



Drinking Water Audit Report

County:	Roscommon	Date of Audit:	03/07/2014
Plant visited:	Castlerea Regional (Longford Springs)	Date of issue of Audit Report:	17/07/2014
		File Reference:	DW2008/382
		Auditors:	Ms Yvonne Doris
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>. • <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> • The recommendations specified in the EPA Report on <i>The Provision and Quality of Drinking Water in Ireland</i>. • The recommendations in any previous audit reports. 		

MAIN FINDINGS

- i. The Castlerea Regional public water supply is on the EPA's Remedial Action list of supplies since 2009 for inadequate treatment for *Cryptosporidium*. A UV disinfection system, installed in March 2012, does not operate within its validated range at all times and at such times the supply does not have an adequate barrier to prevent *Cryptosporidium* entering the drinking water supply. *Cryptosporidium* has been detected in the treated water on several occasions. A Boil Water Notice to consumers on the supply is in place since 4th July 2012.
- ii. On 10th June 2014, the EPA issued a direction to Irish Water to install a *Cryptosporidium* barrier on the supply by 30th June 2015

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. Where the text refers to the Water Service Authority this refers to Irish Water in accordance with Section 7 of the Water Services (No. 2) Act 2013.

The Castlerea Regional supply is an extremely vulnerable groundwater spring source. It serves 3,443 people around Castlerea town. Treatment comprises chlorination, UV and fluoridation. A UV disinfection system was installed in March 2012. However, at times it does not operate within its validated range as there is no pre-filtration to reduce turbidity, and at such times the supply does not have an adequate barrier in place to prevent *Cryptosporidium* entering the drinking water supply, if it is present in the raw water. *Cryptosporidium* has been detected in the treated water on several occasions. The Castlerea Regional supply is on the EPA's Remedial Action List since 2009 because of inadequate treatment for *Cryptosporidium*. A Boil Water Notice to consumers of the supply is in place since 4th July 2012. On 10th June 2014, the EPA issued a direction to Irish Water to install a *Cryptosporidium* barrier on the supply by 30th June 2015.

Photographs taken by Yvonne Doris during the audit are attached to this report and are referred to in the text where relevant. The opening meeting commenced at 16.20 at Longford Spring. 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: (* indicates that person was also present for the closing meeting)

Name – Job Title

Sean Higgins, Water Engineer, Irish Water*

Vincent Walsh, Senior Executive Engineer, Roscommon County Council*

Gerry Healy, caretaker, Roscommon County Council*

Representing the Environmental Protection Agency:

Name – Job Title

Yvonne Doris, 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>1.</p>	<p>Source Protection</p> <ul style="list-style-type: none">a. The source is Longford Springs (photograph 1). The <i>Cryptosporidium</i> risk assessment score is 150 (very high risk). Longford springs overflows to the river Francis. The abstraction chamber contains two abstraction pipes (photograph 2). The water table fluctuates by about a metre. The water table was 1.2 m below ground level at the time of the audit but can be as high as 0.5m below ground level.b. The GSI report <i>Castlerea Water Supply Scheme Longford Spring and Silver Island Spring, Groundwater Source Protection Zones</i> (GSI, 2003) delineated the source protection zone for the Longford Spring as extremely vulnerable due to significant karstification. The zone of contribution (ZOC) comprises five springs including the Longford Spring. Groundwater within any part of the ZOC could reach the spring within 100 days and the entire ZOC should be classified as the Inner Protection Area. The report found total and faecal coliforms in the raw water samples and suggested that a source of contamination is likely to be organic waste, possibly farmyard wastes. The GSI recommended that, all potential hazards in the ZOC should be adequately assessed.c. The new borehole at Longford springs (photograph 3) produces 1,000m³/day. Further capping and wellhead protection work will be completed by Roscommon County Council. Demand in the Castlerea Regional supply is 1,300 m³/day.
<p>2.</p>	<p>Chlorination and Disinfection</p> <ul style="list-style-type: none">a. The primary disinfectant is sodium hypochlorite (14%) dosed neat at 1.2mg/l at a fixed rate (pumping is constant) and manually adjusted based on chlorine residuals in the network (typically 0.4-0.5mg/l). Chlorine residual readings are taken at the plant and in the network daily but the network readings are not recorded in the plant diary.b. Duty and standby chlorine dosing pumps are in place but there is no automatic switchover between the duty and standby pump. The chlorine monitor is alarmed (low is 0.5mg/l and high is unknown) and dials out to the caretakers. Chlorine contact time is >1 day but the effective chlorine contact time has not been calculated. The chlorine residual at the Mullaghadooey reservoir was 1.27mg/l at the time of the audit.c. A UV system was installed in March 2012 at the Longford springs pumphouse. A duty and standby UV lamp with automatic switchover is operating. The UV system is validated to operate above 80%. The UVT is almost always >80% and has been since November 2012. The UVT reading at the time of the audit was 87.3%. UVT readings are recorded in the pumphouse but are not relayed to Roscommon County Council offices.d. It is planned to retain the UV unit and install pre-treatment (DAF, Ozone or pressure filters) to remove organic matter.

3.	<p>Treated Water Storage and Distribution Network</p> <ul style="list-style-type: none"> a. Security at the Mullaghadooey reservoir was good. The reservoir was built in the 1980s. It was inspected and integrity tested in 2013. It has not been cleaned. The access hatches were locked but the mesh covers on the vents were not secure. b. Flushing and scouring of the network is done every 4- 6 weeks but this is not done in a uni-directional fashion. There are insufficient hydrants and scour valves to flush and scour the entire network and there are sections of the network that have never been adequately scoured and flushed.
4.	<p>Chemical storage and bunds</p> <ul style="list-style-type: none"> a. A drum of sodium hypochlorite was stored unbunded at the Mullaghadooey reservoir.
5.	<p>Management and Control</p> <ul style="list-style-type: none"> a. The boil water notice cannot be lifted until either a temporary treatment system (DAF or Ozone) or a long term treatment solution (pressure filters) is in place at Longford springs which could take a further two years, and subject to HSE decision. b. Manual records are kept by the caretaker in the plant diary

3. AUDITORS COMMENTS

Irish Water should install an appropriate barrier to *Cryptosporidium* on the Castlerea Regional supply to prevent the entry of *Cryptosporidium* if it is present in the raw water so as to secure compliance with the drinking water standards and improve the security of the supply

4. RECOMMENDATIONS

Source Protection

1. The Water Services Authority should characterise the variability in raw water quality and compile a source water safety plan in order to mitigate any risks to the abstracted water (http://whqlibdoc.who.int/publications/2009/9789241562638_eng_print.pdf). Trends in raw water quality should be analysed and used to determine the optimum treatment conditions for the water at the plant. Data should be used to identify whether rapid variations in raw water quality give rise to problems with the treatment process.
2. The Water Services Authority should have regard to the information and recommendations of the GSI report Castlerea Water Supply Scheme Longford Spring and Silver Island Spring, Groundwater Source Protection Zones (GSI, 2003).
3. The Water Services Authority 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. The Water Services Authority 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.
4. The Water Services Authority should ensure that the borehole at Longford Spring is suitably capped and that the linings and seals are maintained.

Disinfection

5. The Water Services Authority 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. The Water Services Authority should submit a calculation of the effective contact time to the Agency.
6. The Water Services Authority should ensure there is automatic switchover between the duty and

standby chlorine pump in the event of the failure of one of the pumps.

7. The Water Services Authority should arrange for the recording of residual chlorine readings in the network and for these to be available for both management of the treatment process and inspection.
8. The Water Services Authority should ensure that the UV disinfection system operates within its validated range at all times.

Treated Water Storage

9. The Water Services Authority should ensure that the service reservoir is cleaned out on a regular basis and any maintenance and repairs completed as soon as possible after the need has been identified.
10. The Water Services Authority should ensure that all vents on the reservoirs are secured against ingress of animals or deliberate introduction of any contaminant or acts of vandalism.

Distribution System

11. The Water Services Authority should ensure adequate hydrants and scour valves are in place to carry out a regular programme of uni-directional flushing and scouring of the mains.

Chemical Storage and Bunds

12. The Water Services Authority 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

13. The Water Services Authority should install a barrier to prevent *Cryptosporidium* entering the supply if it is present in the raw water.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

During the audit the Water Services Authority representatives were advised of the audit findings and that action must be taken as a priority by the Water Services Authority to address the issues raised. This report has been reviewed and approved by Mr Nigel Hayes, Drinking Water Inspector.

The Water Services Authority 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:

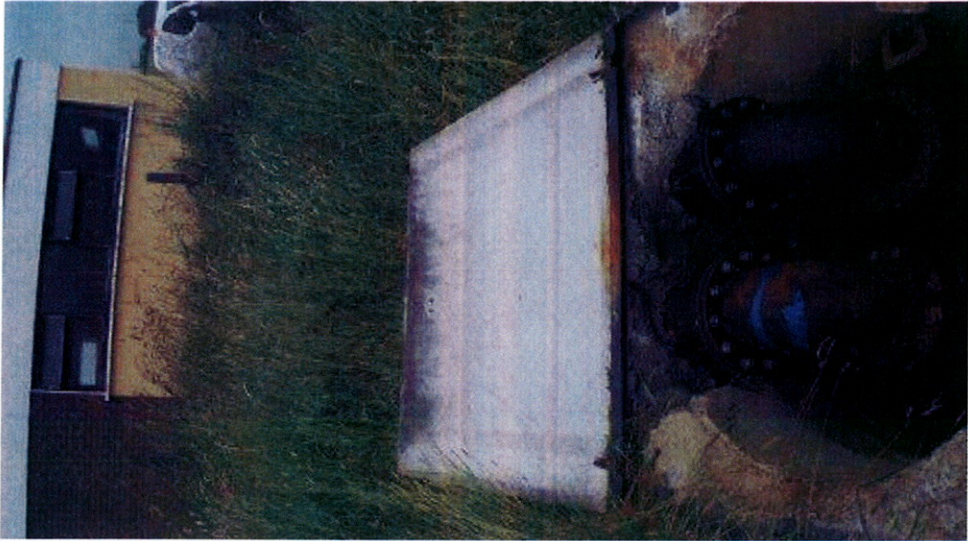
Yvonne Doris
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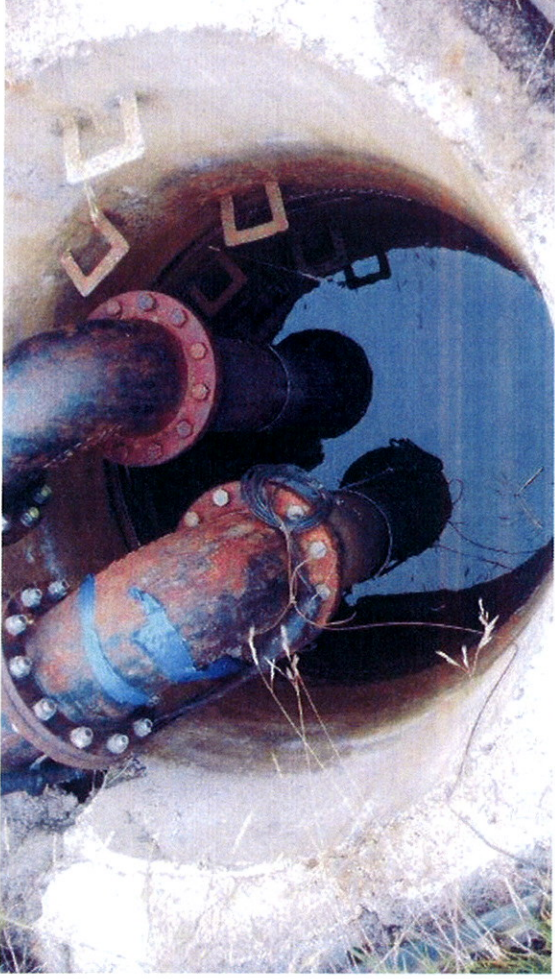
17th July 2014

Inspector

***2003, Geological Survey of Ireland (GSI) “Castlerea Water Supply Scheme, Longford Spring and Silver Island Spring, Groundwater Source Protection Zones”.**



Photograph 1: Longford springs abstraction and pumphouse



Photograph 2: Water table in abstraction chamber



Photograph 3: New borehole at Longford Springs

