



# Drinking Water Audit Report

<b>County:</b>	Kildare	<b>Date of Audit:</b>	24 <sup>th</sup> April 2015
<b>Plant(s) visited:</b>	Clonuff Water Treatment Plant	<b>Date of issue of Audit Report:</b>	11 <sup>th</sup> May 2015
		<b>File Reference:</b>	DW2015/49
		<b>Auditors:</b>	Ms. Ruth Barrington Ms. Michelle Roche
<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>• 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></li> <li>• The recommendations specified in the <i>EPA Drinking Water Report</i>.</li> <li>• The recommendations in any previous audit reports.</li> </ul>		

## MAIN FINDINGS

- i. **The chlorine disinfection system in place at the plant requires significant improvement. Chlorine disinfection should be improved in accordance with the EPA Disinfection Manual.**
- ii. **While the borehole source is enclosed in a secure chamber the borehole itself is not capped. The borehole should be capped in accordance with the EPA advice note on Borehole Construction and Well Head Protection (Advice Note No. 14).**

## 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. The Clonuff supply was identified for audit on the basis of low chlorine residuals recorded at consumer taps in 2013.

The Clonuff Water Treatment Plant supplies water from a single borehole to 14 houses in the townland of Clonuff, Co. Kildare. The Water Treatment Plant treats approximately 3 cubic metres of water per day and this volume is demand led from the network. Treatment consists of chlorine disinfection, pH correction and Iron and Manganese removal.

The opening meeting commenced at 15.45pm at the Clonuff 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: (\* indicates that person was also present for the closing meeting)  
 Mr. Andrew Boylan, Regional Water Compliance Monitoring Liaison Specialist, Irish Water\*  
 Mr. Tselophile Tlou, Water Engineer, Irish Water\*  
 Mr. Mark Flanagan, Water Engineer, Kildare County Council\*  
 Ms. Eileen Loughman, HSE\*  
 Mr. John Keena, Overseer, Kildare County Council\*

Representing the Environmental Protection Agency:

Ms. Ruth Barrington, Inspector\*  
 Ms. Michelle Roche, 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.*

<p><b>1.</b></p>	<p><b>Source Protection</b></p> <ul style="list-style-type: none"> <li>a. The source of the Clonuff public water supply is a single borehole located approximately 100m south of the Water Treatment Plant. No details on borehole construction were available at the time of the audit.</li> <li>b. The borehole is housed in a well chamber located on the green in front of the Millrace Lawns housing estate. The chamber is covered with a heavy manhole cover which is unlocked.</li> <li>c. The catchment is grassland and grazing is the main agricultural activity in the area. Local landowners have not been formally written to about the presence of a water supply borehole in proximity to their lands; however they have been verbally informed.</li> <li>d. No zone of contribution or source protection zone has been mapped for the supply.</li> </ul>
<p><b>2.</b></p>	<p><b>Filtration</b></p> <ul style="list-style-type: none"> <li>a. A Filox filtration system for the removal of Iron and Manganese is installed at the water treatment plant and the filtration occurs before disinfection.</li> <li>b. The water is pre-chlorinated and pH corrected with calcite, prior to filtration, to aid the removal of Iron and Manganese.</li> <li>c. The filter media was topped up in March 2015 and last replaced in 2011.</li> <li>d. No operational monitoring programme is in place for Iron and Manganese monitoring in the raw or treated water, to determine the effectiveness and efficiency of the filtration system.</li> </ul>
<p><b>3.</b></p>	<p><b>Chlorination and Disinfection</b></p> <ul style="list-style-type: none"> <li>a. A duty chlorine dosing pump is installed at the water treatment plant and a concentration of 14-15% Sodium Hypochlorite is dosed at a fixed level when the water supply pump is switched on.</li> <li>b. A chlorine contact tank with a residence time of 3 hours is in place. An effective contact time calculation of 12.33mg.min/l was submitted by Irish Water following the audit. This contact time is below the EPA recommended contact time of 15mg.min/l.</li> </ul>

	<ul style="list-style-type: none"> <li>c. A residual free chlorine monitor is in place and the associated sample point is located after the contact tank. The monitor is not linked to a SCADA network.</li> <li>d. A low level alarm of 0.1mg/l and a high level alarm of 0.8mg/l has been set however, it was outlined during the audit that the low or high level set points must be exceeded for 30 minutes before the monitor will alarm. Alarms send a text alert to the caretaker only or to the overseer if the caretaker is on holidays.</li> <li>e. Manual HACH analysis is carried out occasionally at the plant. The frequency of this monitoring appears to be anything between weekly and monthly.</li> <li>f. A chlorine residual reading of 1.4mg/l was observed during the audit and this was thought to be caused by a fresh batch of Chlorine delivered to the day tank. The high level alarm did not alarm over the duration of the audit.</li> <li>g. No chlorine residual monitoring was being taken in the distribution network at present.</li> </ul>
<b>4.</b>	<p><b>Monitoring and Sampling Programme</b></p> <ul style="list-style-type: none"> <li>a. No raw water monitoring was available at the time of the audit.</li> <li>b. A check monitoring report for 19<sup>th</sup> January 2015 was submitted after the audit. All parameters were in compliance with Part 1of the Schedule of the Drinking Water Regulations, with the exception of Manganese detected at 61ug/l which is above the parametric value of 50ug/l outlined in Table C of the of Part 1 of the Schedule of the Regulations. The filter media in the Iron and Manganese filters was topped up in March 2015 in response to this exceedance.</li> <li>c.</li> </ul>
<b>5.</b>	<p><b>Exceedances of the Parametric Values</b></p> <ul style="list-style-type: none"> <li>a. The audit of the Clonuff public water supply was triggered by low chlorine residuals recorded in the treated water in 2013 and submitted to the EPA with the Drinking Water Returns in 2014. During the audit it was discussed that 2013 chlorine residual samples were collected from consumer taps and low chlorine residuals may be related to low usage at consumer taps. It was also outlined that all chlorine residual samples from 2014 and 2015 were above 0.1mg/l.</li> <li>b. Treated Water sample results for samples collected on 19<sup>th</sup> January 2015 and submitted after the audit found that Manganese was detected at a concentration of 61 µg/l. This is above the parametric value of 50µg/l outlined in Table C of Part 1 of the Schedule of the Drinking Water Regulations. The corrective action taken was to top up the media in the filters.</li> </ul>

### 3. AUDITORS COMMENTS

The Clonuff Public Water Supply was found to lack a robust disinfection system. While disinfection is in place it is not operating in accordance with the EPA disinfection manual. Sufficient effective contact time should be provided and chlorine residual monitoring in the network should commence as a priority. The security of the borehole itself could be improved by the addition of a borehole cap and through writing to the local landowners to inform them of the presence of a water supply in proximity to their lands.

### 4. RECOMMENDATIONS

#### Source Protection

1. Irish Water should ensure that the borehole is capped and sealed in order to prevent ingress. The manhole cover protecting the borehole should be secured with a lock.
2. Irish Water should write to the local landowners to inform them of the presence of a water supply borehole in proximity to their lands and to make them aware of their obligations under

the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)* to ensure, unless an alternative setback distance has been set as per Article 17 that:

- i. Organic fertiliser or soiled water is not applied to land within 200 m of the abstraction point; and
- ii. Farmyard manure held in a field prior to land spreading is not placed within 250 m of the abstraction point.

#### **Filtration (General)**

3. Irish Water should instigate an operational monitoring programme of raw and treated water to ensure the Iron and Manganese removal process is operating effectively and efficiently.

#### **Disinfection**

4. Irish Water should review the contact time for chlorine disinfection to ensure that the effective contact time achieved is 15mg.min/l and that the first connections are receiving appropriately disinfected drinking water.
5. Irish Water should install a duty and standby chlorine pump with automatic switch over in the event of the failure of one of the pumps.
6. Irish Water should ensure the disinfection system is suitably monitored and alarmed for low chlorine residuals in the treated water leaving the water treatment plant. The monitor and alarm should be linked to a SCADA network and the alarm should trigger a notification to relevant plant personnel.
7. Irish Water should ensure that residual chlorine levels at the end of the distribution network are sampled on a weekly basis and maintained at or above 0.1mg/l.

#### **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, 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:** 11<sup>th</sup> May 2015

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Inspector