

# 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	
<b>Name of Installation</b>	Skibbereen Ballyhilty
<b>Organisation</b>	Irish Water
<b>Scheme Code</b>	0500PUB4605
<b>County</b>	Cork
<b>Site Visit Reference No.</b>	SV24389

Report Detail	
<b>Issue Date</b>	08/03/2022
<b>Prepared By</b>	Criona Doyle

Site Visit Detail			
<b>Date Of Inspection</b>	24/02/2022	<b>Announced</b>	Yes
<b>Time In</b>	11:00	<b>Time Out</b>	14:45
<b>EPA Inspector(s)</b>	Criona Doyle		
<b>Additional Visitors</b>			
<b>Company Personnel</b>	Irish Water: Tommy Roche; Oliver Harney.  Cork County Council (acting under service level agreement to Irish Water): Pdraig Sheehan; Michael Russell; Ger Connolly; Seamus Sutton.  EPS: Denis McElligott; Liam Fitzgerald; Vincent Browne; Paul Carlile.  RPS: Diogo Oliveira.		

## > Summary of Key Findings

1. The turbidity incident which occurred overnight on the 07/12/21 to 08/12/21 and subsequent plant shutdown from 10:36am on 08/12/21 to 03:00am on 09/12/21 could have been avoided if the relevant alarm setpoints had been operational at the time of the failure of the coagulant dosing system at Ballyhility Water Treatment Plant (WTP). Operational staff appropriately escalated and investigated the incident upon receipt of the first alarm at approximately 09:00am on 08/12/21.
2. Extensive upgrade works have been completed at the Ballyhility Water Treatment Plant and the plant operates with a large degree of automation. On the day of the audit it was found that a detailed series of process alarms are in place and automatic plant shutdown is enabled in the event a critical alarm setpoint is exceeded.
3. Irish Water should ensure the final water turbidity alarm setpoints at the Ballyhility WTP meet the log performance criteria specified in the EPA Water Treatment Manual: Filtration.

## > Introduction

The Skibbereen Regional Public Water Supply serves a population of 7,508 and produces on average 4,400m<sup>3</sup>/d of treated water from the Ballyhility Water Treatment Plant (WTP). Treatment includes coagulation, flocculation, clarification, filtration, disinfection, fluoridation, final pH correction and sludge treatment. The Ballyhility Water Treatment Plant (WTP) has been upgraded and is currently being operated by EPS for a six month period. Following completion of this six month operational phase the plant will be handed over to Cork County Council who will continue to operate it on behalf of Irish Water under a service level agreement.

This audit was carried out to assess Irish Water's response to a turbidity exceedance on 08/12/21 which lead to shutdown of the Ballyhility Water Treatment Plant and to assess the operation and management of the WTP.

## > Supply Zones Areas Inspected

The audit consisted of an on-site inspection of the Ballyhility WTP on 24/02/22. The treatment processes at the Ballyhility WTP were inspected. Booster chlorination takes places at the 3 no. reservoirs supplied by the Ballyhility WTP. The reservoirs and booster chlorination infrastructure were not inspected as part of this audit.



# 1. Incident Management

1.1

	Answer
Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?	No
<p><b>Comment</b></p> <p>Two new aluminium sulphate storage tanks with duty / standby dosing pumps were installed as part of the upgrade works at the WTP. On the 07/12/21 the duty tank (Tank No. 2) drained down due to normal usage but failed to automatically switch over to the standby tank (Tank No. 1).</p> <p>Commissioning of the WTP was ongoing on the date of the incident following the plant upgrade works. The low liquid level in the aluminium sulphate duty tank should have generated an alarm and instigated automatic switchover to the standby aluminium sulphate tank. The low level setpoint was not reached, as it was set at a lower level than the pumps were capable of pumping to, therefore no alarm was generated. As a result no coagulant was dosed from approximately 10:30pm on 07/12/21. Raw water with no coagulating agent continued to flow through the WTP overnight on 07-08/12/21. This caused the sludge blanket in the clarifiers to rise and break off and carry forward to the filters resulting in an increase in the turbidity levels in the filters from approximately 4:00am on 08/12/21.</p> <p>A plant shutdown was not triggered as the following alarms had not been commissioned at the time of the incident:</p> <p>(1) The alarm on the combined settled water turbidity monitor did not dial out at this function had not been commissioned at the time of the incident.</p> <p>(2) The automatic trigger function to backwash the filters (0.1 NTU) was set to 'disabled' and backwashing could only be triggered manually.</p> <p>Turbidity trends were provided by Irish Water in response to the incident and the trends for the individual filters indicated the turbidity did not exceed 0.3 NTU for 15 or more consecutive readings for any of the individual filters. The trend for the final water turbidity was reviewed on site at the audit and indicated the combined final water turbidity was &gt; 0.3 NTU from approximately 6:30am on 08/12/21 until the WTP was shutdown at 10:36am. During this time the elevated turbidity indicates the <i>Cryptosporidium</i> barrier at the WTP may have been compromised.</p> <p>The first alarm (high turbidity filter no. 2) was raised on 08/12/21 at 9:01am and the plant was shut down at 10:36am when the final water turbidity was approximately 0.96 NTU. The residual chlorine trends confirmed that the disinfection system was not affected during the incident and the required residual chlorine setpoint of 1.5 mg/l was maintained. On identification of the incident at approximately 9:01am on 08/12/21 a review of the operation of the WTP took place and the plant was shutdown at 10:36am.</p> <p>Irish Water and Cork County Council consulted with the HSE at 4:30pm on the 08/12/21. Investigative monitoring was undertaken in response to the incident. <i>Cryptosporidium</i> monitoring was undertaken by Cork County Council at the outlet from the 3 no. reservoirs supplied by the WTP over a 24 hour period from 09/12/21 – 10/12/21. Additional grab samples were taken at the outlet from the Drimoleague, Dereengangan and Gortnaclohy reservoirs by EPS. No <i>Cryptosporidium</i> was detected.</p> <p>EPS and Cork County Council staff remained on site all night on the 08/12/21 to 09/12/21 to backwash the filters and undertake 24 hour monitoring until the plant was back in normal operation. The plant was brought back into production at 3:00am on 09/12/21. There was no loss of supply to the public during the WTP shutdown as water continued to be supplied from the reservoirs. The appropriate alarm setpoints were corrected on 08/12/21 once the issue was identified.</p> <p>The turbidity incident was not suitably escalated to the plant operators and the plant shutdown on 08/12/21 – 09/12/21 could have been avoided if the relevant alarm setpoints had been in place to trigger automatic plant shutdown when the coagulant dosing system initially failed. However, operational staff appropriately escalated and investigated the incident following the receipt of the first alarm. Irish Water should implement suitable controls to ensure alarms remain operational at water treatment plants during upgrade works and commissioning works.</p>	



## 2. Filtration

2.1

	Answer
Are the filters designed and managed in accordance with EPA guidance?	No
<p><b>Comment</b></p> <p>There are 4 no. rapid gravity filters on site. The filter media is composed of 800mm silica sand and 200mm manganese dioxide (for manganese removal). Automatic backwashing of each individual filter takes place on a 48 hour frequency. Backwashing can also be automatically triggered based on differential pressure (setpoint 0.8m) or turbidity (setpoint 0.1 NTU for 15 mins). There is a run to waste following backwashing and a filter can only return to service once the turbidity drops below 0.1 NTU. A backwash of Filter No. 4 was observed during the audit.</p> <p>There are turbidity monitors on each of the individual filters and a combined final water turbidity monitor at the clear water tank (CWT). The individual filters have a high level turbidity alarm setpoint of 0.08 NTU (15 minute delay). There is a further alarm setpoint at 0.1 NTU which results in the filter being automatically taken out of service and backwashed.</p> <p>The combined final water turbidity monitor is located in the clear water tank. On the day of the audit the alarm set point at this location was 0.8 NTU. The alarm setpoint on the combined final filtered water does not meet the log performance criteria specified in the EPA Water Treatment Manual: Filtration. However the alarms on the individual filters meet the performance criteria.</p>	



### 3. Treatment Process Chemicals

	Answer
3.1 Are treatment process chemicals appropriately managed and stored?	No
<b>Comment</b>	
<p>A build-up of liquid was observed in the fluorosilicic acid day tank bund.</p> <p>The chemical dosing points (sodium hypochlorite, fluorosilicic acid and sodium hydroxide) at the clear water tank were not labelled.</p>	



		Answer
4.1	Has the protozoal compliance log treatment requirement been identified for the water treatment plant?	No
<b>Comment</b>		
<p>The protozoal log treatment requirement and any log deficit could not be confirmed at the audit as the site has not been assessed under the Irish Water Methodology. The upgrade works at the Ballyhility WTP allow for the future recirculation of backwash water from the filters to the head of the works if required for example during drought conditions. This recirculation facility is not currently in use but is incorporated into the plant design. Irish Water should provide confirmation of the protozoal log treatment requirement for the source and any log deficit for both scenarios (i.e. with and without recycling of the backwash water from the filters).</p>		



## 5. Site Specific Issues

	Answer
5.1 Has training been provided to site staff following the upgrade of the Ballyhility Water Treatment Plant ?	No
<b>Comment</b>	
<p>The upgrade works have been completed and EPS are to remain on site for a six month operating period after which the operation of the WTP will be handed over to Irish Water and Cork County Council staff. The Cork County Council Water Curator has remained on site for the duration of upgrade works and commissioning phase. Training on secondary disinfection at the reservoirs has been provided to Cork County Council operational staff.</p> <p>Further training of Cork County Council operational staff on the operation of the Ballyhility Water Treatment Plant is scheduled to take place during March 2022.</p>	

## Recommendations

<b>Subject</b>	Ballyhilty WTP - Audit 2022	<b>Due Date</b>	08/04/2022
<b>Action Text</b>	<p><b>Recommendations</b></p> <p><b>Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address the issues described in this report, Irish Water should implement the following recommendations without delay.</b></p> <ol style="list-style-type: none"><li>1. Irish Water should install turbidity alarms and inhibitors on the final filtered water in accordance with the turbidity log performance criteria as set out in the EPA Water Treatment Manual: Filtration.</li><li>2. Irish Water should ensure training is provided to the local authority site staff and relief staff, on the operation of the upgraded Ballyhilty Water Treatment Plant, prior to the handover of the operation of the WTP to the local authority.</li><li>3. Irish Water should confirm the protozoal log treatment requirement at the Ballyhilty WTP and confirm how any log treatment deficit will be addressed. The assessment should include the option of the recirculation of backwash water to the head of the works.</li><li>4. Irish Water should ensure the bund of the fluorosilicic acid day tank is cleaned out and any build-up of liquid in the bund is removed.</li><li>5. Irish Water should ensure that the chemical dosing points at the clear water tank are appropriately labelled.</li></ol> <p><b>Follow-Up Actions required by Irish Water</b></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 Regina Campbell, Drinking Water Team Leader.</p> <p>Irish Water should submit a report to the Agency on or before 08/04/22 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 Compliance Plan DW20210224 in any future correspondence in relation to this Report.</p>		