

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	Longwood
Organisation	Irish Water
Scheme Code	2300PUB1014
County	Meath
Site Visit Reference No.	SV22350

Report Detail	
Issue Date	05/05/2021
Prepared By	Ruth Barrington

Site Visit Detail			
Date Of Inspection	23/04/2021	Announced	Yes
Time In	14:00	Time Out	14:55
EPA Inspector(s)	Ruth Barrington Daryl Gunning		
Additional Visitors	Michelle Minihan Derval Devaney		
Company Personnel	Irish Water: Andrew Boylan, Fran Glancy, John Hand, Donal Heaney, Mairead Conlon, David Henry, Darran Killian, John Leamy Meath County Council: Gerry Boyle, Helen McDonnell, David O'Reilly, Norbert McMahon, Siobhán Johnston		

> Summary of Key Findings

1. Irish Water has failed to comply with the requirements of the Regulation 9(1) Direction issued by the EPA, to provide adequately disinfected drinking water for the Longwood PWS by the due date of 31/12/2019. This is due to inadequate contact times in place for primary chlorination, and the failure to achieve disinfection using the installed UV disinfection system.
2. The Longwood Water Treatment Plant is currently being operated with primary disinfection by chlorination. The two properties on the network previously identified as being impacted by inadequate contact time remain on a Boil Water Notice.
3. The upgraded treatment processes (the UV system and Disinfection Programme upgrades to monitoring and process controls) at Longwood WTP entered process proving on 19/04/2021.

> Introduction

Longwood PWS serves a population of 1,725 people from two borehole sources. Treatment processes at the water treatment plant include oxidation and pressure filtration for the removal of iron and manganese, with UV and chlorination as disinfection processes.

A Boil Water Notice on two properties has been in place since 05/07/2019 reflecting inadequate disinfection (chlorine contact time) for these properties closest to the water treatment plant. The EPA issued a Regulation 9(1) Direction on 26/07/2019, requiring Irish Water to provide adequately disinfected water by 31/12/2019 through either chlorination with adequate contact time, or through installation of a validated UV disinfection system. Irish Water's selected response communicated to the EPA, was that a validated UV system was being installed, in order to provide adequate primary disinfection at Longwood Water Treatment Plant. Chlorination would continue to be used, in order to provide secondary disinfection within the distribution network.

On 24/12/2020 Irish Water provided a Direction update to the EPA, stating that process proving at Longwood WTP of the upgraded treatment, including the UV system and additional online monitoring and controls, had started. On 18/03/2021 Irish Water provided a Direction update to the EPA stating that pre-treatment upgrades were now required and that process proving had not yet occurred.

This audit was carried out by the EPA following the failure to comply with the Regulation 9 (1) Direction and a notification from Irish Water on 23/03/2021 that process monitoring alarms and shutdowns had been deactivated at Enfield WTP and that issues with treatment had also been identified at Kilmurray WTP and in Longwood Public Water Supply.

> Supply Zones Areas Inspected

The audit was carried out virtually by video conference due to the Level 5 Covid 19 restrictions in place on 23/04/2021.



1.1

	Answer
Are the filters designed and managed in accordance with EPA guidance?	No
Comment	
<p>1. The two pressure filters at Longwood Water Treatment Plant are designed to remove iron and manganese present in the groundwater abstraction. There is a chlorination pre-treatment prior to the filters to oxidise the iron and manganese for removal in the filters.</p> <p>2. The chlorine pumps providing the pre-treatment dose were identified for replacement by Meath County Council due to problems maintaining target concentrations. The new pumps and link to the existing SCADA will be provided as an add-on to the Disinfection Programme.</p> <p>3. During the audit, Meath County Council stated that process proving of the Disinfection Programme process monitoring and controls, including final water turbidity monitoring, was not completed as originally planned in December 2019 due to carry over of iron and manganese from the filters causing fouling of the UV lamps. Process proving started again on 19/04/2021 and will run for 28 days.</p> <p>4. There is no online monitoring of turbidity at each filter outlet. This means that in the event of turbidity rising in the final treated water, there is no way of easily determining whether an individual filter is at fault. Monitoring turbidity on individual filter outlets is best practice and has been recommended by the EPA for many years. It is a recommended critical control in the EPA's <i>Water Treatment Manual: Filtration</i>.</p> <p>5. There is no run to waste following backwash of the pressure filters. Without a run to waste, returning the filters to service after a backwash is accompanied by a spike in turbidity which may trigger the automatic shutdown of the plant, and also may interfere with the adequacy of the disinfection processes through a potential shielding effect.</p>	



2. Disinfection

2.1

Is the chlorine dosed appropriately?

Answer

No

Comment

1. Following assessment under Irish Water's National Disinfection Programme, the chlorine contact time at Longwood WTP was assessed as being inadequate. The EPA's Regulation 9(1) Direction was issued on this basis, following which Irish Water selected UV as a suitable primary disinfection process for use in this Public Water Supply.

2. During the audit, Meath County Council stated that primary disinfection at Longwood WTP remains using chlorination due to issues with iron and manganese fouling of the UV lamps and the failure to process prove the Disinfection Programme upgrades and UV system. There was no formal risk assessment carried out to support the decision to retain chlorination. While the properties affected by inadequate contact time remain on a Boil Water Notice, the impact on those consumers remaining on a long-term boil water notice since July 2019 does not appear to have been considered.

3. Some teams within Irish Water appear to have been aware of the issues with process proving of the water treatment plant upgrades, but the supply does not appear to have received any level of priority within the National Disinfection Programme. The significance of the issues was not communicated effectively to the EPA in Irish Water's updates to the EPA on Direction progress.



3. Management and Control

3.1

Is the water treatment plant resilient enough to cope with significant variations in raw water quality or demand?

Answer

No

Comment

1. Several inadequacies were identified at the Longwood Water Treatment Plant which point to a lack of resilience to deal with raw or in-process water quality variability.

(i) Lack of treated water storage leaving the supply vulnerable to plant outages;

(ii) requirement for replacement chlorine dosing pumps at the pre-treatment location, linked to SCADA, to maintain the target dose;

(iii) lack of online turbidity monitors on individual filters;

(iv) lack of chlorine residual monitoring post filters;

(v) lack of run to waste facilities on the pressure filters to prevent out of specification water from entering supply;

(vi) the use of UV lamps vulnerable to fouling from iron and manganese carried over from the filters which increases required maintenance interventions;

(vii) The failure to process prove and operate water treatment plant upgrades designed to enhance treatment and controls available to plant operators.

2. Inadequacies in the decision making relating to Longwood water treatment plant were identified during the audit.

(i) Irish Water's failure to prioritise the follow-up to the failed process proving which started in December 2020 and to clearly communicate this to the EPA, considering both the BWN applying to part of the supply and the Regulation 9(1) Direction issued by the EPA in relation to the supply;

(ii) Irish Water and Meath County Council's selection of a treatment option (the UV system) in isolation without due consideration being given to the known constraints of the raw water, namely the iron and manganese content of raw water and the limitations of the existing pre-treatment and pressure filters in dealing with iron and manganese.

3. It was noted that the water treatment plant schematic provided by Meath County Council includes a "By-pass to Mains" indicated after the boreholes but before the treatment processes. Meath County Council provided reassurance during the audit that this bypass is not in use.

3.2

Are suitable alarm settings in place to alert operators to deteriorating water quality and/or the failure of a critical treatment process?

Answer

No

Comment

1. During the audit, Meath County Council stated that alarms and inhibits were in place at Longwood Water Treatment Plant and had not been deactivated at any time.
2. Data provided by Meath County Council as part of the audit process was considered unreliable for the purposes of both assessment and water treatment plant operational control. Duplicate timestamps displaying different turbidity readings and 90% of turbidity readings frozen at the lower limit of detection of 0.02 NTU were seen in the data.
3. Process proving of the plant upgrades only commenced on 19/04/2021.
4. In light of Points 2 and 3 above, the auditors considered that while alarms and shutdowns may be active on the system, they can not be relied upon until the data can be validated and the process proving completed.

3.3

	Answer
Is the data obtained from sampling and monitoring used to actively inform the processes on site and in the distribution network?	No
Comment	
<p>1. Data provided as part of the audit process was considered unreliable for the purposes of both assessment and water treatment plant operational control. Duplicate timestamps and 90% of turbidity readings frozen at the lower limit of detection of 0.02 NTU were evident in the data.</p> <p>2. Meath County Council stated during the audit that further data review and downloads had been requested from the contractors in an attempt to verify the output of online monitoring.</p>	

Recommendations

Subject	Longwood Audit Recommendations	Due Date	07/06/2021
Action Text	<p>Recommendations</p> <ol style="list-style-type: none"> 1. Irish Water and Meath County Council should ensure that adequate, verifiable disinfection is provided at all times in the Longwood PWS, by process proving and operating the disinfection processes within validation envelopes and in accordance with EPA guidance. 2. Irish Water and Meath County Council should ensure that there is no active bypassing of the water treatment plant. 3. Irish Water should ensure that the Longwood Water Treatment Plant is operated and controlled using representative, verifiable data as a basis, and that the results of online monitoring are actively used to control the plant. 4. Irish Water should implement internal communications procedures so that operational issues can be effectively communicated to the EPA, with specific reference to Direction compliance and progress with National Programmes. 5. Irish Water should provide an Action Programme including timeframes for addressing the treatment deficiencies at Longwood WTP. This should cover the following points: <ol style="list-style-type: none"> (i) Address the lack of treated water storage leaving the supply vulnerable to plant outages; (ii) Provision of replacement pumps for chlorine pre-treatment and the linking of these pumps to the existing SCADA; (iii) Provision of online turbidity monitors on individual filters; (iv) Provision of chlorine residual monitoring post filters; (v) Provision of run to waste facilities on the pressure filters to prevent out of specification water from entering supply; (vi) Maintenance of UV lamps vulnerable to fouling from iron and manganese carried over from the filters. <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. Irish Water should note that the EPA will consider legal action regarding the failure to comply with the Regulation 9(1) Direction issued on 26/07/2019.</p> <p>This report has been reviewed and approved by Michelle Minihan, Senior Manager, Drinking Water Team.</p> <p>Irish Water should submit a report to the Agency on or before 07/06/2021 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 the Action Reference Number in any future correspondence in relation to this Report.</p>		

