



Private Drinking Water Monitoring Programme Audit Report

County:	Galway	Date of Audit:	20 th August 2019
Location visited:	Galway County Council Offices	Date of issue of Audit Report:	9 th October 2019
		Auditors:	Ms. Derval Devaney (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), as amended.</i> • The <i>EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Private Water Supplies (ISBN: 978-1-84095-349-7).</i> • The <i>EPA Information Note on Monitoring issued January 2019 to Local Authorities.</i> 		

MAIN FINDINGS

- Galway Co. Co's register of regulated private water supplies was not fully complete and may not capture all private water supplies in its functional area that are required to be monitored for drinking water compliance purposes.
- Galway Co. Co. did not monitor small private supplies for Group B parameters, as required.
- Galway Co. Co. did not monitor 19 regulated private supplies (six group water schemes and 13 small private supplies) at all during 2018.
- Galway Co. Co. did not carry out compliance monitoring for turbidity and nitrite at private water treatment plants and there was no protocol to determine the concentrations of acrylamide, epichlorohydrin and vinyl chloride in drinking water if and where these chemicals are used in treatment and supply.
- Weaknesses in procedures were identified, particularly for the selection and taking of compliance samples and pre-determining sampling locations and dates to ensure that compliance samples are evenly spread and representative of water in the supply zone.

1. Introduction

Under the *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) as amended*, the Environmental Protection Agency has a supervisory role in relation to the establishment and implementation of monitoring programmes prepared by Local Authorities. This audit was carried out to assess the performance of Galway County Council (Co. Co.) in carrying out effective monitoring of private drinking water supplies in County Galway to ensure the provision of clean and wholesome drinking water.

An audit of the 2018 monitoring programmes implemented by Galway Co. Co. was carried out at the Galway County Council Offices, CenterPoint Building, Lois Ban Industrial Estate, Galway H91 PY8H. Prior to the audit, the EPA assessed the 2018 monitoring returns submitted by Galway Co. Co. to identify any areas of discrepancy between samples taken and analysed and reported to EPA. Using a questionnaire as a guide, Galway Co. Co. 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. An Environmental Laboratory Services (ELS) Ltd. staff member was interviewed as part of the EPA's audit of the 2018 Public Water Supply Monitoring Programme on the morning of 20/08/19. As ELS Ltd. also undertake compliance sampling and analysis of the regulated private water sector some of the observations from the PWS audit also apply to this audit.

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

Representing Galway County Council:

Michael Timmins - Senior Engineer
Colette Cronin - Executive Technician
Christina Ryan – Assistant Scientist
Enda Moloney - Administrator Officer
Michael Sheil - Senior Executive Engineer

Representing the Environmental Protection Agency:

Ms. Derval Devaney - Inspector, EPA
Dr. John Gray - Consultant

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. Compliance Monitoring Programme

- a) Information submitted by Galway Co. Co. to the EPA as part of the drinking water returns for 2018 indicate the county has 244 regulated private water

supplies.

- b) Galway Co. Co. maintain a Register of Regulated Private Supplies. The list of water suppliers was originally provided by the HSE and primarily at the time included water supplied by food premises. The Council stated it confirmed the list in 2017 via telephone calls to 79 suppliers. Only 140 supplies are on the Council's current list, of which 87 private supplies had no contact details.
- c) The Register includes the name and address of the water supplier, the supply zone code, and for some, the source of water and type of treatment. Population and volume data is also recorded but not for small private supplies. Galway Co. Co. stated their Register may not be the most up-to-date and is updated through direct contact between Galway Co. Co. and the water supplier or by publication of newspaper notices to potential private water suppliers such as hotels, golf courses etc. requesting them to submit information on their water supply source. Some 19 small private supplies have been closed, one of which was re-opened in 2019.
- d) The 2018 compliance monitoring programme was prepared by the Executive Scientist and Administration staff of Galway Co. Co. and lists both population and volume data, where available, and type of treatment. Some population and volume data are not readily available for all supplies and is gathered during audits carried out by Galway Co. Co.; from subsidy applications where the water supplier is required to submit details of population and volumes; or from Groups Schemes which are under a Design Build Operator (DBO) contract.
- e) The compliance monitoring programme is held on the Council's IT system and individuals may retain a hard copy as needed. The programme is maintained by the Galway Co. Co.'s Assistant Scientist.
- f) The 2018 predetermined compliance sampling programme, prepared by the Environment Section of Galway Co. Co., was generated from data on the LIMS system and was examined electronically during the audit. ELS Ltd. carry out the sampling on behalf of the Council. ELS Ltd. is accredited by the Irish National Accreditation Board (INAB) to undertake testing for specified parameters in potable water in compliance with the International Standard ISO/IEC 17025:2005 2nd Edition.
- g) The minimum number of Group A and Group B samples required are based on volume for many of the Group Water Schemes under a DBO contract and on population for other supplies, where population data is available. For supplies where there are no population or volume data, many being the small private supplies, two Group A samples are assigned by default. There was no Group B sample taken in these small private supplies, despite the requirement to do so under the *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) as amended*.
- h) Nineteen regulated private supplies (13 small private supplies and six group water schemes) were not monitored at all for compliance purposes during 2018. Galway Co. Co. stated that in relation to nine of those supplies, ELS Ltd. failed to include the supplies in their sampling programme. There was no explanation provided for the lack of monitoring on the remaining 10 supplies.
- i) ELS Ltd. determine the sample locations for larger private supplies by liaising

with the trustees of the Group Water Schemes to ensure the location is served from the Group Water Scheme. ELS Ltd. provide a compliance sampling plan to Galway Co. Co. in advance of sampling each month. The approximate date on which a sample should be taken in a private regulated supply is recorded. For smaller systems (e.g. a B&B) it is recognised that there are generally few, if any, alternative sampling locations (other than the kitchen tap). Sampling locations are generally not randomly selected.

- j) Galway Co. Co's Executive Technician cross checks the results at the end of the month with the proposed sampling plan which was submitted by ELS Ltd.
- k) ELS Ltd. record the Grid References of the sampling locations when out sampling. The larger group water schemes water supply zones (WSZs) and sampling locations are not recorded on the LIMS but are mapped on the Council's GIS system. The GIS map for Gallagher/Browns Grove group water scheme was examined during the audit which has three sources entering three WSZs. Four Group A samples and one Group B sample were programmed for 2018, as required. It was noted however that samples taken were concentrated towards the second half of 2018 – in May, June, August, October and November 2018. This was attributed to the ELS Ltd. sampling contract not starting until March 2018. Also, two Group A samples were taken at the same sampling location and therefore not evenly spread to represent the entire network. There is a requirement for ELS Ltd. to ensure that samples are taken at evenly spaced intervals throughout the year. Compliance sampling undertaken during 2018 for Black Manor Nursing Home private supply was also inspected during the audit. There was no population or volume attributed to this supply and it was sampled twice for Group A parameters only. No Group B parameters were monitored, as is required. It was also noted that the two Group A samples were taken within a short period of time (14 November 2018 and 12 December 2018). Galway Co. Co. stated that this supply may have been added to the sampling programme later in the year. It was noted that this supply was listed in EDEN prior to 2018 and therefore should have been included in the 2018 compliance sampling programme and commencing in January 2018 for the required number of Group A and B samples.
- l) Turbidity (for surface water sources) and nitrite are required to be monitored for compliance purposes at water treatment plants in addition to the network. Galway Co. Co. stated most group water schemes would have continuous final water turbidity monitors in place but data from such monitors are not used for compliance purposes. Nitrite is also not being monitored in the final water at the water treatment plants in Co. Galway despite the monitoring of nitrite and turbidity being specified as parameters to be monitored in Galway Co. Co.'s "Protocol for implementation of Drinking Water Monitoring Programme by External Laboratories" Issue No. 4 dated November 2012.
- m) Sampling frequencies for each of the supply zones are specified and there are no reduced monitoring frequencies.
- n) A limited amount of sampling for pesticides is undertaken as many supplies did not have any Group B monitoring undertaken during 2018, as required.
- o) No provision has been made to determine acrylamide, epichlorohydrin and vinyl

	<p>chloride levels in drinking water where these chemicals are used in treatment or supply.</p> <p>p) Monitoring for radioactivity is carried out in accordance with the EPA’s Radiological Monitoring Programme as and when required.</p> <p>q) It is appreciated that the HSE also take water samples to monitor for food safety and that some duplication of sampling may occur.</p>
<p>2.</p>	<p>Monitoring Programmes for Specific Parameters</p> <p>a) There is a specific investigative monitoring programme in place for trihalomethanes (THMs) where it is found above the parametric limit in a Group B sample. Five private supplies are currently being monitored at an increased monthly frequency for THMs.</p> <p>b) If tankers or bowsers are deployed in an emergency, the sampling protocol according to the EPA handbook should be followed. However, Galway Co. Co. did not have a specific protocol for compliance monitoring from tankers if they were deployed.</p>
<p>3.</p>	<p>Sampling Procedures</p> <p>a) Galway Co. Co. has in place a “Protocol for implementation of Drinking Water Monitoring Programme by External Laboratories” Issue No. 4 dated November 2012 which includes the requirement to take samples in accordance with the Drinking Water Regulations 2014 and the EPA’s Handbook; confirmation of the need to ensure that all sampling is completed and the notification procedure for reporting non-compliant results. This protocol was in place for the 2018 sampling programme</p> <p>b) Galway Co. Co. rely on ELS Ltd. to fulfill its sampling requirements. ELS Ltd. has a basic procedure for sampling all drinking water samples (Doc. Ref. SP04, Revision C, dated 1 August 2019). Although ELS Ltd. claimed the procedure was a controlled document it did not indicate who is responsible for its upkeep. Individual samplers hold their own copy and sign to say they have received it although no record is kept on who holds a copy. No details are given of the methods for sampling different parameters or groups of parameters. Some limited guidance is included on the selection of an appropriate tap, disinfection of the taps and some timings. No methods are included for carrying out on-site tests. The procedure requires bacteriological samples to be placed in the cooler area for transport, but no guidance is given on the temperature requirements nor the maximum time period within which bacteriological samples should be returned to the laboratory for analysis.</p> <p>c) Monthly worksheets are provided by ELS Ltd. to its samplers and include approximate date of sampling, location, type of sample (compliance, operational, etc.) and reference number for the location. If it is not possible to collect the designated sample, an alternative location would be selected. The reasons for selecting a particular alternative are not recorded and there is no protocol for guiding the selection of alternative addresses should the predesignated sample point be inaccessible.</p>

	<ul style="list-style-type: none"> d) Adhesive sample labels are prepared in the laboratory, printed off the LIMS system with the sampling location documented and securely fixed to the sample container. Compliance samples are pre-designated and as the sample bottles are pre-labelled in the laboratory before filling at the customer's tap, it is not possible to alter the designation of the sample. The auditors were not able to inspect sample handling as the audit was not conducted in close proximity to the contract laboratory. e) A chain of custody is maintained for samples throughout. The LIMS system does not allow the generation of duplicate sample numbers. Individual and unique sample numbers are generated when samples are logged on to the system by laboratory staff.
<p>4.</p>	<p>Data Handling</p> <ul style="list-style-type: none"> a) Galway Co. Co. has a protocol for the submission of results from the laboratory however this was not available for review during the audit. It was stated that the laboratory contacts Galway Co. Co. by telephone and group email if a microbiological failure is detected. Communication is by group email only if a non-microbiological failure is detected. The audit found that the email from the laboratory is not acknowledged to reassure the laboratory that it has been received. The laboratory's final report is sent electronically to the group email. b) Analytical and associated data is recorded on the sampler's worksheet by the sampler for on-site tests such as residual disinfectant, taste, odour, temperature and in the laboratory by the relevant analyst. After Quality Control (QC) checks have been validated, analytical data entered on the STARLIMS system is "accepted". Data is transferred to Galway Co. Co. electronically from ELS Ltd. by means of an Excel spreadsheet and data is imported on to the LABWORKS system by Galway Co. Co. staff who are nominated users or administrators of LABWORKS. Users can only import results to LABWORKS while administrators of LABWORKS can change and approve results. c) Galway Co. Co.'s Executive Technician can accept and subsequently approve data entry. No changes may be made to data once it has been approved. The system is capable of producing an audit trail of access to the system and of data entries. d) If the data from the laboratory is shown subsequently to be incorrect, a new laboratory report would be issued with corrected data to be entered on the system. The auditors were unable to examine the relevant procedure. e) Galway Co. Co. issue all compliance results by post to the water supplier as soon as practical and non-compliant results are notified immediately by phone and followed by correspondence. Galway Co. Co. would also notify the Health Service Executive (HSE) of the failure and a procedure is in place for this form of communication. Compliance monitoring results are also available on Galway Co. Co.'s website however results for the small private regulated supplies did not appear to be available online. f) All compliance monitoring results for regulated private supplies were reported to EPA as part of the Annual Drinking Water Returns for 2018.

5. Exceedances of Parametric Values

- a) Galway Co. Co. have a single page Internal Protocol for the management of drinking water results (V5, 19 August 2019). The HSE has issued a Guideline for the management of an initial notification of a drinking water issue of potential danger to human health. A Drinking Water Protocol issued jointly by Galway Co. Co. and the HSE (dated June 2012) details actions to be taken in the event of a non-compliant sample result, roles and responsibilities, communications, incident response team and actions to be taken to protect consumers. Non-compliant results associated with compliance and investigative samples are reported to the HSE who are consulted for health advice.
- b) The 2018 compliance monitoring data for 2018 show 20 samples contained *E. coli*, four of which also contained *Enterococci* and two samples contained *Enterococci* alone; 19 private supplies were affected. There are no documented procedures in place to guide the identification of reasons for non-compliant results and remedial actions required. Galway Co. Co. stated they would carry out an audit of the affected treatment plant. For example, they stated that four of the five schemes where trihalomethanes have been identified have been audited during 2019 with a plan to audit the final plant by the end of the year. Regarding the Council's enforcement efforts in 2018, audits are prioritised based on risk to human health with those supplies which have detected *E. coli* or being on Boil Water Notices being prioritised for an audit without delay. While 19 supplies were affected by microbiological failures during 2018, 14 audits were carried out during that year and twelve notices to boil water were in place affecting 1,311 consumers. No Directions were issued.
- c) In the annual 2018 monitoring returns submitted to EPA, it was identified that 19 regulated private supplies were not sampled in 2018 for *E. coli*. Nine supplies were not sampled because ELS Ltd. had failed to include the supplies in their sampling round.
- d) The Corohan Group Water Scheme has on-site disinfection and serves a population of 431. A sample taken on 11 June 2018 was found to contain 13,540 *E. coli*/100ml and 4,300 *Enterococci*/100ml and a repeat sample also failed. Galway Co. Co. consulted with the HSE on the failures and issued advice to the Group Water Scheme to boil water. There are four groundwater sources for this supply next to a river and sample points were installed and while the Council audited the supply without delay, the source of the contamination remains to be identified. No illnesses were identified in the community.
- e) A sample taken on 11 June 2018 from Kiltvna Group Water Scheme contained 10.7 µg/l of lead which was above the parametric limit. The property sampled was a shop and it was possible that there was internal lead plumbing. The operator was informed, and the scheme took a re-sample for lead which was compliant. The Council is to follow up on this to investigate the re-sample type (random, stagnant or flushed), if remedial action was taken prior to the sample being taken and if not, if a Regulation 6 Notice and health advice was provided to the consumer.

3. Auditors comments

Galway Co. Co. has a large number of regulated private supplies in its functional area. This requires a dedicated resource to ensure this sector is appropriately monitored and supervised to ensure these water supplies are safe to drink. Galway Co. Co. is making a concerted effort to identify small private supplies which fall under the remit of the Drinking Water Regulations in its functional area, so as to ensure they are included on its register for monitoring purposes and are effectively delivering water that complies with the Drinking Water Standards.

While good progress has been made in some areas, such as the auditing of supplies with persistent THMs failures, Galway Co. Co. needs to continue its efforts to address deficiencies identified during this monitoring programme audit.

Many of the small private water supplies were not appropriately recorded on Galway Co. Co.'s register, some were not monitored for Group B parameters and 19 supplies (13 small private supplies and six group water schemes) were not monitored at all during 2018. This shortfall in monitoring, and the fact that there may be additional small private supplies which fall under the remit of Galway Co. Co. that are not on its register and not being monitored, is of concern to the EPA.

Regarding procedures, weaknesses were highlighted in relation to the lack of pre-determined sampling locations and dates and suitable alternative sample locations to ensure samples are evenly spread and representative of the entire water supply zone. To satisfy Part 3 of the schedule to the *European Union (Drinking Water) Regulations 2014, as amended*, the laboratory used to carry out analysis of drinking water for compliance purposes should be accredited to ISO 17025 for all compliance parameters. While the laboratory used for compliance monitoring purposes is accredited, Galway Co. Co. needs to satisfy itself of the appropriateness of the sampling manual and sampling procedures.

Upon review of the compliance monitoring results for 2018, a significant number of the 244 listed regulated private water supplies on EDEN had failures with the parametric values. Where failures have been detected, Galway Co. Co. is advised to ensure that appropriate follow-up action is taken by adopting a risk-based approach to its enforcement of the regulated private water supply sector.

4. Recommendations

Compliance Monitoring Programme

1. Galway Co. Co. should:
 - a) ensure all regulated private supplies are included on its register and compliance monitoring programme. All relevant information pertaining to each private water supply should be recorded for the purposes of the register and the compliance monitoring programme as required by Regulation 8(3) of the *European Union (Drinking Water) Regulations 2014 (S.I. No. 122/2014), as amended*.
For example, the name and address of the water supplier, the volume of water supplied

per day (m³), the population served by the water supply, the type of treatment in place, the source of the water supply and the water supply zone code should be included in the register.

The register should be maintained and kept up to date;

- b) ensure that all private supplies that fall within its remit are monitored for compliance at their required frequencies in accordance with the requirements of the *European Union (Drinking Water) (Amendment) Regulations 2017 (S.I. 464 of 2017)*. Galway Co. Co. should also have regard to the monitoring requirements set out in the *EPA's Information Note on Monitoring issued January 2019 to Local Authorities*;
- c) ensure all regulated private water supplies are entered into the EPA's database, EDEN, and those supplies that are no longer active are closed out on the system. Each water supply should be given a scheme code, as required under the Drinking Water National Monitoring Programme. Galway Co. Co.'s list of regulated private water supplies should be updated annually on EDEN. The results of all Group A and Group B compliance samples required to be taken should be uploaded to EDEN to ensure there is no annual shortfall in compliance monitoring;
- d) undertake a review of the temporal and spatial distribution of sampling for compliance monitoring for Group Water Schemes. A formal and structured method of assessment should be developed and implemented to ensure that sampling is representing the entire 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 to ensure that compliance samples are representative of water quality consumed throughout the year as required by the Drinking Water Regulations;
- e) ensure that compliance monitoring for turbidity (where there is a surface water source) and nitrite is undertaken as is required at private water treatment plants;
- f) ensure a protocol is put in place to ensure acrylamide, epichlorohydrin and vinyl chloride levels in drinking water are determined at the required frequency where such chemical is used in the water treatment process or where uPVC pipes are used for distribution mains;
- g) ensure the compliance sampling programme includes specific predetermined sampling locations and a predetermined narrow window of sampling dates;
- h) ensure the compliance sampling programme has predetermined alternative sample locations in the event that a sample location is unsuitable or inaccessible;
- i) ensure the WSZ is mapped on LIMS and the samplers are provided with a water supply zone map for each private water supply, where relevant, to ensure samples are representative of the WSZ.

Monitoring Programmes for Specific Parameters

- 2. Galway Co. Co. should ensure Section 4, Paragraph 5 of the EPA's Handbook is adhered to in relation to sampling required on water supplied from tankers in the event of their deployment. Galway Co. Co. should put in place a protocol for record keeping and compliance sampling from tankers in the event of their deployment.

Sampling Procedures

- 3. Galway Co. Co. should review the sampling procedure for compliance sampling and

ensure that:

- a) the contract laboratory has in place a sampling manual which is a controlled document subject to regular review and a record is kept of who it is issued to;
 - b) it includes appropriate and relevant information such as sampling methods for all parameters, disinfection of taps, timing and temperature limitations, criteria for sample location selection;
 - c) a formal procedure is established and implemented for the selection of random addresses for compliance monitoring at consumer's premises and for the selection of alternative addresses, if required, in the event that a sample location is unsuitable or inaccessible and that appropriate records are kept;
 - d) the sampler's worksheets should include reasons for selecting alternative sample locations, where applicable.
4. Galway Co. Co. should audit the external laboratory to ensure analysis 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.

Data handling

5. Galway Co. Co. should:
- a) prepare and implement a protocol for the reporting of failures by the laboratory to Galway Co. Co. and ensure that when notified of a failure via email by the laboratory, the protocol specifies the requirement to acknowledge such notification;
 - b) all data relating to compliance monitoring of private regulated water supplies is available on Galway Co. Co.'s website.

Exceedances of Parametric Values

6. Galway Co. Co. should:
- a) develop and implement a written procedure for dealing with sample results that exceed the parametric values outlined in the *Drinking Water Regulations (SI no 122 of 2014), as amended*. The procedure should include (a) actions to be taken to investigate the exceedance and determine its cause, (b) reporting the exceedance to the HSE and any other relevant party and (c) remedial action required. The circumstances that constitute trivial and the more serious exceedances should be clearly defined;
 - b) ensure that an annual audit plan is in place as is required under Regulation 17 of the *Drinking Water Regulations (SI no 122 of 2014), as amended* and in accordance with Section 13 of the EPA's Handbook for Private Supplies;
 - c) ensure where failures have been detected in Private Regulated Supplies that appropriate follow-up action is taken by adopting a risk-based approach to enforcement. This approach should be particularly focused on supplies that have water restriction or boil

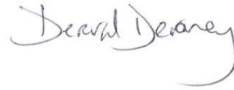
water notices in place, have persistent non-compliances, have no treatment, have treatment plants that are overloaded or have been categorised as being high or very high risk in relation to *Cryptosporidium*. This enforcement risk-based approach should be documented and implemented to ensure appropriate action is taken by Galway Co. Co. in the event that monitoring data reveals poor drinking water quality.

Follow-Up Actions Required by Galway County Council:

This report has been reviewed and approved by Emer Cooney, Inspector, EPA.

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

Report prepared by:



Date:

09 October 2019

Derval Devaney

Inspector