

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	Borris In Ossory PWS
Organisation	Uisce Éireann
Scheme Code	1600PUB1007
County	Laois
Site Visit Reference No.	SV29615

Report Detail	
Issue Date	05/07/2024
Prepared By	Derval Devaney

Site Visit Detail			
Date Of Inspection	07/06/2024	Announced	Yes
Time In	14:30	Time Out	16:30
EPA Inspector(s)	Derval Devaney Sean O'Leary		
Additional Visitors			
Company Personnel	Uisce Éireann (UÉ): Linda Doran, Blathnaid Cox. Laois County Council (working in partnership with Uisce Éireann): Conor Ryle, Larry Gittens, Tony Saunders		

> Summary of Key Findings

1. There is no raw water monitoring programme in place for the groundwater source.
2. The UVT plant alarms and plant inhibits were not enabled. Some alarm set points do not protect critical treatment processes or statutory limits.
3. The plant is currently undergoing a disinfection upgrade. Once complete, UÉ is to carry out a review of alarm and inhibit settings and implement its findings.

> Introduction

The Borris in Ossary public water supply (PWS) serves 330 m³/day (figure provided on-site) from a borehole located in a secure kiosk at the Donaghmore water treatment plant (WTP).

The WTP is undergoing a disinfection upgrade, which includes the installation of UV for primary disinfection which will enable chlorination on-site to provide secondary disinfection. The chlorination process and its control system is also undergoing an upgrade.

There is no reservoir on-site. Treated water directly enters the distribution network prior to entering Sentry Hill Reservoir in Borris town (271 m³ capacity). Customers are served prior to this reservoir, the nearest being 350 m from the WTP.

Treated water also serves 88 persons on Ballybrophy Public Group Water Scheme via Ballybrophy Reservoir. Laois County Council monitor this scheme daily and it is the intention of UÉ to take over this scheme. The Group Water Scheme receives a volume of treated water in the range of 50 - 100 m³/day.

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 treatment plant and the procedures in place to ensure appropriate oversight of treatment processes.

> Supply Zones Areas Inspected

The borehole, treatment plant and associated equipment and monitors were inspected during the audit.



1. Management and Control

		Answer
1.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	Yes
Comment		
<ol style="list-style-type: none">1. UÉ stated a source and sanitary survey was completed concluding a Log 3 treatment was required for the treatment plant.2. The groundwater source is next to the Donaghmore Water Treatment Plant in an area of agricultural activity.3. A raw water monitoring programme for the groundwater source is not in place. UÉ stated as there is UV providing a barrier of 3 log +, this source will not be prioritised for raw water monitoring.		



2. Alarms, Inhibits & Oversight Audits 2024

		Answer
2.1	Were online monitors operational?	No
Comment		
<ol style="list-style-type: none"> 1. The chlorine monitor CL001 was not operational on the day of the audit as it is still in its commissioning phase. The Donaghmore WTP is currently undergoing a disinfection upgrade which includes the installation of a Duty and Standby UV unit to provide primary disinfection and a secondary disinfection chlorination dosing and control system. 2. It was explained that while the disinfection upgrade works are ongoing, UÉ continue to observe and operate the current chlorination disinfection control system. 3. This includes observation of the CL17 chlorine monitor which samples residual chlorine post the UV unit and chlorine dosing. This monitor was within calibration and reading 0.85 mg/l on the day of the audit. 4. There is no reservoir on-site to achieve adequate contact time for disinfection using chlorination treatment. In the past, disinfection by chlorination could not be guaranteed within the 350m pipeline from the WTP to the first customer as chlorine residuals could not be continuously verified at that customer's tap. The new UV unit will now ensure adequate disinfection is achieved at the WTP. 5. Until such time as the UV unit is fully commissioned, UÉ stated it is aiming for a chlorine target of 1 mg/l on-site, to ensure 0.75 mg/l is achieved at the first consumer to meet the target Ct of 18 mg.min/l for adequate chlorination. 6. Once the disinfection upgrade works are complete and the UV unit is commissioned, the chlorine target on-site can be amended to reflect its secondary disinfection purpose and to ensure 0.1 mg/l is being maintained in the network. 		

		Answer
2.2	Were online monitors within their calibration dates?	No
Comment		
<ol style="list-style-type: none"> 1. There were no calibration stickers on the new chlorine dosing pumps. The plant is undergoing a disinfection upgrade. UÉ stated all critical equipment and monitors will display calibration stickers once the upgrade is complete. 		

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

1. The time delay of 24 minutes on chlorine monitor CL001 does not allow for a timely response should an inadequate chlorine dose occur. The EPA's Water Treatment Manual: Disinfection states: "Low level alarms are critical ... and a maximum of 0.1 mg/l below the target concentration for a maximum of 5 minutes would be recommended."
2. The high and high-high alarm settings on Cl001 are 1.5 mg/l and 2 mg/l respectively. The alarm set points are not in line with EPA guidance. The EPA's Water Treatment Manual: Disinfection states: "A high level alarm is needed to prevent excess DBP formation and avoid customer complaints. A maximum of 0.2 mg/l above the target concentration is recommended."
3. The pH monitor, PH001, located on the inlet pipe has a low-low pH alarm setting of 6 with a time delay of 15 minutes. This should be reviewed to ensure treated water meets the statutory limit of between 6.5 and 9.5 pH units.
4. The new turbidity monitor TU001 located on the inlet pipe pre UV treatment has a high-high alarm time delay setting of 6 minutes on the 1 NTU high-high set point, which is not in line with the specified three consecutive minutes time delay (at a turbidity in excess of 1 NTU) as per UÉ's Disinfection Strategy.
5. The UVT monitor UVT001 located on the inlet pipe was reading 99.12% on the day of the audit but it's low alarm set at 75% and low-low alarm set at 85% was not enabled.
6. The UV validation certificate for the UV unit at the WTP (Visades T 1200L-400) was provided during the audit. It outlines when max. flow is 31.91 m³/hour, disinfection is achieved at a minimum UVT of 74.1% and a minimum UVI of 23.3 W/m². The plants inlet flow monitor FL001 had a high alarm setting at 38 m³/hr and a high-high at 42 m³/hr, which was outside the 31.91 m³/hr validation criteria for adequate disinfection.

		Answer
2.4	Has UÉ carried out an alarm and inhibit review at the water treatment plant?	No
Comment		
<ol style="list-style-type: none"> 1. UÉ plans to carry out an alarm and inhibit review at the water treatment plant once the disinfection upgrade works are complete. 		

		Answer
2.5	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
Comment		
<ol style="list-style-type: none"> 1. A plant shutdown was not enabled on the UVT monitor, UVT001. 2. The plant shutdown settings on the flow monitor, FL001, were outside the UV validation criteria. 3. The time delay settings on the chlorine monitor CL001 and turbidity monitor TU001 were too long to ensure prompt response and prevent inadequately treated water entering the network. 4. See point 2.3 above for further details on inadequate plant shutdown/inhibit settings for high chlorine and low pH concentrations. 		

		Answer
2.6	Are plant performance trends accessible remotely?	Yes
Comment		
<ol style="list-style-type: none"> 1. The monitors in place prior to the upgrade are not trending on-site, but are available remotely. The upgrade will ensure monitors are trending on-site and remotely 		

	Answer
2.7 Did plant performance trends demonstrate that data was being captured and recorded at all times?	No
Comment	
<ol style="list-style-type: none"> 1. There were gaps in trends displayed on-site for chlorine monitor, CL001. This is a new monitor which was installed as part of the disinfection upgrade and is still in its commissioning phase. 2. While the disinfection upgrade works are on-going, UÉ is maintaining online monitoring of residual chlorine at the WTP from its pre-existing CL17 monitor which was within calibration and reading 0.84 mg/l on the day of the audit. This monitor is alarmed with plant shutdown enabled. 3. The plant operator also takes handheld chlorine readings at the WTP and compares them to the CL17 monitor. 	

	Answer
2.8 Is there a documented alarm response procedure?	Yes
Comment	
<ol style="list-style-type: none"> 1. There is a documented site specific procedure setting out how alarms are responded to in order to protect water quality and public health. This should be reviewed following the disinfection upgrade works to ensure the procedure includes all (new and revised) critical alarms. 	

	Answer
2.9 Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?	No
Comment	
<ol style="list-style-type: none"> 1. There is no procedure in place covering the verification of alarms and inhibits following maintenance or other work on-site. 	



3. Site Specific Issues

3.1

	Answer
Was supply information submitted to the EPA accurate?	No
Comment	
<ol style="list-style-type: none">1. EDEN documents that the supply serves a population of 11,348 persons, produces a volume of 40 m³/day with chlorination as the only form of treatment.2. The data on EDEN needs to be verified for accuracy, as the large population figure is questionable, a production volume of 330 m³/d was provided during the audit, and UV treatment is being commissioned on-site for primary disinfection purposes in addition to chlorination which will be used for secondary disinfection.	

Recommendations

Subject	Borris in Ossary PWS Audit Recommendations	Due Date	05/08/2024
Action Text	<p>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendation(s) without delay.</p> <ol style="list-style-type: none"> 1. Put in place a raw water monitoring programme for the Borris in Ossary PWS source. 2. Display calibration stickers on all critical equipment (e.g., pumps and monitors) once the disinfection upgrade is complete. 3. Alarms: <ol style="list-style-type: none"> i. Enable alarms and plant shutdown on the UVT monitor; ii. Once the disinfection upgrade works are complete, review the site-specific chlorine target concentration to ensure 0.1 mg/l is met in the entire distribution network at all times. iii. Review alarm and time delay settings at the plant for pH, turbidity, chlorine and flow to protect site specific target levels and ensure critical treatment processes and statutory limits are protected; iv. Carry out an Alarm and Inhibit Review once upgrade works are complete and implement the findings. 4. Update the documented procedure in place for responding to and escalating all alarms generated and incidents occurring at the WTP once the disinfection upgrade works are complete. The procedure should clearly document corrective actions and set out delegation of responsibilities for operational and relief staff. Ensure staff are trained on the procedure. 5. Put a documented procedure in place for operators and contractors to check and sign-off that all alarms have been correctly re-set upon completion of any maintenance work. Ensure staff are trained on the procedure. 6. Ensure Borris in Ossary PWS supply details on EDEN are accurate (e.g. for supply volume, population and treatment). <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 due date 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>		