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	Enfield
Organisation	Irish Water
Scheme Code	2300PUB1010
County	Meath
Site Visit Reference No.	SV20116

Report Detail

Issue Date	12/03/2020
Prepared By	Daryl Gunning

Site Visit Detail

Date Of Inspection	21/02/2020	**Announced**	Yes
Time In	10:00	**Time Out**	11:20
EPA Inspector(s) **Additional Visitors**	Daryl Gunning Michelle Roche		
Company Personnel	Irish Water: Francis Glancy, Aodhnait Ni Chathasaigh Meath County Council: Joseph Cleary, Norbert McMahon, David O'Reilly, Christina Sweeney, Helen McDonnell		

Summary of Key Findings

1. Ultraviolet (UV) disinfection was installed at Enfield Water Treatment Plant (WTP) in accordance with the requirements of the Regulation 16(1) Direction issued by the EPA on 22/11/19, which directed Irish Water to install, commission, and validate to an international standard, a UV disinfection system at the Enfield WTP by 31/12/19.
2. This audit found that Enfield WTP is operating effectively and the newly installed UV system has been successfully commissioned and validated to an international standard.

Introduction

The Enfield Public Water Supply (PWS) is supplied by a borehole that provides 699 m3/day to a population of 3,274. Treatment consists of sodium hypochlorite dosing prior to filtration to oxidise the manganese and iron in the raw water, pressure filtration, UV disinfection (commenced operation in November 2019), and post-UV chlorination with sodium hypochlorite (secondary disinfection).

As part of Irish Water's National Disinfection Programme site assessments carried out in Meath public water supplies, Irish Water identified that the chlorine contact time at Enfield WTP did not meet the minimum requirement of 15 mg.min/l to ensure adequate disinfection of the water supply. To address this treatment deficiency, Irish Water committed to install a UV disinfection system to provide a dual disinfection barrier at Enfield WTP.

On 22/11/19, the EPA issued a Direction to Irish Water under Regulation 16(1) of the European Union (Drinking Water) Regulation 2014, as amended. The Direction required Irish Water to install and commission the UV disinfection system at Enfield WTP by 31/12/19. Irish Water has fully complied with this Direction.

Supply Zones Areas Inspected

This audit of Enfield WTP sought to verify the installation of UV disinfection treatment as per the requirements of the Regulation 16(1) Direction issued by the EPA on 22/11/19. A full site tour of the WTP was conducted, including an inspection of the onsite borehole.

1. Source Protection

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

Comment

The borehole, located at the WTP site, was visited during the audit.

1. The borehole was drilled in 2001. Irish Water has classified it as G3 (high risk of microbiological contamination).
2. The borehole was adequately capped and located in a lockable chamber.
3. No ingress of surface water into the chamber was evident.
4. There is a second borehole at the WTP site, however, it has been fully decommissioned.

2. Filtration

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

Comment

1. There are 3 pressure filters at Enfield WTP.
2. Filter media consists of sand and manganese dioxide to remove manganese and iron from the raw water.
3. Sodium hypochlorite (14-15%) is dosed prior to filtration to oxidise the manganese and iron. Removal performance of the manganese and iron from the raw to final water is >95%.
4. Backwashing of each filter occurs once per day. Two filters remain in operation while one is being backwashed. The backwash water is discharged to the local sewer.
5. The turbidity post-filters was 0.02 NTU on the day of the audit.

3. Disinfection

		Answer
3.1	Is the UV disinfection system operating within its validated range?	Yes

Comment

1. A "VISADES T1200L-400" (2 reactors) UV disinfection system was installed and commissioned at Enfield WTP in November 2019. The UV system is validated to an international validation standard by the Austrian Association for Gas and Oil (OVGW certification). A copy of the validation certificate was provided at the audit.
2. The UV system is alarmed for UVT and dose rate as follows: (i) low-low UVT: 75%; (ii) low UVT: 85%; (iii) low-low dose: 35 mJ/cm2. The plant will shutdown when a low-low UV alarm setpoint is reached.
3. The UV system is also alarmed for UVI. On the day of the audit the low-low (alarm and automatic shutdown at this setpoint) and low alarm setpoints were different for reactor 1 and 2 as follows: (i) low-low reactor 1: 2.53 mW/cm2; (ii) low reactor 1: 3.03 mW/cm2; (iii) low-low reactor 2: 3.32 mW/cm2; (iv) 3.82 mW/cm2.
4. A cascade system is in place to alert staff in the event of an alarm being triggered.
5. UV was being dosed at 120 mJ/cm2 at the time of the audit.
6. Automatic switch-over of duty and standby UV pumps occurs every 12 hours.

		Answer
3.2	Is the chlorine dosed appropriately?	Yes

Comment

1. Sodium hypochlorite (14-15%) is dosed prior to filtration to oxidise the manganese and iron in the raw water. There is a chlorine residual of approximately 0.5 mg/L post filtration and prior to UV disinfection.
2. Sodium hypochlorite (14-15%) is also dosed prior to the final water leaving the plant as secondary disinfection to maintain a residual level of disinfection in the distribution network. A residual of 0.5 mg/L is aimed for in the final water leaving the WTP.
3. There is no requirement for chlorine boosting in the network. A chlorine residual of >0.1 mg/L is being achieved in the network.

Recommendations

Subject	Enfield Audit Recommendations	**Due Date**	09/04/2020
Action Text	**Recommendations** 1. Irish Water should ensure that the UV disinfection system at Enfield water treatment plant operates within its validated range at all times. 2. Irish Water should provide clarification on why the alarm setpoints for low-low and low UVI are different for each reactor and review these setpoints to ensure they are appropriate to the operation of the UV system at Enfield WTP. **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 Aoife Loughnane, Drinking Water Team Leader. Irish Water should submit a report to the Agency on or before 09/04/20 detailing how it has dealt with the issues of concern during this audit. 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. 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 Reference Number DW2019/174 in any further correspondence in relation to this Report.		