

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	Granard
Organisation	Irish Water
Scheme Code	2000PUB1006
County	Longford
Site Visit Reference No.	SV22333

Report Detail	
Issue Date	19/05/2021
Prepared By	Michelle Roche

Site Visit Detail			
Date Of Inspection	20/04/2021	Announced	Yes
Time In	11:00	Time Out	12:30
EPA Inspector(s)	Michelle Roche		
Additional Visitors			

Company Personnel

Irish Water:
Andrew Boylan
Emily Mulqueen
Barry Leonard
Ian Walsh
Paraic Joyce
Sean Healy
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Longford County Council:
Kieran Gaffney
Angela Brady
Barry Lennon
Eugene Caherly
Des Reynolds
Karina O'Grady
Tom Murtagh

> Summary of Key Findings

1. Irish Water upgraded a number of treatment processes at Granard (Lough Kinale) water treatment plant in January 2021, in line with the Remedial Action List action programme. The upgrades which include the addition of pH correction on the raw water prior to coagulation, replacement of rapid gravity filter infrastructure and media, and improved disinfection controls were assessed by the EPA during the audit using final water quality data trends and THM results in the distribution network.
2. The audit found that the upgrades were effective in ensuring that THM levels remain below the water quality limit and the Granard public water supply was subsequently removed from the EPA's Remedial Action List in the Q1 2021 update published to the EPA website on 30/04/21.

> Introduction

The Granard public water supply serves approximately 2,598 people in County Longford. The raw water is abstracted from Lough Kinale and receives the following treatment at Lough Kinale water treatment plant;

- pH correction with sulphuric acid,
- coagulation with aluminium sulphate coagulant,
- clarification in a dissolved air floatation unit,
- filtration across three rapid gravity filters,
- disinfection with sodium hypochlorite, and
- final water pH correction with sodium hydroxide.

The water treatment plant has a design capacity of 2000m³/day and is currently treating an approximate volume of 1440m³/day.

The supply was added to the EPA's Remedial Action List (RAL) in October 2015 due to 'Elevated Levels of Trihalomethanes (THMs) above the standard in the Drinking Water Regulations'. The purpose of the audit was to assess the treatment upgrade works and improved process controls that had been implemented under the RAL action programme and verify if the Granard public water supply could be removed from the RAL. Aspects of the treatment process outside of treatment to minimise THM formation were also assessed.

> Supply Zones Areas Inspected

The audit consisted of a video conference with Irish Water and Longford County Council staff on 20/04/21. The water treatment plant was not visited during the audit due to Covid-19 travel restrictions.

The audit assessed each step of the water treatment process including associated alarm and automatic shutdown set-points and process verification data from continuous online monitors. Final water quality data and THM results from the network were also assessed.



1. Source Protection

	Answer
1.1	Is the abstraction source(s) adequately protected against contamination?
	Yes
Comment	
<p>Raw water is abstracted from Lough Kinale and pumped to Lough Kinale water treatment plant. There is a continuous online turbidity monitor on the raw water feed and daily pH, alkalinity, colour, temperature and UVT samples are taken by the caretaker. The raw water is tested for ammonium on a weekly basis.</p> <p>Irish Water stated that the raw water abstraction point, which is located in the lake, was cleaned in 2020 and vegetation was also removed from the lake in the vicinity of the abstraction point.</p>	



2. Coagulation Clarification Flocculation (CFC) Stage

		Answer
2.1	Is the pH within a suitable range for the coagulant used?	Yes
Comment		
<p>The raw water is dosed with sulphuric acid prior to coagulation to lower the pH to within a range of 6.0 to 6.4. The pH dose is flow proportional and maintained within the required range with a feedback trim from a continuous online pH monitor at the outlet of the flash mixer.</p>		

		Answer
2.2	Are the CFC processes appropriately controlled?	Yes
Comment		
<p>The aluminium sulphate coagulant dose is fixed by the caretaker based on daily raw water sampling and an approved dosing chart. Raw water conditions are generally stable from the lake source therefore the dose is rarely adjusted. The coagulant is dosed into a flash mixer, to ensure rapid distribution of the coagulant, before the treated water is directed through a 2-stage (fast and slow) flocculation tank and on to a dissolved air flotation unit for clarification. Polyelectrolyte is dosed at the inlet to the flocculation tank to aid floc formation.</p> <p>A continuous online turbidity monitor has been installed on the outlet of the dissolved air flotation unit to measure the turbidity of the clarified water. The monitor is set to alarm and shutdown the water treatment plant at 2 NTU.</p> <p>All chemical dosing pumps are duty standby with automatic switchover between the pumps.</p>		



3. Filtration

3.1

	Answer
Are the filters designed and managed in accordance with EPA guidance?	Yes
Comment <p>There are three rapid gravity filters at Lough Kinale water treatment plant which have been upgraded under the RAL action programme. Filter media has been replaced and filled to a depth of 1200mm to comply with the minimum depth of between 1000mm-1200mm outlined in the EPA Filtration Manual.</p> <p>Filter backwash is triggered based on time, headloss and a filter water turbidity of 1.5 NTU on each filter. New backwash pumps were installed on each filter to allow a higher backwash rate. There is a run to waste on each filter following a backwash and this is based on time and filter turbidity. The run to waste is directed to an onsite washwater tank where settlement occurs before the decant water discharges to Lough Kinale. The solids from the washwater tank are pumped to the onsite sludge holding tank.</p> <p>The performance of the filters is assessed with continuous online turbidity monitors on the outlet of each individual filter and an online turbidity monitor on the combined filtered water coming from the filters. The monitors on each filter are set to alarm at 0.3 NTU and the combined filtered water monitor is set to alarm and shutdown the water treatment plant at a turbidity of 0.46 NTU. Combined filtered water turbidity results from January to April 2021 were assessed as part of the audit and all results were typically below 0.2 NTU. All individual filter turbidity results were also below the alarm set-point of 0.3 NTU.</p>	



4. Disinfection

4.1

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

Answer

Yes

Comment

The disinfection system at Lough Kinale water treatment plant has been upgraded in accordance with the Irish Water disinfection specification. The system is verified using a CL17 online chlorine residual monitor downstream of the chlorine dosing point. The chlorine residual monitor is set to alarm and shutdown the plant at 1.1mg/l, and residuals leaving the plant are generally above 2mg/l. An upper alarm limit and plant shutdown of 5mg/l is also set on this chlorine residual monitor.

10-12% sodium hypochlorite is dosed by a duty standby dosing pump arrangement with automatic switchover, prior to final water pH correction with sodium hydroxide. The chlorine dose is flow proportional and also has an automatic dose trim to maintain a minimum effective chlorine contact time of 18mg.min/l at the outlet of the Rathcronan reservoir, where two further chlorine residual monitors are located. Sodium hypochlorite is delivered to the site every 2-3 weeks.



5. Reservoirs and Distribution Networks

	Answer
5.1 Is the distribution network adequately maintained to protect drinking water quality?	Yes
Comment	
<p>There are three reservoirs on the Granard public water supply, Rathcronan and Corbaun reservoirs are served directly from the water treatment plant and Moatfield reservoir is fed from Rathcronan reservoir. Moatfield and Rathcronan reservoirs were fully cleaned in 2019 and 2020 respectively. The Corbaun reservoir was inspected and it was deemed that cleaning was not required.</p> <p>Irish Water have established a programme of uni-directional flushing across the distribution network which will occur three times a year, with aim of reducing THM formation in the network. The treated water storage capacity at Corbaun reservoir has been reduced and an automatic scouring valve has been installed in an area of low water usage downgradient of the Corbaun reservoir. The automatic scouring valve scours this area of the network on a weekly basis.</p> <p>THM results from six network sampling events on dates between 14/01/21 and 08/03/21 were examined during the audit. All results were below the drinking water limit of 100µg/l and ranged from 22.5µg/l to 63.7µg/l.</p>	



		Answer
6.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No
Comment		
<p>Irish Water are still in the process of identifying the final protozoal compliance log treatment requirement for the water treatment plant. A preliminary log treatment requirement of Log 3 has been assigned to the Lough Kinale source, however a full sanitation survey had not been included in that log removal determination at the time of the audit.</p> <p>Irish Water are carrying out monthly <i>Cryptosporidium</i> monitoring on the supply in the meantime, until the log treatment requirement is finalised.</p>		

> 7. Supply on the Remedial Action List

	Answer
7.1 Do the audit findings support progress made with the Remedial Action List upgrades?	Yes
Comment	
<p>1. Irish Water has upgraded Lough Kinale water treatment plant as follows:</p> <ul style="list-style-type: none"> • pH correction on the raw water prior to coagulation. • Online clarified turbidity monitor with alarm and plant shutdown. • New rapid gravity filter media to a depth of 1200mm. • Backwash of rapid gravity filters initiated on time, headloss and filter turbidity. • Run to waste facility on rapid gravity filters following backwash. • Washwater and sludge management system upgraded with new picket fence thickener and sludge holding tank. • Disinfection system upgraded to Irish Water disinfection specifications. • Final water pH correction with sodium hydroxide. • Online final water UVT monitor with alarm set-point below 85% UVT. <p>2. Irish Water has improved the operational management and control of the treatment processes as follows:</p> <ul style="list-style-type: none"> • Alarm and plant shutdown based on clarified water turbidity. • Alarm and plant shutdown based on combined filtered water turbidity. • Alarm and investigation of plant processes triggered if final water UVT drops below 85%. • Daily water quality checks at the plant recorded in an Excel spreadsheet. Checks include raw water pH, turbidity, colour, alkalinity and UVT, final water pH, turbidity, residual aluminium, colour and UVT and chlorine residual. • Daily checks on online chlorine residual and UVT monitor performance against handheld monitors. <p>3. Irish Water has improved the management of the distribution network as follows:</p> <ul style="list-style-type: none"> • Planned programme of uni-directional across the network three times a year. • Automatic scouring of a part of the network with low usage once a week. • Lower storage capacity in Corbaun reservoir. <p>Six rounds of network verification sampling have shown that these improvements have been successful in reducing THM formation in the network and therefore improving THM compliance on the Granard public water supply. The supply was removed from the EPA Remedial Action List in the Q1 2021 update published on the EPA website on 30/04/21.</p>	

Recommendations

Subject	Audit Recommendations	Due Date	19/06/2021
Action Text	<p>Recommendation</p> <p>1. Irish Water should confirm the protozoal compliance log treatment requirement for Lough Kinale water treatment plant, and submit it to the EPA when finalised.</p> <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 Aoife Loughnane, Drinking Water Team Leader.</p> <p>Irish Water should submit a response to the Agency on or before 19th June 2021 detailing how it has dealt with the issue of concern identified during this audit.</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, DW20120078 in any future correspondence in relation to this Report.</p>		