



# Drinking Water Audit Report

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| <b>County:</b>           | Waterford   | <b>Date of Audit:</b>                 | 13/02/19        |
| <b>Plant(s) visited:</b> | Kill/Ballylaneen<br>(Scheme Code<br>3100PUB1106)  | <b>Date of issue of Audit Report:</b> | 11/03/19        |
|                          |   | <b>File Reference:</b>                | DW2018/209      |
|                          |   | <b>Auditors:</b>                      | Regina Campbell |
| <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. **Irish Water should submit a programme of works and timeframe for the decommissioning of the Kill/Ballylaneen water treatment plant and connection to the East Waterford Water Supply Scheme.**
- ii. **Irish Water should confirm that the turbidity and chlorine monitors and the chemical dosing pumps have been serviced and calibrated.**

## 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 notifications by Irish Water in December 2018 of the failure to meet the aluminium parametric value in the Kill/Ballylaneen Public Water Supply (PWS). The Kill/Ballylaneen PWS serves a population of 1,100 and produces a volume of 250 m<sup>3</sup>/day.

The opening meeting commenced at 1.30pm at the Kill/Ballylaneen 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 audits observations and recommendations are listed in Section 2 and 4 of this report. The following were in attendance during the audit.

Representing Irish Water:

Brian O' Leary, Operations Lead  
Patrick Duggan, Compliance Specialist  
Siobhan Clifford, Compliance Analyst

Representing Waterford City and County Council (WCCC):

Lar Power, Caretaker  
 Ken Walsh, O & M Engineer  
 Maura Phelan, Acting Senior Executive Engineer, Water Services  
 Representing the Environmental Protection Agency:  
 Regina Campbell, 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.*

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| <p><b>1.</b></p> | <p><b>Source Protection</b></p> <ul style="list-style-type: none"> <li>a) The source for the supply is the Mahon River. The water treatment plant is adjacent to the river. The river is described as flashy and has flooded the site of the treatment plant in the past.</li> <li>b) Landuse in the vicinity is agriculture and the Kilmacthomas Wastewater Treatment Plant is situated approximately 5 kilometres upstream of the intake.</li> <li>c) There are online alarmed monitors on the raw water intake for turbidity and ammonia. At the time of the audit the raw water turbidity monitor was displaying 0.75 NTU.</li> <li>d) The raw water is gravity fed to a sump. In order to provide early warning of the build up of silt at the intake and sump, a hydrostatic sensor has recently been installed in the sump to continuously monitor the silt level.</li> </ul>  |
| <p><b>2.</b></p> | <p><b>Coagulation, Flocculation and Clarification</b></p> <ul style="list-style-type: none"> <li>a) Raw water from the River Mahon undergoes coagulation, flocculation and clarification.</li> <li>b) Alkali dosing using caustic soda takes place first followed by coagulant dosing. Caustic soda dosing is flow proportional at a rate of 5mg/l. There are duty and standby caustic soda dosing pumps with manual switchover once per week.</li> <li>c) 17% kibbled aluminium sulphate is used to make up the coagulant dose. No coagulant aid is used.</li> <li>d) The alum dosing pumps are linked to a streaming current monitor (SCM) that controls the dose using a feedback system. The SCM was installed at the plant at the beginning of February 2019. Prior to installation of the SCM, the dose was set manually based on jar tests. Daily jar tests are also undertaken by the caretaker and results are used as a check on the alum dosing rates. A dose chart is available at the site.</li> <li>e) There are duty and standby alum dosing pumps with manual switchover required. There was no record of servicing or calibration of the pumps available.</li> <li>f) Irish Water said that the aluminium exceedances in December were linked to the pulsator device for the clarifier which was found to be operating intermittently (due to blockages by silt from the river). This was leading to the sludge blanket rising and high settled water turbidity. Irish Water said that on each occasion the settled water turbidity alarms were responded to promptly and the plant was shut down while investigations were carried out and the pulsator was unblocked. The intake and raw water sump was cleaned of silt on 03/01/2019 and the pulsator is now working normally. Irish Water said that they plan to replace the pulsator with an alternative mechanism to prevent further issues in the future but couldn't give a timeframe for completion of this work.</li> <li>g) Daily aluminium testing is undertaken on the final water at the plant.</li> <li>h) Automatic sludge bleeds are undertaken on a timed basis at a 60 minute frequency for 3 minutes duration.</li> <li>i) The clarifier is drained down and cleaned at regular intervals</li> </ul> |
| <p><b>3.</b></p> | <p><b>Filtration</b></p> <ul style="list-style-type: none"> <li>a. Settled water then passes through a rapid gravity filter. The media consists of</li> </ul>   |

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|           | <p>approximately 1m sand and a sublayer of gravel.</p> <ul style="list-style-type: none"> <li>b. The final water turbidity monitoring point is located in the clear water tank and is alarmed at 0.5 NTU. The final water turbidity monitor was reading 0.06 NTU at the audit. Calibration of the turbidity monitors was overdue since January 2019.</li> <li>c. Backwashing of the filter is undertaken on a daily basis and takes approximately two hours. I was unable to observe a backwash as it had been undertaken earlier that morning. The filter is run to waste for 10 minutes after the backwash is completed. There is a Filter Backwash Procedure in place.</li> <li>d. I was informed that the filter media was last replaced in 2010 and that the media is due to be replenished shortly. It is planned to put in place a procedure for measuring the depth of media during these works.</li> </ul> |
| <b>4.</b> | <p><b>Disinfection</b></p> <ul style="list-style-type: none"> <li>a. The water is disinfected using 14-15% low bromate sodium hypochlorite. Duty and standby/assist chlorine dosing pumps are in place with automatic switchover. Dosing is flow proportional.</li> <li>b. The target residual chlorine at the plant is between 1.1 and 1.3mg/l. The low chlorine alarm is set at 0.94 mg/l and the high chlorine alarm is set at 1.5 mg/l.</li> <li>c. There was no record available on site of the servicing or calibration of the chlorine monitors.</li> </ul>  |
| <b>5.</b> | <p><b>Treated Water Storage and Distribution Network</b></p> <ul style="list-style-type: none"> <li>a. There are two storage reservoirs off-site with a combined capacity of 550m<sup>3</sup>. These were not visited on the day of the audit due to time constraints.</li> <li>b. A program of scouring in the network commenced in January.</li> <li>c. Regular monitoring of residual chlorine on the network takes place.</li> </ul>  |
| <b>6.</b> | <p><b>Exceedances of the Parametric Values</b></p> <ul style="list-style-type: none"> <li>a. There were three exceedances of the aluminium parametric value notified to the EPA in December 2018.</li> </ul>  |
| <b>7.</b> | <p><b>Chemical storage and bunds</b></p> <ul style="list-style-type: none"> <li>a. The alum mixing tanks in the chemical dosing room were not adequately bunded.</li> <li>b. There was no expiry date on the drums of sodium hypochlorite. The date of manufacture was displayed.</li> </ul>  |
| <b>8.</b> | <p><b>Hygiene and Housekeeping</b></p> <ul style="list-style-type: none"> <li>a. The daily record-keeping was good.</li> </ul>  |

### 3. AUDITORS COMMENTS

The audit was carried out in response to a number of aluminium exceedances during December 2018. Corrective actions were found to have taken place in response to the exceedances and I was informed that the plant had undergone some operational improvements in recent months.

Irish Water should ensure that there is a maintenance programme in place for the servicing and calibration of all plant monitors, and that records of maintenance and calibration of all monitoring and dosing equipment are kept at the plant.

Irish Water plan to decommission this supply in 2020 and connect the network to the East Waterford Regional Supply Scheme. An action programme should be submitted in relation to this.

### 4. RECOMMENDATIONS

#### General

1. Irish Water should submit an action programme, including a detailed schedule and timeframe, for the decommissioning of the Kill/Ballylaneen water treatment plant and connection to the East Waterford Water Supply Scheme.

### Coagulation, Flocculation and Clarification

2. Irish Water should review the operation of the alum dosing pumps to ensure that there is a procedure in place in the event of the failure of one of the pumps.
3. Irish Water should provide a timeframe for the replacement of the pulsator device for the clarifier.

### Filtration

4. Irish Water should undertake a review of the final water turbidity results at the plant and investigate the possibility of lowering the current 0.5 NTU alarm.
5. Irish Water should put in place a method of measuring the media depth in the filter.
6. Irish Water should ensure that a logbook is kept (“the filter logbook”) for the filter containing the following:
  - i. A record of all maintenance work and inspections carried out on the filter;
  - ii. Details of the media depth and the condition of the filter when it is drained down;
  - iii. Where appropriate, details of the operation of the backwashing / air scouring systems and underdrains;
  - iv. Details of any changes or required changes to filters, the backwashing /air scoring systems or underdrains; and
  - v. Details of any trial work carried out on the filters.

### Chemical Storage and Bunds

7. Irish Water should review chemical storage arrangements at the plant. Chemicals must be stored in banded areas capable of containing at least 110% of the volume of chemicals stored therein. Fill points for storage tanks inside the bunds should be within the banded area. Refer to EPA guidance document – “*IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities*”. The review should include an assessment of the risk to final water from spillages or leaks of chemicals at the plant.
8. Irish Water should ask chemical suppliers to provide an expiry date on all chemicals supplied.

### Management and Control

9. Irish Water should confirm that the turbidity and chlorine monitors and the chemical dosing pumps have been serviced and calibrated.
10. Irish Water should ensure that there is a maintenance programme in place for the servicing and calibration of all plant monitors, and that records of maintenance and calibration of all monitoring and dosing equipment are kept at the plant.

### 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 Dr. Michelle Minihan, Senior Inspector.

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. A response to recommendation no. 9 is required within 1 week.

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:

11/03/19

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Inspector