northern ireland water

Drinking Water Quality **Annual Report 2007**

Chairmans **Statement**

I am pleased to present Northern Ireland Water's (NI Water) Annual Drinking Water Quality report covering the calendar year 2007.

This is our fourth annual review on the quality of drinking water in Northern Ireland since new regulations came into force in January 2004, and the first to be produced since DRD Water Service transformed into Northern Ireland Water (a wholly government owned company).

During this challenging period we have maintained a high quality of water to our customers whilst implementing substantial service, environmental and efficiency improvements to meet the demands of a 21st Century economy and the changing needs of our customers.

In 2008 five of NI Water's existing Water Treatment Works (including the large non-compliant slow sand filter works) are due to be replaced through a £110 million capital investment under the Alpha PPP Contract. This, in conjunction with the £122m we have committed to spend by 2010 in water treatment, storage and mains improvements will further improve drinking water compliance with EU drinking water standards.

I hope you find this report informative and interesting. As we gain the benefits of this investment by NI Water, you will be assured of our ongoing commitment to maintaining and where possible improving the quality of the drinking water delivered to our customers throughout Northern Ireland.

Chris Mellor

Chris Mellor
Chairman,
Northern Ireland Water

Chris Mellor
Chairman

" five of NI Water's existing Water Treatment Works are due to be replaced through a £110 million capital investment"

Report **Contents**

Introduction

Northern Ireland Water (NI Water) is a government owned company with the Department for Regional Development its sole shareholder.

Until 31st March 2007 it was known as Water Service, which was an Executive Agency within the Department for Regional Development. Water supplied for domestic or food production purposes, must meet the standards contained in "The Water Supply (Water Quality) Regulations (Northern Ireland) 2007". The Department for Regional Development is responsible under the Water and Sewerage Services (Northern Ireland) Order 2006 to supply and distribute water, and NI Water performs the Department's water supply functions. This responsibility transferred under law on 1st April 2007 from Water Service to NI Water.

Water is regularly monitored and tested for quality. This composite report summarises DRD Water Service's / NI Water's regulatory results from 1 January 2007 to 31 December 2007 and reports them as one entity. During this reporting period, 99.30% of all tests carried out on samples taken from customers' taps and authorised supply points, complied with the regulatory standards assessed using Mean Zonal Compliance (MZC) method of assessment. MZC is the method suported by the drinking water regulator in Northern Ireland.

NI Water aims to provide high quality drinking water, in a cost effective manner, to meet the requirements of existing and future customers. By doing this we contribute to the health and well being of the community, the needs of commerce and the protection of the environment.

NI Water continues to meet the obligations placed upon it to comply with regulatory standards and increasing customers' expectations. Investing in the extension and upgrading of water treatment works remains a high priority and the current programme is detailed in Appendix 4.

During 2007, a degradation in the raw water quality led to a higher than expected number of Total Trihalomethane (THM) exceedances. These exceedances were the principal cause in Water Service / NI Water not meeting its water quality targets in 2007. The new Water Treatment Works which come into service during 2008 have been designed to provide a more modern treatment regime to reduce the amount of THMs reaching customers' taps.

A higher percentage of the Northern Ireland population, as compared to Great Britain, live in rural areas. As a result there is a greater length of watermain per head of population connected to the public supply. The average length of watermain per head of population served in Northern Ireland is estimated at 15.4 metres as compared to 6.2 metres in England and Wales, and 9.0 metres in Scotland. This means that NI Water's ongoing mains rehabilitation programme to restore or replace the existing water mains pipework requires more investment than the comparable process in Great Britain.

To assist in understanding the contents of this report, a glossary of technical terms is provided (Appendix 5).

Drinking Water Quality Summary **Year on Year**

Compliance assessed against the "Water Supply (Water Quality) Regulations (Northern Ireland) 2007"

Reporting Year	2004	2005	2006	2007
Mean Zonal Compliance (i) (average water quality at customer tap at parameter level)	98.65%	99.02%	99.34%	99.30%
Customer Tap / Supply Point Water Quality (ii) (not including Authorised Departures and including total coliforms)	98.63%	99.19%	99.42%	99.33%
Customer Tap / Supply Point Water Quality (ii) (including Authorised Departures and including total coliforms)	99.63%	99.73%	99.66%	99.63%
Service Reservoirs Water Quality	99.81%	99.71%	99.79%	99.86%
Water Treatment Works Water Quality	99.83%	99.89%	99.90%	99.92%
Overall Quality (including Authorised Departures)	99.72%	99.75%	99.75%	99.75%

Notes

(i) Mean Zonal Compliance (MZC) – method of assessment used across the UK, and supported by the Drinking Water Inspectorate as an industry comparator.

(ii) Previous methods of compliance calculation, being phased out after 2007. Included for transitional information during transfer to MZC assessment.


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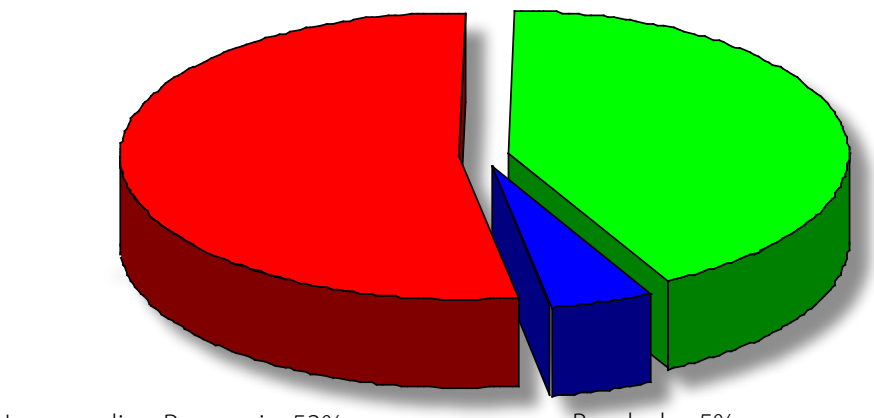
Sufficiency of **Supply**

Approximately 795,000 domestic, agricultural, commercial and business properties in Northern Ireland are connected to the public water supply.

Each day during the year we supplied some 617 million litres of high quality drinking water to customers. NI Water operates approximately 50 sources which include upland Impounding Reservoirs, Boreholes, Rivers and Loughs. Effective planning for the sufficiency of future water supplies is essential.

NI Water, through its Water Resource Strategy, plans to ensure that demand for drinking water is met for the period up to 2030. The strategy emphasises the need to rationalise existing uneconomic water sources and concentrate on the sources that can meet our needs cost-effectively and reliably.

Water supplies in Northern Ireland are obtained from three types of source, as shown: -



Leakage

NI Water currently has a Water Efficiency Plan with an associated Leakline number:

(Freephone) 08000 282 011

The Leakline number allows customers to report leaks on roads and footpaths at no cost to themselves and NI Water is committed to the prompt investigation and repair of any leaks.
The plan aims to implement and promote a range of water conservation measures that can be employed by both NI Water and its customers.

Water Safety **Plans**

A Water Safety Plan (WSP) is the most effective way of ensuring that a water supply is safe for human consumption and that it meets the health based standards and other regulatory requirements. It is based on a comprehensive risk assessment and risk management approach to all the steps in a water supply chain from catchment to consumer.

The primary objectives of a water safety plan in protecting human health and ensuring good water supply practice are the minimisation of contamination of source waters and effective treatment using appropriate processes. The majority of the regulatory requirements are monitored at the customer tap thereby ensuring the quality of the product at the point where it is made available to the customer.

The Water Industry has adopted the WSP approach to risk management from the raw water source, through water treatment and distribution to our customer's taps. As the first steps towards complete WSPs, NI Water has put in place systems to identify hazards which could potentially threaten each stage of water supply process from catchment to consumer.

These include a comprehensive catchment management plan, liaison with the Environment and Heritage Service (EHS), raw water monitoring and the completion of "Tests of Likely Significance" studies and subsequent attainment of Abstraction Licences for our raw waters. We have in place a system of audits and procedures to effectively deal with risks associated with treatment at our water treatment works. NI Water has a well established Environmental Management System certified to ISO 14001. In terms of its distribution system, it is progressing with a comprehensive Mains Rehabilitation Programme with a view to upgrading an ageing distribution system of drinking water mains. NI Water has a monitoring programme in place which covers raw waters, water at various treatment stages, drinking water in distribution and at customer tap. NI Water liaises with its customers on a wide variety of issues and where there is an exceedance of a regulatory parameter, investigations and remedial work is carried out to ensure that drinking water is regulatory compliant. Where the monitoring programme highlights a problem with customer plumbing, NI Water informs the customer, the local Environmental Health Officer and the Drinking Water Inspectorate.

Authorised Departures (ADs)

Authorised Departures (ADs) from standards in Northern Ireland are authorised and administered by the Department of the Environment's Drinking Water Inspectorate (DWI) with the agreement of the Health Authorities. The standards that have a limited AD are for Total Trihalomethanes and 2 pesticides (MCPA and MCPP(Mecoprop)) and apply to the water supplied to the Water Supply Zones listed in Appendix 2. These named Zones are supplied from Water Treatment Works that have an agreed fixed programme of works intended to make them fully compliant with the regulations.

Mean Zonal Compliance (MZC)

Under "The Water Supply (Water Quality) Regulations (Northern Ireland) 2007", assessment of the quality of water supplied to NI Water's customers is also monitored using a measurement known as "Mean Zonal Compliance". This is the average water quality supplied to our customers and is based on 40 specified para,eters measures at either customers' taps or authorised supply points. These parameters are specified by the Drinking Water Inspectorate (DWI). This method provides a simple means of summarising drinking water compliance and comparing year on year performance, and gives a consistent method of comparing water quality across the UK. It is supported by the DWI as an industry comparator allowing direct comparisons of results.

Mean Zonal Compliance introduces a consistent method of reporting across the UK and is supported by the DWI as an industry comparator allowing direct comparisons of results. The traditional method has also been included in this report as a transitional feature, but in the future Mean Zonal Compliance will be the main method of assessing compliance.

"NI Water has a well established Environmental Management System certified to ISO 14001"

Drinking Water **Quality Standards**

During 2007 Drinking Water Quality in Northern Ireland was assessed against standards set in the Water Supply (Water Quality) Regulations (Northern Ireland) 2007.

The Water Supply (Water Quality) Regulations (Northern Ireland) 2007 (the "Regulations") fully incorporate the requirements of the European Commission's Drinking Water Directive 98/83/EC (the "Directive") relating to the quality of water intended for human consumption and, for certain parameters, more stringent UK national standards. These regulations updated "The Water Supply (Water Quality) Regulations (Northern Ireland) 2002" with effect from 1st April 2007.

The Regulations set out the requirements to be met by NI Water when supplying water for domestic or food production purposes and include: -

- water quality standards for wholesomeness;
- sampling locations for monitoring purposes;
- minimum requirements for the number, frequency and types of water samples to be taken at sampling locations;
- water sample collection and testing regimes;
- maintaining records of water sample results; and
- provision and publication of information

NI Water assesses standards for water quality against the parameters as listed in Appendix 1. The standards in the Regulations are normally expressed as 'Prescribed Concentrations or Values' (PCV) and are generally specified as maximum, minimum, percentile or average concentrations for a particular substance. Standards are set to ensure that water is safe to drink and aesthetically acceptable.

The Directive and the Regulations permit standards to be relaxed in certain specified circumstances provided there is no risk to public health under a process of "Authorised Departures". These allow a time limited Authorised Departure from the regulatory limit for certain parameters, provided there is a planned programme of work at the Water Treatment Works to improve the water quality and there are no adverse health implications.

The Regulations set demanding standards for the quality of drinking water but contraventions of these standards do not necessarily imply the water represents any public health risk. These contraventions are reported to the Drinking Water Inspectorate, investigated by NI Water, and prompt remedial action taken where appropriate.

"standards are set to ensure that water is safe to drink and aesthetically acceptable"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Drinking Water Inspectorate **Technical Audit**

A Drinking Water Inspectorate (DWI), established within the Environment and Heritage Service Agency, has an independent responsibility to audit drinking water quality compliance against the standards set in the Regulations.

Each year DWI undertakes a technical audit of the measures taken by NI Water to comply with the Regulations. The technical audit process includes:

- the transfer, to DWI, of analytical results of samples taken throughout the year, from water treatment works, service reservoirs and customers' taps;
- a compliance assessment of this information against the regulatory standards; and
- carrying out an inspection programme which examines the sampling, analytical, reporting, water treatment, distribution policies and relevant procedures

In 2007, the technical audit inspection programme included:

- evaluation and implementation of strategies to meet new regulatory requirements;
- audit of four service reservoirs (Cabragh, Collone, Magheraliskmisk and Redhills);
- audits of Dorisland, Gortlenaghan and Killyhevlin Water Treatment Works (full audits);
- audits of Drumaroad and Seagahan Water Treatment Works (post-incident analysis);
- a Cryptosporidium laboratory audit (Altnagelvin);
- two analytical laboratory audits (Altnagelvin and Westland House);
- two sampling audits (Altnagelvin and Westland House);
- the Laboratory Information Management System (LIMS) audit (Northland House);
- an audit of procedures and practices used within the mains rehabilitation programme;
- a ***Cryptosporidium*** risk assessment and monitoring review; and
- progress reporting on agreed follow-up action including non-trivial parameter contraventions, previous inspections and post incident analysis

DWI made a number of recommendations and suggestions and NI Water has followed up on these issues. DWI will report on the inspections and the quality of water supplied by NI Water in its annual report, due to be published later in the year.

DWI is located at:
Klondyke Building
Cromac Avenue
Gasworks Business Park
Lower Ormeau Road
Belfast BT7 2JA

Incidents

In addition to DWI's audit of drinking water quality, DWI requires that it be notified whenever an incident or event occurs that has the potential to impact on drinking water quality. After investigation these may prove not to have had a detrimental effect on water quality and are classified in the "Drinking Water Inspector's Report" as "events" as opposed to "incidents".

During 2007, there were 20 notifiable incidents and 8 events.

Water Quality Incidents and Events

Date	Area and Estimate of Population / Properties Potentially Affected	Nature and Cause of Incident / Event	Incident or Event Classification
8-10 Jan 2007 (3 days)	Rathlin Island (130 population)	Coliform bacteria failures in final waters at the Water Treatment Works, Service Reservoir and in the Water Supply Zone.	Incident
17 Jan 2007 (1 day)	Ballinrees Water Treatment Works (79000 population)	Treatment failure led to aluminium and turbidity exceedances in the final water.	Incident
9 May 2007 (2 days)	Lisraw Service Reservoir (60 properties)	E. coli & coliform bacteria failures caused by inadequate disinfection.	Incident
16 May 2007 (1 day)	Dunore Point Water Treatment Works (30000 population potentially affected)	Coliform bacteria exceedence due to inadequate disinfection.	Incident
21 May 2007	Altmore Water Treatment Works (22000 population)	Pesticide (MCPA) exceedence and also total pesticide limit exceeded. Insufficient treatment to remove MCPA from raw water.	Incident
29 May 2007 (1 day)	Lenamore Springs Water Treatment Works & Teebane West Service Reservoir. (350 properties)	E. coli & coliform bacteria exceedances due to inadequate disinfection.	Incident
29 May 2007 (1 day)	Crocknabohil Service Reservoir (110 properties)	E. coli & coliform bacteria exceedances due to inadequate disinfection at Water Treatment Works	Incident
12 June 2007	Dorisland Water Treatment Works (170000 population)	Pesticide (MCPA) exceedence due to breakdown of carbon dosing plant.	Incident
13 June 2007 (3 days)	Scarva – Newry Main (2300 properties)	Coliform bacteria exceedances at four Service Reservoirs after inadequate disinfection.	Incident
20 June 2007 (1 day)	Ballymullock Service Reservoir (400 properties)	Coliform bacteria exceedence due to inadequate disinfection.	Incident
3 July 2007 (1 day)	Layde Service Reservoir (8 properties)	E. coli & coliform bacteria exceedances due to inadequate disinfection and possible ingress.	Incident
19 July 2007 (2 days)	Altmore Water Treatment Works (22000 population)	Treatment difficulties led to aluminium exceedances in the works final water and in supply.	Incident
19 July 2007 (3 days)	Killylane Water Supply Zone (3200 properties)	E. coli & coliform bacteria exceedances due to inadequate disinfection.	Incident

Date	Area and Estimate of Population / Properties Potentially Affected	Nature and Cause of Incident / Event	Incident or Event Classification
July – Sept 2007 (2 months)	Drumaroad Supply Area (250000 population)	Aluminium and manganese exceedances due to a number of factors.	Incident
2 October 2007 (2 days)	Loughans Service Reservoir (120 properties)	E. coli & coliform bacteria exceedances following ingress.	Incident
5 October 2007 (4 days)	Coast Road, Ballygalley (50 properties)	Coliform bacteria exceedence due to inadequate disinfection.	Incident
26-30 October 2007 (5 days)	Ards Boreholes @ Ballycullen (74500 population)	Introduction of new trunk main led to contraventions of the turbidity standard.	Incident
1 November 2007 (5 hours)	Drumaroad Water Treatment Works (250000 population)	Treatment difficulties led to aluminium exceedances in the works final water.	Incident
9 November 2007 (2 days)	Stradreagh Water Treatment Works (2500 population)	E. coli & coliform bacteria exceedances due to inadequate disinfection.	Incident
21-24 December 2007 (4 days)	Moyola Water Treatment Works (66000 population)	Mechanical failure on secondary filters led to turbidity exceedances.	Incident
5 February 2007 (1 day)	Carron Hill Water Treatment Works (10000 population)	E. coli & coliform bacteria exceedances reported due to unrepresentative sampling.	Event
27 April 2007 (1 day)	Carmoney Water Treatment Works (80000 Population)	Coliform bacteria exceedence reported. No apparent reason.	Event
12 June 2007 (1 day)	Ballysallagh Water Treatment Works (22500 population)	Coliform bacteria exceedence reported. No apparent reason.	Event
13 June 2007 (1 day)	Seagahan Water Treatment Works (15000 population)	Coliform bacteria exceedence reported. No apparent reason.	Event
13 June 2007 (1 day)	Carron Hill Water Treatment Works (10000 population)	Coliform bacteria exceedence reported. No apparent reason.	Event
18 June 2007 (1 day)	Lough Fea Water Treatment Works (50000 population)	E. coli & coliform bacteria exceedances reported. No apparent reason.	Event
6 September 2007 (1 day)	Dunore Point Water Treatment Works (30000 properties)	Coliform bacteria exceedence reported. No apparent reason.	Event
20-31 December 2007	Shanmoy Borehole Water Treatment works (24000 population)	Turbidity exceedances due to naturally occurring particles.	Event

Regulatory **Enforcement**

During 2007 DWI monitored NI Water's progress on the implementation of correctve action against 3 "Formal Notice Action Letters" issued in 2006 - these require an ongoing implementation of targeted capital investment by NI Water at Clay Lake and Killylane Water Treatment Works due to THM exceedances as well as Drumharvey Service Reservoir due to bacteriological exceedances.

DWI also issued 3 "Consideration of Provisional Enforcement Orders" - these related to 2 of the major PPP water treatment works upgrade projects which come into service in 2008 at Dunmore Point and Castor Bay Water Treatment Works, as well as targeted capital investment at Seagahan Water Treatment Works - all of these orders regarding THM exceedances.

"an ongoing implementation of targeted capital investment "

Monitoring **Drinking Water Quality**

The Regulations necessitate a thorough and extensive water sampling programme to be undertaken, to monitor water quality throughout the supply and distribution systems. The sampling locations and frequencies for the monitoring of drinking water quality are specified in the Regulations. These are audited by the Drinking Water Inspectorate (DWI). The mandatory sampling programme requires water samples to be collected regularly at water treatment works, at service reservoirs and water towers used to store treated water and at customers' taps in the water supply zones.

Under the Regulations, samples to be analysed for parameters which do not change in the supply watermain may be collected from Authorised Supply Points. These samples are collected from the final distribution point of the Water Treatment Works, and are considered under the Regulations to be equivalent to samples collected from the customer tap. All samples are carefully collected, handled and transported to ensure that they accurately represent the water quality which customers receive. NI Water employs skilled and experienced sampling staff for the collection and delivery of the regulatory samples to the laboratories. All sampling staff wear uniforms and carry identity cards when they call upon customers to take a sample.

Samples collected from customers' taps are taken randomly in each water supply zone. A water supply zone is a designated area of no more than 100,000 population supplied with water by one treatment works or blended water from several works. The number and boundaries of water supply zones are subject to change according to operational requirements, as supply sources to areas are adjusted to meet demand and infrastructure developments. On this basis 62 water suppley zones were monitored during the periodof this report.

The parameters for which samples are tested include: -

- microbiological, e.g. Coliform bacteria
- physical, e.g. pH (Hydrogen ion)
- chemical, e.g. Iron, Manganese, Lead and Nitrate
- aesthetic, e.g. Taste, Odour and Colour

Compliance with the drinking water standards is determined by comparing the results of laboratory analysis of water samples with the relevant parameter PCV. Where monitoring indicates that a standard has not been met, appropriate immediate investigation and remedial action is undertaken to ensure that the water supply does not present any public health risk. Sampling programmes are adjusted and increased testing may be scheduled in the water supply zone for the parameter involved. NI Water will at all times liaise with the DWI and the relevant Health Authorities to ensure customer safety.

"where monitoring indicates that a standard has not been met, appropriate immediate investigation and remedial action is undertaken"

Quality **Assurance**

The Regulations require water quality to be monitored using analytical systems which can demonstrate that appropriate accuracy is achieved and maintained. NI Water attaches great importance to the integrity of the analysis and for this reason applies stringent laboratory analytical quality control procedures. These systems and procedures are subject to external inspection and audit by the Drinking Water Inspectorate and an assessment of NI Water's performance will be included in the Inspectorate's annual report.

NI Water has achieved the requirements of the Drinking Water Testing Specification, a national scheme agreed between the Drinking Water Inspectorate and the United Kingdom Accreditation Service for quality assurance within laboratories carrying out analysis for the water industry.

In addition to this, both NI Water Testing Laboratories have attained the necessary standard of analytical excellence and have been awarded United Kingdom Accreditation Service (UKAS) accreditation. UKAS external auditors continuously monitor this accreditation.

The importance of rapid detection of ***Cryptosporidium*** oocysts has resulted in a ***Cryptosporidium*** Analytical Unit being established at the Altnagelvin Laboratory. This Unit has Drinking Water Inspectorate approval and is instrumental in the development of new accredited methods for the water industry.

"both NI Water Testing Laboratories have attained the necessary standard of analytical excellence and have been awarded UKAS accreditation"


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Waterline: 08457 440088
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Water Quality **Summary**

NI Water Sites in Service

During 2007, the numbers of NI Water sites in service were:

Location Type	Number in Service
Water Treatment Works	43
Service Reservoirs	342
Water Supply Zones	62
Authorised Supply Points (see glossary)	43

Overall Water Quality

111,994 microbiological, physical and chemical tests were carried out for Schedule 1 and zonal total coliform (as set out in Appendix 3) parameters on water samples taken from water treatment works, service reservoirs and customers' taps in the year 2007. 111,548 of these tests complied with the regulatory standards giving an overall percentage compliance of 99.60% including authorised departures.

Microbiological Quality

Water leaving water treatment works is disinfected with chlorine to safeguard public health by destroying microorganisms. This is the most important part of the water treatment process and is monitored for effectiveness at water treatment works, service reservoirs and in the distribution system at customers' taps.

To ensure the wholesomeness of water supplied, treated water is regularly examined for total coliforms and faecal coliforms (E. coli). The presence of these organisms may indicate potential microbiological contamination of water supplies, and if they are detected in drinking water, immediate action is taken to identify the source and to minimise any risk to public health.

Many instances of microbiological failure in samples taken from customers' taps are due to contamination of the tap itself, in particular with mixer type kitchen taps. For this reason if a positive result is obtained, investigations are immediately carried out to identify if the positive result is due to the specific tap or the general system.

A summary of the microbiological quality of water supplied in 2007 is given below.

Water Leaving Treatment Works

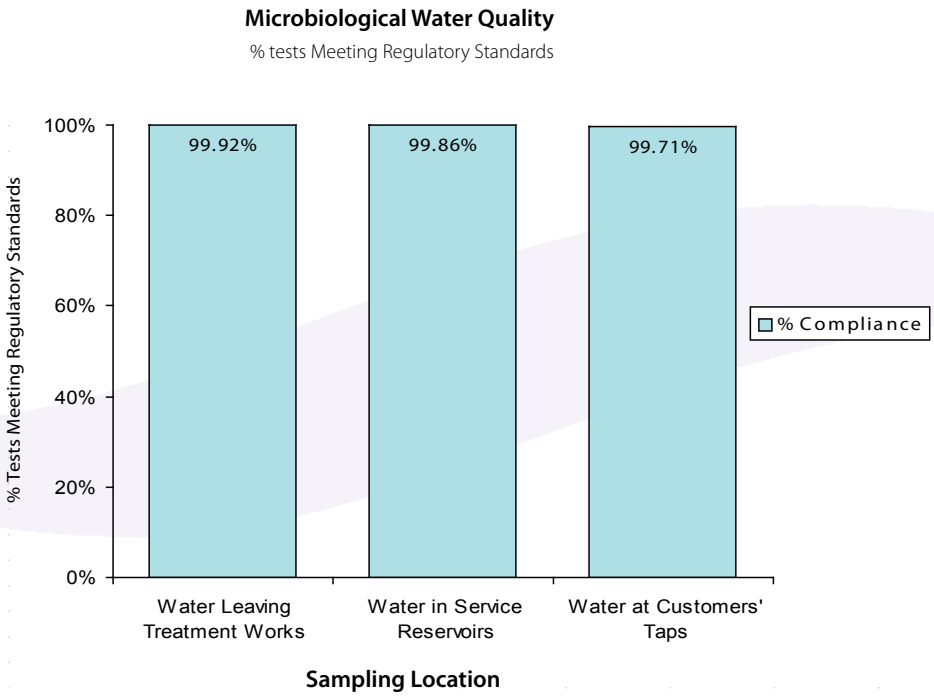
- 9,471 samples were taken and examined for coliforms. Of these, total coliforms were absent from 99.88% of samples and E. coli from 99.96%.

Water in Service Reservoirs

- 17,581 samples were taken and examined for coliforms. Of these, total coliforms were absent from 99.76% of samples and E. coli from 99.97%.

Water at Customers' Taps

- 5,568 samples were taken from customers' taps and examined for coliforms. Of these, total coliforms were absent from 99.44% of samples and E. coli from 99.95% of samples. 464 samples were taken from customer's taps and examined for Enterococci, and of these Enterococci was absent from all samples. Follow up investigations determined that the majority of coliform failures were caused by the condition of the actual customer tap at the time of sampling.



Overall Water Quality

Overall Water Quality					
	Number of Analytical Tests	Number of Tests Exceeding PCV	% Compliance with Regulatory Standards	Number of Tests Exceeding PCV or Authorised Departures	% Compliance with Regulatory Standards including Authorised Departures
Water Leaving Treatment Works					
Total Coliform	9,471	11	99.88	11	99.88
E. coli	9,471	4	99.96	4	99.96
Microbiological Total	18,942	15	99.92	15	99.92
Nitrite	387	0	100.00	0	100.00
Total	**19,329**	**15**	**99.92**	**15**	**99.92**
Water in Service Reservoirs					
Total Coliform	17,581	43	99.76	43	99.76
E. coli	17,581	5	99.97	5	99.97
Total	**35,162**	**48**	**99.86**	**48**	**99.86**
Water at Customer's Taps or Authorised Supply Points					
Total Coliform	5,568	31	99.44	31	99.44
E. coli	5,568	3	99.95	3	99.95
Enterococci	464	0	100.00	0	100.00
Microbiological Total	11,600	34	99.71	34	99.71
Zone Chemical Analysis	53,400	343	98.53	175	99.25
Supply Point Chemical Analysis	22,503	6	99.97	6	99.97
Total	**57,503**	**383**	**99.33**	**215**	**99.63**
Overall Water Quality Total	**111,994**	**446**	**99.60**	**278**	**99.75**

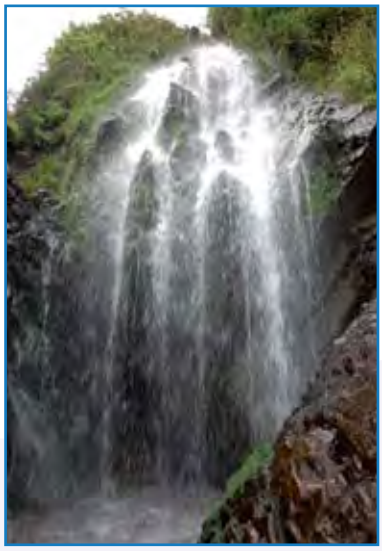
Note: Total coliform results at customers' taps are not used in the Mean Zonal Compliance calculations in Appendix 3.

Physical and Chemical Quality

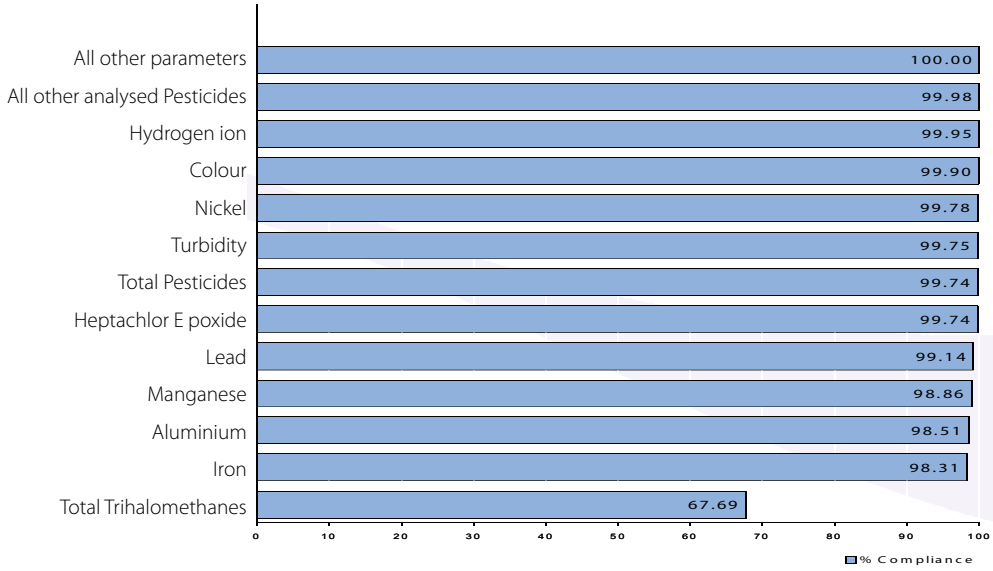
Physical and chemical quality standards apply to water supplied at customers' taps. The Regulations lay down the required sampling frequency for each parameter or group of parameters dependent on the resident population of the water supply zones.

Appendix 3 shows the extent of NI Water's compliance with the regulatory standards at both customer tap and authorised supply point. For most parameters, compliance is judged on the basis of the results of individual samples. If a single sample exceeds the PCV, that supply is deemed not to comply with the regulatory standards, even if the cause is outside NI Water's control, e.g. defective plumbing within premises. Improved compliance will be achieved through the water treatment works investment programme and thereafter through improvements to the distribution system. Appendix 3 also shows the Mean Zonal Compliance achieved by NI Water for 2007.

- In 2007 a total of 45,688 physical and chemical parameters analysed for, achieved 100% compliance.



Physical and Chemical Water Quality at Customer Tap or Authorised Supply Point
Mean Zonal Compliance Parameter



Water Quality **Issues**

Total Trihalomethanes (THMs)

THMs are chlorination by-products arising from the reaction of chlorine, used for disinfection, with natural organic material present in water. The maintenance of microbiological quality (and hence the use of chlorine) is NI Water's main priority. NI Water's water abstractions are predominantly drawn from surface sources, which can contain these organic materials.

The water treatment works investment programme is designed to provide improved treatment to reduce organic matter prior to chlorination and thereby reduce THM levels. Improved compliance is expected as improvements to water treatment works and distribution system are completed. During 2007 NI Water had a higher than expected number of THM failures largely as a result of higher than usual THM levels in zones fed from slow sand filter works. These works are due to be upgraded or alternative sources used to supply these zones in the future.

An industry recognised independent expert engaged by NI Water determined that "…the single largest factor appears to be increased natural organic matter in the raw water driven by two relatively dry years and particularly the following period of very intense rainfall. This is reflected in reports of increased peaks of THMs from several water companies in England and Wales."

In 2008 five of the existing NI Water Water Treatment Works (including the major non-compliant slow sand filter works) are due to be replaced through a £110 million capital investment under the Alpha PPP Contract. These new Water Treatment Works have been designed to provide a more effective treatment regime to reduce the amount of THMs in the distribution system, providing higher quality water and preventing exceedances. In the interim NI Water has carried out remedial work, where possible, to ensure that THM levels in drinking water supplied from the existing plants are restored to lower levels. This is part of a THM reduction action plan.

Time limited Authorised Departures for THMs are in place in many of the Water Supply Zones which exceeded the THM regulatory PCV level. During the period of the report, there were 42 exceedances of the Authorised Departure level in these zones, the rest not exceeding the agreed authorised limits.

While the above programmes of work are being completed, NI Water is constantly reviewing its operational procedures to reduce THM levels in the distribution system, whilst maintaining microbiological quality.

Aluminium

Aluminium can be present in water supplies as a natural constituent due to the nature and structure of the ground from which the supplies are taken. Water supply zones served from the Silent Valley source in the Mourne Mountains have naturally occurring aluminium in their water supplies and the new treatment facilities at Drumaroad and Fofanny Water Treatment Works will lower these levels to below the regulatory standard.

Aluminium compounds are used at some water treatment works as coagulants, for the removal of suspended matter and impurities. The coagulant is subsequently removed, along with the impurities, before the water leaves the treatment works.

The standard set for aluminium is based on aesthetic considerations. A number of water supplies may contain concentrations of aluminium which could exceed the standard from time to time because of changes in raw water quality or treatment process fluctuations. These treatment processes are being reviewed and upgraded where required to lower the aluminium levels to below regulatory levels.

Iron

The iron standard has been set for aesthetic reasons as levels persistently above the standard can give rise to discoloured water and particulate manner. Where the standard for iron has not been met, this may be due to problems of corrosion of iron watermains. There is an ongoing programme of scouring and cleaning of the distribution system to minimise the problem. In addition, NI Water has an ongoing Water Mains Rehabilitation Programme in which supply zones that experience water quality and other supply problems are subjected to a detailed zonal study. These detailed zonal studies include the analysis of historic water quality data (including iron) and the implementation of targeted water sampling and analysis programmes to determine the nature and extent of the water quality problems. Appropriate solutions to the problems are then developed which include mains cleaning and renovation and replacement of parts of the distribution system. Implementation of the solutions is undertaken either by NI Water or its contractors.

Hydrogen ion Concentration (pH)

Hydrogen ion Concentration (pH) is used as a measure of the acidity or alkalinity of water supplies. In Northern Ireland many upland waters used for water supply contain organic matter derived from peat which is acidic by nature.

The pH of water supplied is adjusted to control the corrosion of watermains and as a preventative measure to reduce the uptake of metals such as lead, copper and zinc from customers' plumbing.

Where the standard for pH has not been met in treated water, this may be related to a problem at a water treatment works, or occasionally from newly installed cement lined water mains in the distribution systems. As water treatment works are upgraded the number of exceedances arising from this source should decrease.

Lead

Water leaving treatment works and in the distribution systems contains only trace amounts of lead. However, where lead has been used for service pipes between the watermain and the kitchen tap or for domestic plumbing, there may be a risk of concentrations at the customers' tap exceeding the lead standard.

Many older properties still have service pipes and internal plumbing wholly or partly comprised of lead. If a sample is found to exceed the limit for lead in drinking water, both the customer and the local Environmental Health Officer are notified. NI Water will replace free of charge, any of its lead pipes supplying a property, if it receives a written request from a customer who has replaced the portion of lead service pipe for which the householder is responsible. A leaflet on lead in drinking water "Have you got lead pipes?" is available, free of charge, from NI Water's Customer Service Units.
All major supplies in Northern Ireland are now being treated a small amount of orthophosphoric acid, which forms a protective coating over lead pipes, to minimise levels of lead in the water supply. This dosing is reviewed and authorised by the Drinking Water Inspectorate.

The Water Mains Rehabilitation Programme detailed Zonal studies referred to earlier includes sampling and testing for lead and aims to identify the presence of lead communication pipes in a zone. Also, where water mains are being rehabilitated, NI Water requires any lead communication pipes encountered to be replaced to the edge of the property.

Manganese

Manganese occurs naturally in many water sources. Concentrations can vary seasonally or be attributed to the disturbance of accumulated deposits at the bottom of reservoirs when the water is drawn down or when water circulation occurs. A number of exceedances in 2007 were attributed to the uptake of Manganese from the distribution system following a change in raw water pH. The standard for manganese has been set for aesthetic reasons to prevent unpleasant tastes, staining or discoloured water.

Pesticides

Pesticides include insecticides, herbicides, fungicides and algaecides. These can find their way into watercourses from a variety of sources, mainly from use in agriculture or weed control. NI Water has an ongoing pesticide monitoring programme and currently analyses samples for 48 individual pesticides. NI Water constantly liaises with other regulatory bodies in Northern Ireland such as Environment and Heritage Service regarding the control of pesticide usage.

The pesticide exceedances were for some of the more commonly used pesticides – in particular MCPA and a single exceedance of Heptachlor Epoxide.

NI Water is engaged on an ongoing series of catchment management plans which include looking at pesticide usage and control.

Turbidity

Particulate matter, usually the re-suspension of sediments present in the distribution system, affects the turbidity of drinking water. Systematic flushing of the local pipe work usually restores water quality.

Nickel

A single exceedance of the Nickel standard was detected in 2007. Subsequent resamples were all clear, and it is likely that the exceedance was due to degradation of the tap where the sample was taken.

Other Parameters

Several exceedances were recorded for colour. These were nvestigated and no repeat exceedances were recorded.

Summary

All exceedances of the regulatory standard are investigated following procedures agreed with the Health Authorities and the Drinking Water Inspectorate. Closure of an event cannot take place without their approval.

Investing **for the Future**

Water Treatment and the Distribution System

During the period of this report work continued on the on-going programme of improvements to our Water Treatment Works (WTW). NI Water has completed the improvements to Carron Hill / Lough Ross WTW, close to Crossmaglen while improvement work at Clay Lake WTW which serves Keady and the surrounding area is nearing completion. During 2008 work on upgrading the water treatment facilities at Seagahan, Lough Bradan and Carmoney is scheduled to commence.

Work is planned for the rehabilitation of pipework in more than 71 zonal areas throughout Northern Ireland. Of these 71 areas, 36 studies have been completed with 20 on-going. Studies on 8 of the remaining zones are about to commence while the other 7 zonal studies have yet to be programmed. As a result of these studies some 50 construction work-packages have been initiated. It is expected that 39 work-packages will be complete or in progress during 2008 and the remaining 11 are programmed to commence during 2008/09. Alongside the rehabilitation programme, other frameworks currently have over 80 contracts due to start.

Work continued throughout the year to implement the recommendations of the Water Resource Strategy. The Strategy provides NI Water with a robust basis for the development and management of secure and sustainable water resources in Northern Ireland.

Asset Management

The second DRD Water Service Asset Management Plan (NIAMP2) was completed in 2003, and set out a possible long term capital investment strategy to meet the then known statutory obligations. Elements of NIAMP2 were subsequently revised and incorporated into the Strategic Business Plan, which was drafted in 2006 and covers the 3 year period from 1st April 2007 (when DRD Water Service became NI Water) to 31st March 2010.

NI Water will now be regulated by 'price cap regulation' whereby the Economic Regulator, which for NI Water is the Northern Ireland Authority for Utility Regulation (NIAUR), will set limits on the prices that can be charged to customers for fixed periods. The process of reviewing the companies' submission, requesting income, is called the 'Price Control'. NIAUR has required that the first price control period will commence on 1st April 2010, be known as PC10, and last for a 2 year period ending 31st March 2012. NI Water is required to make a PC10 submission to the UR in May 2009. At the core of the PC10 submission will be the third Asset Management Plan (NIAMP3) which will set out the capital investment needed to maintain base levels of service, the investment to cover enhancements associated with improved quality driven by legislation, investments linked to maintaining the supply / demand balance (having more capacity that demand) and investments linked to improved levels of customer service. NI Water is currently working with its Environmental Regulators to estimate the cost of possible NIAMP3 investments related to quality enhancements for a number of scenarios to inform the DRD Minister and the NIAUR before the end of 2008. The final quality targets will be set by the DRD Minister in consultation with UR, before the final NIAMP3 is developed by NI Water and submitted as part of the PC10 submission. A similar process will be followed for the subsequent Price Control, which will be called PC12, and will cover the 5 year period from 1st April 2012 to 31st March 2017.

Research and Development

NI Water through its Asset Management Research & Development (R&D) section undertakes a programme of applied research and technology development to support the development of standards and best practice, and promote technical innovation across all of NI Water's activities.

This programme is driven by the desire to improve quality, whilst making efficiency gains, and contains several projects designed to improve drinking water quality and consented discharges compliance, a better service to our customers and protecting the environment.

NI Water together with other UK Water Companies, employs research bodies such as the United Kingdom Water Industry Research Ltd (UKWIR) and the Water Research Centre (WRc) to provide a collaborative programme of research work tailored to suit the needs of the UK water industry. Examples of the areas in which this work is carried out are given below:

- As a member of UKWIR, an organisation that provides a framework for the procurement of a programme of common research for UK water operators on "one-voice" issues. Projects undertaken by UKWIR include work in such areas as:

- Climate Change
- Developing a framework for
- drinking water safety plans
- Customer Issues
- Regulation
- Environment & Quality
- Drinking Water
- Sewage Sludge

- NI Water also participates with other utilities in a programme of collaborative research managed by WRc. This programme covers a range of specific topics of interest to smaller groups of water companies including:

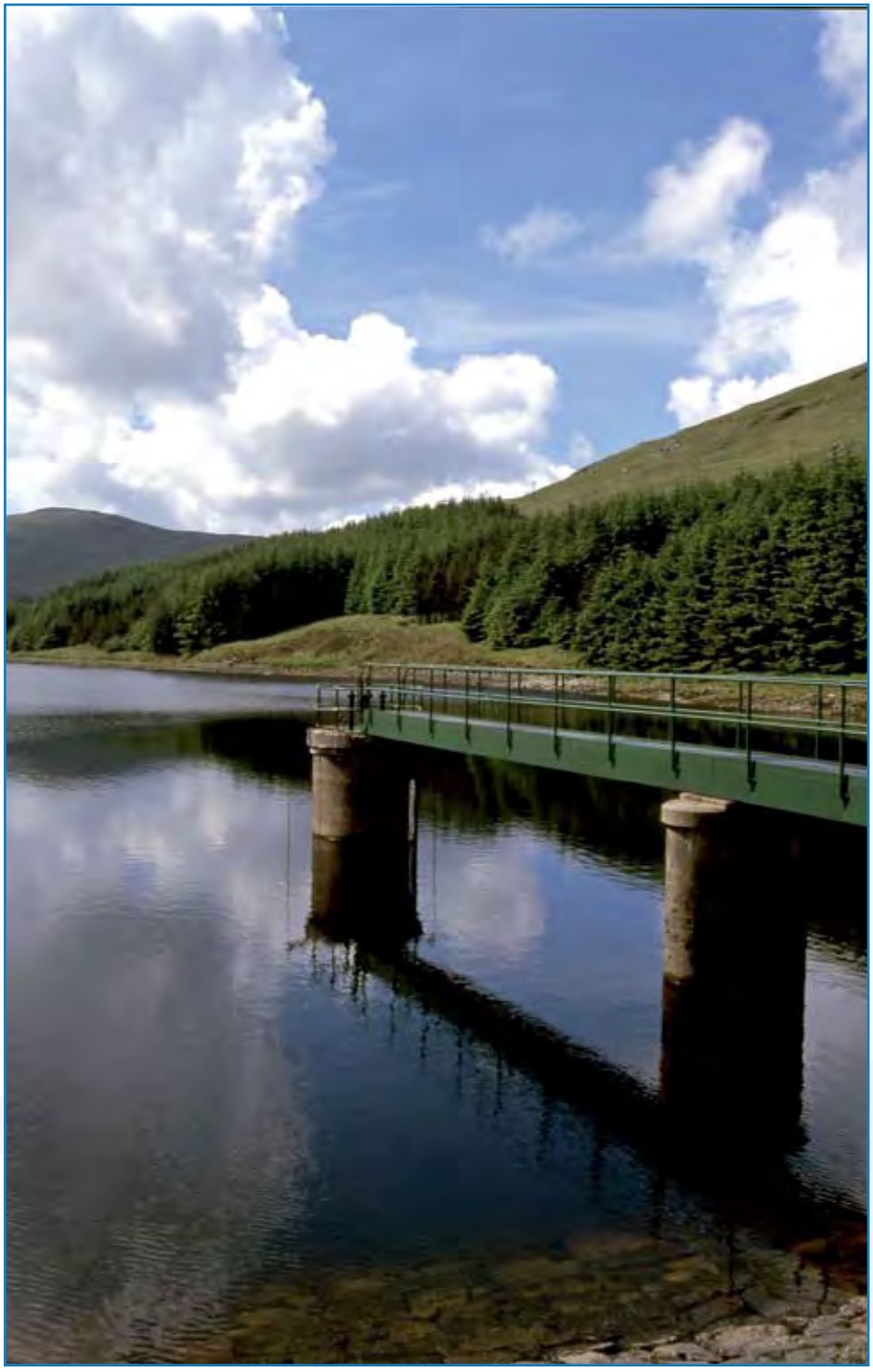
- Asset Management
- Leakage
- Sewerage
- Drinking Water Quality
- Wastewater treatment
- Sustainability
- Climate change

The R&D section also supports our business in other areas such as identifying appropriate treatment processes and development of strategy to improve efficiency through ensuring consistency and standardisation across a range of business activities.

The R&D section provides knowledge and technology transfer by identifying and facilitating appropriate workshops, dissemination of research outputs and updates the section informs directors and managers of current technological developments, industry best practice and providing a research library facility for NI Water staff.

The section also manages projects which require industry consultants to provide expertise to bridge knowledge gaps and solve problems specific to NI Water.

Through the R&D section NI Water collaborates with and supports local and other UK university research projects and we are members of Queens University Environmental Science and Technology Research Centre (QUESTOR) which is an international environmental research organisation based at Queens University in Belfast.



Public **Information**

Drinking Water Register

A Drinking Water Register is maintained recording detailed water quality results for each water supply zone.

The Register is available for inspection, free of charge, during normal working office hours at the customer relations centre below. Customers can examine any record on the register and obtain a free copy of the information for the water supply zone they live in. A charge may be made for printed information on other zones.

Customers, who wish to receive information about the quality of water in their water supply zone by post, can write to the address listed below:

Customer Relations Centre
4th Floor
Capital House
3 Upper Queen St
Belfast BT1 6PU

Customers can alternatively contact the Customer Relations Centre on:
08457 440088

There is also a text number for customers who have hearing difficulties:

08457 023206

Calls to these numbers are charged at the local rate.

Customers may also contact Customer Services by email on:

waterline@niwater.com

Further information for customers may be obtained at the following website:

http://www.niwater.com

This site also contains electronic versions of recent Water Quality reports.

Customer Services

Staff in the Customer Relations Centre record details and the nature of all enquiries, requests for services, emergencies and complaints. All enquiries etc. are logged and routed directly to staff who will investigate the matter and resolve the problem as quickly as possible.

Customer Services produces a range of leaflets about services provided, including those designed to give customers the opportunity to learn more about water quality standards, water efficiency and the need to use water wisely. The leaflets can be obtained from the Customer Relations Centre or may be viewed on the Website.

"customers can examine any record on the register and obtain a free copy of the information"

Appendix 1

Drinking Water Quality Standards

SCHEDULE 1
PRESCRIBED CONCENTRATIONS AND VALUES

TABLE A.
MICROBIOLOGICAL PARAMETERS

Part I: Directive requirements

Parameters	Concentration or Value (maximum)	Units of Measurement	Point of compliance
Enterococci	0	number/100ml	Customers' taps
Escherichia coli (E. coli)	0	number/100ml	Customers' taps
Coliform bacteria	0	number/100ml	Customers' taps **(i)**

TABLE B.
CHEMICAL PARAMETERS

Part I: Directive requirements

Parameters	Concentration or Value (maximum)	Units of Measurement	Point of compliance
Acrylamide	0.10	µg/l	**(ii)**
Antimony	5	µg Sb/l	Customers' taps
Arsenic	10	µg As/l	Customers' taps
Benzene	1	µg/l	Customers' taps
Benzo (a) pyrene	0.01	µg/l	Customers' taps
Boron	1	mg B/l	Customers' taps
Bromate	10	µg BrO_3/l	Customers' taps
Cadmium	5	µg Cd/l	Customers' taps
Chromium	50	µg Cr/l	Customers' taps
Copper	2	mg Cu/l	Customers' taps
Cyanide	50	µg CN/l	Customers' taps
1.2 Dichloroethane	3	µg/l	Customers' taps*
Fluoride	1.5	mg F/l	Customers' taps
Lead	(a) 25, from 25th December 2003 until immediately before 25th December 2013	µg Pb/l	Customers' taps
	(b) 10, on and after 25th December 2013	µg Pb/l	Customers' taps
Mercury	1	µg Hg/l	Customers' taps
Nickel	20	µg Ni/l	Customers' taps
Nitrate	50	mg NO3/l	Customers' taps

Part I: Directive requirements (cont.)

Nitrite	0.5	mg NO2/l	Customers' taps
Aldrin	0.03	µg/l	Customers' taps*
Dieldrin	0.03	µg/l	Customers' taps*
Heptachlor	0.03	µg/l	Customers' taps*
Heptachlor epoxide	0.03	µg/l	Customers' taps*
Other pesticides	0.1	µg/l	Customers' taps*
Total Pesticides **(iii)**	0.5	µg/l	Customers' taps*
PAH - Sum of four substances **(iv)**	0.1	µg/l	Customers' taps
Selenium	10	µg Se/l	Customers' taps
Tetrachloroethene/ Trichloroethene – Sum **(v)**	10	µg/l	Customers' taps*
Total Trihalomethanes **(vi)**	100	µg/l	Customers' taps
Vinyl chloride	0.50	µg/l	**(ii)**

Notes:

(i) Water Service, with the agreement of the Drinking Water Inspectorate, includes Total Coliforms within the Part I: Directive Requirements table for statistical purposes.

(ii) The parametric value refers to the residual monomer concentration in the water as calculated according to specifications of the maximum release from the corresponding polymer in contact with the water. This is controlled by product specification.

(iii) Total Pesticides: means the sum of the concentrations of the individual pesticides detected and quantified in the monitoring procedure.

(iv) The specified compounds are:

- benzo(b)fluoranthene
- benzo(k)fluoranthene
- benzo(ghi)perylene
- indeno (1,2,3-cd) pyrene.

(v) The parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.

(vi) The specified compounds are:

- chloroform
- bromoform
- dibromochloromethane
- bromodichloromethane

* May be monitored from samples of water leaving treatment works or other supply point, as no significant change during distribution.

Parameters	Concentration or Value (maximum unless otherwise stated)	Units of Measurement	Point of compliance
Aluminium	200	µg Al/l	Customers' taps
Colour	20	mg/l Pt/Co	Customers' taps
Hydrogen ion	10	pH value	Customers' taps
	6.5 (minimum)	pH value	
Iron	200	µg Fe/l	Customers' taps
Manganese	50	µg Mn/l	Customers' taps
Odour	3 at 25°C	Dilution number	Customers' taps
Sodium	200	mg Na/l	Customers' taps
Taste	3 at 25°C	Dilution number	Customers' taps
Tetrachloromethane	3	µg/l	Customers' taps
Turbidity	4	NTU	Customers' taps

SCHEDULE 2
INDICATOR PARAMETERS

Parameters	Specification Concentration or Value (maximum) or State	Units of Measurement	Point of monitoring
Ammonium	0.5	mg NH4/l	Customers' taps
Chloride **(i)**	250	mg Cl/l	Supply point*
Clostridium perfringens (including spores)	0	Number/100ml	Supply point*
Colony counts	No abnormal change	Number/1ml at 22°C Number/1ml at 37°C	Customers' taps, service reservoirs and treatment works
Conductivity **(i)**	2500	µS/cm at 20°C	Supply point*
Hydrogen ion	9.5	pH value	Customers' taps
Sulphate **(i)**	250	mg SO4/l	Supply point*
Total indicative dose (for radioactivity) **(ii)**	0.1	mSv/year	Supply point*
Total organic carbon (TOC)	No abnormal change	mg C/l	Supply point*
Tritium (for radioactivity)	100	Bq/l	Supply point*
Turbidity	1	NTU	Treatment works

Notes:

(i) The water should not be aggressive.

(ii) Excluding tritium, potassium-40, radon and radon decay products.

* May be monitored from samples of water leaving treatment works or other supply point, as no significant change during distribution.

Explanatory Notes

Measurement Units:
mg/l means one part in a million.
µg/l means one part in a thousand million.

Parameter:
A parameter refers to any substance, organism or property listed above.

Appendix 2

2007 Authorised Departures by Water Supply Zones under Regulation 37

Site Code	Zone/Supply Point Name	Parameter	AD Value	AD Start	AD End
W2501	Altmore	MCPA	0.5	22-Nov-07	24-Dec-09
W3505	Lough Cowey	MCPP(Mecoprop)	0.3	01-Jan-07	24-Dec-09
Z104	Ballymena Borough	Total Trihalomethanes	150	01-Jan-07	15-Oct-09
Z109	Dunore North	Total Trihalomethanes	150	01-Jan-07	15-Oct-09
Z112	Mormeal	Total Trihalomethanes	150	01-Jan-07	16-Jul-09
Z113	Moyola	Total Trihalomethanes	150	01-Jan-07	16-Jul-09
Z116	Unagh	Total Trihalomethanes	150	01-Jan-07	16-Jul-09
Z201	Altmore	Total Trihalomethanes	150	01-Jan-07	24-Dec-09
Z202	Altmore-Gortlenaghan	Total Trihalomethanes	150	01-Jan-07	24-Dec-09
Z209	Castor Bay-Shanmoy	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z210	Clay Lake	Total Trihalomethanes	150	08-Sep-06	30-Nov-07
Z219	Seagahan	Total Trihalomethanes	150	01-Jan-07	24-Dec-09
Z221	Banbridge-Babylon Hill	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z222	Ballydougan-Ballyhannon	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z223	Lurgan-Magheraliskmisk	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z225	Newry-Ballintemple	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z227	Castor Bay-Richill	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z309	Dunmurry	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z310	Dunore East	Total Trihalomethanes	150	01-Jan-07	15-Oct-09
Z311	Holywood	Total Trihalomethanes	150	01-Jan-07	31-Oct-08
Z314	Lisburn North	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z316	Lough Cowey	Total Trihalomethanes	150	01-Jan-07	24-Dec-09
Z318	Oldpark	Total Trihalomethanes	150	01-Jan-07	15-Oct-09
Z320	Stoneyford	Total Trihalomethanes	150	01-Jan-07	24-Sep-09
Z321	Woodvale	Total Trihalomethanes	150	01-Jan-07	15-Oct-09
Z410	Lough Braden	Total Trihalomethanes	150	07-Aug-07	06-Aug-10

Programmes of Work to meet Authorised Departure Requirements

During 2007, certain planned and remedial programmes of work to meet Authorised Departure requirements continued. These were:

Water Treatment Works	Zone code affected	Zone name affected
Dunore Point WTW	Z104	Ballymena Borough
	Z109	Dunore North
	Z310	Dunore East
	Z318	Oldpark
	Z321	Woodvale
Moyola WTW	Z112	Mormeal
	Z113	Moyola
	Z116	Unagh
Castor Bay WTW	Z209	Castor Bay - Shanmoy
	Z221	Banbridge - Babylon Hill
	Z222	Ballydougan - Ballyhannon
	Z223	Lurgan - Magheraliskmisk
	Z225	Newry - Ballintemple
	Z227	Castor Bay - Richill
Forked Bridge WTW	Z309	Dunmurry
	Z314	Lisburn North
	Z320	Stoneyford
Altmore WTW	Z201	Altmore
	Z202	Altmore-Gortlenaghan
Seagahan WTW	Z219	Seagahan
Creighton's Green WTW	Z311	Holywood
Lough Cowey WTW	Z316	Lough Cowey
Lough Braden WTW	Z410	Lough Braden

Appendix 3

Water Quality Report for Water Supply Zones

Schedule 1 parameters	2007 Samples	No > PCV	% > PCV	No > AD	% > AD
Enterococci	464	0	0.00%	--	--
E. coli	5568	3	0.05%	--	--
Aluminium	2012	30	1.49%	--	--
Antimony	464	0	0.00%	--	--
Arsenic	464	0	0.00%	--	--
Benzo (a) pyrene	464	0	0.00%	--	--
Bromate	464	0	0.00%	--	--
Cadmium	464	0	0.00%	--	--
Chromium	464	0	0.00%	--	--
Colour	2012	2	0.10%	--	--
Copper	464	0	0.00%	--	--
Hydrogen ion	2012	1	0.05%	--	--
Iron	2012	34	1.69%	--	--
Lead	464	4	0.86%	--	--
Manganese	2012	23	1.14%	--	--
Nickel	464	1	0.22%	--	--
Nitrate	492	0	0.00%	--	--
Nitrite	492	0	0.00%	--	--
Odour	2012	0	0.00%	--	--
Selenium	464	0	0.00%	--	--
Sodium	464	0	0.00%	--	--
Taste	2012	0	0.00%	--	--
PAH - Sum of four substances	464	0	0.00%	--	--
Total Trihalomethanes	752	243	32.31%	42	5.59%
Turbidity	2012	5	0.25%	--	--

Indicator parameters	2007 Samples	No > SPEC	% > SPEC
Total Coliforms	5568	31	0.56%
Total - Residual disinfectant	5568	0	0.00%
Free - Residual disinfectant	5568	0	0.00%
Colony Counts 37 (48hrs)	2012	0	0.00%
Colony Counts 22	2012	0	0.00%
Hydrogen ion (indicator) pH value	2012	0	0.00%
Ammonium	2012	3	0.15%

Water Quality Report for Authorised Supply Points

Schedule 1 parameters	2007 Samples	No > PCV	% > PCV	No > AD	% > AD
Benzene	388	0	0.00%	--	--
Boron	388	0	0.00%	--	--
Cyanide	388	0	0.00%	--	--
1.2 Dichloroethane	388	0	0.00%	--	--
Fluoride	387	0	0.00%	--	--
Mercury	388	0	0.00%	--	--
Aldrin	388	0	0.00%	--	--
Dieldrin	388	0	0.00%	--	--
Heptachlor	388	0	0.00%	--	--
Heptachlor Epoxide	388	1	0.26%	--	--
Total Pesticides	388	1	0.26%	--	--
All other analysed Pesticides	17460	4	0.02%	--	--
Tetrachloroethene/Trichloroethene - Sum	388	0	0.00%	--	--
Tetrachloromethane	388	0	0.00%	--	--

Indicator parameters	2007 Samples	No > SPEC	% > SPEC
Clostridium perfringens	2939	3	0.10%
Chloride	387	0	0.00%
Conductivity	2980	0	0.00%
Sulphate	387	0	0.00%
Total Organic Carbon	388	0	0.00%
Total Indicative Dose	388	0	0.00%
Tritium	388	0	0.00%

Water Quality Report for Water Treatment Works

Schedule 1 parameters	2007 Samples	No > PCV	% > PCV
Total Coliforms	9471	11	0.12%
E. coli	9471	4	0.04%
Nitrite	387	0	0.00%

Indicator parameters	2007 Samples	No > SPEC	% > SPEC
Turbidity	9471	50	0.53%
Total - Residual disinfectant	9471	0	0.00%
Free - Residual disinfectant	9471	0	0.00%
Colony Counts 37 (48hrs)	9471	0	0.00%
Colony Counts 22	9471	0	0.00%

Water Quality Report for Cryptosporidium Oocysts

Parameter	2007 Samples	No > Reporting Level	% > Reporting Level
Cryptosporidium Oocysts	130	0	0.00%

Water Quality Report for Service Reservoirs

Schedule 1 parameters	2007 Samples	No > PCV	% > PCV
Total Coliforms	17581	43	0.24%
E. coli	17581	5	0.03%

Indicator parameters	2007 Samples	No > SPEC	% > SPEC
Colony Counts 22	17581	0	0.00%
Colony Counts 37 (48hrs)	17581	0	0.00%
Total - Residual disinfectant	17581	0	0.00%
Free - Residual disinfectant	17581	0	0.00%

2007 Mean Zonal Compliance

Parameter	Number of Samples	No of fails at zone / supply point	No of zones / supply points with fails	% Zonal Compliance
Colour	2012	2	2	99.91
Turbidity	2012	5	4	99.77
Odour	2012	0	0	100.00
Taste	2012	0	0	100.00
Hydrogen ion	2012	1	1	99.98
Sodium	464	0	0	100.00
Nitrate	492	0	0	100.00
Nitrite	492	0	0	100.00
Nitrite/Nitrate Formula	492	0	0	100.00
Aluminium	2012	30	19	98.78
Iron	2012	34	22	98.29
Manganese	2012	23	20	98.87
Copper	464	0	0	100.00
Fluoride	387	0	0	100.00
Arsenic	464	0	0	100.00
Cadmium	464	0	0	100.00
Cyanide	388	0	0	100.00
Chromium	464	0	0	100.00
Mercury	388	0	0	100.00
Nickel	464	1	1	99.80
Lead	464	4	4	98.79
Antimony	464	0	0	100.00
Selenium	464	0	0	100.00
Pesticides - total substances	388	1	1	99.71
Total PAH (sum of 4 substances)	464	0	0	100.00
E. coli	5568	3	3	99.80
Enterococci	464	0	0	100.00
Boron	388	0	0	100.00
Benzo (a) pyrene	464	0	0	100.00
Tetrachloromethane	388	0	0	100.00
Tetrachloroethene/Trichloroethene - Sum	388	0	0	100.00
Total Trihalomethanes	752	243	34	79.37
1,2 Dichloroethane	388	0	0	100.00
Benzene	388	0	0	100.00
Bromate	464	0	0	100.00
Aldrin	388	0	0	100.00
Dieldrin	388	0	0	100.00
Heptachlor	388	0	0	100.00
Heptachlor epoxide	388	1	1	99.90
Pesticides - other substances (P999)	17460	4	3	99.03
Total Number of Samples / Fails	52427	352		
Mean Zonal Compliance %				**99.30**

Appendix 4

Investment Programme

Over the last number of years improvement work has been completed at the following water treatment works:

Altnahinch WTW
Ballysallagh WTW
Carron Hill WTW
Caugh Hill WTW
Derg WTW
Drumaroad WTW
Dungonnel WTW
Fofanny WTW
Killyhevlin WTW
Lough Fea WTW
Lough Macrory WTW
Rathlin Island WTW
Woodburn WTW

During 2007 NI Water continued with the construction of:

Clay Lake WTW

While construction also continued on improvements at the following PPP sites:

Ballinrees WTW
Castor Bay WTW
Dunore Point WTW
Moyola WTW

It is anticipated that during 2008 work will commence at:

Carmoney WTW
Lough Bradan WTW
Seagahan WTW

As the programme for improvement / replacement of WTWs nears completion NI Water is shifting the emphasis of upgrading work into the distribution system:

- North Down Strategic Water Main commenced in December 2005 and is scheduled for commissioning in 2008.
- Dunore to Hydepark Pumping Main Replacement commence construction in 2006 and has been supplying water since December 2006 with completion of the contract in 2007.
- Ballinrees to Limavady Water Main commenced in February 2007
- Ballinrees to Ballymoney Water main commenced in February 2007
- Castor Bay to Forked Bridge Water Main commenced in February 2007

Appendix 5

Glossary of Technical Terms

Aesthetic	Associated with the senses of taste, smell and sight.
Authorised Departure (AD)	A time limited authorised departure from the regulatory limit for certain parameters, provided that there is a planned programme of work at the water treatment works to improve the water quality and that there are no adverse health implications.
Authorised Supply Point	A sampling point within the distribution system authorised by the DWI for certain parameters, because the results of the analysis of such samples are unlikely to differ in any material respect from the results of the analysis of samples taken from customers' taps.
Catchment	The area of land that drains into a watercourse.
Chloramination	An alternative form of disinfectant, based on chlorine and ammonia, which provides a longer lasting residual disinfectant in the distribution system compared to free chlorine.
Coagulation	The process of aggregating colloidal and fine particulate matter into a settleable material.
Coliforms	A group of bacteria which may be faecal or environmental in origin.
Compliance assessment	A comparison made by the DWI of data (gathered by NI Water) against standards and other regulatory requirements.
Contravention	A breach of the regulatory requirement.
Cryptosporidiosis	The illness produced by infection with ***Cryptosporidium.***
Cryptosporidium	A protozoan parasite.
Determination	A single analytical result for a specific parameter.
Distribution systems	NI Water's network of mains, pipes, pumping stations and service reservoirs through which treated water is conveyed to customers.
Drinking Water Directive	European Council Directive (98/83/EC) relating to the quality of water intended for human consumption.

DWI	Northern Ireland Drinking Water Inspectorate - has an independent responsibility to audit drinking water quality compliance against the standards set in the Regulations.
Event	A situation affecting or threatening to affect drinking water quality.
Exceedance	Synonym for contravention (see above).
Faecal coliforms	A sub-group of coliforms, almost exclusively faecal in origin.
Filtration	The separation of suspended particulate matter from a fluid.
Groundwater	Water from aquifers or other underground sources.
Hydrogen ion	A measure of the acidity or basicity related to the concentration of the hydrogen ion (also referred to as pH).
Incident	An event where there has been a demonstrable deterioration in the quality of drinking water.
Investment programme	Investment in improvement works to water treatment works and distribution systems.
Mains rehabilitation	Restoration or replacement of water mains pipework to a proper condition.
Mean Zonal Compliance	The assessment of water quality at a parameter level based on water supply zones.
Microbiological	Associated with the study of microbes.
m3/d	Cubic metres per day.
mg/l	Milligrammes per litre.
µg/l	Microgrammes per litre.
ml	Millilitre.
Ml/d	Megalitres per day (one Ml/d is equivalent to 1,000 m3/d or 220,000 gallon/d).

Oocyst	The resistant form in which ***Cryptosporidium*** occurs in the environment, and which is capable of causing infection.
Orthophosphoric acid	A chemical dosed in low concentrations at water treatment works to minimise the uptake of lead from old pipework into customers' water.
PAHs	A group of organic compounds known as polycyclic aromatic hydrocarbons, comprising, for the purposes of the Regulations, four substances: benzo(b) fluoranthene, benzo(k)fluoranthene benzo(ghi)perylene and indeno (1,2,3-cd) pyrene,
Parameter	A parameter is any substance, organism or property listed in the regulations.
Pathogen	An organism which causes disease.
PCV	See 'Prescribed concentration or value'.
Pesticides	Any fungicide, herbicide or insecticide or related product (excluding medicines) used for the control of pests or diseases.
Plumbosolvency	The tendency for lead to dissolve in water.
Prescribed Concentration or Value	The numerical value assigned to water quality standards (PCV), defining the maximum or minimum legal concentration or value of a parameter. In certain circumstances, the DWI may authorise a time limited departure from the regulatory value. See 'Authorised Departure'.
Protozoan parasites	A single celled organism that can only survive by infecting a host.
Public register	The information made available by NI Water to the public as required by regulation 34.
Regulations	The Water Supply (Water Quality) Regulations (Northern Ireland) 2007 S.R. No.147.
Remedial action	Action taken to improve a situation.
Service reservoir (SR)	A water tower, tank or other reservoir used for the storage of treated water within the distribution system.
Springs	Groundwater appearing at the surface at the outcrop of the junction of an impermeable stratum.

Surface water	Water from rivers, impounding reservoirs or other surface water sources.
Technical audit	The means of checking by the DWI that NI Water is complying with its statutory obligations.
Toxicology	The study of the health effects of substances.
Treated water	Water treated for use for domestic purposes as defined in the Regulations.
Trihalomethanes (THMs)	A group of organic substances comprising, for the purposes of the Regulations, four substances: trichloromethane (also known as chloroform), dichlorobromomethane, dibromochloromethane and tribromomethane.
UKAS	The sole national accreditation body recognized by government to assess, against internationally agreed standards, organisations that provide certification, testing, inspection and calibration services.
Water Safety Plan	A means of ensuring that a water supply is safe for human consumption based on a comprehensive risk assessment and risk management approach to all the steps in a water supply chain from catchment to tap.
Water supply zone (Zone)	The basic unit of supply for establishing sampling frequencies, compliance with standards and information to be made publicly available.
Website	Location of information on the Internet. NI Water's website is: http://www.NIWater.com
Wholesomeness	A concept of water quality which is defined by reference to standards and other requirements set out in the Regulations.

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