

Site Visit Report

Under the *European Union (Drinking Water) Regulations 2014* as amended, 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	Youghal Regional
Organisation	Uisce Éireann
Scheme Code	0500PUB2510
County	Cork
Site Visit Reference No.	SV27526

Report Detail	
Issue Date	08/03/2023
Prepared By	Criona Doyle

Site Visit Detail			
Date Of Inspection	27/02/2023	Announced	Yes
Time In	10:30	Time Out	13:05
EPA Inspector(s)	Criona Doyle Cormac MacGearailt		
Additional Visitors			
Company Personnel	Uisce Éireann: Pat Britton; Tommy Roche; Cormac Bergin. Cork County Council (working in partnership with Uisce Éireann): Eimer O'Riordan; Pdraig Griffin; Michael Linehan; Coleman Walsh.		

> Summary of Key Findings

1. Alarms and inhibits on each filter and combined filtered water are required in accordance with the turbidity performance criteria as set out in the *EPA Water Treatment Manual: Filtration* to verify the *Cryptosporidium* barrier and to prevent the entry of inadequately treated water into the network.
2. The water treatment plant is due to be upgraded in line with the Uisce Éireann Disinfection Programme in 2023. The upgrade works will address the deficiencies identified on the day of the audit in relation to contact time and the continuous verification of primary disinfection through online monitoring of chlorine residual after contact time.

> Introduction

Youghal Regional Public Water Supply (PWS) supplies a population of 8,157 with a volume of approximately 2,600m³/d (EDEN figures). Raw water is abstracted from the Tourig River (20%) and Glendine River (80%). Treatment includes raw water pH correction (Glendine River source only), coagulation (poly aluminium chloride and polyelectrolyte), clarification, rapid gravity filtration, chlorination, fluoridation and sludge treatment. The focus of the audit was on alarms and inhibits of the treatment processes and oversight.

> Supply Zones Areas Inspected

All the main water treatment plant areas of the Youghal Regional Water Treatment Plant (WTP) were inspected.



1. Filtration

	Answer
1.1 Are the filters designed and managed in accordance with EPA guidance?	No
Comment	
Automatic backwashing of filters is undertaken on a timed basis only with each filter being backwashed every 48 hours. Automatic filter backwashing is not linked to turbidity or head loss.	



2. Management and Control

		Answer
2.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No
Comment		
The log treatment requirement for the source is provisionally classed as a 3 log requirement pending the completion of the sanitary survey.		



3. Sludge Management

		Answer
3.1	Is sludge arising from the treatment processes adequately managed?	No
Comment		
Sludge is removed from site by a licenced contractor 2 to 3 times per year. A significant build up of sludge was observed in the storage area.		



4. Alarms, Inhibits & Oversight Audits 2023

		Answer
4.1	Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	No
Comment		
<p>There is no residual chlorine monitor located after contact time for verification of primary disinfection. There is one residual chlorine monitor at the WTP which verifies the chlorine dose.</p> <p>There are six properties supplied via a spur off the gravity main which supplies the two off site reservoirs and the water tower. A total effective contact time of 24.92mg.min/l has been calculated for these properties (located 1.7km from the WTP). This is less than the site specific target contact time of 31.20mg.min/l but is above the WHO minimum of 15mg.min/l. This issue is to be resolved via the installation of UV disinfection for these six properties which is planned under the Disinfection Programme upgrades.</p> <p>There is additional contact time between the spur serving these houses and the two reservoirs and water tower serving the remainder of the supply area. There are no residual chlorine monitors to verify contact time is being maintained at all times.</p>		

		Answer
4.2	Is suitable continuous monitoring in place to verify treatment performance?	No
Comment		
<p>There is no residual chlorine monitor located after contact time to verify contact time is being maintained at all times.</p> <p>There are continuous turbidity monitors on each of the filters and on the final filtered water.</p> <p>A new online aluminium monitor has been installed on the final water and is due to be commissioned.</p>		

		Answer
4.3	Were online monitors operational?	No
Comment		
<p>The continuous aluminium monitor has been out of operation since 22/02/23. The raw water ammonia monitors on the Tourig and Glendine abstractions were not operational. The streaming current monitor on the Tourig treatment stream was not operational.</p>		

		Answer
4.4	Was there a plan in place for repair of any monitor not in operation during the audit?	Yes
Comment		

A new aluminium monitor has been installed and is due to be commissioned in the coming weeks. The ammonia monitors on the raw water are due to be installed by June 2023. There are also plans to replace the streaming current monitor on the Tourig treatment stream. A new streaming current monitor had been recently installed on the Glendine treatment stream.

		Answer
4.5	Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?	No
Comment		
<p>There are no turbidity alarms on the individual filters or on the combined filtered water as required by the EPA Water Treatment Manual: Filtration. There is an alarm setpoint of 1.5 NTU on the settled water which triggers plant shutdown (50 minutes delay). There is no final water turbidity alarm or pH alarm.</p> <p>The chlorine alarm setpoints at the dose point are 0.70mg/l (low) and 2.50mg/l (high) with 30 minutes time delay. The chlorine alarms trigger full plant shutdown and run to waste. There are no residual chlorine monitors with alarms to validate contact time is being maintained at all times.</p>		

		Answer
4.6	Are critical alarms dialled out to operators?	No
Comment		
<p>The settled water turbidity alarm (after coagulation but before filtration stage) and high and low chlorine alarms (at chlorine dose point) are dialled out to operators. There are no turbidity alarms on the individual filters or combined filtered water which means that the protozoal barrier cannot be verified.</p>		

		Answer
4.7	Has UÉ carried out an alarm and inhibit review at the water treatment plant?	No
Comment		
<p>Uisce Éireann has not carried out the alarm and inhibit review but indicated that this is planned to take place next month.</p>		

		Answer
4.8	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
Comment		
<p>There are no turbidity inhibits or shutdowns linked to the individual filters or the combined final filtered water turbidity.</p>		

4.9

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

Answer

No

Comment

There are continuous turbidity and pH monitors on the raw water for both the Tourig and Glendine abstractions but the data is not trended at the plant. A new PLC is required to allow the data to be trended. Cork County Council indicated at the audit that this work is scheduled to take place next month.

It is not possible to view individual filter turbidity or final turbidity trends on the HMI at the WTP. Trends were accessed via the countywide SCADA during the audit. On the day of the audit the countywide SCADA was viewed on site to review the trend data for Filters 1, 2 and 4 while Filter 3 was not trending (monitor on Filter 3 was working).

A new online aluminium monitor has been installed and has yet to be commissioned and therefore was not trending on the day of the audit. Daily levels are being recorded using the handheld monitor at present.

The residual chlorine trend was visible on the plant HMI and indicated stable trends.



5. Site Specific Issues

	Answer	
5.1	Is there automatic switchover on chemical dosing pumps ?	No
	Comment	
	There is no automatic switchover between duty and standby chemical dosing pumps for the coagulant aid (polyelectrolyte). Automatic switchover was present on all other chemical dosing pumps.	
	Answer	
5.2	Were the fluoride dosing pumps within calibration dates ?	No
	Comment	
	The duty and standby fluoride dosing pumps were past the calibration date of 24/02/23.	
	Answer	
5.3	Where all chemical storage bunds clean and free of debris ?	No
	Comment	
	A build up of liquid was observed in the chemical storage bund on the polyelectrolyte day tank.	
	Answer	
5.4	Where the settled water channels clean ?	No
	Comment	
	The settled water channels were stained and a build up of material was observed.	

Recommendations

Subject	Youghal Regional PWS - Audit	Due Date	08/04/2023
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. Install appropriate turbidity alarm settings and inhibits for the individual filters and combined filtered water to verify critical treatment performance and statutory limits are protected as per the requirement of the EPA Water Treatment Manual: Filtration. 2. Inform the HSE that the protozoal barrier cannot be verified. 3. Ensure that the trends from the continuous monitoring of the raw and treated water are accessible to operational staff at the WTP to monitor plant performance. 4. Progress (i) the Disinfection Programme upgrades; (ii) submit an updated contact time calculation following the completion of the upgrade works to demonstrate that the target contact time is being achieved for all consumers on the supply; (iii) install residual chlorine monitors to provide continuous verification of primary disinfection through online monitoring of chlorine residual after contact time. 5. Provide (i) an update on the outcome of the alarm and inhibit review and (ii) confirm how any protozoal log treatment deficit will be addressed following the completion of the alarm and inhibit review and the sanitary survey. 6. Ensure the following continuous monitors are returned to operation (i) two raw water ammonia monitors; (ii) streaming current monitor on the Tourig treatment stream; (iii) final water aluminium monitor. 7. Examine the feasibility of installing additional setpoints to trigger automatic filter backwashing linked to turbidity and head loss. 8. Ensure (i) automatic switchover is in place between duty and standby chemical dosing pumps for polyelectrolyte dosing and (ii) the fluoride dosing pumps are calibrated. 9. Undertake an assessment of the adequacy of the sludge treatment stage and carry out any necessary remedial works. 10. Ensure the settled water channels and all bunds on chemical day tanks are regularly cleaned out. <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 08/04/23 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>		