



Drinking Water Audit Report

County:	Cork	Date of Audit:	27/07/17
Plant(s) visited:	Minane Bridge Drinking Water Treatment Plant Scheme Code 0500PUB2209	Date of issue of Audit Report:	31/07/17
		File Reference:	DW2017/101
		Auditors:	Criona Doyle Cliona Ni Eidhin
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 <i>EPA Drinking Water Report</i>. • EPA Drinking Water Advice Notes No.s 1 to 15. • The recommendations in any previous audit reports. 		

MAIN FINDINGS

- i. *In response to the elevated manganese concentrations in the Minane Bridge Water Supply, Irish Water plans to temporarily shut down the current groundwater supply. A temporary connection point is to be installed to allow treated water from the nearby Ballea treatment plant, imported by tanker, to be fed directly into the Minane Bridge Water Treatment Plant. The treated water will undergo re disinfection at the treatment plant prior to being distributed to consumers via the supply network. The works are due to take place in the week commencing 31/07/17.*
- ii. *Irish Water should inform the EPA when the works are completed and keep the Agency informed of any developments relating to the re commissioning of the infiltration gallery.*

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 in response to the notification by Irish Water on the 19/07/17 of the failure to meet the manganese parametric value (as specified in Table C of Part 1 of the Schedule of the Regulations) in the Minane Bridge Water Supply. On the advice of the HSE, a “Do Not Consume” Notice was placed on the supply on the 20/07/17.

The supply serves the village of Minane Bridge. The raw water for the supply is obtained from an infiltration gallery which is groundwater-fed. The volume of water produced ranges from 20 – 25m³/day and serves a population of 155. The water is disinfected by chlorination in the adjacent treatment plant building. There is no storage reservoir and the treated water is pumped directly into the network.

The opening meeting commenced at 11.00am at the Minane Bridge 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 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:

Patrick Duggan, Compliance Analyst, Irish Water.

Pat Britton, Irish Water.

Padraig Thornton, Senior Executive Engineer, Cork County Council.

Jerry Creedon, Executive Engineer, Cork County Council.

Mary Hickey, Executive Scientist, Cork County Council.

James Meade, Caretaker, Cork County Council.

Representing the Environmental Protection Agency:

Criona Doyle, Inspector.

Cliona Ni Eidhin, Inspector.

Ciarán Dower (Observer)

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. Exceedances of the Parametric Values

- a. A complaint was received from a householder on Thursday 13/07/17 relating to an unusual odour in the water supply. Cork County Council undertook sampling of the supply on Friday 14/07/17. The official results obtained from the laboratory on Monday 17/07/17 indicated a manganese concentration of 1,802 ug/l which is in excess of the parametric value of 50 ug/l specified in the Drinking Water Regulations (S.I. No. 122 of 2014).
- b. Irish Water consulted with the HSE on Tuesday 18/07/17. A “Do Not Consume” Notice was placed on the supply on Thursday 20/07/17 on the instruction of the HSE. The notice was hand delivered door to door on the evening of Thursday 20/07/17. The notice was also placed on the Irish Water website.
- c. In response to the manganese exceedance Cork County Council Environment Section undertook an inspection of the landholdings within the Zone of Contribution. The investigations indicated no activities of significance had taken place that could be linked to the change in water quality.
- d. A programme of investigative monitoring has been taking place since the identification of elevated manganese. Prior to the date of the audit investigative sampling has taken place on the 17/07/17; 20/07/17; 21/07/17; 24/07/17 and 26/07/17. The manganese concentration in all of the samples was above the parametric value. The highest measured manganese concentration of 8,130 ug/l occurred on 20/07/17.
- e. There was a significant reduction in the manganese concentration between the 24/07/17 and 26/07/17. The concentration reduced from a range of 6,700 – 7,500 on 24/07/17 ug/l to 730 – 3,810 ug/l on 26/07/17. Irish Water attributed this reduction in manganese levels to groundwater recharge following recent rain.
- f. The cause for the elevated manganese has not been identified to-date. The investigative monitoring is still taking place. The analysis to-date indicates no other elevated water quality parameters.

2.	<p>Action Plan</p> <ul style="list-style-type: none"> a. A 25,000 litre tankered water supply was provided at the public car park next to the church. Notices were fixed to the tank to warn the public that the tankered water should be boiled before use. b. During the week commencing 31st of July Irish Water propose to install a temporary connection point to allow tankered water to be fed directly into the treatment plant at Minane Bridge. The treated and disinfected water will be transported by tanker from the Ballea drinking water treatment plant in Carrigaline. To ensure adequate disinfection, the tankered water will also pass through the disinfection treatment process at the plant. The treated water will be distributed as normal to the public via the supply network.
3.	<p>Source Protection</p> <ul style="list-style-type: none"> a. The Zone of Contribution for the supply was delineated by the Geological Survey of Ireland in 2002 and includes the hillside to the north of the gallery and lowlying area between the infiltration gallery and the adjacent stream. b. In August 2007 Cork County Council informed all landowners within the Zone of Contribution of their obligations with respect to the Good Agricultural Practice Regulations. This was followed by a programme of farm inspections in October 2008.
4.	<p>Disinfection</p> <ul style="list-style-type: none"> a. Disinfection consists of chlorination using 10-11% sodium hypochlorite. Dosing of neat sodium hypochlorite is undertaken. No drums are stored on site. Liquid was present in the bund of the sodium hypochlorite tank on the day of the audit. b. Dosing is flow proportional but is not linked to the residual chlorine monitor. The caretaker manually adjusts the dosing in response to increases in chlorine demand based on the observed residual chlorine readings. c. Duty and standby dosing pumps are provided with automatic switchover. All pumps were within service and calibration dates. d. The target dose is 0.6 to 0.7 mg/l. e. Sodium hypochlorite is obtained from the County Council depot at Ballea as required. The caretaker checks the expiry date on the drum prior to filling the day tank. No written records are kept in relation to the filling of the sodium hypochlorite tank. f. Contact time (Ct) vessels are provided in the pump house. The calculated Ct for the supply is 18.93 mg.min/l. g. A text alarm is sent to the caretaker and relief caretaker, only, in the event the residual chlorine level drops below 0.2 mg/l (low level alarm) or exceeds 2.5mg/l (high level alarm). A copy of the Caretaker's Manual was provided on site which indicates that the plant automatically shuts down in the event the chlorine level drops below the low level limit or exceeds the high level limit. h. Residual chlorine levels are recorded in the plant every 1 to 2 days and documented in the plant log book. i. The SCADA trend, illustrating the chlorine levels for the previous month, was provided.
5.	<p>Treated Water Storage and Distribution Network</p> <ul style="list-style-type: none"> a. There is no reservoir on the supply therefore water is discharged directly into the distribution network. b. The residual chlorine level in the network is monitored on a weekly basis but the results are not documented. c. It is not possible to flush the network prior to the connection of the tankered supply to the water treatment plant due to insufficient pressure.
6.	<p>Monitoring and Sampling Programme for treated water</p> <ul style="list-style-type: none"> a. The check monitoring results from 2001 to March 2017 indicated no exceedances for any of the parameters. The audit monitoring results for 2016 indicated no exceedances. The manganese concentration was < 1 ug/l in the 2016 audit sample.
7.	<p>Chemical Storage and Bunds</p>

	a. Liquid was present in the bund surrounding the sodium hypochlorite tank on the day of the audit.
8.	Hygiene and Housekeeping a. It was not possible to remove the cover on the infiltration gallery sump to observe the condition of the sump. It was not known to Irish Water when the sump was last cleaned. Irish Water advised that this is proposed to be undertaken as part of the works to return the infiltration gallery to full use.
9.	Management and Control b. Records were available in relation to minor works undertaken in the plant, repairs and calibration in the Maintenance Register which is kept on site. c. A Caretaker's Manual is kept on site which provides details on the equipment on site and procedures to be followed. d. The caretaker visits the site every 1 or 2 days. Records are kept on the average daily usage, free chlorine and total chlorine levels and any observations relating to the operation of the treatment plant. e. The caretaker covers a number of water and wastewater treatment plants. He has completed the Drinking Water Supply Hygiene course and has separate PPE for use at wastewater treatment plants.

3. AUDITORS COMMENTS

As an interim solution to deal with elevated manganese concentrations in the Minane Bridge PWS, Irish Water proposes to install a connection at the water treatment plant to facilitate the importation of treated water via road tankers. The works are due to take place during the week commencing the 31/07/17. This interim measure is proposed in response to the elevated concentration of manganese in the groundwater being abstracted from the infiltration gallery. The measures proposed by Irish Water to maintain adequate disinfection of the imported water are considered sufficient by the Agency.

Irish Water should inform the EPA when the interim works have been completed and keep the Agency informed of any developments relating to the re commissioning of the infiltration gallery.

In the absence of a flushing programme Irish Water should undertake monitoring of the manganese levels from a number of locations in the network following the switch over to the interim supply. This is required to ensure any pockets of water with elevated concentrations of manganese within the network have been flushed out.

4. RECOMMENDATIONS

General

1. Irish Water should inform the EPA when the interim works have been completed and keep the Agency informed of any developments relating to re commissioning of the infiltration gallery. Irish Water should provide:
 - a. details of the criteria to be met prior to resuming the abstraction from the infiltration gallery and returning it for use in the public supply.
 - b. details of how it is proposed to obtain representative groundwater samples from the infiltration gallery while the source is not being pumped.
2. Irish Water should inform the EPA of any change to any aspect of the "Do Not Consume" notice currently effective on this supply or of any change in the advice provided by the HSE.

Disinfection

3. Irish Water should investigate the feasibility of linking the chlorine dose to the residual chlorine monitor, with a view to eliminating the need for the caretaker to manually adjust the chlorine dose.
4. Irish Water should investigate the options for expanding the cascade on the text alert system, when the high or low chlorine limit is exceeded, to include additional personnel.

Treated Water Storage and Distribution Network

5. Irish Water should ensure that the results of the residual chlorine monitoring in the network are documented.
6. Irish Water should undertake monitoring of the manganese concentrations at a number of locations in the network following the switch over to the interim supply to ensure any pockets of water with elevated concentrations of manganese have been flushed out.

Chemical Storage and Bunds Storage and Distribution Network

7. Irish Water should ensure that the bund around the sodium hypochlorite tank is empty at all times.

Hygiene and Housekeeping

8. Irish Water should ensure that the infiltration gallery sump is regularly inspected and a programme is in place for routine cleaning of the sump.

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 provide updates on recommendations 1 and 2, above, as these become available.

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:

Croina Doyle

Date:

31/07/17

Inspector