

Drinking Water Audit Report

County:	Co. Monaghan	Date of Audit:	16 th December 2014
Plant(s) visited:	Carrickmacross PWS and borehole abstractions at Nafferty, Spring Lake, Monanny and Donaghmoynne	Date of issue of Audit Report:	30 th December 2014
		File Reference:	DW2009/54
		Auditors:	Ms Ruth Barrington Ms Aoife Loughnane
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014)</i>. • The <i>EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies (ISBN: 978-1-84095-349-7)</i> • The recommendations specified in the EPA Report on <i>The Provision and Quality of Drinking Water in Ireland</i>. • The recommendations in the previous EPA audit report dated 03/08/2012. 		

MAIN FINDINGS

- i. The newly developed boreholes, plant, rising main and reservoir are all now in place, with the plant having been commissioned in November 2014.
- ii. The supply is on the Remedial Action List (RAL) due to HSE concerns and the lack of a *Cryptosporidium* barrier. Irish Water should consult with the HSE to obtain agreement on proposing the removal of the supply from the RAL, now that the barrier has been provided.

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 following the development and commissioning of the new plant and abstraction sources for the Carrickmacross PWS.

Where the text of this report refers to the Water Service Authority this refers to Irish Water in accordance with Section 7 of the Water Services (No. 2) Act 2013.

Carrickmacross PWS serves a population of approximately 5,400 in the town and environs of Carrickmacross PWS. The supply is on the Remedial Action List and until the new plant was built, had no barrier to *Cryptosporidium* entering the drinking water. The new plant is a DBO with the contractor being Veolia. Treatment comprises coagulation, flocculation, filtration, and disinfection utilising UV followed by chlorination.

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

The opening meeting commenced at 10.30 a.m. at Carrickmacross 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)

Mr Vincent McKenna – Senior Resident Engineer, Carrickmacross DBO (Monaghan County Council)

Mr Matthew Lambe- Assistant Engineer (Monaghan County Council)

Mr Pascal Rooney – Senior Executive Technician (Monaghan County Council)

Ms Cara Guilfoyle – Process Engineer (Veolia)

Mr Mark Rooney – Plant Manager (Veolia)

Ms Anne Bonner – Compliance Specialist (Irish Water)

Ms Louise Brennan – Water and Wastewater Compliance Monitor Liaison Analyst (Irish Water)

Mr Martin Temple – Water and Wastewater Engineer (Irish Water)

Representing the Environmental Protection Agency:

Ms Ruth Barrington – Inspector

Ms Aoife Loughnane – 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.	<p>Source Protection</p> <ol style="list-style-type: none"> a. Abstraction for the supply is from a range of boreholes located at four separate sites, Monanny, Nafferty, Spring Lake and Donaghmoyne. The boreholes are situated in secure locked compounds b. Wellhead construction and protection at each borehole is suitable. The exceptions are Monanny Borehole 1 and Nafferty Borehole 2 (refer to photographs 008.jpg, 010.jpg and 019.jpg). These boreholes were being used in supply during the construction/commissioning phase and in case of emergency supply being required at that time. Improvement works are planned for both the boreholes. c. There is a trial borehole drilled at Monanny which has been capped but not decommissioned (refer to photograph 009.jpg). d. Information has been made available to indicate that agricultural land users within the relevant setback distances have been advised of their responsibilities under the <i>European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014</i> (S.I. 31 of 2014). e. There are other landusers in the vicinity of some of the boreholes whose activities may have an impact on water quality, for example adjacent to Donaghmoyne there is a golf course and furniture making business. It was not clear whether these neighbours have been advised of the drinking water abstraction or whether any risk posed by their activities has been assessed. f. The <i>Cryptosporidium</i> risk assessment has been revised to consider the new abstractions and range of treatment provided, and has now been assessed as Low Risk.
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2.	<p>Coagulation, Flocculation and Clarification</p> <ul style="list-style-type: none"> a. There is provision through a separate dosing system for pre-chlorination to control iron and manganese. This has not been used to date as the raw water levels have been favourable. b. Coagulation is carried out using PAC.
3.	<p>Filtration</p> <ul style="list-style-type: none"> a. There are three multi-media filters in place at the plant, of which two are in operation at present. The third will allow future expansion of the plant from the current throughput of 160 m³/h to the full design capacity of 240 m³/h. b. The filters are run to waste for 10 minutes following backwashing. c. Continuous turbidity monitoring is provided at the raw water, the outlet of each filter and on the final treated water. d. Treated water turbidity for the period assessed (end October 2014 to early December 2014) was satisfactory, at levels between 0.08 NTU and 0.09 NTU.
4.	<p>Chlorination and Disinfection</p> <ul style="list-style-type: none"> a. Duty and standby chlorination dosing is provided on a flow proportional basis with automatic switchover. The disinfectant is liquid sodium hypochlorite. b. The chlorine contact time provided is adequate. The auditor noted that the Ct calculation includes provision for a “chlorine residual measured at sample point” of 0.046 mg/l, which would not meet the required 0.1 mg/l at the end of the network. c. A duty UV system, manufacturer Aquafides with DVGW validation certificate, is provided as a barrier to <i>Cryptosporidium</i>. While a duty only unit is installed, the plant is set to automatically shutdown in the event of out of validation UVT/UVI results. d. The chlorination and UV systems are alarmed to SCADA and to Veolia staff phones (for response on a 24/7 basis). e. The information required under the <i>European Union (Biocidal Products) Regulations of 2013</i> was not available during the audit.
5.	<p>Treated Water Storage</p> <ul style="list-style-type: none"> a. A new reservoir has been provided as part of the contract. It is located at the treatment plant and has been constructed with two cells to allow for reservoir cleaning. b. At current levels of demand, approximately two days’ storage is provided by the reservoir capacity.
6.	<p>Chemical storage and bunds</p> <ul style="list-style-type: none"> a. New bulk tanks and bunds have been provided as part of the contract. The auditors noted that the fill points for the bulk tanks are located outside the bunded areas (refer to photographs 036.jpg and 037.jpg). b. The bulk tanks and bunds are located outside in an unroofed area open to rainfall, which if not maintained properly will impact on the degree of containment provided.
7.	<p>Management and Control</p> <ul style="list-style-type: none"> a. The auditors note that a number of alarm settings will shut down the plant to prevent incompletely treated water entering supply. Such settings have been placed on low residual chlorine, out of validation UVI/UVT and high turbidity. The chlorine alarm setting is currently at 0.2 mg/l, however it was not clear whether a chlorine residual at that concentration is sufficient to provide the required 0.1 mg/l at the end of the network.
8.	<p>Monitoring and Sampling Programmes</p>

	a. The <i>Cryptosporidium</i> monthly sampling regime remains in place on the supply, but should be re-assessed since the UV and plant commissioning is complete.
9.	<p>Sludge Management</p> <p>a. The backwash supernatant discharge point at Nafferty was visited as part of the audit. It was noted that the water immediately around the discharge pipe was slightly milky in colour and the mud was cracked (refer to photograph 021.jpg) as though some polyelectrolyte (which is used in the sludge settlement) had carried over.</p>

3. AUDITORS' COMMENTS

The auditors welcomed the commissioning of this new plant. With the proper on-going operation and maintenance, it should continue to provide a safe supply of drinking water to the Carrickmacross PWS.

4. RECOMMENDATIONS

Remedial Action List

1. Irish Water should consult with the HSE to obtain agreement for a proposal to remove the scheme from the RAL. The outcome of this consultation should be reported to the EPA along with any such proposal.

Source Protection

2. Irish Water should ensure that risks to the abstraction sources are identified and suitable measures put in place to ensure the security of the supply. Activities in the catchment that may be relevant include pesticide usage on the golf course adjacent to Donaghmoynne boreholes and in agricultural use, and business activities such as that close to Donaghmoynne boreholes.
3. Irish Water should ensure that the planned works are carried out on borehole housing and capping at Monanny Borehole 1 and Nafferty Borehole 2 to protect them against contamination, ingress of rainwater and/or vandalism.
4. Irish Water should ensure that any trial wells, such as the one at Monanny, are decommissioned appropriately to avoid any contamination source entering the aquifer through these points.

Chlorination and Disinfection

5. Irish Water should ensure that the chlorine alarm settings are reviewed to ensure that the required 0.1 mg/l minimum level is achieved at all stages in the network. This should also be considered as relevant in assessing the Ct, which while adequate even at low chlorine levels, will not maintain an adequate residual in the network.
6. Irish Water should review the use of disinfectants in the Carrickmacross PWS and all other public water supplies to ensure that all disinfectants are authorised in accordance with the EU Biocides Products Regulation (528/2012) and associated Irish Regulations, *European Union (Biocidal Products) Regulations, 2013*.

Chemical Storage and Bunds

7. Irish Water should ensure that chemicals are stored in banded areas, having regard to the EPA guidance document "*IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities*". Banded areas should be capable of containing at least 110% of the volume of chemicals stored therein, and fill points for storage tanks inside the bunds should be within the banded area.

Monitoring and Sampling Programmes

8. Irish Water should review the *Cryptosporidium* monitoring programme in light of the commissioning of a treatment plant incorporating *Cryptosporidium* barriers.

Sludge Management

9. Irish Water should ensure that the backwash supernatant discharge point is added to the inspection log checklist undertaken by Veolia staff. Any change in the appearance of the water as discharged which may indicate contamination should be investigated and reported as part of Veolia's contracted reporting system.

FOLLOW-UP ACTIONS REQUIRED BY IRISH WATER

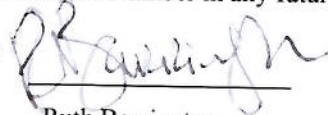
During the audit the Water Services Authority representatives were advised of the audit findings and that action must be taken as a priority by the Water Services Authority to address the issues raised. This report has been reviewed and approved by Mr Darragh Page, Drinking Water Team Leader.

The Water Services Authority 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:



Ruth Barrington

Inspector

Date:

30th December 2014



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