# Site Visit Report

Under the European Union (Drinking Water) Regulations 2014 as amended, 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 water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

## Water Supply Zone

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| **Name of Installation** | Clonmel Poulavanogue |
| **Organisation** | Irish Water |
| **Scheme Code** | 2900PUB0109 |
| **County** | Tipperary |
| **Site Visit Reference No.** | SV18293 |

## Report Detail

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| **Issue Date** | 26/09/2019 |
| **Prepared By** | Criona Doyle |

## Site Visit Detail

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| **Date Of Inspection** | 02/09/2019 | **Announced** | Yes |
| **Time In** | 10:34 | **Time Out** | 12:37 |
| **EPA Inspector(s)** | Criona Doyle | | |
| **Additional Visitors** | HSE: Eamon Moore; Kay O'Connor | | |
| **Company Personnel** | Irish Water: Colin Cunningham; Patrick Duggan; Catherine Rice; Duane O'Brien.<br>Tipperary County Council: John Fogarty; Eoin Lawlor; James Whelan. | | |

## Summary of Key Findings

The audit identified that (1) the current treatment process does not provide an adequate barrier against *Cryptosporidium* and (2) remedial measures are required to address the inadequate contact time affecting 36 properties (90 population) served by the water supply.

Both of these issues are to be resolved by the replacement of the existing surface water sources with a new groundwater source with UV disinfection. The date for the completion of these remedial works is December 2020.

Irish Water should continue to progress the remedial works without delay and provide quarterly updates to the Agency on progress until the works have been completed. Groundwater investigations are currently taking place and the outcome of the investigations will be available at the end of Quarter 4 2019.

## Introduction

The Clonmel Poulavanogue Public Water Supply (PWS) serves a population of 2,566 in the older part of Clonmel Town. The sources are 3 streams in the Comeragh Mountains. Treatment is slow sand filtration followed by chlorination and fluoridation. The audit was carried out in response to the detection of *Cryptosporidium* (15/05/19; 14/08/19; 15/08/19; 20/08/19; 22/08/19 & 27/08/19) and the notification of elevated turbidity (09/08/19) in the final treated water. The supply was previously audited by the EPA on 10/11/2010. The supply has been on the EPA Remedial Action List (RAL) for inadequate treatment for *Cryptosporidium* since 2008.

## Supply Zones Areas Inspected

The treatment plant facilities were examined as part of the audit.

## 1. Incident Management

| | | Answer |
|---|---|---|
| 1.1 | Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health? | Yes |

**Comment**

The turbidity of the raw water is influenced by rainfall events on the catchment. This results in elevated turbidity in the raw water which can lead to blinding of the slow sand filters. A procedure is in place "Protocol for dealing with turbidity alarms associated with drinking water supply". There is no auto shut off of the raw water intake linked to the turbidity alarm.

During the extreme weather event on night of 08/08/19 and early morning of 09/08/19 the treated water turbidity in the network exceeded 1 NTU due to extremely heavy rainfall. The daily log at the plant indicated the final water turbidity was 1.77 NTU. Filter No. 4 was out of service at the time of the incident as it was being matured following resanding operations. The Clonmel Poulavanogue supply was shut off at 06:30 hours on 09/08/19. Water was supplied from the Glenary supply while the Clonmel Poulavanogue supply was shut off.

The high turbidity incident resulted in the blinding of all of the slow sand filters. The slow sand filters were taken offline and skimmed. The water supply remained off until the 12/08/19. The slow sand filters were brought back on line at a turbidity of 0.5 NTU.

The network was scoured on 13/08/19. Once water was reintroduced into the network water quality testing included bacteriological (Coliform bacteria, E. coli), chlorine (free / total), turbidity and *Cryptosporidium* monitoring.

Works are underway to install an auto shutdown of the supply linked to the high turbidity alarm level on the raw water. The anticipated date for completion of the auto shutdown was not available at the time of the audit.

The existing treatment does not provide an adequate barrier against *Cryptosporidium*. Irish Water could not confirm the log deficit of the supply as per the Irish Water Protozoal Compliance Requirements. It is proposed that the replacement of the existing surface water supply with a groundwater source and UV disinfection will provide an adequate barrier against *Cryptosporidium*.

## 2. Filtration

| | | Answer |
|---|---|---|
| 2.1 | Are the filters designed and managed in accordance with EPA guidance? | No |

**Comment**

There are online turbidity monitors on each of the 5 no. slow sand filters and on the combined filtered water. The final turbidity alarm level is 0.62 NTU. There is no facility to review the turbidity trends on site. The trends are regularly reviewed by the process control technicians in County Buildings. Subsequent to the audit on 09/09/19 Irish Water submitted the turbidity trend data for filters 1 to 5 and the combined final filtered water turbidity for the month prior to the audit. The raw water turbidity data was not submitted.

On the day of the audit the turbidity was < 0.2 NTU for all filters in service. The criteria for bringing the slow sand filters back online after the recent incident was a turbidity of 0.5 NTU.

The plant records indicate that regular maintenance is being carried out on the slow sand filters. The records for 2019 indicate each filter is skimmed on a 3 week frequency in rotation. Head loss also triggers skimming.

The filtration rate for the slow filters was not documented on site. Subsequent to the audit on 09/09/19 Irish Water confirmed that the filtration rate varies depending on the flow rate and which filters are in production but is not more than 0.25m3/m2/hr.

It is proposed to install an auto shutoff of the raw water intake linked to the raw water turbidity monitor and the works are currently at the design stage. The expected date for completion of the works is expected to be of the order of two months but an exact date could not be confirmed at the audit.

## 3. Disinfection

| | | Answer |
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| 3.1 | Is the disinfection system verified using monitors and alarms, with trended data recorded and accessible? | No |

**Comment**

Irish Water could not confirm the high and low level chlorine alarm set points and time delay at the audit. This information was subsequently provided to the EPA on 09/09/19 and indicated a high level alarm at 3 mg/l and a low level alarm at 0.81 mg/l with a 15 minute delay. There is no auto shutdown of the supply linked to the chlorine alarm. There is no contact tank or reservoir on this supply and so there is potential for inadequately disinfected water to be discharged to the network.

On the date of the audit the CL 17 was reading 1.49mg/l. The target level is 1.4 mg/l.

| | | Answer |
|---|---|---|
| 3.2 | Is the residual chlorine monitored at a suitable sample location after contact time has been completed? | No |

**Comment**

There is no contact tank or reservoir in the supply. The CL17 is monitoring the residual chlorine level prior to contact time being achieved.

| | | Answer |
|---|---|---|
| 3.3 | Does the trend in chlorine residual at the treatment plant indicate adequate and stable levels of disinfection? | No |

**Comment**

The trend data was not reviewed during the audit as the data was not available to view on site. All alarms are reviewed daily centrally in County Buildings.

| | | Answer |
|---|---|---|
| 3.4 | Is there adequate chlorine contact time before the first connection? | No |

**Comment**

Inadequate contact time was identified in this supply in October 2018 for a portion of the supply. A dual advisory notice has been in place for 36 houses (population 90) since 12/10/18. The notices were delivered to the affected households.

The inadequate contact time will be addressed through the replacement of the existing surface water source with a groundwater source with UV disinfection which will remove the need for contact time.

A trial borehole has been completed at the WTP site in August 2019 but the borehole can only provide 12m3/hour which is insufficient to replace the existing surface water source. A copy of the borehole log was provided subsequent to the audit on 09/09/19. Further groundwater investigations are to take place in the Clonmel area and the results are expected to be available in Q4 2019 to determine if the surface water source can be replaced.

## 4. Treatment Process Chemicals

| | | Answer |
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| 4.1 | Are treatment process chemicals appropriately managed and stored? | No |

**Comment**

There is no regular switch over between the duty and standby fluoride dosing pump to ensure the standby pump is correctly working.

## 5. Management and Control

| | | Answer |
|---|---|---|
| 5.1 | Are suitable alarm settings in place to alert operators to deteriorating water quality and/or the failure of a critical treatment process? | No |

**Comment**

The raw water quality responds rapidly to rainfall events in the catchment which results in elevated turbidity in the raw water. The final water turbidity alarm is set at 0.62 NTU. This does not provide an adequate warning to prevent against blinding of the filters as seen in the recent incident on 09/08/19. An automatic shut down of the raw water intake linked to the turbidity alarm would provide additional protection to the supply from high turbidity events in the catchment.

## Recommendations

| Subject | Clonmel Poulavanogue Audit Recommendations | Due Date | 26/10/2019 |
|---|---|---|---|
| **Action Text** | ***Recommendation(s)***<br><br>1. Irish Water should continue to update the EPA on a quarterly basis on progress with the groundwater investigations to address the inadequate treatment for *Cryptosporidium* and the inadequate contact time on a portion of the supply.<br>2. Irish Water should confirm the log deficit for the current treatment process as per the Irish Water Protozoal Compliance Requirements.<br>3. Irish Water should provide a print out from the PAC system for the raw water turbidity data for the month prior to the audit.<br>4. Irish Water should undertake a review of the turbidity alarm settings to ensure the levels of turbidity in the filtered water are as low as possible and no greater than 0.5 NTU.<br>5. Irish Water should progress with the installation of the automatic shut off linked to turbidity alarm level on the raw water intake and confirm the proposed completion date. Irish Water should confirm the turbidity shut off level and time delay for shut down of the raw water intake.<br>6. Irish Water should provide a print out of the online residual chlorine levels from the water treatment plant for the last month.<br>7. Irish Water should examine the feasibility of installing automatic shut off of the supply linked to the chlorine alarm.<br>8. Irish Water should undertake a review of the operation of the fluoride dosing pumps to ensure they are switched over on a regular basis.<br>9. Irish Water should keep the EPA informed of any changes in relation to the HSE advice.<br><br>**Follow-Up Actions required by Irish Water**<br><br>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.<br><br>This report has been reviewed and approved by Regina Campbell, Drinking Water Team Leader.<br><br>Irish Water should submit a report to the Agency on or before 26/10/2019 detailing how it has dealt with the issues of concern identified during this audit.<br><br>The report should include details on the action taken and planned to address the various recommendations, including time frame for commencement and completion of any planned work.<br><br>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.<br><br>Please quote the Action Reference Number DW2009/300 in any future correspondence in relation to this Report. | | |