Guernsey Water
Water Quality Report

2017

States of Guernsey
Trading Assets

GuernseyWater
Running water

water.gg

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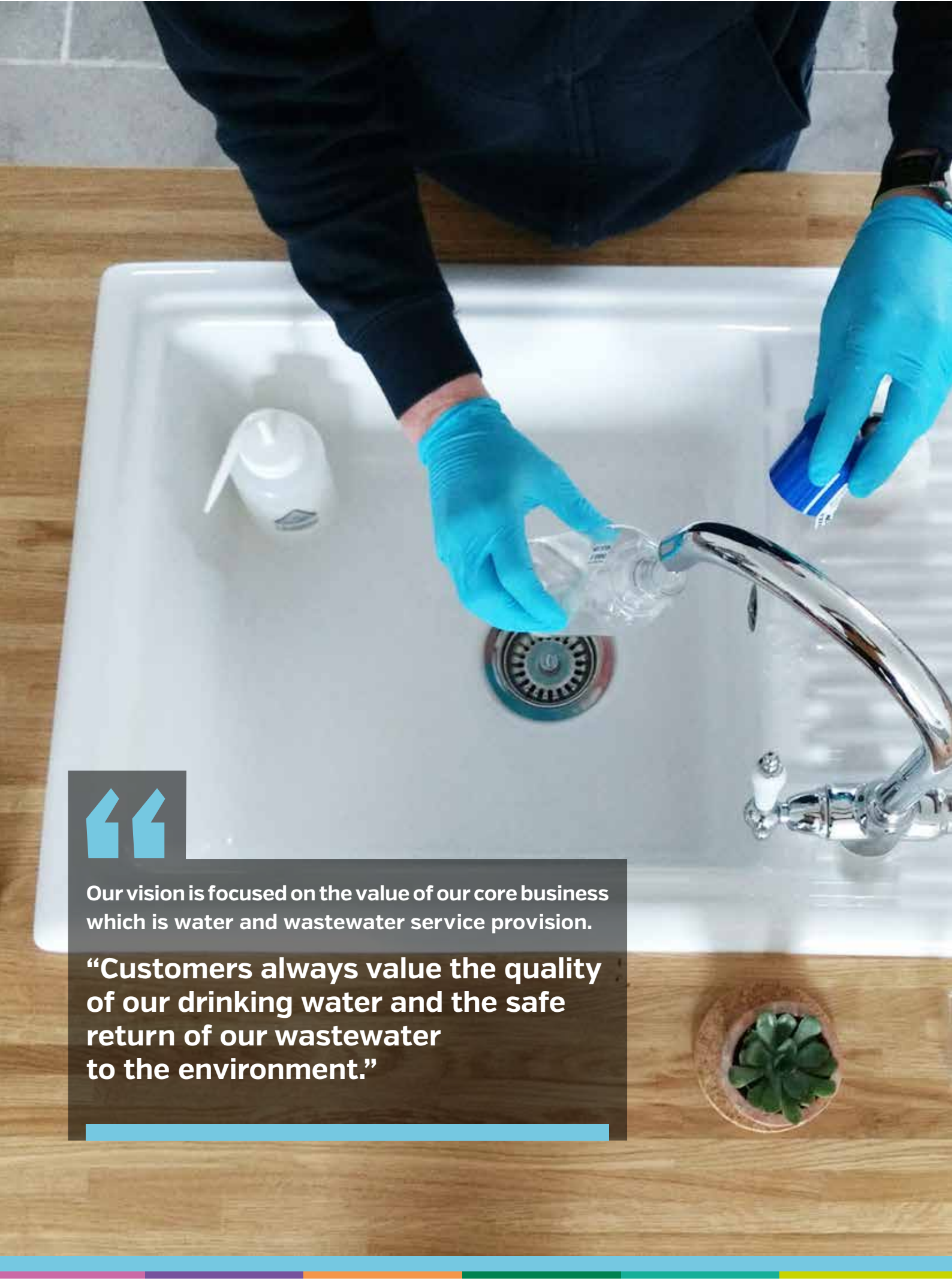
OUR 6 OUTCOMES



Our vision is focused on the value of our core business which is water and wastewater service provision.

“Customers always value the quality of our drinking water and the safe return of our wastewater to the environment.”

SAFE AND GOOD TO DRINK

Our customers trust that our drinking water looks good and tastes good

- **Invest in efficient water treatment to improve drinking water and reduce costs**
- **Reduce water quality-related customer complaints**

99.85%

COMPLIANCE WITH DRINKING WATER STANDARDS

In 2017, Guernsey Water provided 4,542 mega litres of safe and high quality drinking water (over 4 times the volume of St Saviours Reservoir) to its customers.

Protecting public health with clean, fresh, wholesome drinking water is vitally important to Guernsey Water and in 2017 we conducted 7,821 laboratory analyses on compliance samples taken at water treatment works, service reservoirs and customers taps. These samples verify that the water produced at treatment works and supplied to customers complies with the standards set out in the regulations we follow as best practice.

Many more samples were analysed both in laboratories and onsite for operational reasons over and above these compliance samples, providing additional checks and monitoring of the performance of our assets.

The quality of water supplied was excellent with 99.85% of 7,821 analyses meeting the prescribed standards. The achievement of such a high compliance figure is due to the collective technical expertise of our staff that covers all aspects of the science and engineering of the public water supply.

Safe, clean drinking water is vital to public health and the wellbeing of our island. This is ever more important in the face of significant challenges to drinking water supplies from the impacts of climate change on the quality and availability of water resources. It is essential that good quality drinking water, and the investment by Guernsey Water necessary to achieve it, is maintained into the future.

2017 Water Quality Key Performance Indicators

- Achieve 99.5% compliance for Maximum Admissible Concentrations at Water Treatment Works
- Achieve 99% compliance for Maximum Admissible Concentrations at service reservoirs
- Achieve 99% compliance for Maximum Admissible Concentrations at customer taps

Guernsey Water has achieved its 2017 water quality targets with 100% compliance recorded at the Service Reservoirs for the fourth year running and overall compliance being slightly lower than that of 2016, this is due to a number of factors including the rescheduling of some parameters under due diligence to target the times where failures are more likely to occur. Guernsey Water continues to provide safe, high quality drinking water to the satisfaction of its customer's requirements. There are a small number of occasions where water quality does not meet the high standard we expect and our customers deserve. We will continue to investigate and strive to eliminate these to further improve the quality of Guernsey's public drinking water supplies.

Tests taken from Guernsey Water's 3 operational treatment works, 3 service reservoirs, water tower and customers' taps in 2 water supply zones show that 99.85% of the 7,821 analyses met all national and European Union standards. This shows a slight decrease in compliance compared to the 2016 figure, which was 99.91%.

Guernsey Water is regulated by the Director of Environmental Health and Pollution Regulation (DEHPR), with the current standard by which water quality is measured taken from England and Wales in the form of The Water Supply (Water Quality) Regulations, 2016. The regulations set out the parameters to be analysed for (Appendix A) and the required frequency of testing.

STEPHEN LANGLOIS
GENERAL MANAGER

SUMMARY

In 2017 there were no breaches at St Saviours water treatment works with one failure each at Kings Mills and Longue Hougue water treatment works. These were fully investigated and actions taken to minimise any re-occurrence. Measures to improve bacterial quality of the Island's service reservoirs have had a continuing positive effect, with 100% compliance being recorded at the 3 service reservoirs and the water tower. 2017 is the fourth consecutive year on record that has seen 100% compliance from all service reservoirs and the water tower.

Supply zones (customer tap samples) had 10 failures in total; 3 were for bacteriological parameters and 7 were Trihalomethane (THM) failures. Bacteriological parameters being present does not necessarily indicate ingress of contamination but they should be absent from treated water so their presence should always be investigated. THMs are disinfection by-products formed primarily by reactions between chlorine and organic matter (measured as Total Organic Carbon).

There are a number of factors which influence the formation of disinfection by-products and these include the type and concentration of disinfectant, the concentration of organic matter within the treated water, the temperature, pH and contact time/length of the distribution network. The increase in the number of THM fails in 2017 can be explained as the sampling was targeted at the times of the year most likely to give rise to failures, which is during the warmer months of the year. Altering the sampling in this way follows the principles of Due Diligence.

The 3 bacteriological failures were taken from customer's taps and on further investigation and resampling it was identified that the failures were due to a combination of internal issues within the properties and low chlorine levels which resulted from prolonged periods of warm weather. This will continue to be a focus of our distribution strategy going forward.

THM formation remains an area of focus and further work will be undertaken throughout our latest business planning period to further reduce these by operational and capital investment. The UK Drinking Water Inspectorate (DWI) is however clear that "at all times that actions taken to minimise disinfection by-product formation should not compromise the effectiveness of the disinfection process." Guernsey Water follows this guidance as best practice.

We regularly analyse for a wide range pesticides and of these only 35 were detected and no breaches of the 0.1 µg/l limit were observed. We have continued to monitor our streams regularly for the presence of glyphosate which is regularly detected but at present remains a low risk, and we will continue to monitor for this parameter in 2017 to ensure that the levels we find are of no concern to our treatment processes.

Perfluorooctane sulphonate (PFOS) has been monitored on a regular basis both in the raw water in St Saviours Reservoir and treated water leaving St Saviours water treatment works. The maximum result detected in the treated water analysis was 0.027µg/l (ppb) which is within Tier 1 (<0.3µg/l) of the guidance issued by the UK DWI on PFOS (http://dwi.defra.gov.uk/stakeholders/information-letters/2009/10_2009annex.pdf).

Categorisation as Tier 1 merely recognises that there may be a potential hazard which should as a minimum be considered by a risk assessment. Guernsey Water has gone much further than this to ensure the protection of drinking water quality by working closely with the DEHPR and other States of Guernsey Departments to actively reduce PFOS levels found in raw water through the treatment of stream water from affected catchments as well as the removal and containment of contaminated soils.

The affected catchments have also been closely monitored and measures put in place (such as stream diverts) to minimise levels in raw waters. This has had a positive effect with a drop in the maximum detected PFOS concentration recorded in the raw water stored at St Saviours Reservoir from 0.074µg/l in 2016 to 0.029µg/l recorded in 2017. There was a decrease in the maximum PFOS concentration detected in samples collected from streams, from 5.5µg/l in 2016 to 3.38µg/l in 2017. This was due to a combination factors including the ongoing remedial works at the airport and the natural variation in rainfall amounts.

There were a total of 147 water quality enquiries from customers in 2017, compared to 114 in 2016. We received 33 more taste complaints than we did in 2016 but this was still less than half the number received in 2015. Guernsey Water uses the same methodology for recording consumer contacts and enquiries regarding water quality as is used in England and Wales, whereby every contact is recorded and categorised and to enable year on year comparison. This will remain an area of focus throughout our business planning period.

The implementation of Water Safety Planning in 2016, a proactive management system that aims to ensure clean, safe drinking water, will continue to assist us in our aim of consistently supplying high quality drinking water to our customers. The updating and development of these plans will be ongoing throughout our business plan period.

It should also be noted that in 2017 our water quality sampling programme was audited externally by the Drinking Water Quality Regulator for Scotland and was deemed fit for purpose, this has given us further confidence that we are as an organisation following the Water Supply (Water Quality) Regulations as best practice.

"Drinking water is vital for public health so we strive to provide safe, clean water at all times and in 2017 our water quality remained high."

MARGARET McGUINNESS,
WATER QUALITY RISK MANAGER

INTRODUCTION

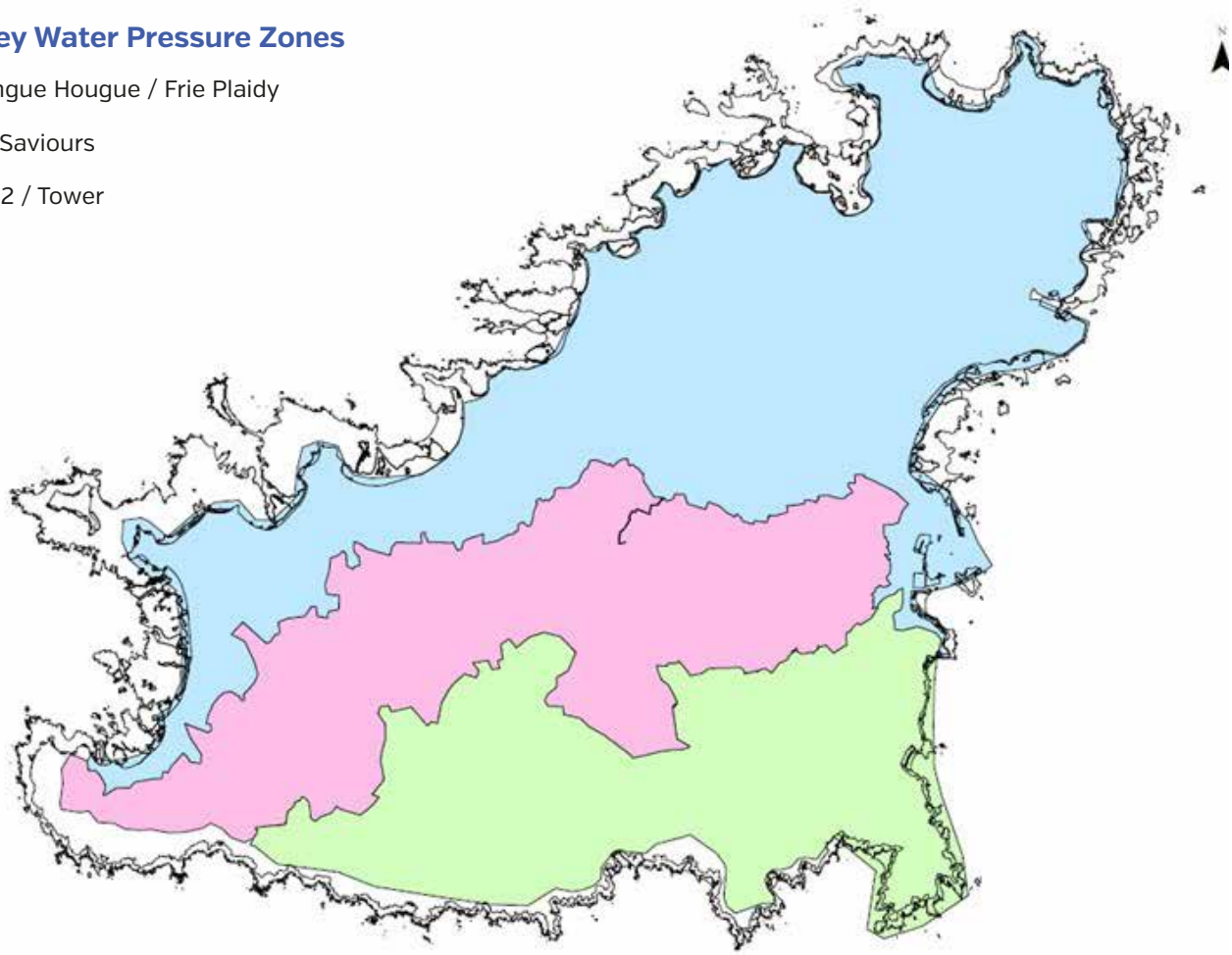
Treated Water

Guernsey Water operates using current Drinking Water Inspectorate regulations and guidance as best practice. This requires us to meet very high standards to satisfy our Regulator, the Director of Environmental Health and Pollution Regulation. Guernsey Water has 4 treatment works (3 in service and 1 mothballed plant), 3 service reservoirs, a water tower and 2 water supply zones.

The general rationale of water movement in Guernsey is: St Saviours water treatment works supplies water to No.2 East and West service reservoirs which then either goes into the Water Tower and onto the Tower Supply Zone (green in image below) or direct to No.2 Supply Zone (pink in image below). Longue Hougue water treatment works (or Kings Mills water treatment works when Longue Hougue is offline) supplies water direct into Longue Hougue Supply Zone (blue in image below) and into Frie Plaidy Service Reservoir.

Guernsey Water Pressure Zones

- Longue Hougue / Frie Plaidy
- St. Saviours
- No.2 / Tower



2017 COMPLIANCE SUMMARY

Below is a breakdown of the compliance for 2017, as measured against The Water Supply (Water Quality) Regulations, 2016.

Water Treatment Works

	St Saviours	Juas (offline)	Kings Mills	Longue Hougue	Total
No of Breaches	0	0	1	1	2
No of Passes	1934	0	1384	1830	5148
No of Samples	1934	0	1385	1831	5150
% Compliance	100.00%		99.93%	99.95%	99.96%

Service Reservoirs & Water Tower

	No.2 East	No. 2 West	Frie Plaidy	Tower	Total
No of Breaches	0	0	0	0	0
No of Passes	104	104	104	104	416
No of Samples	104	104	104	104	416
% Compliance	100.00%	100.00%	100.00%	100.00%	100.00%

Distribution Zones

	North Zone	South Zone	Total
No of Breaches	4	6	10
No of Passes	704	522	1226
No of Samples	708	528	1236
% Compliance	99.44%	98.86%	99.19%

Overall Total – all parameters

	Total
No of Breaches	12
No of Passes	7809
No of Samples	7821
% Compliance	99.85%

Tables 1 to 11 have the breakdown of drinking water quality in the detailed format used by water companies in England and Wales and annually reported by the DWI.

Raw Water

With regard to the Island's water catchment area, Guernsey Water has in the past managed the legislation concerning pollution of this area. This has meant water quality that could potentially have an effect on drinking water has been managed through strict limits on discharges to the environment. This responsibility has now been moved to fall under the jurisdiction of the Director of Environmental Health and Pollution Regulation, as a result Guernsey Water is now managing the Island's wastewater infrastructure in line with the recommendations agreed by the States of Guernsey in Billet d'Etat XX1 2012 (dated 31st October 2012).

Raw water quality is closely monitored with analyses of 21 streams and stored water in 17 quarries and reservoirs. Raw water quality determines if water is collected and stored; in turn stored water is transferred to water treatment works based on water quality parameters to ensure that good quality water is supplied to our customers.

Nitrate levels in some streams are at the upper acceptable limit but through careful blending and storage, levels are reduced to ensure compliance with the prescribed limit of 50 mg/l for the provision of wholesome drinking water.

Tables 12 and 13 show the raw water quality that was observed in 2017 in the Island's various streams and storage reservoirs.

TREATED WATER SUMMARY

Treated Water 2017 Data Summary Tables

These tables contain a summary of results of treated water monitoring undertaken by Guernsey Water in 2017.

Notes relating to the interpretation of the tables: -

The tables below show the maximum and minimum levels detected over the year. The symbol < indicates that the result was less than the limit of detection of the analytical method used. The symbol > indicates that the result was above the recording range of the analytical method used.

Table 1: Quality of water leaving treatment works - Directive requirements

Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of WTWs with failures
Nitrite	0.1 mg NO_2/l	123	0	<0.03	<0.03	0
TOTAL	-	123	0	-	-	-

Table 2: Quality of water leaving treatment works - National requirements

Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of WTWs with failures
Coliform Bacteria	0 number/100ml	572	1	0	2	1
E. coli	0 number/100ml	572	0	0	0	0
Cryptosporidium	oocysts <1 in 10 litres	16	0	<0.00338	<0.01852	0
TOTAL	-	1160	1	-	-	-

Table 3: Quality of water leaving treatment works - Additional monitoring requirements

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum
Colony Counts After 3 Days At 22°C	No abnormal change	572	1	0	103
Colony Counts After 48 Hours At 37oC	No abnormal change	119	0	0	2
Residual Disinfectant - Free	No abnormal change	862	0	0.00	1.32
Residual Disinfectant - Total	No abnormal change	860	0	0.13	1.44
Turbidity	1 NTU	569	1	<0.01	5.10
TOTAL	-	2982	2	-	-

Table 4: Quality of water leaving service reservoirs - National requirements

Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of reservoirs failing standard
Coliform Bacteria	0 number/100ml	208	0	0	0	0
E. coli	0 number/100ml	208	0	0	0	0
TOTAL	-	416	0	-	-	-

Table 5: Quality of water leaving service reservoirs - National requirements

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum
Colony Counts After 3 Days At 22°C	No abnormal change	208	6	0	125
Colony Counts After 48 Hours At 37oC	No abnormal change	48	0	0	2
Residual Disinfectant - Free	No abnormal change	208	0	0.01	0.47
Residual Disinfectant - Total	No abnormal change	208	0	0.09	0.67
TOTAL	-	672	6	-	-

*these are marked as n/a as they refer to changes observed and not a set numerical standard

Table 6a: Quality of water leaving bulk supply points - European Standards

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of supply points failing standard
1,2 Dichloroethane	3 µg/L	16	0	<0.07	<0.1	0
Benzene	1 µg/L	16	0	<0.02	<0.07	0
Boron	1 mg B/L	16	0	70.1	105.0	0
Bromate	10 µg Br03/L	16	0	<0.1	0.50	0
Cyanide	50 µg CN/L	24	0	<0.7	1.1	0
Fluoride	1.5 mg F/L	16	0	<0.1	0.14	0
Mercury	1 µg Hg/L	24	0	<0.02	0.03	0
Tetrachloroethene / Trichloroethene	10 µg/L	32	0	<0.05	<0.05	0
TOTAL	-	160	0	-	-	-

Table 6b: Quality of water leaving bulk supply points - European Standards (pesticides)

Parameter	Prescribed Concentration or Value	Count of times detected	Tests Failed	Minimum	Maximum	No. of supply points failing standard
2,4-D	0.1 µg/L	19	0	0.004	0.086	0
2,4-DB	0.1 µg/L	1	0	0.006	0.006	0
2,4-DP [Dichloroprop]	0.1 µg/L	1	0	0.003	0.003	0
Atrazine	0.1 µg/L	24	0	0.002	0.006	0
Atrazine Desethyl	0.1 µg/L	23	0	0.004	0.007	0
Atrazine Desisopropyl	0.1 µg/L	21	0	0.002	0.006	0
Atrazome Desisopropyl	0.1 µg/L	1	0	0.004	0.004	0
Benazolin	0.1 µg/L	3	0	0.007	0.011	0
Bromoxynil	0.1 µg/L	5	0	0.003	0.005	0
Carbendazim	0.1 µg/L	1	0	0.001	0.001	0
Clopyralid	0.1 µg/L	17	0	0.007	0.022	0
Demeton-S-Methyl	0.1 µg/L	2	0	0.001	0.001	0
Dichlorvos	0.1 µg/L	1	0	0.004	0.004	0
Diflufenican	0.1 µg/L	4	0	0.003	0.006	0
Diuron	0.1 µg/L	12	0	0.003	0.009	0
Ethofumesate	0.1 µg/L	1	0	0.001	0.001	0
Fluazifop-butyl	0.1 µg/L	5	0	0.001	0.001	0
Gamma-HCH	0.1 µg/L	1	0	0.001	0.001	0
Isoproturon	0.1 µg/L	2	0	0.003	0.004	0
MCPA	0.1 µg/L	23	0	0.003	0.088	0
MCPP [Mecoprop]	0.1 µg/L	23	0	0.003	0.085	0
Metalaxyl	0.1 µg/L	1	0	0.005	0.005	0
Metsulfuron-methyl	0.1 µg/L	4	0	0.003	0.003	0
Mevinphos	0.1 µg/L	1	0	0.003	0.003	0
Monuron	0.1 µg/L	6	0	0.002	0.004	0
Propazine	0.1 µg/L	1	0	0.001	0.001	0
Propiconazole	0.1 µg/L	12	0	0.003	0.009	0
Quinmerac	0.1 µg/L	2	0	0.003	0.003	0
Simazine	0.1 µg/L	21	0	0.001	0.005	0
Tebuconazole	0.1 µg/L	7	0	0.002	0.004	0
Terbuthylazine	0.1 µg/L	6	0	0.001	0.002	0
Terbutryn	0.1 µg/L	1	0	0.001	0.001	0
Triclopyr	0.1 µg/L	15	0	0.006	0.055	0
Aldrin	0.03 µg/L	24	0	<0.001	<0.001	0
Dieldrin	0.03 µg/L	24	0	<0.001	<0.002	0
Heptachlor	0.03 µg/L	24	0	<0.001	<0.002	0
Heptachlor epoxide	0.03 µg/L	24	0	<0.001	<0.002	0
Pesticides - Total Substances	0.5 µg/L	24	0	0.016	0.275	0
Total	-	387	0	-	-	-

Table 7: Quality of water leaving bulk supply points - National Standards

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of supply points failing standard
Tetrachloromethane	3 µg/L	16	0	<0.02	<0.14	0
TOTAL	-	16	0	-	-	-

Table 8: Quality of water leaving bulk supply points - Additional Monitoring Requirements

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of supply points failing standard
Clostridium Perfringens	0 number/100ml	120	0	0	0	0
Conductivity	2500 µS/cm	123	0	456	685	0
Radioactivity - Gross Alpha	0.1 Bq/L	24	0	<0.015	<0.037	0
Radioactivity - Gross Beta	1 Bq/L	24	0	0.071	0.201	0
Radioactivity - Tritium	100 Bq/L	24	0	<5.0	<5.0	0
Total Organic Carbon (TOC)	No abnormal change	127	0	1.30	5.60	
TOTAL	-	442	0	-	-	-

Table 9: Quality of water at consumer's tap (zones) - European Standards

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of zones with failures
Antimony	5 µg Sb/L	16	0	0.294	1.354	0
Arsenic	10 µg As/L	16	0	0.91	1.96	0
Benzo(a)pyrene	0.01 µg/L	16	0	<0.00022	<0.00022	0
Cadmium	5 µg Cd/L	16	0	<0.006	0.025	0
Chromium	50 µg Cr/L	16	0	0.23	0.62	0
Copper	2000 µg Cu/L	16	0	11.30	1420.00	0
E. Coli	0 number/100ml	156	0	0	0	0
Enterococci	0 number/100ml	16	0	0	0	0
Lead	25 µg Pb/L	16	0	0.19	1.87	0
Nickel	20 µg Ni/L	16	0	1.06	5.47	0
Nitrate	50 mg NO_3/L	16	0	14.5	29.9	0
Nitrite	0.5 mg NO_2/L	16	0	<0.03	<0.03	0
Polycyclic aromatic hydrocarbons (PAHs)	0.1 µg/L	16	0	0.0009	0.002	0
Selenium	10 µg Se/L	16	0	2.85	6.54	0
Trihalomethanes (THMs)	100 µg/L	16	7	47.12	155.48	2
TOTAL	-	380	7	-	-	-

Table 10: Quality of water at consumer's tap (zones) - National Standards

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum	No. of zones with failures
Aluminium	200 µg Al/L	60	0	16.00	78.00	0
Colour	20 mg/L Pt/Co scale	60	0	<5	<5	0
pH	6.5 - 9.5 pH value	60	0	6.78	7.48	0
Iron	200 µg Fe/L	60	0	<10	32	0
Manganese	50 µg Mn/L	60	0	<10	16.00	0
Organoleptic Odour	3 at 25°C dilution number	60	0	0	1	0
Organoleptic Taste	3 at 25°C dilution number	59	0	0	1	0
Sodium	200 mg Na/L	16	0	56	71	0
Turbidity	4 NTU	60	0	<0.01	0.19	0
TOTAL	-	495	0	-	-	-

Table 11: Quality of water at consumer's tap (zones) - Additional Monitoring Requirements

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum
Ammonium	0.5 mg NH_4/L	60	0	<0.01	0.03
Coliform Bacteria	0 number / 100ml	156	3	0	3
Colony Counts after 72 hours at 22°C	No abnormal change	60	5	0	82
Residual Disinfectant - Free	No abnormal change	156	0	0.01	0.37
Residual Disinfectant - Total	No abnormal change	156	0	0.06	0.64
TOTAL	-	588	8	-	-

RAW WATER SUMMARY

Raw Water 2017 Data Summary Tables

These tables contain a summary of results of raw water monitoring undertaken by Guernsey Water in 2016.

Notes relating to the interpretation of the tables: -

The symbol < indicates that the result was less than the limit of detection of the analytical method used. The symbol > indicates that the result was above the recording range of the analytical method used.

Table 12: Quality of water in Island streams - Monitoring

Indicator Parameter	Units of Measure	Total number of tests	Minimum	Maximum
Conductivity	µS/cm	240	135	4230
Nitrate	mg NO_3/L	240	1.2	72.1
Ammonia	mg NH_4/L	232	<0.01	0.89
Phosphate	mg P/L	240	0.03	0.71
Total Organic Carbon [TOC]	mg C/L	20	1.9	15.2
Coliforms	number / 100ml	238	40	>100,000
E.Coli	number / 100ml	238	10	>100,000
Enterococci	number / 100ml	235	20	>10,000
TOTAL	-	1683	-	-

Table 13: Quality of stored water in quarries and reservoirs - Monitoring

Indicator Parameter	Units of Measure	Total number of tests	Minimum	Maximum
pH	pH value	24	7.35	10.24
Conductivity	µS/cm	24	501	775
Total Oxidised Nitrogen	mg NO_3/L	24	0.80	28.00
Ammonium	mg NH_4/L	24	0.01	0.47
Nitrite	mg NO_2/L	11	<0.03	0.13
Chloride	mg Cl/L	24	63	135
Coliforms	number / 100ml	24	2	>100,000
E. Coli	number / 100ml	24	1	>100,000
Enterococci	number / 100ml	24	7	>10,000
Total Organic Carbon [TOC]	mg C/L	6	2.1	9.8
TOTAL	-	209	-	-

Perfluorooctane Sulfonate (PFOS)

Since 2007 PFOS has been monitored in raw and treated water in accordance with guidance from DWI who set the 'wholesomeness' value as 1.0 µg/l. Guernsey Water has used its available water resources to manage the levels of PFOS in water leaving St Saviours water treatment works. The tables below provide a breakdown of the levels of PFOS observed in 2017 in drinking water from St Saviours water treatment works, St Saviour's reservoir and affected stream systems.

Table 14: Quality of water leaving treatment works - PFOS

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum	Maximum
Perfluorooctane sulfonate (PFOS)	1.0 µg $C_8HF_{17}O_3S/L$	23	0	0.0148	0.0270
TOTAL	-	23	0	-	-

Table 15: Quality of water in St Saviours Reservoir - PFOS

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Minimum	Maximum
Perfluorooctane sulfonate (PFOS)	1.0 µg $C_8HF_{17}O_3S/L$	23	0.0148	0.0294
TOTAL	-	23	-	-

Table 16: Quality of water in Island streams - PFOS

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Minimum	Maximum
Perfluorooctane sulfonate (PFOS)	1.0 µg $C_8HF_{17}O_3S/L$	87	0.0107	3.3800
TOTAL	-	87	-	-

WATER CATCHMENT

2017 Water Catchment Area Nitrate Loadings

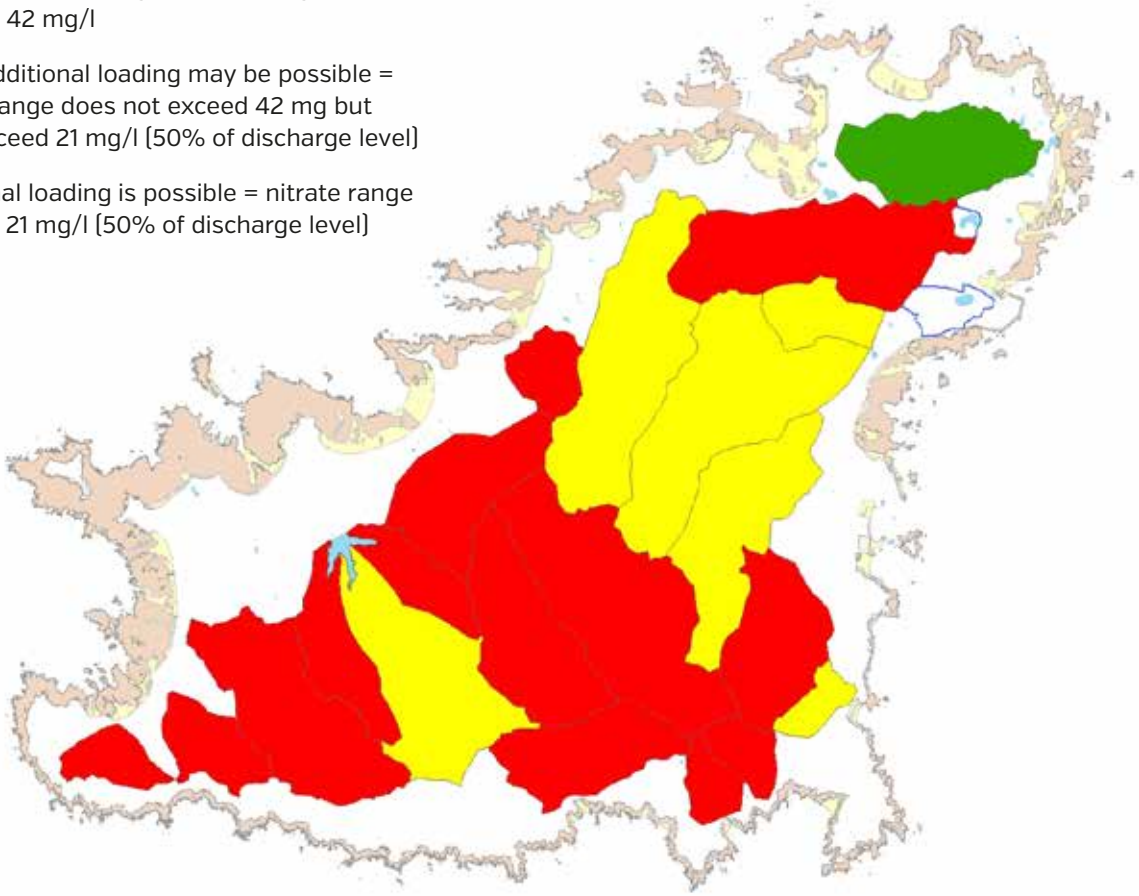
The 2017 nitrate loadings have been evaluated to produce a nitrate map showing the level of nitrates in each catchment area.

The Director of Environmental Health and Pollution Regulation submitted discharge standards for inclusion within Part VI of The Environmental Pollution (Guernsey) Law, 2004, to the States of Guernsey in Billet d'Etat XX1 2012 (dated 31st October 2012) and the proposed nitrate discharge level is recommended at 42 mg/l* (as NO_3). The nitrate drinking water limit as prescribed in The Water Supply (Water Quality) Regulations 2000, as amended, is set at 50 mg/l.

No additional loading = nitrate range exceeds 42 mg/l

Some additional loading may be possible = nitrate range does not exceed 42 mg but does exceed 21 mg/l (50% of discharge level)

Additional loading is possible = nitrate range is below 21 mg/l (50% of discharge level)



*this lower level has been set to ensure that nitrate loadings decrease over time.

Table 18: Quality of water in Island streams – Nitrate

Catchment Area	5th Percentile (mg/L)	Mean (mg/L)	95th Percentile (mg/L)
Beau Vallee	25.7	32.9	47.7
Charroterie	7.7	23.0	29.0
Choffins	36.6	53.0	60.0
Cobo	28.5	56.1	70.5
Douit du Moulin	23.6	30.7	36.0
Fauxquets	29.6	52.0	68.5
Fermain	23.2	29.3	33.6
Les Clercs	16.3	25.0	35.2
Les Nicolles	5.1	8.7	12.9
Marais Stream	1.3	9.5	19.3
Mare De Carteret	10.6	21.3	30.0
Moulin Huet	18.8	30.0	36.5
Padins	26.7	35.1	43.5
Petit Bot	17.2	34.7	50.1
Saints	18.9	30.0	38.0
Talbots	29.5	42.1	64.0
Vale Pond	7.1	17.8	29.6
Vielle Marais	1.8	6.5	18.4
Vrangue	5.3	22.8	29.0

APPENDIX A

Table 19: Listed parameters Guernsey Water samples for and prescribed concentrations of values

Bacteriology Parameter	Prescribed Concentration or Value
Clostridium perfringens	0 number/100ml
Coliforms	0 number/100ml
Colony Count cfu /mL 22°C / 72 hr	No abnormal change
Colony Count cfu /mL 37°C / 48 hr	No abnormal change
Cryptosporidium	oocyst >1 in 10 litres
E. coli	0 number/100ml
Enterococci	0 number/100ml

Chemistry Parameter	Prescribed Concentration or Value
1,2-Dichloroethane	3 µg/L
Aluminium	200 µg/L Al
Ammonium	0.5 mg/L NH_4
Antimony	5 µg/L Sb
Arsenic	10 µg/L As
Benxo(a)pyrene	0.01 µg/L
Benzene	1 µg/L
Boron	1000 µg/L B
Bromate	10 µg/L $Br0_3$
Cadmium	5 µg/L Cd
Chloride	250 mg/L Cl
Chromium	50 µg/L Cr
Colour	20 mg/L Pt/Co
Conductivity	2500 µS/cm
Cyanide	50 µg/L CN
Fluoride	1.5 mg/L F
Iron	200 µg/L Fe
Manganese	50 µg/L Mn
Mercury	1 µg/L Hg
Nitrate	50 mg/L N03
Nitrate / Nitrite Formula	1 mg/L NO_2
Nitrite (treatment works)	0.1 mg/L NO_2
Nitrite (consumers' tap)	0.5 mg/L NO_2
Organoleptic Odour	3 at 25°C dilution number
Organoleptic Taste	3 at 25°C dilution number

Chemistry Parameter	Prescribed Concentration or Value
PAH Total	0.1 µg/L
pH	6.5 - 10.0
Radioactivity - Gross alpha	0.5 Bq/L
Radioactivity - Gross beta	1 Bq/L
Radon	100 Bq/L
Residual Disinfectant - Free Chlorine mg/L	No abnormal change
Residual Disinfectant - Total Chlorine mg/L	No abnormal change
Selenium	10 µg/L Se
Sodium	200 mg/L Na
Sulphate	250 mg/L SO_4
Tetra/Trichloroethene	10 µg/L
Tetrachloromethane	3 µg/L
THMs Total	100 µg/L
Total Organic Carbon (TOC) mg/L C	No abnormal change
Tritium	100 Bq/L
Turbidity (treatment works)	1 NTU
Turbidity (consumer's tap)	4 NTU

Pesticides	
Aldrin	0.03 µg/L
Dieldrin	0.03 µg/L
Heptachlor	0.03 µg/L
Heptachlor epoxide	0.03 µg/L
Individual Pesticides	0.1 µg/L
Total Pesticides	0.5 µg/L

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