

Private Drinking Water Monitoring Programme Audit Report

County:	Kerry	Date of Audit:	22 nd August 2019	
Location visited:	Kerry County Council Offices	Date of issue of Audit Report:	17 th December 2019	
		Auditors:	Ms. Derval Devaney (EPA)	
			Dr. John Gray (Consultant)	
Audit Criteria:	 The European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) as amended. The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Private Water Supplies (ISBN: 978-1-84095-349-7. The EPA Information Note issued January 2019 to Local Authorities. 			

MAIN FINDINGS

- Kerry Co. Co's register of regulated private water supplies was not fully complete and accurate and may not capture all private water supplies in its functional area that are required to be monitored for drinking water compliance purposes.
- Kerry Co. Co. did not monitor small private supplies for Group B parameters, as required and nine of these supplies were not monitored at all for *E. coli* during 2018.
- Kerry Co. Co. did not carry out compliance monitoring for turbidity and nitrite at private water treatment plants, as required.
- 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.
- Kerry Co. Co. has a significant number of small public water supplies where it is unclear whose responsibility (Irish Water or the County Council) they fall under and therefore who is to undertake compliance monitoring.

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 Kerry County Council (Co. Co.) in carrying out effective monitoring of private drinking water supplies in County Kerry to ensure the provision of clean and wholesome drinking water.

An audit of the 2018 monitoring programme implemented by Kerry Co. Co. was carried out at the Kerry County Council Offices, County Buildings, Tralee, Kerry V92 H7VT. Prior to the audit, the EPA assessed monitoring returns to identify any areas of discrepancy between samples taken and analysed and reported by Kerry Co. Co. to the EPA. Using a questionnaire as a guide, Kerry 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.

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

Representing Kerry County Council:

John Breen – Director of Services, Water and Environment

Colm Mangan - Senior Executive Engineer, Water Services

Brian Lennon – Senior Executive Engineer, Water Services

Kathleen Casey – Senior Executive Technician, Water Services

Michael Griffin – Executive Engineer, Rural Water, Water Services

Lawrence Foley – Executive Engineer, Health & Safety, Water Services

Derry Bowler – Senior Executive Technician, Kerry Co. Co. Laboratory

Andrew Scanlon – Environmental Technician, Kerry Co. Co. Laboratory

David Lenihan – Senior Executive Chemist, Kerry Co. Co. Laboratory

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 Kerry Co. Co. to the EPA as part of the drinking water returns for 2018 indicates the county has 140 regulated small private water supplies (39 No. Public Group Water Schemes (PUGs,) 10 No. Group Water Schemes (PRGs) and 91 No. Small Private Supplies (SPSs)).
- b) Kerry Co. Co. maintain a register of regulated private supplies. The register had 137 private supplies listed (38 No. PUG, 10 No. PRGs and 89 No. SPSs); three fewer than that submitted to the EPA for 2018.
- c) The regulated private supplies 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 are recorded for group schemes but not for SPSs. Population data for group schemes is assessed by considering the number of connections to each scheme and from subsidy applications where the water supplier is required to submit details of population and volumes or from group schemes which are under a Design Build Operator contract. The population and volume supplied by SPSs was unknown and a default population of 51 and volume of 5 m³/day was assigned by Kerry Co. Co. for this supply type.
- d) The register is maintained by the Senior Executive Chemist and updated through quarterly liaison meetings with Water Services and the Health Service Executive (HSE). The General Data Protection Regulations (GDPR) has limited the possibility of information sharing between the Council and the HSE. The register is kept up to date through direct contact between Kerry Co. Co. and the water supplier and from local knowledge and liaising with the HSE.
- e) The 2018 compliance monitoring programme was prepared and maintained by the Senior Executive Chemist of Kerry Co. Co. and lists both population and volume data. The programme is held on the Council's Information Technology (IT) system and relevant Council staff may retain a hard copy as needed.
- f) The compliance monitoring sampling plan does not contain pre-determined sampling locations and dates. The compliance monitoring plan is not generated before the start of the year and private water suppliers are not consulted to make sure the selected premises (consumers' taps) are supplied by the private water supplies and that the parameters to be sampled in the water leaving the water treatment works (e.g. turbidity, nitrite) are appropriate.
- g) Compliance sampling is carried out on a regulated private supply when a sampler is in the area taking samples in respect of the compliance programme for public water supplies. The general timing (e.g. week/month) for sampling a private water supply is determined by the Senior Executive Chemist, but the actual date of sampling is determined by the sampler. The sampler also determines the sampling location. Sampling locations are not randomly selected within a water supply zone (WSZ) for group water schemes.
- h) The compliance monitoring programme includes a list of the regulated supplies, the size of the water supply and the required number of Group A and Group B samples. The minimum number of Group A and Group B samples required for group water schemes are based on population since the volume supplied

- cannot often be determined. Kerry Co. Co. aim to take two Group A samples a year for SPS, one including metals and other additional parameters if there are particular concerns. The SPSs therefore are not routinely monitored for compliance for Group B parameters, as required by the *European Union* (*Drinking Water*) (*Amendment*) Regulations 2017 (S.I. 464 of 2017).
- i) Turbidity (for surface water supplies) and nitrite are required to be monitored for compliance purposes at the water treatment plant in addition to the network. Nitrite is not being monitored in the final water at water treatment plants. While some group water scheme water treatment plants may have an online and continuous final water turbidity meter for operational purposes, data from such continuous monitors are not used by Kerry Co. Co. for compliance purposes.
- j) Since coagulant aids are not used at any private water supply source, provision has not been made for the determination of acrylamide, epichlorhydrin and vinyl chloride
- k) Kerry Co. Co. stated it has liaised with the HSE regarding the avoidance of duplication of samples (e.g. arrangements have been made for the HSE to monitor commercial and food premises that only open at weekends). In conjunction with the HSE it is recognised that some premises, such as food premises, are more appropriately sampled by the HSE and that on occasion some duplication may occur. A protocol between Kerry Co. Co. and the HSE ensures that sample results are made available by the HSE to Kerry Co. Co.
- Nine small private supplies were not monitored for E. coli during 2018 for compliance purposes. Kerry Co. Co. stated that the samplers may have attempted to gain access to these commercial premises which may have been closed as some are operational on a seasonal basis. In one instance Kerry Co. Co. thought erroneously that a guest house was to be monitored by the HSE, and therefore it was not monitored at all during 2018.
- m) Maps of WSZ and their sampling locations (by plotting sample location grid references) are maintained for larger schemes to ensure that, as far as possible, sample locations are evenly spread. The WSZ map for Clanmaurice Private Water Supply was examined. A list of sampling locations is available to the sampler and once one has been sampled it is removed from the list of options, thereby removing the possibility of repeat sampling. Appropriate information regarding sampling (e.g. sampling location) is recorded on the reverse of the maps.
- n) The Council stated during the audit that most of the 38 public group water schemes (i.e. private supplies served from a public water supply operated and managed by Irish Water) that exist in Co. Kerry are classified as small public supplies. This means that these supplies are considered by Kerry Co. Co. to be Irish Water's responsibility. However, Irish Water have no plan in place currently to take these supplies in charge. It was acknowledged during the audit that the Department of Housing, Planning and Local Government are undertaking a nationwide review of these "orphan schemes" and the outcome of this review is

eagerly awaited.

Monitoring Programme for Specific Parameters

a) Monitoring for radioactivity in regulated private water supplies is carried out in accordance with the EPA's Radiological Monitoring Programme, as and when required.

3. Sampling Procedures and Sampling Manual

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- a) In the event that tankers or bowsers are deployed to a regulated private water supply in an emergency, Kerry Co. Co., in accordance with the EPA 's Handbook for Private Supplies, is to carry out compliance sampling from the alternative supply if the tanker is not emptied and refilled within 48 hours with water that meets the standards in the Drinking Water Regulations. No procedure was available to inspect detailing the sampling protocol for tankers as required by the EPA's Handbook for Private Water Supplies (Section 4, Paragraph 4).
- b) Kerry Co. Co. have in place a Standard Operating Procedure (SOP) for sampling (Sampling P-001 Rev 19/08/19). Although sampling details were limited there were adequate references to other documents where additional detail could be found on, for example, preparation of sample containers and methods for carrying out on-site tests. Although the procedure requires bacteriological samples to be placed in a cool box for transport, no guidance is given for the maximum time period within which bacteriological samples should be returned to the laboratory for analysis. Such a critical constraint should be identified in the main body of the SOP. Guidance of the selection of a sample tap is included.
- c) The manual is a controlled document subject to regular review by all users and annually by an internal quality audit team. A named person is responsible for issuing the manual and all laboratory staff hold a copy. Records are kept of its issue and the Information Technology (IT) system audits access to the electronic location where the manual resides. Amendments are notified by email to all users and the document identifies the latest issue. Changes are audited by laboratory staff.
- d) Daily worksheets are provided by the Senior Executive Chemist by email to the samplers who may download a hard copy if required. The worksheet identifies the water supply name, type of compliance sample (Group A or Group B) required and the general timing of the sampling. The sampling of private supplies occurs when sampling is planned for the public water supply i.e. if it is planned to sample a public water supply for compliance monitoring and a private water supply is nearby, the sampler will include that private water supply in the compliance sampling round.
- e) There is no procedure for the selection of sample locations or alternative sample locations. The sampling location is chosen by the sampler from the WSZ map or sampling location list prior to going out sampling and the reference number for the location is recorded.
- f) No adhesive sample labels are used, and samples are labelled by marker pen. The laboratory intends to institute a system of pre-printed bar-coded adhesive labels.

- Compliance samples are pre-designated as Group A or Group B. The Laboratory Information Management System (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.
- g) Field sheets are used by samplers to record sample details and the results of any on-site tests together with details of the cool box in use and data retrieved from the data logger. Any amendments to the field sheet are corrected using a single line strike-through which must be initialed.
- h) While sampling, if it is not possible to collect a sample at the samplers intended sampling location, an alternative location would be selected by the sampler, usually a neighbouring property within 500m of the planned sampling location. The reason for selecting a particular alternative sampling point is not recorded in the sampler's field sheet and there is no protocol for guiding the selection of alternative addresses should the initial sample point be inaccessible. A record of the selection of an alternative sample location and its grid reference number is entered into the samplers' worksheet. It is stipulated in the SOP that repeat samples should not be taken from the same location.
- i) Sample details are recorded manually in the Databook and LIMS system. A chain of custody is maintained throughout the sampling process which records personnel involved, sample details, refrigeration units used and analytical requirements.

4. Data Handling

- a) Analytical and associated data is recorded on the sampler's worksheet for on-site tests such as residual disinfectant, taste, odour and temperature. Results of laboratory tests are available on the printouts from the analytical instruments. Results are recorded manually by the relevant analyst in the laboratory in databooks and on the LABWARE LIMS system.
- b) After Analytical Quality Control (AQC) checks have been verified, data is entered on the LIMS system and is validated by the Senior Executive Chemist. Should the AQC data be out of limits or showing adverse trends the method is revalidated before being used for compliance analysis. No changes may be made to data once it has been validated. The system is capable of producing an audit trail of access to the system and of data entries.
- c) If the data from the laboratory is shown subsequently to be incorrect, a new laboratory report would be issued, and corrected data entered on the system.
- d) Kerry Co. Co.'s Rural Water Section has commenced issuing compliance monitoring reports to the private water suppliers. However, monitoring results, water restrictions notices and boil water notices are not published on Kerry Co. Co's website. Kerry Co. Co. stated that it is looking into publishing its monitoring results on its website.
- e) All compliance monitoring results for regulated private supplies were

reported to the EPA as part of the Annual Drinking Water Returns for 2018.

5. Exceedances of Parametric Values

- a) In 2018 Kerry Co. Co. had a protocol for the management of drinking water results (V5, 19 August 2019). The HSE also issued a "Guideline for the Management of Initial Notification of a Drinking Water Issue of Potential Danger to Human Health".
- b) An alert protocol has been developed by Kerry Co. Co. Laboratory for use from 2019, which relies on the notification by email of microbiological failures to relevant staff of the local authority. It was not possible to verify from the protocol the actions that would be taken by Kerry Co. Co. in the event of a non-compliant sample. The relationship between the protocol and other procedures was not clear (e.g. roles and responsibilities of personnel involved, subsequent communications and actions to be taken to protect consumers were not included). However, Kerry Co. Co. stated that in the event of non-compliant samples, the HSE would be consulted and the private water supplier would be contacted by telephone, if the Council had its contact details. If direct contact by telephone was not possible, a hand delivered note would be presented to the water supplier within 24 hours.
- c) Six Private Water Supplies (one Private Group Water Scheme and five Small Private Supplies) where *E. coli* were detected in 2018 were discussed. These are Top of Coom Pub, Kilgarvan (78 No./100 ml); Faungort Activity Centre & Caravan Park, Faungort (1 No./100 ml); Seaview Caravan Park, Kells Bay (101 No. / 100 ml); Cordal Post Office, Castleisland (15 No./100 ml); Pauline's Pantry, Kells (32 No/100 ml); and Kells Private Group Water Scheme (16 No./100 ml). The latter Group Water Scheme is subject to a long-term boil water notice and on a separate sampling event during 2018 it contained trihalomethanes (THMs) at 108 μg/l. Kerry Co. Co. stated that the Group Water Scheme has issues with persistent THM failures but is not on the National THMs list for priority action. Kerry Co. Co. stated that upon detecting an *E. coli* failure, the HSE is consulted and regarding these six private supplies listed above, Boil Water Notices (BWNs) were issued to the affected water supplies.
- d) There were seven BWNs in place during 2018; served on the six supplies above and another group water scheme, which is exempt from the Drinking Water Regulations as it serves just two houses (therefore serving < 50 persons) and is not a commercial or public activity.
- e) A sample taken on 31 July 2018 from Falvey's Caravan Park, Glenbeigh contained 26.3 μ g/I lead. Kerry Co. Co. consulted with the HSE regarding risk to human health and carried out an audit of the supply. The caravan park has since been connected to a public water supply. The site is licensed under planning and the water supplier is required to submit quarterly monitoring results to the Council.
- f) A sample taken on 31 July 2018 from Harry Farrell's Caravan Park, Maharees contained the following failures; 12.9 μ g/l arsenic, 4 NTU turbidity, 492 μ g/l

- iron, 379.1 ug/l manganese and colour 48 hazen. Kerry Co. Co. liaised with the HSE and a repeat sample was also non-compliant. Kerry Co. Co. audited the supply and HSE advice was issued to the HQ of the Caravan Park. Usage of water at the site was generally low and not long-term.
- g) Audits of private water supplies carried out by Kerry Co. Co. are reactive and based on failures and risk to human health. For example, in response to noncompliance with regard to arsenic, lead and *E. coli*, Kerry Co. Co. carried out five audits in 2018 of private water supplies. The supplies audited were: two audits of Beal Gheal Caravan Park, Maharees [which had failures of turbidity (16.3 NTU), ammonium (0.8 mg/l), iron (1,229 and 1,239 ug/l), manganese (2,501 ug/l) and colour (21 and 97 Hazen) during 2018]; and an audit of Sandy Bay Caravan Park, Maharees [which had failures of turbidity (18.5 NTU), ammonium (0.87 mg/l), iron (1,155 ug/l), manganese (2,344 ug/l) and colour (102 Hazen) during 2018]; Seaview Caravan Park, Kells Bay [which had failures of *E. coli* (101 No. / 100 ml) and Colony Count (126 No / 1 ml) during 2018] and Kells Private Group Water Scheme [which had failures of pH (5.8 pH units), THMs (108 ug/l), *E. coli* (16 No. / 100 ml), coliform bacteria (201 No./ ml), colony count (301 No / 1 ml) and colour (21 and 32 Hazen) during 2018].

3. Auditors comments

Arrangements by Kerry County Council in assessing the quality of public water supplies for 2018 was generally found to be satisfactory but improvement is required. For example, the audit found that the private water supplies register did not contain all the required data and many regulated private supplies had shortfalls in their compliance monitoring requirements or were not monitored at all for *E. coli* during 2018.

Weakness were identified in the sampling manual, regarding the lack of a 2018 predetermined compliance monitoring programme that sets out in advance sampling dates and locations and suitable alternative sample locations to ensure samples are randomly pre-selected prior to a sampling event. It is therefore recommended that a review of such procedures is undertaken by Kerry Co. Co. to ensure appropriate sampling procedures are in place. Procedures also need to clearly define roles and responsibilities regarding the notification of the HSE and the Water Supplier in the event of a failure in a water supply and action to be taken to ensure the matter is investigated and remedial action is undertaken.

Upon review of the compliance monitoring results for 2018, a significant number of the listed regulated private water supplies on EDEN had failures of the parametric values. While some audits were carried out by Kerry Co. Co. during 2018, it is recommended that where failures have been detected, Kerry Co. Co. ensures appropriate follow-up action is taken by adopting a risk-based approach to its enforcement of the regulated private water supply sector.

Finally, Kerry Co. Co. is advised to liaise with the relevant stakeholders regarding the oversight of Public Group Water Schemes, as recommended below. Also ensure monitoring results are provided to the water supplier and such monitoring and notices issued are published in a prominent location on its website.

The EPA acknowledges that fulfilling the role and responsibility of the supervisory authority for private supplies requires a dedicated resource to ensure this sector is appropriately monitored and supervised and water supplied is safe to drink. Kerry Co. Co. is advised to continue its efforts and address deficiencies identified during this monitoring programme audit.

4. Recommendations

Compliance Monitoring Programme

- 1. Kerry Co. Co. should ensure that:
 - a. 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 resister 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 each 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. 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).* Kerry 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. the compliance sampling programme is generated before the start of the monitoring year and Kerry Co. Co. liaises with the private water supplier (e.g. the Group Water Schemes and any other private water supplies with large water supply zones) when compiling the sampling plan for the upcoming year to ensure that the sample locations are representative of the water supply zone and parameters to be taken at the water treatment plant are relevant;
 - d. the compliance monitoring programme includes specific predetermined sampling locations and a predetermined narrow window of sampling dates;

- e. the predetermined timing of samples should be taken into consideration for those private water supplies that operate seasonally (e.g. caravan parks, guesthouses, schools, etc.) to ensure regulated supplies are monitored for compliance at the required frequency;
- f. 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 2014, as amended;
- g. 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. Kerry 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;
- h. that compliance monitoring for turbidity (where there is a surface water source) and nitrite is undertaken as is required at private water treatment plants; and
- i. a review is undertaken of the disputed small public water supplies, in consultation with Irish Water and the Department of Housing, Planning and Local Government in an effort to determine whose responsibility they fall under. Such supplies should be included in the relevant monitoring programme for 2020 and onwards.

Sampling Procedures and Sampling Manual

- 2. Kerry Co. Co. should:
 - a) review the sampling procedure for compliance sampling and ensure that the sampling manual, which is a controlled document, identifies sampling methods for all parameters, disinfection of taps, timing and temperature limitations to ensure samples are transported under appropriate conditions and in a timely manner, and any other appropriate information;
 - ensure the sampling procedure used by contract laboratories is adequate and that samples are transported under appropriate conditions and in a timely manner;
 - ensure a formal protocol 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;

- d) ensure the sampling procedure includes the need to record, in the samplers fieldsheet, the samplers' reason for selecting alternative sample locations;
- e) ensure the use of permanent marker pens for the labelling of sample containers ceases as soon as possible and is replaced with self-adhesive, bar coded, pre-printed labels; and
- f) develop a procedure to ensure that Section 4, Paragraph 4 of the EPA's Handbook for Private Water Supplies is adhered to in relation to compliance sampling required for water supplied from tankers and other alternative supply sources.

Data handling

3. Kerry Co. Co. should ensure all data relating to compliance monitoring of private regulated water supplies is routinely issued to the regulated Private Water Suppliers as soon as it is available, and measures should be taken to publish this monitoring data and matters affecting the regulated private water supply (such as a Boil Water Notice or Do Not Use Notice) in a prominent location on Kerry Co. Co.'s website.

Exceedances of Parametric Values

- 4. Kerry Co. Co. should:
 - a) 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), as amended*. The procedure should include:
 - (i) reporting of the exceedance to the HSE, the water supplier and any other relevant party;
 - (ii) communications with the water supplier to initiate investigations of the exceedance and determine its cause, and
 - (iii) follow-up on remedial action required to ensure the issue is resolved and water supplied is wholesome and clean. The circumstances that constitute trivial and the more serious exceedances should be clearly defined within the procedure.
- 5. Kerry Co. Co. should ensure that regulated private supplies with persistent THM failures are communicated to the Department of Housing, Planning and Local Government so that they can be represented on the National THMs list for priority action.
- 6. Kerry Co. Co. should ensure where failures have been detected in Regulated Private Water 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 risk-based enforcement approach should be documented and implemented to ensure appropriate action is taken by Kerry Co. Co. in the event that monitoring data reveals poor drinking water quality.

7. Kerry Co. Co. should ensure that an annual audit plan is in place, as required under Regulation 17 of the *Drinking Water Regulations (SI no 122 of 2014), as amended,* and is in accordance with Section 13 of the EPA's Handbook for Private Supplies.

Follow-Up Actions Required by Kerry County Council

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

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

Report prepared by:	Report prepared by:		
	Derval Devaney	_	17 December 2019
	Inspector		