



# Drinking Water Audit Report

<b>County:</b>	Co. Carlow	<b>Date of Audit:</b>	27/04/2017
<b>Plant(s) visited:</b>	Tullow Water Treatment Plant.  Scheme Code 0100PUB1131	<b>Date of issue of Audit Report:</b>	16/05/2017
		<b>File Reference:</b>	DW2017/48
		<b>Auditors:</b>	Ms Ruth Barrington Ms Pauline Gillard Mr Gerard O'Leary
<b>Audit Criteria:</b>	<ul style="list-style-type: none"> <li>• The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</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 Nos. 1 to 15.</li> </ul>		

## MAIN FINDINGS

- i. **Irish Water should review the cause of pin floc carryover and implement appropriate control over the operation of the clarification process.**
- ii. **Irish Water should optimise the operation of the filters and levels of the filter weir.**
- iii. **Irish Water should use the Water Safety plan approach to maintain the safety and security of Tullow public water supply. Irish Water should provide information to the EPA on projects highlighted through the statement of needs process, and how they correspond with identified risks.**

## 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 in the Tullow public water supply.

Treatment at the Tullow WTP comprises coagulation, clarification, rapid gravity filtration, chlorination and fluoridation. The treatment plant produces approximately 1000 m<sup>3</sup>/day and serves a total population of 2396 people in the Tullow area. The Slaney catchment upstream of the abstraction point has a number of potential significant hazards in the area such as wastewater treatment discharges.

The opening meeting commenced at 10.30am at Tullow, Co. Carlow. 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:

Ms Siobhan Clifford – Compliance Analyst

Ms Deirdre O’Loughlin – Compliance Specialist

Mr Liam Brett – Water Lead

Representing Carlow County Council:

Mr Darren Leonard – Caretaker

Mr Rory Jackmann – Relief Caretaker

Representing the Environmental Protection Agency:

Ms Ruth Barrington – Inspector

Ms Pauline Gillard – Inspector

Mr Gerard O’Leary - Director, Office of Environmental Enforcement

## 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>	<b>Source Protection</b>  a. The source of the water is the River Slaney. The abstraction point has mesh screens at the sump. b. The Slaney catchment upstream of the abstraction point has a number of potential significant hazards that could compromise the raw water quality. There are agricultural farms surrounding the River Slaney and wastewater treatment discharges at Rathvilly and Baltinglass and a Section 4 licensed discharge. There is no emergency communication plan/protocol between the wastewater treatment plants (WWTP), Wicklow County Council and Carlow County Council drinking water treatment plant staff to ensure a co-ordinated incident response, should the need arise. c. Carlow County Council stated that 13 farm inspections had been carried out in the previous year. d. The overall <i>Cryptosporidium</i> risk score currently is 94 (high risk). <i>Cryptosporidium</i> monitoring of the treated water was carried out 3 times by Carlow County Council in 2017. Results show that no <i>Cryptosporidium</i> was detected.
<b>2.</b>	<b>Coagulation, Flocculation and Clarification</b>  a. There are two alum and polyelectrolyte (poly) tanks, the poly is made up on site. b. The duty and standby pumps and dosing system were being upgraded at the time of the audit to allow dosing to be automated. The plant has one clarifier and two rapid gravity filters. c. During the audit pin floc carry-over was observed rising in the clarifier tank, the caretaker stated this was due to the sunshine and that it does not happen in cloudy conditions.

<p><b>3.</b></p>	<p><b>Filtration</b></p> <ol style="list-style-type: none"> <li>a. There are two 8 m<sup>2</sup> rapid gravity filters at the plant. A backwash was initiated during the audit on Filter no. 1. There was an even wash but preferential flow was noted across the filter and over the weir, as the wall is not level.</li> <li>b. The filter media was replaced in May 2015.</li> <li>c. The filter is run to waste for 5 minutes after the backwash finishes. This was implemented to address turbidity spikes in the final water and currently is controlled manually. The backwash process will be automated when the process has been streamlined.</li> </ol>
<p><b>4.</b></p>	<p><b>Disinfection</b></p> <ol style="list-style-type: none"> <li>a. Disinfection is achieved using chlorine gas. There are chlorine gas cylinders in a secure, marked and ventilated room. There are duty and standby chlorinators in place.</li> <li>b. Prior to chlorination the target turbidity of the water is 0.1 NTU.</li> <li>c. There is a chlorine monitor and alarm in the plant which was serviced and calibrated in date. The low chlorine alarm setting is 0.5mg/l and the high level alarm is 1.5mg/l.</li> <li>d. When the chlorine alarm is triggered a text is sent to four contact people. There is no documented alarm procedure in place and no automatic shutdown of the plant.</li> <li>e. There are records in place of all alarm call outs.</li> <li>f. Data from online monitors can be accessed by the caretaker remotely.</li> <li>g. There is an adequate chlorine contact time.</li> <li>h. There is 24 hours storage capacity in the reservoir.</li> <li>i. There are manual chlorine checks carried out each day, morning and evening in the network and checked against the results of the chlorine monitor. The free residual chlorine levels at the end of the distribution network are maintained at least 0.1mg/l.</li> </ol>
<p><b>5</b></p>	<p><b>Management and Control</b></p> <ol style="list-style-type: none"> <li>a. At the audit SCADA data was requested in association with turbidity spikes during backwash. A complete set of SCADA data was unavailable at that time via the on-site access.</li> <li>b. Overall the plant was found to be well run with good management practices in place. It was clean, secure and well maintained.</li> </ol>

### 3. AUDITORS' COMMENTS

The Tullow Drinking Water Treatment Plant was found to be well run and managed. Process documentation was up to date but the formalisation of procedures and co-ordinated emergency protocol should be implemented. Some good work has been done by Carlow County Council and Irish Water with stakeholders in the catchment but considering the potential hazards (e.g. wastewater discharge) identified upstream, this work should be enhanced.

### 4. RECOMMENDATIONS

#### Source Protection

1. Irish Water should liaise with the River Basin District team responsible for implementing the Water Framework Directive and establish links with the Environment Sections in relevant local authorities in the catchment to ensure that they are aware of the issues potentially impacting on the raw water abstraction point. Irish Water should identify all potentially polluting discharges into the catchment of the water source and implement mitigation measures, where appropriate, to reduce the potential impact of these discharges.

2. Irish Water should develop an incident communication plan/protocol for use in the event of incidents at the upstream waste water treatment plants to ensure a co-ordinated incident response, should the need arise.

### **Coagulation, Flocculation and Clarification**

3. Irish Water should carry out an investigation to identify the cause of pin floc formation in the clarifier tank and ensure its impact is minimised. In carrying out this investigation Irish Water should have regard to the EPA Water Treatment Manual: Coagulation, Flocculation and Clarification.

### **Filtration**

4. Irish Water should ensure that the backwash is even across the filter and should take appropriate action to optimise the operation of the filter. The uneven weir level should be addressed to prevent loss of media and allow an enhanced even drainage across the filter.

### **Disinfection**

5. Irish Water should ensure there is a documented procedure for response to a chlorine alarm to prevent the entry of inadequately disinfected water into supply.

### **Management and Control**

6. Irish Water should ensure that hazard mitigation plans, with timeframes, are in place for all hazards identified as high risk in the Drinking Water Safety Plan. Irish Water should provide information to the EPA on the projects that are highlighted through the statement of needs process for Tullow PWS, and how these correspond with identified risks.
7. Irish Water should provide in graph form one week of turbidity data for Filter no. 1 with the final water turbidity overlaid (week beginning 17/04/2017).

## **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 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:**

16/05/2017

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Pauline Gillard  
Inspector