

# Water Quality Report 2015

Sampling under The Water Supply (Water Quality) Regulations, 2000, (as amended).



## FOREWORD...

Guernsey Water's vision:

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

In 2015, Guernsey Water provided 4,527 megalitres 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 2015 we conducted 6,293 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 99.84% of 6,293 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.

### 2015 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 2015 water quality targets with 100% compliance recorded at the Service Reservoirs and Water Treatment Works for the second year running and overall compliance being marginally lower than the 2014 result. 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 must continue to investigate and strive to eliminate these to further improve the quality of Guernsey's public drinking water supplies.

**STEPHEN LANGLOIS**  
**GENERAL MANAGER WATER SERVICES**

## SUMMARY...

Tests taken from Guernsey Water's 3 operational treatment works, 3 service reservoirs, water tower and customers' taps in 3 water supply zones show that 99.84% of the 6,293 analyses met all national and European Union standards. This shows a slight decrease compared to the 2014 overall compliance, 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, 2000 (as amended). The regulations set out the parameters to be analysed for (Appendix A) and the required frequency of testing.

In 2015 there were no breaches at Longue Hougue, Kings Mills or St Saviours water treatment works and measures to improve bacterial quality of the Island's service reservoirs has had a continuing positive effect, with 100% compliance also being recorded at the 3 service reservoirs and the Water Tower. 2015 is the second 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; 2 were for Coliform bacteria (1 in Longue Hougue Zone and 1 in Tower Zone) and 7 were Trihalomethane (THM) failures (1 in Longue Hougue Zone, 2 in No2 Zone and 4 in Tower Zone) there was also one pH failure (in Longue Hougue zone). Coliform bacteria are a naturally occurring indicator species that do not necessarily indicate ingress of contamination but that 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. pH is a measurement of the alkalinity or acidity of the water.

The 2 Coliform failures were taken from customers taps and on further investigation and resampling it was identified that both the failures has been due to the presence of biofilm within the tap structure and so were not related to the quality of the mains water supplied. THM formation remains an area of focus and further work will be undertaken in 2016 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."* The pH failure when investigated was found to be due to a minor treatment issue that was quickly resolved.

Guernsey Water regularly analyses for 83 pesticides and of these only 6 were detected and no breaches of the 0.1 µg/l limit were observed.

Perfluorooctane sulphonate (PFOS) has been monitored on a fortnightly 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 0.049 µg/l (ppb) which is within tier 1 (<0.3 µg/l) of the guidance issued by the UK DWI on PFOS ([http://dwi.defra.gov.uk/stakeholders/information-letters/2009/10\\_2009annex.pdf](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 divers) 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 0.19 µg/l in 2014 to 0.077 µg/l recorded in 2015. There was a decrease in the maximum PFOS concentration detected in samples collected from streams, from 20 µg/l in

2014 to 14 $\mu$ g/l in 2015. This was due to a combination factors including the removal of contaminated soil from the catchment and natural variation in rainfall amounts.

There were a total of 226 water quality enquiries from customers in 2015, compared to 136 in 2014 (78 enquiries relating to an earthy/musty taste & odour were received as a consequence of algal bloom die off in St Saviours and Longue Hougue reservoirs). 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 comparison the contact rate per 1,000 population is calculated. These “Acceptability of Water to Consumers” categories had a total of 219 consumer contacts across all 3 supply zones for Guernsey Water during 2015, which equates to a contacts per 1,000 population rate of 3.48. This compares to the Industry Average (for England and Wales Water Companies 2014) rate of 1.75.

**Margaret McGuinness**

**Water Quality Risk Manager**

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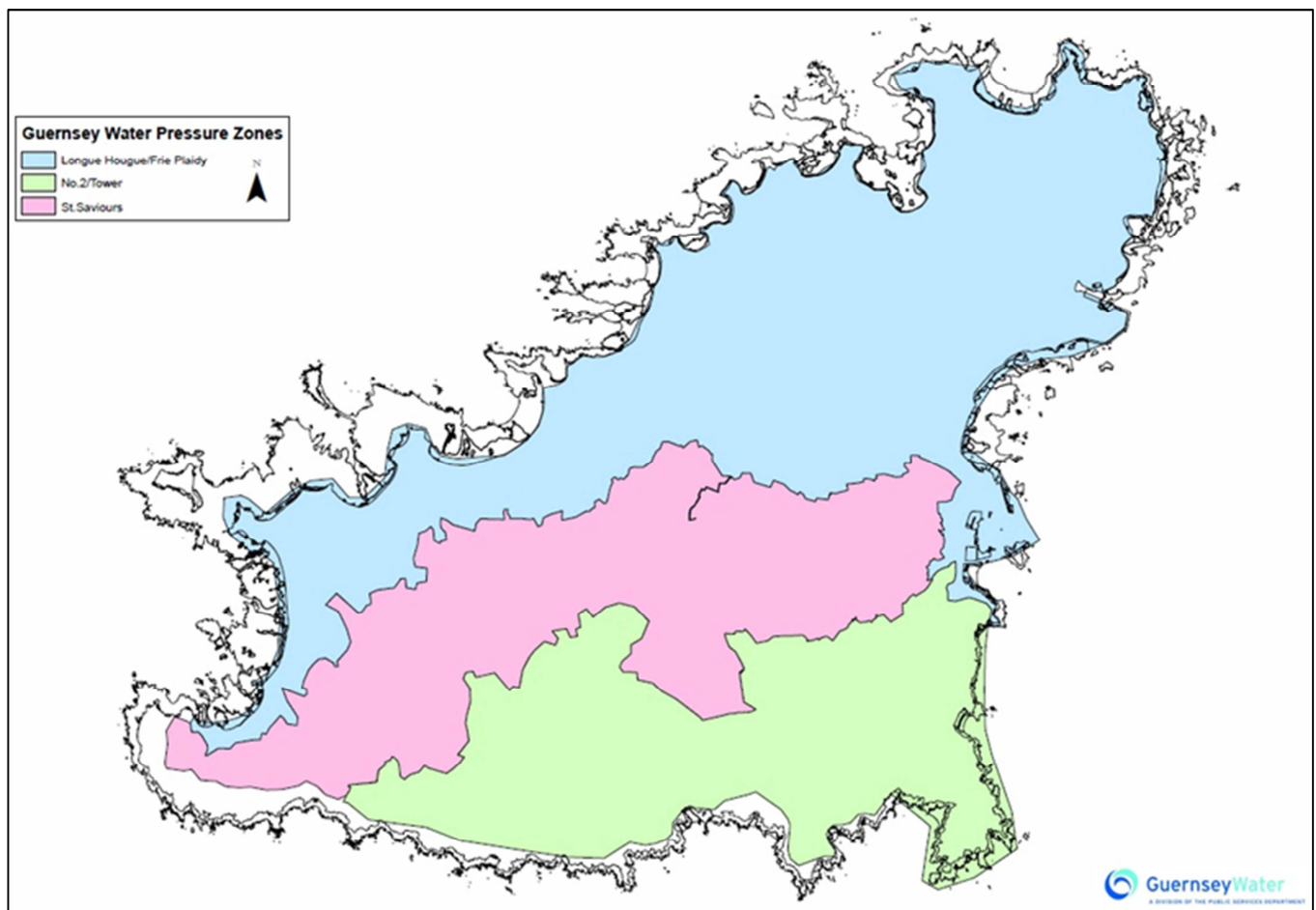
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**INTRODUCTION...**Treated Water

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 standby plant), 3 service reservoirs, a water tower and 3 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 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 off line) supplies water direct into Longue Hougue Supply Zone (blue in image below) and into Frie Plaidy Service Reservoir.



Below is a breakdown of the compliance for 2015, as measured against The Water Supply (Water Quality) Regulations, 2000, as amended : -

#### Water Treatment Works

	St Saviours	Juas	Kings Mills	Longue Hougue	Total
No of Breaches	0	0	0	0	0
No of Passes	1504	0	414	1753	3671
No of Samples	1504	0	414	1753	3671
% Compliance	100%	0%	100%	100%	100%

#### 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	208	208	208	208	832
No of Samples	208	208	208	208	832
% Compliance	100%	100%	100%	100%	100%

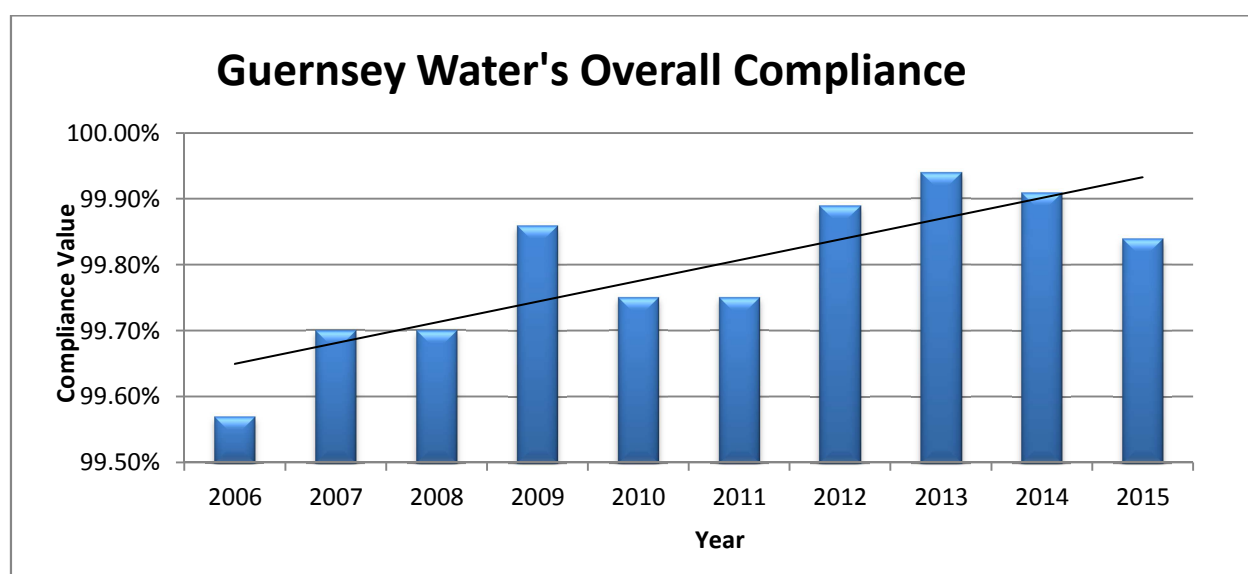
#### Supply Zones

	Longue Hougue Zone	No.2 Zone	Tower Zone	Total
No of Breaches	3	2	5	10
No of Passes	780	498	502	1780
No of Samples	783	500	507	1790
% Compliance	99.74%	99.60%	99.60%	99.44%

#### Overall Total

	Total
No of Breaches	10
No of Passes	6283
No of Samples	6293
% Compliance	99.84 %

The graph below shows the historic trend of total compliance since the introduction of compliance sampling in line with The Water Supply (Water Quality) Regulations 2000, as amended, started in 2005.



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 current function has now been moved to fall under the jurisdiction of the Director of Environmental Health and Pollution Regulation as a result of Guernsey Water now managing the Island's wastewater infrastructure and in line with the recommendations agreed by the States of Guernsey in Billet d'Etat XX1 2012 (dated 31<sup>st</sup> 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 2015 in the Island's various streams and storage reservoirs.



## TREATED WATER 2015 DATA SUMMARY TABLES FOR GUERNSEY WATER...

These tables contain a summary of results of treated water monitoring undertaken by Guernsey Water in 2015.

### Notes relating to the interpretation of the tables: -

Columns on the following tables that are headed '1 percentile representing a minimum' and '99 percentile representing a maximum' contain figures for the 1 percentile and 99 percentile sample results respectively except where less than 100 samples were taken, when the figures are the actual maximum and minimum results.

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 failed	1 percentile (representing a minimum)	99 percentile (representing a maximum)	No. of works with failures
Nitrite	0.1 mg NO <sub>2</sub> /l	119	0	<0.03	<0.03	0
<b>TOTAL</b>	-	<b>119</b>	<b>0</b>	-	-	-

**Table 2: Quality of water leaving treatment works – National requirements**

Parameter	Prescribed Concentration or Value	Total number of tests	Tests failed	1 percentile (representing a minimum)	99 percentile (representing a maximum)	No. of works with failures
Coliform Bacteria	0 number/100ml	565	0	0	0	0
Cryptosporidium	oocysts >1 in 10 litres	15	0	0	0	0
<i>E. coli</i>	0 number/100ml	565	0	0	0	0
<b>TOTAL</b>	-	<b>1145</b>	<b>0</b>	-	-	-

**Table 3: Quality of water leaving treatment works – Additional Monitoring Requirements**

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	1 percentile (representing a minimum)	99 percentile (representing a maximum)
Colony Counts After 3 Days At 22°C	No abnormal change	565	n/a*	0	4
Colony Counts After 48 Hours At 37°C	No abnormal change	563	n/a*	0	1
Residual Disinfectant - Free	No abnormal change	559	n/a*	0.05	0.64
Residual Disinfectant - Total	No abnormal change	559	n/a*	0.10	0.88
Turbidity	1 NTU	546	0	0.01	0.49
<b>TOTAL</b>	-	<b>2792</b>	<b>0</b>	-	-

**Table 4: Quality of water leaving service reservoirs – National requirements**

Parameter	Prescribed Concentration or Value	Total number of tests	Tests failed	1 percentile (representing a minimum)	99 percentile (representing a maximum)	No. of reservoirs failing standard
Coliform Bacteria	0 number/100ml	208	0	0	0	0
<i>E. coli</i>	0 number/100ml	208	0	0	0	0
<b>TOTAL</b>	-	<b>416</b>	<b>0</b>	-	-	-

**Table 5: Quality of water leaving service reservoirs – Additional Monitoring Requirements**

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	1 percentile (representing a minimum)	99 percentile (representing a maximum)
Colony Counts After 3 Days At 22°C	No abnormal change	208	n/a*	0	24
Colony Counts After 48 Hours At 37°C	No abnormal change	208	n/a*	0	32
Residual Disinfectant - Free	No abnormal change	208	n/a*	0.05	0.15
Residual Disinfectant - Total	No abnormal change	208	n/a*	0.05	0.35
<b>TOTAL</b>	-	<b>832</b>	-	-	-

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

**Table 6: Quality of water leaving bulk supply points – Directive requirements**

Parameter	Prescribed Concentration or Value	Total number of tests	Tests failed	1 percentile (representing a minimum)	99 percentile (representing a maximum)	No. of supply points with failures
1,2 Dichloroethane	3 µg/l	12	0	<0.12	<0.12	0
Benzene	1 µg/l	12	0	<0.07	<0.07	0
Boron	1 mg B/l	19	0	0.07	0.11	0
Bromate	10 µg BrO <sub>3</sub> /l	14	0	<0.5	0.77	0
Cyanide	50 µg CN/l	18	0	<0.002	0.003	0
Fluoride	1.5 mg F/l	17	0	<0.1	0.12	0
Mercury	1 µg Hg/l	19	0	<0.002	0.01	0
Tetrachloroethene/Trichloroethene	10 µg/l	12	0	<0.07	<0.07	0
Pesticides (Dieldrin)	0.1 µg/l	16	0	0.002	0.002	0
Pesticides (Diflufenican)	0.1 µg/l	16	0	0.002	0.003	0
Pesticides (Hexachlorocyclohexane Gamma)	0.1 µg/l	16	0	0.001	0.002	0
Pesticides (Mecoprop)	0.1 µg/l	16	0	Not found	Not found	0
Pesticides (Propiconazole)	0.1 µg/l	16	0	0.007	0.027	0
Pesticides (Simazine)	0.1 µg/l	16	0	0.004	0.006	0
Pesticides (Triclopyr)	0.1 µg/l	16	0	0.016	0.016	0
Pesticides - Total Substances	0.5 µg/l	16	0	0.00	0.103	0
<b>TOTAL</b>	-	<b>251</b>	<b>0</b>	-	-	-

**Table 7: Quality of water leaving bulk supply points – National requirements**

Parameter	Prescribed Concentration or Value	Total number of tests	Tests failed	1 percentile (representing a minimum)	99 percentile (representing a maximum)	No. of supply point with failures
Tetrachloromethane	3 µg/l	12	0	<0.07	0.14	0
<b>TOTAL</b>	-	<b>12</b>	<b>0</b>	-	-	-

**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	1 percentile (representing a minimum)	99 percentile (representing a maximum)
Chloride	250 mg Cl/l	18	0	79.00	96.83
<i>Clostridium perfringens</i>	0 number/100ml	119	0	0	0
Conductivity	2500 µS/cm	114	0	543.13	634.61
Radioactivity - Gross Alpha	0.1 Bq/l	17	0	<0.02	0.06
Radioactivity - Gross Beta	1 Bq/l	18	0	0.06	0.18
Radioactivity - Tritium	100 Bq/l	17	0	<10	<10
Sulphate	250 mg SO <sub>4</sub> /l	17	0	51.32	96.84
Total Organic Carbon (TOC)	No abnormal change	548	n/a	1.50	4.60
<b>TOTAL</b>	-	<b>868</b>	<b>0</b>	-	-

**Table 9: Quality of water at consumer's tap (zones) – Directive requirements**

Parameter	Prescribed Concentration or Value	Total number of tests	Tests failed	1percentile (representing a minimum)	99 percentile (representing a maximum)	No. of zones with failures
Antimony	5 µg Sb/l	24	0	0.28	1.51	0
Arsenic	10 µg As/l	24	0	0.20	0.48	0
Benzo(a)pyrene	0.01 µg/l	22	0	0.14	0.90	0
Cadmium	5 µg Cd/l	24	0	0.10	0.10	0
Chromium	50 µg Cr/l	24	0	0.70	0.70	0
Copper	2 mg Cu/l	24	0	0.10	1.63	0
<i>E. coli</i>	0 number/100ml	168	0	0	0	0
Enterococci	0 number/100ml	24	0	0	0	0
Lead	10 µg Pb/l	24	0	5	5	0
Nickel	20 µg Ni/l	24	0	0.76	1.80	0
Nitrate	50 mg NO <sub>3</sub> /l	24	0	15.55	26.20	0
Nitrite	0.5 mg NO <sub>2</sub> /l	24	0	0.03	0.03	0
Nitrate/Nitrite Formula	1mg NO <sub>2</sub> /l	24	0	0.32	0.73	0
Polycyclic aromatic hydrocarbons (PAHs)	0.1 µg/l	22	0	0	0.002	0
Selenium	10 µg Se/l	24	0	0.22	0.57	0
Trihalomethanes (THMs)	100 µg/l	24	7	28.85	148.32	3
<b>TOTAL</b>	-	<b>524</b>	<b>7</b>	-	-	-

**Table 10: Quality of water at consumer's tap (zones) – National requirements**

Parameter	Prescribed Concentration or Value	Total number of tests	Tests failed	1 percentile (representing a minimum)	99 percentile (representing a maximum)	No. of zones with failures
Aluminium	200 µg Al/l	83	0	15.28	70.44	0
Colour	20 mg/l Pt/Co scale	86	0	<5	5	0
Hydrogen ion (pH)	6.5 – 10.0 pH value	86	1	6.40	7.38	1
Iron	200 µg Fe/l	84	0	10	53.41	0
Manganese	50 µg Mn/l	84	0	10	15.17	0
Organoleptic Odour	3 at 25°C dilution number	84	0	0	1	0
Organoleptic Taste	3 at 25°C dilution number	82	0	0	1	0
Sodium	200 mg Na/l	24	0	55.23	64	0
Turbidity	4 NTU	84	0	0.01	0.21	0
<b>TOTAL</b>	-	<b>697</b>	<b>1</b>	-	-	-

**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	1 percentile (representing a minimum)	99 percentile (representing a maximum)
Ammonium	0.5 mg NH <sub>4</sub> /l	84	0	0.01	0.04
Coliform Bacteria	0 number/100ml	168	2	0	0.33
Colony Counts After 3 Days At 22°C	No abnormal change	84	n/a	0	300
Colony Counts After 48 Hours At 37°C	No abnormal change	84	n/a	0	43.28
Conductivity	2500 uS/cm	86	0	542.85	629.6
Residual Disinfectant - Free	No abnormal change	86	n/a	0.05	0.33
Residual Disinfectant - Total	No abnormal change	86	n/a	0.05	0.33
<b>TOTAL</b>	-	<b>764</b>	<b>3</b>	-	-

## RAW WATER 2015 DATA SUMMARY TABLES FOR GUERNSEY WATER...

These tables contain a summary of results of raw water monitoring undertaken by Guernsey Water in 2015.

### Notes relating to the interpretation of the tables: -

Columns on the following tables that are headed '1 percentile representing a minimum' and '99 percentile representing a maximum' contains figures for the 1 percentile and 99 percentile sample results respectively except where less than 100 samples were taken, when the figures are the actual maximum and minimum results.

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 Result	Maximum Result
Hydrogen ion (pH)	pH value	1323	6.60	8.12
Conductivity	uS/cm	1323	334	1018
Potassium	mg K/l	1320	2.5	22.8
Nitrate	mg NO <sub>3</sub> /l	1323	1.62	79.89
Ammonium	mg NH <sub>4</sub> /l	1323	0.01	1.20
Nitrite	mg NO <sub>2</sub> /l	1323	0.03	0.72
Phosphate	mg P/l	1323	0.02	0.69
Chloride	mg Cl/l	1323	41	174
TOC	mg C/l	1283	1.3	15.8
Coliform Bacteria	number/100ml	603	30	100,000
E.coli	number/100ml	603	0	37,980
Faecal streptococci	number/100ml	593	0	10,000
<b>TOTAL</b>	-	<b>13,663</b>	-	-



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

Indicator Parameter	Units of Measure	Total number of tests	Minimum Result	Maximum Result
Hydrogen ion (pH)	pH value	921	6.83	9.17
Conductivity	uS/cm	921	357.2	807
Ammonium	mg NH <sub>4</sub> /l	525	0.01	0.48
Nitrate	mg NO <sub>3</sub> /l	525	0.5	50.2
Nitrite	mg NO <sub>2</sub> /l	525	0.03	0.62
Phosphate	mg P/l	525	0.02	0.59
Chloride	mg Cl/l	524	56	146
Potassium	mg K/l	518	3.7	13.35
Silicate	mg SiO <sub>2</sub> /l	181	2.0	18.5
TOC	mg C/l	892	2.0	15.7
<b>TOTAL</b>	-	<b>6,057</b>	-	-

**Table 14: Quality of water in Island streams – Glyphosate \***

Indicator Parameter	Units of Measure	Total number of tests	Minimum Result	Maximum Result
Glyphosate	µg C <sub>3</sub> H <sub>8</sub> NO <sub>5</sub> P /l	24	<0.010	0.517
<b>TOTAL</b>	-	<b>24</b>	-	-

\*following a risk assessment of pesticide usage on the island Glyphosate was recognised as a compound that monitoring was required for, a quarterly monitoring programme has been initiated to monitor levels in Island streams

### 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 2015 in drinking water from St Saviours water treatment works, St Saviour's reservoir and affected stream systems.

**Table 15: Quality of water leaving treatment works – PFOS**

Indicator Parameter	Prescribed Concentration or Value	Total number of tests	Tests Exceeding Specification	Minimum Result	Maximum Result
Perfluorooctane sulfonate (PFOS)	1.0 µg C <sub>8</sub> HF <sub>17</sub> O <sub>3</sub> S/l	19	0	<0.01 µg	0.049 µg
<b>TOTAL</b>	-	<b>19</b>	<b>0</b>	-	-

**Table 16: Quality of stored water in St Saviours Reservoirs – PFOS**

Indicator Parameter	Units of Measure	Total number of tests	Minimum Result	Maximum Result
Perfluorooctane sulfonate (PFOS)	µg C <sub>8</sub> HF <sub>17</sub> O <sub>3</sub> S/l	18	0.026 µg	0.077µg
<b>TOTAL</b>	-	<b>18</b>	-	-

**Table 17: Quality of water in Island streams – PFOS**

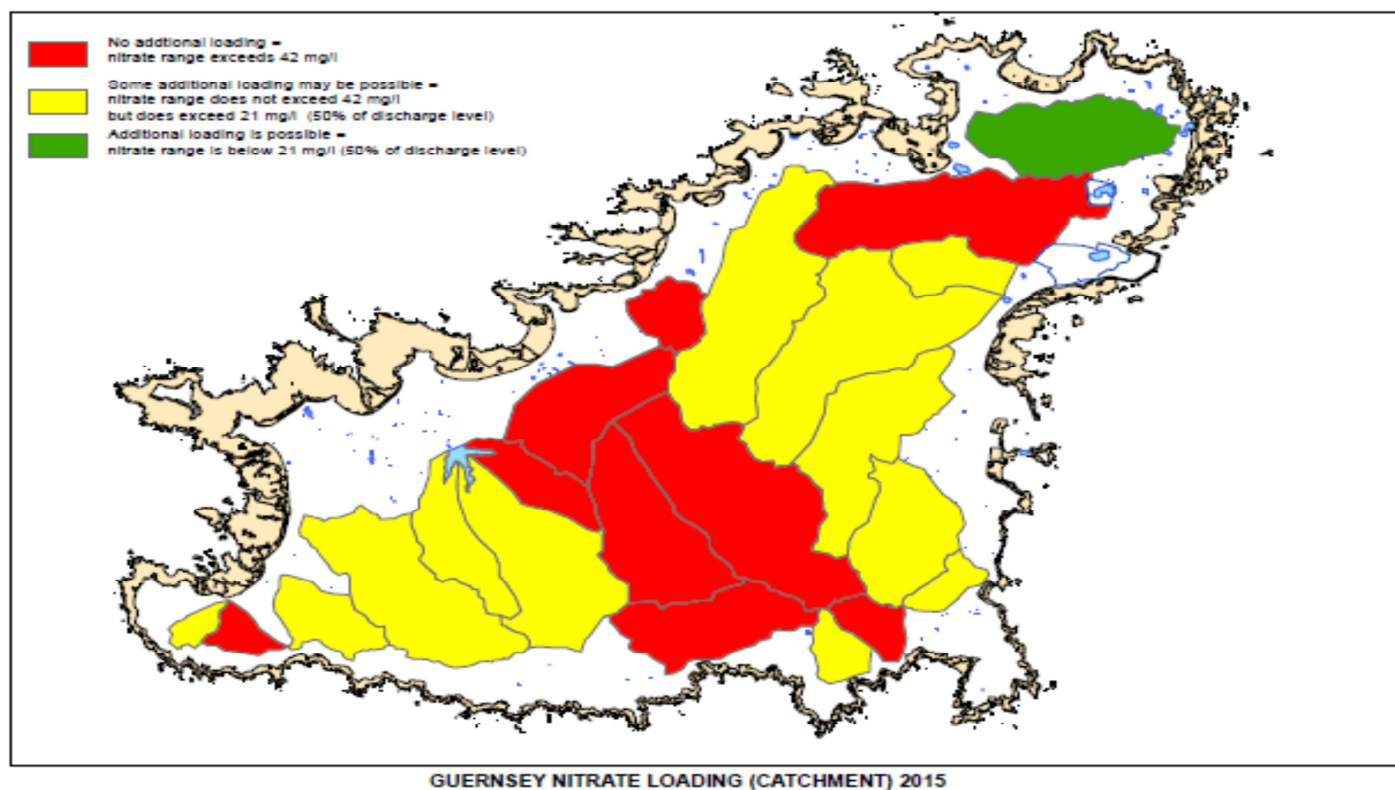
Indicator Parameter	Units of Measure	Total number of tests	Minimum Result	Maximum Result
Perfluorooctane sulfonate (PFOS)	µg C <sub>8</sub> HF <sub>17</sub> O <sub>3</sub> S/l	91	0.012 µg	14 µg
<b>TOTAL</b>	-	<b>91</b>	-	-

## 2015 WATER CATCHMENT AREA NITRATE LOADINGS...

The 2015 nitrate loadings have been evaluated to produce a nitrate map showing the level of nitrates in each catchment area.

Samples are taken from each catchment area every week and this data has been statistically analysed to give the range of 90% of the samples (the top and bottom 5% have been removed as outliers from the observed range).

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 31<sup>st</sup> October 2012) and the proposed nitrate discharge level is recommended at 42 mg/l\* (as NO<sub>3</sub>). The nitrate drinking water limit as prescribed in The Water Supply (Water Quality) Regulations 2000, as amended, is set at 50 mg/l.



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

Table 18: Quality of water in Island streams – Nitrate

<b>2015 Water Catchment Area Nitrate Loadings</b>		
<b>CATCHMENT AREA</b>	<b>5%ILE (MG/L)</b>	<b>95%ILE (MG/L)</b>
Beau Valet	14.7	32.72
Charroterie	23.68	35.52
Choffins	19.46	61.18
Cobo	39.84	82.86
Fauxquets	40.8	72.36
Fermain	24.34	34.3
Grande Mare	1.94	56.28
Les Arquets	25.6	39.74
Les Clercs	14.86	26.42
Marais Sump	2.1	21.42
Marais Stream	1.64	25.58
Mare de Carteret	12.66	36.92
Moulin Huet	27.9	42.58
Old Marais	1.44	7.76
Padins	18.06	41.12
Petit Bot	14.62	62.56
Pleinmont East	23.06	48.2
Pleinmont West	21.64	39.96
Saints	25.52	36.28
Talbots	25.78	51.48
Vale Pond	7.92	46.82
Vrangue	17.98	31.66

## APPENDIX A...

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

Parameter	Prescribed Concentration or Value
<b>Bacteriology</b>	
<i>Clostridium perfringens</i>	0 number/100ml
Coliform Bacteria	0 number/100ml
Colony Counts After 3 Days At 22°C	No abnormal change
Colony Counts After 48 Hours At 37°C	No abnormal change
Cryptosporidium	oocyst >1 in 10 litres
<i>E. coli</i>	0 number/100ml
Enterococci	0 number/100ml
<b>Chemistry</b>	
1,2 Dichloroethane	3 µg/l
2,3,6-TBA	0.1 µg/l
2,4,5-TCA	0.1 µg/l
2,4-DB	0.1 µg/l
2-4,D	0.1 µg/l
Aldrin	0.03 µg/l
Aluminium	200 µg Al/l
Ammonium	0.5 mg NH <sub>4</sub> /l
Antimony	5 µg Sb/l
Arsenic	10 µg As/l
Atrazine	0.1 µg/l
Azinphos-methyl	0.1 µg/l
Benazolin	0.1 µg/l
Bentazone	0.1 µg/l
Benzene	1 µg/l
Benzo(a)pyrene	0.01 µg/l
Boron	1 mg B/l
Bromate	10 µg BrO <sub>3</sub> /l
Bromoxynil	0.1 µg/l
Cadmium	5 µg Cd/l
Carbendazim	0.1 µg/l
Carbetamide	0.1 µg/l
Carbophenothion	0.1 µg/l
Chlordane (cis)	0.1 µg/l
Chlordane (trans)	0.1 µg/l
Chloride	250 mg Cl/l
Chlorofenvinphos	0.1 µg/l
Chloroprotham	0.1 µg/l
Chloropyriphos	0.1 µg/l
Chlorothalonil	0.1 µg/l
Chlorotoluron	0.1 µg/l
Chlorthal	0.1 µg/l
Chlorthal di methyl	0.1 µg/l
Chromium	50 µg Cr/l
Clopyralid	0.1 µg/l
Colour	20 mg/l Pt/Co scale
Conductivity	2500 µS/cm

Table 18: continued

Parameter	Prescribed Concentration or Value
Copper	2 mg Cu/l
Cyanazine	0.1 µg/l
Cyanide	50 µg CN/l
Cypermethrin	0.1 µg/l
D.D.D. Op	0.1 µg/l
D.D.D. Pp	0.1 µg/l
D.D.E. Op	0.1 µg/l
D.D.E. Pp	0.1 µg/l
D.D.T. Op	0.1 µg/l
D.D.T. Pp	0.1 µg/l
Dalapon	0.1 µg/l
Diazinon	0.1 µg/l
Dicamba	0.1 µg/l
Dichloroprop	0.1 µg/l
Dichlorvos	0.1 µg/l
Dieldrin	0.03 µg/l
Diflufenican	0.1 µg/l
Dimethoate	0.1 µg/l
Diuron	0.1 µg/l
Endrin	0.1 µg/l
Fenitrothion	0.1 µg/l
Fluoride	1.5 mg F/l
Fluroxpyr	0.1 µg/l
Glyphosate	0.1 µg/l
Heptachlor	0.03 µg/l
Heptachlor epoxide	0.03 µg/l
Heptenophos	0.1 µg/l
Hexachlorocyclohexane alpha	0.1 µg/l
Hexachlorocyclohexane beta	0.1 µg/l
Hexachlorocyclohexane Delta	0.1 µg/l
Hexachlorocyclohexane gamma	0.1 µg/l
Hydrogen ion (pH)	6.5 - 9.5 pH value
Ioxynil	0.1 µg/l
Iprodione	0.1 µg/l
Iron	200 µg Fe/l
Isodrin	0.1 µg/l
Isoproturon	0.1 µg/l
Lead	10 µg Pb/l
Linuron	0.1 µg/l
M.C.P.A.	0.1 µg/l
M.C.P.B.	0.1 µg/l
Malathion	0.1 µg/l
Manganese	50 µg Mn/l
Mecarbam	0.1 µg/l
Mecoprop	0.1 µg/l
Mercury	1 µg Hg/l
Metaldehyde	0.1 µg/l
Methabenzthiazuron	0.1 µg/l
Monolinuron	0.1 µg/l



Table 18: continued

Parameter	Prescribed Concentration or Value
Nickel	20 µg Ni/l
Nitrate	50 mg NO <sub>3</sub> /l
Nitrate/Nitrite Formula	1mg NO <sub>2</sub> /l
Nitrite	0.1 mg NO <sub>2</sub> /l (treatment works)
Nitrite	0.5 mg NO <sub>2</sub> /l (consumers' tap)
Organoleptic Odour	3 at 25°C dilution number
Organoleptic Taste	3 at 25°C dilution number
Oxamyl	0.1 µg/l
Parathion-ethyl	0.1 µg/l
Pendimethalin	0.1 µg/l
Pentachlorophenol	0.1 µg/l
Perfluorooctane sulphonate (PFOS)	1 µg/l
Perfluorooctanoic acid (PFOA)	10 µg/l
Pesticides: Total	0.5 µg/l
Picloram	0.1 µg/l
Pirimephos-methyl	0.1 µg/l
Pirimicarb	0.1 µg/l
Polycyclic aromatic hydrocarbons (PAHs)	0.1 µg/l
Prometryne	0.1 µg/l
Propazine	0.1 µg/l
Propetamphos	0.1 µg/l
Propiconazole	0.1 µg/l
Propyzamide	0.1 µg/l
Radioactivity - Gross Alpha	0.1 Bq/l
Radioactivity - Gross Beta	1 Bq/l
Radioactivity - Tritium	100 Bq/l
Residual Disinfectant - Free	No abnormal change
Residual Disinfectant - Total	No abnormal change
Selenium	10 µg Se/l
Simazine	0.1 µg/l
Sodium	200 mg Na/l
Sulphate	250 mg SO <sub>4</sub> /l
Tebuconazole	0.1 µg/l
Terbuthylazine	0.1 µg/l
Terbutryn	0.1 µg/l
Tetrachloroethene/Trichloroethene	10 µg/l
Tetrachloromethane	3 µg/l
Total Organic Carbon (TOC)	No abnormal change
Triadimefon	0.1 µg/l
Triallate	0.1 µg/l
Triazophos	0.1 µg/l
Trichloroacetic acid	0.1 µg/l
Trichlorophenoxyacetic acid (2,4,5)	0.1 µg/l
Triclopyr	0.1 µg/l
Trietazine	0.1 µg/l
Trihalomethanes (THMs)	100 µg/l
Turbidity	1 NTU (treatment works)
Turbidity	4 NTU (consumers' tap)