



Annual Report on Water Quality
North Hertfordshire District Council 2018

May 2019

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1 Introduction

Affinity Water produces an annual report for each local authority regarding the general quality of water supplied to premises in the authority's area. The information includes results of samples taken from water supply zones in the authority's area of responsibility and any associated exceedences (see section 3 Water Quality) relevant to those supply areas i.e. exceedences from supplying water treatment works and service reservoirs. In 2018, 99.96% of the 180,000 tests taken as part of the Company's regulatory monitoring programme complied with the standards confirming that drinking water quality continues to be of a very high standard.

The report also includes details of the actions taken to comply with any enforcement orders, authorised departures and notices under regulation 19(4). This report is for North Hertfordshire District Council and covers the year ending 31 December 2018.

2 Water Treatment Works, Service Reservoirs and Water Supply Zones

In 2018, the Company met the demand for drinking water by operating 85 water treatment works. The water supply to the area covered by the Council was provided by the following water treatment works:

- Bowring
- Chipping
- Codicote
- Eagle Tavern
- Fuller
- Hare Street
- Kings Walden
- London Road
- Offley Bottom
- Oughton Head
- Slip End
- Temple End
- Therfield Heath
- Watton Road
- Well Head
- Weston Hills
- Wickerhall
- Wyndley

There is also a bulk import of treated water from Anglian Water Services' (AWS) Grafham water treatment works, which supplements the supply to the area via Preston reservoir and the Bulls Green reservoir and water tower complex.

Treated water from the above works is either passed directly into supply or via one of the following service reservoirs:

- Ashwell
- Bulls Green

Bulls Green WT
 Buntingford
 Codicote WT
 Jacks Hill
 Meesden WT
 Offley WT
 Preston
 Rabley Heath WT
 Tea Green WT
 Therfield WT
 Throcking WT
 Weston WT
 Whitwell WT
 Windmill Hill

The Company's area is divided into discrete Water Supply Zones, each with a population of 100,000 or less. In 2018, Affinity Water had 89 such zones.

In 2018, North Hertfordshire District Council's area was served by Zones:

001	Baldock / Letchworth
002	Barkway / Therfield
003	Royston
014	Codicote
015	Knebworth / Tewin
031	Offley / Kimpton
032	Hitchin

Maps and results of analyses for the above water supply zones can be found in Appendix 2.

3 Water Quality

During July, lead was detected at a concentration above the standard in a sample taken from a customer's property in Zone 001. The investigation established that the elevated concentration of lead was likely to have been caused by lead pipework leading to and within the customer's property. We replaced the lead pipework on our side of the boundary stop tap and a letter was sent to the customer explaining the situation and how to reduce the lead concentration in their water supply.

Also, in July, a sample taken from a customer's property in Zone 003 had a slight Quantitative Odour detected in it. Our investigation identified the internal plumbing fittings at the property as the most likely cause of the exceedence. The customer at the property had not noticed an unusual odour to their water supply and there were no complaints from customers in the Royston area regarding an unacceptable odour to the water supply around the time the sample was taken.

All exceedences of the standards are reported to the Drinking Water Inspectorate (DWI) in monthly exception reports. In the event that the DWI is not satisfied with the Company's explanation of the circumstances and the action taken, enforcement action can be initiated.

4 Customer Contacts

Under the Water Industry (Suppliers' Information) Direction 2017, the Company must provide the DWI with annual information on all consumer contacts received related to drinking water quality. For each water supply zone, the consumer contacts are separated into five main categories (with further division into sub-categories). An overall rate of contact per 1000 population is calculated for each zone as well as contact rates for combined categories.

The customer contact data for water supply zones within your Council's area of responsibility is shown in the table below.

Zone (Population)	Zone Rate (Consumer Enquiries & Drinking Water Quality Concern per 1000 population)	Zone Rate (Appearance, taste and odour & illness per 1000 pop.)	Overall zone rate (Contacts per 1000 pop.)
Company average	0.26	0.91	1.18
Z001 (50,786)	1.12	1.24	2.36*
Z002 (16,181)	0.31	1.42	1.73
Z003 (16,683)	0.54	0.48	1.02
Z014 (2,550)	0.39	0.78	1.18
Z015 (14,462)	0.21	0.97	1.18
Z031 (6,901)	0.29	2.32	2.61*
Z032 (41,905)	0.24	0.74	0.98

* The customer contact rate in Zone 001 was significantly higher than the Company average. However, this is an anomaly that has arisen because a number of general enquiries were logged on a dummy customer reference assigned to this zone. The customer contact rate in Zones 031 was significantly higher than the Company average; this is because contacts from a small population generate statistical anomalies. Investigations in the zone confirm that the water quality is satisfactory.

5 Section 19 Undertakings, Authorised Departures & Regulation 28 Notices

Within the Council's area of supply there is an Undertaking in place for Zone 015 relating to Metaldehyde & Total Pesticides for the bulk import of treated water from AWS's Grafham water treatment works. The Undertaking requires the Company to: AWS has agreed to: implement a monitoring strategy; to engage with relevant stakeholders & provide regular updates on data; investigate new, sustainable treatment processes, supporting national research programmes where appropriate; and to continually review & appraise the risk from these hazards as part of the regulatory process.

Zone 031 has an Undertaking in place relating to nitrate from Kings Walden Water Treatment Works. The Company agreed to install a new treatment process at the works that will reduce the levels of nitrate in the water leaving the works. Construction of the new treatment process was completed by March 2014 and fully commissioned in 2017. The DWI was satisfied that we had met our obligation under the terms of the Undertaking and relieved us of any obligation to carry out further work.

The Company did not have any Authorised Departures in place in the Council's area during 2018.

In order to meet the standard relating to lead, the Company has continued operating orthophosphate dosing plants at 38 sites across the Company's area. Zones 001, 014 and 015 receive water dosed with orthophosphate.

6 Notifiable events

Under the Water Industry (Suppliers Information) Direction 2017, the DWI must be notified of any situation where water quality is likely to be, or has been, adversely affected. Since 2009 the DWI has been using an event classification system to assess and quantify the significance of a notifiable event, giving each one a number (1 to 5) with an equivalent rating ("not significant" through to "major"). The Company regards any event classified as a 3 Significant or above as being equivalent to the previously designated 'incident'. During 2018 there was two notifiable events within your Borough's area of responsibility.

During 2018, the UK experienced a spell of severe winter weather with very low temperatures and significant snowfalls from late February to early March, the so called "Beast from the East". The severe weather event was followed by a rapid increase in temperature. The resultant thaw caused an increase in burst mains on Affinity Water's network and leaks appeared on consumer supplies and internal plumbing systems. This resulted in exceptionally high levels of demand for water during this period, similar to summer peak.

Since the beginning of 2018 we had been operating under our Winter Readiness Action Plan which anticipates the need for greater resource for leakage and maintenance and repair associated with the seasonal weather. During January 2018, we increased our leakage detection resource and maintenance and repair gangs.

As soon as the Met Office issued the severe weather warning, we followed our Emergency Response Plan for such events. Alongside Thames Water, we implemented the London LRF Water Supply Disruption Plan. This included establishing contacts with stakeholders, identifying areas affected with loss of supply, establishing alternative supply points and maintaining information flow to stakeholders. We remained in regular contact with London,

Kent, Surrey, Essex, Bucks, Central Bedfordshire and Barnet LRFs throughout until the event was closed.

During the course of this event we experienced two significant loss of supply events; one in Barnet due to low reservoir levels, resulting in an air lock on the distribution system; and one in Colindale, London NW9 following a third-party power failure and the resulting loss of boosters which instigated increases in consumer contact. Both issues were resolved within 12 hours.

Like other water companies we were asked to provide a detailed review to OFWAT on how we had prepared for, and responded to, the event. In June 2018, OFWAT published their findings in a review called 'Out in the Cold', the DWI and the CCW also provided feedback on the industry's performance. Feedback for Affinity was largely very positive, and we welcomed OFWAT's view that we had "largely met its customers' expectations" as well as their request that we help share best practice across the industry. The event was classified by the DWI as a serious event.

In August, a consumer contacted the Company to advise they had an unusual odour to their water supply in Royston. The investigation confirmed that the solvent odour was confined to two properties and was caused by fuel oil permeating the plastic water supply pipes. Although there are heating oil tanks on site it was not proven that these were the sources of the contamination. The consumers were advised to use bottled water for drinking and cooking purposes. Samples taken following the subsequent remedial work and replacement of the plastic supply pipe with barrier pipe were satisfactory with no odour detected and the restriction notice was lifted. The event was classified by the DWI as a minor event.

7 Further information and advice

For further information and advice on all water quality matters please contact:

Eddie Lintott
Water Quality Manager
Affinity Water
Tamblin Way
Hatfield
Hertfordshire
AL10 9EZ

Telephone: 01707 277165

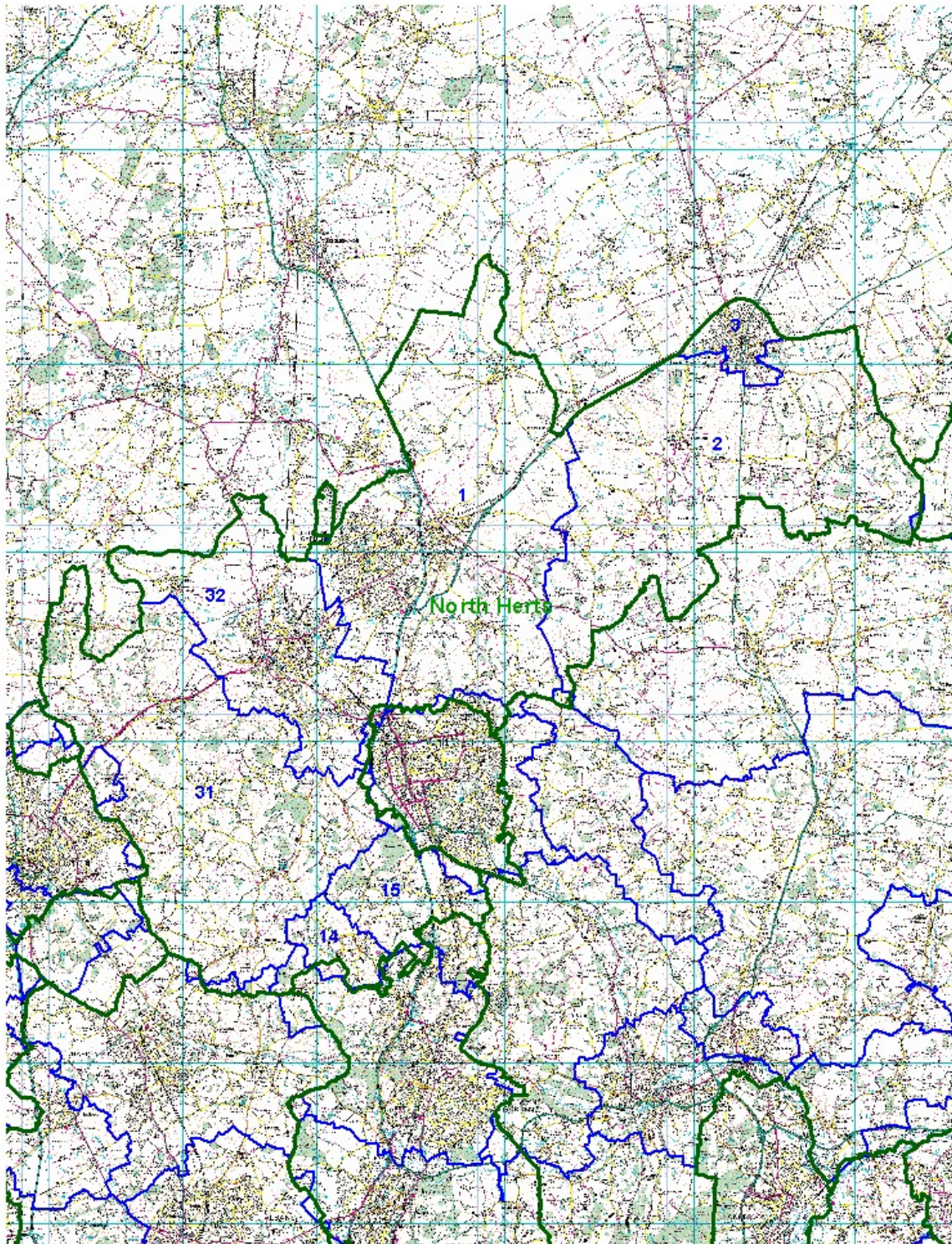




Your local supply, on tap

Appendices

8 Appendix One – Map

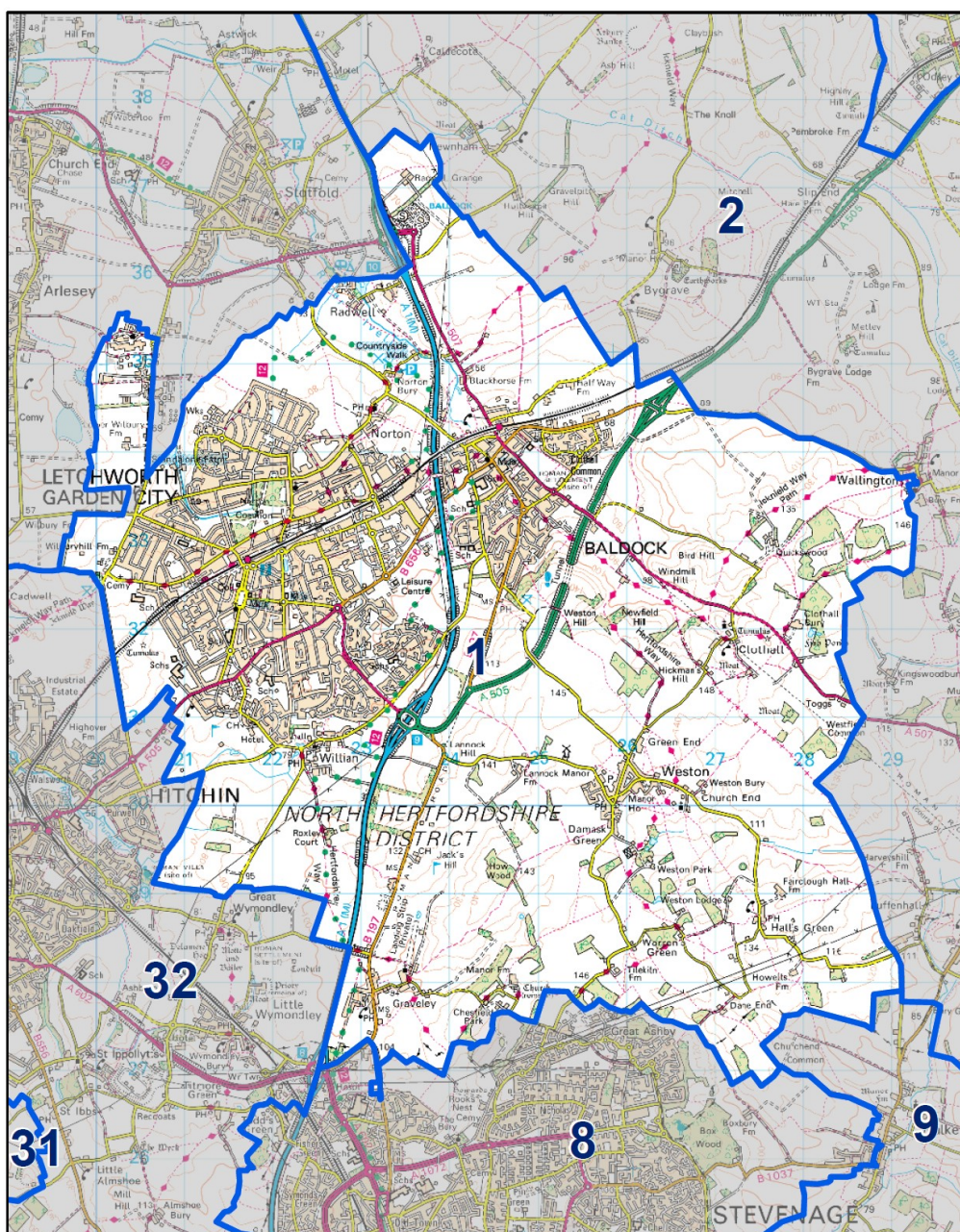
North Hertfordshire District Council



-  Local Authority Boundary
-  Water Supply Zone Boundary

9 Appendix Two – Water Quality Results

WQZ 1 - Baldock / Letchworth



0 650 1,300 2,600 Meters
January 2010

Legend

- This Water Quality Zone
- Other WQZ

Water Supply Zone: Baldock/Letchworth (AF001)
 Period: 01-Jan-2018 to 31-Dec-2018
 Population: 50,786



Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	132	0	0	0	0	0	0
E coli	No./100ml	132	0	0	0	0	0	0
Clostridium perfringens	No./100ml	8	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
5 day plate count 22 °C	No./1ml at 22 °C	52	No abnormal change	0	0	0	2	31
Customer Parameters								
Alkalinity	mgHCO ₃ /l	1	No PCV	0	0	310	310	310
Calcium	mgCa/l	1	No PCV	0	0	130	130	130
Chlorine (Residual)	mgCl ₂ /l	132	No PCV	0	0	0.1	0.23	0.59
Colour	mg/l Pt/Co	38	20	0	0	<1.0	<1.0	<1.0
Fluoride	mg/l	8	1.5	0	0	0.128	0.128	0.132
Hardness (Total)	mgCaCO ₃ /l	1	No PCV	0	0	325	325	325
Hydrogen Ion (pH)	pH value	39	6.5-9.5	0	0	7.1	7.4	7.6
Quantitative Odour	Dilution No.	39	Abnormal & unacceptable to consumers	0	0	0	0	0
Quantitative Taste	Dilution No.	39	Abnormal & unacceptable to consumers	0	0	0	0	0
Temperature	°C	131	No PCV	0	0	7.3	13.8	23.6
Turbidity	NTU	52	4	0	0	<0.10	<0.10	0.33
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	8	200	0	0	<5.0	<5.0	17.9
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	<0.20
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<0.5	2.8	6.3
Copper	mgCu/l	8	2	0	0	0.01	0.1	0.339
Iron	mgFe/l	8	200	0	0	<15.0	<15.0	20.8
Lead	µgPb/l	8	10	1	13	<1.00	1.88	14
Manganese	µgMn/l	8	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	<2.0	<2.0	3.8
Sodium	mgNa/l	8	200	0	0	12.3	12.7	13.1
Pesticides								
Atrazine	µg/l	8	0.1	0	0	0.021	0.022	0.023
Carbentamide	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Coprynelid	µg/l	8	0.1	0	0	<0.012	<0.012	<0.012
Diuron	µg/l	8	0.1	0	0	<0.010	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.005	<0.005	<0.005
Simazine	µg/l	8	0.1	0	0	0.008	0.009	0.01
Total Pesticide	µg/l	8	0.5	0	0	0.06	0.064	0.075
Additional Parameters								
Ammonium	mgNH ₄ /l	39	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	7	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100
Bromate	µgBrO ₃ /l	8	10	0	0	<0.5	<0.5	<0.5
Chloride	mgCl/l	8	250	0	0	27	27	28
Electrical Conductivity at 20 °C	µS/cm at 20 °C	39	2500	0	0	550	571	600
Nitrate	mgNO ₃ /l	8	50	0	0	32.1	34.8	35.7
Nitrite	mgNO ₂ /l	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		8	1	0	0	<0.64	<0.71	<0.71
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO ₄ /l	8	250	0	0	27	29	29
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	0.2	0.4	0.6
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<1.0	<1.0	1.2
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	0.6	0.7	0.7
Total PAHs	µg/l	7	0.1	0	0	0	0	0.001
Total Trihalomethanes	µg/l	8	100	0	0	4.45	6.67	8.19
1, 2 dichloroethane	µg/l	8	3	0	0	<0.04	<0.04	<0.04

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

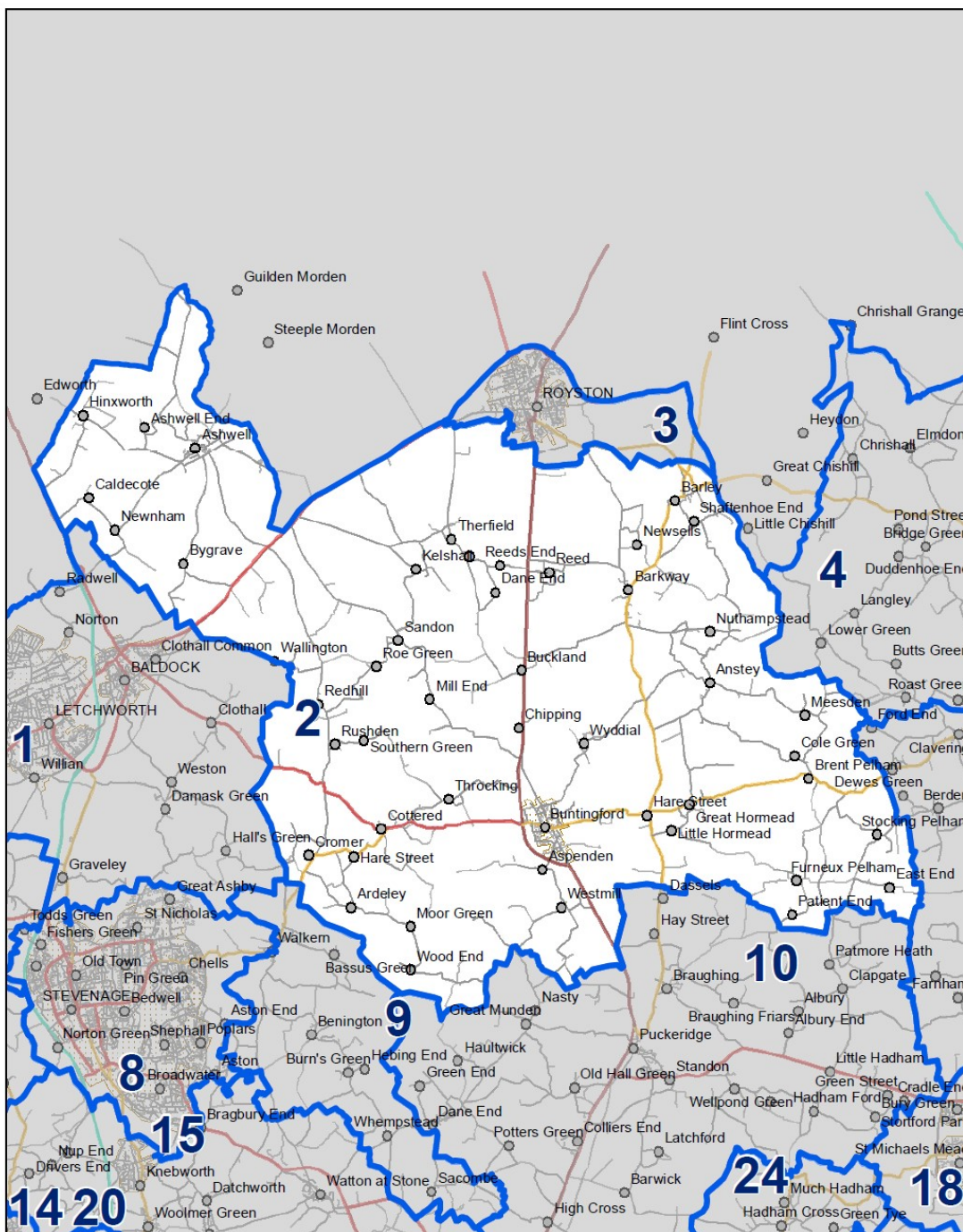
Commentary on Water Quality

During July, lead was detected at a concentration above the standard in a sample taken from a customer's property in Hill Mead, Letchworth Garden City. The investigation established that the elevated concentration of lead was likely to have been caused by lead pipework leading to and within the customer's property. We replaced the lead pipework on our side of the boundary stop tap and a letter was sent to the customer explaining the situation and how to reduce the lead concentration in their water supply.

Undertakings & Authorised Departures

No Undertakings or Authorised Departures applied to this water supply zone during 2018.

WQZ 2 - Barkway / Therfield



0500002,000 Meters
 ++++++
 January 2010

Legend

- This Water Quality Zone
- Other WQZ

Water Supply Zone: Buntingford/Therfield (AF002)
 Period: 01-Jan-2018 to 31-Dec-2018
 Population: 16181



Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	48	0	0	0	0	0	0
E coli	No./100ml	48	0	0	0	0	0	0
Clostridium perfringens	No./100ml	8	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
3 day plate count 22 °C	No./1ml at 22 °C	24	No abnormal change	0	0	0	1	12
Customer Parameters								
Alkalinity	mgHCO ₃ /l	1	No PCV	0	0	336	336	336
Calcium	mgCa/l	1	No PCV	0	0	151	151	151
Chlorine (Residual)	mgCl ₂ /l	48	No PCV	0	0	0.04	0.17	0.42
Colour	mg/l Pt/Co	17	20	0	0	<1.0	<1.0	<1.0
Fluoride	mgF/l	8	1.5	0	0	0.107	0.138	0.179
Hardness (Total)	mgCaCO ₃ /l	1	No PCV	0	0	378	378	378
Hydrogen Ion (pH)	pH value	18	6.5-9.5	0	0	7	7.1	7.2
Quantitative Odour	Dilution No.	18	Abnormal & unacceptable to consumers	0	0	0	0	0
Quantitative Taste	Dilution No.	18	consumers	0	0	0	0	0
Temperature	°C	48	No PCV	0	0	7.7	13.5	19.9
Turbidity	NTU	24	4	0	0	<0.10	<0.10	0.32
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	8	200	0	0	<5.0	<5.0	16
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	<0.20
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<0.5	0.6	4.6
Copper	mgCu/l	8	2	0	0	0.031	0.127	0.299
Iron	mgFe/l	8	200	0	0	<15.0	<15.0	20.4
Lead	mgPb/l	8	10	0	0	<1.00	1.13	4.07
Manganese	µgMn/l	8	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	<2.0	2.2	17.8
Sodium	mgNa/l	8	200	0	0	10	12.8	16.1
Pesticides								
Atrazine	µg/l	8	0.1	0	0	0.005	0.009	0.011
Carbetamide	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Clopyralid	µg/l	8	0.1	0	0	<0.012	<0.012	<0.012
Diuron	µg/l	8	0.1	0	0	<0.010	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.005	<0.005	<0.005
Simazine	µg/l	8	0.1	0	0	<0.007	0.013	0.02
Total Pesticide	µg/l	8	0.5	0	0	0	0.023	0.038
Additional Parameters								
Ammonium	mgNH ₄ /l	18	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100
Bromate	µgBrO ₃ /l	8	10	0	0	<0.5	<0.5	<0.5
Chloride	mgCl/l	8	250	0	0	23	33	45
Electrical Conductivity at 20 °C	µS/cm at 20 °C	18	2500	0	0	512	616	729
Nitrate	mgNO ₃ /l	8	50	0	0	31.5	38.3	43.4
Nitrite	mgNO ₂ /l	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula	µg/l	8	1	0	0	<0.63	<0.87	<0.87
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO ₄ /l	8	250	0	0	24	35	42
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	0	0.2	0.7
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<1.0	<1.0	<1.0
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	0.6	0.7	0.8
Total PAHs	µg/l	8	0.1	0	0	0	0	0.001
Total Trihalomethanes	µg/l	8	100	0	0	2.55	7.11	10.59
1,2 dichloroethane	µg/l	7	3	0	0	<0.04	<0.04	<0.04

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

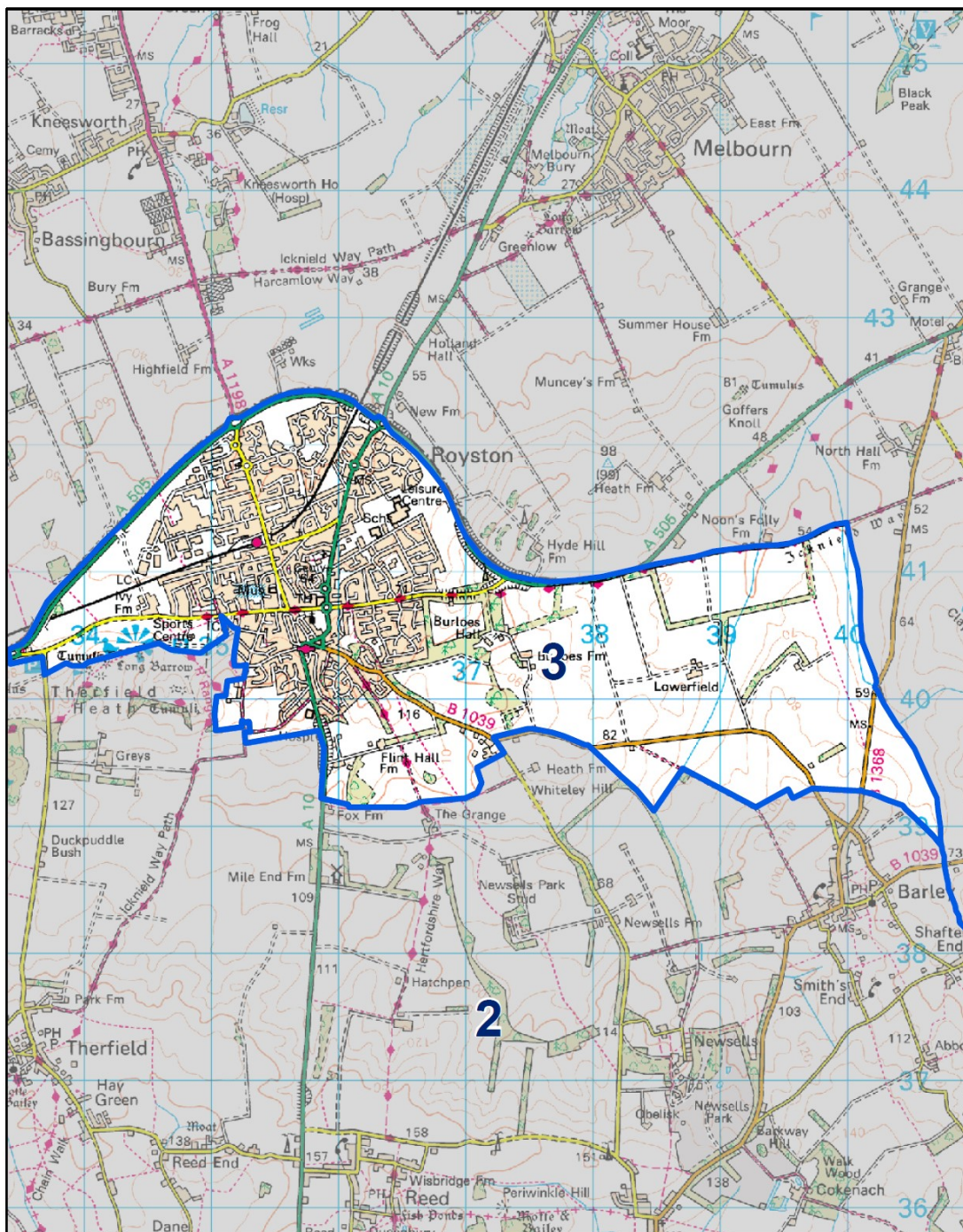
Commentary on Water Quality

Water quality was satisfactory in this zone in 2018.

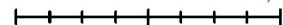
Undertakings & Authorised Departures

No Undertakings or Authorised Departures applied to this water supply zone during 2018.

WQZ 3 - Royston





0 460 920 1,840 Meters



January 2010

Legend

-  This Water Quality Zone
-  Other WQZ

Water Supply Zone: Royston (AF003)
 Period: 01-Jan-2018 to 31-Dec-2018
 Population: 16683



Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	48	0	0	0	0	0	0
E coli	No./100ml	48	0	0	0	0	0	0
Clostridium perfringens	No./100ml	8	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
3 day plate count 22 °C	No./1ml at 22 °C	25	No abnormal change	0	0	0	3	51
Customer Parameters								
Alkalinity	mgHCO ₃ /l	1	No PCV	0	0	286	286	286
Calcium	mgCa/l	1	No PCV	0	0	125	125	125
Chlorine (Residual)	mgCl ₂ /l	48	No PCV	0	0	0.08	0.31	0.57
Colour	mg/l Pt/Co	18	20	0	0	<1.0	<1.0	<1.0
Fluoride	mgF/l	8	1.5	0	0	0.116	0.152	0.173
Hardness (Total)	mgCaCO ₃ /l	1	No PCV	0	0	313	313	313
Hydrogen Ion (pH)	pH value	19	6.5-9.5	0	0	7	7.2	7.5
Quantitative Odour	Dilution No.	19	Abnormal & unacceptable to consumers	1	5	0	0	1
Quantitative Taste	Dilution No.	19		0	0	0	0	0
Temperature	°C	48	No PCV	0	0	8.5	14	20.4
Turbidity	NTU	25	4	0	0	<0.10	0.13	0.37
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	8	200	0	0	<5.0	<5.0	16.9
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	<0.20
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<0.5	<0.5	<0.5
Copper	mgCu/l	8	2	0	0	<0.010	0.071	0.352
Iron	µgFe/l	8	200	0	0	<15.0	<15.0	<15.0
Lead	µgPb/l	8	10	0	0	<1.00	<1.00	1.02
Manganese	µgMn/l	8	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	2	2.3	2.8
Sodium	mgNa/l	8	200	0	0	8.7	10.4	13.3
Pesticides								
Atrazine	µg/l	8	0.1	0	0	<0.005	<0.005	0.009
Carbetamide	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Clopyralid	µg/l	8	0.1	0	0	<0.012	<0.012	<0.012
Diuron	µg/l	8	0.1	0	0	<0.010	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.005	<0.005	0.005
Simazine	µg/l	8	0.1	0	0	<0.007	<0.007	0.013
Total Pesticide	µg/l	8	0.5	0	0	0	0.011	0.032
Additional Parameters								
Ammonium	mgNH ₄ /l	19	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	7	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100
Bromate	µgBrO ₃ /l	8	10	0	0	<0.5	<0.5	<0.5
Chloride	mgCl/l	8	250	0	0	19	23	37
Electrical Conductivity at 20 °C	µS/cm at 20 °C	19	2500	0	0	482	512	539
Nitrate	mgNO ₃ /l	8	50	0	0	27.7	33.4	39.2
Nitrite	mgNO ₂ /l	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		8	1	0	0	<0.55	<0.78	<0.78
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO ₄ /l	8	250	0	0	22	25	37
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	0	0.7	1.6
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<1.0	<1.0	<1.0
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	0.5	0.6	0.8
Total PAHs	µg/l	7	0.1	0	0	0	0	0.001
Total Trihalomethanes	µg/l	8	100	0	0	0	4.13	6.29
1, 2 dichloroethane	µg/l	8	3	0	0	<0.04	<0.04	<0.04

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

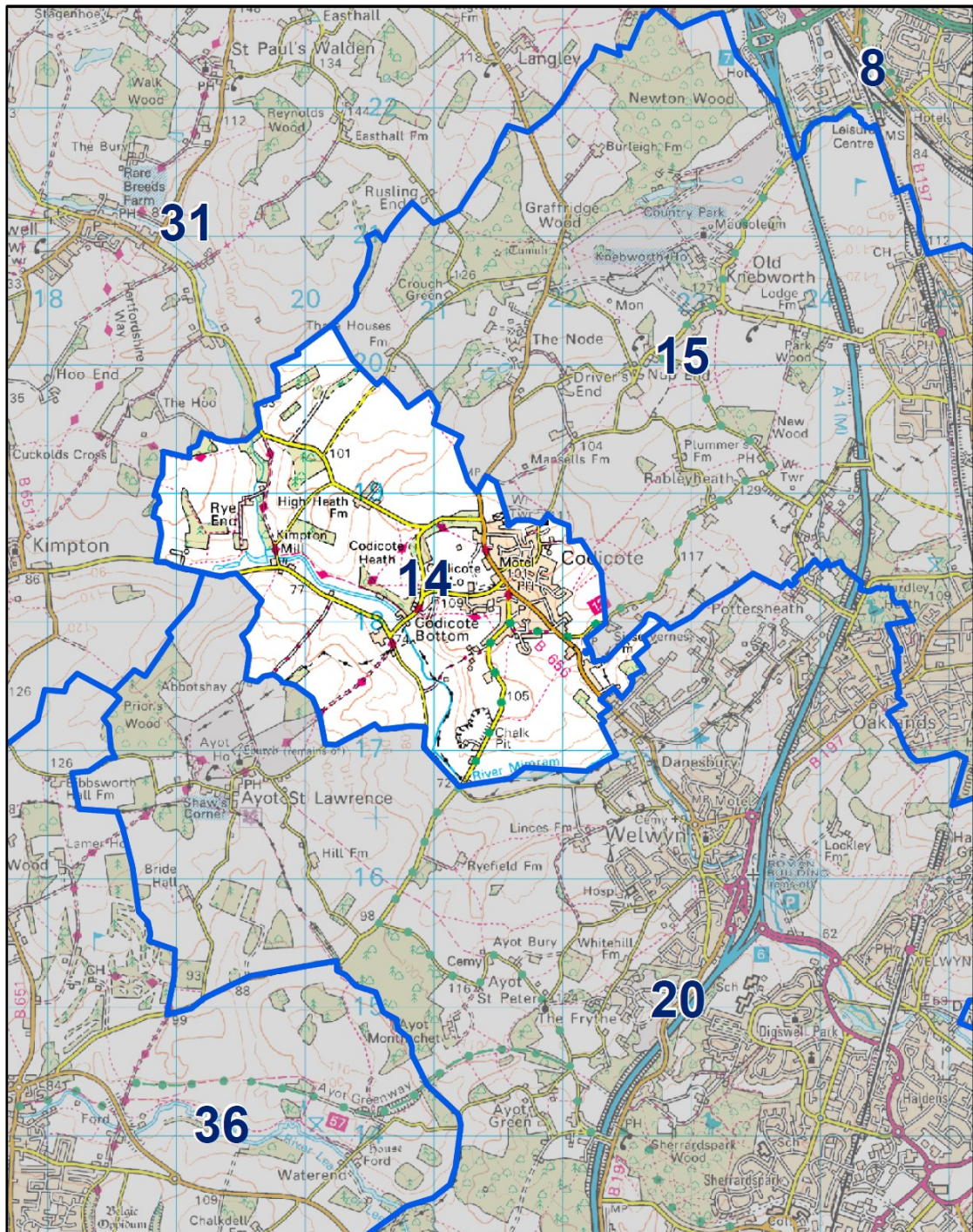
Commentary on Water Quality

In July, a sample taken from a customer's property in Briary Lane, Royston had a slight Quantitative Odour detected in it. Our investigation identified the internal plumbing fittings at the property as the most likely cause of the exceedence. The customer at the property had not noticed an unusual odour to their water supply and there were no complaints from customers in the Royston area regarding an unacceptable odour to the water supply around the time the sample was taken.

Undertakings & Authorised Departures

No Undertakings or Authorised Departures applied to this water supply zone during 2018.

WQZ 14 - Codicote



0 410 820 1,640 Meters

January 2010

Legend

- This Water Quality Zone
- Other WQZ

Water Supply Zone: Codicote (AF014)
 Period: 01-Jan-2018 to 31-Dec-2018
 Population: 2550



Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	12	0	0	0	0	0	0
E coli	No./100ml	12	0	0	0	0	0	0
Clostridium perfringens	No./100ml	4	0	0	0	0	0	0
Enterococci	No./100ml	4	0	0	0	0	0	0
3 day plate count 22 °C	No./1ml at 22 °C	4	No abnormal change	0	0	0	2	7
Customer Parameters								
Alkalinity	mgHCO ₃ /l	1	No PCV	0	0	327	327	327
Calcium	mgCa/l	1	No PCV	0	0	126	126	126
Chlorine (Residual)	mgCl ₂ /l	12	No PCV	0	0	0.13	0.23	0.38
Colour	mg/l Pt/Co	3	20	0	0	<1.0	<1.0	<1.0
Fluoride	mgF/l	4	1.5	0	0	0.097	0.136	0.203
Hardness (Total)	mgCaCO ₃ /l	1	No PCV	0	0	315	315	315
Hydrogen Ion (pH)	pH value	3	6.5-9.5	0	0	7	7.1	7.1
Quantitative Odour	Dilution No.	3	Abnormal & unacceptable to consumers	0	0	0	0	0
Quantitative Taste	Dilution No.	3	consumers	0	0	0	0	0
Temperature	°C	12	No PCV	0	0	8.9	13.5	20.2
Turbidity	NTU	4	4	0	0	<0.10	<0.10	0.21
Chemicals								
Metals								
Arsenic	µgAs/l	4	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	4	200	0	0	<5.0	<5.0	16.1
Antimony	µgSb/l	4	5	0	0	<0.20	<0.20	0.32
Cadmium	µgCd/l	4	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	4	50	0	0	<0.5	1.1	4.5
Copper	mgCu/l	4	2	0	0	0.036	0.093	0.151
Iron	µgFe/l	4	200	0	0	<15.0	<15.0	20.2
Lead	µgPb/l	4	10	0	0	<1.00	<1.00	<1.00
Manganese	µgMn/l	4	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	4	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	4	20	0	0	<2.0	<2.0	<2.0
Sodium	mgNa/l	4	200	0	0	9.3	21.6	48.8
Pesticides								
Atrazine	µg/l	4	0.1	0	0	-0.005	0.006	0.008
Carbetamide	µg/l	4	0.1	0	0	-0.009	-0.009	-0.009
Clopyralid	µg/l	3	0.1	0	0	-0.012	0.013	0.039
Diuron	µg/l	4	0.1	0	0	-0.010	-0.010	-0.010
Mecoprop	µg/l	3	0.1	0	0	-0.005	-0.005	-0.005
Simazine	µg/l	4	0.1	0	0	-0.007	-0.007	-0.007
Total Pesticide	µg/l	4	0.5	0	0	0.007	0.036	0.094
Additional Parameters								
Ammonium	mgNH ₄ /l	3	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	3	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	3	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	4	1	0	0	<0.100	<0.100	<0.100
Bromate	µgBrO ₃ /l	4	10	0	0	<0.5	<0.5	1.5
Chloride	mgCl/l	4	250	0	0	18	35	74
Electrical Conductivity at 20 °C	µS/cm at 20 °C	3	2500	0	0	503	512	521
Nitrate	mgNO ₃ /l	4	50	0	0	15.2	21.3	23.6
Nitrite	mgNO ₂ /l	4	0.5	0	0	<0.008	0.049	0.196
Nitrite Nitrate Formula		4	1	0	0	<0.46	<0.47	<0.47
Selenium	µgSe/l	4	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO ₄ /l	4	250	0	0	8	38	113
Sum of Tri & Tetrachloroethene	µg/l	4	10	0	0	0	0	0
Tetrachloromethane	µg/l	3	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	4	50	0	0	<1.0	<1.0	1.3
Total Organic Carbon	mgC/l	4	No abnormal change	0	0	0.4	1.3	3.3
Total PAHs	µg/l	3	0.1	0	0	0	0	0
Total Trihalomethanes	µg/l	4	100	0	0	1.82	10.25	31.55
1, 2 dichloroethane	µg/l	3	3	0	0	<0.04	<0.04	<0.04

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

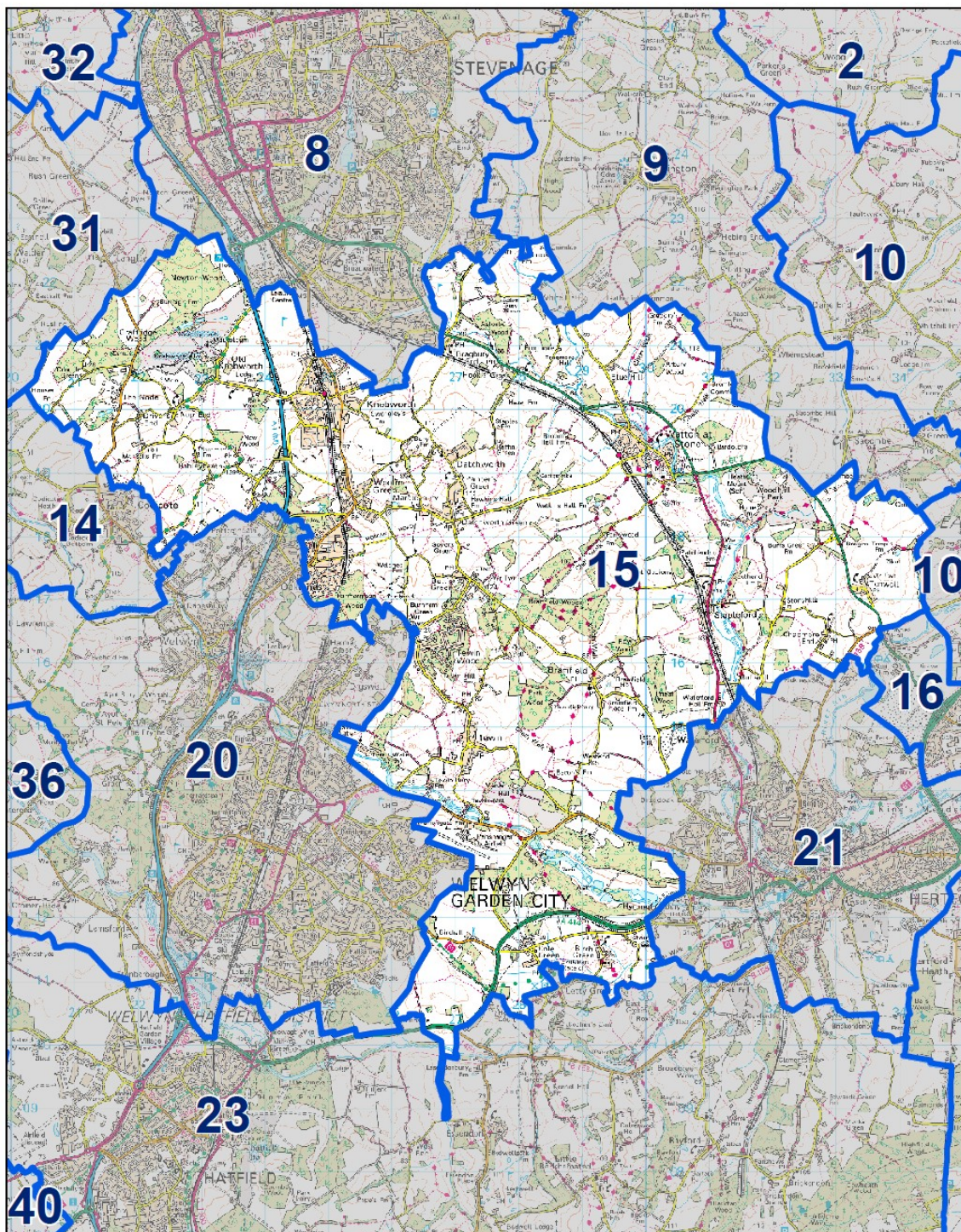
Commentary on Water Quality

Water quality was satisfactory in this zone in 2018.

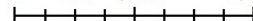
Undertakings & Authorised Departures

No Undertakings or Authorised Departures applied to this water supply zone during 2018.

WQZ 15 - Knebworth / Tewin





0 800 1,600 3,200 Meters



January 2010

Legend

-  This Water Quality Zone
-  Other WQZ

Water Supply Zone: Knebworth/Tewin (AF015)
 Period: 01-Jan-2018 to 31-Dec-2018
 Population: 14462



Parameter	Units	No. of Samples	PCV		% of Samples		Min.	Mean	Max.
			No. of Samples	>PCV	>PCV	>PCV			
Microbiological Parameters									
Coliform bacteria	No./100ml	36	0	0	0	0	0	0	0
E coli	No./100ml	36	0	0	0	0	0	0	0
Clostridium perfringens	No./100ml	24	0	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0	0
3 day plate count 22 °C	No./1ml at 22 °C	24	No abnormal change		0	0	0	2	21
Customer Parameters									
Alkalinity	mgHCO ₃ /l	1	No PCV	0	0	237	237	237	
Calcium	mgCa/l	1	No PCV	0	0	127	127	127	
Chlorine (Residual)	mgCl ₂ /l	36	No PCV	0	0	0.05	0.27	0.55	
Colour	mg/l Pt/Co	18	20	0	0	<1.0	<1.0	1.2	
Fluoride	mgF/l	8	1.5	0	0	0.132	0.218	0.27	
Hardness (Total)	mgCaCO ₃ /l	1	No PCV	0	0	318	318	318	
Hydrogen Ion (pH)	pH value	24	6.5-9.5	0	0	7	7.4	7.8	
Quantitative Odour	Dilution No.	18	Abnormal & unacceptable to consumers	0	0	0	0	0	
Quantitative Taste	Dilution No.	18	consumers	0	0	0	0	0	
Temperature	°C	35	No PCV	0	0	4.7	13.1	20.7	
Turbidity	NTU	24	4	0	0	<0.10	0.21	0.38	
Chemicals									
Metals									
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0	
Aluminium	µgAl/l	24	200	0	0	<5.0	<5.0	20.2	
Antimony	µgSb/l	8	5	0	0	<0.20	0.26	0.41	
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20	
Chromium	µgCr/l	8	50	0	0	<0.5	0.6	4.7	
Copper	mgCu/l	8	2	0	0	<0.010	0.062	0.236	
Iron	µgFe/l	24	200	0	0	<15.0	<15.0	35.4	
Lead	µgPb/l	8	10	0	0	<1.00	<1.00	1.02	
Manganese	µgMn/l	24	50	0	0	<1.0	<1.0	<1.0	
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10	
Nickel	µgNi/l	8	20	0	0	<2.0	2.2	5.1	
Sodium	mgNa/l	8	200	0	0	15.6	41	61.2	
Pesticides									
Atrazine	µg/l	8	0.1	0	0	<0.005	<0.005	<0.005	
Carbetamide	µg/l	8	0.1	0	0	<0.009	<0.009	0.02	
Clopyralid	µg/l	8	0.1	0	0	<0.012	0.019	0.038	
Glyphosate	µg/l	8	0.1	0	0	<0.003	<0.003	0.004	
Mecoprop	µg/l	8	0.1	0	0	<0.005	<0.005	<0.005	
Metaldehyde	µg/l	8	0.1	0	0	<0.009	0.039	0.089	
Metazachlor	µg/l	8	0.1	0	0	<0.005	<0.005	<0.005	
Propyzamide	µg/l	8	0.1	0	0	<0.006	0.021	0.058	
Simazine	µg/l	8	0.1	0	0	<0.007	<0.007	0.01	
Total Pesticide	µg/l	8	0.5	0	0	0	0.076	0.165	
2,4-D	µg/l	8	0.1	0	0	<0.007	<0.007	<0.007	
Additional Parameters									
Ammonium	mgNH ₄ /l	18	0.5	0	0	<0.04	<0.04	0.13	
Benzene	µg/l	7	1	0	0	<0.02	<0.02	<0.02	
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	<0.001	
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100	
Bromate	µgBrO ₃ /l	8	10	0	0	<0.5	1	3.5	
Chloride	mgCl/l	8	250	0	0	27	64	90	
Electrical Conductivity at 20 °C	µS/cm at 20 °C	18	2500	0	0	554	657	781	
Nitrate	mgNO ₃ /l	24	50	0	0	13	21.4	29.9	
Nitrite	mgNO ₂ /l	24	0.5	0	0	<0.006	0.061	0.166	
Nitrite Nitrate Formula		24	1	0	0	<0.54	<0.60	<0.60	
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0	
Sulphate	mgSO ₄ /l	8	250	0	0	28	94	131	
Sum of Tri & Tetrachloroethene	µg/l	7	10	0	0	0	0	0.1	
Tetrachloromethane	µg/l	7	3	0	0	<0.1	<0.1	<0.1	
Total Cyanide	µgCN/l	8	50	0	0	<1.0	<1.0	1	
Total Organic Carbon	mgC/l	8	No abnormal change		0	0.4	2.9	5	
Total PAHs	µg/l	8	0.1	0	0	0	0	0	
Total Trihalomethanes	µg/l	7	100	0	0	5.61	22.35	36.33	
1, 2 dichloroethane	µg/l	7	3	0	0	<0.04	<0.04	<0.04	

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality

Water quality was satisfactory in this zone in 2018.

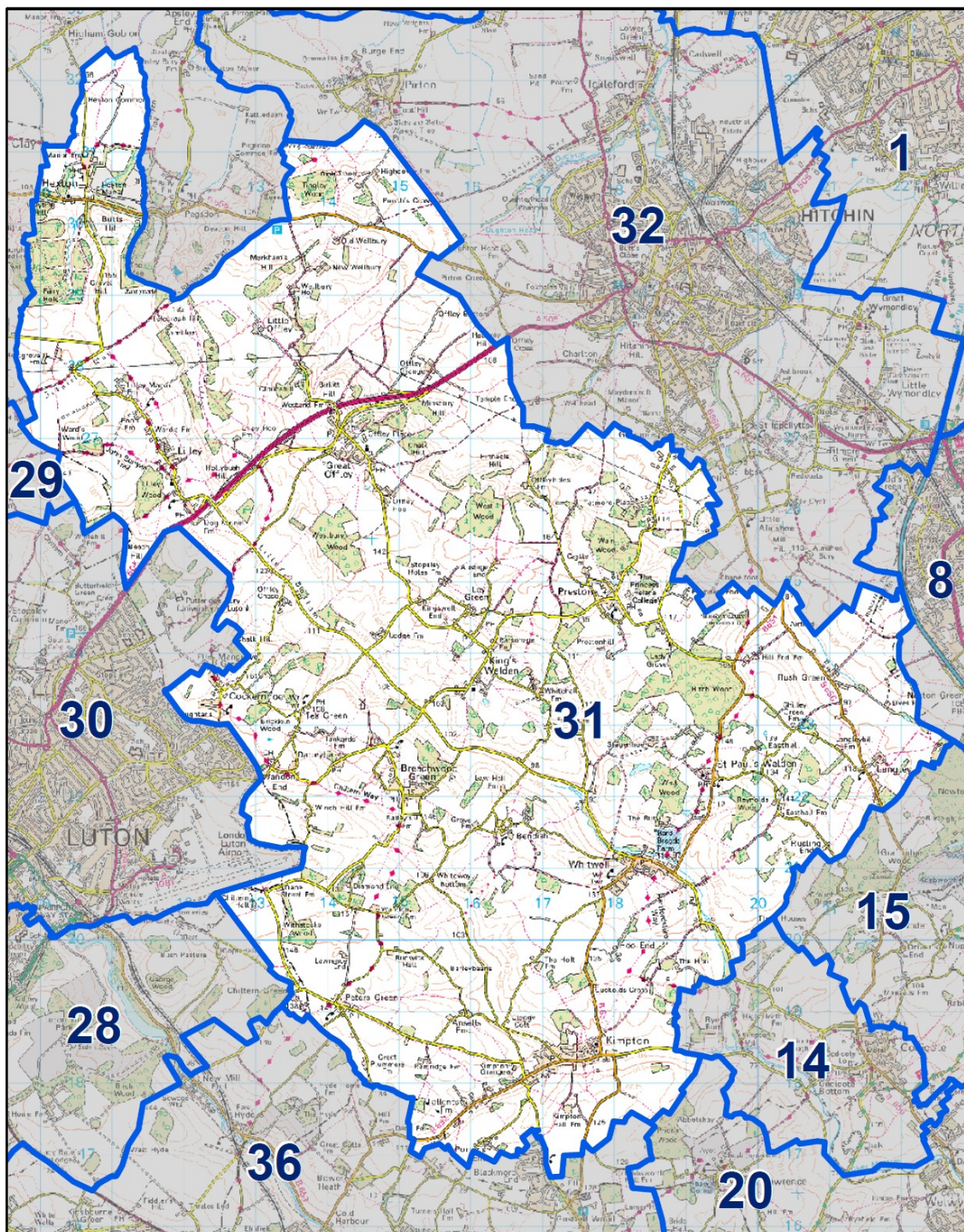
Undertakings & Authorised Departures

No Authorised Departures applied to this water supply zone during 2018.


An

Undertaking is in place for this zone relating to Metaldehyde & Total Pesticides from Anglian Water Services' (AWS) Grafham Water Treatment Works. AWS has agreed to: implement a monitoring strategy; to engage with relevant stakeholders & provide regular updates on data; investigate new, sustainable treatment processes, supporting national research programmes where appropriate; and to continually review & appraise the risk from these hazards as part of the regulatory process.

WQZ 31 - Offley / Kimpton





0 5001,000 2,000 Meters



January 2010

Legend

-  This Water Quality Zone
-  Other WQZ

Water Supply Zone: Offley/Kimpton (AF031)
 Period: 01-Jan-2018 to 31-Dec-2018
 Population: 6901



Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	24	0	0	0	0	0	0
E coli	No./100ml	24	0	0	0	0	0	0
Clostridium perfringens	No./100ml	8	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
3 day plate count 22 °C	No./1ml at 22 °C	25	No abnormal change	0	0	0	1	5
Customer Parameters								
Alkalinity	mgHCO ₃ /l	1	No PCV	0	0	294	294	294
Calcium	mgCa/l	1	No PCV	0	0	129	129	129
Chlorine (Residual)	mgCl ₂ /l	24	No PCV	0	0	0.14	0.29	0.51
Colour	mg/l Pt/Co	8	20	0	0	<1.0	<1.0	<1.0
Fluoride	mgF/l	8	1.5	0	0	0.104	0.123	0.153
Hardness (Total)	mgCaCO ₃ /l	1	No PCV	0	0	323	323	323
Hydrogen Ion (pH)	pH value	9	6.5-9.5	0	0	7.1	7.3	7.4
Quantitative Odour	Dilution No.	9	Abnormal & unacceptable to consumers	0	0	0	0	0
Quantitative Taste	Dilution No.	9	Abnormal & unacceptable to consumers	0	0	0	0	0
Temperature	°C	24	No PCV	0	0	7.9	13.3	20.8
Turbidity	NTU	12	4	0	0	<0.10	0.11	0.25
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	8	200	0	0	<5.0	<5.0	16.4
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	<0.20
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<0.5	<0.5	<0.5
Copper	mgCu/l	8	2	0	0	<0.010	0.097	0.306
Iron	µgFe/l	8	200	0	0	<15.0	<15.0	<15.0
Lead	µgPb/l	8	10	0	0	<1.00	<1.00	<1.00
Manganese	µgMn/l	8	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	<2.0	<2.0	<2.0
Sodium	mgNa/l	8	200	0	0	16	21.2	28.4
Pesticides								
Atrazine	µg/l	8	0.1	0	0	<0.005	<0.005	0.005
Carbentamide	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Clopyralid	µg/l	8	0.1	0	0	<0.012	<0.012	0.015
Diuron	µg/l	8	0.1	0	0	<0.010	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.005	<0.005	<0.005
Simazine	µg/l	7	0.1	0	0	<0.007	<0.007	<0.007
Total Pesticide	µg/l	8	0.5	0	0	0	0.011	0.034
Additional Parameters								
Ammonium	mgNH ₄ /l	12	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100
Bromate	µgBrO ₃ /l	8	10	0	0	<0.5	<0.5	1.2
Chloride	mgCl/l	8	250	0	0	39	48	57
Electrical Conductivity at 20 °C	µS/cm at 20 °C	9	2500	0	0	555	599	643
Nitrate	mgNO ₃ /l	8	50	0	0	31.1	35.2	40.7
Nitrite	mgNO ₂ /l	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		8	1	0	0	<0.62	<0.61	<0.61
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO ₄ /l	8	250	0	0	28	45	61
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	0	0	0
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<1.0	<1.0	<1.0
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	0.5	1.3	2.7
Total PAHs	µg/l	8	0.1	0	0	0	0	0.001
Total Trihalomethanes	µg/l	8	100	0	0	3.59	8.3	18.2
1,2 dichloroethane	µg/l	8	3	0	0	<0.04	<0.04	<0.04

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality

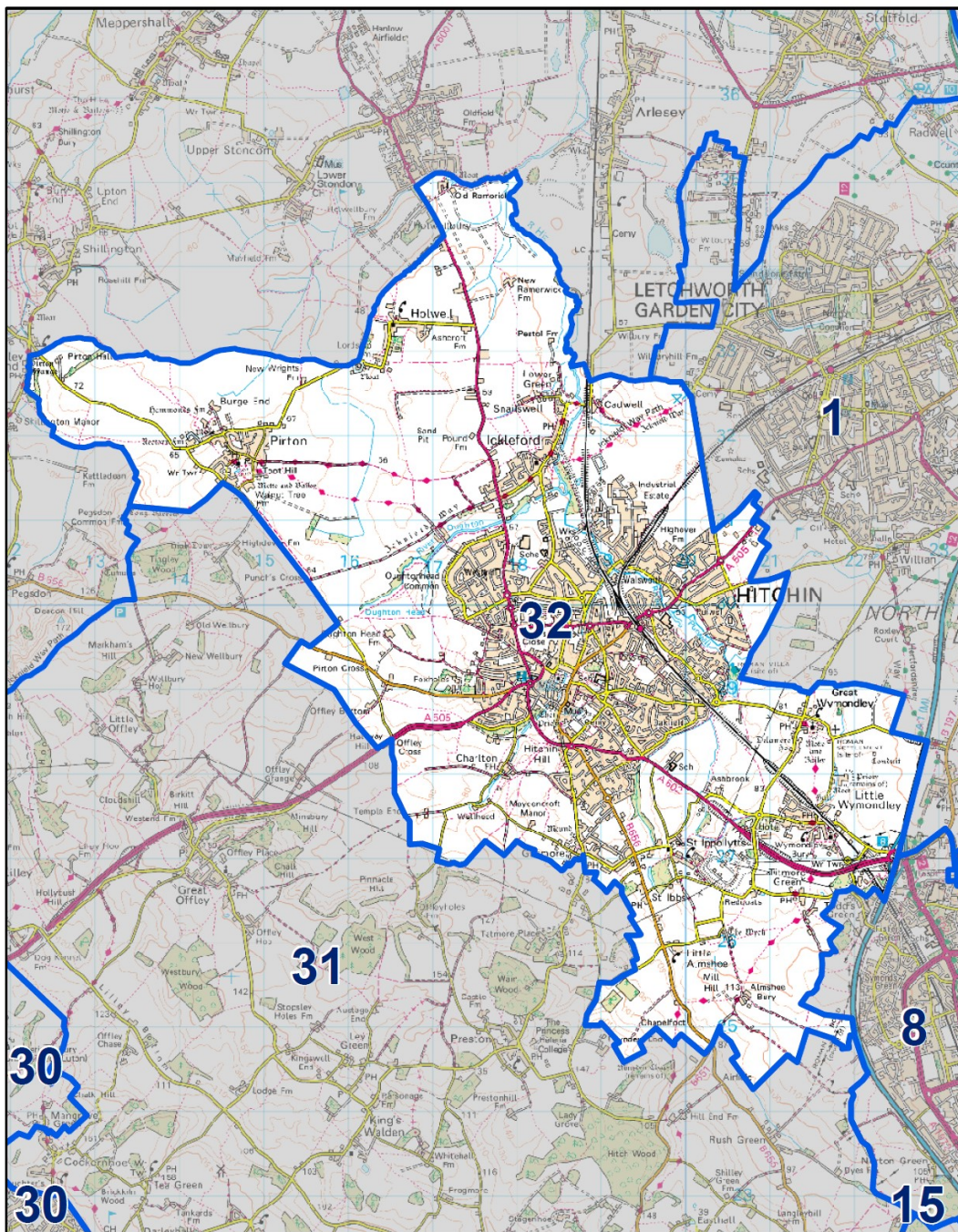
Water quality was satisfactory in this zone in 2018.

Undertakings & Authorised Departures

No Authorised Departures applied to this water supply zone during 2018.

An Undertaking is in place for this zone relating to nitrate from Kings Walden Water Treatment Works. The Company agreed to install a new treatment process at the works that will reduce the levels of nitrate in the water leaving the works. Construction of the new treatment process was completed by March 2014 and fully commissioned in 2017. The DWI was satisfied that we had met our obligation under the terms of the Undertaking and relieved us of any obligation to carry out further work.

WQZ 32 - Hitchin





0 410 820 1,640 Meters



January 2010

Legend

-  This Water Quality Zone
-  Other WQZ

Water Supply Zone: Hitchin (AF032)
 Period: 01-Jan-2018 to 31-Dec-2018
 Population: 41905



Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	108	0	0	0	0	0	0
E coli	No./100ml	108	0	0	0	0	0	0
Clostridium perfringens	No./100ml	8	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
3 day plate count 22 °C	No./1ml at 22 °C	36	No abnormal change	0	0	0	4	50
Customer Parameters								
Alkalinity	mgHCO ₃ /l	1	No PCV	0	0	315	315	315
Calcium	mgCa/l	1	No PCV	0	0	131	131	131
Chlorine (Residual)	mgCl ₂ /l	108	No PCV	0	0	0.06	0.38	0.65
Colour	mg/l Pt/Co	27	20	0	0	<1.0	<1.0	1.2
Fluoride	mgF/l	8	1.5	0	0	0.098	0.131	0.2
Hardness (Total)	mgCaCO ₃ /l	1	No PCV	0	0	328	328	328
Hydrogen Ion (pH)	pH value	26	6.5-9.5	0	0	7	7.3	7.7
Quantitative Odour	Dilution No.	27	Abnormal & unacceptable to consumers	0	0	0	0	0
Quantitative Taste	Dilution No.	27	consumers	0	0	0	0	0
Temperature	°C	103	No PCV	0	0	6.3	13.6	26.5
Turbidity	NTU	36	4	0	0	<0.10	0.1	0.3
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	8	200	0	0	<5.0	<5.0	16.7
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	0.23
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<0.5	0.5	1.9
Copper	mgCu/l	8	2	0	0	<0.010	0.034	0.116
Iron	µgFe/l	8	200	0	0	<15.0	<15.0	<15.0
Lead	µgPb/l	8	10	0	0	<1.00	<1.00	<1.00
Manganese	µgMn/l	8	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	<2.0	<2.0	2.5
Sodium	mgNa/l	8	200	0	0	7.7	12.9	32.8
Pesticides								
Atrazine	µg/l	8	0.1	0	0	<0.005	0.009	0.022
Carbetamide	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Clopyralid	µg/l	7	0.1	0	0	<0.012	<0.012	<0.012
Diuron	µg/l	8	0.1	0	0	<0.010	<0.010	<0.010
Mecoprop	µg/l	7	0.1	0	0	<0.005	<0.005	<0.005
Simazine	µg/l	8	0.1	0	0	<0.007	<0.007	0.009
Total Pesticide	µg/l	7	0.5	0	0	0	0.026	0.066
Additional Parameters								
Ammonium	mgNH ₄ /l	27	0.5	0	0	<0.04	<0.04	0.06
Benzene	µg/l	7	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100
Bromate	µgBrO ₃ /l	8	10	0	0	<0.5	<0.5	0.6
Chloride	mgCl/l	8	250	0	0	18	27	59
Electrical Conductivity at 20 °C	µS/cm at 20 °C	26	2500	0	0	504	559	692
Nitrate	mgNO ₃ /l	8	50	0	0	25.5	31	34.5
Nitrite	mgNO ₂ /l	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		8	1	0	0	<0.51	<0.69	<0.69
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO ₄ /l	8	250	0	0	15	28	81
Sum of Tri & Tetrachloroethene	µg/l	7	10	0	0	0	0.1	0.4
Tetrachloromethane	µg/l	7	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<1.0	<1.0	1.1
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	0.4	0.8	2.8
Total PAHs	µg/l	8	0.1	0	0	0	0	0
Total Trihalomethanes	µg/l	7	100	0	0	2.18	6.97	14.25
1, 2 dichloroethane	µg/l	7	3	0	0	<0.04	<0.04	<0.04

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality

Water quality was satisfactory in this zone in 2018.

Undertakings & Authorised Departures

No Undertakings or Authorised Departures applied to this water supply zone during 2018.