. In many cases the remedial measures taken by NI Water in response to these early detections prevent, or limit the impact of, water quality events.

In 2024, there were ten Significant events at three WTWs relating to elevated levels of aluminium – see Annex 2 for details – indicating improvement in this area is still required. The majority of these events occurred at Drumaroad WTW, where work is ongoing to improve aluminium compliance (see Enforcement Action in Annex 4) and Killylane WTW which is currently undergoing treatment performance studies to improve compliance. Although these events do not always directly correlate with regulatory contraventions at consumers' taps at the time of the event, they can lead to the accumulation of aluminium in the distribution system and can contribute to contraventions at a later date.

Overall, it is encouraging to see an increase in regulatory compliance for aluminium in 2024. However, NI Water must continue to review the operational practices at its water treatment works and take appropriate action to sustain or improve this level of compliance moving forward. Improvements to the treatment processes at WTWs which have been identified for funding in the PC21 Price Control process should support improved aluminium compliance over the next three years.

Trihalomethanes (THMs)

THMs are a group of disinfection by-products that form when naturally occurring organic substances combine with chlorine, which is added to disinfect the water and make it safe to drink. There are a number of reasons for THM non-compliance including: the quality of the raw water; the performance of the WTWs; the condition of the networks; and the length of time water spends in the distribution system (residence time). Effective and well managed treatment processes reduce the levels of these organics, which are directly related to the level of THMs occurring in final waters.

In 2024, THMs had the second lowest compliance figure of all regulatory parameters with 99.17%, due to four non-compliant samples. However, this is a significant improvement compared to 97.84% recorded for ten non-compliant samples in 2023. THM levels are known to increase in the distribution system, and contraventions often occur at or near the end of distribution systems. Still Figure 2 - 4 displays a marked improvement for 2024 following a downward trend of THM compliance over the previous three years.

Despite this improvement in THM compliance, there remained elevated THM levels just below the regulatory limit for a number of water supply areas in 2024. Therefore, in order to maintain and improve THM compliance, NI Water must ensure that treatment processes at WTWs are optimised for organics removal at all times. It should also carefully manage the storage levels in service reservoirs and ensure the distribution network is adequately maintained to control the formation of THMs. Ongoing investment in the delivery of NI Water’s THM reduction programmes should reduce the risk of THM contraventions at the consumer tap in the future.

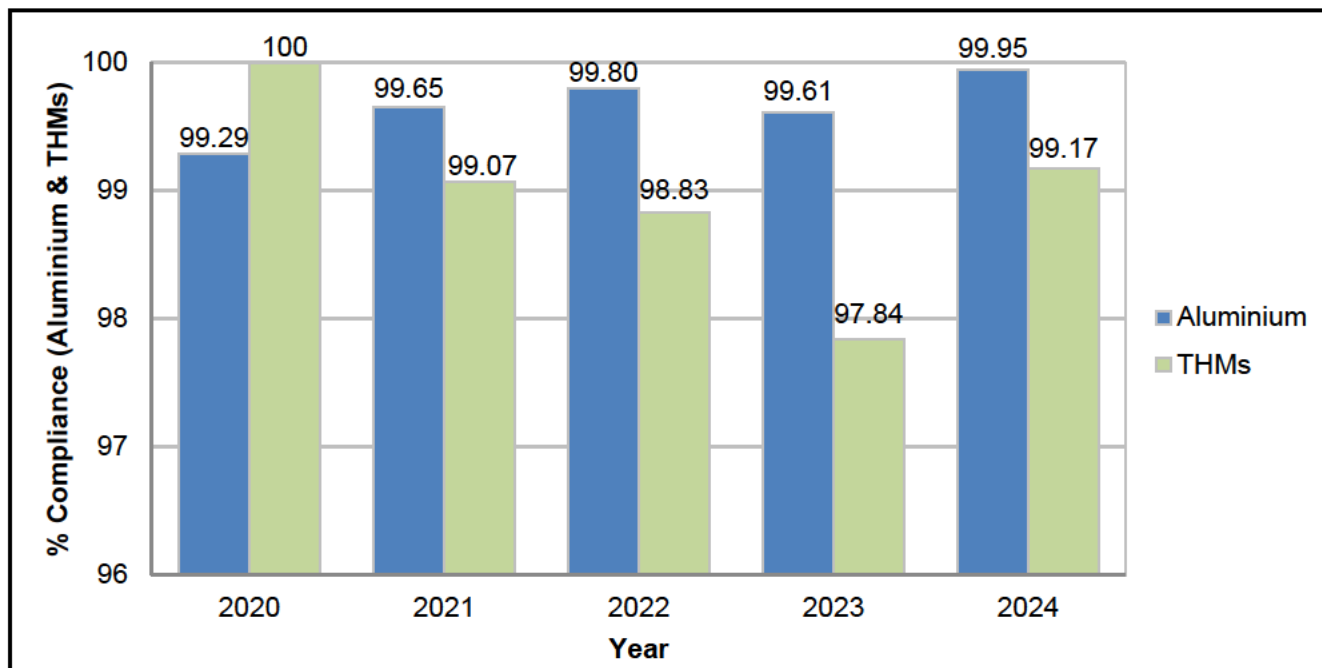


Figure 2 - 3 Percentage Compliance for Aluminium & THMs at Consumers’ Taps, 2020 – 2024

Disinfection Parameters

The parameters, coliform bacteria, *E. coli* and turbidity (Table 2 - 2 refers) demonstrate the effectiveness of disinfection and pathogen removal. Effective disinfection is fundamental to the treatment process in order to safeguard consumers from the risk of microbiological organisms being present in their drinking water. Testing for *E. coli* and coliform bacteria at WTWs provides assurance of adequate treatment and the provision of safe, clean drinking water. In 2024, NI Water reported 99.97% compliance for *E. coli* and 99.78% compliance for coliform bacteria at its WTWs, compared to 99.98% and 99.95% respectively for 2023. This marks a decrease in coliform bacteria compliance, with 14 contraventions (at seven WTWs) in 2024 compared to three contraventions (at three WTWs) in 2023. There was also a slight decrease in *E. coli* compliance at WTWs with two contraventions in 2024 (99.97%) compared to the one contravention in 2023 (99.98%). Investigations determined that the increase in bacteriological contraventions was largely due to environmental contamination of microbiological samples during analysis at NI Water’s Gelvin Grange laboratory. See ‘Drinking Water Quality Events’ (Annex 2) section for further details.

Turbidity is caused by finely suspended particles in the water which must be reduced to below 1 NTU to ensure adequate disinfection. There was a decrease in compliance with the turbidity standard in 2024 (99.86% compared to 99.94% in 2023). Nine turbidity contraventions occurred at seven WTWs in 2024. Of these, two contraventions at Caugh Hill WTW were assessed as being a Significant event related to treatment issues whilst the other seven contraventions were

assessed as being Not Significant and mostly due to unrepresentative sample collection. DWI emphasises the importance of representative sample collection and analysis to ensure the quality of the water in supply is being monitored effectively.

Indicator Parameter

Clostridium perfringens

Clostridium perfringens can be used in association with other parameters to assess the effectiveness of the water treatment processes. This organism is a spore-forming bacterium that is exceptionally resistant to unfavourable conditions in the water environment such as extremes of temperature and pH; and disinfection by chlorination.

In 2024, as for 2023, full compliance was achieved for *Clostridium perfringens*.

Distribution

The water distribution network in Northern Ireland is extensive, consisting of 287 service reservoirs (SRs) and 27,215 km of mains pipe. Water mains transfer drinking water from the WTWs to service reservoirs and onwards to the consumer. The volume of water in service reservoirs is carefully managed throughout each day to ensure an adequate supply is always available at consumers’ taps.

In Table 2 - 3, two measures are used to assess the water quality within a distribution system: reservoir integrity and distribution networks.

Table 2 - 3 Water Quality Indicators within the Distribution System, 2024

Parameters	Place of Sampling	Number of Tests in 2024	Number of Tests not Meeting the Standards in 2024	% of Tests Meeting the Standards	
				2024	2023
Reservoir Integrity					
Coliform bacteria	SR	14814	26	99.82	99.93
<i>E. coli</i>	SR	14814	0	100	100
Distribution Networks					
Turbidity	WSZ	2040	0	100	99.95
Iron	WSZ	2040	20	99.02	99.71
Manganese	WSZ	2040	2	99.90	99.90

Service Reservoirs

Samples are collected weekly at every service reservoir in Northern Ireland. One such service reservoir is shown in Figure 2 - 5. It is a regulatory requirement that at least 95% of samples collected annually from each reservoir are free from coliform bacteria. The 287 reservoirs sampled in 2024 all met this requirement.



Figure 2 - 4 Service Reservoir

Figure 2 - 6 shows coliform bacteria compliance was 99.82% in 2024, a decrease compared to 99.93% recorded in 2023. Coliform bacteria were detected on 26 occasions at 26 different service reservoirs, compared to 11 occasions at ten different service reservoirs in 2023.

Again, this decrease in compliance can largely be attributed to environmental contamination of microbiological samples during analysis at NI Water’s Gelvin Grange laboratory. See ‘Drinking Water Quality Events’ (Annex 2) section for further details. *E. coli* was not detected at any service reservoir in 2024 as in 2023.

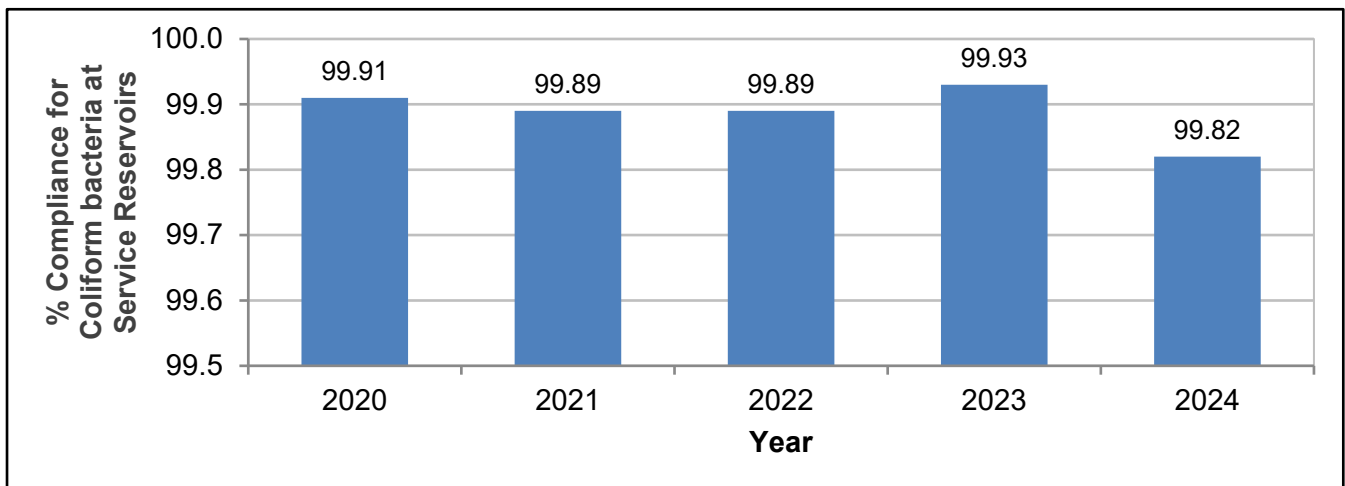


Figure 2 - 6 Percentage Compliance for Coliform bacteria at Service Reservoirs, 2020 - 2024

Water Mains

In 2024, a total of 2,040 samples taken from consumers’ taps were tested for iron, manganese and turbidity. Of these, 20 (0.98%) contravened the regulatory standard for iron of 200 µg/l. This demonstrates a decrease in compliance over 2023 when there were six (0.29%) contraventions reported and the lowest level of iron compliance in the last five years, as illustrated in Figure 2 - 7. There were two (0.10%) contraventions of the regulatory standards for manganese (50 µg/l) as in 2023, and no contraventions of the turbidity standard (4 NTU) in 2024, following 99.95% compliance in 2023.

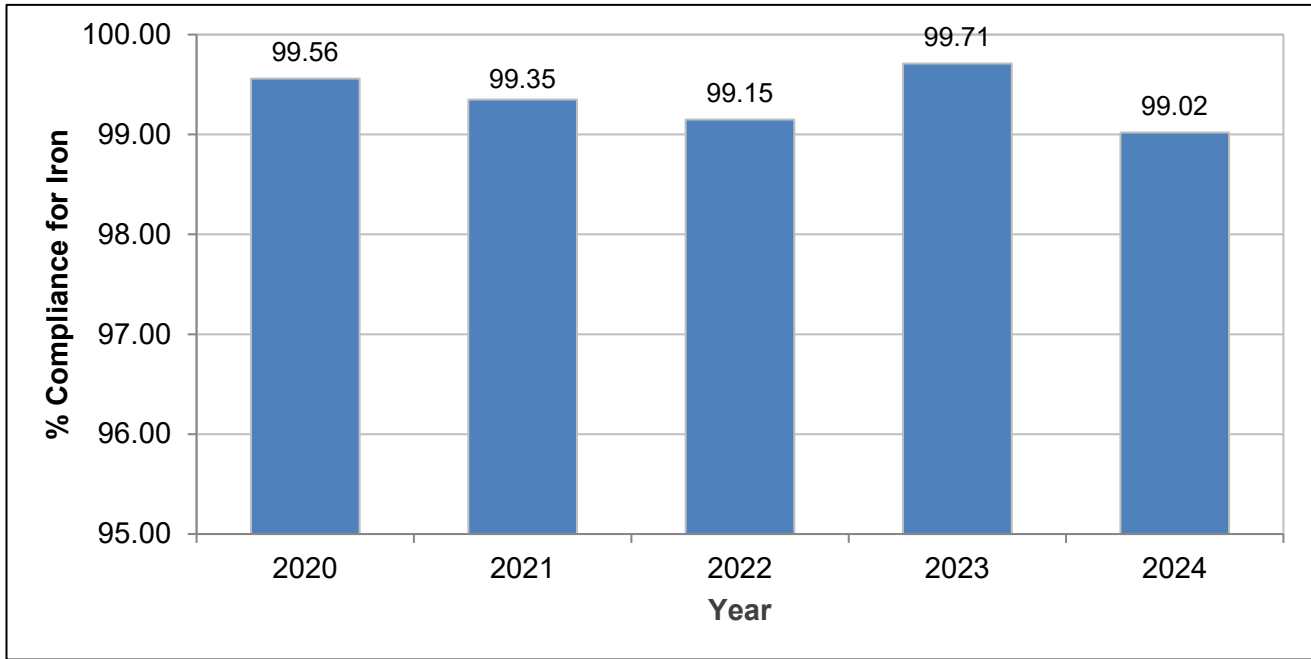


Figure 2 - 6 Percentage Compliance of Iron in Distribution, 2020 – 2024

Many of the mains delivering water to consumers’ taps are made of cast iron and the deterioration of older mains may result in consumers receiving discoloured drinking water due to the presence of iron and manganese. NI Water has an ongoing Water Mains Rehabilitation Programme (WMRP) and this enables corrective action to be taken on a priority basis to improve the water quality being supplied to consumers. In 2024, NI Water reduced the outputs of their WMRP due to financial constraints, however, mains with associated water quality issues continued to be prioritised. New mains are also installed or upgraded as required for new developments. A typical new mains installation is shown in Figure 2 - 8.



Figure 2 - 7 New Mains Installation

Events and Risk Management

Drinking Water Quality Events

NI Water inform us of events that have affected, or are likely to affect, drinking water quality or sufficiency, and subsequently where there may be a risk to consumers’ health. Each event is assessed into one of five categories based on increasing severity: Not Significant, Minor, Significant, Serious or Major. It is important that lessons are learnt from events and any

necessary remedial action is undertaken. For events categorised as Significant or above the risk assessments in place for each water supply system are required to be reviewed.

48 events were reported to us in 2024. Of these, we categorised two as Serious; 19 as Significant; three as Minor; and 24 as Not Significant.

The two Serious events involved high levels of consumer contacts regarding the taste and odour of the mains water supply, described as “earthy/musty”, and contraventions of the taste and odour parameters in the water supplied from Castor Bay and Moyola WTWs. These WTWs are supplied by Lough Neagh and the events occurred during an algal bloom in Lough Neagh. As a follow-up to these events, DWI issued questionnaires to consumers in the affected areas to evaluate their experience during the events and considered appropriate enforcement action. DWI issued Warning Letters to NI Water, in 2025, for Castor Bay and Moyola WTWs in relation to these events, and may take further enforcement action, if required.

There were 17 Significant events at nine WTWs (Altnahinch; Ballinrees; Carmoney; Caugh Hill; Derg; Drumaroad; Killylane; Killyhevlin and Lough Bradan) in 2024. The majority of these events were due to treatment difficulties or lack of adequate treatment. Ten related to elevated aluminium in the final water at Killylane WTW, Drumaroad WTW and Caugh Hill WTW due to various treatment difficulties including chemical dosing failures and technical faults. Two events related to the individual pesticide (MCPA) at Derg WTW and Carmoney WTW. The remainder related to taste; odour; cryptosporidium; coliform bacteria & *E. coli*; and THM contraventions.

One Significant event occurred in the distribution network and was related to a bromate contravention. The final Significant event related to the environmental contamination of microbiological samples at Gelvin Grange Laboratory which occurred between April and October 2024 and is associated with eight Not Significant events due to unrepresentative analysis.

Annex 2 provides further information on the two Serious and 19 Significant events in 2024.

Risk Management

As part of the drinking water safety plan (DWSP) approach, NI Water is required to carry out a risk assessment of each water supply system. The risk assessment is “Source to Tap”, and assesses the risk from the catchment, at the abstraction point, the treatment process, the storage system and finishes at the consumer tap. The assessments must be kept under review, to ensure ongoing risks are adequately controlled and any new or emerging risks are properly identified. We monitor these plans to ensure, where risks are identified, there are control measures in place to ensure the protection of public health. There are 24 risk assessments in place covering all of NI Water’s drinking water supplies.

Regulatory Control

The Technical Audit Process

DWI normally conducts a risk based technical audit programme to check NI Water’s compliance with statutory obligations and best practice. The recommendations from technical audits form part of the risk management approach in protecting drinking water supplies. Four technical

audits were completed in 2024. A summary of the 2024 Technical Audit Programme is detailed in Annex 3.

Enforcement Action

The PC21 (2021 - 2027) capital investment programme, which commenced in April 2021, was ongoing throughout 2024. DWI continued to monitor the delivery of the agreed outputs which have drinking water quality drivers and, alongside other stakeholders, provided feedback on the Mid-Term Review of PC21 which concluded in 2024.

Although it is better to be able to plan investment through the PC process, there are occasions when it is necessary for DWI to take enforcement action against NI Water to secure compliance and protect public health.

During 2024, three Regulation 31(4) Notices issued under The Water Supply (Water Quality) Regulations (Northern Ireland) 2017 (the Regulations) were ongoing. The details of these enforcements are contained in Annex 4.

NI Water continued to work on treatment improvements at Ballinrees WTW (circa £17.5m) to comply with the two Notices which we issued in 2020 in relation to the individual pesticide MCPA contraventions, and taste and odour contraventions. The compliance date for these Notices was December 2024. Figure 2 - 9 shows the construction work at Ballinrees WTW.

The third Notice was issued in July 2021, due to non-compliances with the aluminium standard at Drumaroad WTW. This Notice, which was amended in 2025, requires NI Water to have treatment in place by September 2025 to meet the regulatory standard for aluminium. During 2024, NI Water continued to implement the recommendations identified by pilot studies at Drumaroad WTW to improve the treatment process and work towards this compliance deadline.



Figure 2 - 8 Ballinrees WTW GAC Filter Construction

DWI monitors the progress of these projects through site visits and regular updates from NI Water.

Future Investment in Drinking Water Quality

DWI will continue to work with stakeholders as they consider investment in drinking water quality through the remainder of the PC21 process, which has been extended

to include 2027, and in the preparatory work for the next price control process, PC28, which commenced in 2024.

In identifying the capital investment needs, NI Water will continue to assess the most effective treatment solutions through the use of pilot plants. Pilot plants can mimic the existing treatment process and identify potential improvements. This approach increases the probability that a selected process will be effective on the actual water treatment works itself. It also helps to identify more carbon neutral solutions for water treatment, thereby contributing to the company's net zero targets. We fully support this approach and will continue to work closely with NI Water to contribute to climate change targets.

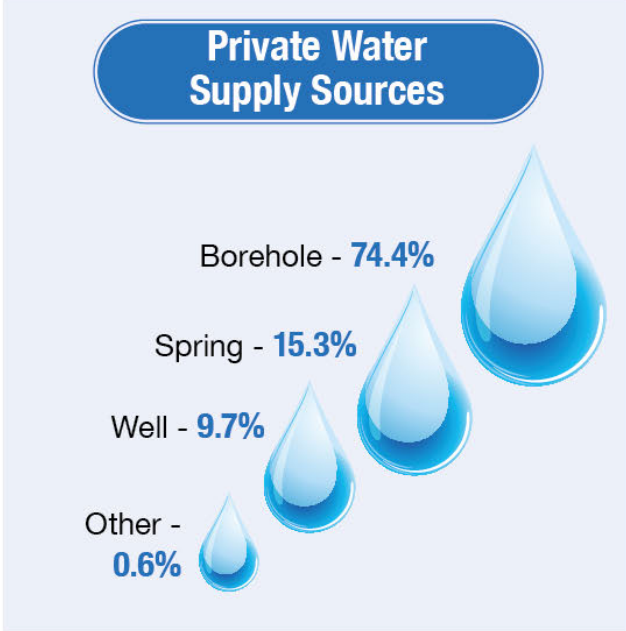
Section 2

Private Water Supplies

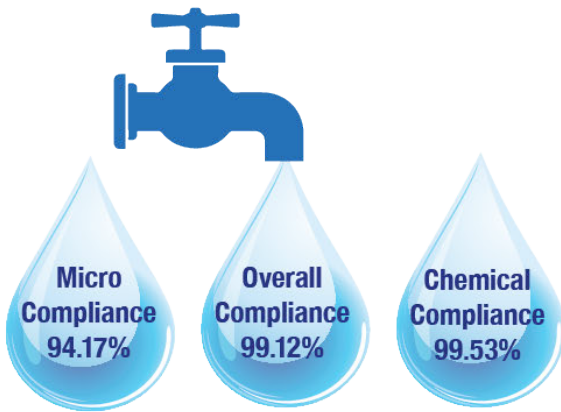


Image: Private Water Supply Well Source

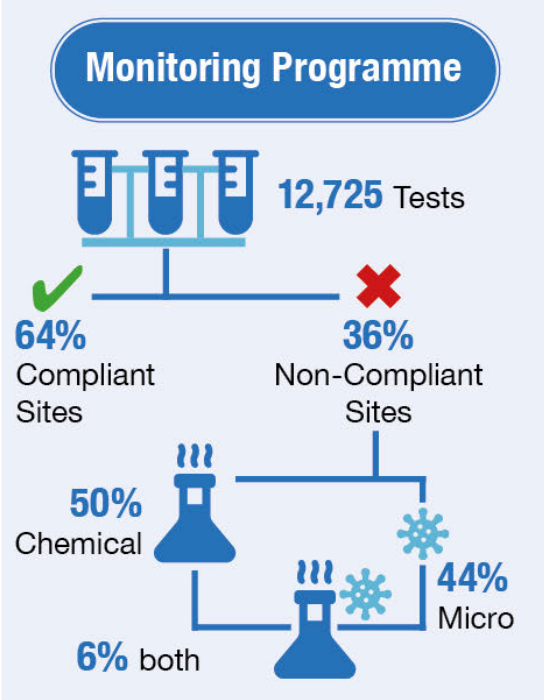
Private Water Supplies 2024 Key Facts



% Compliance



Actions



Restrictions	Training	Risk Assessments	Sampling	Advice
Applied at 36 sites Removed at 23 sites	53 local Environmental Health staff trained	82 site risk assessments completed / progressed	99.78% of scheduled samples collected	Responded to 200 queries

Section 2

Private Drinking Water Supplies

NI Water supplies potable drinking water to over 99% of the Northern Ireland population through a network of public water mains. Alternative water supplies, separate from NI Water mains, are classified as private water supplies. This includes those found in remote areas with no access to mains water or in urban areas where businesses opt to use water not provided by NI Water. The geographical extent of the NI Water mains water supply network, and subsequently the areas which cannot avail of this service, is shown in Figure 1 - 1. Properties using private water supplies outside of the NI Water mains network are typically domestic properties.

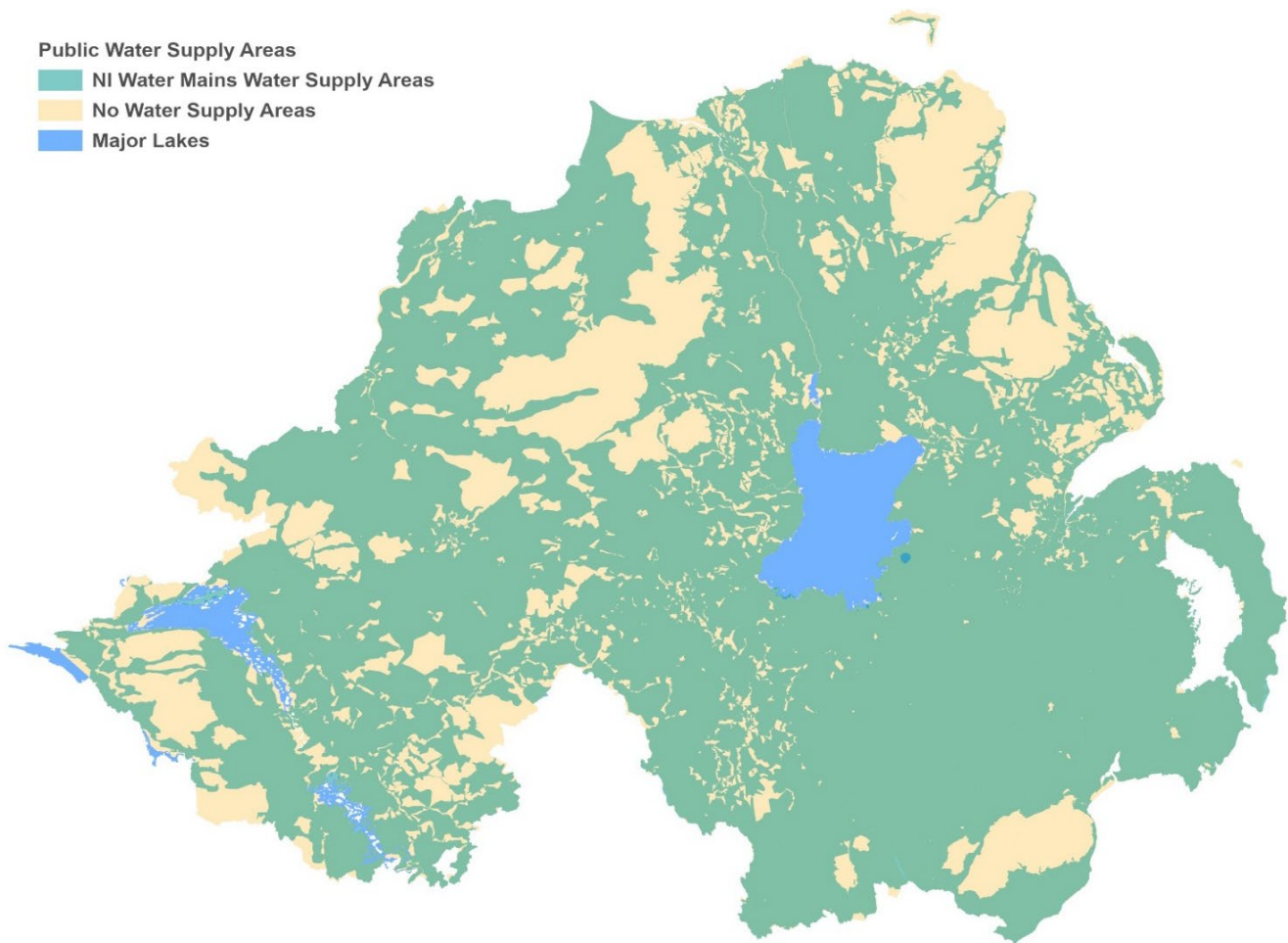


Figure 1 - 1 NI Water Mains Water Supply (and no water supply) Areas

Consumers often assume the water they are drinking is from the public water supply provided by NI Water. However, although the proportion of the population directly served by a private supply is relatively small, many more people are exposed to water from private supplies through its use in both commercial activities and public buildings. Despite a public water supply being available, some businesses utilise groundwater as a sustainable and more economically viable option.

Private water supplies are often used as an alternative to, or in conjunction with, the public water supply depending on the nature of operations at the site. In some circumstances, a particular composition of water is required as an ingredient for a food product or perhaps a

significant volume is required which is beyond the capacity of the existing mains water network. Private water supplies are found at a range of sites such as:

- food and drink manufacturers;
- public buildings including hospitals, workplaces and universities; and
- within the hospitality industry such as hotels, restaurants, and tourist accommodation.

Register of Supplies

The Private Water Supplies Regulations (Northern Ireland) 2017 require a register to be maintained and monitoring undertaken of private water supplies serving more than one domestic dwelling / commercial premises / public buildings for domestic purposes or the production of food / drink for human consumption. There were 176 private water supplies on our register in 2024 which required monitoring under the Regulations. The categories of these supplies are presented in Figure 1 – 2.

In addition, it is estimated there are at least a further 1,200 supplies to single domestic dwellings which are not monitored under the Regulations. These supplies are sampled by the Environmental Health Departments of local councils on request from owners / users.

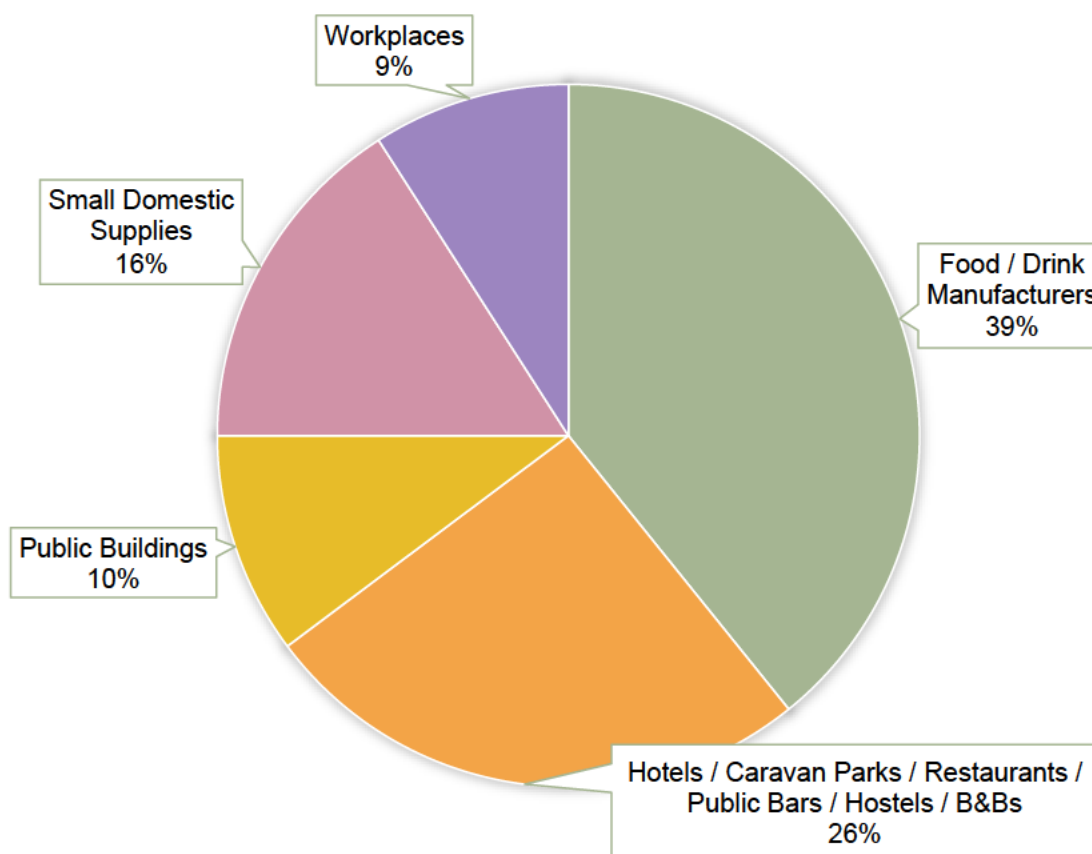


Figure 1 - 2 Categories of Registered Private Water Supplies in Northern Ireland in 2024

Private water supplies may be drawn from either surface or groundwater sources. Surface sources can include streams, rivers and reservoirs while groundwater sources can include boreholes, springs and wells. In 2024, 99.4% of registered private supplies in Northern Ireland were from groundwater sources, most commonly, boreholes. A properly installed and tested

borehole which has been appropriately sited can provide a sustainable yield of groundwater throughout the year.

Monitoring of Supplies

An annual sampling programme is required under the legislation and is in place for all registered supplies. The sampling frequency and range of parameters analysed are determined by the volume of water used and the type of the supply, i.e. commercial, public or domestic. Samples of private water supplies are collected on behalf of the Inspectorate by Environmental Health Departments of local councils. Council sampling officers can only collect samples once they have completed the relevant training provided by us and are issued with an appropriate warrant card to confirm their authority. The 2024 sampling programme included premises using private water supplies in all 11 council areas and contained 176 registered sites.

Of the 176 registered private water supplies for monitoring in 2024, 84% were commercial or public supplies and 16% were small domestic supplies (groupings of two or more houses). A breakdown of the numbers and sizes of private water supplies in 2024 is shown in Table 1 – 1.

Table 1 - 1 Numbers and Types of Private Water Supplies in 2024

Types of Private Water Supplies Volume (m ³ /day)	Number of Supplies	Frequency of Sampling (per annum)
(i) Commercial / Public Supplies		
> 1000 ≤ 2000	2	10
> 100 ≤ 1000	21	4
> 10 ≤ 100	52	2
≤ 10	73	1
(ii) Small Domestic Supplies (two or more dwellings)		
≤ 10	28	1
Total	176	

During 2024, five sites were removed from the sampling programme as they no longer met the criteria to be monitored (i.e. no longer used for human consumption or supply no longer used in food production). In addition, a total of eight new supplies were registered with us, these were:

- seven food / drink manufacturers;
- one holiday accommodation premises.

One public supply was not sampled due to the site temporarily utilising the mains water network and one public site had a reduced number of samples collected due to maintenance and subsequent temporary use of the mains water supply for periods of the year. In 2024, 15,256 determinations were carried out under the Regulations, of which 12,725 determinations are compliance based. These 12,725 determinations represent delivery of 99.78% of the regulatory monitoring programme, with 44 individual parameters not analysed and contributing to the annual shortfall for 2024.

Although the sampling frequency for compliance sampling is set within the Regulations, many supplementary samples are taken throughout the year during follow-up investigations. If the circumstances warrant additional sampling, we assist site owners through additional testing to either help identify the location of a water quality issue or to confirm a water quality issue has been remediated. In addition, where necessary, sites can be put on an increased sampling frequency for a set period of time to monitor any parameters identified as a risk in the supply. During 2024, a total of 45 such samples were collected. The results of the individual tests of these samples are not included in the calculation of the overall compliance for private water supplies.

A breakdown of registered supplies in Northern Ireland in 2024, categorised by size, is shown in Figure 1 - 3. The distribution of all monitored supplies can be found on the [DAERA viewer](#).

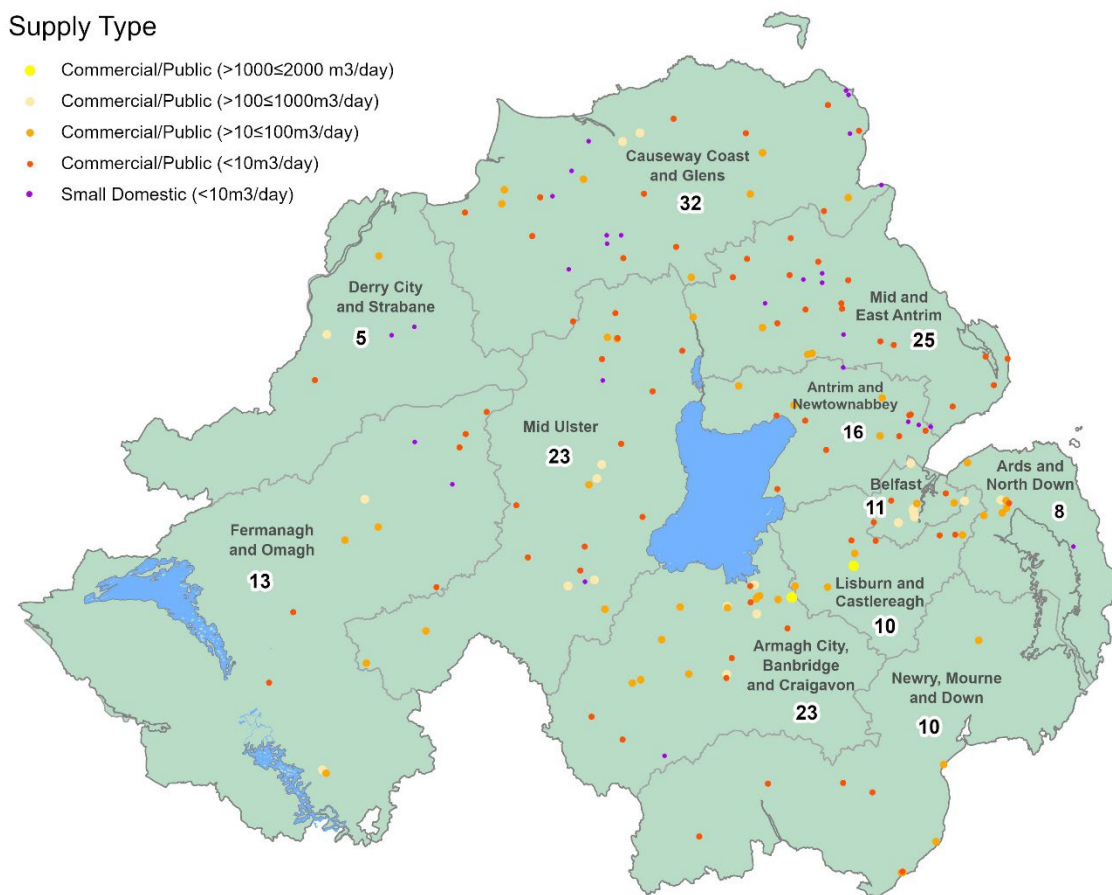



Figure 1 - 3 Distribution of Registered Private Water Supplies by Council Area in 2024

 The number of private water supplies in each council area (due to the small scale of the map all sites are not distinguishable)

Risk Assessment

The Regulations require a risk assessment to be carried out for each registered supply to identify where there may be potential risks to the water quality. This assessment includes the whole private water supply system, from its source to the point where the water is used, incorporating any storage or treatment systems. These assessments are required to follow the same standard (BS: EN 15975-2:2013¹) as is used for the risk assessment of the public water supply.

The risk assessments of private water supplies are undertaken by Environmental Health Departments of local councils, acting on our behalf who input the findings onto a web-based application, developed by DWI, to record the risk assessments. This web-based application helps ensure consistency of approach across all forms and volumes of supplies.

Each Environmental Health staff member can only risk assess a private water supply once they have completed the relevant training provided by us. This training details the principles of risk assessment (including likelihood, severity and risk scores) and an overview of process and information required before summarising in a suitable case study. As required, DWI attend site and / or assist the Environmental Health staff with the written completion of the assessment. Upon completion, the Environmental Health staff present the initial assessments to DWI who then review, verify and finalise the assessment.

A total of 82 risk assessments of private water supplies were completed on the web application in 2024 with a further 21 having been progressed with the onus now on us to finalise. The information gathered through the risk assessment process is used by us to provide sites with an action plan to mitigate identified risks and to assist sites with the ongoing management of their water supplies. It can also be used to fine-tune the monitoring programme for each site as it can identify additional analysis which may be required to monitor a risk or reduce the need for specific analysis where there is no risk to drinking water quality.

Looking ahead to 2025, under the Regulations, we must review and where necessary update the risk assessment when monitoring programmes are reviewed, which is every five years. We must also review, and if necessary update, a risk assessment where there has been a deterioration of the quality of water or a modification to, or extension of, the supply system. This five-year review process will commence in 2025.

Overall Drinking Water Quality

Comparable water quality standards are applied to both private and public water supplies in Northern Ireland through appropriate drinking water regulations. The Regulations provide flexibility and enable reduced monitoring of some parameters where certain criteria are met, and a risk assessment confirms there is no risk to human health. This flexibility was introduced in 2021, with a large set of parameters being placed on a reduced frequency monitoring schedule and this continued into the 2024 monitoring schedule.

¹ [BS: EN 15975-2: Concerning security of drinking water supply, guidelines for risk and crisis management](#)

Table 1 - 2 Overall Water Quality in Private Water Supplies in 2024

Parameters	Determinations in 2024		
	Total Number of Tests	Number of Tests not Meeting the Standards	% Compliance
Coliform bacteria	303	30	90.10
Enterococci	177	9	94.92
<i>E.coli</i>	303	11	96.37
<i>Clostridium perfringens</i>	143	4	97.20
Microbiological Total	926	54	94.17
Sodium*	68	5	92.65
Manganese	269	17	93.68
Sulphate*	34	2	94.12
Hydrogen Ion (pH)	302	16	94.70
Bromate*	51	2	96.08
Iron	270	8	97.04
Ammonium	143	1	99.30
Trihalomethanes, Total	143	1	99.30
Turbidity	302	2	99.34
Pesticides, Individual	8005	1	99.99
Other parameters	2046	0	100.00
Chemical Total	11633	55	99.53
Radon*	96	3	96.88
Radioactivity*	70	0	100.00
Radiochemical Total	166	3	98.19
Overall Total	12,725	112	99.12

* Parameters on reduced monitoring frequency

The results in Table 1 - 2 show that, out of a total of 12,725 tests carried out in 2024, 99.12% met the regulatory standards, a slight increase from 99.11% reported for 2023. The regulatory requirements were not met on 112 occasions for 15 parameters, namely: Coliform bacteria; *E. coli*; Enterococci; *Clostridium perfringens*; Manganese; Sulphate; Hydrogen Ion (pH); Iron; Ammonium; Trihalomethanes; Turbidity; Pesticides, individual (Clopyralid); Sodium; Bromate and Radon.

Where a parameter has historically failed or is greater than 30% of the parametric concentration value, it is retained and its inclusion in the monitoring programme will be reviewed again on an annual basis. This annual review of monitoring requirements for each private water supply also considers the removal of parameters not detected and where there is no identified risk. In 2024, a total of 19 sites were subject to a reduction in parameters which required monitoring. This reduction is set for a period of up to five years at which point all parameters will be analysed again to re-evaluate the potential risk.

A different approach is adopted for the annual review of the radon monitoring requirements in private water supplies. The radon risk is determined independently using Public Health England and British Geological Survey data in support of our monitoring results. Where no risk is

identified and results are historically stable, monitoring for radon is removed with a review to be conducted through a check sample after five years. The ‘Notice of Decision’ not to monitor radioactivity parameters in 2024 is published on our website.²

Microbiological contraventions account for 54 (48%) of the 112 contraventions at private water supplies in 2024. Following a dip in 2022, as illustrated in Figure 1 - 4, the figures represent a further improvement from 93.44% in 2023 to 94.17% compliance with the standards in 2024. The microbiological compliance is still at a lower rate compared to 2020 and 2021; however, the gap is continuing to close.

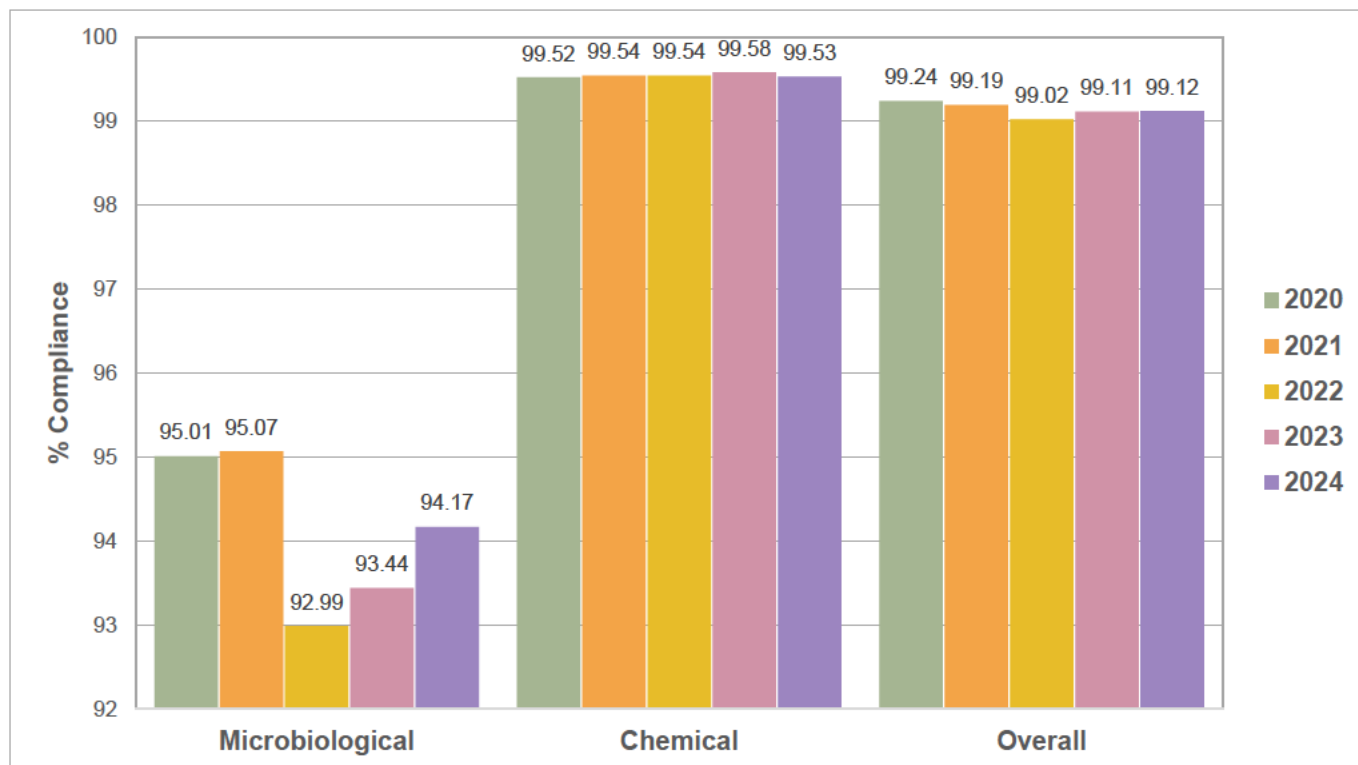


Figure 1 - 4 Comparison of Compliance in Private Water Supplies, 2020 – 2024

Contraventions of the chemical standards have been reported for a range of parameters listed in Table 1 - 2. Overall, the number of chemical contraventions in 2024 increased to 55 from 48 in 2023. A total of 55 contraventions out of the 11,633 chemical parameters analysed provides a chemical compliance of 99.53% for 2024, as displayed in Figure 1 - 4, a slight decrease from 99.58% in 2023. As with previous years, where the chemical standards have not been met, they relate mainly to Manganese, Hydrogen ion (pH), Iron and Sodium, which together comprise 46 of the 55 recorded contraventions.

Full compliance was achieved for 64% (112 sites) of the private water supplies tested in 2024. Of the 64 sites which did not comply with the regulatory standards, 44% (28 sites) contravened only microbiological standards; 50% (32 sites) chemical standards; and 6% (4 sites) failed to comply with both microbiological and chemical standards.

² [Notice of Decision Not to Monitor Radioactivity Parameters – 2018 to 2025 | Department of Agriculture, Environment and Rural Affairs](#)

The categories of these non-compliant sites, presented in Figure 1 - 5, show that c. 94% of chemical only contraventions occurred at commercial / public sites such as food / drink manufacturers, hotels, or holiday lets. For the microbiological only contraventions, 39% were at small shared domestic supplies and 61% were at commercial / public sites; this is at variance with 2023 when the ratio of sectors for microbiological only contraventions was effectively reversed (57% and 43% respectively).

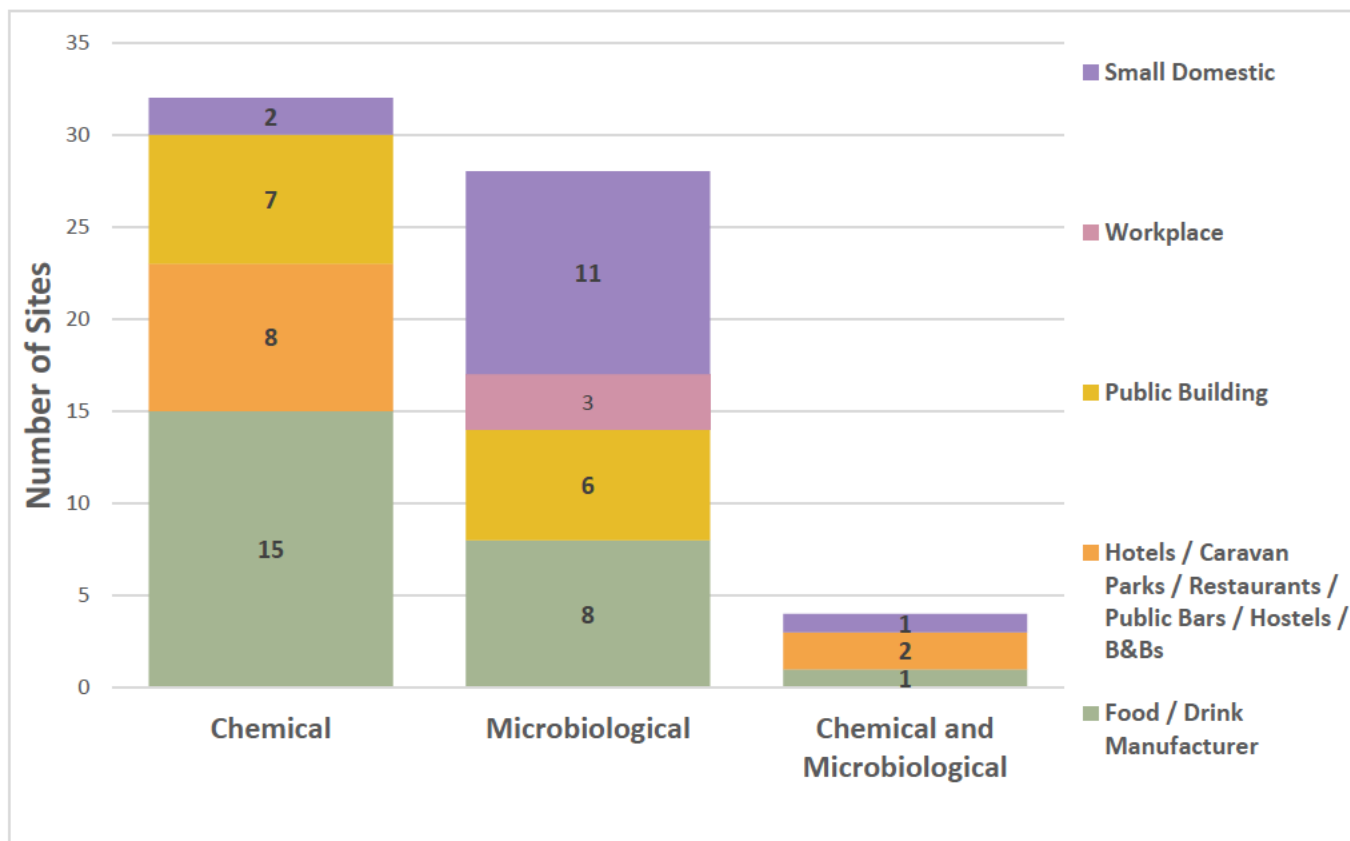


Figure 1 - 5 Categories of Non-Compliant Private Water Supply Sites in 2024

The significance of each contravention not only depends on the category or size of the sites but often, more importantly, on the purpose for which the water is used at the sites. In summary, for the 64 sites which did not comply with all the drinking water quality standards in 2024:

- 47 use the supply as the primary source of drinking water;
- 20 use the supply for the washing of equipment and surfaces in contact with food or drink;
- 17 use the supply as an ingredient in food or drink; and
- four use the supply for personal hygiene.

Please note that some sites use their private water supply for more than one purpose.

Factors Affecting Drinking Water Quality

Different aspects of the water supply chain contributed to the microbiological and chemical water quality contraventions reported in 2024 such as: catchment (including source protection); treatment; distribution; and sampling point (tap) issues.

Monitoring of private water supplies was kept constantly under review and adapted to account for any operational changes within businesses or access restrictions at domestic dwellings. Communication with supply owners primarily focused on regulatory contraventions and how they could effectively remediate their supply to ensure the wholesomeness of the water.

Micro-Organisms

The presence of micro-organisms in a private water supply is indicative of contamination of the water either at source or at some point within the distribution system. In particular, the detection of *E. coli* or Enterococci bacteria specifically indicates faecal contamination of a water supply and can be a risk to public health. Micro-organisms, as detailed in Table 1 – 2 above, were found to be present in 15 supplies during 2024: nine small shared domestic supplies, three of which had disinfection treatment in place at the time of sampling; and six commercial / public supplies, four of which had disinfection treatment in place at the time of sampling.

Rural water supplies in the vicinity of where animals graze or manure is spread are most at risk. This is particularly prevalent at times of heavy rainfall when water may run directly off farmland and carry micro-organisms into unprotected private supplies. Guidance on source protection is available in the [Private Water Supplies Technical Manual](#).

Poor microbiological quality also highlights where there is a lack of suitable treatment, or the treatment installed is not being operated and maintained appropriately. The quality of the raw water is a key element in selecting the correct treatment for a private water supply which may require pre-treatment prior to disinfection.

Metals

Metals can occur naturally in groundwater for a variety of reasons, i.e. brackish groundwaters contain sodium, geology can provide nickel, manganese, iron and arsenic. Concurrently, they can be present in private water supplies as a result of other processes i.e. sodium introduced from mismanaged softening treatment, iron from cast iron pipe / storage tank, or nickel / copper from corroded pipework.

On occasion, elevated concentrations of metals or other particulate matter can increase the turbidity (cloudiness) of a water source. Turbidity should be below 1 NTU in treated water to ensure the effectiveness of the disinfection process. There were two turbidity contraventions within 2024, both of which, occurred concurrently with contraventions for metals.

High levels of iron and manganese may affect the appearance, taste or smell of the water resulting in turbidity, colour, taste, and odour contraventions and discoloration or staining of water fittings. It can also affect treatment systems, such as ultra-violet lamps due to metal deposits causing a reduction in their effectiveness for disinfection. Sites are advised to routinely purge wells / boreholes, clean out storage tanks and flush through pipe work or, where required,

replace parts of their distribution network to reduce the levels of iron in their supplies. In 2024 24 sites reported contraventions for one or both of these metals.

Lead, and other heavy metals such as nickel and copper, are usually detected at elevated levels due to corrosion of pipe work or fittings, especially if the source water is naturally acidic, and / or due to the use of inappropriate fixtures and fittings. The Regulations specify that only products and substances approved for use with drinking water supplies should be used. The Drinking Water Inspectorate for England and Wales has published a list of [approved products](#) which are suitable for use within a private water supply system.

There were no nickel, copper or lead contraventions in 2024.

Ammonium

Ammonia or ammonium compounds are naturally present, in trace amounts, in both ground and surface water sources. However, unexpected levels may indicate that recent pollution has taken place.

Sodium

The regulatory standard for sodium is set for aesthetic reasons as elevated levels may give rise to taste problems. The source of elevated sodium is typically through a mismanaged treatment system; however, it can occur naturally in brackish waters. In 2024, five sites reported contraventions for sodium, four of which had water softening treatment processes. The cause of the sodium contravention in the remaining site was undetermined.

Disinfection by-products

Trihalomethanes (THMs) are formed during the disinfection process by a reaction between chlorine and naturally occurring organic substances. The use of chlorine in water treatment is a very important health safeguard. Good operational practice of treatment processes minimizes the production of THMs. There was one contravention of THMs Total, which is a combination of chloroform, bromoform, dibromochloromethane, bromodichloromethane. The cause of this contravention was determined to be an overdosing of chlorine into the treatment process.

Bromate is not present in source waters. It may be formed when concentrated hypochlorite solutions are used to disinfect water containing elevated bromide concentrations due to saline intrusion or it may also be present in some sources of sodium hypochlorite disinfectant. There were two bromate contraventions in 2024: both sites use sodium hypochlorite disinfection.

Pesticides

There was one individual pesticide contravention in 2024: Clopyralid.

Clopyralid is a herbicide used for controlling broad-leaved weeds such as docks and creeping thistle in grassland. This contravention could have been due to the inappropriate storage or use of pesticides in the vicinity of the source, although the exact cause was not determined.

In addition to these contraventions, trace levels of a range of individual pesticides, below the regulatory limit of 0.10 µg/l, were also detected at 32 sites.

Actions in the Event of Failure

Contraventions are investigated through site visits conducted by Environmental Health staff and the collection of follow up samples. Depending on the nature and significance of the contraventions, it may also be necessary for us to conduct a site inspection.

Any contraventions at supplies, where the water is used as an ingredient in food production or as drinking water, and that are considered as a potential risk to human health, are reported to the Public Health Agency (PHA) for appropriate health advice. Where necessary, the Regulations contain a provision to issue Notices which can be used to restrict or prohibit the use of a supply.

Out of the 64 sites with contraventions identified in 2024, 60 were notified to PHA for advice: 41 microbiological and 19 chemical. Consequently, restrictions on the use of the private water supply were put in place at 15 sites to protect public health.

These restrictions of private water supplies can include switching to, or blending with, the public water supply (where this is available), 'Boil Water Before Use' and 'Do Not Use' advisory notes.

Removal of these restrictions requires investigation into the cause of the water quality contravention, completion of work to remedy any issues identified, and two consecutive satisfactory resamples. Accordingly, the restrictions were removed at five sites.

We continue to work with the owners and users of private water supplies and Environmental Health staff to bring the remaining supplies into compliance. Priority is given to advancing improvements to the water quality through provision of advice and guidance; agreeing action plans (particularly at the larger commercial / public sites); and promotion of Drinking Water Safety Plans (DWSP) for the ongoing management of these supplies.

We have a duty to ensure compliance with the water quality standards in The Private Water Supplies Regulations (Northern Ireland) 2017. Our approach, where there is no known health risk, is initially through informal negotiations. However, where necessary, we may take formal enforcement action to secure compliance and ensure a safe, clean supply of drinking water from private water supplies.

Provision of Advice and Guidance

The DWI routinely provides advice and guidance to the owners / users of all private water supplies across Northern Ireland. However, currently limited information is available on the estimated 1,200 single dwellings in Northern Ireland, mainly in rural and remote areas, served by a private water supply. The [Single Well Application](#) which was launched in 2021, continues to be a valuable resource for these owners by highlighting potential risks and identifying measures to improve the quality of their water.

When contacted directly regarding the contamination of a private water supply, DWI can provide relevant advice to the site owner / user specific to their situation. This may include steps to protect their drinking water source, treatment options, or how to get their water supply tested. Throughout 2024, DWI provided appropriate advice and guidance on 200 separate occasions.

Collaborative Working

DWI has a Service Level Agreement and Data Processing Contract in place with the Environmental Health Departments of all 11 local councils for the regulation of private water supplies. These agreements are reviewed by all parties every two years, and this review was last conducted in December 2023. They provide details of the roles and responsibilities and ensure the efficient operational delivery of services in regulating private water supplies across Northern Ireland. In addition, private water supplies have a standing agenda update presentation at the annual Drinking Water Working Group which met in June 2024.

Annual formal training sessions, and ad-hoc guidance, are provided to councils on an ongoing basis. In 2024, a total of 30 Environmental Health staff were trained in how to complete sampling of a private water supply, and a total of 21 Environmental Health staff were trained in how to complete the risk assessment process. This was through scheduled training sessions throughout the year and ad-hoc in response to council staff needs. In addition, DWI worked collaboratively with Environmental Health staff through joint site visits to complete a number of risk assessments of private water supplies in 2024.

DWI continue to engage with a range of stakeholders in relation to private water supplies to promote the protection of source water catchments, investigate new and emerging contaminants of concern, and support the sustainable use of groundwater resources. The register of monitored supplies is regularly updated and expanded as new supplies become notified to us through our Environmental Health partners, direct from supply owners or are identified by DWI staff.

Annexes

Annex 1 **Glossary**

Annex 2 **Events**

Annex 3 **Technical Audit Programme**

Annex 4 **Enforcement Action**



Annex 1

Glossary and Definition of Terms

Abstraction Point	The point at which water is abstracted from a lake, reservoir, river, or groundwater source for the purposes of drinking water production.
Aesthetic	Associated with the senses of taste, smell, and sight.
Ammonium	May be naturally present in water sources. Unexpected levels may indicate that recent pollution has taken place.
Animalcule	A tiny or microscopic life form.
Bromate	Is not present in source waters. It may be formed when concentrated hypochlorite solutions are used to disinfect water containing elevated bromide concentrations due to saline intrusion. It may also be generated in the manufacture of sodium hypochlorite disinfectant.
Catchment	The area of land that drains into a watercourse.
Clarification	A process employed during drinking water treatment to assist in the removal of suspended solids and particulate matter.
Clopyralid	A herbicide used for controlling broad-leaved weeds such as dock and creeping thistle in grassland and cereal crops. It can be persistent in soil and water systems.
<i>Clostridium perfringens</i>	A spore-forming bacterium which is exceptionally resistant to unfavourable conditions in the water environment.
Coagulation	A process during drinking water treatment which uses metallic salts to cause impurities to form small particles which can be removed following further treatment.
Coliform bacteria	A group of bacteria which may be faecal or environmental in origin.
Contravention	A breach of the regulatory requirement.
<i>Cryptosporidium</i> oocyst	A protozoan parasite.
DAF (Dissolved Air Flotation)	A process during drinking water treatment which uses air bubbles as a flotation agent to assist removal of suspended particles from the water.
Determination	An analysis for a specific parameter.
Desludging	The process of removing a layer of accumulated solids (sludge) from a tank.

Dicamba	Dicamba (3,6-dichloro-2-methoxybenzoic acid) is a herbicide used for control of annual and perennial broadleaved weeds and brush species.
Distribution Network	The system of mains water pipes bringing water from a water treatment works to service reservoirs and onwards to the consumer.
Drinking Water Quality Standards	The prescribed concentrations or values listed in the Regulations.
Drinking Water Safety Plan (DWSP)	A comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to consumer.
Enterococci	A sub-group of faecal streptococci commonly found in the faeces of humans and warm-blooded animals.
<i>Escherichia coli</i> (<i>E. coli</i>)	A type of faecal coliform bacteria commonly found in the intestines of animals and humans. The presence of <i>E. coli</i> in water is a strong indication of recent sewage or animal waste contamination.
Event	A situation affecting, or with the potential to affect, drinking water quality.
Faecal Coliform	A sub-group of coliforms, almost exclusively faecal in origin.
Faecal Indicators	A group of organisms that indicate the presence of faecal contamination of a water supply e.g. <i>E. coli</i> .
Filtration	A process used during drinking water treatment to remove suspended particles from water.
Flocculation	A process during drinking water treatment used to increase the size of particles formed during coagulation. This enables impurities to be removed by settlement, flotation or filtration.
Granular Activated Carbon (GAC)	An absorbent filtration media used to remove trace organic compounds from water.
Groundwater	Water from aquifers or other underground sources.
Hydrogen ion (pH)	The degree of acidity of the water. A pH of 7 is neutral; values below 7 are acidic and above 7 are alkaline. A low pH water may result in pipe corrosion. This is corrected by adding alkali during water treatment.
Impounding reservoir	A raw water source from which water is abstracted for the purposes of drinking water production.
Incident	An event where there has been a demonstrable deterioration in the quality of drinking water.
Indicator Parameter	Something that is measured to check that the control measures, such as water treatment, are working effectively.

Leaching	To lose, or cause to lose, soluble substances by the action of a percolating liquid.
MCPA	A herbicide used for controlling broad-leaved weeds in grass or cereal crops.
Microbiological	Associated with the study of microbes.
m ³ /d	Cubic metres per day.
µg/l	Micrograms per litre (one millionth of a gram per litre).
Parameters	The substances, organisms and properties listed in Schedules 1 and 2, and regulation 2 of the Regulations.
Pathogen	An organism which causes disease.
PC15	The third price control process whereby funding was allocated to NI Water by the Utility Regulator for the 2015 to 2021 period.
PC21	The fourth price control process whereby funding was allocated to NI Water by the Utility Regulator for the 2021 to 2027 period.
PC28	The fifth price control process whereby funding will be allocated to NI Water by the Utility Regulator. Time period to be finalised.
Pesticides	Any fungicide, herbicide, insecticide or related product (excluding medicines) used for the control of pests or diseases.
Powder Activated Carbon (PAC)	An adsorbent media typically used to remove taste and odour compounds during a water treatment process.
Price Control Process (PC)	The process for the funding of NI Water by the Utility Regulator for a set period.
Prescribed Concentration or Value (PCV)	The numerical value assigned to drinking water standards, defining the maximal or minimal legal concentration or value of a parameter.
Raw Water	The term used for water abstracted for the purpose of drinking water provision, prior to receiving treatment.
Remedial Action	The action taken to improve a situation.
Residence Time	The period of time treated water spends in a clear water tank, service reservoir or other storage facility.
Service Reservoir	A water tower, tank or other reservoir used for the storage of treated water within the distribution system.
Sludge	A semi-solid waste material removed from water during treatment processes.

Supply Point	A point, other than a consumer's tap, authorised for the taking of samples for compliance with the Regulations.
Sulphate	May occur naturally in water sources. Concentrations normally found in drinking water do not represent a risk to health. The regulatory standard is set for aesthetic reasons as levels above the standard (250mg/l) may cause noticeable taste problems.
Trihalomethanes (THMs)	A group of organic substances comprising, for the purposes of the Regulations, four substances: trichloromethane (also known as chloroform), tribromomethane (also known as bromoform), dibromochloromethane and bromodichloromethane.
Turbidity	Turbidity is the measure of relative clarity of a liquid.
Water Catchment Partnership	The Water Catchment Partnership (WCP) was established in 2013 to help address significant water quality issues in Northern Ireland related to pesticides.
Water Supply Zone	A pre-defined area of supply used for establishing sampling frequencies, compliance with standards and information to be made publicly available.
Water Treatment Works	A facility that produces drinking water from a raw water source.
Wholesome/Wholesomeness	A concept of water quality which is defined by reference to standards and other requirements set out in the Regulations.

Annex 2 – Events

Serious Drinking Water Quality Events in 2024

Date of Serious Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Serious Event	Associated Council Area(s)
07/09/2024 – 04/10/2024	Moyola WTW (53,656 population)	Algal blooms impacting the raw water quality in Lough Neagh led to a high level of consumer contacts regarding the taste and odour of the mains water supply and contraventions of the taste and odour parameters in the final water from Moyola WTW. A similar event occurred in 2023. DWI issued questionnaires to consumers and has issued a Warning Letter to NI Water in relation to this event.	Antrim and Newtownabbey Borough; Causeway Coast and Glens Borough & Mid Ulster District
12/09/2024 – 03/10/2024	Castor Bay WW (360,281 population)	Algal blooms impacting the raw water quality in Lough Neagh led to a high level of consumer contacts regarding the taste and odour of the mains water supply and contraventions of the taste and odour parameters in the final water from Castor Bay WTW. DWI issued questionnaires to consumers and has issued a Warning Letter to NI Water in relation to this event.	Belfast City; Armagh City, Banbridge and Craigavon Borough; Lisburn and Castlereagh City; Newry, Mourne and Down District; Mid Ulster District; & Fermanagh and Omagh District

Significant Drinking Water Quality Events in 2024

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
10/01/2024 – 12/01/2024	Killylane WTW (48,323 population)	Contraventions of the aluminium parameter in the works supply area. The most probable cause was the use of a chemical past its recommended shelf-life resulting in treatment difficulties at Killylane WTW. A technical audit of Killylane WTW was carried out by DWI on 16/01/2025.	Antrim and Newtownabbey Borough & Mid and East Antrim Borough
16/01/2024 – 12/02/2024	Drumaroad WTW (436,350 population)	Contraventions of the aluminium parameter occurred in the works final water. An investigation by NI Water identified issues with the sample point as the most likely cause. Drumaroad WTW has a history of aluminium contraventions and DWI has enforcement in place to deal with this issue by September 2025.	Belfast City; Lisburn and Castlereagh City; Ards and North Down Borough; Armagh City, Banbridge and Craigavon & Newry, Mourne and Down District
22/02/2024 – 23/02/2024	Killylane WTW (47,057 population)	A contravention of the aluminium parameter occurred in the works final water due to treatment difficulties following a planned shutdown at Killylane WTW. A technical audit of Killylane WTW was carried out by DWI on 16/01/2025.	Antrim and Newtownabbey Borough & Mid and East Antrim Borough
13/03/2024 – 22/03/2024	Drumaroad WTW (436,350 population)	Contraventions of the aluminium parameter occurred in the works supply area and elevated pH and aluminium occurred in the works final water. This was caused by a technical fault impacting the treatment process. Drumaroad WTW has a history of aluminium contraventions and DWI has enforcement in place to deal with this issue by September 2025.	Belfast City; Lisburn and Castlereagh City; Ards and North Down Borough; Armagh City, Banbridge and Craigavon & Newry, Mourne and Down District

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
23/05/2024 – 24/05/2024	Altnahinch WTW (31,777 population)	A contravention of the coliform bacteria and E. Coli parameters occurred in the works final water. The precise cause of the bacteriological contravention was undetermined; however, the sample point was upgraded following concerns raised regarding its condition. Resamples taken were satisfactory.	Causeway Coast and Glens Borough & Mid and East Antrim Borough
14/05/2024 – 26/06/2024	Carmoney WTW (56,390 population)	Contraventions of the individual pesticide standard for MCPA occurred in the works final water on five occasions. Carmoney WTW has pesticide removal treatment in place which is normally effective at reducing MCPA levels to below the regulatory limit. A technical audit of Carmoney WTW was carried out by DWI on 13/02/2025. DWI issued a Warning Letter to NI Water in relation to this event.	Causeway Coast and Glens Borough & Derry City and Strabane District
12/05/2024 – 05/06/2024	Killylane WTW & Killyglen SR (47,057 population)	Treatment difficulties following a shutdown at Killylane WTW resulted in elevated aluminium in the works final water. Additionally, planned maintenance at Killyglen SR resulted in contraventions of the aluminium, iron and manganese parameters when the SR was returned to service. A technical audit of Killylane WTW was carried out by DWI on 16/01/2025.	Antrim and Newtownabbey Borough & Mid and East Antrim Borough
22/05/2024 – 28/05/2024	Derg WTW (40,125 population)	Contraventions of the individual pesticide standard for MCPA occurred in the works final water. NI Water completed a major upgrade to this works in 2023 following DWI issuing a Regulation 31(4) Notice in respect of pesticide contraventions. However, the new treatment process was not fully effective at removing elevated levels of MCPA which occurred in the raw water at the time of this event. The treatment process is now optimised to manage the pesticide risk.	Derry City and Strabane District & Fermanagh and Omagh District

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
09/07/2024 – 16/07/2024	Killylane WTW (47,057 population)	A contravention of the aluminium parameter in the works final water. Following investigation, NI Water was unable to identify the cause of the contravention. A technical audit of Killylane WTW was carried out by DWI on 16/01/2025.	Antrim and Newtownabbey Borough & Mid and East Antrim Borough
09/07/2024 – 25/07/2024	Rathlin Island Zone (246 population)	A contravention of the bromate standard occurred at a property in the works supply area. Following investigation, NI Water was unable to identify a cause. Resamples were satisfactory.	Causeway Coast and Glens Borough
06/08/2024 – 09/08/2024	Ballinrees WTW (116,868 population)	A contravention of the odour parameter occurred in the works final water; the cause was undetermined. DWI has enforcement in place to deal with taste & odour contravention at Ballinrees WTW by December 2024. The new treatment is now fully operational.	Causeway Coast and Glens Borough; Derry City and Strabane District & Mid Ulster District
12/08/2024 – 02/10/2024	Killyhevlin WTW (73,516 population)	A <i>Cryptosporidium</i> oocyst was detected in the works final water on four occasions. The UV disinfection system at the works was operational at the time of the detections and ongoing filter refurbishment work is now complete. All subsequent samples were satisfactory.	Fermanagh and Omagh District & Mid Ulster District
08/08/2024 – 11/09/2024	Altnahinch WTW (31,777 population)	Contraventions of the Total Trihalomethanes (THMs) parameter occurred in the works supply area due to insufficient organics removal. Improvement work in relation to THMs at Altnahinch WTW is included in the PC21 work plan.	Causeway Coast and Glens Borough & Mid and East Antrim Borough
31/10/2024 – 04/11/2024	Lough Bradan WTW (43,724 population)	A contravention of the odour parameter occurred in the works final water. Following investigation, NI Water was unable to identify a cause. There were no consumer complaints associated with this event and the resamples were satisfactory.	Fermanagh and Omagh District; Derry City and Strabane District & Mid Ulster District

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
31/10/2024 – 01/11/2024	Drumaroad WTW (436,350 population)	Elevated aluminium occurred in the works final water due to treatment difficulties caused by a chemical dosing failure. Drumaroad WTW has a history of aluminium contraventions and DWI has enforcement in place to deal with this issue by September 2025.	Belfast City; Lisburn and Castlereagh City; Ards and North Down Borough; Armagh City, Banbridge and Craigavon & Newry, Mourne and Down District
15/11/2024 – 18/11/2024	Drumaroad WTW (436,350 population)	Elevated aluminium occurred in the works final water due to treatment difficulties caused by a chemical dosing failure. Drumaroad WTW has a history of aluminium contraventions and DWI has enforcement in place to deal with this issue by September 2025.	Belfast City; Lisburn and Castlereagh City; Ards and North Down Borough; Armagh City, Banbridge and Craigavon & Newry, Mourne and Down District
25/11/2024 – 27/11/2024	Drumaroad WTW (436,350 population)	A contravention of the aluminium parameter occurred in the works final water due to treatment difficulties caused by a technical fault. Drumaroad WTW has a history of aluminium contraventions and DWI has enforcement in place to deal with this issue by September 2025.	Belfast City; Lisburn and Castlereagh City; Ards and North Down Borough; Armagh City, Banbridge and Craigavon & Newry, Mourne and Down District
11/12/2024 – 20/12/2024	Caugh Hill WTW (77,183 population)	Contraventions of the turbidity, aluminium, iron, and manganese parameters in the works final water and related supply area caused by treatment difficulties. Rezoning of water in the distribution area was undertaken.	Causeway Coast and Glens Borough & Derry City and Strabane District

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
15/04/2024 - 07/10/2024	Gelvin Grange Laboratory	An increase in bacteriological contraventions reported in 2024 led to an investigation of the microbiological analysis at the Gelvin Grange laboratory. Environmental contamination of microbiological samples was identified as the cause of the contraventions. Consequently, samples were transferred to the Westland House laboratory for analysis from 22/10/2024. Following completion of remedial work and satisfactory sterility testing microbiological analysis was transferred back to the Gelvin Grange laboratory from 18/11/2024.	Causeway Coast and Glens Borough; Mid-Ulster District; Mid and East Antrim Borough; Derry City and Strabane District & Fermanagh and Omagh District

After investigations during the reporting period, there were also three events categorised by DWI as “Minor”, and 24 events categorised as “Not Significant”.

Annex 3

Technical Audit Programme

DWI carried out four technical audits in 2024. We acknowledge NI Water's co-operation during the completion of the audits as detailed in Table 3 - 1. NI Water has implemented or provided comment on, the recommendations and suggestions we raised in our audit reports.

The following table provides a summary of our 2024 Inspection Programme:

Table 3 - 1: Summary of the 2024 Inspection Programme

Date of Audit	Location	Audit Activity	Number of Recommendations ¹	Number of Suggestions ²
23/01/2024	Moyola WTW	To check that good operational practice is used in the water treatment process.	7	11
08/03/2024	Caugh Hill WTW	To check that good operational practice is used in the water treatment process.	4	10
27/03/2024	Sampling Procedures	To check the sampling technique and ensure sample points are fully compliant.	3	7
26/11/2024	Laboratory Information Management System (LIMS)	To check that data is adequately managed by the LIMS.	5	5

¹ Recommendations are made where, in our opinion, action is required to avoid a foreseeable risk or a breach of a regulatory duty. If such a breach occurs, then we may consider 'enforcement action'. A formal written response from NI Water is required.

² Suggestions are made in relation to matters which relate to best practice.

Annex 4

Enforcement Action

The DWI Section of the [DAERA website](#) publishes details of all Enforcement actions.

Table 4 - 1: Summary of Enforcement Actions 2024

Type of Enforcement	Location	Reason for Enforcement	Summary
Regulation 31(4) Notice 2020/001	Derg WTW	Contravention of the regulatory standard for the herbicide, MCPA	Required NI Water to install and have operational, a treatment system at Derg WTW that is effective in the removal or reduction of MCPA to achieve a final water result that meets the maximum regulatory limit of MCPA of 0.10µg/l by 31 March 2023. This Notice was revoked in January 2024, following completion of the required work.
Regulation 31(4) Notice 2023/001	Ballinrees WTW	Contravention of the regulatory standard for the herbicide, MCPA	Requires NI Water to install and have operational, a treatment system at Ballinrees WTW that is effective in the removal or reduction of MCPA to achieve a final water result that meets the maximum regulatory limit of MCPA of 0.10µg/l by 22 December 2024. This was issued on 18 December 2023 following the revocation of Regulation 31(4) Notice 2020/002 on the same date.
Regulation 31(4) Notice 2023/002	Ballinrees WTW	Contravention of the regulatory standards for Taste and Odour	Requires NI Water to install and have operational, a treatment system at Ballinrees WTW that is proven to be effective in the treatment of taste and odour parameters to achieve a final water and consumer tap result that is acceptable to the consumer and there is no abnormal change by 22 December 2024. This was issued on 18 December 2023 following the revocation of Regulation 31(4) Notice 2020/003 on the same date.
Regulation 31(4) Notice 2021/001	Drumaroad WTW	Contravention of the regulatory standard for Aluminium	Requires NI Water to install and have operational, a treatment system at Drumaroad WTW that is proven to be effective in the removal or reduction of Aluminium to achieve a final water result that meets the maximum regulatory limit for Aluminium of 200µg/l by 30 April 2025. This was issued on 8 July 2021. This Notice was amended on 27 May 2025 to extend the compliance date to 30 September 2025, Regulation 31(4) Notice 2025/001.

Type of Enforcement	Location	Reason for Enforcement	Summary
Warning Letter 01/24	Creevery Road, Antrim (21 Properties)	Article 110 Offence of Supplying Water Unfit for Human Consumption	Coliform bacteria contraventions recurred at four properties following mains rehabilitation work in the area. On the advice of the Public Health Agency (PHA), "Boil Water before Use until Further Notice" advice was issued to these four properties. However, 21 properties were potentially affected. NI Water should have identified the number of properties potentially affected at an early stage of its investigation. This information should have been relayed to the PHA to ensure the protection of all consumers potentially affected. As part of the remedial actions NI Water carried out a new connection audit, reshared guidance, and identified a need to improve communications.

Useful Information

(To access the information, click on the links below)

[Regulatory Framework](#) – provides details and links to current legislation relating to drinking water quality.

Drinking Water Quality Tables – provide details of drinking water compliance within individual water supply zones and council areas for [Public](#) and [Private](#) Supplies.

Drinking Water Advice and Guidance for [Public](#) and [Private](#) Supplies – provides a list of links for consumers and professionals requiring further information on drinking water quality.

[Useful Contacts](#) – provides a list of organisations and contact details related to drinking water.



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