

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	Kells-Oldcastle
Organisation	Uisce Éireann
Scheme Code	2300PUB1011
County	Meath
Site Visit Reference No.	SV27869

Report Detail	
Issue Date	23/06/2023
Prepared By	Lorcan Farrell

Site Visit Detail			
Date Of Inspection	24/05/2023	Announced	Yes
Time In	10:30	Time Out	12:30
EPA Inspector(s)	Lorcan Farrell		
Additional Visitors			
Company Personnel	Uisce Éireann: Daniel Behan, Michael Cunniffe. Meath County Council (Working in partnership with Uisce Éireann): John Carrol, Linda Doran, Martin Gorman, Michael Kenny, Helen McDonnell.		

> Summary of Key Findings

1. There is no verified protozoal barrier in place at Clavin's Bridge Water Treatment Plant (WTP) due to the absence of individual filter turbidity monitors. No monitoring for *Cryptosporidium* in line with Uisce Éireann's *Rationale for Determining the Frequency of Cryptosporidium in Public Water Supplies* is taking place at the treatment plant.
2. The outlet of the reservoir fed by Clavin's Bridge WTP is not an appropriate point for chlorine contact time verification as the reservoir receives additional treated water from Lough Bane WTP. The warning alarm in place on the continuous residual chlorine monitor on the outlet of the reservoir is not set at an appropriate level and there is no plant shutdown setpoint in place.

> Introduction

Kells-Oldcastle Public Water Supply serves a population of 11,886 people (EDEN figure) and is supplied by Lough Bane and Clavin's Bridge WTPs. This audit focused specifically on Clavin's Bridge WTP. Clavin's Bridge WTP sources its water from the River Blackwater and produces 1,050-1,100 m³/day. Treatment at the plant consists of coagulation, clarification, pressure filtration, chlorination and fluoridation.

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 treatment plant.

> Supply Zones Areas Inspected

The audit included a site tour of Clavin's Bridge WTP.



1. Protozoal Barriers Audits 2023

	Answer	
1.1	Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	No
Comment		
<p>1. There are two reservoirs (SR1 and SR2) located approximately 2km from the treatment plant on the Hill of Lloyd. Clavin's Bridge WTP supplies approximately 80% of the treated water for SR1 with Lough Bane WTP providing the remaining 20%. SR2 is supplied solely by Lough Bane WTP. There is a continuous chlorine monitor located on the outlet of SR1 which is the point of chlorine contact time verification according to the chlorine contact time validation calculation supplied by Uisce Éireann. The outlet of SR1 is not an appropriate location for verification of chlorine contact time as SR1 receives water from both Clavin's bridge WTP and Lough Bane WTP.</p> <p>2. There are high and low warning alarms in place on the continuous chlorine monitor located on the outlet of SR1. The low alarm setpoint (0.20mg/l) is also lower than the minimum free chlorine target concentration as specified on the chlorine contact time validation calculation. There is no plant shutdown based on the output of this monitor which is not in accordance with the <i>EPA Water Treatment Manual: Disinfection</i>.</p> <p>3. There is a chlorine residual monitor (with associated alarm and plant shutdown setpoints) located after sodium hypochlorite dosing on the rising mains connecting the treatment plant with SR1. These settings ensure a suitable shutdown response to a dosing failure.</p>		

	Answer	
1.2	Has UÉ identified the protozoal compliance log treatment requirement for the water treatment plant?	Yes
Comment		
<p>1. Uisce Éireann has identified a 3 log protozoal compliance treatment requirement for Clavin's Bridge WTP. A source and sanitary survey was completed in Q1 2023 with no penalty applied.</p> <p>2. There are no individual filter turbidity meters in place at the treatment plant verifying a filter turbidity <0.3 NTU. The 3 log credit for pressure filters can not be applied without individual filter turbidity monitoring in place (Ref. Section 5.5.2 of the <i>EPA Water Treatment Manual: Filtration</i>).</p>		

	Answer	
1.3	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
Comment		
<p>1. No monitoring for <i>Cryptosporidium</i> in line with Uisce Éireann's <i>Rationale for Determining the Frequency of Cryptosporidium in Public Water Supplies</i> is taking place at the treatment plant.</p>		

Answer

1.4	Are the filters designed and managed in accordance with EPA guidance?	No
Comment		
<p>1. There are no individual filter turbidity meters in place at the treatment plant. Clavin's Bridge WTP is included under the Uisce Éireann Water Treatment Plant Upgrade Programme. Meath County Council stated that the upgrade programme will address the absence of individual filter turbidity meters. No start or completion dates were available for works under Uisce Éireann Water Treatment Plant Upgrade Programme.</p> <p>2. Final water turbidity trends submitted by Uisce Éireann before the audit demonstrated turbidity consistently below 0.3 NTU with the exception of a spike caused by an instrument check.</p> <p>3. There are two pressure filters in operation at the treatment plant. The filters are serviced annually which includes a caustic wash, pressure gauge and valve checks/replacement. Core samples for media integrity analysis are not included in the scope of works for the annual filter service. The filter media was topped up in 2020 but has not been replaced in either filter since the pressure filters were installed in 2004.</p> <p>4. There is no run to waste system at the treatment plant. Meath County Council stated that a run to waste system will potentially be addressed under the Uisce Éireann Water Treatment Plant Upgrade Programme.</p>		

		Answer
1.5	Are alarms and shutdowns on each filter, on the combined filtered water and final water in accordance with the EPA Filtration Manual?	No
Comment		
<p>1. A final water turbidity meter is in place at the treatment plant with a high warning alarm 0.5 NTU and a plant shutdown setpoint of 1 NTU with a 15 minute time delay. This shutdown time delay is not in accordance with the 3 minute delay as specified in the <i>EPA Water Treatment Manual: Filtration</i>.</p>		



2. Site Specific Issues

	Answer	
2.1	Is there a documented procedure in place to ensure that alarms have been responded to by operational staff?	No
Comment		
1. Alarms that are generated in the treatment plant are sent out to the three caretakers on the plant dial-out list at the same time. While there is an informal system in place to make sure alarms have been responded to, there is no formal documented procedure for ensuring that alarms have been responded to. Alarms that are generated at the plant also appear on the county SCADA system and the treatment plant is connected to the Uisce Éireann National Operations Monitoring Center.		
	Answer	
2.2	Are treatment process chemical bunds clean and free of water/chemical residue?	No
Comment		
1. The bund containing the caustic soda storage tank contained water and some chemical residue. Meath County Council stated that a breather pipe connected to another system at the plant was directed into the bund which allowed water to enter the bund. The breather pipe has been disconnected and no more water can enter the bund.		
	Answer	
2.3	Is the CFC system clean and free of debris?	No
Comment		
1. There was organic debris noted floating and adhering to the sidewalls in both the coagulation and flocculation sections of the CFC system at the treatment plant. Meath County Council stated that there are no scour valves present to assist in draining down either section and that these sections have not been drained/cleaned since the system was installed.		

Recommendations

Subject	Kells/Oldcastle (Clavin's Bridge WTP) - Audit Recommendations	Due Date	21/07/2023
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. Investigate re-locating the chlorine contact time verification from the outlet of SR1 to allow the verification of disinfection at Clavins Bridge WTP. This should include installation of a continuous chlorine monitor and provision of appropriate warning alarms and plant shutdown setpoints to ensure target contact time is achieved and verified at all times.2. Install individual filter turbidity monitors at the treatment plant. This should include provision of appropriate alarms/inhibits to ensure an appropriate protozoal barrier is in place at the treatment plant.3. Undertake monitoring for <i>Cryptosporidium</i> at the treatment plant in accordance with Uisce Éireann's <i>Rationale for Determining the Frequency of Cryptosporidium in Public Water Supplies</i> until a protozoal barrier at the plant can be verified.4. Ensure that the plant shutdown on the final water leaving the plant is controlled by the regulatory 1 NTU (with a maximum delay of 3 minutes) as detailed in the <i>EPA Water Treatment Manual: Filtration</i>.5. Develop and implement a documented procedure for confirming treatment plant alarms have been responded to and provide training to staff on the new procedure.6. Ensure that chemical storage bunds at the treatment plant are kept clean and free of water/chemical residue.7. Investigate the feasibility of draining/cleaning the coagulation and flocculation chambers in the CFC system at the treatment plant.8. Conduct a filter media assessment to ensure the integrity, suitability and depth of filter media. <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 21/07/2023 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>		