

# 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	
<b>Name of Installation</b>	Fanad West (Tullyconnell)
<b>Organisation</b>	Uisce Éireann
<b>Scheme Code</b>	0600PUB1042
<b>County</b>	Donegal
<b>Site Visit Reference No.</b>	SV29682

Report Detail	
<b>Issue Date</b>	31/05/2024
<b>Prepared By</b>	Veronica Boland

Site Visit Detail			
<b>Date Of Inspection</b>	23/04/2024	<b>Announced</b>	Yes
<b>Time In</b>	14:45	<b>Time Out</b>	16:45
<b>EPA Inspector(s)</b>	Veronica Boland		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Uisce Éireann: Fionnuala Bonner. Donegal County Council (working in partnership with Uisce Éireann): John Duffy, John Gallagher, Stephen McGlynn, Hugh Whoriskey.		

## > Summary of Key Findings

1. Uisce Éireann has stated that the Fanad West (Tullyconnell) Public Water Supply source has a protozoal log treatment requirement of 3 log. Slow Sand Filtration could provide 2.5 log credit but the controls are not in place. Uisce Éireann should identify how the protozoal log deficit at the plant will be addressed in accordance with the *Uisce Éireann Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies*.
4. There are no automatic shutdowns linked to low and high chlorine residual levels or high turbidity levels in the final water in order to prevent inadequately treated water entering the supply.

## > Introduction

The Fanad West (Tullyconnell) water treatment plant (WTP) serves a population of 1,122 people (EDEN figure), with 540 m<sup>3</sup>/day (570 m<sup>3</sup>/day during peak season) of treated water produced at the Fanad West (Tullyconnell) WTP. The raw water abstraction is from Lough Naglea. A source and sanitary survey was completed in 2023 and a Log 3 treatment requirement is assigned to Fanad West (Tullyconnell). The treatment comprises slow sand filtration and chlorination. The treated water is pumped to an onsite reservoir providing 270 m<sup>3</sup> storage. The Fanad West (Tullyconnell) public water supply (PWS) is supplemented during periods of higher demand from Milford PWS via the Kerrykeel reservoir.

The audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on the protozoal barriers in place at the WTP.

## > Supply Zones Areas Inspected

The audit included a site visit of the treatment processes at Fanad West (Tullyconnell) WTP, the abstraction source and the treated water reservoir on site.



## 1. Source Protection

	Answer
1.1	Is the abstraction source(s) adequately protected against contamination? <b>Comment</b> <p>1. The abstraction source, Lough Naglea, located nearby the Fanad West (Tullyconnell) was visited on the day of the audit. There are farms and farmsheds surrounding Lough Naglea. At the audit Uisce Éireann could not confirm whether landowners in the area had received written notification of setback distances in accordance with the <i>European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2022 (S.I No. 113 of 2022)</i>.</p> <p>2. Uisce Éireann have since advised, that following the audit Donegal County Council Environment Section issued written notification to relevant landowners in the catchment with regard to designated buffer zones and set-back distances from the lake when applying organic or chemical fertiliser or any pesticides.</p>



## 2. Disinfection

2.1

Is there a suitable monitoring frequency for residual chlorine in the network with records available?

**Answer**

No

**Comment**

1. Network chlorine residuals are monitored in the Fanad West (Tullyconnell) water supply once per week. A suitable monitoring frequency (a minimum of every 2-3 days) is recommended to verify that there is a minimum chlorine residual of 0.1 throughout the network to ensure that consumers are receiving adequately disinfected water.



### 3. Reservoirs and Distribution Networks

		Answer
3.1	Is treated water in tanks and reservoirs suitably protected against contamination?	No
<b>Comment</b>		
1. One ventilation pipe on the treated water reservoir was open and not secured against animal entry or contamination.		

		Answer
3.2	Are reservoirs adequately inspected and maintained?	No
<b>Comment</b>		
1. The Tullyconnell reservoir located at the WTP was inspected and there was green algae visible on the internal reservoir ladder. Staff advised that the reservoir would be scheduled for cleaning in September after the summer season, as the plant does not have the capacity to close the reservoir for cleaning during the summer peak demand period.		



## 4. Protozoal Barriers Audits 2024

		Answer
4.1	Is there a documented site specific incident response and incident escalation process?	No
<b>Comment</b>		
<p>1. The Uisce Éireann Incident Communication Response Guidance chart displayed at the WTP did not contain the site specific alarm time delay setpoints that protect critical processes at the Fanad West (Tullyconnell) WTP. The chart should be updated to display the site specific alarms and time delay setpoints for Fanad West (Tullyconnell) WTP.</p>		

		Answer
4.2	Did UÉ confirm whether <i>Cryptosporidium</i> monitoring under the Rationale for Determining the Frequency of <i>Cryptosporidium</i> in Public Water Supplies is being carried out?	No
<b>Comment</b>		
<p>1. <i>Cryptosporidium</i> monitoring is not carried at the Fanad West (Tullyconnell) WTP.</p> <p>2. The pre-audit information submitted for Fanad West (Tullyconnell) stated that a Source and Sanitary Survey was completed for the WTP in 2023 and Log 3 treatment requirement assigned. On the day of the audit, staff advised that a log 2.5 treatment is assigned to Fanad West (Tullyconnell) WTP. While slow sand filters can provide 2.5 Log treatment, this is not achieved in practice at Fanad West (Tullyconnell) WTP because the full range of filtration controls are not in place in accordance with section 4.6.2 of the <i>EPA Water Treatment Manual: Filtration</i>.</p> <p>3. <i>Cryptosporidium</i> monitoring should be carried out in accordance with the <i>Uisce Éireann Rationale for Determining the Frequency of Cryptosporidium in Public Water Supplies, with reference to the log treatment deficit and the livestock farms in the vicinity</i>.</p>		

		Answer
4.3	Are the filters designed and managed in accordance with EPA guidance?	No
<b>Comment</b>		
<p>1. Staff advised at the audit that the slow sand filter media depths are 0.620 metre and the filters are measured every time they are cleaned. The filters are cleaned approximately once a month. At the audit, the record of filter cleaning (from 30/05/2023 to 19/04/2024) was reviewed, staff advised that there is a loss of filter depth of between 25-30 mm everytime a filter is cleaned.</p> <p>2. Filter 1 was last replenished in 2021 and filters 2 and 3 in 2022. There is a risk that the media in the filters will be below the minimum depth as specified in the <i>EPA Water Treatment Manual: Filtration</i> given the loss of filter depth everytime a filter is cleaned.</p> <p>2. At the audit, staff advised that filter 1 often requires a top up of water to keep the filterbed wetted. A overground pipe from a raw water abstraction point, separate to the inlet pipe to the filter is used for this purpose. There may be a risk that this pipe may disturb the upper layers of the <i>schmutzdecke</i>.</p>		

		Answer
4.4	Does continuous turbidity monitoring indicate that the filters are operating effectively?	Yes
<b>Comment</b>		
<p>1. Filter turbidity records reviewed at the audit showed a number of occasions where Filter 3 turbidity was higher than that of Filter 1 and 2.</p> <p>2. During the audit the filter outlet turbidity readings were: Filter 1 was 0.13 NTU, Filter 2 was 0.07 NTU and Filter 3 was 0.16 NTU. The raw water turbidity was 0.68 NTU and the final water turbidity was 0.112 NTU.</p> <p>3. At the time of the audit there was no clear explanation for the discrepancies between the filter turbidity readings.</p>		

		Answer
4.5	Are there suitable plant controls to prevent inadequately treated water entering the distribution network?	No
<b>Comment</b>		
<p>1. There are no automatic shutdowns linked to high turbidity levels in the final treated water in order to prevent inadequately treated water entering the supply.</p> <p>2. There are no automatic shutdowns linked to low and high chlorine residual levels. Following the audit, Uisce Éireann advised that there is a high chlorine <i>dosing</i> shut off of 2.7 mg/l with a delay of one hour and with an automatic restart at 2m/l controlled from the free chlorine analyser on the inlet to the reservoir.</p>		

		Answer
4.6	Are alarms and shutdowns on each filter, on the combined filtered water and final water in accordance with the EPA Filtration Manual?	No
<b>Comment</b>		
<p>1. There are no alarms or shutdowns linked to individual filtered water or final water turbidity. These controls should be in place according to the <i>EPA Water Treatment Manual: Filtration</i>, in order for the log credit approach to be used and the 2.5 Log credit to be claimed.</p>		

		Answer
4.7	Was the chlorine contact time calculation correct?	No
<b>Comment</b>		
<p>1. In the pre-audit information a '<i>Disinfection (Primary) Chlorination Dose &amp; Storage Calculation</i>' sheet was submitted. This sheet did not contain details of the chlorine contact time calculation for the site.</p>		

## Recommendations

<b>Subject</b>	Fanad West (Tullyconnell) Audit 2024 Recommendations	<b>Due Date</b>	01/07/2024
<b>Action Text</b>	<p><b>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendations without delay.</b></p> <ol style="list-style-type: none"> <li>1. Update the Uisce Éireann Incident Communications Response Guidance chart to include site specific information including contacts for escalation and all relevant alarm and inhibit trigger levels and time delay setpoints protecting critical processes at the treatment plant. Provide training to staff on incident response in line with the updated guidance chart.</li> <li>2. (i) Provide details on how the protozoal log deficit will be addressed in the absence of a 2.5 log credit and (ii) undertake <i>Cryptosporidium</i> monitoring immediately as per the <i>Uisce Éireann Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Supplies</i>.</li> <li>3. Submit a site-specific chlorine contact time calculation to the EPA, to verify that the minimum WHO specified contact time of 15mg.min/l is achieved at the WTP and that the first connections are receiving appropriately disinfected water.</li> <li>4. Provide (i) high and low chlorine residual alarms and shutdowns to protect disinfection (ii) turbidity alarms and inhibits which meet the criteria for awarding log credits as specified in the <i>EPA Water Treatment Manual: Filtration</i>.</li> <li>5. Assess the impact of the flow from the additional inlet pipe on the filter sand in Filter 1 and put in place measures to avoid impacting the '<i>schmutzdecke</i>'.</li> <li>6. Investigate the discrepancies in filter performances indicated by turbidity readings and instigate actions to address these discrepancies to ensure that the filters are operating in accordance with the <i>EPA Water Treatment Manual: Filtration</i>.</li> <li>7. Ensure that all vents on the reservoir are appropriately secured against ingress of animals or deliberate introduction of any contaminant or acts of vandalism.</li> <li>8. Schedule cleaning of Tullyconnell reservoir and ensure that it is included in the Uisce Éireann reservoir cleaning programme.</li> <li>9. Carry out monitoring of residual chlorine several (two to three) times per week at different points of the network to include network extremities.</li> </ol> <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 01 July 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>		