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	Swanlinbar PWS
Organisation	Irish Water
Scheme Code	0200PUB0117
County	Cavan
Site Visit Reference No.	SV20697

Report Detail

Issue Date	10/11/2020
Prepared By	Michelle Roche

Site Visit Detail

Date Of Inspection	19/10/2020	**Announced**	No
Time In	10:30	**Time Out**	12:30
EPA Inspector(s) **Additional Visitors**	Michelle Roche		
Company Personnel	Irish Water: Pat O'Sullivan, Pat Collins, Peter Gallagher, Yvonne McMonagle Cavan County Council: Gary Boyd, Vincent Craig, Raymond Warrington, Emma Breiden, Kevin O'Neill, Regina Burke		

Summary of Key Findings

1. Irish Water have upgraded the Swanlinbar water treatment plant in line with the Remedial Action List action programme and the requirements of the EPA Direction issued on 18/12/19.

2. Irish Water have improved the management and control of Swanlinbar water treatment plant with appropriate alarms and shutdowns in place, to ensure compliant drinking water at all times. Cavan County Council (Cavan CC) operational staff have also received training in the operation of all upgraded equipment and in incident response and escalation.

3. Based on the audit findings, Swanlinbar public water supply was removed from the EPA's Remedial Action List in the Q3 2020 update published to the EPA website on 30/10/20.

Introduction

The Swanlinbar public water supply serves approximately 301 people in County Cavan. The raw water is from a spring source and treatmemt at the plant consists of pH correction, coagulation, flocculation, clarification, filtration, disinfection with sodium hypochlorite and final water pH correction.

The Swanlinbar supply has been on the EPA's Remedial Action List (RAL) since July 2019 due to 'EPA Audit Observations - Treatment & Management Issues'. An audit carried out in July 2019 found there was very poor management and control of the treatment processes at Swanlinbar water treatment plant. The EPA also issued a Direction to Irish Water on 18/12/19 under Regulation 16 of the European Union(Drinking Water) Regulations 2014 as amended, directing them to complete a number of treatment upgrades at Swanlinbar water treatment plant and to ensure appropriate critical alarms and automatic shutdowns are in place.

The purpose of the audit was to verify if the Swanlinbar public water supply could be removed from the RAL following the completion of treatment upgrades and installation of critical alarms and automatic shutdowns, and to assess Irish Water's compliance with the EPA Direction.

Supply Zones Areas Inspected

The audit consisted of a video conference with Irish Water and Cavan CC staff on 19/10/20. The Swanlinbar water treatment plant was not visited during the audit due to Covid-19 travel restrictions. A virtual tour of the water treatment plant was facilitated by Cavan CC on 21/10/20 using a camera phone.

The audit assessed each step of the water treatment process including associated alarm and automatic shutdown set-points and process verification data from continuous online monitors. Final water quality data from both continuous online monitors and manual daily sampling was also assessed.

1. Source Protection

		Answer
1.1	Is the abstraction source(s) adequately protected against contamination?	Yes

Comment

Online continuous monitors are in place on the raw water to measure pH, turbidity and UVT. There is a raw water turbidity alarm and a new run to waste facility in place if raw water turbidity goes above 10 NTU. The supply has capacity to run to waste for approximately 30 hours, which improves the resilience of the water treatment plant to deal with periods of poor raw water quality.

2. Coagulation Clarification Flocculation (CFC) Stage

		Answer
2.1	Is the pH within a suitable range for the coagulant used?	Yes

Comment

Soda ash is dosed on the raw water to ensure a pre-coagulation pH of between 6.0 and 6.5. There is a flocculation meter on the inlet to the clarifier which feeds back to the soda ash dosing pumps, ensuring that the pre-coagulation pH is maintained. The flocculation meter is also alarmed at a low of 6.0 and a high of 6.5 pH units and associated shutdowns are in place.

Maintaining a steady pre-coagulation pH means that the coagulant dose can be manually fixed by the plant operator, and effective coagulation should be maintained. A pH and coagulant dosing matrix is due to be complete in the next few weeks.

		Answer
2.2	Are the CFC processes appropriately controlled?	Yes

Comment

Aluminium sulphate is dosed at a fixed rate with duty/standby dosing pumps prior to a static mixer, and 1% polyacrylamide is dosed as water enters the clarifier. There is a flocculation pH meter in place on the inlet to the clarifier and a post-clarification turbidity meter in place at the outlet of the clarifier. The flocculation pH meter is alarmed to shutdown at a low of 6.0 and a high of 6.5 pH units, and the clarifier turbidity meter is alarmed to shutdown at a turbidity greater than 4 NTU.

Automatic sludge bleeds occur every twenty minutes for 3 minutes at a time. The bleed valve is alarmed in the event that it fails to open, and there are regular inspections of the sludge bleeds.

		Answer
2.3	Were the CFC tanks, channels and weirs observed to be clean, level and well maintained during the audit?	Yes

Comment

A virtual inspection of the clarifier was facilitated by Cavan CC staff and the tank and channels appeared to be clean. A viewing platform has been installed across the clarifier and filter since the previous audit in July 2019.

3. Filtration

		Answer
3.1	Does monitoring indicate that the filters are operating effectively?	Yes

Comment

The filter is operated to a final filter turbidity of 0.3 NTU to provide Log 3 removal of protozoa. All filtered water results examined during the audit were below 0.3 NTU. If filtered water turbidity goes above 0.3 NTU a filter backwash is automatically initiated.

Filter sand was replaced 2 years ago, however there is no regular checks in place for filter media depth to ensure the minimum recommended filter media depth is maintained. The EPA recommended filter sand depth was 800mm in the 1995 EPA Water Treatment Manual: Filtration, however the recommended filter sand depth is 1000 to 1200mm in the revised EPA Filtration Manual (due to be published soon).

4. Disinfection

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

Comment

Sodium hypochlorite is dosed flow proportionally by a duty/standby dosing arrangement with automatic switchover between the pumps. Disinfection is verified using the chlorine residual monitor at the outlet of the contact tank. The target chlorine residual at the outlet of the contact tank is 1.1mg/l in accordance with the contact time calculation, however the low chlorine alarm is currently set at 0.95 mg/l. Chlorine residual readings examined during the audit for the month of September and October were all above 1.1mg/l and had an average of approximately 1.4mg/l.

A high chlorine alarm of 2.1mg/l is in place and plant shutdown set-points of 0.8mg/l and 2.3mg/l are also in place.

		Answer
4.2	Is there a chlorine residual ≥0.1 mg/l throughout the network?	Yes

Comment

Network chlorine residuals are taken every 4-5 days and results for August, September and October were examined during the audit. There was one low chlorine residual, below 0.1mg/l, recorded on 31st August 2020. Irish Water were able to demonstrate at the audit that the appropriate incident response procedure was followed. The Caretaker contacted the Water Services Lead for the area, the location was flushed and resampled, and the resample result showed a satisfactory chlorine residual above 0.1mg/l.

5. Supply on the Remedial Action List

		Answer
5.1	Is the Action Programme on track to meet the Remedial Action List completion date?	Yes

Comment

The RAL action programme, and the EPA Direction issued on 18/12/19, required the upgrade of Swanlinbar public water supply and the installation of appropriate critical alarms and automatic shutdowns by 30/09/20. The audit found that the RAL completion date and Direction completion date were met by Irish Water.

The audit verified that the following upgrade works were completed by Irish Water:

- Raw water run to waste if raw water quality deteriorates. The run to waste is triggered if raw water turbidity goes above 10 NTU.
- Adequate pH correction prior to coagulation.A flocculation pH meter before the clarifier with alarm and shutdown setpoints.
- A post-clarifier turbidity monitor with an alarm and shut-down setpoint.
- New clearwater tank to provide increased backwash water capacity, ensuring the filter is adequately backwashed and brought back in to service based on a turbidity of 0.3NTU.
- Automation of the backwash procedure and installation of a backwash trigger if filtered water turbidity goes above 0.3NTU.
- A new contact tank and chlorine residual monitor on the outlet of the tank, with alarm and shutdown setpoints, to verify adequate contact time.

Cavan CC operational staff have also received training in the operation of all upgraded equipment and in incident response and escalation.

Recommendations

Subject	Swanlinbar Audit Recommendations	Due Date	10/12/2020
Action Text	**Recommendation(s)** 1. Irish Water should complete and implement the pH and coagulant dosing matrix to ensure effective coagulation is maintained during variations in raw water quality at Swanlinbar water treatment plant. 2. Irish water should ensure that filter media depth in the rapid gravity filter is regularly checked to ensure between 1000 to 1200 mm media depth above the support gravel. 3. Irish Water should adjust the low chlorine residual alarm setpoint at the outlet of the contact tank to ensure effective contact time can be accurately verified as per the contact time calculation. **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 Aoife Loughnane, Drinking Water Team Leader. Irish Water should confirm to the Agency on or before 10th December 2020 that the recommendations identified during this audit have been addressed. 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 DW20200247 in any future correspondence in relation to this Report.		