



Drinking Water Audit Report

Local Authority:	Offaly County Council	Date of Audit:	02/07/2013
Plant(s) visited:	Dunkerrin Public Water Supply (Jones' Well source) (2500PUB1007)	Date of issue of Audit Report:	15/07/2013
		File Reference:	DW2013/53
		Auditors:	Ms. Cliona Ní Eidhin
Audit Criteria:	<ul style="list-style-type: none"> • The <i>European Communities (Drinking Water) (No. 2) Regulations, 2007</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 any previous audit reports. 		

MAIN FINDINGS

- i. *The Water Services Authority's investigation into the recent E. coli exceedance was ongoing on the date of the audit and the Boil Water Notice was still in place on 7 dwellings. Investigations undertaken by the water Services Authority to-date were found to have been methodical and adequate towards isolating the location of the suspected contamination from within consumers' premises to one area, although the exact cause had yet to be identified.*
- ii. *The main findings of the previous audit conducted by the EPA of the Dunkerrin Public Water Supply had been addressed in full.*
- iii. *The supply would benefit from the preparation of documented procedures to be maintained on-site within a plant manual.*

1. INTRODUCTION

Under the *European Communities (Drinking Water) (No. 2) Regulations 2007* the Environmental Protection Agency is the supervisory authority in relation to the local authorities and their role in the provision of public water supplies. This audit was carried out in response to the notification by Offaly County Council dated 14/06/2013 of the failure to meet the *E. coli* parametric value (as specified in Table A of Part 1 of the Schedule of the Regulations) in the Dunkerrin Public Water Supply PWS and the subsequent placing of a Boil Water Notice (BWN) on the supply.

The audit also served to verify that recommendations made by the EPA on a previous audit had been implemented by the Water Services Authority (WSA).

The raw water source for the Dunkerrin PWS (2500PUB1007) is Jones' well; a spring source located approximately 3 km north west of Moneygall village in south Co. Offaly. Two additional raw water sources serve the Dunkerrin PWS; the Dunkerrin Village source and the Lisduff source. The Jones' Well source serves a population of 515. The total population served by all three sources is 1030. Offaly County Council advised that due to relative water pressures in the network the water from the three sources is not mixed. This audit examined the Jones' Well source and treatment only as the

WSA, through their investigation, isolated the recent exceedance to this portion of the network. The previous audit conducted by the EPA on this supply examined all 3 sources.

Spring water from Jones' Well is contained within a concrete chamber as it emerges from the ground. From this chamber it is pumped to the adjacent treatment hut where it is disinfected using UV and chlorination. The abstraction pump operates in response to demand and produces an average of 5 m³/hour. The supply was operating as normal on the day of the audit and the BWN was still in place on 7 houses.

The opening meeting commenced at 15:30 at the Dunkerrin Drinking 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. Photographs taken by Cliona Ní Eidhin during the audit are included in the Appendix to this report and are referred to in the text where relevant.

The following were in attendance during the audit and the closing meeting:

Representing Local Authority:
Mr. Tom Shanahan - Senior Engineer Mr. Paddy Devereux – Scheme Caretaker Mr. David Doyle – Clerk of Works Ms. Catherine Casey –Environmental Technician
Representing the Environmental Protection Agency:
Ms. Cliona Ní Eidhin - 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> <ul style="list-style-type: none"> a. The WSA verified that 6 acres in the immediate vicinity of Jones' Well remain leased by Offaly Co. Co. and that no agricultural activity takes place in this area. b. There was no evidence of shallow groundwater or surface water ingress into the spring chamber. c. There was no evidence of herbicide use in the area surrounding the spring source. d. The spring abstraction chamber was observed to be protected from above-ground influence from the nearby (100m) stream by the presence of a duckbill valve placed in the overflow channel. e. A secure, sealed second cover was confirmed to have been installed on the spring chamber's inspection hatch following a recommendation made at the last audit. f. A septic tank is located approximately 250m from the spring source; this has not been inspected by the WSA. g. The WSA informed the auditor that letters had not yet been sent to farmers within the buffer zone applied but that this was about to be undertaken.
2.	<p>Monitoring and Sampling Programme for treated water</p> <ul style="list-style-type: none"> a. An online turbidity monitor is in place measuring turbidity in NTU prior to treatment. At the time of the audit, the readout panel of this turbidity monitor was showing a reading of 0.077 NTU. This reading was identical to that observed at the last audit. The turbidity meter is linked to a recording advice and is alarmed at a set-point of 1 NTU. The WSA advised that there is very little variation in raw water turbidity. The turbidity meter calibration was up to date.

4.	<p>Chlorination and Disinfection</p> <p><u>Ultra Violet Disinfection</u></p> <ul style="list-style-type: none"> b. A single duty UV disinfection system is in place at the Jones' Well treatment hut. The unit houses two UV bulbs; both operate concurrently in order to achieve the required dose. Bulbs are replaced once per year and the quartz sleeves are cleaned at the same time as bulb replacement c. A UV intensity meter is in place measuring in W/m^2. At the time of the audit this was reading $33.1 W/m^2$. The UVI meter is alarmed with early warning and auto shut-down set-points of $30 W/m^2$ and $20W/m^2$ respectively. d. A copy of the validation certificate was made available to the auditor. <p><u>Chlorination</u></p> <ul style="list-style-type: none"> a. The sodium hypochlorite day tank is maintained approximately one third full. (See photograph 1) The WSA advised that the level is checked daily. The requirement to do this check each day is not documented in a procedure / schedule of daily checks. b. Duty and standby chlorine dosing pumps are in place. The calibration sticker on the pumps indicated that calibration was up to date. The duty role is cycled automatically between the two pumps. The automatic switch-over facility was demonstrated to the auditor and found to be operating correctly. Dosing is flow proportional and a chlorine concentration of $0.43 mg/l$ is strived for in water entering the distribution network. c. The chlorine monitor is alarmed with automatic shut-down at an alarm set-point of $0.25 mg/l$. d. The WSA confirmed that works to address inadequate chlorine contact time have been undertaken at this supply since the last audit. A 300 m network of 12-inch diameter pipes was installed within the spring site. Adequate chlorine contact time of $40.49 mg.min/l$ is now achieved within the spring site. e. The curator undertakes daily checks for free chlorine levels in the distribution network. Records of these checks were reviewed during the audit. All records were found to exceed the recommended minimum of $0.1 mg/l$.
7.	<p>Exceedances of the Parametric Values</p> <ul style="list-style-type: none"> a. The WSA notified the EPA on 14/06/2013 of the detection of <i>E. coli</i> and coliform bacteria in the Dunkerrin PWS (Jones' Well supply). A boil water notice was communicated to consumers on 13/06/2013. The WSA informed the auditors that the issue had been identified as isolated to a small group of houses close to Moneygall village. The BWN was reduced from a population of 515 to these 7 houses. The investigation into this exceedance was on-going on the date of the audit. All results of resampling since the 13/06/2013 exceedance have been clear of contamination. b. The WSA explained that coliform bacteria and low chlorine detected in another sample taken on the same date, 13/06/2013, from a hydrant in Ballaghveaney was not representative of water in the network and was considered a rogue sample. This hydrant is at the end of a line and was not flushed prior to the sample being captured. Explanation of this had not been received by the EPA.
8.	<p>Chemical storage and bunds</p> <ul style="list-style-type: none"> a. The sodium hypochlorite day tank is filled from 20L containers which are brought to site by the curator from a nearby depot location. Two 20L containers were stored within a bund. The adequacy of the bund to hold the volume of both canisters was unclear to the auditor. (See Photograph 2)
10.	<p>Management and Control</p> <ul style="list-style-type: none"> a. The WSA curator visits the plant every day, 7 days per week. A pro-forma records book has been developed specifically for the recording of particulars in relation to this supply by

	<p>the curator. Records maintained were found to be of a high standard.</p> <p>b. The calibration and maintenance schedule for treatment instruments is managed by the WSA rather than by a contractor. There were, however, no documented procedures for the checking of maintenance / calibration requirements and the initiation of these.</p> <p>c. It was noted by the auditor that a plant manual had not been prepared with standard operating procedures or duty schedules.</p>
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3. AUDITORS COMMENTS

The Jones' Well spring provides raw water of good quality to the Dunkerrin supply with very little deviation in critical water quality parameters such as turbidity. The treatment processes in place are suited to the raw water and the addition of automatic shut-off linked to both the chlorine and UV monitors is considered a valuable safeguard against inadequately disinfected water entering the distribution network. The installation of automatic shut-off facilities linked to both the UV and the chlorine monitors since the last audit is regarded as a commendable step towards enhancing the security of treatment on this supply.

Offaly County Council was found to have implemented the majority of the recommendations made in the previous audit report at the Jones' Well source and treatment hut. The main findings of the previous audit concerning inadequate disinfection contact time, protection of the spring chamber and the linking of the UV monitor to a recording device had all been addressed.

The investigation into the recent (14/06/2013) exceedances notified to the EPA was still on-going on the date of the audit. The audit and review of past records verified that the treatment technologies and monitors in place at Jones' Well are working correctly at the time of the exceedance and since that date and that there was no breakdown in treatment which may have contributed to the exceedance.

4. RECOMMENDATIONS

1. **Source Protection:** The Water Services Authority should undertake an inspection of all onsite waste water treatment systems located within the buffer zone of the Jones' Well spring.
2. **Source Protection:** The Water Services Authority should ensure that all farmers working within the buffer zone of the Jones' Well supply are written to outlining their responsibilities under the *European Communities (Good Agricultural Practice for the Protection of Waters) Regulations 2010 (SI No.610 of 2010)*.
3. **Disinfection:** The Water Services Authority should ensure that a procedure is documented to ensure that there is adequate chlorine in the day tank to ensure chlorine disinfection is maintained at all times.
4. **Exceedances of the Parametric Values:** The Water Services Authority should provide the rationale for disregarding the Ballaghveaney hydrant sample as a rogue result to the EPA in writing.
5. **Chemical Storage and Bunds:** The Water Services Authority should ensure that the small bund holding the 20 L canisters of Sodium Hypochlorite is capable of containing at least 110% of the volume of chemicals stored therein
6. **Management and Control:** The Water Services Authority should prepare a plant manual of standard operating procedures and schedules for routine duties and checks to be undertaken in the operation of the Dunkerrin drinking water treatment plant.
7. **Management and Control:** The Water Services Authority should notify the EPA when the Boil Water Notice on the remaining 7 houses is lifted.
8. **Management and control:** The Water Services Authority should ensure that all sampling is undertaken in accordance with Section 4 of the EPA Handbook on the Implementation of the Regulations for Water Services Authorities for Public Water Supplies. The WSA should

ensure that a sampling manual has been prepared, that all staff with responsibility for taking samples have been trained on the requirements of the manual and that all samples are taken from suitable sampling points; i.e. from consumers' taps.

FOLLOW-UP ACTIONS REQUIRED BY THE LOCAL AUTHORITY

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 issue of this audit report detailing how it has dealt with the items 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 Offaly County Council.

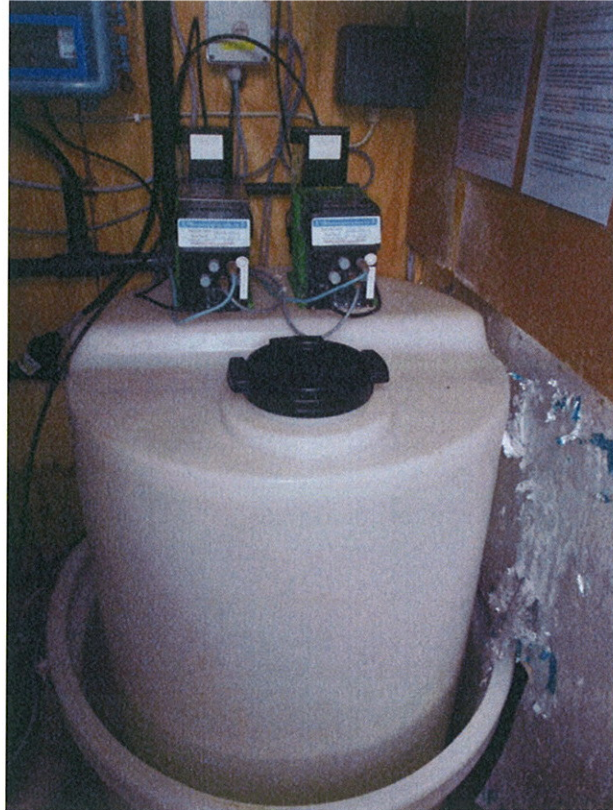
Please quote the File Reference Number **DW2013/53** in any future correspondence in relation to this Report.



Report prepared by: Cliona Ní Eidhin **Date:** 15/07/2013

Inspector

Photograph 1: Sodium Hypochlorite day tank. No procedure in place for checking level.



Photograph 2 – Bund holding two 20 L drums of Sodium Hypochlorite.
Bund adequacy requires checking.

