

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	Mountrath 2 PWS
Organisation	Uisce Éireann
Scheme Code	1600PUB1055
County	Laois
Site Visit Reference No.	SV29616

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

Site Visit Detail			
Date Of Inspection	07/06/2024	Announced	Yes
Time In	11:10	Time Out	13:15
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, Declan Carroll.		

> Summary of Key Findings

1. The contact time calculation submitted pre-audit was incorrect, due to the lack of baffling in the new contact tank. Therefore it could not be confirmed at the audit if adequate disinfection is being provided at the water treatment plant.
2. The Drim reservoir, which stores treated water at the plant, has not been inspected for maintenance in approximately 23 years.
3. The plant is currently undergoing disinfection upgrade works. Uisce Éireann will carry out a review of alarm and inhibit settings once works are complete.

> Introduction

The Mountrath 2 public water supply (PWS) serves 276 m³/day to a population of approximately 310 (EDEN data) from a borehole located in a kiosk across the road from the Drim water treatment plant.

Water is pumped to the plant where it is disinfected using sodium hypochlorite. Treated water enters a new contact tank and the existing on-site Drim reservoir. Water is then pumped to Drim Group Water Scheme Reservoir (50m³ capacity which now forms part of the PWS). Water is also fed by gravity to the PWS distribution network. At Mountrath village the supply blends with treated water from Knocks water treatment plant (WTP). Customers are served prior to the blend taking place and the blended water is included in the population served by Mountrath 2 PWS.

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 groundwater borehole and treatment processes at the water treatment plant were inspected in addition to the new contact tank and Drim treated water storage reservoir located on-site.



1. Reservoirs and Distribution Networks

		Answer
1.1	Are reservoirs adequately inspected and maintained?	No
Comment		
<ol style="list-style-type: none">1. The on site Drim Reservoir (214 m³ capacity) was lined approximately 23 years ago and it is thought that was the last time it was inspected for maintenance.2. The concrete walls and covered roof of the reservoir were cracked in places with vegetation growing in the cracks.		



2. Management and Control

2.1

Has the protozoal compliance log treatment requirement been identified for the water treatment plant?

Answer

No

Comment

1. UÉ stated a source and sanitary survey had been completed concluding a Log 3 treatment was required. But that assessment referred to a spring source and not the current groundwater source (a nearby river was used in the past as a raw water source). UÉ is to confirm if a source and sanitary survey was completed for the groundwater source.
2. There is no raw water monitoring programme in place for the groundwater source.

3. Alarms, Inhibits & Oversight Audits 2024

		Answer
3.1	Were online monitors operational?	Yes
Comment		
<ol style="list-style-type: none"> Sodium hypochlorite is dosed into the inlet pipe prior to entry into a new contact tank. The CL001 monitor, sampling post the chlorine dose after a 15 minute contact loop, was brought online in May 2024 but is still in its commissioning phase. While the disinfection upgrade works installed by an external contractor are ongoing, UÉ continue to observe and operate the pre-existing disinfection control system. This includes observation of the CL17 chlorine monitor, which samples from the on-site Drim reservoir. This monitor was within calibration and meeting the chlorine site specific target of 0.6 mg/l, reading 0.62 mg/l on the day of the audit. Chlorine monitors CL002 and CL003 monitor chlorine residual on the outlet of the Drim reservoir and were reading 0.67 mg/l and 0.68 mg/l respectively on the day of the audit. 		

		Answer
3.2	Were online monitors within their calibration dates?	Yes
Comment		
<ol style="list-style-type: none"> UÉ stated new equipment and monitors were calibrated. But there were no calibration stickers on the new chlorine dosing pumps. UÉ stated all critical equipment and monitors will display calibration stickers once the disinfection upgrade is complete. The pre-existing disinfection system control system was within calibration dates. 		

		Answer
3.3	Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?	No
Comment		
<ol style="list-style-type: none"> The time delay of 24 minutes on the low and low low alarms on monitors CL001, CL002 and CL003 is too long and does not allow for a timely response should an inadequate chlorine dose occur. The <i>EPA's Water Treatment Manual: Disinfection</i> 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." The high and high high alarm settings on CL001, CL002 and CL003 are 1.5 mg/l and 2 mg/l respectively with a time delay of 24 minutes. The alarm set points and time delay are not in line with EPA guidance. The <i>EPA's Water Treatment Manual: Disinfection</i> 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." The pH monitor 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. The pH monitor is used to calculate the site's disinfection target contact time and was reading 7.02 on the day of the audit. The turbidity monitor located on the inlet pipe 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. The turbidity monitor is used to calculate the site's disinfection target contact time and was reading 0.169 NTU on the day of the audit. 		

Answer

3.4	Has UÉ carried out an alarm and inhibit review at the water treatment plant?	No
Comment		
1. UÉ plans to carry out an alarm and inhibit review at the water treatment plant once the disinfection upgrade works are complete.		

		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. Plant shutdowns are enabled on the low low alarm set points and high high alarm set points. 2. See Question 3.3 above which refers to unsuitable alarm set points and/or time delays with regard to shutdowns linked to the chlorine, turbidity and pH monitors.		

		Answer
3.6	Is there a documented alarm response procedure?	Yes
Comment		
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
3.7	Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?	No
Comment		
1. There is no procedure in place covering the verification of alarms and inhibits following maintenance or other work on-site.		

		Answer
3.8	Is the chlorine contact time calculation correct?	No
Comment		

1. UÉ's chlorine disinfection validation calculation submitted in advance of this audit illustrates a Target Contact Time (Ct) of 32.75 mg.min/l is required at the plant for adequate disinfection and a Total Effective Ct of 35.05 mg.min/l is provided on site.
2. The Ct calculation provides a Df factor of 0.5 for the new contact tank installed as part of the disinfection upgrade works. Such Df factor would indicate the contact tank is baffled. UÉ confirmed post the audit that the new contact tank is unbaffled stating: "*The Ct calculations which were provided in advance of the audit were based on the assumption that all works including tank baffles are complete. Tank baffles have not yet been installed. These are being procured and process proving will take place as soon as they are installed. Consequently, the Ct calculations were incorrect and UÉ will provide revised calculations that reflect the current configuration.*"
3. The target Ct for the site (32.75 mg.min/l) is not met at the water treatment plant when the Ct calculation is adjusted using a Df factor of 0.1 (for unbaffled tanks in accordance with the EPA's *Water Treatment Manual: Disinfection*) and using chlorine residual data retrieved during the audit.
4. The EPA instructed UÉ to re-calculate the Ct calculation taking account of current configurations at the site and chlorine residuals post Ct. UÉ was also instructed to consult the HSE, without delay, if inadequately disinfected water is being provided to any customer on the supply for the protection of human health.
5. Post the audit UÉ submitted a revised Ct Calculation to the EPA indicating adequate disinfection is being achieved at the plant. The EPA awaits the submission of documentation to support this revised Ct calculation.



4. Site Specific Issues

	Answer
4.1 Was supply information submitted to the EPA accurate	No
Comment	
<ol style="list-style-type: none">1. EDEN documents (2023 data) that the supply serves a population of 310 persons and produces a volume of 276 m³/day.2. UÉ stated this data needs to be verified for accuracy.	

Recommendations

Subject	Mountrath 2 PWS 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 recommendations without delay.</p> <ol style="list-style-type: none"> 1. Put in place a raw water monitoring programme for the Mountrath 2 PWS source. 2. Provide: <ol style="list-style-type: none"> i. the protozoal log treatment requirement following completion of a source and sanitary survey for the groundwater source; ii. details on how a protozoal log deficit, if identified, will be addressed; iii. commence monitoring as per Irish Water Rationale for Determining the Frequency of <i>Cryptosporidium</i> Monitoring in Public Water Supplies until a protozoal barrier at the plant can be verified. 3. Provide: <ol style="list-style-type: none"> i. a revised Ct calculation for the supply to reflect the current site configuration and supporting documentation to reflect any changes to the calculation; ii. confirmation that the HSE has been consulted, if inadequately disinfected water is being provided to any customer on the supply; iii. details on how adequate disinfection will be achieved and/or public health is protected; iv. a timeline for the installation of baffles on the new contact tank. 4. Provide a timeframe for the inspection and cleaning of the WTP reservoir. Ensure that the reservoir is adequately sealed and maintained to prevent surface water ingress or contamination of the treated water. 5. Display calibration stickers on all critical equipment (e.g., pumps and monitors) once the disinfection upgrade is complete. 6. Alarms: <ol style="list-style-type: none"> i. Review alarm and time delay settings at the plant for pH, turbidity and chlorine to protect site specific target levels and ensure critical treatment processes and statutory limits are protected; ii. Carry out an Alarm and Inhibit Review once upgrade works are complete and implement the findings. 7. <ol style="list-style-type: none"> i. 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. ii. Ensure staff are trained on the procedure. 8. <ol style="list-style-type: none"> i. 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. ii. Ensure staff are trained on the procedure. 9. Ensure EDEN contains the correct supply volume and population for Mountrath 2 PWS. <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. A response to Recommendation 3 should be provided in advance of this due date and with priority.</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>		

