

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	North Leitrim Regional
Organisation	Irish Water
Scheme Code	1700PUB7000
County	Leitrim
Site Visit Reference No.	SV20595

Report Detail	
Issue Date	15/10/2020
Prepared By	Daryl Gunning

Site Visit Detail			
Date Of Inspection	18/09/2020	Announced	Yes
Time In	14:00	Time Out	15:30
EPA Inspector(s)	Daryl Gunning		
Additional Visitors			
Company Personnel	Irish Water: Patrick Collins*, Georgina O'Reilly, Thomas Gibbons** Leitrim County Council: Peadar Griffin, Cathal Gormley** *attended pre-site meeting only (17/09/20) **attended site visit only (18/09/20)		

> Summary of Key Findings

The North Leitrim Regional water treatment plant (WTP) was operating well on the day of the audit and all the treatment processes were found to be operating in accordance with EPA guidance.

> Introduction

The North Leitrim Regional Water Supply produces a maximum flow of 4033 m³/day serving a population of 6032. At the time of the audit, flow was approximately 135 m³/hour. Raw water is abstracted from Lough Gill. Treatment consists of coagulation, dissolved air flotation (DAF), rapid gravity filtration, chlorination, and fluoridation.

Irish Water has indicated that the Lough Gill source requires 3 log credit treatment to achieve protozoal compliance, as it is located in an upland catchment with no agricultural activity close to the abstraction point. The current treatment processes at the plant provide 3 log removal credits for protozoa, and an additional log credit for enhanced filtration can be considered where filters deliver consistently good performance of less than 0.1 NTU.

The water treatment plant is operational for 20-22 hours per day. There are 6 group water schemes served by the North Leitrim Regional WTP and the distribution network has 15 reservoirs and 9 chlorine booster stations. Sludge from the DAF treatment process is centrifuged on site.

This audit was carried out to assess Irish Water's performance under *European Union (Drinking Water) Regulations 2014, as amended*, in the provision of drinking water to North Leitrim Regional Water Supply.

> Supply Zones Areas Inspected

All areas of the treatment process at the water treatment plant were inspected during the audit.



1. Source Protection

	Answer	
1.1	Is the abstraction source(s) adequately protected against contamination?	Yes
Comment		
<ol style="list-style-type: none">1. Water is abstracted from Lough Gill, which is approximately 3km from the water treatment plant (WTP).2. The caretaker inspects the abstraction point daily. The screen on the raw water intake is inspected and cleaned regularly.3. A grab sample for raw water turbidity, pH, ammonium, and UVT is taken daily. During August 2020, turbidity levels ranged from 0.05 NTU to 1.89 NTU; pH from 7.26 to 7.58; and UVT from 33.57% to 45.24%. No ammonium was detected in the raw water.		



2. Coagulation Clarification Flocculation (CFC) Stage

2.1

	Answer
Were the CFC processes visually observed to be operating appropriately during the audit?	Yes
Comment	
<ul style="list-style-type: none"> Water is pumped from Lough Gill to the WTP where sulphuric acid (50%) is dosed for pH correction, prior to coagulation. The raw water then enters a splitting chamber and the flow is split between the old (constructed in 2004) and new (constructed in 2017) treatment processes (coagulation, dissolved air flotation, and rapid gravity filtration). Jar tests are conducted on-site daily to determine the appropriate dose of aluminium sulphate (alum) coagulant and polyelectrolyte (poly). 	
<u>Old treatment plant</u>	
<ol style="list-style-type: none"> The maximum flow through the old treatment plant is 200 m³/hr (120 m³/hr at the time of the audit). Alum (8%) and poly (0.1%) are dosed prior to the DAF process. Dosing is flow proportional. Automatic switchover of the alum and poly duty and standby dosing pumps occurs every 48 hours. Retention time within the DAF unit is 30 minutes. The scraper on the DAF runs for 5 minutes every 20 minutes. On the day of the audit, pre DAF pH was reading incorrectly at pH 3.8. The pH meter, which was replaced three weeks prior to the audit, has not been operating effectively since replacement. Leitrim County Council has committed to replacing or repairing this pH meter. However, in the meantime, the caretaker is conducting handheld pH sampling, and on the day of the audit, a pH of 6.3 was recorded. On the day of the audit, post DAF turbidity was 1.21 NTU. Jar tests are currently being conducted to alter this process to achieve a turbidity level of < 1NTU. The DAF unit is cleaned every 6-12 weeks. Cleaning frequency is altered as required. DAF turbidity alarms are as follows: (i) High alarm: 2.5 NTU for 15 minutes and (ii) High shutdown: 4 NTU for 15 minutes. Irish Water and Leitrim County Council plan to review alarm dial-out times to ensure the most effective response. In the old treatment plant, a cascade system is in place to alert staff in the event of an alarm being triggered. 	
<u>New treatment plant</u>	
<ol style="list-style-type: none"> The maximum flow through the new treatment plant is 106 m³/hr (50 m³/hr at the time of the audit). Alum (8%) and poly (0.1%) are dosed prior to the DAF process. Dosing is flow proportional. Automatic switchover of the alum and poly duty and standby dosing pumps occurs every 48 hours. Retention time within the DAF unit is 30 minutes. The scraper on the DAF runs for 4 minutes every 12 minutes. On the day of the audit, pre DAF pH and post DAF turbidity were 6.37 and 0.62 NTU, respectively. The DAF unit is cleaned every 6-12 weeks. Cleaning frequency is altered as required. DAF turbidity alarms are as follows: (i) High alarm: 1.80 NTU for 15 minutes and (ii) High shutdown: 2 NTU for 15 minutes. Irish Water and Leitrim County Council plan to review alarm dial-out times to ensure the most effective response. In the new treatment plant, the caretaker and four Leitrim County Council staff-members are directly notified at the same time in the event of an alarm being triggered. 	



3. Filtration

3.1

	Answer
Are the filters designed and managed in accordance with EPA guidance?	Yes
Comment	
<ol style="list-style-type: none"> 1. There are two rapid gravity filters (RGFs) in the old and new plant (four in total). 2. Filter media (all filters) consist of 700mm sand and 400mm anthracite. 3. Each RGF (in both plants) is backwashed once per day. The backwash procedure lasts 20 minutes. The RGFs are run to waste post backwash for an appropriate length of time. 4. Backwash water goes to the backwash tank, to a mixer, and then to the sludge tank, where it settles and is screened prior to being discharged to the lake. 5. A backwash of a RGF in the new plant was observed at the audit. The flow over the channels were even and no pits or boils were noted on the filter media surface. 6. The RGFs are cleaned every 6-12 weeks. Cleaning frequency is altered as required. 7. There is a turbidity monitor on each of the RGFs. At the time of the audit, post filter turbidity on both the RGFs in the old plant was 0.04 NTU and on the RGFs in the new plant were 0.02 NTU and 0.03 NTU. 8. Filter turbidity alarms for all filters are as follows: (i) High alarm: 0.08 NTU for 15 minutes; and (ii) High shutdown: 0.10 NTU for 15 minutes. 9. There are two different alarm notification systems in place at the North Leitrim Regional WTP. In the new plant, a cascade system is in place to alert staff in the event of an alarm being triggered and in the old plant, the caretaker and four Leitrim County Council staff-members are directly notified at the same time in the event of an alarm being triggered. 10. The filtered water from the old and new plant are combined post filtration at the clear-water tank. 11. Combined final water turbidity is consistently <0.2 NTU. It is alarmed as follows: (i) High alarm: 0.3 NTU and (ii) High shutdown: 0.5 NTU. Alarms are dialed out as per the new plant procedures. 12. Irish Water and Leitrim County Council plan to review alarm dial-out times to ensure the most effective response. 	



4. Disinfection

4.1

Is the chlorine dosed appropriately?

Answer

Yes

Comment

1. Chlorination at North Leitrim Regional WTP was changed from chlorine gas to liquid chlorine in 2016.
2. Sodium hypochlorite (10-12%) is dosed in the combined filtered water at the chlorine contact tank. Dosing is flow proportional. There is a duty and standby dosing pump, which automatically switchover every 24 hours.
3. A chlorine residual of >0.6 mg/l is aimed for leaving the WTP. Chlorine residuals are monitored at the chlorine contact tank and was recorded as 0.89 mg/l on the day of the audit.
4. Chlorine contact time is 23.81 mg.min/l.
5. Chlorine alarms are as follows: (i) alarm high: 1.65 mg/l for 15 minutes; (ii) alarm low: 0.7 mg/l for 15 minutes; (iii) shutdown high: 1.90 mg/l for 15 minutes; and (iv) shutdown low: 0.5 mg/l for 15 minutes.
6. The caretaker and four Leitrim County Council staff are directly notified at the same time in the event of an alarm being triggered. Irish Water and Leitrim County Council plan to review alarm dial-out times to ensure the most effective response.
7. There are nine chlorine booster stations at network reservoirs within the distribution network.
8. Flouride is dosed at the chlorine contact tank.
9. Sodium hydroxide (30%) is dosed at the chlorine contact tank to correct the pH in the final treated water. A pH of 7.2 is aimed for leaving the WTP, and is consistently achieved.

4.2

Is there a chlorine residual ≥ 0.1 mg/l throughout the network?

Answer

No

Comment

Chlorine residuals in the network are consistently >0.1 mg/l at all sampling locations in the network, with the exception of the "Seán MacDiarmada Homestead" historical site, maintained by the Office of Public Works (OPW). This property is not located at the extremity of the network.

It is possible that the low chlorine levels are caused by low water usage at the property, as Leitrim County Council identified that this property is closed for the majority of the time, only opening occasionally for tours with small groups. No water is provided for consumption at the property during these tours.



5. Reservoirs and Distribution Networks

		Answer
5.1	Are reservoirs adequately inspected and maintained?	Yes
Comment		
<ol style="list-style-type: none">1. Approximately 80% of treated water leaves the WTP and arrives at the Cornalaughta reservoirs approximately 2km from the WTP. There are two reservoirs at Cornalaughta, with a combined storage capacity of approximately 1.5 days (1500 m³ and 3800 m³).2. Leitrim County Council plan to clean the Cornalaughta reservoirs (date to be confirmed).3. There are no water supply connections to consumers on the distribution network prior to the Cornalaughta reservoirs.4. Approximately 20% of treated water leaves the WTP and travels to Dromahair, prior to arriving at a network reservoir. There are approximately 10 water supply connections to consumer properties on the distribution network prior to Dromahair, however, the chlorine contact time is sufficient (>15 mg.min/l) before water arrives at these properties.5. There are 15 reservoirs on the network, the majority of which were last cleaned between 2015 and 2018.		



6. Drinking Water Quality

	Answer
6.1 Have relevant failures to comply with the requirements of the European Union (Drinking Water) Regulations 2014, as amended, been notified to the EPA?	Yes
<p>Comment</p> <p>Two parametric exceedances (>0.1 ug/l) for the pesticide Glyphosate, were recorded in the North Leitrim Regional water supply distribution network on 10/06/2020 and 01/07/2020. These exceedances were notified to the EPA and the HSE in a timely manner. As a result of these pesticide detections, this water supply is on the EPA's watch list for pesticides in drinking water and Irish Water and Leitrim County Council have put in place a monthly pesticides monitoring programme during the growing season (April to November inclusive), and will notify the EPA of any further exceedances.</p> <p>The abstraction point and areas immediately upstream have been inspected by Leitrim County Council for evidence of herbicide use and no evidence of pesticide application was observed. Leitrim County Council have written to all landowners within 200m of drinking water abstraction points across the county, to provide guidance on the safe and sustainable use of pesticides.</p> <p>Notification of these exceedances has been forwarded to all relevant local stakeholders including the Environment Section of Leitrim County Council, the Local Authority Waters Programme, and Teagasc. A media awareness campaign was also initiated following these exceedances.</p>	

Recommendations

Subject	North Leitrim Regional Audit Recommendations	Due Date	15/11/2020
Action Text	<p>Recommendations</p> <ol style="list-style-type: none">1. Irish Water should review the 15 minute time delay for turbidity and chlorine alarm dial-outs to minimise the risk of inadequately treated water being supplied to consumers in North Leitrim Regional Water Supply.2. Irish Water should review the alarm response procedure at the new plant to ensure a cascade system is in place.3. Irish Water should ensure that the pH meter on the dissolved air flotation (DAF) unit in the old plant is repaired without delay.4. Irish Water should continue with monthly monitoring of pesticides in treated water during the months April to November until one full growing season's worth of compliant results for pesticides (over a period not exceeding 2 calendar years) is obtained.5. Irish Water should ensure that the two treated water reservoirs at Cornalaughta are inspected and cleaned. <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 report to the Agency within one month of the issuing of this audit report 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 DW2020/48 in any future correspondence in relation to this Report.</p>		