



# Drinking Water Audit Report

<b>County:</b>	Cork	<b>Date of Audit:</b>	05/04/19
<b>Plant(s) visited:</b>	Mogeely Drinking Water Treatment Plant  (Scheme Code 0500PUB2508)	<b>Date of issue of Audit Report:</b>	15/04/19
		<b>File Reference:</b>	DW2018/51
		<b>Auditors:</b>	Ms. Criona Doyle
<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>• The recommendations specified in the <i>EPA Drinking Water Report.</i></li> <li>• EPA Drinking Water Advice Notes No's 1 to 15.</li> <li>• The recommendations in any previous audit reports.</li> </ul>		

## MAIN FINDINGS

- i. **The purpose of the audit was to assess the suitability of the Mogeely Public Water Supply for removal from the EPA's Remedial Action List (RAL). The Mogeely PWS is on the EPA's RAL since July 2018 due to inadequate treatment for *Cryptosporidium*.**
- ii. **A containerised pressure filtration and UV disinfection system has been installed to provide an adequate barrier to *Cryptosporidium*. Irish Water have provided verification data to demonstrate the effectiveness of the works.**
- iii. **Mogeely PWS will be recommended for removal from the RAL to be published at the end of April 2019.**

## 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. The Mogeely public water supply (PWS) has been on the EPA's Remedial Action List (RAL) since July 2018 due to inadequate treatment for *Cryptosporidium*. This audit was carried out to assess the remedial works undertaken to provide an adequate barrier to *Cryptosporidium* and to determine if the supply can be removed from the RAL.

The raw water for the supply is obtained from an infiltration gallery located adjacent to the Kiltha River. According to the EPA's EDEN system the current Mogeely PWS supplies a population of 2,609 with a volume of approximately 946m<sup>3</sup>/d. Treatment includes pressure filters, disinfection (UV and chlorination), fluoridation and pH correction. The supply serves the area of Mogeely, Castlemartyr and Ladysbridge.

The opening meeting commenced at 10am at the Mogeely Water Treatment Plant. The scope and purpose of the audit were outlined at the opening meeting. The audit process consisted of interviews with staff, review of records and observations made during an inspection of the treatment plant. 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:**

Tommy Roche, Drinking Water Compliance Analyst

Oliver Harney, Water Engineer

**Representing Cork County Council:**

Eimer O’Riordan, Senior Executive Engineer

Ken O’Keefe, Executive Engineer

Killian Tate, Caretaker

**Representing the Environmental Protection Agency:**

Criona Doyle, Inspector

**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.*

<b>1.</b>	<p><b>Source Protection</b></p> <ul style="list-style-type: none"> <li>a. In response to the recommendation from the previous audit (04/05/2018) Cork County Council revisited all farms in the buffer zones during July 2018 and issued letters to the landowners (June &amp; July 2018) with details of their obligations under the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (S.I. No. 31 of 2014).</li> <li>b. It has not been possible to locate any construction details of the infiltration gallery (previous audit recommendation in 2018).</li> <li>c. There is an automatic shutdown of the raw water intake when the turbidity exceeds 2 NTU (15 minutes delay).</li> </ul>
<b>2.</b>	<p><b>Filtration</b></p> <ul style="list-style-type: none"> <li>a. Two pressure filters have been installed to treat a maximum combined volume of 40m<sup>3</sup>/hr. The filter media is composed of silica sand and anthracite.</li> <li>b. On the day of the audit a turbidity of 0.157 NTU was displayed for Filter No. 1 and 0.334 NTU for Filter No. 2.</li> <li>c. The filters are automatically backwashed on a timed basis (every 12 hours) or when the turbidity reaches (0.95 NTU) whichever occurs first. There is also the facility to undertake a manual backwash if required. There is a 2 minute run to waste following backwashing prior to the filter going back into supply.</li> <li>d. There is a warning alarm at a turbidity set point of 0.7 NTU (after 15 minutes) which generates a SMS alert to the caretaker, relief caretaker, executive engineer and senior executive engineer.</li> <li>e. There is auto shutdown of the plant if the turbidity of the filtered water reaches the high set point of 0.8 NTU (15 minutes delay).</li> </ul>
<b>3.</b>	<p><b>UV Disinfection</b></p> <ul style="list-style-type: none"> <li>a. A UV disinfection system has been installed to provide a barrier against <i>Cryptosporidium</i>. The units are LBX 90e reactors validated to USEPA UVDGM Calculated Dose Approach. The validated operating range of the UV system was provided to the EPA in advance of the audit.</li> </ul>

	<ul style="list-style-type: none"> <li>b. Duty and standby UV reactors are provided with automatic switchover (12 hour changeover).</li> <li>c. Plates are attached to both reactors indicating the validation criteria for the units.</li> <li>d. The UV unit is linked to a continuous UVT and dose monitor. The HMI displayed the following for Unit No. 2 which was in operation at the time of the audit: UVI 156.8 W/m<sup>2</sup>; Red Dose 88.09 mJ/cm<sup>2</sup>; Power 50%, flow 40.0m<sup>3</sup>/hr; UVT 70.0%.</li> <li>e. The UV units are validated to operate at a flow of 40m<sup>3</sup>/hr and deliver a dose of 40mJ/cm<sup>2</sup> at 70% UVT.</li> <li>f. The UV disinfection system was operating within its validated range during the audit.</li> <li>g. The dose rate is maintained within the validated range and the plant is alarmed and programmed to shut down if the UV unit drops outside of its validated range.</li> <li>h. It is proposed that Cork County Council staff will be trained to undertake lamp replacement.</li> </ul>
<b>4.</b>	<p><b>Treated Water Storage and Distribution Network</b></p> <ul style="list-style-type: none"> <li>a. As part of the previous audit report Irish Water were requested to confirm that the supply is on the Irish Water reservoir cleaning programme. This information has not been provided to date.</li> </ul>
<b>5.</b>	<p><b>Management and Control</b></p> <ul style="list-style-type: none"> <li>a. Training on the UV units and pressure filters has been provided by the UV system contractor to the plant staff.</li> <li>b. At present alarms are being received by both the UV contractor and plant staff until the works are handed over.</li> <li>c. The trends for the UV units are not currently available to view on site on the HMI but are available on the countywide SCADA. A copy of two months of trend data was provided by Irish Water in advance of the audit and demonstrates that the UV units are operating effectively.</li> </ul>

### 3. AUDITORS COMMENTS

The purpose of the audit was to assess the suitability of the Mogeely PWS for removal from the RAL. The audit confirmed that the installation of the containerised pressure filtration and UV disinfection system has been completed. The verification data indicates that the plant is operating effectively.

Mogeely PWS will be recommended for removal from the RAL to be published at the end of April 2019.

### 4. RECOMMENDATIONS

#### Filtration

1. Irish Water should examine the feasibility of reducing the time delay, prior to auto shutdown of the plant, in response to high turbidity alarm on the filtered water.

#### Treated Water Storage and Distribution Network

2. Irish Water should ensure that a regular programme of reservoir inspection, cleaning and maintenance is in place, in accordance with EPA Drinking Water Advice Note No. 10. Irish Water should confirm that the supply is on the Irish Water reservoir cleaning programme.

#### Management and Control

3. Irish Water should ensure the trends for the UV units are available to view on site and provide an update to the Agency when this issue has been resolved.
4. Irish Water should ensure that there are standard operating procedures in place for routine and periodic check and maintenance activities to be undertaken by the plant operator on the UV system.

## **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 Ms Regina Campbell, Drinking Water Team Leader.

Irish Water should submit a report to the Agency within one month 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:**

*Cristina Doyle*

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**Date:**

15/04/19

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Inspector