



Drinking Water Audit Report

County:	Galway	Date of Audit:	2 nd October 2017
Plant visited:	Portumna Public Water Supply (1200PUB1042)	Date of issue of Audit Report:	19 th October 2017
		File Reference:	DW2008/146
		Auditor:	Aoife Loughnane
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>. • The <i>EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)</i> • The recommendations specified in the <i>EPA Drinking Water Report</i>. • EPA Drinking Water Advice Notes No.s 1 to 16. • The recommendations in any previous audit reports. 		

MAIN FINDINGS

- i. **Irish Water has carried out works at Portumna water treatment plant to implement the recommendations of the EPA audit carried out on 4th April 2017. Irish Water has demonstrated that the plant is operating satisfactorily and producing water quality which complies with the requirements of the *European Union (Drinking Water) Regulations 2014*. On this basis, Portumna will be removed from the EPA’s Remedial Action List when the Q3 RAL update is published.**
- ii. **Irish Water should continue the jar testing programme and other optimisation activities at the plant, including sludge bleed reviews, tube settler performance review and filter cleaning.**

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. Portumna has been on the EPA’s Remedial Action List (RAL) since 2008 due mainly to persistent THM exceedances. Following the EPA audit on 4th April 2017, the RAL heading was changed to “*EPA audit observation – Treatment & Management Issues*”. This audit was carried out to assess the works carried out at Portumna water treatment plant since the previous audit, and to assess whether the supply can be removed from the RAL.

Portumna water treatment plant supplies water to approximately 2,719 people. The raw water source is Lough Derg. Treatment comprises pH adjustment, coagulation, flocculation, clarification, rapid gravity filtration, UV disinfection, chlorination, final pH adjustment and fluoridation.

The opening meeting commenced at 10 am at Portumna 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. Photographs taken by Aoife Loughnane during the audit are attached to this report and are referred to in the text where relevant. The following were in attendance during the audit.

Representing Irish Water and Galway County Council:

Eoin Hughes, Drinking Water Compliance Analyst, Irish Water
 Shay Walsh, Engineer, Operations & Maintenance, Irish Water
 Adrian Raftery, Area Engineer, Galway County Council
 Tara Meehan, Technician, Galway County Council
 John Conroy, Caretaker, Galway County Council

Representing the Environmental Protection Agency:

Aoife Loughnane, 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.

1.	<p>Source Protection</p> <p>a. Works have commenced on the placement of marker buoys in Lough Derg to mark the location of the raw water intake pipe, to safeguard from future damage by passing boats.</p>
2.	<p>Clarification</p> <p>a. Since the previous audit, Irish Water has investigated the cause of floc carry over from the clarifiers to the filters and has put in place more comprehensive cleaning of the clarifiers and tube settlers, monthly jar testing, and increased the sludge bleed duration.</p> <p>b. A visual inspection of both clarifiers showed floc rising to the surface at the edges of the tanks where the tube settlers are not flush against the clarifier walls. Some of the tube settlers appeared to be damaged with bits of plastic broken off, especially at the edges (see photo 1).</p> <p>c. Irish Water confirmed that the sludge cone is located in the centre of the tanks, with sludge drawn off from the central tube settlers only, and not from the outer tubes.</p>
3.	<p>Filtration</p> <p>a. During a backwash of Filter No. 1, the following issues were observed:</p> <ul style="list-style-type: none"> i. a build-up of algae present on filter walls & decanting channel (see photo 2); ii. less vigorous air scour in the area close to the inlet pipework (see photo 2); and iii. uneven flow of backwash water over the weir (see photo 3).
4.	<p>Disinfection</p> <p>a. A review of the SCADA system found inadequate chlorine levels at the following network locations at the time of the audit:</p> <ul style="list-style-type: none"> • Sheeaunrush chlorine monitor: 0.06 mg/l • Quay chlorine monitor: 0.04 mg/l • Oakwood view chlorine monitor: 0.05 mg/l <p>b. The caretaker confirmed there was a low chlorine alarm at the plant on Saturday 30th September caused by a leak from the chlorine dosing pump. Repair works were scheduled to take place on 3rd October.</p> <p>c. At the request of the auditor, Galway County Council arranged for microbiological sampling to be carried out in those areas of the network as soon as possible. Irish Water subsequently provided the results of samples taken on 3rd October which were clear of bacteria and chlorine levels had recovered to satisfactory levels.</p>
5.	<p>Final pH adjustment</p> <p>a. Irish Water confirmed that a permanent solution has been identified to the caustic blockage of the pipeline entering the clear water tank. The solution involves relocating the caustic dosing point to the tank inlet, and will be implemented in the coming weeks.</p>

6.	<p>Chemical storage and bunds</p> <p>a. As identified in the previous audit, the current arrangement of the hydrofluorosilicic acid day tank bund presents a risk that any potential acid spill or leakage may not be contained within the bund (see photo 4). Some works have been carried out to lower the tank into the bund. Further works remain to be completed, including the installation of a screen to prevent acid splash out.</p>
7.	<p>Management and Control</p> <p>a. Irish Water has provided 2 months SCADA operational data from 23/07/17 to 23/09/17 which demonstrates satisfactory plant performance, to support the removal of Portumna PWS from the RAL.</p> <p>b. Irish Water has investigated the cause of the turbidity fluctuations post clarification and the following works have been carried out to rectify the issues identified;</p> <ul style="list-style-type: none"> • Clarifier No. 1: Repairs were completed on an inlet distribution pipe which had separated from the manifold on Friday 29th September. • Clarifier No. 2: A de-bubbler unit has been installed on the sample line to prevent air entrapment causing erroneous turbidity readings. <p>c. Irish Water has identified that spikes in treated water turbidity are being caused by turbulence in the sample line because the same line is used to supply water to sanitary facilities at the treatment plant.</p> <p>d. Following the audit, Irish Water provided further SCADA operational data from 01/10/17 to 13/10/17 which demonstrates a significant reduction in turbidity spikes at the plant.</p> <p>e. The EDEN drinking water data for Portumna public water supply need to be updated (treatment type, confirmation of turbidity monitors after each filter, etc.).</p>

3. AUDITORS COMMENTS

The audit found that Irish Water has carried out works at Portumna water treatment plant to implement the recommendations of the EPA audit carried out on 4th April 2017. Irish Water has investigated the cause of the floc carryover from the clarifiers to the filters and has adopted practices to improve the performance of the clarifiers, including monthly jar testing, more thorough cleaning practices and adjustments to the sludge bleed regime.

Irish Water has provided two months SCADA operational data which demonstrates that the plant is operating satisfactorily and producing water quality which complies with the requirements of the *European Union (Drinking Water) Regulations 2014*. On this basis, Portumna will be removed from the EPA's Remedial Action List when the Q3 RAL update is published.

Irish Water should continue the jar testing programme and other optimisation activities at the plant, including sludge bleed reviews, tube settler performance review and filter cleaning.

4. RECOMMENDATIONS

Clarification

1. Irish Water should continue to regularly inspect the coagulation / flocculation processes at the water treatment works, and continue the programme of jar testing of the raw and coagulated waters to determine the optimum chemical coagulant dose and pH for the treatment of the water. The frequency of checks should be appropriate to the nature of supply and changing conditions. Results should be recorded at the treatment works and used for control of the treatment plant.
2. Irish Water should review the performance of the tube settlers in the clarifiers, and replace the damaged tubes as necessary, to prevent floc rising to the surface at the edge of the tanks. The extent of the sludge cone should also be examined to establish the optimum regime of sludge draw-off.

Filtration

3. Irish Water should address the following aspects of filter management at the plant:
 - i. ensure the filters are cleaned on a regular basis to prevent build-up of algae on the walls and the decanting channels;
 - ii. ensure the air/water backwash is even across the filter and that air nozzles are fully functional and not blocked or damaged; and
 - iii. ensure that filter weirs are level to allow an even flow of backwash water into the decanting channels.

Distribution System

4. Irish Water should ensure that free residual chlorine levels at the end of the distribution network are maintained at 0.1mg/l.

Chemical Storage and Bunds

5. Irish Water should ensure that any potential spillage or leakage from the hydrofluorosilicic acid day tank will be contained in the bund.

Management and Control

6. Irish Water should take action to minimise the interference leading to spikes and erroneous readings on turbidity monitors at the plant.
7. Irish Water should implement a permanent solution to the caustic blockage of the pipeline entering the clear water tank.
8. Irish Water should update the EDEN drinking water data for Portumna public water supply.

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 to address the issues raised. This report has been reviewed and approved by Emer Cooney, 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 DW2008/146 in any future correspondence in relation to this Report.

Report prepared by:

Aife Laghane

Inspector

Date:

19th October 2017



Photo 1: Damaged tube settlers in the clarifier



Photo 2: Algae on filter walls and uneven air scour during backwash of Filter No. 1



Photo 3: Uneven flow of backwash water over the weir in Filter No. 1

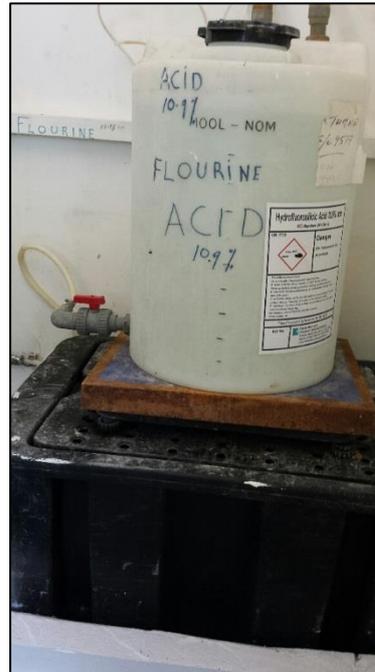


Photo 4: Hydrofluorosilicic Acid day tank