Drinking Water Audit Report

County:	Clare	**Date of Audit:**	23/03/2017
Plant visited:	Carron Public Water Supply (0300PUB1031)	**Date of issue of Audit Report:**	12/04/2017
		File Reference:	DW2015/210
		Auditors:	Mr Niall Dunne Ms Criona Doyle
Audit Criteria:	• The *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014).* • *The EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)* • The recommendations specified in the EPA *Drinking Water Report*. • EPA Drinking Water Advice Notes No.s 1 to 15. • The recommendations in any previous audit reports.		

MAIN FINDINGS

i. **The upgrade works on the disinfection system at the Carron drinking water treatment plant are substantially complete. However, Irish Water needs to complete the following works as a priority to safeguard the disinfection of drinking water delivered to consumers and to ensure the supply can be removed from the EPA's Remedial Action List;**

   a. **The chlorine monitor was not operational at the time of the audit. The caretaker was also not receiving any dial out alarms. Irish Water needs to rectify these issues to ensure that consumers receive adequately disinfected water and that any deficiencies with the chlorine dosing system are immediately notified to the caretaker.**
   b. **The UV disinfection system shutdown set-point on the raw water is currently below the validated operating criteria, which presents a potential risk of inadequately disinfected water entering into the distribution network.**
   c. **The UVT/UVI recording system has to be configured so as to allow recorded UVI/UVT trends to be accessed and viewed by staff on and off site.**

ii. **According to Clare County Council, the carbon pressure filters are located after the UV units in the treatment process. Irish Water needs to review the current sequence of treatment processes at the plant, in order to ensure that treatment is fully optimised.**

1. INTRODUCTION

Under the *European Union (Drinking Water) Regulations 2014* the Environmental Protection Agency is the supervisory authority in relation to Irish Water and its role in the provision of public water supplies. Carron public water supply is on the EPA's remedial action list (RAL) since Q4 2015 due to

treatment and management issues at the plant. This audit was carried out to assess the performance of Irish Water in providing clean and wholesome drinking water and to assess whether Carron can be removed from the RAL.

Carron water treatment plant serves a population of approximately 90. The supply is fed from two spring sources. Treatment at the plant consists of UV disinfection, chlorination and two carbon pressure filters.

The opening meeting commenced at 12.30 pm at Carron WTP. The scope and purpose of the audit were outlined at the opening meeting. The audit process consisted of interviews with staff, review of records and observations made during an inspection of the treatment plant. The audits observations and recommendations are listed in Section 2 and 4 of this report. The following were in attendance during the audit.

Representing Irish Water:

Deirdre O'Loughlin- Compliance Specialist;

Representing the Local Authority:

Maeve Lait - Senior Executive Technician :

Maura McNulty - Executive Scientist:

John Strand - Engineer:

Roisin Breheny - Executive Technician:

Marin Carkhill - Caretaker:

Representing the Environmental Protection Agency:

Niall Dunne - Inspector:

Criona Doyle - Inspector.

2. AUDIT OBSERVATIONS

The audit process is a random sample on a particular day of a facility's operation. Where an observation or recommendation against a particular issue has not been reported, this should not be construed to mean that this issue is fully addressed.

1.	**Source Protection** a. Clare County Council (CCC) stated that two spring sources feed this supply and these sources are protected by fences and lockable covers. Only one source was visited during this audit. CCC stated that since the last audit no work has been undertaken on the springs. b. The current *Cryptosporidium* risk assessment is out of date due to the recent disinfection upgrade works. Irish Water (IW) committed to resubmitting an updated version to account for the upgrade to the UV disinfection system. c. CCC stated that all farmers in the area have been written to informing them of their obligation under the European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014.
2.	**Disinfection** a. There are duty and standby UV units with dial out alarms in place. The duty standby units are set to auto switch over every Monday at 9.01 am, CCC stated that the six minutes warm up period is allowed for. The UV units are validated to 19 W/m^2 UVI and 74.1 % UVT and are set to shut down or changeover between units at 19 W/m^2. The UVI reading at the time of the audit was 56.4 W/m^2 and the UVT was 96.21%, (raw UVT was 89.5%) which demonstrated that the UV system was operating within its validated range at the time of the audit. b. IW stated that it was currently not possible to view historic UV trends as the data logger was being

	configured. c. There are duty and standby chlorine dosing pumps with auto switch over in place. The dosing pumps are housed within a sealed unit. CCC stated that chlorine dosing is flow proportional. At the time of the audit the continuous chlorine monitor was not operational as it was also being commissioned. d. CCC stated that chlorine residuals are tested within the network four times a week and that the recorded readings at the end of the network were 0.35 mg/l, this is compared with 0.1 mg/l noted in the last audit. e. CCC confirmed the caretaker receives dial out alarms for low UVT, no flow and high turbidity, but as the chlorine alarm is not yet operational the caretaker does not receive low chlorine alarms. IW also confirmed that all alarm set points are yet to be finalised. IW stated that it should take approximately a month to complete the commissioning work on the UV and chlorine dosing system. f. IW stated that even though the disinfection systems have not yet been fully commissioned, they would still be able to gather and provide two months UVT/UVI data.
3.	**Filtration** a. There are two carbon pressure filters in place after the UV units; no reason was given why the filters were in this location. CCC stated that the filters are set to back wash automatically on a daily basis.
4.	**Monitoring and Sampling Programme for treated water** a. The turbidity reading on the final water was 0.158 NTU. b. CCC confirmed that four check and one audit sample are undertaken annually and that operational samples are undertaken monthly.
5.	**Monitoring and Sampling Programme for treated water** a. There were two *Cryptosporidium* detections in the final water; 0.24 oocysts / 10L on the 28/04/2016 and 0.06 oocysts / 10L on the 09/05/2016. This was prior to the UV disinfection upgrade works. Subsequent to these detections a boil water notice (BWN) was placed on this supply on the 04/05/2016 and rescinded on the 15/12/2016, once the UV disinfection upgrade works were complete.
6.	**Management and Control** a. CCC stated that the plant was set to auto shut off at 70% UVT of the combined raw water, and it was noted by the auditor that the UV unit was validated to a minimum of 74.1 %. UVT. The current shut off set-point is inadequate because it is below the validated range of the UV system and therefore there is a risk that inadequately disinfected water could enter into supply. b. It was observed during the audit that a water leak within the plant room was being repaired.

3. AUDITORS COMMENTS

Carron water treatment plant is on the RAL for treatment and management issues. Irish Water needs to ensure that all disinfection systems are fully commissioned and that the appropriate monitoring verification data is submitted to the EPA to support the removal of this supply from the RAL.

Irish Water should review the current sequence of treatment processes at the plant, in particular the use of filtration after disinfection, in order to ensure that treatment is fully optimised.

The audit found that a number of deficiencies identified during the previous EPA audit on 11/02/2016 have been addressed. At that time, the UV units were operating outside of their validated ranges and there was no automatic switch over between the duty and standby chlorine dosing pumps. Automatic switchover between the pumps has been installed and it was observed that the duty UV unit was operating within its validated range. Other issues previously identified were also addressed such as the UV units were now connected to a UVT monitor and auto switch over and UV dial out alarms are in place.

Commissioning works on the UV and the chlorine systems is ongoing. As a result it was not possible to view historical UVI/UVT results; but it was observed that the UV units were operating within their validated ranges. As the chlorine monitor was not operational, due to the commissioning works, it was not possible to view chlorine residual readings and the chlorine residual dial out alarm was also not functioning. IW must ensure that the commissioning works of the disinfection systems are expedited so that these issues can be rectified.

4. RECOMMENDATIONS

1. Irish Water should ensure that the UV disinfection system is fully commissioned and that UVT/UVI readings are logged on a recording device so that they can be viewed by staff on and off site.

2. Irish Water should ensure that the continuous chlorine residual monitor is;

    a. Commissioned so that residual chlorine readings are continually monitored, recorded and can be viewed on site;
    b. Linked to a dial out alarm with alarm limits set so as to give staff appropriate notice to implement appropriate remedial actions.

3. Irish Water should review the UVT shut off limits of the combined raw water, having regard to the validated operating range of the UV system, in order to ensure there is no risk of inadequately disinfected water entering into the distribution network.

4. Irish Water should confirm the alarm and shut off limits for the key parameters for the water treatment plant.

5. Irish Water should review the current sequence of treatment processes at the plant, in particular the use of filtration after disinfection, and reconfigure the processes as necessary to optimise treatment.

6. Irish Water should submit two months plant operational performance data in graph form (to include UVT/UVI, flow, turbidity and residual chlorine), to support the removal of the supply from the RAL.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

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. This report has been reviewed and approved by Ms Aoife Loughnane, Drinking Water Team Leader.

Irish Water should submit a report to the Agency within one month of the date of this audit report detailing how it has dealt with the issues of concern identified during this audit. The report should include details on the action taken and planned to address the various recommendations, including timeframe for commencement and completion of any planned work.

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.

Please quote the file reference number DW2015/210 in any future correspondence in relation to this Report.

Report prepared by:  **Date:** 12/04/2017

Inspector