

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 | |
|---------------------------------|-----------------------------|
| Name of Installation | Roscrea RWSS (Zone 1 - Mix) |
| Organisation | Irish Water |
| Scheme Code | 2800PUB1009 |
| County | Tipperary |
| Site Visit Reference No. | SV26089 |

| Report Detail | |
|--------------------|--------------|
| Issue Date | 22/11/2022 |
| Prepared By | Criona Doyle |

| Site Visit Detail | | | |
|----------------------------|---|------------------|-------|
| Date Of Inspection | 25/10/2022 | Announced | Yes |
| Time In | 10:30 | Time Out | 13:45 |
| EPA Inspector(s) | Criona Doyle Michelle Roche | | |
| Additional Visitors | | | |
| Company Personnel | Irish Water: Pat Duggan; Colin Cunningham; Samantha Keane. Tipperary County Council (acting under service level agreement to Irish Water): Shane Boland; Aidan Delaney and Thomas Delaney. | | |

> Summary of Key Findings

(1) The Roscrea Regional Public Water Supply is served by 2 no. water treatment plants (WTPs) at Fanure and Glenbeha. The audit found that there is no treatment barrier in place at the Glenbeha WTP (spring sources) to prevent *Cryptosporidium* entering the supply and that there is no treatment barrier for *Cryptosporidium* in the spring supplementary source at Fanure WTP.

(2) Regular monitoring for *Cryptosporidium* should continue on the final water from Glenbeha WTP and on the treated spring water at Fanure WTP until the *Cryptosporidium* risk is addressed. The Roscrea Regional Public Water Supply (PWS) will be considered for addition to the EPA Remedial Action List in 2023 under the category inadequate treatment for *Cryptosporidium*.

> Introduction

The Roscrea Regional Public Water Supply serves a population of 6,303 and supplies on average 3,200m³/d of water to Roscrea town and the surrounding area. The supply is served by 2 no. water treatment plants at Fanure and Glenbeha. The volume being produced from each plant varies across the year with the yield of the Glenbeha springs dropping as low as 200-300 m³/d in the summer. On the day of the audit 1,268m³/d of treated water was being produced at Fanure WTP.

Treatment at the Fanure WTP includes coagulation, flocculation, clarification, filtration, chlorination and fluoridation of the raw water from the Little Brosna River. A spring source at Fanure WTP provides an additional 25m³/hr which only undergoes chlorination and fluoridation.

Raw water from the 2 no. spring sources at Glenbeha WTP undergoes chlorination and fluoridation.

This audit was undertaken to assess the operation and management of the Roscrea Regional PWS following the detection of *Cryptosporidium* on 4 dates (Fanure WTP 04/03/22 and Glenbeha WTP on 13/07/21, 29/09/22 and 05/10/22) and the elevated turbidity in the final water from Glenbeha WTP on 16/10/22.

> Supply Zones Areas Inspected

The auditors examined the treatment processes at Fanure WTP and Glenbeha WTP. The treated water reservoirs were not visited.



1. Incident Management

1.1

| | Answer |
|--|--------|
| Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health? | Yes |
| Comment | |
| <p>On Sunday 16/10/22 the raw water turbidity increased to above 1 NTU for 1 hour from 20:00 to 21:00 hours at the Glenbeha WTP and reached a maximum turbidity of 1.5 NTU in response to prolonged heavy rainfall on 16/10/22 and 16/10/22. There was no automatic plant shutdown linked to the raw water turbidity alarm setpoint of 0.50 NTU (300 seconds time delay) at the time of the incident or treated water turbidity setpoint of 0.30 NTU (300 seconds time delay). On the day of the audit the raw water turbidity alarm setpoint was 0.80 NTU.</p> <p>The incident was responded to outside of normal working hours. Site operational staff responded to the alarm at 21:38 hours and undertook the following actions:</p> <ul style="list-style-type: none"> (i) Closed the raw water inlet valve; (ii) Closed the Glenbeha New Reservoir outlet valve; (iii) Treated water was run to scour; (iv) Opened the High Level Reservoir to feed the network. <p>The reservoir inlet valve remained closed overnight on the 16 to 17/10/22 therefore no chlorine dosed water entered the reservoir and in response the chlorine level in the reservoir dropped overnight. However, this water was run to waste and was not discharged to the network.</p> <p>Irish Water notified the Agency on 17/10/22 of the turbidity exceedance at the Glenbeha WTP. Tipperary County Council undertook sampling at the WTP and in the reservoir on 18/10/22. The final water samples from 17/10/22 to 18/10/22 indicated no <i>Cryptosporidium</i> or <i>Giardia</i> detections. Water from the Glenbeha WTP was brought back into the Glenbeha New Reservoir on Tuesday 18/10/22 and back into the network on Wednesday 19/10/22.</p> <p>In response to the incident it is proposed to install automatic plant shutdown at the Glenbeha WTP linked to the turbidity and chlorine alarm setpoints.</p> | |



2. Coagulation Flocculation and Clarification (CFC) Stage

| | | Answer |
|---|---|--------|
| 2.1 | Are the CFC processes appropriately controlled? | No |
| Comment | | |
| <p>Manual coagulant dosing (aluminium sulphate) is undertaken at the Fanure WTP. Polyelectrolyte (0.1%) is used as a coagulant aid. On the day of the audit the aluminium sulphate dose rate was reported to be 250mg/l.</p> <p>There is no pH correction prior to the coagulation stage. There are pH alarm setpoints at 6.0 pH units (low) and 7.1 pH units (high) at the coagulant contact tank.</p> <p>Jar testing is not carried out on a regular basis.</p> <p>Tipperary County Council stated there is an issue with sludge bleeds in Settlement Tank No. 3 which needs to be fixed.</p> | | |

| | | Answer |
|--|--|--------|
| 2.2 | Were the CFC tanks, channels and weirs observed to be clean, level and well maintained during the audit? | No |
| Comment | | |
| <p>The settlement tanks were last deep cleaned in February and March 2022 and a build up of material was observed on the walls of the tanks. The channels were observed to be clean however some leaves were observed collecting on the V notch weirs.</p> | | |



3. Filtration

| | | Answer |
|---|---|--------|
| 3.1 | Are the filters designed and managed in accordance with EPA guidance? | No |
| Comment | | |
| <p>(1) The filter media in the 3 no. rapid gravity filters is 10 years old. The filter media depth is reported to be 600mm to 700mm. This is less than the 1m minimum depth of sand recommended in the <i>EPA Water Treatment Manual: Filtration</i>.</p> <p>(2) There are no marker posts in the filters to assist with monitoring of the depth of the filter media.</p> | | |



4. Disinfection

| | | Answer |
|---|--------------------------------------|--------|
| 4.1 | Is the chlorine dosed appropriately? | No |
| Comment | | |
| <p>Fanure WTP: Duty and standby chlorine dosing pumps are provided with automatic switchover between the duty and standby pumps in the event of failure of the duty pump. The chlorine dose rate is adjusted manually to achieve a chlorine residual target level of 0.7 to 0.8 mg/l at Parkmore (Roscrea) Reservoir. The dosing arrangements do not meet the minimum criteria as set out in <i>EPA Drinking Water Advice Note No. 3: E. Coli in Drinking Water</i>.</p> <p>Glenbeha WTP: Duty and standby chlorine dosing pumps are provided with automatic switchover between the duty and standby pumps in the event of failure of the duty pump. The chlorine dose rate is normally operated on a flow proportional basis with a boost function. During periods of low flow in the spring sources, as was the case on the day of the audit, dosing is at a fixed rate.</p> <p>Irish Water outlined that an upgrade of the disinfection stage of the Roscrea PWS is scheduled to take place in 2023. The installation of UV treatment at the spring sources at the Glenbeha WTP and Fanure WTP is also being examined.</p> | | |

| | | Answer |
|---|---|--------|
| 4.2 | Is there a suitable monitoring frequency for residual chlorine in the network with records available? | No |
| Comment | | |
| <p>The results of residual chlorine monitoring indicate regular (daily) monitoring at Parkmore, Town and Corville however these locations are not located at the network extremities. The records inspected indicated the residual chlorine levels were satisfactory.</p> | | |



5. Management and Control

| | | Answer |
|--|---|--------|
| 5.1 | Is the water treatment plant resilient enough to cope with significant variations in raw water quality or demand? | No |
| Comment | | |
| <p>There is no automatic shutdown linked to the raw water high turbidity alarm (30 NTU) on the Little Brosna River at the Fanure WTP. Irish Water is investigating the installation of automatic shutdown linked to the raw water turbidity alarm set point at Fanure WTP. An assessment of the current PLC system at the Fanure WTP is required to determine if this is feasible. In the absence of this automatic shutdown manual intervention is undertaken by operational staff in response to the turbidity alarm.</p> <p>There is no automatic shutdown linked to the raw water high turbidity alarm on the springs at the Glenbeha WTP (0.80 NTU). Irish Water is investigating the installation of automatic shutdown linked to the turbidity alarm set point at Glenbeha WTP.</p> | | |

| | | Answer |
|--|---|--------|
| 5.2 | Has the protozoal compliance log treatment requirement been identified for the water treatment plant? | No |
| Comment | | |
| <p>At present both the Fanure WTP and Glenbeha WTP are classed as having a protozoal log treatment requirement of Log 3 removal. A sanitary survey has not been completed to date to finalise the score and the alarm and inhibit review has not been completed. Irish Water propose to undertake monthly monitoring in accordance with the <i>Irish Water Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies</i>.</p> <p>Irish Water outlined that the installation of UV treatment on the spring sources at Fanure and Glenbeha is currently being assessed as part of the upgrade works planned under the new "Water Treatment Programme" which is a regional programme that includes planned upgrade works at a number of WTPs in Co. Tipperary.</p> | | |

| | | Answer |
|---|---|--------|
| 5.3 | Is there a documented alarm response procedure? | No |
| Comment | | |
| <p>There is no documented alarm response procedure at the Fanure WTP or Glenbeha WTP.</p> | | |

| | | Answer |
|----------------|--|--------|
| 5.4 | Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network? | No |
| Comment | | |

There is no automatic plant shutdown at Fanure WTP linked to the final water turbidity (combined filters). There is automatic plant shutdown at Fanure WTP linked to the turbidity alarm (0.3 NTU) on each of the individual filters. At Fanure WTP (Roscrea reservoir) there are high (1.10mg/l) and low (0.70 mg/l) chlorine alarm setpoints. There is no automatic shutdown linked to the residual chlorine alarms at Roscrea Reservoir to prevent inadequately treated water entering the distribution network. Irish Water outlined at the audit that it is proposed to install automatic plant shutdown linked to the final water turbidity (combined filters) and chlorine alarm setpoints at Fanure WTP.

At Glenbeha WTP there are turbidity alarm setpoints for raw water (0.80 NTU) and treated water (0.30 NTU reservoir outlet) but there is no automatic plant shutdown linked to the turbidity alarm set points. At Glenbeha WTP there are low (0.90 mg/l) and high (1.60 mg/l) chlorine alarm setpoints in chlorine residual sump. There are also low (0.65 mg/l) and high (1.2 mg/l) chlorine alarm setpoints at the reservoir outlet. There is no automatic shutdown linked to the final water turbidity and chlorine alarm setpoints at Glenbeha WTP to prevent inadequately treated water entering the distribution network.



6. Fluoridation

| | | Answer |
|---|---|--------|
| 6.1 | Is the fluoridation dosing system appropriately controlled? | No |
| Comment | | |
| <p>There are issues with the operation of the flow proportional fluoride dosing system at Glenbeha WTP when the volume of water being produced at the springs drops during the summer months. Irish Water confirmed that the HSE had been notified on 25/08/22 that fluoride dosing has ceased at Glenbeha due to the difficulty in dosing at the very low flow rates. The delivery of anti syphon valves is required prior to the fluoride dosing system being switched back on.</p> <p>No issues were identified with the fluoridation treatment stage at Fanure WTP.</p> | | |

Recommendations

| | | | |
|--------------------|--|-----------------|------------|
| Subject | Roscrea Regional PWS - Audit 25 10 22 | Due Date | 22/12/2022 |
| Action Text | <p>Recommendations</p> <p>Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address these issues Irish Water should implement the following recommendations without delay.</p> <ol style="list-style-type: none"> 1. Irish Water should (i) confirm the protozoal log treatment requirement deficit for the Fanure and Glenbeha WTPs (ii) confirm how the log treatment deficit will be addressed at both WTPs (iii) ensure <i>Cryptosporidium</i> monitoring is undertaken at both WTPs as per the <i>Irish Water Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Supplies</i> until the protozoal log treatment deficit is addressed. 2. Irish Water should provide details and estimated timeframes for completion of (i) the planned disinfection upgrade works and (ii) additional works planned under the Water Treatment Programme. 3. Irish Water should install the automatic plant shutdown linked to the turbidity and chlorine alarms at Glenbeha WTP and Fanure WTP. 4. Irish Water should ensure that there is documented alarm response procedure in place at both WTPs and that training of staff on the procedure has been undertaken. 5. Irish Water should ensure that (i) settlement tanks at Fanure WTP are cleaned and (ii) the issue with the sludge bleeds at Fanure WTP is addressed. 6. Irish Water should undertake (i) an assessment of the depth and condition of the filter media and undertake any upgrade works required (ii) install filter media depth marker posts at Fanure WTP. 7. Irish Water should ensure monitoring of the residual chlorine is undertaken at the network extremities several times per week. 8. Irish Water should ensure regular jar testing is undertaken at Fanure WTP. 9. Irish Water should complete the remedial works on the fluoride treatment stage at Glenbeha WTP. <p>Follow-Up Actions required by Irish Water</p> <p>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.</p> <p>This report has been reviewed and approved by Regina Campbell, Drinking Water Team Leader.</p> <p>Irish Water should submit a report to the Agency on or before 22/12/22 detailing how it has dealt with the issues of concern identified during this audit.</p> <p>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.</p> <p>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.</p> <p>Please quote Compliance Plan DW20210098 in any future correspondence in relation to this Report.</p> | | |