



Drinking Water Audit Report

County:	Kilkenny	Date of Audit:	11/3/20115
Plant(s) visited:	Pilltown/Fiddown (1500PUB1013)	Date of issue of Audit Report:	26/03/2015
		File Reference:	DW2015/31
		Auditors:	Ms. Yvonne Doris Ms. Cliona Ní Eidhin Ms. Michelle Roche
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>. • The recommendations in any previous audit reports. 		

MAIN FINDINGS

- i. **Irish Water should consider installation of a turbidity monitor on the spring intake to alert the caretaker to any risk of *Cryptosporidium* in the catchment.**
- ii. **The reservoir on site should be made more secure by ensuring material cannot enter vents, scour valve points or access hatches.**

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 particular to audit the risk posed by *Cryptosporidium*. The supply has a *Cryptosporidium* risk assessment score of 142.

The Pilltown/Fiddown public water supply serves a population of 2,225 persons in County Kilkenny. A mixture of borehole water and spring water supplies 950m³/day. Treatment consists of pH correction, disinfection and fluoridation only.

Photographs taken by Cliona Ní Eidhin during the audit are attached to this report and are referred to in the text where relevant.

The opening meeting commenced at 12.45am at Pilltown/Fiddown 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:

Name – Job Title

Deirdre O'Loughlin, Southern Region Compliance Analyst, Irish Water.

Eamon Morrissey, Executive Chemist, Kilkenny County Council

Eamon Maher, Executive Engineer, Kilkenny County Council

P.J. Phelan, Supervisor, Water Services, Kilkenny County Council

Niall Dwyer, Caretaker, Kilkenny County Council

Representing the Environmental Protection Agency:

Name – Job Title

Yvonne Doris, Inspector;

Cliona Ní Eidhin, Inspector;

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.

1.	Source Protection <ul style="list-style-type: none">a. The source comprises three springs, about 0.5m deep, described as Templeorean Springs, which are augmented by a borehole on the site of the treatment plant, supplying 950m³/day.b. 420m³/day is collected in a chamber and piped to the treatment plant. The springs are in an area of scrubland/woodland that is difficult to access, approximately 0.75 miles from the treatment plant. The springs were not inspected as part of the audit. Recent photographs of the springs were viewed. The springs are cleaned out annually and inspected monthly. They are fenced to prevent animal access and some, but not all, of the spring chambers are locked. There is no grazing in the area immediately surrounding the springs but there is rough grazing and approximately 30 domestic wastewater treatment systems in Templeorean village upgradient of the springs.c. There is no zone of contribution (ZOC) to the springs delineated. A standard 200m inner buffer zone and 250m outer buffer zone is in place. The landowners in the ZOC have been notified under the Good Agricultural Practices Regulations. Vulnerability of the aquifer is unknown.d. The well on site was drilled in 2003 and is 68m deep with a pump at 48m depth. Depth of casing and details of grouting of the well is unknown and well drilling logs are unavailable from the driller. The wellhead is below ground level (the land around the wellhead was raised when the pH correction equipment was installed).e. There are high levels of CO₂ in the well. The pH of the groundwater is 5.5 which caused corrosion problems. Caustic soda was unsuccessful to adjust pH so a calcium carbonate plant was installed to adjust pH (see photograph 1). Borehole water is treated with CaCO₃. Backwashing of the CaCO₃ plant is done weekly, with chlorinated water. The backwash water is collected in an attenuation tank on site prior to being discharged to a drain which eventually meets the Pil river. The backwash water has not been tested for chlorine levels.f. The abstraction rate is 470m³/day, pumping 45m/hr for 10 - 11 hours per day. The pH of the borehole water is adjusted and then blended with spring water, prior to disinfection.
2.	Chlorination and Disinfection <ul style="list-style-type: none">a. 14/15% low bromate sodium hypochlorite is used for disinfection. A date of manufacture of 25/2/2015 was observed on the 25 litre drums. The caretaker fills the chlorine day tank every 4 or 5 days with about 25 litres of neat sodium hypochlorite, keeping the amount in the day tank to a minimum.b. Dosing is flow proportional and linked to the residual chlorine reading. Duty and standby dosing pumps with automatic switchover, if one should fail, are in place.c. The chlorine residual monitor takes a reading from the outlet of the reservoir and was reading 0.828mg/l at the time of the audit. The low chlorine alarm is 0.4mg/l. The chlorine monitor is serviced every 6 months.d. The alarm dials out to the caretaker, the standby caretaker and the supervisor (all get the alarm at the same time) and there is no escalation of alarms if there is no response to the initial alarm. Caretakers respond to alarms outside of normal working hours.e. Chlorine contact time is greater than 60 minutes.f. There is no booster chlorination in the network.g. The caretaker takes free chlorine readings in the network and they are typically 0.6 to 0.7mg/l.

	There is very little uptake of chlorine in the network. Chlorine residual records were inspected and all readings were above 0.1mg/l.
3.	<p>Treated Water Storage and Distribution Network</p> <ul style="list-style-type: none"> a. The reservoir was built in 1948 and has a capacity of 450m³, approximately 10 hours storage. It is an unbaffled twin celled reservoir. It was last cleaned in 2009 and a visual integrity test was done at that time. There is no obvious loss of water from the reservoir. b. The reservoir on site has scour valves that are unlocked and provide access to the reservoir. The reservoir vents are meshed but flat-topped and liquid could potentially be poured into the reservoir. c. There are two other reservoirs in the network at Templeorean and Ballynacronney. d. The distribution network consists mostly of PVC and asbestos pipes. e. Unidirectional flushing and scouring was undertaken throughout the network in 2009. Scouring is done at the ends of the line monthly.
4.	<p>Monitoring and Sampling Programme for treated water</p> <ul style="list-style-type: none"> a. Monitoring for the presence of <i>Cryptosporidium</i> has been done for the past 5 years and is done four times per year, 3 samples in spring and one in autumn. The sampling schedule does not seek to capture the period following heavy rainfall events. Samples taken in 2014 detected no <i>Cryptosporidium</i> oocysts and samples in previous years detected no <i>Cryptosporidium</i> oocysts. b. There is no turbidity monitor at the treatment plant.
8.	<p>Chemical storage and bunds</p> <ul style="list-style-type: none"> a. The caretaker supervises all chemical deliveries. b. The fill point for Fluorosilicic acid was unbunded and had no drip tray (see photograph 2)
9.	<p>Hygiene and Housekeeping</p> <ul style="list-style-type: none"> a. The plant was clean, tidy, secure and well maintained.
10.	<p>Management and Control</p> <ul style="list-style-type: none"> a. There are some complaints about hardness and a taste of chlorine in the water, but none recently.

3. AUDITORS COMMENTS

The Pilltown/Fiddown treatment plant is well operated. Irish Water should consider installation of a turbidity monitor on the spring intake to alert the caretaker to any risk of *Cryptosporidium* in the catchment. The reservoir on site should be made more secure by ensuring material cannot enter vents, scour valve points or access hatches.

4. RECOMMENDATIONS

Source Protection

1. Irish Water should ensure that all spring chambers are locked.
2. Irish Water should consider the installation of a turbidity monitor on the spring water intake to alert the caretaker to a risk from *Cryptosporidium* in the catchment.
3. Irish Water should schedule *Cryptosporidium* sampling to take place following heavy rainfall events.

Disinfection

4. Irish Water should review the current alarm response procedures, in particular to ensure that alarms are responded to if the caretaker is unable to respond (cascade system).

Treated Water Storage

5. Irish Water should ensure that all vents on the reservoirs are secured against ingress of animals or deliberate introduction of any contaminant or acts of vandalism and all scour valves and access hatches on the reservoirs are locked.

Chemical Storage and Bunds

6. Irish Water should review chemical storage arrangements at the treatment plant. 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

7. Irish Water should test the backwash water discharge from the attenuation tank for chlorine levels.

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: Yvonne Doris Date: 26/3/2015

Yvonne Doris

Inspector



Photograph 1: CaCO₃ plant adjacent to borehole on site.



Photograph 2: Fluorosilicic acid fill point (unbundled and no drip tray)