



Drinking Water Audit Report

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| County: | Cork County | Date of Audit: | 14/02/2019 |
| Plant(s) visited: | Glengarriff (Scheme Code 0500PUB4208) | Date of issue of Audit Report: | 11/03/2019 |
| | | File Reference: | DW2018/111 |
| | | Auditors: | Ms Criona Doyle |
| Audit Criteria: | <ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) as amended.</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 <i>EPA Drinking Water Report.</i> • EPA Drinking Water Advice Notes No.s 1 to 15. • The recommendations in any previous audit reports. | | |

MAIN FINDINGS

- i. **Irish Water should continue to investigate the cause of the presence of *Cryptosporidium* and *Giardia* in the final treated water at the Glengarriff WTP.**
- ii. **Irish Water should ensure continuous turbidity monitors are installed on the filtered water at each individual slow sand filter.**

1. INTRODUCTION

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 drinking water following the detection of *Cryptosporidium* (23/01/19) and *Giardia* (15/01/19) in the Glengarriff Public Water Supply in January 2019.

The Glengarriff Public Water Supply (PWS) supplies a population of 443 with an average daily volume of 364m³/d. The source of the supply is the Barony River. Treatment includes slow sand filtration and chlorination. The Glengarriff PWS is on the EPA's Remedial Action List for public water supplies (RAL) as a result of persistent trihalomethane failures.

The opening meeting commenced at 10.35am at the Glengarriff 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 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:

Tommy Roche, Compliance Analyst

Representing Cork County Council:

Michael Russell, Acting Senior Executive Engineer.

Pauline McAree, Executive Engineer.

Con O’Sullivan, Water Curator

Representing the Environmental Protection Agency:

Criona Doyle, 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.

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| 1. | Source Protection a. There is a turbidity shut off (15 minutes delay) on the raw water intake when the turbidity exceeds 3 NTU. b. The raw water turbidity at the audit was 0.145 NTU. c. The <i>Cryptosporidium</i> risk score for the supply is 73 (moderate risk). The risk score, population and volume for 2019 have been updated by Irish Water on EDEN since the audit. d. Landuse on the catchment includes low intensity agriculture with rough grazing and forestry. Sheep were visible on the higher ground and low numbers of cattle are reported in the catchment. There is a low density of one off housing in the area. e. In 2010 Cork County Council wrote to all landowners with lands in the buffer zones to remind them of their obligations under the GAP regulations. f. In 2017 Cork County Council Environment Section wrote to all landowners with lands in the safeguard zone following a detection of pesticides (MCPA) and undertook an inspection. No pesticide use was identified within the safeguard zones but there was evidence of pesticides being applied to land approximately 750m north of the abstraction. |
| 2. | Filtration a. There are 4 no. slow sand filters on site. On the day of the audit filter no. 2 was not operational and was being discharged to waste. b. The filters were resanded in 2016. The maximum depth of the sand layer is restricted to 700mm by the level of the bellmouth. The depth of sand is currently 600mm. c. The filters are regularly skimmed and records since 2016 indicated skimming takes place up to 5 times a year. Microbiological testing is carried out to confirm maturation of the filter before the filters are brought back on line and the results recorded on the Record Sheet for Ripening Process for Slow Sand Filters. d. Continuous monitoring of turbidity is undertaken on the raw water and the combined final filtered water. There are no turbidity monitors on the individual filters. e. On the day of the audit the combined filtered water turbidity was 0.117 NTU. Six months of turbidity trend data (August 2018 – January 2019) for the raw and final treated water was reviewed on site. The turbidity of the final treated water is consistently < 0.2 NTU. f. On the day of the audit the procedure for cleaning of the slow sand filters was not available on site. Following the audit a copy of the procedures was forwarded on 19/02/2019. |

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| 3. | <p>Disinfection</p> <ul style="list-style-type: none"> a. The water is disinfected using 10 -11% ultra-low bromate sodium hypochlorite. b. Duty and assist chlorine dosing pumps are in place with automatic switchover. Chlorine dosing is flow proportional and linked to the residual chlorine monitor in the reservoir. It was outlined that upgrade works associated with the County Cork disinfection programme are to take place with an estimated mobilisation date of April 2019. c. The target chlorine level is 0.8 to 1.0mg/l leaving the plant. The residual chlorine level on the day of the audit was 1.01mg/l. d. The low-level chlorine alarm is set at 0.45 mg/l and the high-level alarm at 2.0 mg/l. Both chlorine alarms trigger automatic plant shutdown (15 minutes delay). e. The contact time provided is 49.2 mg.min/l. f. The date of manufacture was provided on the sodium hypochlorite drums (12/12/18) but an expiry date was not provided on the drums. |
| 4. | <p>Treated Water Storage and Distribution Network</p> <ul style="list-style-type: none"> a. There are 2 no. reservoirs on site which operate in parallel. The reservoirs provide < 24 hours' storage during times of peak summer demand. b. The reservoirs were last cleaned in October 2016. c. Monitoring of the residual chlorine level is undertaken daily at the end of the network. |
| 5. | <p>Exceedances of the Parametric Values</p> <ul style="list-style-type: none"> a. The historic <i>Cryptosporidium</i> and <i>Giardia</i> monitoring results were provided at the audit. Previous monitoring included 1 round of sampling on the following dates: 07/09/12; 21/11/12; 30/04/13; 28/05/14, 11/05/16 and 11/04/17. There were no detections in the treated water prior to 2018. b. <i>Cryptosporidium</i> has been detected in the treated water on 06/06/2018 and 23/01/2019. While <i>Giardia</i> was detected on 15/01/2019. Subsequent to the audit a notification was received on 19/02/19 that <i>Cryptosporidium</i> was detected in the treated water in a sample taken on 12/02/19. c. Investigative <i>Cryptosporidium</i> monitoring has also been undertaken in each of the individual slow sand filters on 29/01/19. All four filters were clear. d. A <i>Cryptosporidium</i> sampling rig has been installed at the treatment plant. Resamples of the final treated water on the 29/01/19 and 05/02/19 were clear for both <i>Cryptosporidium</i> and <i>Giardia</i>. e. The pesticide parametric value was exceeded on 15/08/2017 and 12/06/2018 (MCPA). Irish Water is undertaking monthly monitoring of pesticides during the pesticide spraying season of April to November inclusive. The results for July, August, September, October and November 2018 were compliant. f. Monthly monitoring of trihalomethanes is being carried out until the upgrade works to ensure compliance with the trihalomethane parametric value have been completed. There was one trihalomethane exceedance during 2018 (17/04/18). |
| 6. | <p>Chemical storage and bunds</p> <ul style="list-style-type: none"> a. All chemical storage areas were bunded. |
| 7. | <p>Management and Control</p> <ul style="list-style-type: none"> a. A detailed and up to date plant manual was available. Good record keeping was observed. b. There was good signage and labelling of all equipment at the WTP. |
| 8. | <p>Progress in relation to Remedial Works for THMs</p> <ul style="list-style-type: none"> a. The supply is on the EPA's Remedial Action List (RAL) for inadequate treatment for trihalomethanes. The treatment plant is to be upgraded by December 2020. At the audit it was confirmed that the contract for the upgrade works was signed before Christmas 2018. b. Monitoring of the raw water UVT for three months has commenced. The Quarter 4 update in December 2018 outlined that the initial water quality data indicates that a coagulation, flocculation, clarification, filtration solution will be required. |

3. AUDITORS COMMENTS

Irish Water should continue to investigate the cause of the presence of *Cryptosporidium* and *Giardia* in the final treated water at the Glengarriff WTP. The cause of the exceedances has not been identified to date.

A turbidity monitor is present on the final filtered water but there are no turbidity monitors on each of the individual slow sand filters. Irish Water should install continuous turbidity monitors on the filtered water at each individual slow sand filter. The installation of the additional monitors would provide improved process control and may assist with the investigations into the *Cryptosporidium* and *Giardia* exceedances.

Good record keeping and documentation was observed during the audit.

4. RECOMMENDATIONS

Exceedances of the Parametric Value

1. Irish Water should continue to investigate the cause of the presence of *Cryptosporidium* and *Giardia* in the final treated water at the Glengarriff WTP and provide an update to the Agency. Irish Water should keep the EPA informed of any changes to the HSE advice in relation to the monitoring of *Cryptosporidium* and *Giardia*.

Source Protection

2. Irish Water should liaise with Cork County Council to ensure that all landowners are made aware of the set-back distances as per the European Union (*Good Agricultural Practice for the Protection of Waters*) Regulations 2014 (SI No. 31 of 2014) for the abstraction point.

Filtration

3. Irish Water should install continuous turbidity monitors on each individual filter. These monitors should be linked to a recording device and generate an alarm in the event of a deviation from the acceptable operating range of the filters.

Disinfection

4. Irish Water should review the location of the chlorine monitor to ensure it is at a suitable location to verify adequate disinfection. Irish Water should confirm the estimated completion date for the disinfection upgrades proposed under the Cork County Disinfection Programme and provide details of the proposed works. Treated Water Storage and Distribution Network
5. Irish Water should confirm that the Glengarriff WTP is on the Irish Water reservoir cleaning programme and provide a timeframe for completion of the reservoir cleaning.

Progress in relation to Remedial Works for THMs

6. Irish Water should continue to progress the planned upgrade works at the Glengarriff Water Treatment Plant to ensure that the drinking water supplied to consumers complies with the trihalomethanes parametric value of 100 µg/l as set out in the *European Union (Drinking Water) regulations 2014 (S.I. No. 122 of 2014), as amended*. Irish Water should continue to provide quarterly updates to the Agency and notify it when works are complete. Irish Water should forward a copy of the Contractor's Work Programme to the EPA for the planned upgrade works at the Glengarriff Water Treatment Plant.

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 Ms Regina Campbell, 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:

Criona Doyle

Date:

11/03/2019

Inspector