



# Drinking Water Audit Report

<b>County:</b>	Meath	<b>Date of Audit:</b>	9 <sup>th</sup> February 2018
<b>Plant(s) visited:</b>	Summerhill Road Booster Station, Dunboyne	<b>Date of issue of Audit Report:</b>	14 <sup>th</sup> February 2018
		<b>File Reference:</b>	DW2018/15
		<b>Auditors:</b>	Ms Michelle Roche Ms Aoife Loughnane
<b>Audit Criteria:</b>	<ul style="list-style-type: none"> <li>• The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014), as amended.</i></li> <li>• <i>The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)</i></li> <li>• EPA Drinking Water Advice Note No. 3 <i>E. coli</i> in Drinking Water.</li> </ul>		

## MAIN FINDINGS

- i. **Elevated chlorine residual levels were discovered in a section of the Dunboyne Public Water supply on 7<sup>th</sup> February 2018. A “Do Not Use / Do Not Wash” water restriction was placed on 1,200 consumers in the Kilcloon area on 7<sup>th</sup> February 2018, and subsequently lifted on 8<sup>th</sup> February 2018. Irish Water’s initial investigations into the incident point to a malfunction with chlorine dosing pumps at the Summerhill Road chlorine booster station; however, investigations were still ongoing at the time of the audit. Irish Water should complete their investigations into the incident and provide a report to the EPA within one week of the date of this audit report.**
- ii. **There was no chlorine monitor or alarm on the outlet of the Summerhill Road chlorine booster station. If chlorine dosing is to be reinstated at the booster station, a chlorine monitor and alarm must be installed on the chlorine dosing system, in accordance with the disinfection criteria in *EPA Drinking Water Advice Note No. 3: E. coli in Drinking Water.***
- iii. **Irish Water should undertake a nationwide review of chlorine booster stations to ensure they are adequately monitored and alarmed. Progress on this review should be reported to the EPA under the quarterly Disinfection Programme Updates.**

## 1. INTRODUCTION

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 in response to the notification by Irish Water on 7<sup>th</sup> February 2018 of excessively high residual chlorine levels in the Dunboyne Public Water Supply, and the issuing of a “Do Not Use / Do Not Wash” water restriction to 1,200 consumers in the affected area.

The Dunboyne Public Water Supply serves approximately 9,400 people in Dunboyne and the surrounding hinterland. The water is treated at Leixlip Water Treatment Plant and delivered to Dunboyne via the Ballycoolin Water Reservoir. West of Dunboyne town the treated water is mechanically pumped at Summerhill Road booster station to deliver it to the surrounding townlands

and Kilcloon village. The treated water is also given a chlorine boost of 0.1 – 0.2 mg/l to ensure adequate disinfection to the end of the distribution line.

The opening meeting commenced at 10.00am at Meath County Council Civic Offices, Dunshaughlin. The scope and purpose of the audit were outlined at the opening meeting. The scope of the audit was confined to the details of the high chlorine residual incident and disinfection at the booster station. The audit process consisted of interviews with staff, review of records and observations made during an inspection of the booster station. Photographs taken by Aoife Loughnane during the audit are attached to this report and are referred to in the text where relevant. The audit observations and recommendations are listed in Section 2 and 4 of this report. The following were in attendance during the audit.

**Representing Irish Water:**

Andrew Boylan – Irish Water Compliance Specialist  
 Michael Cuniffe – Irish Water SLA Lead  
 Aodhnait Ní Chathasaigh – Irish Water Compliance Analyst

**Representing Meath County Council:**

Helen McDonnell – Executive Environmental Technician  
 Paul McKeown – Engineer

**Representing the Environmental Protection Agency:**

Michelle Roche – Drinking Water Inspector  
 Aoife Loughnane – Drinking Water Inspector

**Observer:**

Margaret Kelly – HSE, Environmental Health

**2. AUDIT OBSERVATIONS**

*The audit process is a random sample on a particular day of a facility's operation. Where an observation or recommendation against a particular issue has not been reported, this should not be construed to mean that this issue is fully addressed.*

1.	<p><b>Chlorine Booster Disinfection</b></p> <ol style="list-style-type: none"> <li>a. Treated water from Leixlip Water Treatment Plant is delivered to the Dunboyne Public Water Supply via the Ballycoolin Water Reservoir, where it receives an initial chlorine boost.</li> <li>b. Treated water receives a further chlorine boost of 0.1 – 0.2 mg/l at a combined chlorine booster and pump station at Summerhill Road, Dunboyne. Approximately 300 m<sup>3</sup>/day of water is pumped from this booster station to supply Kilcloon, Moygaddy, Killeany, Kilgraique, Harristown, Brownstown, Ballynare, Butlerstown, Staffordstown, Brownrath, Blackhall Little, Waynestown, Harlockstown, Ballymacoll in Co. Meath.</li> <li>c. The location of the booster station is dangerous in terms of access and health and safety. The station is in an underground chamber at the side of a busy road, coming off a bend (Photograph 1 and 2). Water ingress and damp conditions in the underground chamber create a difficult environment for maintaining pumps and monitoring equipment.</li> <li>d. Chlorine of 10-12% strength is dosed flow proportionally, with a duty/standby dosing</li> </ol>
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	<p>arrangement at the Summerhill Road booster station.</p> <ul style="list-style-type: none"> <li>e. The day tank is banded and is filled from 25L drums which are brought to site from Meath County Council's stock chlorine tanks in Trim.</li> <li>f. There is a chlorine monitor on the inlet to the booster station, however this was not working at the time of the incident or the audit. The chlorine monitor is not linked to telemetry.</li> <li>g. There is no chlorine monitor or alarm on the outlet to the booster station.</li> <li>h. There is no fixed programme of chlorine residual monitoring in the network after the booster station and any sampling carried out is infrequent.</li> </ul>
<p><b>2.</b></p>	<p><b>Chlorine Disinfection Incident</b></p> <ul style="list-style-type: none"> <li>a. Irish Water received a notification to their Local Representatives Service Desk on Tuesday evening, 6<sup>th</sup> February 2018, regarding a chlorine odour at customers taps in the Kilcloon area of Co. Meath. A work order was generated to Meath County Council at 5:36 pm on Tuesday evening to investigate the matter.</li> <li>b. At 10am on Wednesday morning, 7<sup>th</sup> February, two complaints were received by Irish Water regarding chlorine odours at customers taps on Moygaddy Road, and two additional work orders were raised.</li> <li>c. Meath County Council took their first investigative sample at a water hydrant outside Kilcloon National School at 10:20am on Wednesday morning. This sample had a chlorine residual reading of 6.9 mg/l. The World Health Organisation limit for chlorine in drinking water is 5 mg/l.</li> <li>d. Meath County Council immediately responded by shutting down the booster chlorination, flushing and scouring the network and carrying out further sampling.</li> <li>e. Meath County Council also contacted Irish Water and the HSE and Irish Water initiated an Incident Management Team.</li> <li>f. A "Do Not Use/ Do Not Wash" water restriction was put on part of the Dunboyne supply on Wednesday lunchtime, affecting approximately 1,200 people. Bottled water was provided at Kilcloon Church and Kilcloon School and tankered water was provided thereafter.</li> <li>g. Meath County Council stated that the network was fully flushed and chlorine residual levels returned to safe levels by 9 pm on Wednesday 7<sup>th</sup> February. The EPA received confirmation of safe chlorine levels of between 0.13 and 0.48 mg/l from network samples taken on Thursday 8<sup>th</sup> February. The "Do Not Use / Do Not Wash" restriction was lifted at 5pm on Thursday 8<sup>th</sup> February following consultation with the HSE.</li> <li>h. Irish Water are continuing to take daily chlorine residual samples in the network following the incident.</li> </ul>
<p><b>3.</b></p>	<p><b>Investigation of Chlorine Disinfection Incident</b></p> <ul style="list-style-type: none"> <li>a. At the time of the EPA audit, Irish Water investigations into the cause of the high chlorine levels in the drinking water were still ongoing.</li> <li>b. Irish Water suspected that new chlorine dosing pumps installed at the booster station on 31<sup>st</sup> January 2018 may not have been dosing at the correct rate. Elevated levels of chlorine may have built up in the network over time, leading to the high level of 6.9 mg/l detected on 7<sup>th</sup> February 2018.</li> <li>c. Irish Water indicated that it may not be necessary to dose additional chlorine at the booster station into the future. Chlorine residual readings in the treated water delivered from Leixlip Water Treatment Plant are currently higher than in the past because of new users and greater water demand upstream of Dunboyne.</li> <li>d. A manual measurement of chlorine residuals on the inlet to the booster station were 0.45 mg/l on the morning of the audit. Further investigation is required to confirm that these levels can be maintained and to ensure they will be adequate to provide a chlorine residual of 0.1 mg/l or higher at the end of the network to ensure the water supply is adequately disinfected.</li> </ul>

### 3. AUDITORS COMMENTS

The audit found that current disinfection controls at Summerhill Road booster station on the Dunboyne public water supply are inadequate because there is no chlorine monitor or alarm in place on the disinfection system. After discovering high chlorine residuals in the network at Kilcloon, Meath County Council and Irish Water acted quickly to deal with the incident and issued a “Do Not Use / Do Not Wash” water restriction upon the advice of the HSE, to protect public health.

Irish Water should complete their investigation into the cause of the high chlorine incident at Kilcloon and the surrounding areas. The scope of the investigation should include the need for chlorine boosting at this location. If Irish Water determines that a chlorine boost is required to ensure adequate disinfection at the end of the network, a chlorine monitor and alarm must be installed on the chlorine dosing system, in accordance with the disinfection criteria in *EPA Drinking Water Advice Note No. 3: E. coli in Drinking Water*.

Irish Water should provide an update on the chlorine dosing incident investigations (including chlorine levels) to consumers in the affected areas, to address concerns about the quality of the public water supply.

### 4. RECOMMENDATIONS

#### General

1. Irish Water should continue to take daily chlorine residual samples in the areas of Dunboyne public water supply network affected by the chlorine dosing incident.
2. Irish Water should provide an update on the chlorine dosing incident investigations (including chlorine levels) to consumers in the affected areas, to address concerns about the quality of the public water supply.
3. Irish Water should continue their investigation into the cause of the high chlorine incident on the Dunboyne public water supply. Irish Water should provide a report on the outcome of the investigation to the EPA.
4. The scope of the incident investigation should include the need for an additional chlorine boost on the Dunboyne public water supply. Focus should be on ensuring that adequate chlorine residuals can be maintained to the end of the network, to protect against bacteriological contamination.
5. If Irish Water determines that an additional chlorine boost is required at Summerhill Road booster station, then a chlorine monitor and alarm must be installed on the chlorine dosing system, in accordance with the disinfection criteria in *EPA Drinking Water Advice Note No. 3: E. coli in Drinking Water*.
  - a. The chlorine alarm set point should allow sufficient reaction time in the case of an issue occurring.
  - b. The chlorine alarm should call out to caretaking staff on a cascade system.
6. Irish Water should establish a regular programme of chlorine residual monitoring across the entire network of the Dunboyne public water supply.
7. Irish Water should undertake a nationwide review of chlorine dosing booster stations and ensure that all locations comply with the disinfection criteria in *EPA Drinking Water Advice Note No. 3: E. coli in Drinking Water*. Progress on this review should be reported to the EPA under the quarterly Disinfection Programme Updates.

**FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER**

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. This report has been reviewed and approved by Aoife Loughnane, Drinking Water Team Leader.

Irish Water should submit a report to the Agency within one week of the date of this audit report detailing how it has dealt with the issues of concern identified during this audit. The report should include details on the action taken and planned to address the various recommendations, including timeframe for commencement and completion of any planned work.

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.

Please quote the File Reference Number in any future correspondence in relation to this Report.

**Report prepared by:**  **Date:** 14<sup>th</sup> February 2018

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Inspector



Photograph 1: Location of combined chlorine booster and pump station at Summerhill Road, Dunboyne.



Photograph 2: View into combined chlorine booster and pump station underground chamber.