Drinking Water Audit Report

County:	Clare	**Date of Audit:**	16/10/2015
Plant(s) visited:	Shannon / Sixmilebridge Supply	**Date of issue of Audit Report:**	20/11/2015
		File Reference:	DW2014/375
		Auditors:	Mr Niall Dunne
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.* • The recommendations in any previous audit reports.		

MAIN FINDINGS

i. **In 2015 there were two pesticide exceedances on this supply. Irish Water should continue to monitor for pesticides, especially during the periods of high usage from April to October and these results should be submitted to the EPA on a bimonthly basis. Irish Water should put remedial measures in place to ensure that there are no further pesticide exceedances on this supply.**

ii. **The last THM exceedance on this supply was in 2014. However, on review of historical monitoring results it was observed that THM levels have approached the exceedance levels, 98 ug/l on the 13/07/2015. Irish Water should review the efficiency of the treatment plant in the removal of THM pre-cursors, and should put a scheduled preventative network scouring programme in place to prevent THM exceedance on this supply.**

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 to assess the performance of Irish Water in providing clean and wholesome drinking water.

The Shannon/Sixmilebridge PWS is a supply fed by surface water from Castle Lake. The supply produces approximately 13,500 m^3/day and serves approximately 16,000 people in Shannon Industrial Estate and Town, Sixmilebridge, Kilmurry, Kilkishen, Quin, Cratloe, Bunratty and Newmarket-on-Fergus. The surface water is treated at the plant in two streams (old and new) that run in parallel through the treatment process. Treatment is as follows; coagulation using aluminium sulphate, clarification, rapid gravity filtration, chlorination using sodium hypochlorite, fluoridation, soda ash pH correction and powder activated carbon.

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

The opening meeting commenced at 10:30 at Sixmilebridge 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: (* indicates that person was also present for the closing meeting)
Ms Deirdre O'Loughlin, Compliance Specialist, Irish Water.
Mr Kevin Murphy, Water Engineer, Irish Water.
Mr Anthony McNamara, Senior Executive Engineer, Clare County Council.
Mr Tom Mellet, Executive Engineer, Clare County Council.
Ms Maeve Lait, Senior Exc. Technician, Clare County Council.
Ms Patricia Ryan, Senior Exc. Technician, Clare County Council.
Mr Eugene Maloney, Caretaker, Clare County Council.
Representing the Environmental Protection Agency:
Niall Dunne, 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 algal blooms are not an issue in the lake source and PAC (Powered Activated Carbon) is dosed annually from April – October as a precautionary measure. b. CCC confirmed they have written to farmers within the catchment re pesticides and that catchment surveys are carried out every second month. c. CCC stated that the Crypto risk assessment is deemed low, with a risk score of 40.6.
2.	**Coagulation, Flocculation and Clarification** a. According to CCC aluminium sulphate is dosed at a rate of 150 – 160 mg/l and poly is dosed to a concentration of 0.16%. CCC confirmed that there is no auto switch over between the duty and standby chemical dosing pumps, there is manually switch over only. CCC also confirmed that the alum dosing pumps are not alarmed but the poly dosing is alarmed, in the event of pump failure. b. It was observed that the clarifiers were well maintained. There was no evidence of pin floc in the clarifiers. CCC stated that the lamella plates are cleaned approximately every 3 months and the decanting channels daily. c. The sludge bleeds are set to run for 40 seconds every five minutes.
3.	**Filtration** a. The sand within the filter was last changed in 2010, at the time of the audit it was scheduled to be changed in November 2015. There were no sand level indicators located within the rapid gravity filters. b. PAC is dosed, at 3 mg/l, prior to the rapid gravity filter (RGF). a. The backwash sequence is set at 6 minutes air followed by 6 minutes water. The filters are allowed to settle for 15 minutes prior to being brought back into service. The filters are washed every 24 hours. Backwash water is sent to an onsite lagoon. b. It was noted on SCADA that there are slight elevations in turbidity levels once the filters are brought back into service after backwashing, (see photograph 1).

4.	**Chlorination and Disinfection** a. Duty standby chlorine dosing pumps with automatic switch over were in place. CCC stated that they manually switch over between the pumps once a month. b. CCC stated that the chlorine levels are checked within the network once a month, and every second month within Shannon Industrial Estate. CCC also stated that a caretaker located in Newmarket on Fergus checks chlorine levels daily. c. There are two booster chlorination points within the network. One at Barnhill, the other at Clonmoney. On the day of the audit CCC stated that there were duty standby dosing pumps at Barnhill and Clonmoney and these were not alarmed. (In subsequence correspondence on the 13/11/2015, CCC/ IW stated that these booster chlorine stations were alarmed). d. A chlorine reading taken on the day returned a result of 1.38 mg/l and 1.5 mg/l; free and total respectively. The reading on the chlorine monitor was 1.17 mg/l.
5.	**Treated Water Storage and Distribution Network** a. CCC stated that the scouring program within the network is carried out on an as needed basis.
6.	**Monitoring and Sampling Programme for treated water** a. CCC confirmed that *Cryptosporidium* samples are taken at the plant every second month. b. It was noted on SCADA that the turbidity alarms are set at 0.4 NTU, (see photograph 2), however documentation noted on site stated that turbidity alarms are set at 0.6 NTU, (see photograph 3). c. Turbidity readings on the day of the audit were observed to range from 0.14 NTU – 0.2 NTU.
7.	**Exceedances of the Parametric Values** a. There have been two MCPA exceedances on this supply in 2015, 0.111ug/l in August and 0.123 ug/l in September. b. The most recent THM exceedance on 03/11/2014 was 106 ug/l. According to CCC this was following network scouring which had been undertaken two weeks previous. c. On observation of monitoring results, it was noted that values above 90 ug/l have been recorded within the network, 98 ug/l on the 13/07/2015.
8.	**Chemical storage and bunds** a. At the fill point on the bulk chlorine storage tank, it was observed that there was not a proper spill tray in place, (see photograph 4).
9.	**Hygiene and Housekeeping** a. The standard of housekeeping at the plant was good, certain areas need attention. In the alum dosing chamber there was no floor or sump and standing water was observed in the base of the chamber, (see photograph 5), algae was observed in the alum spill trays (see photograph 6).
10.	**Management and Control** c. There is a SCADA system on site but it is not accessible remotely. d. The booster chlorination stations can be viewed remotely online.

3. AUDITORS COMMENTS

There have been two pesticide exceedances within this supply in 2015, 0.111ug/l in August and 0.123 ug/l in September. Clare County Council monitor for pesticides within the raw and treated water. IW should continue to monitoring for pesticides on a monthly basis during the main periods of usage; April to October and should submit these monitoring results bi-monthly to the EPA in 2016.

The last THM exceedance on this supply was on the 03/11/2014. Even though samples taken since the exceedance have been in compliance, it was noted from monitoring results that recent samples have been close to the exceedance limit, 98 ug/l on the 13/July 2015. To prevent further THM exceedances Irish Water should review the operation of the treatment plant to assess its efficiency in the removal of THM precursors and should develop a targeted network scouring programme.

Irish Water should clarify to the EPA whether the duty stand pumps at the booster chlorination points are alarmed.

This is a well-managed treatment plant. All equipment was calibrated and appropriate calibration stickers were in place, all appropriate documentation was on site.

4. RECOMMENDATIONS

Filtration (General)

1. Irish Water should review the alarm settings of 0.4 NTU on the turbidity monitors after the filters to ensure that the caretaker is given adequate time to respond to elevated turbidity readings.

2. Irish Water should undertake a review of the elevated turbidity readings detected when the rapid gravity filters are brought back into service following backwash. Irish Water should put measures in place to rectify this.

3. Irish Water should ensure that the sand within the filters is replaced as scheduled.

Disinfection

4. Irish Water should confirm whether the duty standby booster chlorination pumps are alarmed.

Exceedences of the Parametric Values

5. Irish Water should carry out a pesticide monitoring programme during the months of April and October, and should submit the monitoring results to the EPA on a bi monthly basis.

6. Irish Water should submit proposals with timeframes for the upgrade of the treatment plant to adequately treat pesticides to ensure compliance with the 2014 Drinking Water Standards.

7. Irish Water should investigate the effectiveness of the treatment plant in the removal of THM precursors.

8. Irish Water should instigate a flushing and scouring programme to inhibit the formations of THMs within the network.

Management and Control

9. Irish Water should install automatic switch over between the chemical dosing pumps, and ensure that the pumps are alarmed in the event of pump failure.

10. Irish Water should ensure that proper spill trays are located on all bulk storage fill points.

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.

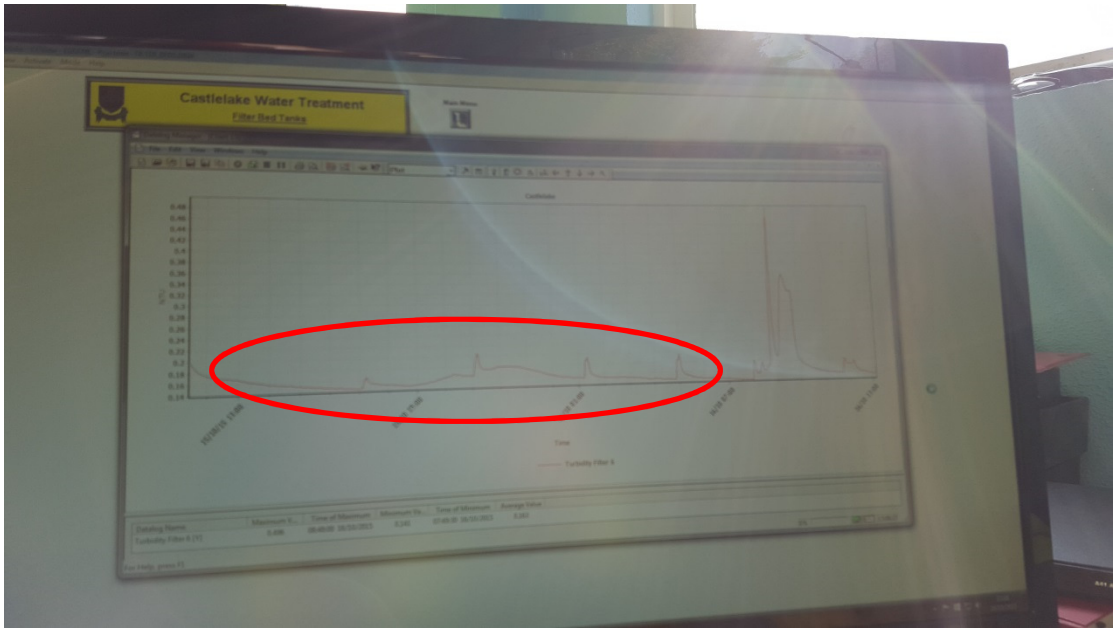
Please quote the File Reference Number DW2014/375 in any future correspondence in relation to this Report.

Report prepared by: Date: 20/11/2015

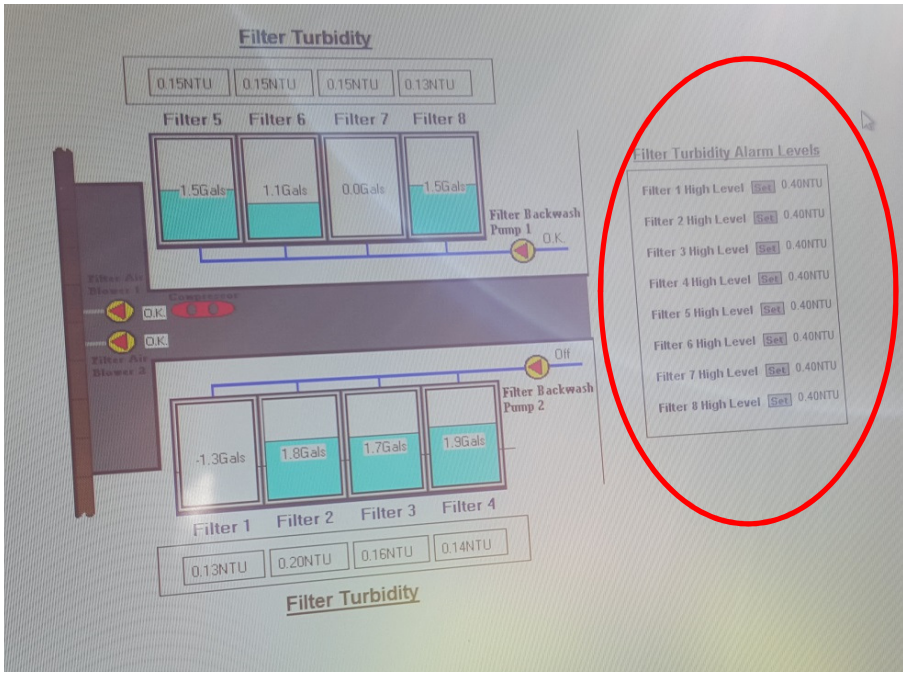
Niall Dunne

Inspector

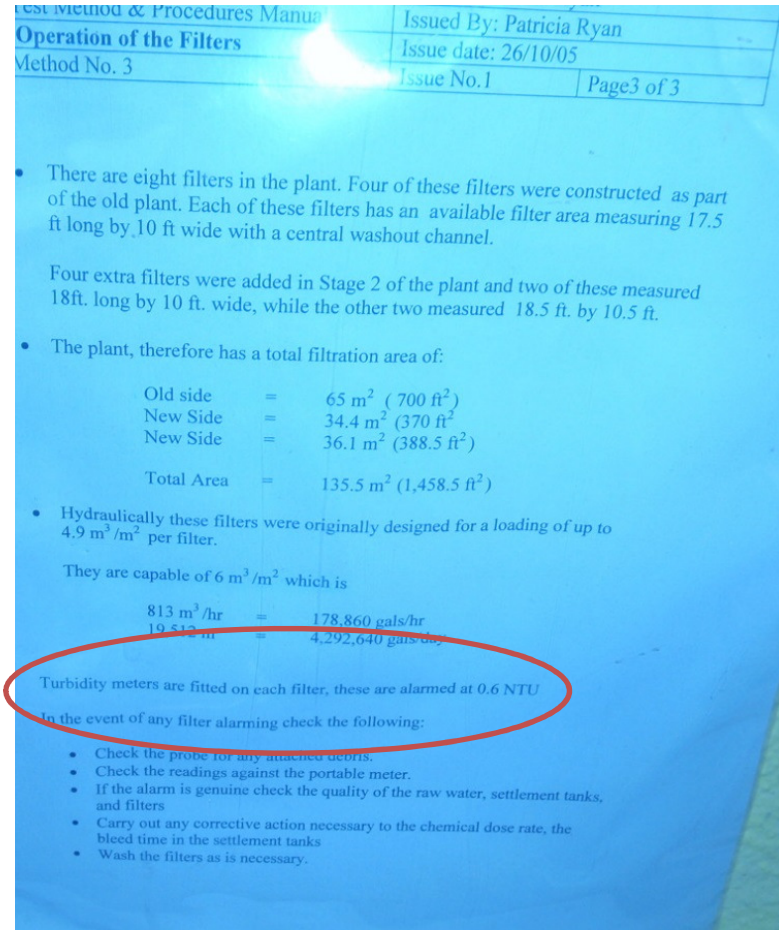
Photograph 1: Slight spikes in the turbidity readings noted after backwash.



Photograph 2: Turbidity alarms set at 0.4NTU



Photograph 3: On site documentation showing alarms set at 0.6 NTU.



Photograph 4: Inappropriate spill tray on bulk storage tank.

Photograph 5: No finished floor or sump within chamber, standing water observed.

Photograph 6: Algae within spill chamber.