

Site Visit Report

Under the *European Union (Drinking Water) Regulations 2014* as amended, 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	Lough Mourne
Organisation	Uisce Éireann
Scheme Code	0600PUB1076
County	Donegal
Site Visit Reference No.	SV27535

Report Detail	
Issue Date	23/03/2023
Prepared By	Ruth Barrington

Site Visit Detail			
Date Of Inspection	23/02/2023	Announced	Yes
Time In	10:20	Time Out	13:00
EPA Inspector(s)	Ruth Barrington		
Additional Visitors			
Company Personnel	Uisce Éireann: Fionnuala Bonner, Eamonn Doherty Donegal County Council (working in partnership with Uisce Éireann): Hugh Alexander, Cathal Faulkner, Martin O'Donnell		

> Summary of Key Findings

1. The audit found that the coagulation flocculation and clarification (CFC) and filtration treatment processes were meeting turbidity criteria for 3-log protozoal treatment requirements at the time of the audit.
2. The feasibility of enhancing filtration performance by increasing media depth and providing a run to waste capacity should be assessed by Uisce Éireann under the programme of filter refurbishment planned for the Meencrumlin WTP.

> Introduction

The Lough Mourne public water supply provides water treated at Meencrumlin Water Treatment Plant (WTP) to a population of 20,998 people, from a water abstraction point at Lough Mourne. Treatment processes on site include coagulation, flocculation and clarification (CFC), followed by rapid gravity filtration and disinfection using chlorination.

> Supply Zones Areas Inspected

This audit focused on the performance of protozoal barriers at Meencrumlin WTP.



1. Protozoal Barriers Audits 2023

		Answer
1.1	Did UÉ confirm the target residual for chlorine contact time?	Yes
Comment		
<p>1. There were two versions of the chlorine contact time calculation available during the audit. The minimum free chlorine required at the validation point was different across the two versions.</p> <p>2. The current low chlorine alarm and shutdown point at 0.7 was lower than either of the calculated minimum free chlorine required figures. The calculation and alarm/ shutdown settings should be reviewed to ensure they meet the criteria for primary disinfection.</p> <p>3. An issue with the chlorine trend data was identified whereby at the time of the audit, the final water chlorine residual read-out on the monitor was 1.01 mg/l, while on the HMI and SCADA the trend line was frozen at 0.94 mg/l, which is above the alarm trigger set point. Staff present agreed that an alarm may not be generated in this scenario if the chlorine residual dropped below the set point, as alarm signals come from SCADA readings rather than the monitor display.</p> <p>4. The time delay set on a WTP shutdown for final water chlorine residual was set at 30 minutes. This may be too long to enable an effective response to inadequately disinfected water entering the distribution network, and should be reviewed.</p>		

		Answer
1.2	Has UÉ identified the protozoal compliance log treatment requirement for the water treatment plant?	Yes
Comment		
<p>1. Uisce Éireann confirmed a 3-log treatment requirement for the Lough Mourne surface water source.</p> <p>2. Filter backwashes are triggered by time, headloss and by a filter turbidity in excess of 0.3 NTU which protects the log treatment requirement. A time delay of 10 minutes is placed on the turbidity trigger, meeting the EPA <i>Water Treatment Manual: Filtration</i> event definition.</p>		

		Answer
1.3	Are the filters designed and managed in accordance with EPA guidance?	No
Comment		

1. There are two banks of rapid gravity filters on-site, Filters 1-4 provided as part of the original WTP, and Filters 5 and 6 installed during a WTP upgrade in 2009. All filters have a media depth of 700 mm (less than the 1000 to 1200 mm specified in the EPA *Water Treatment Manual: Filtration*).
2. Staff outlined that the freeboard capacity within the filters may limit the potential to increase the media depth.
3. After backwashing, filters return to service with a slow start. There is currently no facility for an automatic run to waste after backwash.
4. A filter refurbishment programme is in place with Filters 3 and 4 due for refurbishment during 2023, and other filters to follow in subsequent years.

1.4

		Answer
	Does continuous turbidity monitoring indicate that the filters are operating effectively?	Yes
Comment		
<ol style="list-style-type: none"> 1. The turbidity trends viewed during the audit support the 3-log requirement being met by the CFC and filtration processes, although individual filters display some short term spikes over 0.3 NTU particularly during mid February 2023 when raw water turbidity was high. 2. The auditor noted that the 0.3 NTU level is protected by a backwash trigger with an appropriate time delay of 10 minutes. 		



2. Site Specific Issues

	Answer
2.1 Is all chemical storage on-site suitably maintained?	No
Comment	
<p>1. There was liquid contained in the sodium hypochlorite bund. Staff stated that this was a spill of sodium hypochlorite which had occurred during a delivery. While the spill was retained in the bund, its continued presence affects bund capacity and as with any chemical spill, should be removed from the bund and disposed of appropriately.</p> <p>2. A number of small drums of kerosene were noted in an unbunded area in the chemical storage room. If these are required on site they should be placed on a suitable bund tray.</p>	

Recommendations

Subject	Lough Mourne Audit 23/02/2023	Due Date	24/04/2023
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. During the filter refurbishment programme, review (i) the media depth and evaluate the feasibility of increasing it in line with the depths set out in <i>EPA Water Treatment Manual: Filtration</i>; (ii) the feasibility of providing a run to waste facility following filter backwash.2. Assess the data capture capabilities of the HMI/SCADA system to ensure that reliable data is available for alarm and inhibit generation.3. Review (i) the chlorine contact time (Ct) calculation to show the minimum free chlorine concentration required at the Ct validation point after contact time, and if relevant, change the low chlorine alarm set point to protect this requirement; (ii) the delay time on the chlorine residual inhibit which may be too long at the current setting of 30 minutes.4. Remove and suitably dispose of the spillage in the sodium hypochlorite bund, and provide suitable banded containers for small kerosene drums stored on site. <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 24/04/2023 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>		