

# Site Visit Report

Under the *European Union (Drinking Water) Regulations 2014* as amended, the Environmental Protection Agency (EPA) is the supervisory authority in relation to Uisce Éireann and its role in the provision of public drinking water supplies. This audit was carried out to assess the performance of Uisce Éireann in providing clean and wholesome water to the public water supply named below.

The audit process is a sample of the performance of a water treatment plant and public water supply on a given date.

Water Supply Zone	
<b>Name of Installation</b>	Lettermacaward
<b>Organisation</b>	Uisce Éireann
<b>Scheme Code</b>	0600PUB1069
<b>County</b>	Donegal
<b>Site Visit Reference No.</b>	SV27534

Report Detail	
<b>Issue Date</b>	14/03/2023
<b>Prepared By</b>	Ruth Barrington

Site Visit Detail			
<b>Date Of Inspection</b>	22/02/2023	<b>Announced</b>	Yes
<b>Time In</b>	14:45	<b>Time Out</b>	17:00
<b>EPA Inspector(s)</b>	Ruth Barrington		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Uisce Éireann: Fionnuala Bonner, Eamonn Doherty, John McElwaine EPS (DBO Contractor): Shane McCloskey		

## > Summary of Key Findings

1. The chlorine contact time calculation provided underestimated the amount of contact time on site, due to the reservoir capacity being omitted from calculations. Uisce Éireann should ensure that accurate chlorine contact time calculations and corresponding disinfection set-points are used by contractors.
2. Completion of the ongoing Remedial Action List programme of works for Lettermacaward WTP is crucial for the provision of automated and fully controlled water treatment processes.

## > Introduction

The Lettermacaward Public Water Supply (PWS) supplies treated water to a population of 2,266 from the water source at Lough Derkmore impoundment. The supply is on the EPA's Remedial Action List due to trihalomethanes exceedances. The action programme to address these exceedances includes the construction of a new water treatment plant (WTP) adjacent to the old WTP, which is underway and scheduled for completion by December 2024. The existing WTP is being operated by the contractor (EPS) for the duration of the construction works and for 12 months following completion.

## > Supply Zones Areas Inspected

The audit at Lettermacaward WTP was focused on alarms, inhibits and the oversight of existing water treatment processes.



## 1. Alarms, Inhibits & Oversight Audits 2023

		Answer
1.1	Is there a documented site specific incident response and incident escalation process?	No
	<b>Comment</b>	
	1. Extracts from the Uisce Éireann incident response and incident escalation process were displayed on-site. The full site specific flow chart and information sheet was not available.	
		Answer
1.2	Did UÉ confirm the target residual for chlorine contact time?	Yes
	<b>Comment</b>	
	1. The chlorine contact time (Ct) calculation dated 30/09/2022, which was provided prior to the audit, did not appear to be calculated correctly. The target Ct was set at 15 mg.min/l without any factor adjustment for pH, temperature or turbidity. Only the volume of the clearwater tank was included in the calculation, the on-site reservoir volume was not included, so the effective contact time was underestimated.	
	2. The minimum free chlorine concentration required at the Ct validation point was identified in the calculation as 1.5 mg/l, however the recalculation required may result in a change to this figure. Operational staff stated that the validation point is the monitor at the reservoir outlet.	
	3. At the time of the audit the chlorine residual concentration at the validation point was 1.51 mg/l.	
		Answer
1.3	Are suitable alarm settings in place to alert operators to deteriorating water quality or the failure of a critical treatment process?	No
	<b>Comment</b>	
	1. A limited range of alarm settings are in place on the existing treatment processes, with filter turbidity, contact tank pH, pre-reservoir chlorine and reservoir levels being alarmed.	
	2. As part of the upgrade, alarm settings will be enhanced.	
		Answer
1.4	Are suitable plant shutdowns/inhibits in place to prevent the entry of inadequately treated water entering the distribution network?	No
	<b>Comment</b>	

1. There are no alarms or shutdowns on turbidity at 0.3 NTU to protect the protozoal barrier on individual filters. There is a turbidity shutdown at 0.98 NTU to protect the disinfection barrier, with a time delay of 3 minutes being established at the audit, changed from the previous 5 minutes.
2. There is a shutdown on low chlorine of 0.8 mg/l, but this setting did not match the minimum free chlorine required at the Ct validation point, specified as 1.5 mg/l in the chlorine contact time calculation.
3. Inhibits and shutdowns will be enhanced within the new water treatment plant.

1.5

Are plant performance trends accessible by operational staff at the water treatment plant?

**Answer**

Yes

**Comment**

1. Limited duration of trend information is available to operational staff via tablet, phone and through the HMI screen on-site.
2. There is no PC on-site for SCADA access.
3. The filter trends for Filters 1 and 2 since 23/01/2023 showed an unusual pattern of spikes which were not consistent with normal patterns following backwash. The turbidity data obtained between 23/01/2023 and 22/02/2023 should be reviewed to assess the percentage of readings where turbidity was <0.3 NTU and <1 NTU to protect the log credit and disinfection barriers respectively.

1.6

Is there a documented alarm response procedure?

**Answer**

No

**Comment**

1. No formal documented alarm response procedure was available during the audit. A list of emergency phone numbers was noted, displayed at the WTP.

1.7

Are there appropriate procedures covering verification of alarms and inhibits status following maintenance or other work on site?

**Answer**

No

## Recommendations

Subject	Lettermacaward Audit 22/02/2023	Due Date	14/04/2023
Action Text	<p><b>Uisce Éireann is responsible for ensuring a clean and wholesome supply of drinking water and should implement the following recommendations without delay.</b></p> <ol style="list-style-type: none"><li>1. Recalculate the chlorine contact time including all contact before the validation point and addressing factor correction where required. Make any necessary changes to alarm and shutdowns based on minimum chlorine required, informed by the recalculated contact time.</li><li>2. Review the turbidity data from Filters 1 and 2 for the period 23/01/2023 to 22/02/2023 and assess percentage of readings less than 0.3 NTU and less than 1 NTU for barrier integrity.</li><li>3. Formalise the incident response and escalation chart and alarm response procedure.</li><li>4. On completion of the new water treatment plant, include an assessment of critical alarms and inhibits, and associated procedures for safeguarding their operation, as part of the RAL action programme report to the EPA.</li></ol> <p><b>Actions required by Uisce Éireann</b></p> <p>During the audit, Uisce Éireann representatives were advised of the audit findings and that action must be taken by Uisce Éireann to address the issues raised.</p> <p>Uisce Éireann should submit a report to the EPA on or before 14/04/2023 detailing the actions taken and planned, with timescales, to close out the above recommendations.</p> <p>The EPA advises that the findings and recommendations from this audit report should, where relevant, be addressed at other public water supplies.</p>		