Drinking Water Audit Report

County:	Carlow	**Date of Audit:**	28th April 2015
Plant(s) visited:	Hacketstown Water Treatment Plant 0100PUB1123	**Date of issue of Audit Report:**	2nd June 2015
		File Reference:	DW2014/324
		Auditors:	Ms. Ruth Barrington Ms. Michelle Roche
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*.		

MAIN FINDINGS

i. **Local landowners should be formally informed of the abstraction point and their obligations under the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)*.**
ii. **Disinfection control at the supply should be optimised by ensuring that automatic switchover is in place in the event of a low chlorine alarm.**

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. This audit was carried out in response to the notification of a pesticide exceedance in the supply and in response to the EPA being informed by Irish Water the ortho-phosphate dosing for the control of plumbosolvency was in place at the Hacketstown plant.

The Hacketstown public water supply serves 982 people across the town of Hacketstown and the village of Clonmore. Clonmore is located approximately 3.5km south of Hacketstown. The source of the supply is a single surface water abstraction from the Mill Race on the River Derneen. The Hacketstown Water Treatment Plant treats 380 to 400m^3 of water per day and is operational for 17 to 18 hours per day. The plant has been operated by EPS as part of the South Leinster Design Build Operate contract since 2010. Treatment of the Hacketstown water supply consists of the following processes:

- pH correction of the raw water with Soda Ash
- Coagulation with Aluminium Sulphate
- Clarification in a DAFF unit
- Disinfection with Sodium Hypochlorite

- Ortho-phosphate dosing for control of plumbosolvency in domestic distribution systems due to the age of the predominant housing stock.

Final water is stored in a single dual-celled reservoir with a capacity of approximately 1000m^3 which equates to a supply capacity of between 3 to 4 days.

As the Hacketstown supply is the only public water supply nationally to have an existing ortho-phosphate dosing system installed, Irish Water propose to include Hacketstown in a programme of lead sampling under a pilot project for Irish Water's National Lead Strategy. As such, a Lead Implementation Plan for Hacketstown has been drawn up by Irish Water and is due to be implemented by the end of June 2015.

Photographs taken by Michelle Roche during the audit are attached to this report and are referred to in the text where relevant.

The opening meeting commenced at 11.00am at Hacketstown Water Treatment Plant. 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 audit observations and recommendations are listed in Section 2 and 4 of this report.

The following were in attendance during the audit.

Representing Irish Water: (* indicates that person was also present for the closing meeting)
Ms. Deirdre McLoughlin – Compliance Analyst, Irish Water*
Mr. Bernard Sexton, EPS South Leinster Supervisor*
Mr. Eamon Wall – EPS Operations*
Mr. Ger O'Brien – Senior Executive Engineer Carlow County Council*
Mr. Brian Galvin DBO Lead South East, Irish Water*
Mr. Maurice O'Connell – Irish Water Strategy*
Representing the Environmental Protection Agency:
Ms. Ruth Barrington – Inspector*
Ms. Michelle Roche – 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. The raw water intake is located at the Mill Race on the River Derneen (Photograph 1). The intake is screened and the screen is fitted with a Hydroblast self-cleaning system which cleans the screen every 15 minutes. During the autumn months the Caretaker manually brushes fallen leaves off the intake screen. b. The land surrounding the source is agricultural land, with grazing being the predominant agricultural activity. Local landowners have not been written to with regard to the location of the water supply abstraction point and their obligations under the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014).* c. The raw water is continually monitored for turbidity, pH and colour and a manual check for colour is also carried out on a daily basis. d. The raw water feeds into an intake tank where it is subsequently pumped to the water

	treatment plant. The intake tank has a capacity of 75m^3 and can provide up to 2 hours storage.
2.	**Coagulation** a. Coagulation with Aluminium Sulphate was observed during the audit. Aluminium Sulphate is dosed from a bunded day tank. b. A slow mixing tank is in place to ensure the coagulant is effectively distributed before it enters the DAFF unit.
3.	**Filtration** a. Filtration at the Hacketstown Water treatment Plant occurs in a Dissolved Air Flotation Filtration (DAFF) unit. b. Removal of the sludge blanket from the top of the filter, by automatic scrapers, was observed during the audit. The sludge blanket was observed to be stable. c. Sludge removed from the DAFF is stored in a sludge storage tank and removed from site every 2 months by a licenced contractor.
4.	**Chlorination and Disinfection** a. Chlorine is dosed flow proportionately by a duty/standby pump arrangement with automatic switchover on pump failure. Chlorine residuals in the reservoir and network are automatically monitored and used to inform manual dose changes where necessary. b. The chlorine dosing point is on the DAFF outflow and from that point the treated water enters a clearwater tank with a calculated effective chlorine contact time of 28mg.min/l. The integrity of the clearwater tank was inspected towards the end of 2013. c. The plant has a low chlorine alarm of 1.0mg/l and a low low chlorine alarm of 0.2mg/l. The sampling point is located after the clearwater tank. The alarm dials out to the caretaker during office hours and a cascade system involving EPS staff is in place outside of office hours. d. Chlorine residuals in the network are sampled manually and recorded every two days.
5.	**Treated Water Storage and Distribution Network** a. Final water is stored in single dual-celled reservoir which has an in ground design (Photograph 2). The reservoir has a capacity of 1000m^3 and stores between 3 and 4 days water supply. b. The reservoir was cleaned in 2010. c. The reservoir is surrounded by agricultural land where grazing occurs. The reservoir is fenced off from grazing animals. d. The distribution network at Clonmore is scoured once a week and the remaining network is scoured every two weeks.
6.	**Exceedances of the Parametric Values** a. The parametric value for pesticides (individual) was exceeded on 12/08/14 and notified to the EPA on the 16/09/14. A concentration of 0.236 mg/l of 2,4-D, a common herbicide used for the control of broadleaved weeds, was detected. b. Catchment surveys and a schedule of monthly pesticide monitoring of the raw water and final water were implemented following the exceedance. c. During the audit it was stated that monthly pesticide monitoring had ceased since January 2015; however Irish Water advised that monthly monitoring would recommence after the audit and continue through to October 2015 as a minimum.
7.	**Management and Control** a. Hacketstown public water supply has been using ortho-phosphate dosing to respond to the

	presence of lead in the network since 2009. Hacketstown is included as a pilot project for the ortho-phosphate dosing element of Irish Water's National Lead Strategy. As such, a Lead Implementation Plan for Hacketstown has been drawn up by Irish Water and is due to be implemented for this supply by the end of June 2015. b. During the audit a review of the SCADA data noted that a low chlorine residual alarm was recorded on 29/03/15. The alarm dialled out to the EPS cascade system as it was outside of office hours; however no alarm response record was available for viewing on the day of the audit. An alarm response procedure was provided to the EPA after the audit and an account of how the alarm was responded to by EPS was given. c. Subsequent to the audit Irish Water confirmed that the alarm response procedure will be amended to ensure that all alarms are acknowledged, assessed and responded to as required and all alarms are logged and any corrective action taken is recorded formally and reported.

3. AUDITORS' COMMENTS

The Hacketstown water treatment plant was found to be well run and well managed. Work should be carried out in the catchment to ensure the source is protected from agricultural activities upstream, including writing to landowners in the catchment and informing them of their obligations under the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)* . Irish Water should optimise the chlorine dosing process to allow automated linked chlorine residual trim on the basis of monitoring after contact time. The disinfection process should be optimised to further minimise the reliance on manual input, particularly in relation to alarm responses. An alarm response procedure should be in place for all alarms and should include a system of documenting alarm response actions by both the Caretaker and EPS.

4. RECOMMENDATIONS

Source Protection

1. Irish Water should liaise with the relevant local authority in relation to the requirements of the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014)* to ensure, unless an alternative setback distance has been set as per Article 17 that:

   i. Organic fertiliser or soiled water is not applied to land within 200 m of the abstraction point; and
   ii. Farmyard manure held in a field prior to landspreading is not placed within 250 m of the abstraction point.

Disinfection

2. Irish Water should optimise the chlorine dosing process to allow automated SCADA linked residual trim on the basis of monitoring after contact time, rather than the current manual process augmenting flow proportional dosing.

Exceedences of the Parametric Values

3. Irish Water should follow the EPA Advice Note No. 13 Pesticides in Drinking Water in its investigation of the 2014 exceedance. In particular, the schedule of monthly pesticide monitoring should be continued until October 2015 at which point the necessity for further sampling will be reviewed by the EPA.

Management and Control

4. Irish Water shall use the findings of the Hacketstown Lead Implementation Plan to inform the ortho-phosphate dosing trial at the Hacketstown plant. The dosing shall be optimised for supply specific requirements with regard to, the information gathered on lead levels at the sample locations, water chemistry and the outcome(s) of the environmental assessments of the

impact of the ortho-phosphate dosing at the Hacketstown plant on the environment. Irish Water shall report to the EPA on the resultant actions to be taken for dosing control, the impact on compliance with the lead parametric value and the environmental impacts of ortho-phosphate dosing.

5. Irish Water should ensure that the existing alarm response procedures are amended to ensure that all alarms are acknowledged, assessed and responded to as required and all alarms are logged and any corrective action taken is recorded formally and reported.

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 Yvonne Doris, 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 in any future correspondence in relation to this Report.

Report prepared by:  **Date:** 2nd June 2015

Inspector

Photograph 1: Intake Screen

Photograph 2: Top of Reservoir