# Drinking Water Audit Report

| | | | |
|---|---|---|---|
| **County:** | Longford | **Date of Audit:** | 2nd June 2017 |
| **Plant(s) visited:** | Ballymahon PWS (Abbeyshrule WTP)<br><br>Scheme Code 2000PUB1005 | **Date of issue of Audit Report:** | 13th June 2017 |
| | | **File Reference:** | DW2011/35 |
| | | **Auditors:** | Mr Darragh Page<br>Ms Derval Devaney |
| **Audit Criteria:** | • The *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014).*<br>• *The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)*<br>• The recommendations specified in the EPA *Drinking Water Report*.<br>• EPA Drinking Water Advice Notes No.s 1 to 15.<br>• The recommendations in the previous audit report dated 20th August 2014. | | |

**MAIN FINDINGS**

i. **The quality of the raw water source (River Inny) fluctuates considerably. The dosing control at the plant was not optimised to deal with this variability despite this being recommended in the EPA's 2017 audit.**
ii. **The RAL date to comply with THMs failures in this supply has been extended to December 2018 to afford time to undertake monitoring to determine a solution to disinfection by-product (THMs) formation.**
iii. **Information on catchment pressures, risks and mitigation measures were not available despite this being a recommendation in the EPA's 2014 audit to improve the supply's security.**

## 1. INTRODUCTION

Under the *European Union (Drinking Water) Regulations 2014* 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 drinking water and to determine progress with removal of this supply from the EPA's Remedial Action List (RAL).

The Abbeyshrule water treatment plant runs approx. 18 hours/day serving a population of 9,810 on the Ballymahon public water supply with approximately 3,621 $m^3$/day of water. The plant, which was commissioned in 1974, is operating within its design capacity treating water abstracted from the River Inny via clarification, rapid gravity filtration and disinfection using liquid sodium hypochlorite.

Photographs taken by Deval Devaney during the audit are attached to this report and are referred to in the text where relevant.

The opening meeting commenced at 10:15am at Abbeyshrule 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:

Mr Padraig Farrell - Irish Water
Mr Andrew Boylan – Irish Water
Mr Tomás Cawley – Irish Water
Mr Barry Leonard – Irish Water
Mr Tom Murtagh- Longford County Council
Ms Angela Brady - Longford County Council
Mr Noel Madden –Longford County Council
Mr Barry Lennon - Longford County Council
Mr Dessie Reynolds - Longford County Council
Mr John Byrne - Longford County Council

Representing the Environmental Protection Agency:

Mr Darragh Page – Inspector
Ms Derval Devaney – Inspector

## 2. AUDIT OBSERVATION

*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.** | **Source Protection**<br><br>a. The quality of raw water from the River Inny fluctuates. Colour can increase from 78 to 400 Hazen after heavy rain.<br>b. Information on catchment investigation, protection activities or assessment of the risk to drinking water was not available despite this being recommended in the last EPA audit in 2014. Irish Water's response to that audit report stated that it is developing a risk based approach to Drinking Water Safety Plans (DWSPs) which will identity the risks to the abstraction source and mitigation measures required.<br>c. There is online raw water turbidity, pH and UVT monitor in place. However it was stated that the UVT monitor is not currently operating. It was stated that raw water pH is generally 7.9 and the raw water turbidity monitor read 2 NTU on the day of the audit.<br>d. The 12 month raw water characterisation monitoring ended in February 2017 and is being assessed currently. The levels of alkalinity in the raw water indicate that pH correction is required at the plant for optimum coagulation. |
| **2.** | **Coagulation, Flocculation and Clarification**<br><br>a. Coagulation, assisted via the addition of Chemifloc 101, is manually controlled and dosed at the raw water chamber. The dose rate is varied by the caretaker on the basis of predicted raw water quality. Poly (flopam) is added inline and mixed by a flash mixer. There are plans to install an additional chamber and rapid mixer mid-July 2017.<br>b. Irish Water is undertaking a study of jar testing to determine if acid dosing is needed prior to automation of the coagulant dose.<br>c. There are 2 clarifiers on-site. Some of the clarifier channels (e.g. Clarifier 1) were not level |

| | |
|---|---|
| | and had uneven flow. This issue was identified at the previous EPA audit and had not been corrected.<br>d. Pin floc was present in Clarifier 2 and its downpipes were pitted, rusted, damaged in places (see Photo 1) and in need of replacement.<br>e. Some algae was noted in Clarifier 1. It was stated that the channel length cannot currently be cleaned fully as there are walkways on only one side of each of the two clarifier tanks. This was also identified in the previous EPA audit.<br>f. Irish Water is to commence monitoring from source to tap to determine the THM formation potential (THMFP) and organics removal capacity which is to inform the plant upgrade required. As a result, Irish Water stated that the RAL date, to achieve compliance with the THMs parametric value, has been pushed out by 18 months to December 2018. This project is to be dealt with under Irish Water's Minor Programmes. |
| **3.** | **Filtration**<br>a. There are three rapid gravity filters at the plant. These were refurbished in 2012, including replacement media in all three filters, and replacement pipework/ nozzles in Filter No. 1.<br>b. Filters are normally backwashed on a time basis (every 20 hours), but can be triggered on headloss or if turbidity on the filter outflow rises above 1 NTU.<br>c. Filter 2 was backwashed during the audit on request. An area towards the back right hand side of the filter and middle showed significant boiling (see Photo 2). This was also identified in the previous EPA audit.<br>d. The combined filtered water online turbidity monitor read 0.6 NTU on the day of the audit.<br>e. Upon review of the turbidity concentrations in the final water on SCADA, spikes in turbidity were observed and the cause was not apparent. However it was stated that during the backwash of a filter the other filters receive additional flows. |
| **4.** | **Disinfection, pH correction and fluoridation**<br>a. The pH of the final water is corrected in the 100$m^3$ clear water tank on-site by the addition of sodium carbonate to achieve a pH of about 7.2.<br>b. Sodium hypochlorite (10-11%) is also dosed flow proportionally into the clear water tank. The disinfection system has been upgraded recently to Irish Water specification.<br>c. The water is not currently dosed with hydrofluorosilic acid as the process is in need of an upgrade (the pumps keep failing). Irish Water has notified the HSE of this matter. |
| **5.** | **Monitoring and Sampling Programme for treated water**<br>a. The final water online turbidity monitor read 0.132 NTU and the chlorine residual from the CL17 online monitor read 2.29 mg/l on the day of the audit. |
| **6.** | **Exceedances of the Parametric Values**<br>a. There are two open files for this supply; one for MCPA failures (File ref: DW2015/152) and another for THMs failures (File ref: DW2011/35). Irish Water was requested during the audit to submit outstanding information relating to the MCPA file and provide an update in the Q2, 2017 tracker relating to the specifics of the RAL works to address the THMs failures in the supply. |
| **7.** | **Chemical storage and bunds**<br>a. The bund wall containing the chemifloc 101 bulk tanks appeared to have a crack in it and pipework penetrating close to its base (see Photo 3). |
| **8.** | **Sludge Management**<br>a. The sludge facilities on-site were upgraded 4 years ago and sludge generated from the treatment process is drawn off for treatment at Longford Waste Water Treatment Plant. |

## 3. AUDITORS COMMENTS

While the disinfection system at the plant was upgraded recently, the auditors found that 8 of the 13 recommendations from the EPA's last audit in 2014 had yet to be implemented and that it would be a further 18 months before they would be implemented in full.

## 4. RECOMMENDATION

### Source Protection

1. Irish Water should ensure that risks to the abstraction source are identified and suitable mitigation measures put in place to ensure the security of the supply. Activities in the catchment that may be relevant include wastewater treatment discharges upstream, agricultural activities, pesticide use on farms and at the aerodrome. The management of emergency situations should be considered in this exercise, and suitable information should be maintained on site to enable plant operators to address relevant risks to the abstraction in an emergency situation.

2. Irish Water should ensure the UVT monitor on the raw water is operational.

### Coagulation, Flocculation and Clarification

3. Irish Water should:
    a. ensure that the clarifier pipework is repaired and channels are level, free from blockage and that flow into these channels is even;
    b. carry out an investigation to identify the cause pin floc formation;
    c. ensure that the clarifier tanks and channels are cleaned regularly to prevent the build-up of algae/ weed growth. Facilities should be provided to carry out this work safely.

4. Irish Water should optimise the coagulation / flocculation processes at the water treatment works to include monitoring to determine the THMFP, optimum chemical coagulant dose and pH for the treatment of the water appropriate to the nature of supply and changing conditions. Consideration should be given to the provision of an automatic dosing system given the rapid fluctuations described as typical of the abstraction source, having regard to EPA guidance *Advice Note No. 15: Optimisation of Chemical Coagulant Dosing.*

### Filtration

5. Irish Water should investigate the cause of the boils in the filter media during backwash of Filter No. 2 and review the backwash performance of Filters 1 and 3 to identify if there are similar issues present. The cause of spikes in final water turbidity should also be identified.
   Irish Water should take appropriate action to optimise the operation of the filters to ensure that the final water quality is not affected.

6. Irish Water should review the turbidity trigger level for automatic backwash as the level of 1 NTU is high considering the plants average final water turbidity level.

### Chemical Storage and Bunds

7. Irish Water should inspect the bunds in use on-site to ensure they are of sound integrity. Chemicals must be stored in bunded 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 bunded area. Refer to EPA guidance document –"*IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities*".

### Management and Control

8. Irish Water should report to the EPA on the progress with the operational evaluation of the treatment and distribution system in relation to the potential for THM formation and its associated plans to enable the supply to be removed supply from the EPA's RAL.

## 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 Mr Darragh Page, 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.

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:**

Derval Devaney — 13 June 2017

Inspector

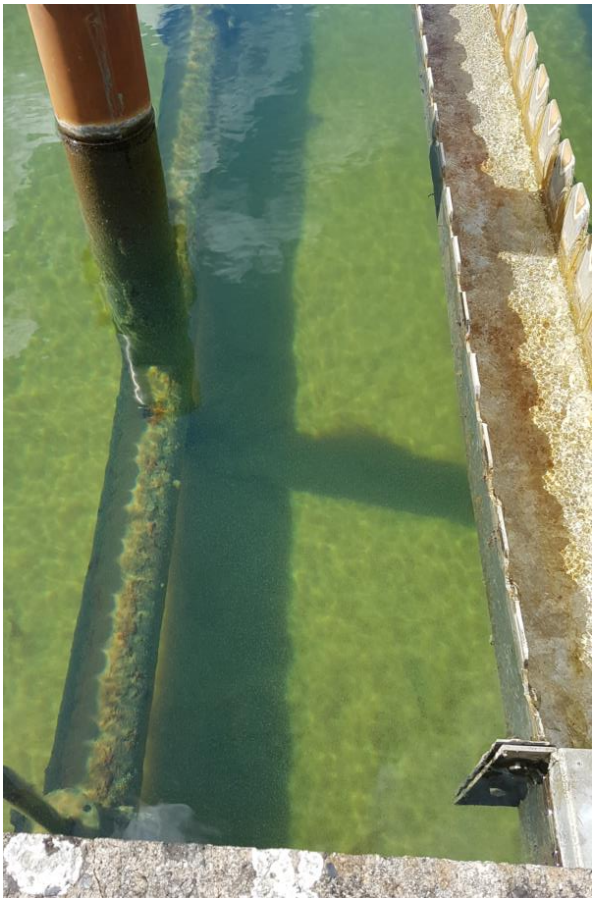

**Photo 1** Clarifier pipework rusted and pin floc present

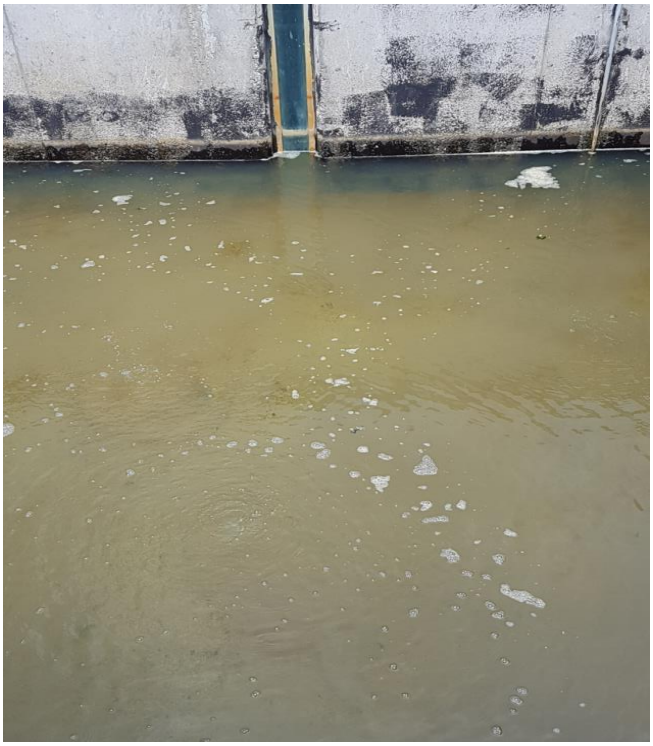

**Photo 2** Boiling evident during backwash in a number of locations at Filter 2

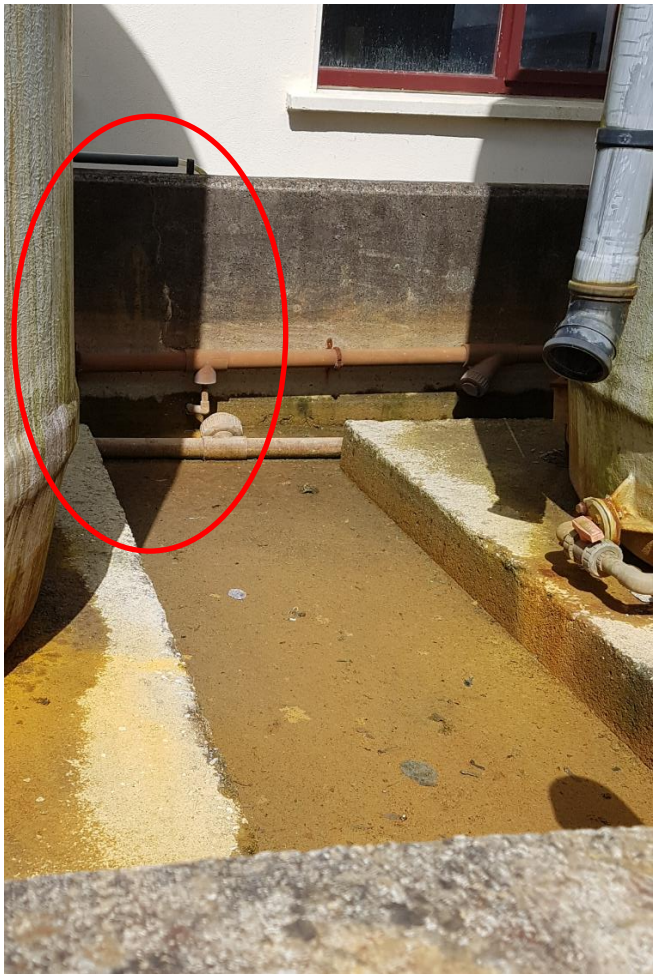

**Photo 3** The Chemifloc 101 bund wall appeared to be cracked and had pipework routed through its wall