

# 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>	Whitegate Regional
<b>Organisation</b>	Irish Water
<b>Scheme Code</b>	0500PUB2407
<b>County</b>	Cork
<b>Site Visit Reference No.</b>	SV20171

Report Detail	
<b>Issue Date</b>	31/03/2020
<b>Prepared By</b>	Criona Doyle

Site Visit Detail			
<b>Date Of Inspection</b>	12/03/2020	<b>Announced</b>	Yes
<b>Time In</b>	10:20	<b>Time Out</b>	12:10
<b>EPA Inspector(s)</b>	Criona Doyle Regina Campbell		
<b>Additional Visitors</b>	Andy Fanning HSE: Catherine Mc Carthy		
<b>Company Personnel</b>	Irish Water: Deirdre O'Loughlin; Oliver Harney; Ronan O'Shea.  Cork County Council: Eimear O'Riordan; Graham Whittaker; Jim O'Neill.		

## > Summary of Key Findings

1. Irish Water have not complied with the Regulation 16 (1) Direction issued by the EPA for the Whitegate Public Water Supply (PWS), due to the failure to commission the new coagulation stage of the treatment process by the specified date of 28/02/20. However, Irish Water is progressing the works to resolve the issue as soon as practicable. The process proving cannot be completed without testing of the coagulant and coagulant dosing system during periods of elevated turbidity associated with rainfall events.

## > Introduction

The Whitegate Regional Public Water Supply produces 6,191m<sup>3</sup>/d and serves a population of 9,508. The source of the supply is the Dower Spring. The raw water is subject to periods of elevated turbidity.

The current treatment includes microfiltration followed by UV disinfection, fluoridation and chlorination (secondary disinfection).

On the 23/12/19 the EPA issued a Direction to Irish Water under Regulation 16 (1) of the European Union (Drinking Water) Regulations 2014, as amended. The Direction required Irish Water to install and commission a suitable coagulation dosing system before the filtration stage at the Kilva Water Treatment Plant by 28/02/20 following a boil water notice imposed in November 2019 for 23 days.

The coagulation stage is required to deal with periods of elevated raw water turbidity.

## > Supply Zones Areas Inspected

The purpose of the audit was to (i) examine progress with the installation and commissioning of the coagulation stage as per the requirements of the Regulation 16(1) Direction issued by the EPA on 23/12/19 and (ii) check on progress with the recommendations from the previous audit conducted on 04/12/19.

A review of the most recent turbidity incident which resulted in the placing of a Boil Water Notice on the supply on 16/02/20 was undertaken. A full tour of the water treatment plant (WTP) was conducted including an inspection of the coagulation dosing system.



## 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?		Yes
<b>Comment</b>		
<p>A protocol was agreed between EPA and Irish Water on 20/12/19 for the operation of the plant on a short-term temporary basis in response to elevated filtered water turbidity. It allows the pre UV turbidity control set point for the filtered water to be increased to 1.8 NTU where water levels in the reservoirs are approaching critical levels and subject to the following criteria (i) the treated water turbidity must be kept &lt; 1.8 NTU; (ii) the microfilters and UV disinfection unit must be operational and (iii) the demand must be reduced by switching customers to alternative supplies where possible.</p> <p>Elevated raw water turbidity on February 9th (2.98 NTU) and 13th (4.82 NTU) resulted in a number of short term plant shutdowns. As a result lower volumes of treated water were produced which lead to a reduction in the volume of treated water being stored.</p> <p>On 14/02/20 elevated raw water turbidity resulted in a further plant shutdown when the filtered water turbidity exceeded 1 NTU. Cork County Council contacted Irish Water to request the implementation of the protocol to allow the turbidity set point to be increased to 1.8 NTU as storage levels were critically low. The HSE and EPA were informed that the protocol was being implemented. The protocol came into effect at 8pm on 14/02/20.</p> <p>Cork County Council continued to monitor the situation on the 15/02/20. The upper limit of 1.8 NTU allowed under the protocol was exceeded at 6:35pm on 15/02/20 forcing a plant shutdown.</p> <p>At 10pm on 15/02/20 Cork County Council notified Irish Water that due to the continued drop in the storage levels there was a possibility that the plant would have to be switched back on overnight or the following day and operated under a Boil Water Notice if the filtered water turbidity remained above 1.8 NTU.</p> <p>On 16/02/20 Cork County Council worked on bringing the treatment plant back into supply. The filtered water turbidity had reduced below 1.8 NTU but remained above 1 NTU. The plan was to operate the plant under the protocol once the filters and UV unit were in operation, however a leak occurred on the outlet from Filter No. 2 when the plant was brought online. It was then necessary to bypass the filters.</p> <p>The continued operation of the filters is one of the specified control measures required to be in place in order to operate under the protocol. As the filters could not be operated the HSE were consulted and a Boil Water Notice was issued for the supply. The EPA was notified of the imposition of the BWN at 6pm on 16/02/20.</p> <p>On 17/02/20 and 18/02/20 works were undertaken to fix the leak and complete pressure testing. The turbidity had reduced to &lt; 1.8 NTU but remained above 1 NTU for several days and the Boil Water Notice remained in place due to the unsettled weather conditions being forecast.</p> <p>The boil water notice was lifted on 05/03/20 in consultation with the HSE following the reinstatement of the 1 NTU pre-UV turbidity setpoint and the completion of monitoring in the network.</p>		



## 2. Coagulation Clarification Flocculation (CFC) Stage

2.1

Is the CFC process optimised to respond to changes in raw water quality?

**Answer**

No

**Comment**

Duty and standby dosing pumps are provided for the coagulation stage. The coagulation stage has not been commissioned to date and process optimisation has not been completed at the site.

Jar testing has been completed off site to identify a suitable blend of coagulants. The full scale testing on site has not been fully completed as it requires suitable weather conditions. It was outlined at the audit that a period of > 24 hours of a high turbidity event in the raw water (typically caused by heavy rain ) is required to complete the process proving stage. Following the completion of the process proving, dose charts will be available for use on site to respond to changes in raw water quality.

The Caretaker has not been trained yet on the operation of the new coagulant dosing system.



### 3. Reservoirs and Distribution Networks

3.1

Is treated water in tanks and reservoirs suitably protected against contamination?

**Answer**

No

**Comment**

The reservoir at the Kilva WTP was examined during the audit. Insect proof mesh was missing from one of the vents on the roof of the reservoir.



## 4. Treatment Process Chemicals

4.1

Are treatment process chemicals appropriately managed and stored?

**Answer**

No

**Comment**

Sodium hypochlorite is being stored in intermediate bulk containers (IBC) on site on a temporary basis until a new bulk storage tank is installed on site.

The PCS number and expiry date for the sodium hypochlorite stored on site could not be provided at the audit as the delivery dockets are not retained on site but stored centrally.

4.2

Are chemicals appropriately produced/ approved and suitable for use in drinking water treatment?

**Answer**

Yes

**Comment**

It is proposed to use a blend of two coagulants Poly Aluminium Chloride (PACL) and polyamine (Floquat TM FL 2650 SEP). Prior to the audit Irish Water provided confirmation that both substances are certified for use in drinking water. At the audit the EPA asked if information was available from the coagulant supplier in relation to blending of the products in respect of by product formation or reactions as a result of blending. The information was not available at the audit but Irish Water outlined that further information had been provided by the supplier and could be forwarded.



5.1

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

Answer

Yes

**Comment**

The alarm setpoints and shutdown levels were examined on site. The following alarms with 15 mins delay were confirmed to be operational:

Kilva Raw Water Turbidity - 3 NTU Hi Alarm and 5 NTU Hi Hi Alarm.

Kilva Post Filter 1 Turbidity - 0.9 NTU Hi Alarm and 1 NTU Hi Hi Alarm with shutdown.

Kilva Post Filter 2 Turbidity - 0.9 NTU Hi Alarm and 1 NTU Hi Hi Alarm with shutdown.

Kilva Pre UV Turbidity - 0.7 NTU Hi Alarm and 0.9 NTU Hi Hi Alarm with shutdown.

Kilva Reservoir Outlet Free Chlorine - 2.2mg/l Hi Alarm with shutdown.

Kilva UV Dose - 10 mj/cm<sup>2</sup> Lo Lo Alarm with shutdown and 13.90 mj/cm<sup>2</sup> Lo Alarm.

Kilva UVT - 84% Lo Lo Alarm with shutdown and 86% Lo Alarm.

Kilva Reservoir Level - Critical Lo Lo Alarm 3m, Lo Lo Alarm 3.5m and Lo Alarm 4m.

5.2

Are instrument calibrations within date?

Answer

Yes

**Comment**

The label on the UV unit indicated the date the last service was completed but it did not list the date the next service was due.



## 6. Site Specific Issues

6.1

Have all audit recommendations from the EPA audit undertaken on 04/12/2019 been completed ?

**Answer**

No

**Comment**

Progress with the audit recommendations from the previous audit undertaken by the EPA on 04/12/19 was assessed. Audit recommendations no. 3 to no. 9 inclusive and no. 11 have been addressed and are considered to be closed. Audit recommendations No. 1 and No. 2 from the previous audit are being addressed under the process optimisation works associated with the coagulation stage. A further update should be provided by Irish Water in relation to previous audit recommendation No. 10 in relation to accreditation for the microfiltration stage.



## Recommendations

<b>Subject</b>	Whitegate Audit March 2020 - Audit Recommendations	<b>Due Date</b>	01/05/2020
<b>Action Text</b>	<p><b>Recommendation(s)</b></p> <ol style="list-style-type: none"> <li>1. Irish Water and Cork County Council should complete the commissioning of the coagulation stage and ensure an action plan is in place to complete process proving when suitable raw water turbidity conditions occur in response to a weather event.</li> <li>2. Irish Water and Cork County Council should ensure there is a procedure in place to keep the coagulation infrastructure primed for testing to ensure there are no delays in completing the testing when suitable conditions occur.</li> <li>3. Irish Water and Cork County Council should ensure that all staff (including relief staff) are adequately trained in the operation of the new coagulation treatment system and that records of training are maintained. Adequate supervision should be in place at all times.</li> <li>4. Irish Water should submit documentation to the Agency to demonstrate that the blended coagulation products are safe for use in drinking water.</li> <li>5. Irish Water should confirm the estimated completion date for the installation of a new bulk storage tank for sodium hypochlorite. Chemicals must be stored in bunded areas capable of containing at least 110% of the volume of chemicals stored therein. Fill points for storage tanks inside the bunds should be within the bunded area.</li> <li>6. Irish Water should continue to provide progress updates on the outstanding audit recommendation no. 10 (accreditation microfiltration unit) from the previous EPA audit which was completed on 04/12/2019.</li> <li>7. Irish Water should ensure that all disinfectants used in drinking water treatment are authorised and appropriately labelled in accordance with the EU Biocides Products Regulation (518/2012) and associated Irish Regulations S.I. No. 427/2013 (European Union (Biocidal Products) Regulations, 2013. Irish Water should provide confirmation of the PCS number for the sodium hypochlorite product being used on site in line with Biocides Regulations.</li> <li>8. Irish Water should ensure that all vents on the reservoirs are secured against ingress of animals or deliberate introduction of any contaminant or acts of vandalism.</li> <li>9. Irish Water should ensure that service / calibration labels are clearly displayed on all equipment. The label for the UV unit should indicate the date when the next service is due</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 01/05/20 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 DW2019/214 in any future correspondence in relation to this Report.</p>		

