Drinking Water Audit Report

County:	Roscommon	**Date of Audit:**	13/12/2017
Plant(s) visited:	Grange Lough Water Treatment Plant (NERWSS) Scheme Code 2600PUB1030	**Date of issue of Audit Report:**	21/12/2017
		File Reference:	DW2009/373
		Auditors:	Ms Ruth Barrington
Audit Criteria:	• The *European Union (Drinking Water) Regulations 2014 (S.I. 122 of 2014) (as amended)*. • The recommendations specified in the EPA *Drinking Water Report*. • EPA Drinking Water Advice Notes Nos. 1 to 15. • The recommendations in the previous EPA audit report dated 04/10/2016.		

MAIN FINDINGS

i. **Irish Water has demonstrated that the new Grange Lough water treatment plant is operating satisfactorily and producing water which complies with the requirements of the *European Union (Drinking Water) Regulations 2014 (as amended)*. On this basis, North East Roscommon Regional Water Supply Scheme (NERWSS) will be removed from the EPA's Remedial Action List when the Q4 RAL update is published.**

ii. **Grange Lough water treatment plant incorporates validated barriers to *Cryptosporidium* entering the water supply, and has been optimised for removal of trihalomethanes (THM) precursors.**

1. INTRODUCTION

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 drinking water following the completion of works at the new Grange Lough water treatment plant for the North East Roscommon Regional Water supply.

The North East Roscommon Regional Water Supply Scheme (NERWSS) supplies a population of 7791 with a volume of 4119 m^3/day. The supply is on the EPA's Remedial Action List (RAL) due to THM exceedances, and historically due to inadequate treatment to remove *Cryptosporiodium*. The new treatment plant replaces an interim solution to provide a barrier to *Cryptosporidium* put in place at the old treatment plant at Lisheen Lake, comprising containerised filtration and UV systems, which was the subject of the previous EPA audit report dated 04/10/2016.

The new plant, which was brought into service on 08/06/2017, abstracts water from Grange Lough and is operated under a design build operate contract by Glan Agua on behalf of Irish Water. The treatment provided includes coagulation and flocculation followed by dissolved air flotation and filtration. Disinfection is achieved by UV treatment with sodium hypochlorite providing disinfectant residual in the network. Since June 2017 the plant and network has undergone a programme of verification and optimisation to assess its performance, particularly regarding THM compliance.

The opening meeting commenced at 10.10 a.m. at Grange Lough 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:

Mr Anthony Skeffington – Asset Operations Engineer

Mr Pat O'Sullivan – Drinking Water Compliance Specialist

Ms Mary O'Hara – Compliance Analyst

Mr David McLoone- Asset Delivery

Representing Roscommon County Council

Mr Noel Geraghty – Resident Engineer

Mr Justin Farron – Project Manager

Representing Glan Agua

Mr John Fox – Operations Contracts Manager

Mr Gabriel Larkin – Operations Manager

Mr Jimmy Brennan – Glan Agua Operations

Representing the Environmental Protection Agency:

Ms Ruth Barrington – 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 new abstraction point and intake works is located at Grange Lough. Previously water for this supply was sourced from Lisheen Lake. b. A programme of information for farmers/ landowners in the lake catchment has not yet been put in place to inform people of necessary precautions required in the vicinity of a drinking water abstraction to avoid contamination of the source.
2.	**Coagulation, Flocculation and DAF** a. Coagulation is carried out using polyaluminium chloride, which is dosed using rates set according to UVT bands. b. Turbidity is measured on the combined DAF water and then after each individual filter. A turbidity of 1-1.8 NTU after DAF is sufficient to give 0.2 NTU post filtration.

3.	**Filtration** a. There are four filters on-site, Filter 4 was backwashed during the audit showing an even wash on all air/water cycles. b. Filters are run to the backwash settlement tank for 20 minutes following completion of a backwash. Failure to meet the turbidity setpoint of 0.4 NTU results in further backwash being triggered and plant shutdown if the failure continues for four further backwashes.
4.	**Disinfection** a. The UV system is validated for the range 49.7% to 97.6% UVT. The system controls are set to trigger a warning alarm at 75% UVT and a plant shut down at 70% UVT. At the time of the audit final UVT was 85%, within the validated range. b. The minimum UV dose required is set to 25 mJ/cm^2. Failure to achieve the dose is alarmed and triggers plant shutdown. c. The UV dose achieved on process data viewed during the audit was between 55 and 66 mJ/cm^2. d. The UV dose on the HMI screen was viewed during the audit and showed continuous data. However, the SCADA trend showed data drops at various points. e. The UV system is triggered to warm up before the raw water pumps start up on low level signal from the reservoir. Failure to adequately initiate UV will inhibit pump start up to prevent undisinfected water entering supply. f. Sodium hypochlorite is used at the plant for disinfection to provide a chlorine residual in the network. There are also three booster dosing points on the network to ensure disinfection is adequate to the end of the network. g. Sodium hypochlorite is dosed at the plant on a flow proportional basis with residual trim. h. Chlorine residual is monitored manually at the main Kiltrustan reservoir. Based on the results, the dose at the plant can be manually adjusted if necessary. These adjustments require communication between Roscommon County Council which maintains the network, and Glan Agua which runs the plant.
5.	**Exceedances of the Parametric Values** a. Exceedances of the THM parametric value were persistent during the operation of the old plant, due to a combination of the source water quality and inadequate organics removal capacity of the old plant. The Remedial Action List programme to address these issues involved the replacement of the source and the construction of a new plant incorporating appropriate treatment. b. The new plant was brought into operation on 08/06/2017. There have been two exceedances of the THM parametric value since the new plant was brought into service, on 13/06/2017 and 20/07/2017, at end of network locations c. As part of the plant verification, optimisation of the chlorination system at the plant and at booster locations was carried out in September 2017, followed by satisfactory assessments of the THM formation potential and the plant TOC removal efficiency in October 2017. d. The reservoirs were also cleaned during this time period. e. The above programmes were supported by THM and chlorine residual monitoring in the network during October and November 2017. All THM results from this period were compliant, including end of network locations. f. The highest THM results obtained during the October-November 2017 monitoring were obtained at Ballyleague, which is at a network extremity fed by Ballyfeeny Reservoir which has chlorine boosting.
6.	**Management and Control** a. A condition of the planning permission is that there can be no process discharge from the plant to surface waters. This means that settled filter washwater and sludge supernatant must be returned to the head of the works and recycled through the plant. This is done on a continuous basis with turbidity controls to avoid plug flow of high turbidity recycled water.

3. AUDITOR'S COMMENTS

The audit found that Irish Water has provided appropriate treatment at the new Grange Lough water treatment plant serving NERWSS to address the Remedial Action List programme covering THM exceedances and treatment for *Cryptosporidium*.

Irish Water has provided operational data from October to November 2017 which demonstrates that the plant is operating satisfactorily and producing water quality which complies with the requirements of the *European Union (Drinking Water) Regulations 2014 as amended*. The auditor recommends that NERWSS is removed from the EPA's Remedial Action List when the Q4 RAL update is published.

4. RECOMMENDATIONS

Source Protection

1. Irish Water should ensure that farmers, landowners and other users of the lake amenity are informed as necessary about the location of the drinking water abstraction at Grange Lough and the appropriate precautions to be taken to avoid contamination of the source. This programme of communication may involve liaising with Roscommon County Council Environment Section in relation to setback distances for the *European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014 (SI No.31 of 2014).*

Disinfection

2. Irish Water should investigate the feasibility of installing a continuous chlorine residual monitor at the Kiltrustan main reservoir, and of using feedback from such a monitor to adjust chlorine dosing at the plant on an automatic basis rather than the manual interventions currently used.
3. Irish Water should review the cause of UV data drops in SCADA to ensure that data captured at the plant is recorded and accessible to determine trends.

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 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:** 21/12/2017

Ruth Barrington

Inspector