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

Name of Installation	South Kilkenny Environs PWS
Organisation	Irish Water
Scheme Code	1500PUB1020
County	Kilkenny
Site Visit Reference No.	SV20119

Report Detail

Issue Date	26/03/2020
Prepared By	Regina Campbell

Site Visit Detail

Date Of Inspection	18/02/2020	**Announced**	Yes
Time In	14:30	**Time Out**	16:45
EPA Inspector(s) **Additional Visitors**	Regina Campbell		
Company Personnel	Irish Water: Catherine Rice, Colin Cunningham, Kilkenny County Council: Eoin Molloy, David McArdle, John Ormond, Kevin Hogan, Andrew Flood		

Summary of Key Findings

1. There was one *Cryptosporidium* detection in the South Kilkenny Environs PWS in August 2017. There have been no further detections. Since the detection, Irish Water have installed turbidity monitors on each borehole and have established a programme of monitoring of the raw water. Raw water monitoring has shown the presence of *E. coli* on occasions in samples from boreholes K10, K4 and in the combined raw water from the three boreholes. This indicates that there is a source and pathway for faecal contamination of the borehole sources. There is no barrier to *Cryptosporidium* currently in place at the plant. Irish Water should identify the protozoal log treatment requirement for the groundwater sources serving South Kilkenny Environs PWS. If there is a log treatment deficit, Irish Water should identify how the protozoal compliance log deficit is to be addressed at the treatment plant.

2. The wellheads of boreholes K4 and K5 are not adequately sealed. There was standing water at the base of each borehole chamber. Irish Water should undertake any works necessary to ensure that the boreholes are sealed and protected in accordance with *EPA Drinking Water Advice Note 14: Borehole Construction and Wellhead Protection.*

Introduction

The South Kilkenny Environs Public Water Supply (PWS) produces 2,174 m3/day and supplies a population of 6,003 according to figures supplied by Irish Water. The source of the supply are three groundwater boreholes which are located near the village of Kilmacow. The water treatment plant was constructed in 2010. Treatment consists of chlorination and fluoridation only.

Supply Zones Areas Inspected

The audit included an inspection of the treatment processes at the plant. The three groundwater borehole compounds were also inspected.

1. Source Protection

		Answer
1.1	Is the abstraction source(s) adequately protected against contamination?	No

Comment

The supply is fed by three boreholes (K4, K5 and K10) which were installed in 2010. Irish Water have previously classified the supply as having a *Cryptosporidium* Risk score of 49 (Low Risk). Each borehole supplies 100 m3/hr. There is also a turbidity alarm of 0.8 NTU on the combined flow with a shutdown setpoint of 1 NTU. The combined turbidity of the raw water was 0.21 NTU on the day of the audit.

Each borehole is in a locked, fenced compound. However a portion of fencing had been removed at the K4 compound and so it is vulnerable to unauthorised entry. All of the borehole headworks are constructed approximately 1.5-2m below ground level in concrete chambers and are not easily accessible for inspection. The borehole heads of K4 and K5 are not sealed and the top of the PVC casing was visible. The well-head of borehole K10 from initial visual observation appeared to be adequately sealed. The bases of all of the borehole chambers contained standing water with water in K4 and K5 encroaching the unsealed wellheads. Water in the chambers is not draining away adequately. Service ducts going into K5 chamber were not sealed and may be a source of water ingress to the chamber.

All of the boreholes were surrounded by agricultural land and Kilkenny County Council could not confirm if relevant landowners had been written to in relation to the requirements of the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014).

Following a *Cryptosporidium* detection in the supply in 2017, Irish Water established a monitoring programme of the raw water. Continuous turbidity monitors were also installed on each individual borehole with a shutdown setpoint of 1 NTU. Currently, the combined raw water is being monitored fortnightly for coliforms/*E.coli*/turbidity and UVT and additionally well K10 is monitored monthly for the same parameters. There have been a number of detections of *E. coli* in the raw water from all three boreholes combined (7 detections), in borehole K10 (6 detections) and in borehole K4 (2 detections). This indicates that there is a pathway and source for faecal contamination of the borehole sources which may pose a risk to public health.

The EPA's EDEN system does not have the correct names of the boreholes in use recorded on it.

2. Disinfection

		Answer
2.1	Is the disinfection system verified using monitors and alarms, with trended data recorded and accessible?	Yes

Comment

The target residual chlorine dose is 1.2 mg/l in the final water leaving the treatment plant and there are high and low residual chlorine alarms in place.

		Answer
2.2	Are duty and standby chlorine pumps/ UV units in operation?	Yes

Comment

Duty and standby chlorine dosing pumps are in operation with automatic switchover in the event of a failure or breakdown. The pumps are rotated every 24 hours. Chlorine is dosed flow proportionally and based on residual trim.

		Answer
2.3	Is the residual chlorine monitored at a suitable sample location after contact time has been completed?	Yes

Comment

The residual chlorine is monitored after contact time has been achieved.

		Answer
2.4	Does the trend in chlorine residual at the treatment plant indicate adequate and stable levels of disinfection?	Yes

Comment

SCADA trends viewed at the plant showed adequate and stable levels of disinfection.

		Answer
2.5	Is there adequate chlorine contact time before the first connection?	Yes

Comment
The SCADA showed that the target chlorine contact time is 21.6 mg.min/l and the effective target contact time is 72.26 mg.min/l. The contact time calculation sheet at the plant did not reflect the current target residual chlorine dose and should be updated.

3. Reservoirs and Distribution Networks

		Answer
3.1	Are reservoirs adequately inspected and maintained?	Yes
	Comment	
	There are a series of reservoirs fed by the water treatment plant, the Belmount, Ballinvoher, Slieverue and Rockshire reservoirs. The reservoirs were cleaned in 2018.	

4. Treatment Process Chemicals

		Answer
4.1	Are chemicals appropriately produced/ approved and suitable for use in drinking water treatment?	No

Comment

Currently sodium hypochlorite 10-12% is used as the disinfectant. However the MSDS sheet available at the plant was for sodium hypochlorite 10-15% with Calgon and there was no MSDS sheet available on the day for the current disinfectant used. There was no expiry date or PCS number available for the disinfectant batch at the plant.

5. Management and Control

		Answer
5.1	Are relevant alarms dialled out via a cascade system to allow a timely response by plant operators?	Yes
	Comment	
	There are three people on the alarm cascade system.	

6. Drinking Water Quality

		Answer
6.1	Have failures of the parametric values or the detection of pathogenic micro-organisms or parasites in the water supply been adequately investigated?	Yes

Comment

There was one *Cryptosporidium* detection (0.005/10 L) on 15/08/2017 notified to the EPA. This detection was also notified to the HSE and it advised that three rounds of *Cryptosporidium* monitoring along with microbiological sampling take place which gave no further detections. The supply is monitored in accordance with Irish Water's *Rationale for Determining the frequency of Cryptosporidium Monitoring in Public Water Supplies*. There have been no failures for *E. coli* in the treated water notified to the EPA.

Recommendations

Subject	South Kilkenny Environs PWS Audit Recommendations	Due Date	26/04/2020

Action Text

Recommendations

1. Irish Water should identify the protozoal log treatment requirement for the groundwater sources serving the South Kilkenny PWS. If there is a log treatment deficit, Irish Water should identify measures to address the log deficit.

2. Irish Water should undertake a full inspection of each borehole compound and well-head and undertake any works necessary to ensure that boreholes K4, K5 and K10 are constructed, sealed and protected in accordance with EPA *Drinking Water Advice Note No. 14: Borehole Construction and Wellhead Protection*. It should be ensured that all service ducts into each chamber are effectively sealed, that each chamber has a watertight lid and that there is a drain to ensure that any leaks or drips can drain away.

3. Irish Water should liaise with Kilkenny County Council and confirm that all relevant landowners have been written to in relation to the requirements of the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (S.I. No. 31 of 2014).

4. Irish Water should continue to monitor the supply in accordance with Irish Water's *Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Water Supplies*.

5. Irish Water should repair the damaged security fencing at borehole K4 compound.

6. Irish Water should continue to carry out monitoring of the raw water sources (including monitoring of *E.coli*) as an indicator of assessing trends in raw water quality and undertake an investigation into any occurrences of *E.coli* in a borehole sample or in a combined raw water sample.

7. Irish Water should update EDEN with the names of the current boreholes for the supply.

8. Irish Water should update the contact time calculation sheet at the water treatment plant to reflect the current target residual chlorine dose.

9. Irish Water should ensure that a) the MSDS sheet for the current disinfectant is maintained on-site, and b) that the disinfectant used at the plant is approved for use under the Biocidal Products Regulation.

10. Irish Water should put a system in place to ensure stocks of sodium hypochlorite on-site are regularly checked to see if they are in date.

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 Dr. Michelle Minihan, Senior Inspector, Drinking Water Team Leader.

Irish Water should submit a report to the Agency on or before 26/04/2020 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 time frame 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 Action Reference Number DW2017/127 in any future correspondence in relation to this Report.