



# Drinking Water Monitoring Programme Audit Report

<b>County:</b>	Longford	<b>Date of Audit:</b>	17 <sup>th</sup> November 2016
<b>Location visited:</b>	Longford County Council Offices	<b>Date of issue of Audit Report:</b>	6 <sup>th</sup> January 2017
		<b>Auditors:</b>	Ms. Derval Devaney (EPA) Dr. John Gray (Consultant)
<b>Audit Criteria:</b>	<ul style="list-style-type: none"> <li>• <i>The European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014).</i></li> <li>• <i>The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7.</i></li> </ul>		

## MAIN FINDINGS

- i. Irish Water should undertake a review of the temporal and spatial distribution of sampling for compliance monitoring. A formal and structured method of assessment should be developed and implemented to ensure that sampling represents the water supply zone as accurately as possible. The distribution of sample days, times and specific locations within a monitoring programme should be as wide as possible.
- ii. Irish Water should put in place a procedure relating to sampling and provide training to relevant staff on its use.
- iii. Irish Water should provide a written procedure for dealing with all sample results that exceed the parametric values outlined in the Drinking Water Regulations (S.I. no 122 of 2014).
- iv. Irish Water should ensure analysis for compliance sampling is undertaken in accordance with ISO 17025 for all parameters and the that samples are analysed by, or under the supervision of, a person who is competent to perform that task as outlined in Section 5 of the EPA's Public Water Supply's Handbook.
- v. Irish Water should review, in consultation with Longford Co. Co. the four small public water supplies identified during the audit in an effort to determine whose responsibility they fall under. Such supplies should be included in the relevant monitoring programme for 2017 and onwards.

## 1. INTRODUCTION

Under the *European Union (Drinking Water) Regulations 2014* the Environmental Protection Agency is the supervisory authority in relation to Irish Water and its role in the provision of public water supplies. This audit was carried out to assess the performance of Irish Water in carrying out effective monitoring of drinking water supplies to ensure the provision of clean and wholesome drinking water.

An audit of the Irish Water 2015 monitoring programmes implemented in County Longford was carried out at the Longford County Council Offices on 17<sup>th</sup> November 2016. Prior to the audit the EPA assessed

monitoring returns, to identify any areas of discrepancy between samples taken and analysed and reported to EPA. Using a questionnaire as a guide<sup>1</sup>, Irish Water and Longford County Council staff were interviewed to ascertain the principles and methodology for establishing monitoring programmes, sample point selection, sample classification, integrity of data reporting and notification procedures.

There are 16 public water supplies in Co. Longford all derived from surface water sources with the exception of Lanesborough PWS (a groundwater source) and Newtowncashel PWS (a spring source).

The audit observations and recommendations are listed in Section 2 and 4 of this report. The following were in attendance during the audit.

Representing Irish Water: (\*indicates that person was also present for the closing meeting)

Andrew Boylan - Irish Water Compliance Specialist \*

John Brannigan - Director of Services, Longford County Council;

Tom Murtagh, Senior Engineer; Longford County Council\*

Angela Brady, Executive Scientist, Longford County Council\*;

Martin Smyth, Executive Engineer, Longford County Council

Noel Madden, Assistant Executive Engineer, Longford County Council\*

Gerry Cassidy – Executive Engineer, Longford County Council\*

Representing the Environmental Protection Agency:

Ms. Derval Devaney – Inspector, EPA\*

Dr. John Gray – Consultant, John Gray Consultancy\*

## 2. AUDIT OBSERVATIONS

*The audit process is a random sample on a particular day of a facility's operation. Where an observation or recommendation against a particular issue has not been reported, this should not be construed to mean that this issue is fully addressed.*

1.	<p><b>Compliance Monitoring Programme</b></p> <ol style="list-style-type: none"> <li>a. The 2015 compliance monitoring programme was prepared by Longford County Council and the HSE (the latter selecting sampling dates and locations). The programme is not a controlled document and is held by Longford Co. Co. and the HSE. Irish Water did not have a copy of this programme.</li> <li>b. All public supplies have been classified according to volume of water supplied and information is recorded in the National Drinking Water Sampling Plan – Compliance monitoring. Schemes are identified by name and reference number and for each scheme, the source water type, treatment, population served and volume of output are recorded. The minimum number of check and audit samples required based on volume of output are identified and the approximate date in which a sample should be taken within a townland.</li> <li>c. The calculated number of samples to be taken, based on volume, are subject to a “safety factor” of 10% and accordingly, more samples than are legally required may on occasion be taken.</li> <li>d. Sample collection locations (i.e. premises) and suitable alternative sample locations were not pre-determined in the 2015 monitoring programme.</li> <li>e. No compliance samples are taken from the water treatment plant or reservoirs.</li> <li>f. The HSE carry out compliance sampling and selection of premises and alternative premises for compliance sampling is not formalised and is based on the HSE’s sampler’s local knowledge and awareness of the supply networks.</li> </ol>
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<sup>1</sup> The questionnaire was based on those used by the Drinking Water Inspectorate, London, and modified for the purpose.

	<ul style="list-style-type: none"> <li>g. All water supply zones (WSZ) were sampled on a reduced number or frequency of samples as agreed by the EPA.</li> <li>h. Water supply zones were delineated and mapped but sampling locations were not recorded on a map.</li> <li>i. Samples are generally taken from the consumer's tap or at taps at taps in public or commercial buildings. It was stated that on some occasions samples may be taken from outside tap despite the sampling procedure requesting that point of use (i.e. consumers taps) are to be sampled.</li> <li>j. The analysis of audit samples was carried out by the City Analyst Laboratory in Dublin and check samples by the Public Analyst Laboratory in Dublin. Both laboratories are accredited to the International Standard ISO 17025 "General requirements for the competence of testing and calibration laboratories". An audit of these external laboratories was not undertaken by Irish Water or Longford Co. Co.</li> <li>k. A critical review of the temporal and spatial distribution of sampling, to ensure sampling represents the supply as accurately as possible, has not been carried out for County Longford. Reliance is placed on the predetermined sampling plan and sampler's choice of sampling location.</li> <li>l. Upon review of the 2015 compliance sampling data returns submitted to EPA it is evident that most samples taken at PWSs on a Monday with some on Wednesday and a small number on Tuesday. None are taken on other days of the week or at the weekend.</li> <li>m. Consideration of the data for total coliforms shows that the first sample date for Longford Co. Co. was 19 January 2015 and the last 8 December 2015. If these circumstances are repeated year on year then it is apparent that no compliance samples are taken for Longford Co. Co. for a period approaching six weeks. A lack of available resource around the Christmas holiday season was provided as a reason for this significant gap in compliance monitoring.</li> <li>n. Since 2016 Irish Water have been conducting a review of monitoring on an on-going basis throughout the year to ensure monitoring is carried out for the appropriate frequency determined for the PWSs at the start of the year.</li> </ul>
<p><b>2.</b></p>	<p><b>Operational Monitoring Programme</b></p> <ul style="list-style-type: none"> <li>a. An operational monitoring programme for 2015 was not prepared for public supplies. However it was stated that operational samples were taken and documented by the caretakers on a daily basis at the water treatment plants and reviewed monthly to determine trends by the Local Authority's technician. Such log book was reviewed during the audit and had recorded raw water and treated water quality data, coagulant and polyelectrolyte dosage and output volumes from the plant.</li> <li>b. Monitoring of the distribution system is usually for maintenance purposes only involving sampling by caretakers for disinfectant (residual chlorine) and turbidity although specific sampling programmes may be initiated when required. Data is recorded locally.</li> <li>c. Investigative samples are taken in response to failures or incidents, the number of samples being determined by Longford Co. Co. in consultation with IW and HSE.</li> <li>d. There was no routine operational monitoring of service reservoirs or towers. Some large reservoirs have chlorine booster stations which would have chlorine monitors.</li> </ul>
<p><b>3.</b></p>	<p><b>Monitoring Programmes for Specific Parameters</b></p> <ul style="list-style-type: none"> <li>a. A specific monitoring programme for 21 baseline pesticides was included in the 2016 audit monitoring programme and specific pesticides (e.g. MCPA) is included in more frequent investigative monitoring for public supplies which have had such failures.</li> <li>b. There is no specific sampling programme for tankers. Tankers are deployed from contractors in response to incidents and all have "Boil Water Advice" notices permanently affixed. Irish Water has a national draft procedure for the use of water tankers which is out for consultation (2016).</li> <li>c. Irish Water instituted in 2015 a national programme to standardise disinfection specification. Work in the Longford Co. Co. area has started.</li> </ul>

<p><b>4.</b></p>	<p><b>Sampling Procedures</b></p> <ul style="list-style-type: none"> <li>a. A comprehensive document, “Monitoring water quality in the Environmental Health Service, Longford”, dated September 2013, covers sampling and other associated matters. It is not a controlled document. It is issued by HSE and held by the Executive Scientist. The auditors were unable to determine other recipients of the manual. It includes, among other things, consideration of the water sampling plan; sampling procedure; labelling and recording; parametric exceedances and incidents; follow-up actions; outcome/action requirements; and small rural supplies.</li> <li>b. There was no documented procedure available to view during the audit other than for bacteriological sampling. This is clearly defined and includes the need to sterilise taps before taking samples and the need to deliver samples to the laboratories before 1300 on the day following sampling. However, it is best practice to ensure the analysis of bacteriological samples commence within six hours of sampling.</li> <li>c. Sampling procedures are as agreed between Longford Co. Co. and the analysing laboratories. Water sampling log sheets are provided which allow the recording of the sampling point, sampler and chlorine residual.</li> <li>d. Alternative addresses are selected by the HSE sampler in the event that sampling from the originally selected property is not feasible, particularly in more rural areas. No formal procedure is in place to select an alternative address although the sampler is aware of the need to take a representative sample from a given area.</li> <li>e. Compliance samples are pre-designated as such but because the sample receipt and data handling system is remote from Longford County Council it is not known whether the designation can be changed either at the time of sampling or in the laboratory. The auditors were unable to inspect sample handling at the laboratories although it was stated that samples would be received in the respective laboratories at the reception desk by an analyst and a receipt for the sample and the analyses required would be e-mailed to Longford Co. Co.</li> </ul>
<p><b>5.</b></p>	<p><b>Data Handling</b></p> <ul style="list-style-type: none"> <li>a. Analytical and associated data is recorded in the laboratory and when transferred to Longford Co. Co. it is entered on the Labinfo system by the technician and authorised by the Executive Scientist.</li> <li>b. If a result on the database is subsequently shown to be incorrect the data may be changed before the data is archived. The system is capable of producing an audit trail of access to the system and of data entries.</li> </ul>
<p><b>6.</b></p>	<p><b>Exceedances of Parametric Values</b></p> <ul style="list-style-type: none"> <li>a. Non-compliant data associated with compliance and investigative samples are reported to the EPA by Longford Co. Co. There is a documented procedure for notification of non-compliant results to HSE and EPA.</li> <li>b. There is also a documented procedure identifying follow up samples and actions required in the event of exceedances in relation to coliforms, <i>E.coli</i> and Enterococci; <i>Clostridium perfringens</i>, <i>Cryptosporidium</i>; copper, lead or nickel; other chemical exceedances; and turbidity. The required outcomes of any investigation and action required are identified.</li> <li>c. Irish Water monitors indicator parameters on a “tracker” system to determine whether the exceedances are persistent or widespread.</li> <li>d. Records associated with an exceedance of the indicator parameter iron (265µg/l) in a compliance sample taken on 7 September 2015 from a consumer’s property which was not notifiable to the EPA via ODWNS but was included in the 2015 Drinking Water Returns was reviewed. It was noted that there was no history of iron non-compliance and the exceedance was not significantly high. Specific remedial actions were requested of Longford Co. Co. by Irish Water was completed and three repeat samples taken were compliant for iron. The incident was closed on 21 October 2015. The Local Authority had maintained a written record of the failure, follow-up action and remedial action as required by the EPA.</li> </ul>

### **3. AUDITORS COMMENTS**

Arrangements by Longford County Council in assessing the quality of public water supplies for 2015 were generally found to be satisfactory. Weaknesses were highlighted in relation to the lack of pre-determined sampling locations and dates where it was left to the discretion of the sampler to choose sampling locations that were representative of the supply zone. It was also noted that documented procedures implementing the monitoring programme and reacting to exceedances relating to all parametric values outlined in the Drinking Water Regulations (S.I. no 122 of 2014) were lacking.

In order to satisfy Part 3 of the schedule to the *European Union (Drinking Water) Regulations 2014*, as of the end of 2015, the EPA recommends that all compliance samples are analysed by laboratories that are accredited to ISO 17025 for all parameters. While the laboratories used for compliance monitoring purposes are accredited it was not clear if they were accredited for all parameters.

Finally, the four small public water supplies identified during the audit should be reviewed by Irish Water, in consultation with Longford Co.Co., in an effort to determine whose responsibility they fall under. Such supplies should be included in the relevant monitoring programme for 2017 and onwards.

### **4. RECOMMENDATIONS**

#### **Compliance Monitoring Programme**

1. Irish Water should ensure that:
  - (a) the spread of sample days, times and locations within a monitoring programme are as wide as possible to ensure that compliance samples are representative of water quality consumed throughout the year as required by the Drinking Water Regulations;
  - (b) a formal protocol is established for the selection of random addresses for consumer's premises and for the selection of alternative addresses if required;
  - (c) sample locations are mapped using GIS co-ordinates obtained in sampling to assist in reviewing the temporal and spatial distribution of sampling for compliance monitoring. A formal and structured method of assessment should be developed and implemented to ensure that sampling is representing the water supply zone as accurately as possible.
  
2. Irish Water should ensure that the compliance sampling programme:
  - (a) is a controlled document;
  - (b) has a predetermined narrow window of sampling dates to samplers that includes taking samples throughout the entire week;
  - (c) includes specific sampling locations;
  - (d) has predetermined alternative sample locations in the event that a sample location is unsuitable or inaccessible;
  - (e) is accurate (i.e. has correct scheme codes, population and volumes) for all public schemes;
  - (f) its recipients are recorded and include Irish Water.
  
3. Irish Water should review, in consultation with Longford Co. Co, the four small public water supplies identified during the audit in an effort to determine whose responsibility they fall under. Such supplies should be included in the relevant monitoring programme for 2017 and onwards.

#### **Operational Monitoring Programme**

4. Irish Water should put in place a formal operational monitoring programme and ensure that routine operational monitoring of service reservoirs and towers is undertaken.

#### **Monitoring Programmes for Specific Parameters**

5. Irish Water should ensure that Section 4, Paragraph 5 of the EPA's Handbook is adhered to in relation to sampling required on water in tankers. A certain amount of sampling is required on the water used to fill a tanker, depending on the length of time water is stored in the tanker.

## Sampling Procedures

6. Irish Water should:
  - (a) put in place a documented procedure for taking compliance samples (to include sampling of parameters other than bacteriological parameters currently in place);
  - (b) revise the procedure for bacteriological sampling with regard to storage and transport of samples to ensure that the specifications outlined in Section 4, Appendix 1 of the EPA's Public Water Supply's Handbook is adhered to;
  - (c) provide training to sampler on the procedure to ensure compliance sampling is undertaken adequately (e.g. not at an outside tap);
  - (d) audit the external laboratory to ensure analysis is undertaken in accordance with its ISO 17025 for all parameters and the that samples are analysed by, or under the supervision of, a person who is competent to perform that task as outlined in Section 5 of the EPA's Public Water Supply's Handbook.

## Exceedances of Parametric Values

7. Irish Water should develop a written procedure for dealing with sample results that exceed the parametric values outlined in the Drinking Water Regulations (SI no 122 of 2014). The procedure should include (a) actions to be taken to investigate the exceedances of all parameters and determine its cause (b) reporting the exceedance to the HSE, the EPA and any other relevant party and (c) remedial action required. The circumstances that constitute trivial and the more serious exceedances should be clearly defined.

## FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

This report has been reviewed and approved by Mr Darragh Page, Senior Manager, Drinking Water Team.

Irish Water is recommended to put such measures in place as are necessary to implement the recommendations listed in this report. The actions by Irish Water to address the recommendations taken will be verified by the Agency during any future audits.

The EPA also advises that the findings and recommendations from this audit report should, where relevant, be applied to other Public Water Supplies operated and managed by Irish Water.

Report prepared by:



Date:

6<sup>th</sup> January 2017

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Derval Devaney

Inspector