

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	Corofin PWS
Organisation	Uisce Éireann
Scheme Code	0300PUB1010
County	Clare
Site Visit Reference No.	SV30277

Report Detail	
Issue Date	19/08/2024
Prepared By	Orla Harrington

Site Visit Detail			
Date Of Inspection	24/07/2023	Announced	Yes
Time In	11:00	Time Out	12:15
EPA Inspector(s)	Orla Harrington		
Additional Visitors			
Company Personnel	Uisce Éireann: Darragh Conneely, Barry McMahon, Pat Collins, Tommy Roche, Darragh McCormack. Clare County Council (working in partnership with Uisce Éireann): Gerry Murphy.		

> Summary of Key Findings

1. The Corofin public water supply is on the EPA's remedial action list under two categories: 'Excessive levels of aluminium in treated water' and 'EPA Audit Observation - Treatment and Management Issues'. The audit confirmed that the treatment upgrades have been completed bringing improvements to the management, operation, and control of the plant to enhance water quality. All previous audit recommendations have been completed and upgrades include: installation of pH correction, greater operational control on the coagulation process, a new Dissolved Air flotation process and two new sand pressure filters and GAC stage and replacement of SCADA and telemetry systems. The plant was found to be fully commissioned and operating well on the day of the audit. Uisce Éireann have provided verification data to demonstrate the effectiveness of the works.
2. Uisce Éireann also installed a new ultraviolet (UV) disinfection system at Corofin water treatment plant to provide a barrier against *Cryptosporidium*. The audit found that the new UV disinfection system was operating within its validated range, and there were appropriate alarms and controls in place.

> Introduction

The Corofin public water supply (PWS) serves a population of 1,315 with 332 m³/day of treated water produced. Raw water is abstracted from Inchiquin Lake and treatment consists of pH correction, coagulation using polyaluminium chloride, flocculation, clarification by dissolved air flotation, pressure filtration followed by granular activated carbon filtration. Disinfection is by chlorination and a newly installed UV disinfection system.

This plant is on the EPA's remedial action list (RAL) as the supply has aluminium failures dating back to 2012. The purpose of the audit was to verify if Corofin PWS can be removed from the EPA's RAL, focusing on the treatment upgrades undertaken at the plant which were completed in 2022. Since the upgrade there has been extensive process proving to gather verification data.

> Supply Zones Areas Inspected

Treatment processes upgraded under the remedial action plan were inspected on-site, along with supporting information on alarms, controls and monitoring results.



1. Disinfection

		Answer
1.1	Is the UV system suitably validated?	Yes
Comment		
<p>1. The water is disinfected by chlorination and UV treatment. Uisce Éireann stated that either disinfection system can be considered the primary disinfection at the plant.</p> <p>2. Two ATG UVLX-1800-6 UV units are provided on-site. The units operate on a duty/standby basis with automatic switchover if the duty UV unit fails for any reason. There is also a scheduled changeover of the UV units every six hours.</p> <p>3. The validated operating range of the UV system was provided to the EPA in advance of the audit. The units are validated under USEPA UVDGM and validated to operate at a maximum flow of 26m³/hr and deliver a dose of 40 mJ/cm² at 75% UVT. The system automatically shuts down if UV dose is <40 mJ/cm². There is also automatic shutdown of the UV system if the flow exceeds 26m³/hr and UVT is <75% (delay of 120 seconds).</p> <p>4. At the audit the UV dose was 80 mJ/cm², flow 17 m³/hr, UVT 93 %. The purpose of the UV system is to provide a validated UV disinfection specification suitable for a 3 log inactivation for <i>Cryptosporidium</i> and <i>Giardia</i>. One month of verification data for May 2024 was provided and demonstrated that the UV unit was operating within its validation range.</p>		

		Answer
1.2	Is there a suitable monitoring frequency for residual chlorine in the network with records available?	No
Comment		
<p>1. A sample of records provided after the audit on 08/08/2024 showed that there was a gap of 7 days between monitoring results for residual chlorine in the network. Uisce Éireann advised that the operator was on annual leave during this time.</p>		



2. Supply on the Remedial Action List

2.1

	Answer
Do the audit findings support progress made with the Remedial Action List upgrades?	Yes
Comment	
<p>1. Corofin WTP has undergone improvements on the operation, control and treatment of the plant under RAL upgrade works to enhance water quality as follows: (i) replacement of CFC including a new flash mixer, new 2-stage flocculation and new Dissolved Air Flotation Unit; (ii) two new sand pressure filters and GAC stage; (iii) enhanced chemical dosing; (iv) newly installed duty/standby UV disinfection and (v) replacement of site electrics, control system, SCADA and telemetry systems.</p> <p>2. Process proving is complete and verification data has been submitted to the EPA which demonstrates adequate treatment is in place at the plant for the prevention of aluminium exceedances and also demonstrates the UV units are operating within their validated range. This data has been reviewed and the Corofin PWS will be considered for RAL removal in the Quarter 3 2024 RAL review.</p>	



3. Site Specific Issues

	Answer
3.1 Is the GAC suitably managed and controlled?	No
Comment	
<p>1. Raw water is abstracted from Inchiquin Lake. Clarified water is pumped into two parallel sand pressure filters. A new GAC unit was installed and receives approximately 3% of the filtered water. Uisce Éireann stated that the GAC was installed to manage seasonal taste and odour issues.</p> <p>2. At the audit, Uisce Éireann were unable to confirm how or when the changeout of the carbon unit is required.</p>	

Recommendations

Subject	Corofin PWS - Audit Report	Due Date	17/09/2024
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. Ensure that (i) there are standard operating procedures in place for routine and periodic check and maintenance activities on the GAC system and (ii) operators are trained.2. Ensure that residual chlorine monitoring is undertaken in the extremities of the network several times a week. <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 17/09/2024 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.</p>		