

# 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>	West Clare RWS (New WTP)
<b>Organisation</b>	Uisce Éireann
<b>Scheme Code</b>	0300PUB1066
<b>County</b>	Clare
<b>Site Visit Reference No.</b>	SV28120

Report Detail	
<b>Issue Date</b>	26/09/2023
<b>Prepared By</b>	Orla Harrington

Site Visit Detail			
<b>Date Of Inspection</b>	29/08/2023	<b>Announced</b>	Yes
<b>Time In</b>	10:30	<b>Time Out</b>	13:10
<b>EPA Inspector(s)</b>	Orla Harrington Regina Campbell Maria O'Connell		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Uisce Éireann: Darragh Coneely, Deirdre O'Loughlin, Darragh McCormack, Tommy Roche.  Clare County Council (working in partnership with Uisce Éireann): Jerry Maher, Pat O'Loughlin, Michael McNamara, Martin Corry.		

## > Summary of Key Findings

1. It was found that the upgrade to the West Clare Regional Water Supply (new) water treatment plant which was reported by Uisce Éireann as being completed since 30/06/2022 is not preventing trihalomethane formation in the supply. The supply continues to be non-compliant with the trihalomethane parametric value of 100 ug/l following the completion of upgrade works.
2. Uisce Éireann advised that they are progressing with optimisation of chemical dosing and further improvements to the operation of the flocculation tank to ensure trihalomethane compliance and assist removal of the supply from the EPA's Remedial Action List. A revised projected date of completion of works was not provided to the EPA on the day of the audit.

## > Introduction

The West Clare Regional Water Supply (RWS) new water treatment plant (WTP) serves a population of 8,702 with a volume of approximately 14,888 m<sup>3</sup>/day from the water source at Doolough Lake. Treatment consists of pH correction, coagulation, flocculation, clarification, rapid gravity filtration, chlorination and fluoridation. There is sludge treatment onsite consisting of a picket fence thickener and dewatering units.

West Clare RWS (new WTP) has been on the EPA's Remedial Action List (RAL) since 27/10/2017 due to persistent trihalomethanes (THMs) failures above the parametric value specified in the Drinking Water Regulations. A second category 'EPA Audit Observation - Treatment and Management Issues' was added in Quarter 2 2021 following an EPA audit on 05/05/2021. The EPA issued a Direction on 28/11/2019 requiring compliance with the THM parametric value of 100 ug/l by 31/12/2021. On 17/04/2023 the EPA prosecuted Uisce Éireann for failure to comply with the Regulation 16(1) Direction.

A full upgrade of the treatment plant was reported by Uisce Éireann as having been completed since 30/06/2022. However the commissioning stage identified issues with the plant performance and THMs continue to exceed the parametric value of 100 ug/l. Further optimisation works are required to improve chemical dosing and flocculation at the plant. The timeframe for the completion of this work is unknown at present.

This audit was carried out in response to ongoing THM exceedances in the West Clare RWS (new WTP) since the plant upgrade and to assess progress being made to improve performance of the plant and the removal of the supply from the RAL.

## > Supply Zones Areas Inspected

The main water treatment processes were inspected.



## 1. Coagulation Flocculation and Clarification (CFC) Stage

	Answer	
1.1	Is the CFC process optimised to respond to changes in raw water quality?	No
<b>Comment</b>		
<p>1. Clare County Council confirmed that the lake source is generally stable in terms of raw water quality. There is pH correction using sodium carbonate (soda ash) at the inlet chamber to increase the alkalinity of the raw water before the ferric sulphate coagulant is dosed.</p> <p>2. The plant upgrade included the installation of a new flash mixing tank and concrete 2 stage flocculation tank complete with mechanical mixing. During the audit, a visual inspection of the flocculation tank found poor floc formation. Uisce Éireann advised that the pH correction and coagulant dosing is not fully optimised and that further improvements to the operation of the flocculation tank is also required. Specific details on what the works entailed could not be provided to the auditor. Uisce Éireann stated that contractors are onsite until January 2024 and are continuing to progress works to ensure compliance with the THM parametric value.</p> <p>3. The turbidity monitor after the clarifiers does not have a dial out alarm in place to alert staff to operational issues.</p>		

	Answer	
1.2	Were the CFC tanks, channels and weirs observed to be clean, level and well maintained during the audit?	No
<b>Comment</b>		
<p>1. The auditor observed algae growing in the inlet chamber.</p>		

2.1

	Answer
Does monitoring indicate that the filters are operating effectively?	No
<b>Comment</b>	
<p>1. The barrier to <i>Cryptosporidium</i> entering the West Clare RWS (new WTP) is provided by 6 no. rapid gravity filters. The filters are backwashed based on time (every 48 hours) but not based on turbidity levels. Chlorinated water is used for filter backwashing which may lead to some potential for THM formation with organic matter within the filter. Uisce Éireann confirmed that the filters are run to waste for 4 minutes before the filters are brought back into use.</p> <p>2. Prior to the audit, Uisce Éireann provided individual filtered water turbidity trend data for the period 23/07/2023 to 21/08/2023 and prolonged spikes were noted &gt; 0.3 NTU on 07/08/2023 and 08/08/2023. Subsequent to the audit, Uisce Éireann provided all turbidity alarm setpoints and inhibits. The individual filter turbidity monitor has an alarm setpoint of 0.2 NTU (delay of 15 mins). Uisce Éireann stated that the spikes occurred after the filters were brought back into service after the backwash and could not confirm if the spike triggered the alarm and what corrective action was taken by operators. There was no time delay provided on high level turbidity alarm setpoint of 0.5 NTU. It was not possible to confirm at the audit if the filters are being operated in accordance with the turbidity performance criteria as outlined in the EPA Treatment Manual: Filtration in order to verify the <i>Cryptosporidium</i> barrier is fully protected.</p> <p>3. Uisce Éireann stated that monthly monitoring for <i>Cryptosporidium</i> is currently being carried out at the plant. No detections have been notified to the EPA.</p>	



### 3. Management and Control

3.1

Are suitable alarm settings in place to alert operators to deteriorating water quality and/or the failure of a critical treatment process?

**Answer**

No

**Comment**

1. On the day of the audit, the UVT monitor was not operating and had been off-line since early May 2023. In the past, the UVT monitor was used to monitor both raw and final water. Uisce Éireann are now in the process of installing two separate UVT monitors, along with the appropriate alarms, to afford time to react to a decrease in UVT. A date for completion was not provided to the EPA on the day of the audit.
2. There is no alarm on the turbidity monitor after the clarifiers to provide an alert to operators in the event of a turbidity set-point being breached.
3. There is an automatic plant shutdown linked to the high level turbidity alarm setpoint of 0.5 NTU on the combined filtered water, however Uisce Éireann did not provide a time delay for this shutdown setpoint.



## 4. Supply on the Remedial Action List

	Answer
4.1	Is the Action Programme on track to meet the Remedial Action List completion date?
	No
<b>Comment</b>	
<p>1. Uisce Éireann reported that a full treatment plant upgrade was completed since 30/06/2022. Works included an upgrade of the CFC process, filtration, installation of new flocculation tank, tube settlers in the clarifiers, residual treatment and new press plate and process control/SCADA. In the Q2 2023 RAL update, Uisce Éireann confirmed that the RAL upgrade works were complete, with a further three month period for verification data to be provided in Q4 2023 in order to remove the supply from the RAL. During the audit, Uisce Éireann agreed that the upgrade works done were inadequate to ensure THM compliance in the supply and THMs continue to exceed the parametric value of 100 ug/l. The most recent THM exceedance recorded in the distribution network was on 18/08/2023 (125 ug/l).</p> <p>2. Uisce Éireann advised that further optimisation of chemical dosing and improvements to the operation of the flocculation tank was required, however a revised completion date for the RAL upgrade works could not be provided.</p>	



## 5. Site Specific Issues

	Answer
5.1 Have Uisce Éireann concluded their investigation into the accuracy of the THM monitoring results?	No
<b>Comment</b>	
<p>1. Monitoring results submitted to the EPA by Uisce Éireann showed that THM levels of 179 ug/l and 150 ug/l were detected in the raw water on the 20/07/2023 and 13/07/2023 respectively. A possible explanation offered during the audit was that the result name should have been called THM formation potential, however this issue needs further investigation and clarification by Uisce Éireann.</p>	

## Recommendations

<b>Subject</b>	West Clare RWS (new WTP) - Audit Report	<b>Due Date</b>	27/10/2023
<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 recommendation(s) without delay.</b></p> <ol style="list-style-type: none"> <li>1. Remedial Action List:(i) submit the list of planned upgrade and optimisation works to ensure compliance with the THM parametric value; (ii) provide a revised completion date to enable West Clare RWS (new WTP) to be removed from the EPAs Remedial Action List and (iii) continue monthly monitoring of THMs at the plant and network extremities until all works are completed and verified.</li> <li>2. Filtration:(i) install a time delay on the automatic plant shutdown linked to the combined filtered water; (ii) submit findings of the investigation into the prolonged turbidity spikes in the individual filtered water after backwashing; (iii) details of remedial measures taken or planned to prevent a recurrence, including a review of the run to waste to ensure it is adequate.</li> <li>3. Filtration:(i) confirm if the filters are being operated in accordance with the turbidity performance criteria as outlined in the EPA Treatment Manual: Filtration; and (ii) undertake monitoring for <i>Cryptosporidium</i> in line with the Uisce Éireann Rationale for Determining the Frequency of <i>Cryptosporidium</i> in Public Water Supplies.</li> <li>4. Confirm when the UVT monitors on the raw and final water are operational with appropriate alarms in place.</li> <li>5. Install appropriate alarms and inhibits on the turbidity monitor after the clarifiers.</li> <li>6. Confirm if the THM monitoring results reported for raw water on 20/07/2023 and 13/07/2023 are accurate.</li> <li>7. Ensure the inlet chamber is kept clean of algae.</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 27/10/2023 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>		