

# Site Visit Report

Under the European Union (Drinking Water) Regulations 2014 as amended, the Environmental Protection Agency is the supervisory authority in relation to Irish Water and its role in the provision of public water supplies. This Audit was carried out to assess the performance of Irish Water in providing clean and wholesome water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

Water Supply Zone	
<b>Name of Installation</b>	Paulstown-Choill Rua PWS
<b>Organisation</b>	Irish Water
<b>Scheme Code</b>	1500PUB1024
<b>County</b>	Kilkenny
<b>Site Visit Reference No.</b>	SV22201

Report Detail	
<b>Issue Date</b>	19/02/2021
<b>Prepared By</b>	Regina Campbell

Site Visit Detail			
<b>Date Of Inspection</b>	09/02/2021	<b>Announced</b>	Yes
<b>Time In</b>	11:00	<b>Time Out</b>	11:40
<b>EPA Inspector(s)</b>	Regina Campbell Marion O' Neill (HSE)		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Irish Water: Catherine Rice, Pat Duggan, Colin Cunningham Kilkenny County Council: John Ormond, Andrew Flood		

## > Summary of Key Findings

1. A Boil Water Notice was placed on the Paulstown Choill Rua Public Water Supply (PWS) on 17/12/20 following 3 no. detections of *Cryptosporidium* in the supply. The audit found that the incident was suitably escalated and managed to protect public health. Irish Water should notify the EPA of any change to the HSE health advice.
2. Investigations have not to date linked the *Cryptosporidium* detections in the supply to a specific incident. However there was no continuous turbidity monitoring of the water prior to the detections so it cannot be ascertained if there were any fluctuations in raw water quality. The chlorine monitor was not linked to an alarm even though a Phase 1 Site Assessment was completed of the plant in 2017 under the Irish Water Disinfection Programme.
3. On foot of the Boil Water Notice, Irish Water have commenced a programme of works to upgrade the water treatment plant. Works will include borehole capping, installation & commissioning of a cartridge filter & UV unit, installation of turbidity and UVT/UVI monitors, installation of a static mixer and an additional chlorine analyser and installation of chlorine alarms. Irish Water should complete the works without delay.

## > Introduction

The Paulstown Choill Rua Public Water Supply serves a population of 269 and produces 40 - 50 m<sup>3</sup>/day currently. The source of the supply is a borehole. The plant operates 24 hours/day with the borehole pumps operating on and off depending on demand. The audit was undertaken to assess Irish Water's performance in producing clean and wholesome water following the notifications of *Cryptosporidium* detections in samples taken on 08/12/20, 15/12/20 and 17/12/20 in the final water of the supply that lead to the placing of a Boil Water Notice on the 17/12/20. Prior to the issuing of the Boil Water Notice treatment consisted of chlorination only.

Irish Water advised at the audit that the protozoal log credit requirement for the source water is 3 log but that the methodology for source classification is currently under review. Monthly monitoring for *Cryptosporidium* commenced in June 2019 with no detections reported until December 2020. Earlier monitoring undertaken between 2016 and 2019 also did not report any detections either.

## > Supply Zones Areas Inspected

The audit consisted of a video conference call with Irish Water and Kilkenny County Council staff. The HSE were also in attendance. The Paulstown Choill Rua water treatment plant was not visited during the audit due to Covid-19 restrictions. The audit assessed each step of the treatment process and reviewed initial trend data that has been collected from monitors at the plant since January 2021.



## 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
<b>Comment</b>	
<p>The EPA were notified of detections of <i>Cryptosporidium</i> in samples taken at the Paulstown Choill Rua water treatment plant on 08/12/20, 15/12/20 and 17/12/20. Irish Water and Kilkenny County Council consulted with the HSE and on foot of the consultation a Boil Water Notice was placed on the supply on 17/12/20.</p> <p>Genotyping was not possible due to low number of oocysts detected. Monthly <i>Cryptosporidium</i> monitoring has been in place on this supply since June 2019 and there have been no detections of <i>Cryptosporidium</i> prior to December 2020. Earlier monitoring between 2016 and 2019 reported no detections either.</p> <p>Investigations to date have not linked the detections to any particular incident. However, prior to the detections, there was no online turbidity monitor at the plant which may have helped to alert the operator to any deterioration in the raw water quality. Also the chlorine monitor was not linked to an alarm even though a Phase 1 Site Assessment was completed of the plant in 2017 under the Irish Water Disinfection Programme. It could not be established at the audit why there was no chlorine alarm at the plant despite having been assessed under the Disinfection Programme.</p> <p>Subsequent to the placing of the Boil Water Notice Irish Water confirmed that installation of a UV unit along with UVT and turbidity monitors commenced on 19/12/20 with monitors connected to telemetry on 08/01/21. Trend data is currently being collected and reviewed.</p> <p>At the audit Irish Water advised that quotes have been received for upgrade works that include capping of the borehole, installation of a cartridge unit prior to the UV unit, installation of a static mixer and chlorine analyser (linked to the borehole pumps) prior to the storage reservoir and installation of alarms and shutdowns linked to the UV and chlorination disinfection systems. At the audit Irish Water advised that they could not yet give a definite date for completion of the upgrade works.</p>	



## 2. Source Protection

2.1

	Answer
Is the abstraction source(s) adequately protected against contamination?	No
<b>Comment</b>	
<p>The supply is fed by one borehole which was developed around 2008 to supply a large neighbouring housing estate. There are no borehole logs available. At the audit Kilkenny County Council advised that production volume is 40-50 m3. Prior to the BWN being put in place in December 2021 there was no online turbidity monitor. Trends gathered since January 2021 indicate that turbidity is generally in the region of 0.2 - 0.3 NTU.</p> <p>A photo submitted prior to the audit showed that the well-head is not capped and that the concrete pad surrounding it is in poor condition. There is a removable steel cover that protects the well-head which is not padlocked.</p> <p>Kilkenny County Council confirmed that relevant landowners have been written to in the past in relation to the requirements of the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014).</p>	



### 3. Disinfection

		Answer
3.1	Is the disinfection system verified using monitors and alarms, with trended data recorded and accessible?	No
<b>Comment</b>		
<p>Prior to the BWN being put in place, there was a chlorine monitor at the outlet of the storage reservoir, but there were no chlorine alarms in place to prevent inadequately treated water entering the network. Irish Water said that a static mixer and an additional chlorine monitor will be installed at the inlet to the treated water storage tank and chlorine alarms will be installed as part of the upgrade works.</p> <p>Monitors and alarms will also be installed as part of the commissioning of the UV disinfection system.</p> <p>Following the upgrade works, UV will be the primary disinfection system at the plant with chlorination used for secondary disinfection.</p>		

		Answer
3.2	Are duty and standby chlorine pumps/ UV units in operation?	Yes
<b>Comment</b>		
<p>Duty and standby chlorine dosing pumps are in operation with automatic changeover in place. 10% sodium hypochlorite is dosed on a flow proportional basis. A single UV unit has been installed. Using a current production volume of 45 m<sup>3</sup>, there is approximately 19 hours treated water storage at the site.</p>		

		Answer
3.3	Is there adequate chlorine contact time before the first connection?	Yes
<b>Comment</b>		
<p>The total effective chlorine contact time is 15.89 mg.min/l which is adequate. Once the upgrade works are completed, chlorination will be used for secondary disinfection only.</p>		

		Answer
3.4	Is there a chlorine residual $\geq 0.1$ mg/l throughout the network?	Yes
<b>Comment</b>		
<p>Chlorine residuals were <math>&gt;0.1</math> mg/l in records submitted.</p>		



## 4. Management and Control

		Answer
4.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	Yes
<b>Comment</b>		
Irish Water said that the protozoal log credit requirement for the source is 3 log. However, the classification methodology is being updated by Irish Water.		

		Answer
4.2	Are suitable alarm settings in place to alert operators to deteriorating water quality and/or the failure of a critical treatment process?	No
<b>Comment</b>		
Alarms and shutdowns for the UV and chlorination systems need to be installed at the plant and details submitted to the EPA. Alarms should be linked to a dial out system and a suitable cascade system put in place for responding to alarms.		



## 5. Drinking Water Quality

		Answer
5.1	Is <i>Cryptosporidium</i> monitoring being carried out in accordance with Irish Water's 'Rationale for Determining the Frequency of <i>Cryptosporidium</i> Monitoring in Public Water Supplies'?	Yes
<b>Comment</b>		
Monthly <i>Cryptosporidium</i> monitoring is in place since June 2019.		

## Recommendations

<b>Subject</b>	Paulstown Choill Rua Audit Recommendations	<b>Due Date</b>	19/03/2021
<b>Action Text</b>	<p><b>Recommendations</b></p> <ol style="list-style-type: none"> <li>1. Irish Water should complete the installation and commissioning of the turbidity monitor, cartridge filter, UV disinfection system and submit details of the validated operating range of the UV unit and details of all alarm &amp; shutdown setpoints.</li> <li>2. Irish Water should complete the installation and commissioning of the upgrade of the chlorination system and submit details of all chlorine alarm and shutdown setpoints.</li> <li>3. Irish Water should ensure that the borehole well-head is inspected and any necessary construction works undertaken to cap and seal the borehole in accordance with EPA Advice Note No. 14: Borehole Construction and Wellhead Protection.</li> <li>4. Irish Water should a) clarify why the Paulstown Choill Rua WTP was not progressed under the Disinfection Programme and b) undertake a review of all water treatment plants in Co. Kilkenny that were reported as not progressing under the Disinfection Programme to ensure that all plants meet the minimum disinfection criteria as outlined in EPA Advice Note No. 3.</li> <li>5. Irish Water should confirm the protozoal log treatment requirement for the plant and identify how any log deficit will be addressed.</li> <li>6. Irish Water should ensure that there is a cascade system in place for responding to all alarms generated at the plant.</li> <li>7. Irish Water should notify the EPA of any change to the HSE health advice.</li> </ol> <p><b>Follow-Up Actions required by Irish Water</b></p> <p>During the audit, Irish Water representatives were advised of the audit findings and that action must be taken as a priority by Irish Water to address the issues raised.</p> <p>This report has been reviewed and approved by Dr. Michelle Minihan, Senior Inspector, Drinking Water Team,</p> <p>Irish Water should submit a report to the Agency on or before one month from the date of issue of the report detailing how it has dealt with the issues of concern identified during this audit.</p> <p>The report should include details on the action taken and planned to address the various recommendations, including time frame for commencement and completion of any planned work.</p> <p>The EPA also advises that the findings and recommendations from this audit report should, where relevant, be addressed at all other treatment plants operated and managed by Irish Water.</p> <p>Please quote the Action Reference Number DW20200270 in any future correspondence in relation to this Report.</p>		