

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	Mid Kerry - Gearha (H) 300A
Organisation	Uisce Éireann
Scheme Code	1300PUB1063
County	Kerry
Site Visit Reference No.	SV28216

Report Detail	
Issue Date	18/10/2023
Prepared By	Regina Campbell

Site Visit Detail			
Date Of Inspection	04/10/2023	Announced	Yes
Time In	10:30	Time Out	12:10
EPA Inspector(s)	Regina Campbell David O'Malley		
Additional Visitors			
Company Personnel	Uisce Éireann: Tommy Roche. Kerry County Council (working in partnership with Uisce Éireann: Dan Heffernan, John Horgan, Seamus O' Mahony, Brian Lennon.		

> Summary of Key Findings

1. The Mid- Kerry (Gearha) Water Treatment Plant is a direct filtration plant and does not have a clarification stage. There is a protozoal treatment deficit of 0.5 log when the plant is operated in accordance with the log credit approach as outlined in the EPA Water Treatment Manual: Filtration. Uisce Éireann should submit an action programme with timeframes to address the treatment deficit.

2. *Cryptosporidium* was detected in a sample taken of the final water at the plant on 19/09/23. Repeat sampling on 29/09/23 was clear. A definitive cause for the detection was not found. Kerry County Council said that the exceedance may have been linked to a blockage in the inflow chamber which was causing surges to the filter. The blockage has been cleaned. It was also identified that only one filter can be backwashed at a time and that there is no capability to run to waste or shutdown filters if filter turbidity exceeds 0.3 NTU.

> Introduction

The Mid-Kerry (Gearha) Public Water Supply (PWS) serves a population of 9,207 and produces 7,132 m³/day. The sources of the supply are Lough Callee (approximately two-thirds) and the River Gaddagh (approximately one-third). The plant operates 24 hours/day and treatment consists of pH correction, coagulation, flocculation, rapid gravity filtration, chlorination and final pH correction.

The audit was undertaken to assess the operation and management of the protozoal barrier at the plant following the notification of a *Cryptosporidium* exceedance in a sample taken of the final water at the plant on 19/09/23.

> Supply Zones Areas Inspected

The filtration and chlorination stages of the plant were inspected along with turbidity and chlorine trends.



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?	Yes
Comment	
<p>1. The EPA was notified of a <i>Cryptosporidium</i> exceedance in a sample taken of the final water at the Mid-Kerry (Gearha) Water Treatment Plant (WTP) on 19/09/23. The result was 0.02 no/10L.</p> <p>2. Uisce Éireann consulted with the HSE in relation to the exceedance having completed an initial risk assessment. Taking this risk assessment into account the HSE deemed this incident did not pose a risk of such significance that consumers should be notified immediately. It was agreed to resample the treated water for <i>Cryptosporidium</i> as soon as possible, inform the HSE of the results and to continue to monitor the operation of the plant and inform the HSE of any issues arising, particularly turbidity.</p> <p>3. A repeat sample was taken on 29/09/23 and the results were clear.</p> <p>4. Uisce Éireann reported that investigations into the cause of the exceedance found the following issues: a) Turbidity spikes on filter 7 due to blockage of inflow chamber causing surge to filter. The chamber has since been cleaned and the issue resolved; b) The sample pump was flushed out for 24 hours prior to the <i>Cryptosporidium</i> resample, and a gravity fed location for the <i>Cryptosporidium</i> sample will be located in the network for future tests; c) It was identified that there is no capability to run filters to backwash or shut down filters if filter turbidity exceeds 0.3 NTU, if other filters are queued for backwash. Only one filter can be backwashed at a time and filters stay in production until backwash is activated. Options to address this issue are under review.</p>	



2. Protozoal Barriers Audits 2023

	Answer	
2.1	Is there a documented site specific incident response and incident escalation process?	No
Comment		
There is a procedure on what to do in the event of an incident displayed at the water treatment plant. Site specific contact details are listed but site specific trigger levels are not provided in the procedure.		

	Answer	
2.2	Is there a chlorine residual monitor located after contact time for verification of primary disinfection?	Yes
Comment		
1. Chlorine is monitored continuously after the reservoir to verify contact time.		
2. There is no monitor close to the injection point after dosing which means that low chlorine or a dose failure may not be detected until after the reservoir at the point where water enters the network.		

	Answer	
2.3	Has UÉ identified the protozoal compliance log treatment requirement for the water treatment plant?	Yes
Comment		
1. There is a 3 log protozoal compliance treatment requirement for the plant. However as the plant is a direct filtration plant, it can only claim 2.5 log treatment when operated in accordance with the log performance criteria as outlined in the EPA Water Treatment Manual: Filtration and so there is a 0.5 log treatment deficit.		
2. <i>Cryptosporidium</i> sampling takes place monthly.		

	Answer	
2.4	Are the filters designed and managed in accordance with EPA guidance?	No
Comment		
There is no capability to run filters to backwash or to shut filters down if filter turbidity exceeds 0.3 NTU, if other filters are queued for back wash. Only one filter can be backwashed at a time. Filters stay in production until backwash is activated. This means that there are occasions when filters remain in operation when turbidity is > 0.3 NTU until they can be taken offline for backwashing. During these occasions, the protozoal barrier cannot be verified and there is a risk of inadequately treated water entering the network.		
Kerry County Council said that options to address this issue are under review.		

		Answer
2.5	Does continuous turbidity monitoring indicate that the filters are operating effectively?	No
Comment		
<p>Turbidity levels at the filter outlets were satisfactory on the day of the audit.</p> <p>However, as outlined in Section 2.4 above, there are occasions when individual filters will remain in operation when > 0.3 NTU until they can be taken offline for backwashing. This may occur e.g. if raw water conditions are poor due to heavy rainfall.</p>		

		Answer
2.6	Are there suitable plant controls to prevent inadequately treated water entering the distribution network?	No
Comment		
<p>As outlined in Section 2.4 above there are occasions when individual filters will remain in operation when > 0.3 NTU until they can be taken offline for backwashing. This may occur e.g. if raw water conditions are poor due to heavy rainfall.</p> <p>There is no shutdown on the combined filtered water turbidity level.</p>		

		Answer
2.7	Are alarms and shutdowns on each filter, on the combined filtered water and final water in accordance with the EPA Filtration Manual?	No
Comment		
<p>See section 2.6 above.</p>		



3. Site Specific Issues

3.1

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

Answer

No

Comment

There is only 3 hours treated water storage for the Mid- Kerry (Gearha) Water Treatment plant. This becomes a critical issue if there are poor raw water conditions or other operational issues at the plant which affect production of treated water.

Recommendations

Subject	Mid Kerry Audit Recommendations 2023	Due Date	18/11/2023
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. Submit an action programme with timeframes to address the protozoal log treatment deficit at the plant.2. Continue to monitor the supply in accordance with Uisce Éireann's Rationale for Determining the Frequency of <i>Cryptosporidium</i> Monitoring in Public Water Supplies.3. Inform the HSE that there is a 0.5 log protozoal treatment deficit at the plant.4. Review and implement turbidity alarms and shutdown on each filter, combined filters and final water to ensure that the plant operates in accordance with the log performance criteria as outlined in the EPA Water Treatment Manual: Filtration.5. Make provision for adequate run to waste facilities or shutdown of individual filters in the event that turbidity exceeds the limits outlined in the EPA Water Treatment Manual: Filtration.6. Investigate the feasibility of increasing treated water storage for the Mid-Kerry (Gearha) PWS to improve the resilience of the supply.7. Update the incident response procedure with the site specific trigger levels for the plant. <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 18/11/2023 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>		