

# 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	
<b>Name of Installation</b>	Tullamore South And Clonaslee
<b>Organisation</b>	Uisce Éireann
<b>Scheme Code</b>	2500PUB1020
<b>County</b>	Offaly
<b>Site Visit Reference No.</b>	SV27568

Report Detail	
<b>Issue Date</b>	20/03/2023
<b>Prepared By</b>	Lisa Noone

Site Visit Detail			
<b>Date Of Inspection</b>	23/02/2023	<b>Announced</b>	Yes
<b>Time In</b>	11:00	<b>Time Out</b>	13:40
<b>EPA Inspector(s)</b>	Lisa Noone		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Uisce Éireann: Ed Haythornthwaite, Joseph Moran, John Gavin Offaly County Council (working in partnership with Uisce Éireann): John Daly, Stephen Ryan, James Joyce, John Gavin, Keith Brazil, Joe Coleman, Catherine Casey		

## > Summary of Key Findings

1. The audit found a number of shortcomings at Clonaslee Water Treatment Plant (WTP), the *Cryptosporidium* barrier at the Old Plant is not fully protected by suitable alarms and inhibits as set out in the *EPA Water Treatment Manual: Filtration* to prevent the entry of inadequately treated water to the supply.
2. Uisce Éireann were unable to confirm the protozoal log treatment requirement for the Tullamore South and Clonaslee Public Water Supply. No monitoring for *Cryptosporidium* in line with *Uisce Éireann's Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies* is currently taking place for the supply.
3. There is no automatic shutdown of the Old Plant for high turbidity and high/low chlorine residual setpoints and no chlorine contact time calculation was available for the WTP.

## > Introduction

The Tullamore South and Clonaslee PWS serves a population of approximately 4,017 and supplies on average 1,661 m<sup>3</sup>/day of water to South Tullamore and Clonaslee and surrounding areas. The source of the supply is mainly from five boreholes - Clarahill, Glebe, Tinahinch, Forest and Plant boreholes (intake approximately 1,300m<sup>3</sup>/day total) and the Clodiagh River (intake approximately 513 m<sup>3</sup>/day). Groundwater from Clarahill, Glebe and Tinnahinch Boreholes are collected in the Roundhill Collection Chamber and gravity-fed to the Borehole Collection Chamber at Clonaslee WTP along with the Forest and Plant Boreholes. Raw surface water from the Clodiagh River is collected at the Surface Water Collection Chamber at the WTP.

Water treatment at Clonaslee WTP is currently split between the Old Plant for treatment of surface water from Clodiagh River, and the New Plant for treatment of the groundwater sources. The New Plant was recently under a Design, Build and Operate (DBO) contract with Murphy Ireland Ltd. which was handed over to Offaly County Council in partnership with Uisce Éireann on 23rd January 2023. The Old Plant was due to be taken offline following construction of the New Plant however supply volume from the groundwater supplies alone was not sufficient and at present, the Tullamore South and Clonaslee PWS continues to be supplemented from the surface water source.

Treatment of surface water at the Old Plant consists of coagulation, flocculation, clarification (CFC), rapid gravity filtration via two filters, fluoridation and disinfection via chlorination. Treatment of groundwater at the New Plant consists of pressure filtration via three filters, fluoridation, protozoal inactivation via UV and disinfection via chlorination. Both treated surface water and groundwater are stored in the combined on-site reservoir with a storage capacity of approximately 2,850 m<sup>3</sup>.

The audit was undertaken to assess the performance of Uisce Éireann in providing clean and wholesome drinking water.

## > Supply Zones Areas Inspected

Both the Old and New Plant were inspected as part of the audit of Clonaslee WTP. The audit involved an assessment of the alarms/inhibits at the treatment plant and the procedures in place to ensure appropriate management and oversight of same. The surface water and groundwater abstraction points were not inspected as part of the audit.



## 1. Alarms, Inhibits & Oversight Audits 2023

	Answer	
1.1	Is there a documented site specific incident response and incident escalation process?	No
<b>Comment</b>		
1. There is no documented site-specific incident response detailing contacts for escalation and relevant trigger levels at the WTP.		

	Answer	
1.2	Did UÉ confirm the target residual for chlorine contact time?	No
<b>Comment</b>		
1. At the time of the audit, no contact time (Ct) calculation could be provided by Uisce Éireann for the Tullamore South and Clonaslee drinking water supply.		
2. Uisce Éireann were requested to provide the Ct calculation following the audit but this has not been provided to date.		

	Answer	
1.3	Were online monitors within their calibration dates?	No
<b>Comment</b>		
1. A number of online monitors were not within their calibration dates.		
2. Turbidity and pH monitors in the Old Plant had not been calibrated since 2019 and 2021.		
3. In addition, chlorine analysers at the reservoir inlet and outlet were due for calibration on 14/10/2022 and have yet to be completed.		
4. Operational personnel stated that manual checks are carried out on a daily basis to verify the accuracy of the uncalibrated online monitors.		
5. Offaly County Council personnel stated that their service provider is due to carry out an asset register assessment of online monitors in both the Old and New Plant to address calibration requirements.		

	Answer	
1.4	Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?	No
<b>Comment</b>		

1. A post-filter turbidity alarm is in place for both rapid gravity filters in the Old Plant - the alarm set point for turbidity is 0.8NTU for 180 seconds (3 minutes).
2. An assessment of the protozoal log treatment requirement for the surface water or groundwater supplies have not been completed by Uisce Éireann. In addition, no monitoring in line with *Irish Water's Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies* is taking place currently at the treatment plant.
3. The post-filtration turbidity alarm setpoint is considered too high to allow a timely and effective response by operational staff to prevent *Cryptosporidium* entering the public water supply. The use of this single alarm setpoint for filter turbidity is not in accordance with turbidity trigger values set in the *EPA Water Treatment Manual: Filtration*.

		Answer
1.5	Are dial out arrangements suitable to allow a timely response?	No
<b>Comment</b>		
<p>1. Critical alarms are dialled-out on a group-basis to the site caretakers and operational personnel. Alarms are responded to on a hierarchical basis, however there is no way of verifying that they have been responded to.</p> <p>2. The New Plant has an additional response layer whereby actions in response to alarm dial-outs can be overseen by Uisce Éireann to ensure they have been addressed.</p>		

		Answer
1.6	Were all findings of the UÉ alarm and inhibit review implemented?	No
<b>Comment</b>		
<p>1. An alarm and inhibit review has been carried out by Uisce Éireann but the findings have yet to be implemented, and are due for discussion within the Uisce Éireann Implementation Group in the coming weeks.</p>		

		Answer
1.7	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
<b>Comment</b>		
<p>1. There is no automatic plant shutdown for the Old Plant in the event of critical disinfection failure, high or low residual chlorine or elevated turbidity. Plant shutdown can be carried out manually only.</p> <p>2. Automatic plant shutdown is in place for the New Plant.</p>		

		Answer
1.8	Are plant performance trends accessible by operational staff at the water treatment plant?	No

**Comment**

1. Operational personnel were not adequately trained in the use of the SCADA system at the WTP for viewing and zooming in on trend data or the review of alarm setpoints and inhibits.

**Answer**

1.9 Are plant performance trends accessible remotely? No

**Comment**

1. Plant performance trends for the New Plant currently cannot be accessed remotely - operational personnel can access the plant schematic only.

**Answer**

1.10 Is there a documented alarm response procedure? No

**Comment**

1. There is no documented site specific procedure detailing how alarms are responded to at the WTP.

## Recommendations

<b>Subject</b>	Tullamore South and Clonaslee Audit 23/02/2023	<b>Due Date</b>	20/04/2023
<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. Put in place an appropriate post-filtration alarm set-points in the Old Plant as detailed in Table 5.3 of the <i>EPA Water Treatment Manual: Filtration</i> in order to maintain an effective <i>Cryptosporidium</i> barrier.</li> <li>2. Confirm the log treatment requirement for the supply and submit a programme of works to address any log deficit at the supply if applicable.</li> <li>3. Calibrate and maintain monitors in accordance with the manufacturer's instructions.</li> <li>4. Submit a site-specific chlorine contact time calculation to the EPA. In the interim, Uisce Éireann should ensure 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>5. Install automatic inhibits/shutdowns at the Old Plant for high turbidity and high/low chlorine residual setpoints to ensure adequately disinfected water is being supplied to consumers. The chlorine residual alarm level should reflect the minimum free chlorine concentration required at the Ct validation point as outlined in the Ct calculations to be submitted.</li> <li>6. Update the Uisce Éireann Incident Communications Response Guidance Form with site specific information including contacts for escalation and relevant trigger levels protecting critical processes at the water treatment plant and display on-site.</li> <li>7. Put in place an appropriate cascade system for responding to alarms generated at the plant which allows for verification that an alarm has been responded to and ensure documented procedures are put in place for responding to and escalating all alarms generated at the water treatment plant. The procedure should clearly document the corrective actions and set out delegation of responsibilities.</li> <li>8. Ensure that operational personnel have remote access to plant performance trends to assist in the protection of treatment barriers, and have been adequately trained in the use of SCADA to inform their work.</li> </ol> <p><b>Actions required by Uisce Éireann</b></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 20/04/2023 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>		