Site Visit Report

Under the European Union (Drinking Water) Regulations 2014 as amended, 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 providing clean and wholesome water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

Water Supply Zone

Name of Installation	Newcastle West PWS
Organisation	Irish Water
Scheme Code	1900PUB1042
County	Limerick
Site Visit Reference No.	SV26095

Report Detail

Issue Date	21/11/2022
Prepared By	Orla Harrington

Site Visit Detail

Date Of Inspection	02/11/2022	**Announced**	Yes
Time In	10:30	**Time Out**	13:40
EPA Inspector(s) **Additional Visitors**	Orla Harrington		
Company Personnel	Irish Water: Duane O'Brien, Kian Guihen, Claire Hurley. Limerick City and County Council (acting under service level agreement to Irish Water): Declan O'Connor, Dom Hayes, John Kelly, Anthony Donnelly and Anne Peters.		

Summary of Key Findings

1. A microbiological failure in the Newcastle West Public Water Supply was notified to the EPA on 12/10/2022 when *Enterococci* (6 No./100ml) was found in a sample at a location on the network. Repeat sampling was clear. Irish Water stated that, while not confirmed as the cause of the exceedance, it may have been linked to a blocked injection point at a chlorine booster station. There are no chlorine alarms with a dial out facility to ensure an immediate response can be made in the event of inadequate levels of chlorine and no automatic changeover of pumps in the event of a malfunction at the booster chlorination stations in the distribution network.

2. The auditors review of data from the chlorine monitors at the plant and booster chlorination stations found unstable trends, with chlorine levels dropping and spiking significantly for the month of October 2022. Irish Water could not provide an explanation for the large fluctuations in the chlorine residual trend data.

Introduction

The Newcastle West Public Water Supply (PWS) is sourced from the River Deel. The treatment plant serves a population of 9,939 people and produces approximately 3,500 m3/day. Treatment includes coagulation, flocculation, clarification, rapid gravity filtration and chlorination. There are off site storage reservoirs at five locations which were not visited as part of the audit.

Limerick City and County Council advised on the day of the audit that the Southwest Regional PWS (code: 1900PUB1056) where the water is abstracted from Tobergal Springs is used to augment the Newcastle West PWS. Treatment at the Southwest Regional, which was not visited on the day of the audit, includes chlorination and UV disinfection, and it provides a supplementary supply of between 100 and 500 m3/day into the final water sump at the Newcastle West plant.

The audit was undertaken to assess Irish Water's performance in producing clean and wholesome water following a detection of *Enterococci* during investigative monitoring on the network on 10/10/2022. Repeat microbiological sampling was undertaken in the network on 11/10/2022 and 17/10/2022 and all repeat sampling was clear.

Supply Zones Areas Inspected

The audit comprised of a site visit to Newcastle West water treatment plant. The auditor inspected the treatment processes and raw water abstraction point.

1. Disinfection

		Answer
1.1	Is the disinfection system verified using monitors and alarms, with trended data recorded and accessible?	No

Comment

1. A failure to meet the *Enterococci* parametric value on 10/10/2022 was notified to the EPA on 12/10/2022. Irish Water stated that, while not confirmed as the cause of the exceedance, it may have been linked to a blocked injection point at a chlorine booster station. The chlorine residual at the failed location was above the minimum required of >0.1 mg/l. Follow up samples at two locations in the supply zone were taken on 11/10/2022 and 17/10/2022. All results were compliant with the microbiological standards and contained adequate levels of free residual chlorine.

2. There are several chlorination booster stations on the Newcastle West PWS. There are no chlorine alarms with a dial out facility to ensure an immediate response can be made in the event of inadequate levels of chlorine and no automatic changeover of pumps in the event of a malfunction at the booster stations on the network. It was noted at the audit that the chlorine monitors are connected to a recording device and trends are available for viewing at the plant.

3. Limerick City and County Council stated that the target residual chlorine at the plant is approximately 1.5 mg/l. The following alarm set-points were identified at the audit: (i) low shutdown: 0.6 mg/l; (ii) warning high: 2 mg/l and (iii) high high alarm: 2.2 mg/l. There is no automatic shutdown set-point in place for high chlorine.

		Answer
1.2	Does the trend in chlorine residual at the treatment plant indicate adequate and stable levels of disinfection?	No

Comment

The auditors review of data from the chlorine monitors at the plant and reservoirs found unstable trends, with chlorine levels spiking and dipping significantly for the month of October 2022. Irish Water could not provide an explanation for the large fluctuations in the chlorine residual trend data.

		Answer
1.3	Is there a suitable monitoring frequency for residual chlorine in the network with records available?	No

Comment

Records of residual chlorine monitoring in the network were requested in advance of the audit. While check monitoring sampling results between 01/11/2021 and 17/10/2022 at 12 locations were provided and showed adequate residual chlorine levels, records were not submitted to show that residual chlorine in the network is being monitored several times a week in order to demonstrate that a minimum residual chlorine level of > 0.1 mg/l is being maintained throughout the network, including the extremities.

2. Reservoirs and Distribution Networks

		Answer
2.1	Are reservoirs adequately inspected and maintained?	No
	Comment	
	There was no record of the reservoirs in the Newcastle West PWS having been cleaned or inspected.	

3. Management and Control

		Answer
3.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No

Comment

1. Information provided in support of the audit states that the protozoal log credit requirement for the source is 3 log. However, the sanitary survey has not yet been completed and the supply may have the potential to exceed a log requirement of 3 upon failure of the survey.

2. The plant is currently not being monitored in accordance with the Irish Water *Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies.*

		Answer
3.2	Are suitable alarm settings in place to alert operators to deteriorating water quality and/or the failure of a critical treatment process?	No

Comment

1. There was no shutdown setpoints based on high chlorine levels in the final water leaving the plant.

2. There are no high or low pH alarms for the final water.

4. Site Specific Issues

		Answer
4.1	Was there trend data available for the supplementary source?	No

Comment

1. At the audit Limerick City and County Council advised that the Southwest Regional PWS where water is abstracted from the Tobergal Springs is used to augment the Newcastle West PWS. Treatment at the Southwest Regional plant includes chlorination and UV disinfection, and it provides a supplementary supply of between 100 and 500 m3/day into the final water sump at the Newcastle West WTP.

2. As this plant was not visited on the day of the audit, it was not possible to verify the performance of the UV disinfection system.

Recommendations

Subject	Newcastle West PWS Audit Recommendations [02/11/2022]	Due Date	21/12/2022
Action Text	**Recommendations** **Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address these issues, Irish Water should implement the following recommendations without delay:** 1. Irish Water should undertake the following at chlorine booster stations on the network (i) install automatic switchover between duty and standby chlorine dosing pumps at boosting stations on the network in the event of the failure of one of the pumps and (ii) install chlorine alarms at the booster stations and ensure that the alarms will dial out to staff on the cascade system. 2. Irish Water should install automatic shutdown of the plant linked to the high residual chlorine alarm settings. 3. Irish Water should provide an explanation for the fluctuating chlorine trends at the plant and booster stations and put appropriate corrective actions in place. 4. Irish Water should monitor residual chlorine in the network, including extremities, several times a week to ensure a minimum residual chlorine of >0.1 mg/l is maintained. 5. Irish Water should ensure that all reservoirs supplied by the Newcastle West water treatment plant are included in the Irish Water Reservoir Inspection and Maintenance Schedule. 6. Irish Water should (i) confirm the log treatment requirement for the plant following the completion of the sanitary survey (ii) submit a programme of works to address any log deficit at the plant and (iii) undertake monitoring in accordance with *Irish Water's Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies.* 7. Irish Water should (i) provide a copy of the validation certificate for the UV disinfection system installed at Southwest Regional water treatment plant (ii) provide one month performance data to verify that the UV system is operating within its validated range at all times. 8. Irish Water should ensure that the pH monitor is alarmed and linked to SCADA. **Follow-Up Actions required by Irish Water** During the audit, Irish Water representatives were advised of the audit findings and that action must be taken as a priority by Irish Water to address the issues raised. This report has been reviewed and approved by Regina Campbell, Drinking Water Team Leader. Irish Water should submit a report to the Agency on or before 21/12/2022 detailing how it has dealt with the issues of concern identified during this audit. The report should include details on the action taken and planned to address the various recommendations, including time frame for commencement and completion of any planned work. 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. Please quote the Action Reference Number DW20220173 in any future correspondence in relation to this Report.		