



Drinking Water Monitoring Programme Audit Report

| | | | |
|--------------------------|---|---------------------------------------|--|
| County: | Clare | Date of Audit: | 10 th and 11 th November 2015 |
| Location visited: | Clare County Council Offices | Date of issue of Audit Report: | 9 th February 2016 |
| | | Auditors: | Ms. Michelle Roche (EPA) Dr. John Gray (Consultant) |
| Audit Criteria: | <ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>. • The <i>EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)</i>. | | |

MAIN FINDINGS

- i. **Irish Water should undertake a review of the temporal and spatial distribution of sampling for compliance monitoring for County Clare. 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 locations within a monitoring programme should be as wide as possible.**

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 2014 monitoring programmes implemented in County Clare was carried out at the Clare County Council Offices on 10th and 11th November 2015. 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 guide¹, appropriate Irish Water and Clare County Council staff were interviewed to ascertain their principles and methodology for establishing monitoring programmes, sample point selection, sample classification, integrity of data reporting and notification procedures.

The audits 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) |
|---|

¹ The questionnaire was based on those used by the Drinking Water Inspectorate, London, and modified for the purpose.

Mr. John Leamy – Irish Water Compliance Specialist*
 Ms. Catherine Rice – Irish Water Compliance Analyst*
 Mr. Sean Ward – Senior Engineer, Clare County Council*
 Mr. Tony McNamara – Senior Executive Engineer, Clare County Council*
 Ms. Maura McNulty – Executive Scientist, Clare County Council*
 Ms. Maeve Lait – Senior Executive Technician, Clare County Council*
 Ms. Jane Fitzgerald – Laboratory Technician, Water Services, Clare County Council*
 Ms. Sinéad McDonald – Quality Assurance Manager, Water Services, Clare County Council*
 Ms. Sheila Murphy – Laboratory Technician, Clare County Council*

Representing the Environmental Protection Agency:

Ms. Michelle Roche – 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>Compliance Monitoring Programme</p> <ol style="list-style-type: none"> a. The 2014 compliance monitoring programme was prepared by Clare County Council with oversight by Irish Water. From 2016 onwards all monitoring programmes will be prepared by Irish Water in consultation with the relevant Local Authorities. b. The compliance monitoring programme for 2014 included: a list of all public water supplies in the county, population data for each supply, the required number and frequency of all check and audit samples, predetermined sample dates and predetermined sample locations. c. Sample locations were selected randomly based on historical data sets and knowledge of previous sample locations. Efforts are made not to sample at the same location twice in a row. All sample locations visited are recorded on an internal database with GPS co-ordinates and sample dates. d. No water supply zone (WSZ) was sampled on reduced number or frequency of samples and all WSZs are subject to a predetermined increased number of samples of ten per cent as a contingency. e. The number of samples required in each WSZ was calculated based on the WSZ population, using an occupational value of 2.7 persons per property, a value that was derived by the CSO. A review of WSZ populations was being conducted at the time of the audit. f. The sampling and analysis of compliance samples is largely carried out by Clare County Council staff with some pesticide and metal analysis subcontracted out to ELS Laboratories. g. 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 Clare. Reliance is placed on the predetermined sampling plan. |
| 2. | <p>Operational Monitoring Programme</p> <ol style="list-style-type: none"> a. The 2014 operational monitoring programme was prepared by Clare County Council with oversight by Irish Water. The number and frequency of operational samples taken was determined in consultation with Irish Water, Clare County Council and the HSE. |

| | |
|------------------|--|
| | <ul style="list-style-type: none"> b. Operational samples at the water treatment plant and chlorine residuals at the end of the network were taken by the plant caretaker and operational samples at the consumer tap were taken by Clare County Council laboratory technicians. c. Investigative operational samples were taken as required. d. No predetermined locations for operational sampling are outlined in the monitoring programme. e. There was no routine operational monitoring of service reservoirs or towers. |
| <p>3.</p> | <p>Monitoring Programmes for Specific Parameters</p> <ul style="list-style-type: none"> a. The 2014 compliance monitoring programme did not include any specific monitoring of nitrite or turbidity at water treatment plants. b. A specific six month monitoring programme for pesticides was carried out in the Shannon/Sixmilebridge and Limerick City Council public water supply zones in 2014. No specific list of individual pesticides to be monitored for was available in 2014; however Irish Water has since consulted with the Department of Agriculture, Food and the Marine and collated a monitoring suite of 21 baseline pesticides which will be included in the 2016 compliance monitoring programme. c. All supplies were monitored quarterly for trihalomethanes as part of audit monitoring. d. A programme of additional sampling for <i>E. coli</i> from consumer's taps was carried out in Ennis and Shannon/Sixmilebridge public water supplies to provide additional water quality assurance in these largely populated supplies. e. A raw water monitoring programme for <i>Cryptosporidium</i> was carried out in 2014. f. A monthly sampling programme for lead in approximately 80 properties in Ennis was implemented to assess the effectiveness of lead removal in the network. Random day-time samples, flushed samples and stagnant samples were included in this programme. g. The 2014 compliance monitoring programme did not include any radiological sampling; however in agreement with the EPA Office of Radiological Protection recommendation that supplies serving populations above 10,000 persons should carry out radiological sampling every four years, Ennis was last sampled in 2012. h. Clare County Council does not have a specific sampling programme for tankers. Tankers are deployed in response to incidents and all have "Boil Water Advice" notices permanently fixed as well as additional notices on the tanker taps. |
| <p>4.</p> | <p>Sampling Procedures</p> <ul style="list-style-type: none"> a. Clare County Council have a sampling procedure in place which is produced and maintained by the Clare County Council Laboratory Technical Manager and Quality Manager and available to all Clare County Council staff involved in the monitoring programmes. Some samplers do not carry a hardcopy of the sampling procedure with them during all sampling events. b. No compliance samples were taken from water treatment plants or service reservoirs and no data from continuous monitors was used for compliance purposes. c. Sampler's daily worksheets are prepared and provided to the samplers prior to sampling. Completed worksheets are then filed in the Sample Receipt Logbook in the Clare County Council laboratory. d. Free and total chlorine concentrations were required to be taken with each sample collected for bacteriological analysis. e. Sample ID numbers are generated sequentially in the laboratory prior to analysis. f. Sample bottle labels with adhesive backing were fixed securely to the sample container and appropriate information recorded. |
| <p>5.</p> | <p>Data Handling</p> <ul style="list-style-type: none"> a. Monitoring data for 2014 was recorded on the Clare County Council LIMS system, which runs the LabWorks programme from Microworks. b. Relevant information from sampling worksheets including: sample ID, sample date, sample time, preservative used and samplers name are recorded on LIMS. Sample results are also inputted to LIMS when available. |

| | |
|------------------|--|
| | <ul style="list-style-type: none"> c. Samples sent to ELS for analysis are also recorded in LIMS and sample results inputted manually. d. Any changes made to data on LIMS were automatically recorded and an audit trail of entries can be produced at any time. Once data has been validated on LIMS no changes can be made. e. Once sample results were received by Irish Water from Clare County Council they were validated 3 times before being reported to the EPA via EDEN. f. All compliance sample results are also displayed on the Clare County Council website. g. Sample results from operational monitoring undertaken by the plant caretaker were recorded locally at the plant but cannot be accessed through a central system. |
| <p>6.</p> | <p>Exceedances of Parametric Values</p> <ul style="list-style-type: none"> a. A documented procedure is in place identifying the actions to be taken where a sample result shows an exceedance of the microbiological or chemical parametric values outlined in the drinking water regulations (S.I. no 122 of 2014). This procedure has been reviewed and approved by the HSE. b. The procedure includes details of when and how to contact the HSE, the EPA, water service engineers and relevant water treatment plant staff regarding sample results and further actions that may be required. All communication is overseen by the Laboratory Quality Manager. c. A procedure for notifying Irish Water of a sample result which exceeds the parametric limit is outlined in the Irish Water training manual, which is held in the Clare County Council laboratory. d. All actions taken in 2014 were documented and provided to Irish Water in monthly Key Performance Indicator meetings. |
| <p>7.</p> | <p>Review of Sampling Data</p> <ul style="list-style-type: none"> a. Sample times recorded on the Clare County Council LIMS showed a good distribution of sample collection times ranging from 8am to 2.30pm. b. Samples were primarily collected on Mondays and Tuesdays with 71% of samples collected on a Monday. c. Sample collection was well distributed throughout the year. d. During the audit an exercise was undertaken to track a reported aluminium exceedance through the data handling system and all relevant records were present and complete. The exercise identified that two aluminium exceedances were detected on the same day in the same public water supply; however only one exceedance could be officially reported to the EPA through the Online Drinking Water Notifications System (ODWNS). This is due to a limitation in ODWNS where only one exceedance of a parameter in a particular supply can be reported at any one time. Details of the second exceedance were provided to the EPA 'Additional Information' section of the ODWNS notification. This is in line with EPA Guidance on the reporting of exceedances. |

3. AUDITORS COMMENTS

The monitoring programmes drawn up and implemented by Irish Water and Clare County Council in 2014 were generally found to be satisfactory in assessing the quality of water in public water supplies. Written procedures were available and well maintained for all aspects of the monitoring programmes in County Clare. Weaknesses were highlighted in relation to the amount of randomness attributed to the selection of consumers' properties and the temporal distribution of sampling across the week. A review of all 2014 data submitted to the EPA by Irish Water determined that all sample results were accurately reported to the EPA.

4. RECOMMENDATIONS

Compliance Monitoring Programme

1. Irish Water should provide predetermined alternative sample locations to samplers in the event that a sample location is unsuitable or inaccessible.
2. Irish Water should ensure that all water supply scheme data, including population numbers, are updated on EDEN.
3. 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 is representing the water supply zone as accurately as possible. The spread of sample days, times and locations within a monitoring programme should be as wide as possible.

Operational Monitoring Programme

4. Irish Water should ensure that routine operational monitoring of service reservoirs and towers is undertaken.

Monitoring Programmes for Specific Parameters

5. Irish Water should ensure that turbidity at the water treatment plant is sampled where the supply source is surface water or influenced by surface water.
6. Irish Water should ensure that the 21 baseline pesticides and any other pesticides in use in the catchment of water supplies are included in future monitoring programmes.
7. Irish Water should ensure that Section 4, Paragraph 5 of the EPA Handbook is adhered to in relation to sampling required for water tankers. Sampling may be required on the water used to fill a tanker, depending on the length of time water is stored in the tanker and the source of the water used for filling.

Sampling Procedures

8. Irish Water should ensure that all samplers have the sampling procedure with them during all sampling events.

Data Handling

9. Irish Water should investigate if sample results from ELS can be automatically transferred to the Clare County Council LIMS.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

This report has been reviewed and approved by Ms Yvonne Doris, Drinking Water Team Leader.

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 addressed at all other treatment plants operated and managed by Irish Water.

Report prepared by:  **Date:** 9th February 2016

Inspector