

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	Cahersiveen PWS 017H
Organisation	Irish Water
Scheme Code	1300PUB1050
County	Kerry
Site Visit Reference No.	SV25850

Report Detail	
Issue Date	16/09/2022
Prepared By	Regina Campbell

Site Visit Detail			
Date Of Inspection	19/08/2022	Announced	Yes
Time In	14:15	Time Out	16:00
EPA Inspector(s)	Regina Campbell		
Additional Visitors			
Company Personnel	Irish Water: Tommy Roche, Oliver Harney Kerry County Council (operating under service level agreement to Irish Water): Seamus O'Mahony, Brian Lennon, Adrian O' Sullivan		

> Summary of Key Findings

1. The Cahersiveen Public Water Supply (PWS) is on the EPA Remedial Action List (RAL) for inadequate treatment for *Cryptosporidium*. Irish Water have installed UV disinfection to provide a *Cryptosporidium* barrier. However the UVT and turbidity monitors are incorrectly located after the reservoir and should be relocated so that the UV unit can be verified as operating within its validated operating range at all times.
2. The Cahersiveen PWS is also on the RAL for elevated levels of THMs above the Drinking Water Regulations standard of 100 ug/l. The EPA issued a Direction under Regulation 16 of the Drinking Water Regulations on 29/03/22 requiring Irish Water to upgrade the Cahersiveen Water Treatment Plant so that the drinking water supplied to consumers complies with the THMs parametric value by 31/12/2023. Irish Water should undertake remedial actions to ensure compliance with the Direction.

> Introduction

The Cahersiveen PWS serves a population of 1,413 and produces 1,229 m3/day according to information on the EPA's Eden system. Raw water is sourced from the adjacent River Coulagh and 3 no. onsite boreholes. The plant treats 60 m3/hr of water with approximately 40 m3/hr sourced from the river and 20 m3/hr sourced from the boreholes. The river and one of the boreholes are treated by slow sand filtration. The filtered water is then combined with water from two additional boreholes prior to UV and chlorination disinfection.

The Cahersiveen PWS is on the EPA Remedial Action List (RAL) under two categories; for Elevated levels of THMs above the drinking water parametric value of 100 ug/l and for Inadequate treatment for *Cryptosporidium*.

The scope of the audit was to assess the status of the UV disinfection system which was installed to provide a barrier for *Cryptosporidium*.

The EPA has issued a Direction under Regulation 16 of the Drinking Water Regulations requiring Irish Water to upgrade the Cahersiveen Water Treatment Plant so that the drinking water supplied to consumers complies with the THMs parametric value by 31/12/2023.

The EPA EDEN system lists ozone as a treatment type and does not list UV treatment. Eden should be updated with the correct treatment types.

> Supply Zones Areas Inspected

The sources, slow sand filters and disinfection systems were inspected during the audit.



1. Source Protection

1.1

Is the abstraction source(s) adequately protected against contamination?

Answer

No

Comment

There are 3 no. boreholes currently in operation at the plant which supplement the river since 2020. The boreholes have not been capped and are located in kiosks which are not labelled with the correct name for each borehole. There are no turbidity monitors on each borehole to check the variation in water quality.



2. Filtration

2.1

Are the filters designed and managed in accordance with EPA guidance?

Answer

No

Comment

The river source and borehole BH2 combine in a raw water balancing tank and then are split across 5 no. slow sand filters.

Filters are scraped twice per year. Kerry County Council estimate that the media depth is 1000mm and media depth gauges are fixed to each filter. The filter takes about 1 week to settle after scraping and is run to waste during this time before going back into operation.

There is a turbidity monitor with an alarm of 0.18 NTU (after 5 minutes) on each filter and a combined filter turbidity monitor.

There is a combined flow monitor but no individual filter flow monitor or headloss monitor.

2.2

Does monitoring indicate that the filters are operating effectively?

Answer

Yes

Comment

Trends submitted show that turbidity levels for each filter and for the combined filters are low and stable. Turbidities from each filter at the audit were < 0.1 NTU. Final water turbidity was 0.059 NTU.



3. Disinfection

3.1

Is the disinfection system verified using monitors and alarms, with trended data recorded and accessible?

Answer

Yes

Comment

Chlorination

Chlorination is used for primary disinfection at the plant and is dosed after the UV unit and prior to the onsite reservoir where chlorine contact time is achieved.

High and low chlorine alarms and shutdowns are in place on the monitor CL001 which validates dosing and on dual validation monitors CL002/CL003 which validate chlorine contact time. Trended data is recorded and accessible.

Irish Water submitted a calculation that shows that Total Effective Contact Time achieved is 45.78 mg.min/l at 0.5 mg/l chlorine after the onsite reservoir. The dual validation monitors CL002/CL003 were reading 0.97 mg/l residual chlorine on the day.

3.2

Are monitors and alarms operational via dial out and being responded to with a suitable cascade system in place?

Answer

Yes

Comment

A cascade system with 4 people is in place and incident response training has been undertaken.

3.3

Are duty and standby chlorine pumps/ UV units in operation?

Answer

No

Comment

There are duty and standby chlorine pumps but a duty only UV unit. The duty UV unit has been in operation for approximately 12 months.

Irish Water said that the permanent solution proposed for the plant will incorporate a duty/standby UV arrangement and said that the latest timeframe for the permanent salutation is Q3 2024.

3.4

Is the UV disinfection system operating within its validated range?

Answer

No

Comment

A duty only Wedeco LBX400e was installed at the plant approximately 12 months ago. Water from the slow sand filters and water from 2 additional boreholes combine before passing through the UV unit. The UV unit was installed to provide a *Cryptosporidium* barrier only.

The UV unit is validated to the USEPA USDGM validation standard and provides 3 log reduction of *Cryptosporidium* and *Giardia* when operated above a minimum UVT of 60% and below a maximum flow of 195 m³/hr.

There is shutdown of the plant if the UV dose drops below 12 mJ/cm², UVT < 60% and turbidity < 1 NTU. At the audit, the UV dose was reading 29.08 mJ/cm². Trended data for UV dose, UVT and turbidity is recorded and accessible.

The UVT and turbidity monitors are located after the onsite reservoir and not at the UV unit which means that the verification monitors are not located at an appropriate location to verify that the UV unit is operating within its validated range at all times.

In addition, there was no UV dose trend recorded from the 07/06/22 to 29/06/22 due to the failure of 2 bulbs. KCC said that the UV unit continued to operate with 12 out of a total of 14 UV bulbs in operation. It is unclear if the required minimum target UV dose was provided during this time as the UV dose trend is not available. Irish Water said that it would seek clarification from the supplier.



4. Management and Control

4.1

Has the protozoal compliance log treatment requirement been identified for the water treatment plant?

Answer

Yes

Comment

Irish Water said that the log requirement for this supply is calculated at 1.46 and therefore will not exceed the default log 3 requirement. The completion of a sanitary survey will not impact this score.



5. Supply on the Remedial Action List

5.1

Is further information needed to assess completion of the Remedial Action List upgrade?

Answer

Yes

Comment

The UV unit verification monitors should be relocated to an appropriate location and two months verification data should be submitted in order to consider removal of the supply from the *Cryptosporidium* category of the RAL.

The EPA has issued a Direction under Regulation 16 of the Drinking Water Regulations requiring Irish Water to upgrade the Cahersiveen Water Treatment Plant so that the drinking water supplied to consumers complies with the THMs parametric value by 31/12/2023.

Subject	Cahersiveen Audit 2022 Recommendations	Due Date	16/10/2022
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 install a UVT and turbidity monitor with alarms and shutdown at an appropriate location to verify that the UV unit is operating within its validated range at all times. 2. Irish Water should install a standby UV unit at the plant. 3. Irish Water should confirm from the manufacturer how operation of the UV unit is validated in the event that UV dose is not trended and in the event that not all of the bulbs are in operation. 4. Irish Water should ensure that a) all boreholes are lined and sealed in accordance with EPA Advice Note No. 14: Wellhead Protection and Borehole Construction b) ensure turbidity monitors are installed on each borehole and c) label each borehole kiosk with the correct name for the borehole. 5. Irish Water should a) progress remedial actions so that consumers receive water in compliance with the THM parametric value by 31/12/2023 as specified in the Direction issued under Regulation 16 of the Drinking Water Regulations and b) continue to monitor for THM at representative locations in the network and notify the EPA of exceedances. 6. Irish Water should a) install a continuous flow rate monitor on each filter and b) install a continuous headloss or water level monitor on each filter. 7. Irish Water should update EDEN with the correct sources and treatment types for the plant <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 Dr. Michelle Minihan, Senior Inspector, Drinking Water Team.</p> <p>Irish Water should submit a report to the Agency on or before 16/10/2022 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 DW20180171 in any future correspondence in relation to this Report.</p>		