

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	Moynalvey Manor
Organisation	Uisce Éireann
Scheme Code	2300PUB2040
County	Meath
Site Visit Reference No.	SV30601

Report Detail	
Issue Date	12/11/2024
Prepared By	Lisa Noone

Site Visit Detail			
Date Of Inspection	15/10/2024	Announced	Yes
Time In	11:00	Time Out	12:40
EPA Inspector(s)	Lisa Noone		
Additional Visitors			
Company Personnel	Uisce Éireann: Joseph Moran, Jamie Blacoe, Daniel Pur Meath County Council (working in partnership with Uisce Éireann): Declan Keating		

> Summary of Key Findings

1. A Boil Water Notice was placed on Moynalvey Manor Public Water Supply affecting a population of 51 people on 17/10/2024 following this EPA audit, and a subsequent technical investigation by Uisce Éireann. The Boil Water Notice was issued due to the inability of the plant and mains water supply network to achieve adequate chlorine contact time to guarantee drinking water has been fully disinfected.
2. The audit found a lack of automated control over treatment at Moynalvey Manor Water Treatment Plant. There is manual adjustment of chlorine dosing in place to account for raw water ammonia issues, and there is no automatic shutdown for chlorine residual or turbidity.
3. A number of shortcomings were identified in relation to the management and oversight of chlorination in the supply. There is no SCADA system in place to remotely assess plant performance by operators or supervisory staff, and residual chlorine monitoring is not carried out in the network to ensure that the extremities of the supply are receiving sufficient chlorination. The chlorine contact time calculation and associated alarms do not reflect the manual chlorination system that is in place at the water treatment plant. These issues and resulting inability to achieve adequate contact time were not escalated appropriately within Meath County Council and Uisce Éireann.

> Introduction

The Moynalvey Manor Public Water Supply (PWS) produces circa. 20 m³/day of water serving a population of approximately 51 people. Raw water is abstracted from a single borehole located at the Water Treatment Plant (WTP). Treatment at Moynalvey Manor WTP consists of pressure filtration, pre-chlorination for ammonia removal and granular-activated carbon (GAC) filtration, water is then chlorinated again for disinfection purposes before entering a small 10m³ onsite reservoir prior to network distribution.

The audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on the alarms and inhibits in place at the WTP and the procedures in place to ensure appropriate oversight of treatment processes. Following the audit, a Boil Water Notice was placed on Moynalvey Manor PWS on 17/10/2024 due to inadequate chlorine contact time.

> Supply Zones Areas Inspected

The borehole and treatment processes on-site were inspected as part of the audit



1. Incident Management

1.1

	Answer
Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?	No
Comment	
<p>1. During the audit on 15/10/2024 and following a technical review of the Moynalvey Manor WTP by Uisce Éireann on 16/10/2024, it was determined that effective chlorine contact time (Ct) was not being achieved via the plants reservoir and network pipelines. Therefore properties in the Moynalvey Manor PWS may not be receiving adequately disinfected drinking water.</p> <p>2. It was noted during the audit that the dosing of chlorine pre and post filtration was being manually adjusted to account for the fluctuations in raw water ammonia levels and associated changes in chlorine demand.</p> <p>3. According to the WTPs Ct calculation, the target Ct is 15mg.min/l in accordance with the WHO standard for groundwater sources. The Ct calculation states that the minimum residual chlorine concentration required at Ct validation point is 0.9mg/l, and the low low alarm set point at the Ct validation point is 0.4mg/l which should achieve 26.62mg.min/l. However chlorine residual readings from 01/10/2024 to 15/10/2024 showed results ranging from 0.14mg/l to 0.34mg/l at the Ct validation point, thus not achieving the 0.4mg/l.</p> <p>4. Residual chlorine had not been monitored in the network since March 2024 to demonstrate that a minimum residual chlorine level of > 0.1 mg/l is being maintained.</p> <p>5. The technical review carried out by Uisce Éireann at the WTP observed that the minimum chlorine levels required to achieve effective Ct were not adequate and due to a lack of automatic control and manual adjustment of chlorine dosing, it appears that effective contact time cannot be achieved at all times. The inability to achieve effective Ct had not been escalated appropriately in accordance with the site specific incident response and incident escalation process.</p> <p>6. In consultation with the HSE, Uisce Éireann placed a BWN on the supply on 17/10/2024.</p>	



2. Source Protection

2.1

	Answer
Is the abstraction source(s) adequately protected against contamination?	No
Comment	
<p>1. The borehole was not appropriately capped or sealed and therefore vulnerable to contamination by surface water ingress or contamination.</p> <p>2. The plant regularly experiences issues with raw water ammonia which is often associated with agricultural activity. Uisce Éireann could not demonstrate that landowners had been formally written to about the presence of a drinking water supply in proximity to their lands and their obligations under the <i>European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2022</i>, as amended.</p> <p>3. Raw water monitoring is not carried out under the Uisce Éireann Monitoring Programme to determine raw water quality, specifically ammonia levels which are known to fluctuate in the raw water source.</p> <p>4. Details on the borehole's construction (such as its depth, when the borehole was drilled and a borehole log) were unavailable during the audit.</p> <p>5. A source and sanitary survey has not been completed for Moynalvey Manor PWS.</p>	



3. Alarms, Inhibits & Oversight Audits 2024

	Answer
3.1 Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	No
Comment	
1. The chlorine residual monitor for Ct validation is located at the outlet of the on site reservoir, which does not account for the network pipelines included in the Ct calculation sheet.	

	Answer
3.2 Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?	No
Comment	
1. Information was not available prior to or during the audit in relation to time delays currently in place for critical alarms.	
2. A low chlorine residual alarm set point of 0.4mg/l is in place, however there is no low low alarm in place to alert operators of deteriorating water quality. The alarm set point does not align with the 15mg.min/l target set out in the Ct calculation.	

	Answer
3.3 Are dial out arrangements suitable to allow a timely response?	No
Comment	
1. Critical alarms are dialled-out on a group-basis to the site caretaker and standby caretaker. Alarms are responded depending on who is on-call, however there is no way of verifying that they have been responded to.	

	Answer
3.4 Has UÉ carried out an alarm and inhibit review at the water treatment plant?	Yes
Comment	
1. An alarm and inhibit review was carried out in May 2024 and Uisce Éireann could not confirm if the recommendations have been implemented.	

	Answer
3.5 Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No

Comment

1. There is no automatic shutdown of the plant to prevent the entry of inadequately treated water entering the Moynalvey Manor network. The plant can be shutdown on a manual basis only.

3.6

Are plant performance trends accessible remotely?

Answer

No

Comment

1. Plant performance trends are not accessible remotely for operational staff as there is no SCADA system currently in place for Moynalvey Manor WTP.

2. The site caretaker visits the site daily to assess plant performance via inspection of online and handheld monitors and the HMI system.

3.7

Is there appropriate oversight of alarm responses?

Answer

No

Comment

1. Uisce Éireann could not demonstrate that low chlorine residual alarms were being responded to or if there was appropriate oversight of these alarms.

3.8

Is there a documented alarm response procedure?

Answer

No

3.9

Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?

Answer

No

3.10

Is the chlorine contact time calculation correct?

Answer

No



4. Site Specific Issues

		Answer
4.1	Is there automatic switchover of chlorine dosing pumps?	No
Comment		
1. There is no automatic switchover of the chlorine dosing pumps in the event of a failure of the duty pump. Chlorine dosing pumps are manually switched over on a monthly basis.		

		Answer
4.2	Is there a suitable monitoring frequency for residual chlorine in the network with records available?	No
Comment		
1. Residual chlorine monitoring has not been carried out in the network since March 2024.		

Recommendations

Subject	Moynalvey Manor PWS Audit Recommendations	Due Date	12/12/2024
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. Chlorination: (i) Carry out a review of the chlorination system in place at Moynalvey Manor WTP and recalculate/revise the chlorine Ct as required, (ii) Submit details of the proposed corrective/remedial actions to restore compliance and undertake immediate works to ensure that the total effective chlorine Ct is sufficient to meet the revised site-specific target, (iii) Ensure that the chlorine alarm setpoints are based on the revised contact time calculations, to ensure the water leaving the plant has achieved primary disinfection, (iv) Carry out residual chlorine monitoring in the extremities of the network several times a week. 2. Provide details of the outcome of the investigation into the cause of the failure to achieve Ct and period of time that this has been ongoing. 3. Commence operational monitoring to include raw water ammonia levels under the Uisce Éireann Operational Monitoring Programme to provide early warning that source water quality is deteriorating, a treatment process is failing or there is a problem in the distribution network. 4. Management and oversight: Ensure that (i) Training is provided to WTP operators on the requirements of the Uisce Éireann Incident Communication Response Guidance Form to ensure incidents are recognised, escalated and acted upon promptly, (ii) there are robust systems of reviews and checks on water treatment plant performance and the status of alarms, and act on any deficiencies identified to protect public health and maintain drinking water quality. This recommendation covers actions on staff training, operating procedures, and establishing managerial and process oversight of process operations and data. 5. Examine the feasibility of installing a SCADA system at Moynalvey Manor WTP to ensure access to critical plant process information and trended performance data by all operational and supervisory staff. 6. Install (i) automatic shutdown linked to the high and low chlorine alarms and final water turbidity, and (ii) automatic switchover in the event of failure of one of the chlorine dosing pumps. 7. Investigate and report on whether the borehole is lined and sealed in accordance with <i>EPA Advice Note No. 14: Wellhead Protection and Borehole Construction</i>. 8. Complete a Source and Sanitary Survey and confirm the assigned log treatment requirement for the supply. 9. Develop a procedure and deliver appropriate training (i) covering the verification of alarms/shutdowns status following maintenance or other works completed at the treatment plant, and (ii) for responding to and escalating all alarms generated at the water treatment plant. Both procedures should clearly document the corrective actions and set out delegation of responsibilities. 10. 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 <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 the above date detailing the actions taken and planned, with timescales, to close out the above recommendations. The EPA advises that the findings and recommendations from this audit report should, where relevant, be addressed at other public water supplies.</p>		