

Site Visit Report

Under the *European Union (Drinking Water) Regulations 2023*, the Environmental Protection Agency (EPA) is the supervisory authority in relation to Uisce Éireann and its role in the provision of public drinking water supplies. This audit was carried out to assess the performance of Uisce Éireann in providing clean and wholesome water to the public water supply named below.

The audit process is a sample of the performance of a water treatment plant and public water supply on a given date.

Water Supply Zone	
Name of Installation	Wicklow Regional Supply
Organisation	Uisce Éireann
Scheme Code	3400PUB1005
County	Wicklow
Site Visit Reference No.	SV29619

Report Detail	
Issue Date	11/03/2024
Prepared By	Derval Devaney

Site Visit Detail			
Date Of Inspection	16/02/2024	Announced	Yes
Time In	11:00	Time Out	13:15
EPA Inspector(s)	Derval Devaney		
Additional Visitors			
Company Personnel	Uisce Éireann (UÉ): Jessica Evans Wicklow County Council (in partnership with UÉ): Eoin Heslin		

> Summary of Key Findings

1. A minimum free chlorine concentration of 0.1 mg/l was not being maintained at all times throughout the distribution network.
2. The pH and Turbidity monitors were not reliably operating in the lead up to the audit. Despite the chlorine monitor, CL002, being within calibration, it was questionable if it was monitoring accurately.
3. Housekeeping was poor at the site. Spaces around pipework entering the treated water and a hole in the floor and wall of the treatment plant presented a risk of contamination of the water supply. The chlorine bund contained liquid and debris.

> Introduction

The Wicklow Regional Public Water Supply (PWS) is supplied with treated water from the Vartry Reservoir and serves a population of 16,590 (EDEN figure). In the past, Cronroe water treatment plant (WTP) supplemented the supply by one third, but this has ceased since Vartry WTP was upgraded approximately two years ago. Now treated water enters the reservoir at Cronroe where it is booster chlorinated if necessary, and supplies Ashford, Rathnew, Wicklow Town and environs via 4 additional reservoirs, namely Broomhall, Ballineerin, Greenhills and Mariners Point. There is chlorine boosting in place at Broomhall and Greenhill Reservoirs also.

> Supply Zones Areas Inspected

The reservoir at Conroe and its chlorination and monitoring systems were inspected as part of this audit.



1. Disinfection

		Answer
1.1	Is the disinfection system verified using monitors and alarms?	Yes
Comment		
<p>1. There is a chlorine (and pH) monitor located at the "Vartry Inlet" pipe leading to the reservoir. There is a chlorine monitor (CL002) after the reservoir in advance of secondary chlorination which uses 10-12% sodium hypochlorite. A chlorine monitor (CL003) is located after the reservoir and secondary chlorination.</p> <p>2. The target chlorine residual concentration entering supply is 0.6 mg/l, and if CL003's chlorine residual falls below 0.4 mg/l it triggers the secondary chlorine dosing to commence.</p> <p>3. The CL002 monitor signals an alarm at 0.3 mg/l (LoLo); 0.35 mg/l (Lo); 1.2 mg/l (Hi) and 1.5 mg/l (HiHi) after a time delay of 600 seconds. The CL003 monitor signals an alarm at 0.4 mg/l (LoLo); 0.45 mg/l (Lo); 1.2 mg/l (Hi) and 1.5 mg/l (HiHi) after a time delay of 600 seconds.</p> <p>4. The current alarm settings do not appear to ensure the target chlorine residual of 0.6 mg/l entering the network is met at all times.</p>		

		Answer
1.2	Are manual chlorine tests carried out and recorded on final treated water to compare with the continuous monitor results?	Yes
Comment		
<p>1. Twice per week on average the operator compares the readings from CL002 and CL003 to readings taken from a handheld monitor. These reading are entered into a logbook. Records of these readings show a discrepancy between the readings from the handheld monitor and CL002 from 01/02/2024 - 14/02/2024. For example on 04/02/2024 the handheld reading was 0.8 mg/l and the CL002 monitor read 0.37 mg/l.</p>		

		Answer
1.3	Is there a chlorine residual ≥ 0.1 mg/l throughout the network?	No
Comment		
<p>1. The residual free chlorine readings provided during the audit showed a minimum free chlorine residual of 0.1 mg/l was not achieved in the network at "Ballyfree" and "Deputy's Pass" monitoring locations on 31/01/2024. This was after 20 minutes of flushing at these locations.</p>		



2. Management and Control

	Answer	
2.1	Is there a documented alarm response procedure?	No
Comment		
<p>1. There are alarms on chlorine monitors CL002 and CL003, the pH monitor (at the inlet pipe) and turbidity monitor (at the reservoir's outlet).</p> <p>2. An alarm response procedure was not displayed at the site and available for inspection.</p>		

	Answer	
2.2	Is continuous monitoring data accessible?	No
Comment		
<p>1. In response to the EPA's pre-audit information request for turbidity trends, UÉ stated the trend from the turbidity monitor was not representative as it was connected to the old CFC plant which was decommissioned approximately two years ago. This monitor was moved to the outlet of the reservoir on 14/02/2024 and operating during the audit and linked to SCADA. The turbidity read 0.213 NTU on the day of the audit.</p> <p>2. In response to the EPA's pre-audit information request for pH trends, UÉ stated the trend from the pH monitor was not representative for the last month while the delivery of a new probe was awaited. The new probe was installed on 14/02/2024 and linked to SCADA. The pH read 7.65 on the day of the audit.</p> <p>3. It was unclear during the audit how frequently trends and alarms are reviewed by supervisory staff to ensure treatment and monitoring systems are in good working order.</p>		

	Answer	
2.3	Have the recommendations from the previous EPA audit been satisfactorily addressed?	No
Comment		

1. The previous EPA's audit at Cronroe WTP in 2014 reported there was an open hole in the floor at the point where the chlorine dosing line entered the filtered water channel.

Irish Water at the time was requested to seal the hole in the floor of the water treatment works to reduce the potential for any spillages on the floor of the water treatment works entering the final treated water.

2. During the audit there were numerous holes and gaps around sampling points or dosing lines which entered the treated water as follows:

- The sampling points for the turbidity and chlorine monitors (CL002 and CL003) had gaps around its pipework;
- There was a large uncovered hole on the floor of the old treatment plant (next to the pH and chlorine inlet monitor) which appeared to lead to a channel of treated water;
- There was a hole in the wall of the new chlorine boosting unit.

These holes and unsealed gaps present a risk of contamination of the treated water supply from vermin or animal entry and accidental spillages.

3. In addition to the above there were storage of redundant chlorine drums and waste in the chlorination room. The sodium hypochlorite bund also contained liquid and debris.

Recommendations

Subject	Wicklow Regional PWS Audit Recommendations [16/02/2024]	Due Date	11/04/2024
Action Text	<p>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendations without delay.</p> <ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> i. Investigate the discrepancy between the residual chlorine readings on the chlorine monitor (CL002) and the results of the manual residual chlorine test carried out at the Cronroe Reservoir; ii. Review (i) the target chlorine residual leaving Cronroe Reservoir to ensure adequate chlorine residuals can be maintained at the extremities of the distribution network and (ii) review the low chlorine alarm set-point to ensure the required target chlorine residual is achieved at all times; iii. Produce, and display prominently an inspection checklist for operators, including the actions the operator is to take if an issue is found; iv. Ensure equipment and monitors are regularly checked, maintained and calibrated as required, and in accordance with the manufacturer's instructions; 2. Ensure that (i) there are documented site specific alarm response procedures displayed at the plant and (ii) training is provided to all relevant staff on the procedures. 3. Ensure regular review and oversight of trends and alarms by supervisory staff is undertaken. 4. Undertake a review of housekeeping and waste storage at the plant and take measures to ensure (i) bunds are free from liquid and litter; (ii) where there is access to treated water, entry points are sealed to prevent contamination of the supply from accidental spillages, vermin and animals and (iii) the plant is well maintained, clean and tidy. 5. Ensure that residual free chlorine concentrations in the network are at least 0.1 mg/l at all times. Incidents of inadequate chlorine levels should be investigated and actioned to ensure adequate disinfection is achieved. <p>Actions required by Uisce Éireann</p> <p>During the audit, Uisce Éireann representatives were advised of the audit findings and that action must be taken by Uisce Éireann to address the issues raised.</p> <p>Uisce Éireann should submit a report to the EPA on or before the above due date detailing the actions taken and planned, with timescales, to close out the above recommendations.</p> <p>The EPA advises that the findings and recommendations from this audit report should, where relevant, be addressed at other public water supplies and in particular at other chlorine booster stations on the Wicklow Regional distribution network.</p>		