Guidance and Information Requirements [Annex A] to Northern Ireland Water on Long Term Planning for Drinking Water Supplies in PC21 issued by Drinking Water Inspectorate for Northern Ireland

1. Purpose

1.1. The purpose of this Guidance Note is to provide NI Water with guidance on long term planning for the quality of drinking water supplies. This guidance supersedes previous guidance issued by the Inspectorate in relation to Annex A submissions which were made at the start of PC15 planning process.

1.3. The guidance note also provides details of arrangements for information submissions to the Inspectorate; the Inspectorate's assessment processes; and a timeline for supporting current expectations of PC21 requirements.

1.4. We will update this document as necessary to take account of developments in legislation, policy and industry good practice and future periodic reviews. The Inspectorate welcomes comments on the document, including suggestions for areas or matters not currently included.

2. Principles of approach

2.1 The Inspectorate expects NI Water to take a source to tap approach to manage their water supplies to protect the health of their consumers, and maintain consumer confidence in the supply and services provided. Central to achieving these objectives is the use of drinking water safety plans.

2.2 The delivery of this approach should be efficient and sustainable, and provide for a long term benefit for both NI Water and its consumers. The approach needs to be transparent about short and long term investment requirements, for current consumers and future generations.

2.3 For all aspects of planning, whether for event management, drought management, water resource management, maintenance management or operations management, it is a fundamental requirement that drinking water quality is always central to, and accounted for, in all cost benefit assessments of options considered. NI Water's operations and maintenance arrangements should consistently, proactively and sustainably meet all statutory obligations, while addressing any localised changes to risk profiles.

2.4 References in this Guidance Note to the Act and the Regulations are to The Water and Sewerage Services (Northern Ireland) Order 2006, and the Water Supply (Water Quality) Regulations (Northern Ireland) 2017. Links to these and other relevant key legislation can be found here.

2.5 Although the current regulatory framework is as outlined above. The European Council (EC) issued a consultation on a Recast to the current Drinking Water Directive (1998) in February 2018. Member states, including the UK are currently in negotiations with the EC on its proposals. It would be prudent for NI Water to remain engaged in the ongoing development of the Recast Directive as proposals may have an impact on long term planning (e.g. the proposal within the current draft to further reduce the drinking water quality standard for lead from 10 µg/l to 5 µg/l.)

3. Broad considerations in planning for the long term

3.1 Risk assessments

3.1.1 It is mandatory for NI Water to carry out risk assessments of all of their water supply systems, from source to tap, adopting a drinking water safety plan approach. These plans should be central to the company's short, medium and long term planning needs. Consideration should be given to assuring the risks to water supplies are assessed both on the company's ability to provide wholesome water supplies, along with where it may constitute a risk to health.

3.2 Catchment management

3.2.1 The Inspectorate supports catchment management approaches, and has previously included these as undertakings within legal instruments arising from compliance failures, or identified risks.

3.2.2 The likelihood of success of catchment management measures varies depending on the nature of the parameter, the size and nature of the catchment, the origin of the pollution and other factors. Therefore, individual proposals will be assessed on their merits.

3.2.3 The accumulation of catchment management improvements gained from a multiplicity of proactive integrated solutions (such as stakeholder engagement at both national and local levels; pollution control; raw water management; abstraction control; and raw and/or treated water blending) may in some cases negate or delay the need for, new and/or upgraded treatment processes. <u>However, catchment management alone cannot be guaranteed to reduce contaminants to acceptable levels. In such cases a dual approach is considered necessary by the Inspectorate with the implementation of suitable treatment, working alongside catchment solutions.</u>

3.3 Resource and supply management

3.3.1 Section 108(1)(b) of the Order places the following duty on NI Water that may have implications for how it develops its water resource plans:

> '*so far as reasonably practicable, to ensure, in relation to each source or combination of sources from which that undertaker supplies water to premises for domestic or food production purposes, that there is, in general, no deterioration in the quality of the water which is supplied from time to time from that source or combination of sources.*'

3.3.2 Specific matters for consideration when developing proposals should include the following:

a. for all water transfers, within different water supply areas, and for new sources, NI Water is expected to have carried out risk assessments of the potential impacts on public health, wholesomeness, and acceptability to consumers, and must meet regulatory requirements for the introduction of new sources;

b. NI Water should be satisfied that the risk assessment has considered the potential impact of mixing of different water types within its distribution network , including customer acceptability issues and the operation and maintenance requirements of that particular network (e.g. for event mitigation, water stability and age and service reservoir turnover);

c. routine operational matters to be included in these risk assessments should include assessment of the impact on optimisation of phosphoric acid dosing, pH for plumbosolvency control; other chemical stabilisation processes; and compliance with disinfection and the minimisation of disinfection by-products;

d. commissioning of new sources, that increase the risk of non-compliance, such as by discolouration, objectionable tastes and odours, nitrates or pesticides, should not be permitted until steps to mitigate those risks are in place.

3.3.4 The Inspectorate interprets the statutory requirement for ‘no deterioration’ by reference to compliance with the requirements of the Regulations, including standards. A marginal change in the concentration or level of a parameter may not be considered as deterioration if the water as supplied remains wholesome and is acceptable to consumers, provided that it can demonstrate it has considered and limited the deterioration as far as is reasonably practical to do so.

3.4 Raw water deterioration

3.4.1 Localised changes to raw water quality can occur requiring a review of existing risk profiles. Failure or a likelihood of failure to supply wholesome water because of a deterioration in raw water quality (such as nitrate, pesticides, turbidity, THMs (and precursors), colour, Cryptosporidium and other pathogens) should be identified through raw water monitoring and the risk assessments carried out for each treatment works and its associated supply system. Deterioration in this context means a measured change in raw water quality over time, or demonstrable changes brought about by pollution incidents within the catchment, and most frequently arising from diffuse pollution, but occasionally from changing weather patterns. It does not mean evidence of poor performance of a treatment works within its design parameters.

3.4.2 Most hazards will be known about already within existing risk assessment arrangements. However, where a deterioration in raw water quality has been identified and presents a risk to consumers (for example, the existing treatment process is not designed to deal with either the type or level of the contaminant), NI Water must investigate the cause of deterioration and take action to protect consumers. This action should primarily focus on investigations in the catchment and, where feasible, specific actions to control the level of pollution entering the supply at source, although a wide range of other operational interventions, or short-term or permanent treatment solutions, may be necessary.

3.5 Pesticides

3.5.1 NI Water have taken significant steps in recent years to deliver a number of undertakings related to improving compliance with the pesticides standards. These included both catchment solutions, along with new treatment processes. However, the risks from the presence of pesticides with catchments remains a challenge for NI Water within PC15 and moving into PC21.

3.5.2 The Inspectorate will expect NI Water to have in place a long term strategic plan in considering current and potential future challenges within catchments from pesticide/herbicide usage, to determine its work programmes for PC21 and beyond.

3.6 Water Treatment

3.6.1 Treatment facilities should have the operational flexibility over short-, medium- and long-term timescales to support resilience, including suitable monitoring and fail-safe arrangements that make provision for containment and/or flow diversion, to prevent the supply of inadequately treated water to consumers.

3.6.2 The integration of new or replacement processes and equipment should be subject to rigorous integration testing, with supplier support and operator training. There remains room for improvement in the operational performance of treatment facilities, through the application of good practice in maintenance of assets, and in particular, for dosing, monitoring and control systems, where proactive preventative replacement strategies and/or fail-safe back-up facilities are expected as a minimum requirement.

3.6.3 In the operation of treatment facilities considerations should include, as a minimum, the control measures necessary to mitigate any impact on the stability and optimisation of pH, colour, and orthophosphoric acid dosing for plumbosolvency control; on disinfection and control of disinfection by-products; and on the acceptability of the supply to consumers, including taste and odour, and discolouration. Operator training should be comprehensive and relevant to all water supply processes.

3.6.4 NI Water should be considering arrangements to further develop the reliability and use of on-line monitoring systems to improve responsiveness and control.

3.7 Water Distribution

3.7.1 NI Water should be working proactively to reduce the level and frequency of discolouration complaints. Mitigation actions to reduce such complaints must involve operational planning for strategic and recurring cleaning/maintenance, improved treatment processes and/or permanent solutions to reduce complaints in the long term.

3.7.2 Impacts on the quality of supplies arising from burst mains, in particular discolouration that arises from network flow variations should be considered as risks to wholesomeness with appropriate mitigation identified through its risk assessments.

3.8 Lead

3.8.1 In conjunction with NI Water's Long Term Lead Strategy, which should be reviewed in advance of PC21, its risk assessments should also be under constant review, and include consideration of:

a. low medium and high risks as identified through the drinking water safety plan for the relevant water supply system;

b. continuation of, and, if necessary, further enhancement to plumbosolvency control measures;

c. replacement of the lead communications pipe where the standard of 10µg/l is not met and notification to consumers on steps to take on reducing lead levels;

d. consideration of the benefits of opportunistic lead communication and service pipe replacement from planned work on the distribution system;

e. work with local councils, the Public Health Agency and other key stakeholders, to identify vulnerable consumers and appropriate solutions, in particular, for schools and nurseries;

f. a communications and education strategy to make consumers, and other stakeholders, aware of the risk of lead in tap water, what can be done to mitigate the risk, and who has responsibility for lead pipes.

3.9 Other emerging risks

3.9.1 MIB and geosmin levels in raw water at some sites can cause taste and odour issues in supply. Risks to the quality of water supplies presented by such parameters are generally well understood by NI Water and mitigation measures should be included in risk assessments.

3.9.2 NI Water on its engagement with other UK Water companies through Water UK, should keep itself informed of developments in emerging risk areas, for example current research on nanoplastics. Also, in considering its funding requirements for PC21 it should consider the current proposals on the Recast of the Drinking Water Directive which identifies potential new parameters and revised standards.

4. Supporting development of business plans for periodic review

4.1 NI Water must ensure its long term plans are consistent with the outputs within the Department for Infrastructure's: Sustainable Water - A Long Term Water Strategy for Northern Ireland (2015 – 2040), and the Social and Environmental Guidance for Water and Sewerage Services (2015 - 2021).

4.2 The Inspectorate will review and update as necessary this Guidance Note on publication of the Social and Environmental Guidance for PC21.

4.3 The Inspectorate encourages innovation by NI Water. This is particularly relevant for catchment management schemes and for innovative treatment solutions. Where legal instruments are put in place, mitigation steps may include investigative or modelling actions to facilitate identification or confirmation of the optimum solution.

4.4 If NI Water identify that a proposal may no longer be the best available solution, then a revised proposal may be put forward. This should detail how it will deliver benefits over and above the original proposal. The Inspectorate will consider such proposals where genuine unforeseen circumstances have occurred, or new studies have indicated a better solution. Any new solution would have to be considered against the benefit to the consumer. Alternative solutions should be provided to the Inspectorate prior to further consideration under the change control process.

4.5 Similar to 4.4 the Inspectorate may consider any new or revised requirements that might arise from the company's review of its current risk assessments. If proposals for control measures are supported, they may be incorporated into agreed undertakings.

4.6 As highlighted throughout this guidance NI Water should take a clear strategic long term views on their planning needs. This should include a strategic and long term direction on ensuring compliance with the water quality standards, particularly in relation to lead, trihalomethanes, taste and odour, pesticides and iron. The Inspectorate will consider large scale programmes of work, for example in dealing with levels of lead within distribution systems, as part of submissions under Annex A.

4.7 For improvement schemes under PC21 the case for justification of need must be accompanied by the evidential information, including:

a. how it has derived the most appropriate technical and cost effective options to mitigate each named hazard and identified risk;

b. summary details of the capital costs and the net additional operating costs, as part of the overall total expenditure (totex), of each of the options considered;

c. identification of the preferred option and the rationale for choosing that option and reasons for discounting all other possible options and;

d. evidence that the preferred option will adequately mitigate the risk and deliver the required outcome within an appropriate timescale, and that the solution is sustainable; improves resilience; and meets consumers' needs.

4.8 The information requirements to support individual proposals are provided in Annex A. This should include an up to date risk assessment report and comprehensive supporting information and should be sent electronically to dwi@daera-ni.gov.uk .

4.9 The Inspectorate will provide its assessment of each proposal to NI Water's board level contact, and copied to relevant contacts within the Utility Regulator, the Department for Infrastructure, and the Consumer Council for Northern Ireland.

4.10 NI Water should be able to demonstrate that their business plans have been directed by consumer engagement in ensuring consumers' needs are met. NI Water are also expected to consider more generic risks, for example, power outages, flooding, drought, security of supply for treatment chemicals, analytical capacity, and system issues such as critical telemetry, SCADA and other IT systems.

4.11 The Inspectorate's timetable for PC21 has been developed on the basis that a draft business plan will be available by 30 June 2019.

4.12 The Inspectorate would request that submissions are provided by the **30 June 2019**, with a view to our assessment being issued by **31 August 2019**.

4.13 Annex A submissions received after this date, either through an update on a previous submission, or in the form of a new submission, may still be assessed by the Inspectorate. However, it cannot be guaranteed that the timelines will allow for the Inspectorate's assessment to be completed to allow it to provide support for such submissions to allow for consideration within the PC21 programme.

Annex A: Proposals to carry out improvements for drinking water quality reasons – submission of information

An up to date regulation 31 risk assessment report must be appended with all submissions.

This annex lists all of the information that NI Water should provide to the Inspectorate with PC21 proposals, for drinking water quality drivers. If the information is already included in the regulation 31 reports submitted with proposals, or in other documents appended to the submission, there is no need to provide the information again separately, but this should be sufficiently referenced below.

Scheme details

Title of Proposed Programme of Work	
Date of submission	
Name of supply system and Reg 31 Report Reference No.	
Name of Water Treatment Works/Distribution System/Service Reservoir/Other asset	
Water Quality hazard/drivers identified	
Reference to outcome in Long Term Water Strategy	
Stage One – Details of the Water Treatment Works and associated supply system	
Provide supply arrangements and treatment works details:	
A description and diagram of the supply system related to the treatment works	
Design capacity Ml/d	
Volume supplied: Daily average and daily maximum Ml/d [Please include a commentary if there are any constraints on deployable output due to limitations associated with any part of the treatment process]	
Sources of raw water, continuous, seasonal or standby [Include names of individual sources, nature of the source (e.g. surface direct abstraction; surface impounding reservoir; borehole; spring; type of aquifer)	
Treatment processes currently employed (including pre-treatment of raw waters) [In this case, blending is defined as treatment. This includes blending of raw waters prior to treatment. Please also indicate if bankside storage of raw water is utilised, and average retention time in the reservoir]	
Service reservoirs/booster pump details	
Water supply zones supplied [If the supply is blended with waters from other treatment works in the zone, please indicate the relative proportions (as %)]	
Population of each water supply zone supplied	
Stage Two – Hazard identification and Risk Characterisation	
Provide details of methodology used to identify hazard i.e. historic data, events/incidents including near miss situations, operator knowledge, modelling and site visits/technical audits	
Summary of historical data on the values and concentrations of the organism, substance(s) or parameter(s) associated with the hazard in the raw water source and the water entering supply from the relevant treatment works from compliance, investigative, or operational sampling	

Details of any existing contraventions of regulatory requirements and whether they are likely to recur (at WTW, SR and/or at consumers taps or supply points)
If evidence of likely to contravene any regulatory requirement, details of when this is likely to occur (at WTW, SR and/or at consumers taps) including trend analysis & prediction modelling
Details of any other data relevant to the hazard identified
If appropriate, summary of data/information on consumer complaints
Details of any events that have occurred in catchment, at treatment works and in supply that are associated with hazard identified
Details of any existing control measures that might influence the values and concentrations of the organism, substance(s) or parameter(s) associated with the hazard in catchment, treatment and in supply
Details of monitoring of the control measure (including validation monitoring)
Details of any changes in practices or policy which might have influenced the values and concentrations of the organism, substance(s) or parameter(s) associated with the hazard in water supplied to consumers, i.e. in relation to resources, blending arrangements, treatment or supply arrangements and the dates of those changes
Details of any licensed abstraction issues which might influence the values and concentrations of the organism, substance(s) or parameter(s) associated with the hazard in raw water
Reasons for the presence of the hazard, if known, otherwise details of what is being done to identify source of hazard
Outline Risk characterisation i.e.
Details and score arising from consequence v likelihood matrix
Where score sits in risk profile for supply system
Stage Three – Control Measures Required
Provide details of short, medium and long terms control measures i.e.
Details of short term actions currently in place to mitigate against risk & their effect
Details of mid to long term control measures identified for any residual risk:
(i) Options the company has considered which should, where appropriate, include catchment management controls; or communications controls in association with other stakeholders
(ii) Timescale for delivery of each option
(iii) Capital costs and net additional operating costs of each option considered
(iv) Summary of costs and benefits of each option
(v) Reasons for choosing the preferred option
(vi) Specific supporting evidence that the preferred option will address risk of hazard within the required timescale
Full details of how the company intends to assess and measure the benefits delivered (the outcome), including details of proposed sampling programme, number of samples to be taken over the specified period and parameters to be monitored.