

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	Durrow 1 PWS
Organisation	Uisce Éireann
Scheme Code	1600PUB1002
County	Laois
Site Visit Reference No.	SV30555

Report Detail	
Issue Date	11/11/2024
Prepared By	Derval Devaney

Site Visit Detail			
Date Of Inspection	18/10/2024	Announced	Yes
Time In	11:30	Time Out	13:50
EPA Inspector(s)	Derval Devaney		
Additional Visitors			
Company Personnel	Uisce Éireann (UÉ): Linda Doran, Paul Cahill. Laois County Council (working in partnership with UÉ): Francis Hegarty, Larry Gittens, Conor Ryle, Tom O'Carroll.		

> Summary of Key Findings

1. Drums of sodium hypochlorite disinfectant were not appropriately banded.
2. The time delays on the alarm and plant inhibit settings were not in line with EPA guidance and UÉ's specification. UÉ could not provide the alarm settings for the nitrate raw water monitor.
3. The nitrate raw water trend is not displayed at the water treatment plant and historic trends could not be reviewed during the audit.
4. There is no online chlorine monitor on the outlet of the treated water reservoir to verify that the target chlorine is being met to ensure at least 0.1 mg/l residual chlorine is being maintained in the network at all times.

> Introduction

Durrow 1 Public Water Supply (PWS) produces approximately 19 m³/hour serving a population of 546. Raw water is abstracted from a borehole next to the water treatment plant. Treatment consists of primary disinfection using ultraviolet (UV) treatment and secondary disinfection by chlorinating the supply with sodium hypochlorite.

The audit was undertaken to assess Uisce Éireann's performance in producing clean and wholesome water with a focus on verifying that recommendations from previous EPA files relating to the supply have been addressed, that appropriate alarms and inhibits are in place at the water treatment plant (WTP), and procedures are in place to ensure appropriate oversight of treatment processes.

> Supply Zones Areas Inspected

The borehole source ("Durrow Presentation Convent Well") and treatment processes and chemicals stored at the water treatment plant were inspected. The treated water storage reservoir located off-site was not inspected.



1. Source Protection

1.1

		Answer
Is the abstraction source(s) adequately protected against contamination?		Yes
Comment		
<ol style="list-style-type: none">1. UÉ does not have a raw water monitoring programme in place for the groundwater source: "Durrow Presentation Convent Well".2. However the EPA monitors the source three times annually. All available groundwater monitoring results for the period 1990 to 2022 are currently available for download from the EPA Geoportal: https://gis.epa.ie/GetData/Download. The EPA upload results once they are validated.3. UÉ completed a source and sanitary survey for the source and assigned a 3 log protozoal treatment requirement for the water treatment plant (WTP). UÉ confirmed during the audit that the UV treatment at the WTP provides 3 log protozoal treatment.4. The Water Supplier stated that landowners were written out to in the past in relation to their obligations under the <i>European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022</i> as amended but could not demonstrate when this was done last.		



2. Treatment Process Chemicals

2.1

Are treatment process chemicals appropriately managed and stored?

Answer

No

Comment

1. Five drums of sodium hypochlorite 10% used for secondary disinfection at the WTP were stored on a bund of insufficient capacity to contain the chemical should there be a leak or spill.



3. Management and Control

3.1

Is the water treatment plant resilient enough to cope with significant variations in raw water quality or demand?

Answer

Yes

Comment

1. To improve the water treatment plant's resilience, UÉ stated it is making further improvements to the raw water pumping regime (i.e. it is to implement continuous operation of the raw water pumps which will trigger them to automatically respond to treated water reservoir levels).
2. This will ensure a more continuous operation of the treatment systems on-site; such as the UV reactors and avoid frequent stop/start process situations which can be disruptive to treatment processes.



4. Alarms, Inhibits & Oversight Audits 2024

	Answer
4.1	Is suitable continuous monitoring in place to verify treatment performance?
	No
Comment	
1. There is no online chlorine residual monitor at the outlet of the treated water reservoir (with approximately 12 hours storage) to ensure the target chlorine concentration is being met to ensure there is 0.1 mg/l residual chlorine in the network at all times.	

	Answer
4.2	Is continuous monitoring located appropriately to verify treatment performance?
	No
Comment	
1. See Q 4.1 regarding the lack of an online continuous chlorine monitor on the outlet of the treated water storage reservoir to verify secondary chlorination concentrations are adequate leaving the reservoir.	

	Answer
4.3	Were online monitors operational?
	Yes
Comment	
1. There were two online turbidity monitors on the raw water, both displayed NTU readings but one monitor's calibration sticker stated it had failed calibration. 2. UÉ explained that the failed turbidity monitor was due to be decommissioned, as it was replaced by a new monitor which was within calibration and reading 0.025 NTU on the day of the audit.	

	Answer
4.4	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 UV duty and standby unit (2 No. T860F UV Reactors) at Castle Durrow WTP provides primary disinfection followed by chlorination (10% sodium hypochlorite) to provide secondary disinfection.
2. The UV reactor's validation certificate requires UVT > 74.1 %, a minimum UVI of 68.8 W/m² (6.88 mW/cm²) and a maximum flow of 19.9 m³/hr to achieve a UV dose of 40 mJ/cm².
3. There is a 6 minute time delay on the UVT monitor alarm and plant inhibit, this does not meet the 3 minute time delay as set out in Uisce Éireann Disinfection: Ultraviolet Irradiation Document No. TEC-900-05-03.
4. There is a 6 minute time delay on the turbidity monitor alarm and plant inhibit, this does not meet the 3 minute time delay as set out in Uisce Éireann Disinfection: Ultraviolet Irradiation Document No. TEC-900-05-03.
5. There is a 15 minute time delay on the flow monitor alarm and plant inhibit, this does not meet the 3 minute time delay as set out in Uisce Éireann Disinfection: Ultraviolet Irradiation Document No. TEC-900-05-03.
6. There is a 24 minute time delay on the chlorine monitor alarm and plant inhibit, this does not meet the 5 minute time delay recommended in the EPA's Water Treatment Manual: Disinfection.
7. The Low Low pH alarm was set at 6.2, which is below the statutory parametric value of 6.5. This alarm setting was adjusted by UÉ during the audit to 6.5.
8. The continuous nitrate monitor on the raw water is alarmed and has a dial out by text alarm feature, but UÉ could not provide details of the alarm settings.

4.5

Are plant performance trends accessible by operational staff at the water treatment plant?

Answer

No

Comment

1. The nitrate trend from the online raw water monitor is not available at the water treatment plant but UÉ stated it is available remotely on SCADA.
2. The nitrate trends for the raw water source were not available to review during the audit.
3. The online monitor read 35.5 mg/l during the audit which was below the drinking water parametric value of 50 mg/l for nitrate.

4.6

Is there a documented alarm response procedure?

Answer

No

Comment

1. There is no site specific procedure for Durrow 1 PWS setting out how alarms are responded to in order to protect water quality and public health.

Subject	Durrow 1 PWS Audit Recommendations	Due Date	11/12/2024
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. Liaise with Laois County Council to ensure that local landowners have been written to in the recent past in relation to their obligations under the <i>European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022</i>, as amended. 2. Ensure the EPA's raw water monitoring results for the Durrow 1 PWS groundwater source are reviewed on a regular basis by UÉ to inform treatment requirements for the Durrow 1 PWS. 3. Put measures in place to enable the raw water pump to operate on a continuous basis to bring about efficiencies and better process control at the water treatment plant. 4. Decommission the old turbidity monitor and ensure calibrations stickers are displayed on all monitors critical to the treatment process when calibrated. 5. Install a chlorine monitor with appropriate alarms and plant inhibits on the outlet of the reservoir to ensure 0.1 mg/l is being met in the network at all times. Carry out and document daily chlorine monitoring at the reservoir's outlet until online monitoring is in place. 6. Ensure chemicals are stored in appropriately bunded areas capable of containing at least 100% of the volume of chemicals stored therein. 7. <ol style="list-style-type: none"> i. Review the alarm and inhibit settings for pH, turbidity, chlorine and UVT to ensure critical treatment processes and water quality targets are protected and settings align with EPA Guidance (e.g. the <i>EPA Water Treatment Manual: Disinfection</i>), UÉ's Disinfection Specification and statutory limits; ii. Submit the alarm settings for the nitrate monitor on the raw water and include time delays; iii. Ensure there are documented site specific alarm response procedures; iv. Ensure training is provided to all relevant staff on the procedures. 8. <ol style="list-style-type: none"> i. Ensure monthly operational nitrate monitoring in the final water and network continues; ii. Submit monthly nitrate monitoring undertaken during 2023 and 2024; iii. Ensure the plant operator(s) have access raw water nitrate trends. <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>		