

## Serving

Delivering for  
Scotland 24/7



**Ken Hutchison**  
**Managing Director**  
Scottish Water International

**Trusted**  
Putting  
customers first

**Water New Zealand Conference**

**20 September 2018**



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**Customers  
at the heart  
of our business**



**How Drinking Water  
Regulation  
has improved  
the quality of Scotland's  
water supplies**



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**Scottish  
Water**

Trusted to serve Scotland

- **Scottish Water's Vital Role**
- **A Brief History of Water**
- **The Role of DWQR**
- **The Customer Benefits**



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# Our vital role

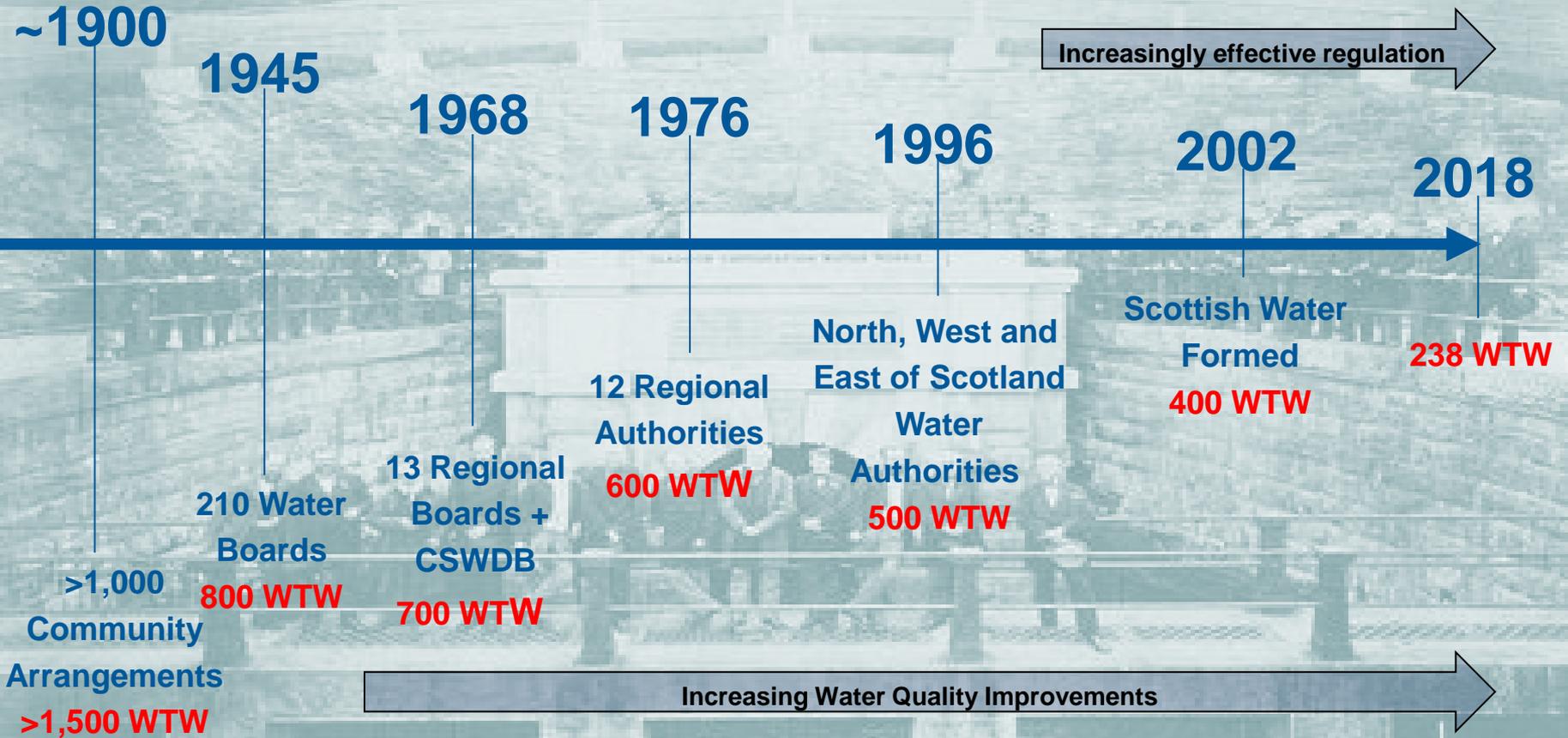


- over 5 million customers
- over 1.3 billion litres of water every day
- 2.52 million households
- 153,000 business premises
- 238 water treatment works
- more than 1800 waste water treatment works
- over 48,000km of water pipes
- £1.2 billion turnover
- around 4,000 people

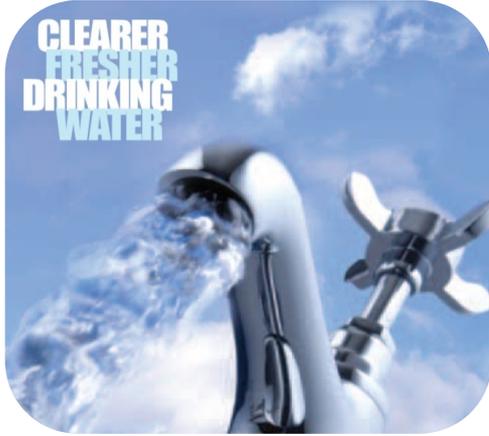


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# A Brief History of Drinking Water Supply in Scotland



# Why all the Changes?..Well .. There was lots to do



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# The 'Scottish model' of regulation



# Drinking Water Quality Regulatory Framework

Water (Scotland) Act 1980

Water Industry (Scotland Act) 2002

Water Quality (Scotland) Regulations 2010

The Public Water Supplies (Scotland) 2014

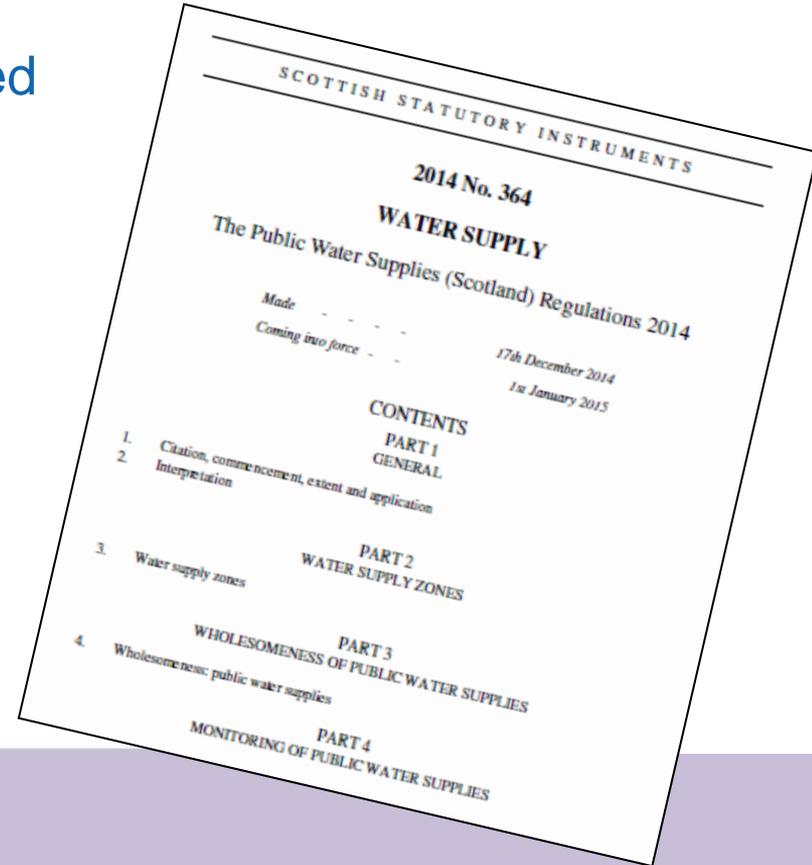
The Private and Public Water Supplies (Misc Amendments) (Scotland) Regulations  
2015

Water Intended for Human Consumption (Private Water Supplies) (Scotland) Regulations 2017



# Public Water Supplies (Scotland) Regulations 2014

- Defines wholesomeness – Prescribed Concentration and Value (PCVs)
- Monitoring requirements
- Investigation requirements
- Treatment and Risk Assessments
- Offences
- Reporting requirements
- 300,000+ tests per annum





# The Role of the Drinking Water Quality Regulator



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- **Independent Regulator**
- **Responsible for ensuring that drinking water quality regulations are complied with to protect public health**
  - **Public & Supervise Councils for Private**
- **Ministerial Appointment**
- **8 employees**
  - **(Policy, Engineering and Water specialists)**



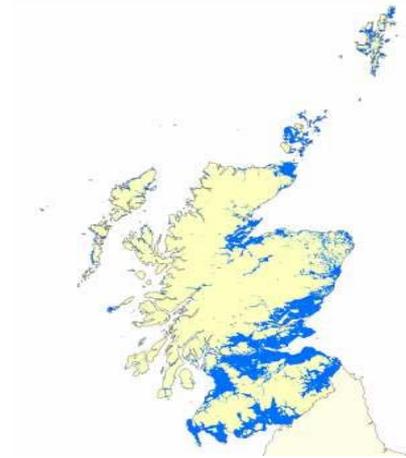
**Sue Petch**



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# Public Water Supplies In Scotland

- **96.4% of population supplied by Scottish Water**
  - **238 water treatment works**
  - **972 service reservoirs**
  - **286 water supply zones**



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# Private Water Supplies In Scotland

- **Responsibility of Owners / Users**
  - Over 20,000, Range of sizes
  - Many poor quality, high risk



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# What the DWQR does?

- **Monitor Scottish Waters performance**
- **Compliance assessment**
- **Audit and Inspection**
- **Incident Investigation**
- **Complaint investigation**
- **Policy / Regulation Development**
- **Enforcement**
- **Research projects**
- **Investment Monitoring**



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# Self Monitoring Regulatory Model

- **Scottish Water must take and analyse samples from:**
  - **Water sources**
  - **Treatment works**
  - **Service reservoirs**
  - **Consumers' taps**
  - **Additional operational sampling**
  - **305,495 tests taken 2017**
- **Lab UKAS accredited**
- **Sampling to Drinking Water Directive and ISO/IEC 17025**



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# Compliance Assessment

- All results reported by Scottish Water to DWQR monthly including remedial action taken
- Significant failures & events are reported immediately
- DWQR assesses severity of failure / event
  - May lead to formation of Water Hazard Incident Team
- Assess Likelihood of failure recurrence and SW action



# Audit and Inspection



Laboratories



Treatment Works



Distribution



Call centre



# Auditing

 <b>Technical Inspection of Scottish Water's Water Treatment Works</b>									
<b>Kyle of Localsh WTW, North Region</b> 08/11/2017									
<b>DWQR Staff Present</b> <b>Scottish Water Staff Present</b>	Moira Malcolm Ross Barclay, Peter Macintyre, Ken Thomson Stephen Sandilands, Gavin Brown, Naomi Dixon								
<b>Summary of Inspection</b>									
<b>Overall Summary</b>									
<p>Kyle of Localsh WTW is a small treatment works which serves Kyle of Localsh, Plockton and surrounding area. Raw water from a local loch and burn are blended and processed through sand filters and ultrafiltration membranes before pH correction, disinfection using chloramination and plumbosolvency. Operator knowledge is good but there are some risks with chemical safety which require attention. pH control is unstable, and as a result optimising plumbosolvency reduction is not currently being addressed. A number of incidents have occurred recently at Kyle which gives cause for concern.</p>									
<b>Observations</b>									
<table border="1"> <thead> <tr> <th>Issue</th> <th>Intervention</th> </tr> </thead> <tbody> <tr> <td>DWSP schematic not up to date</td> <td>Update DWSP schematic</td> </tr> <tr> <td>Moving raw water source from predominantly loch to river abstraction</td> <td>Ensure all factors have been fully considered before changing to new raw water source</td> </tr> <tr> <td>Chemical storage very poor with significant health and safety risks</td> <td>Ensure all chemicals are adequately stored and banded to protect operator H&amp;S</td> </tr> </tbody> </table>	Issue	Intervention	DWSP schematic not up to date	Update DWSP schematic	Moving raw water source from predominantly loch to river abstraction	Ensure all factors have been fully considered before changing to new raw water source	Chemical storage very poor with significant health and safety risks	Ensure all chemicals are adequately stored and banded to protect operator H&S	
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Chemical storage very poor with significant health and safety risks	Ensure all chemicals are adequately stored and banded to protect operator H&S								

 <b>Technical Inspection of Kyle of Localsh WTW, North Region</b>			
<b>Treatment Process: Filtration</b>			
<b>All Filters</b>	How has water entering filters been treated?	no	
	How many filters are present? Describe them	4x sand pressure filters (3 on at 1 time, 4th in backwash) with downward flow followed by 10um cartridge filter	
	What is the media in the filters? Same for all?	yes, 1630 sand	
	Has it ever been sampled and checked / replaced? Is this recorded? What condition is the media in?		
	What are the water collection arrangements (nozzles, wedge wires?)		
	How evenly are flows split between individual filters? Can this be demonstrated? If not even, does it cause issues, if so what's being done about it?	hydraulic flow	
	What is the flow rate through each filter? Is this within design spec and best practice guidance? Is the max flow documented on site? Typical rate ~5m/h		
	Are flow changes through filter minimised (<5% per minute)? What is the effect of other filters backwashing on flows?		
	What is the empty bed contact time of the filter? Is this known?		
	Does each filter have a turbidity monitor? Are these correctly set up and maintained?		
What is the quality of water from each filter? Any large variation between filters? (Should be easily <0.2NTU)			
Are filter log books being kept and used comprehensively?			
Are technical staff monitoring and trending the performance of each filter?			
<b>Specialist Filters</b>	<b>PRESSURE VESSELS</b>		
	When were shells last opened and inspected? (Particular risks with flow balancing and media loss / disturbance). Any issues? Are there alternative (non-invasive) means of monitoring media depth used?	refurbished 2015 with new backwash (filtec). Sand last checked Nov 15.	
	Has an air pattern survey been carried out	Air pattern survey done when air nozzles replaced in 2015. %loss	



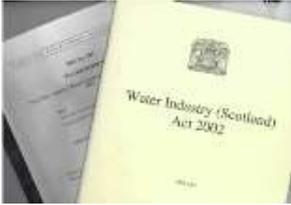
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## Events and Incidents

- **Scottish Water must inform DWQR of water quality events**
- **Treatment process failures**
- **Consumer water quality complaints**
- **Incidents investigated by DWQR, may result in**
  - **Audit**
  - **Enforcement**
  - **Prosecution**



# Enforcement Options



Issue an advisory letter

Make recommendations for action

Support a project for addition to the investment programme

Serve an enforcement notice

Serve an emergency notice (no appeal)

Recommend prosecution



# Director Review of Water Quality Incidents



**LISMORE WATER TREATMENT WORKS  
LOSS OF DISINFECTION  
WATER QUALITY INCIDENT REPORT  
EVENT CDR/DWQ/0009294 (17<sup>TH</sup> MAY 2018)**

Issue and Revision Record:

Revision No	Date	Originated by	Checked by	Approved by	Description
2.0	19 June 2018	Robert White	David Hill	Neil Brennan	Draft



## Enhanced Outcome Report

Loch Calder WSZ - Loch Calder

Aluminium, 8.11.2017 - 8942

Date	Originated by	Checked by	Approved by
02/05/18	Fruzsina Foldes	Ross Barclay & Mark Burton	Neil Brennan

# Risk Assessment : Drinking Water Safety Plans



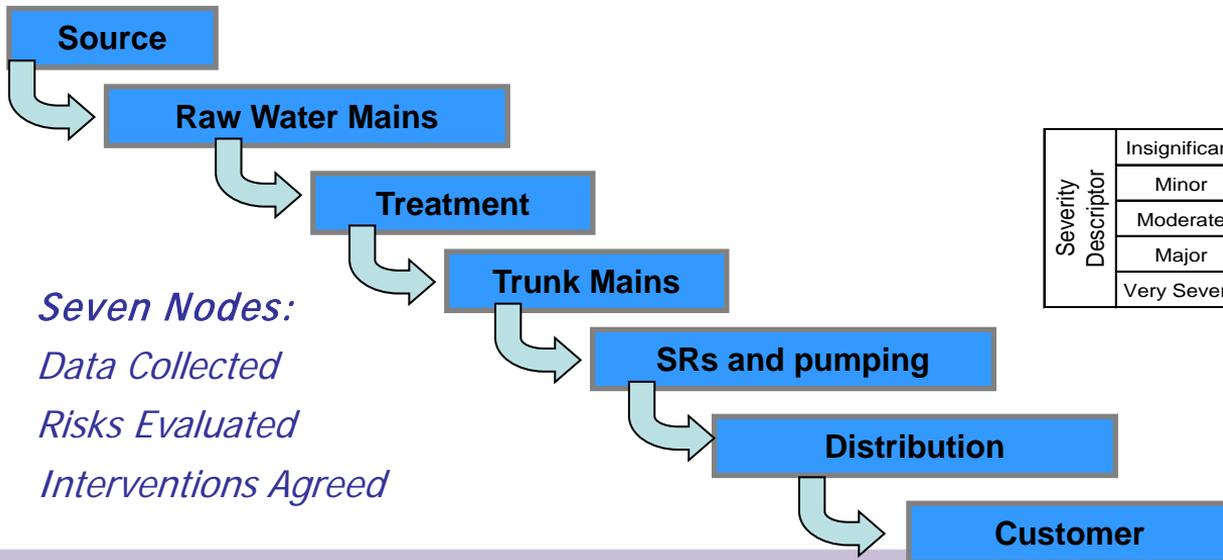
**Source**

**Storage**

**Treatment**

**Distribution**

**Customers**



*Seven Nodes:*

*Data Collected*

*Risks Evaluated*

*Interventions Agreed*

		Likelihood Descriptor					
		Highly Unlikely	Unlikely	Medium	Probable	Almost Certain	
		Score	1	2	4	8	16
Severity Descriptor	Insignificant	1	1	2	4	8	16
	Minor	2	2	4	8	16	32
	Moderate	4	4	8	16	32	64
	Major	8	8	16	32	64	128
	Very Severe	16	16	32	64	128	256

**DWSP Risk Score**



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# DWQR Investment Role



- Advise on the Objectives for drinking water quality
- Agree specific needs and priorities for the investment plan
- Monitor progress and completion at programme & project level (outputs monitoring group)
- Audit investment sign off



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# Investment Objectives 2015 -2021

Address known non-compliance with Regulations and *Cryptosporidium* requirements

Improve the resilience to risks described in water safety plans

Support DWQR in the development of a long term strategy for lead reduction



# Drinking Water Quality Investment 2015 - 2021

Water treatment  
works improved - 73

Mains replaced or  
re-lined – 397km

Mains cleaning –  
7000km

Storage  
improvements - 31  
supplies

Catchment  
improvements and  
studies - 28 supplies

Lead communication  
pipe replacement  
- 6500

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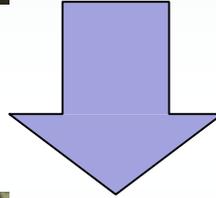


# Water Quality Performance



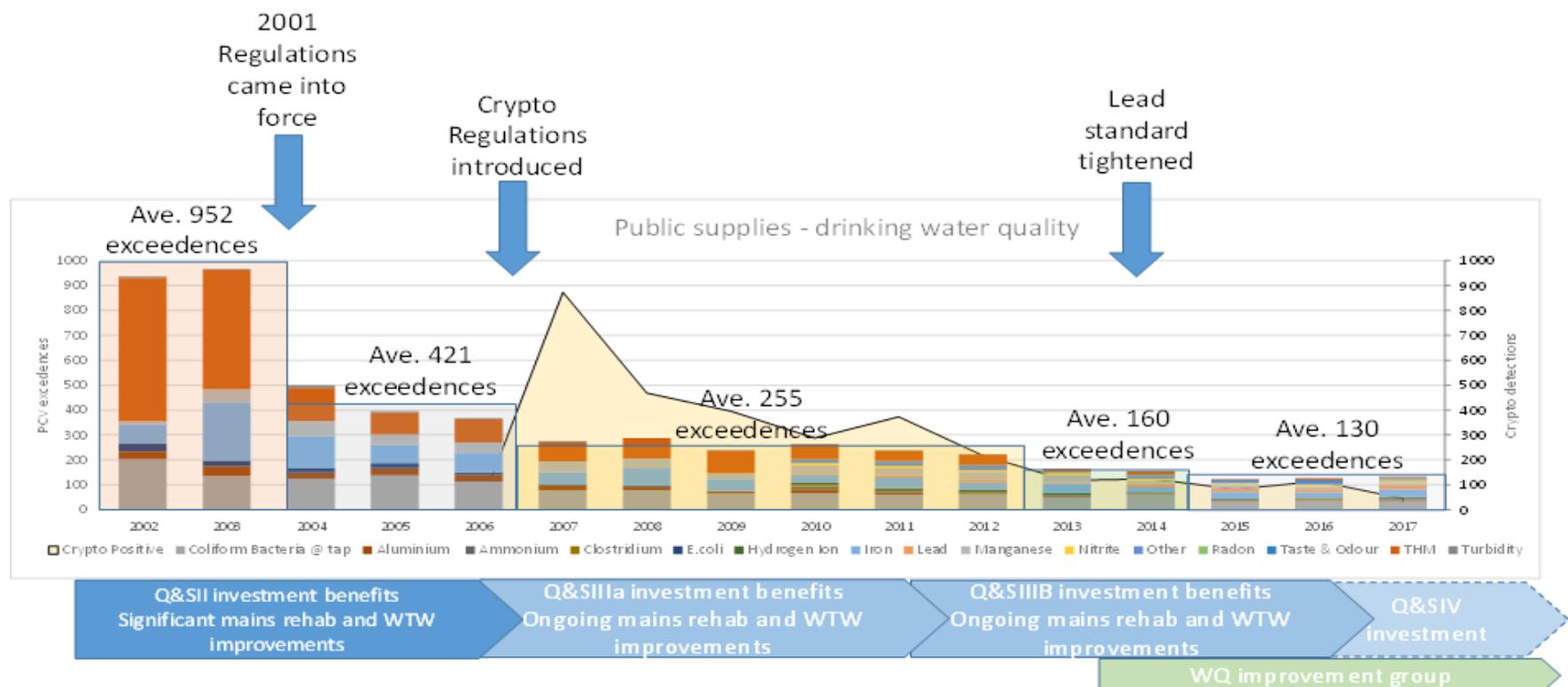
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2002  
Compliance  
99.28%

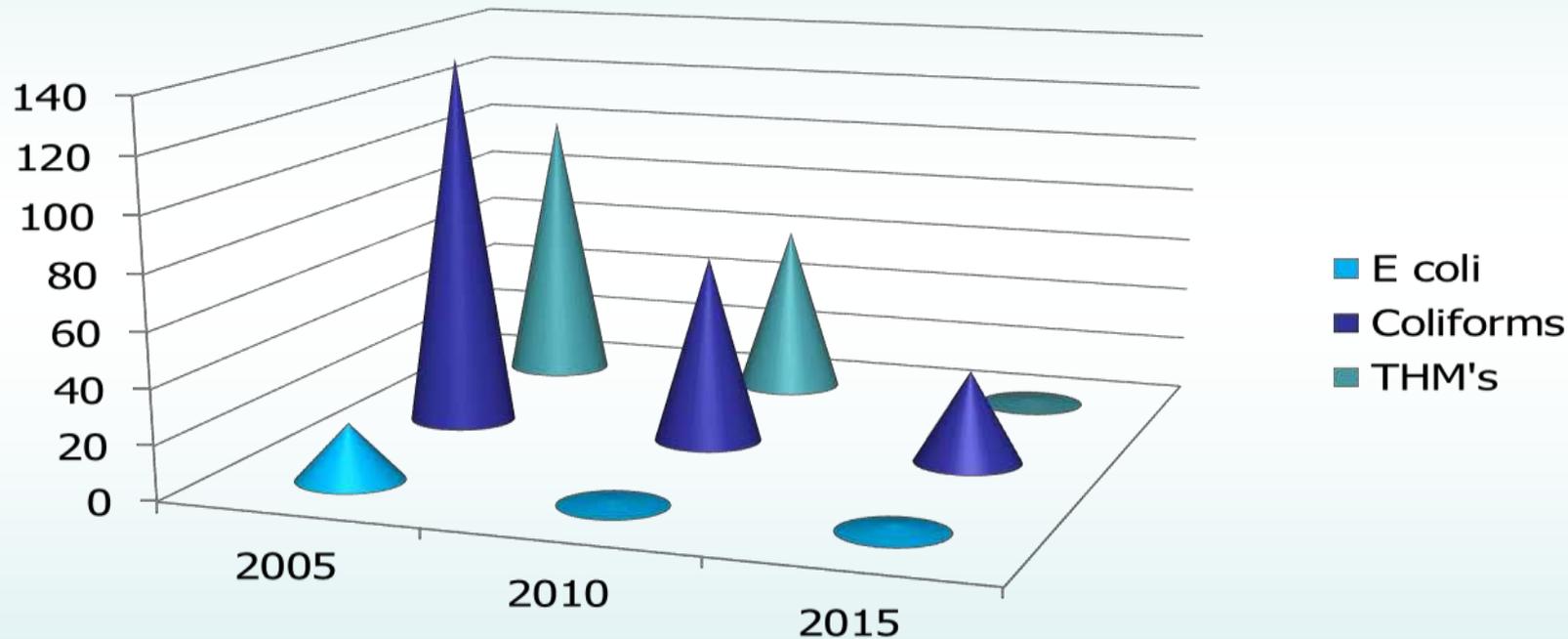


2018  
Compliance  
99.91%

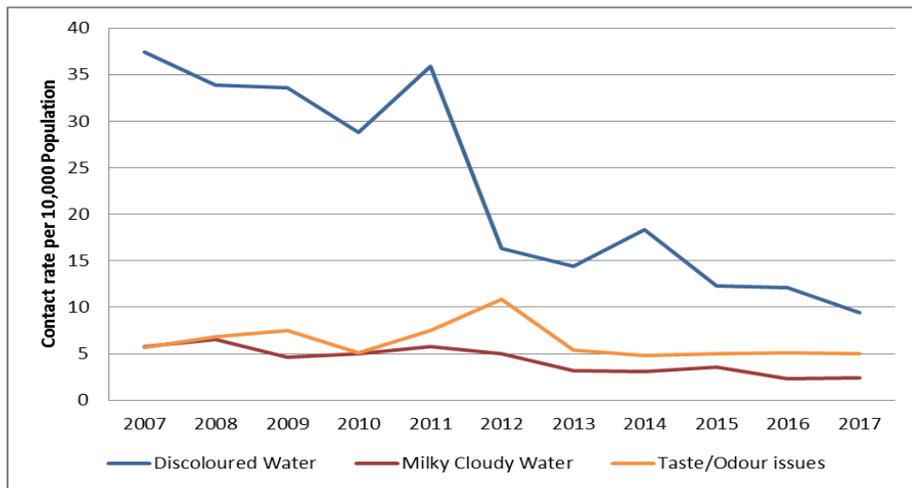
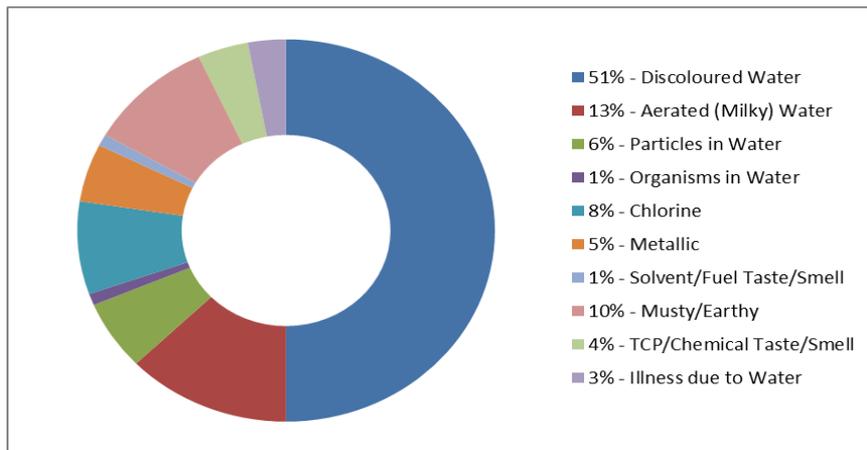




# Customer taps – No. of failing samples



# Customer contacts



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# Future Water Quality Challenges



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# 2017 Performance

c.150,000 regulatory samples/tests  
134 failed  
99.91%



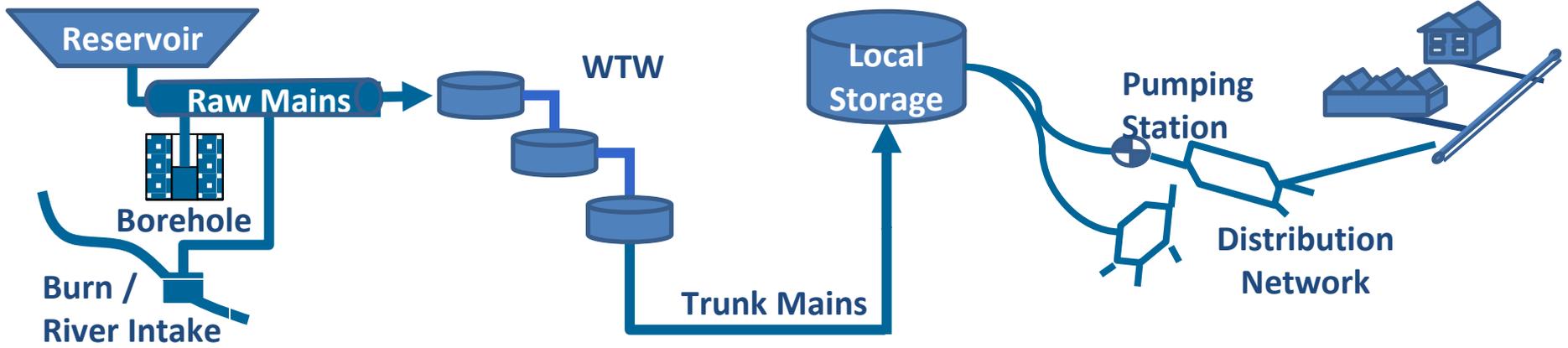
# Types of sources for Public Water Supply in Scotland



# High Quality Drinking Water

## Strategic Objective

Deliver compliant, great tasting water to customers every minute of the day



# 16 Years of DWQR

The path to compliance – approach taken



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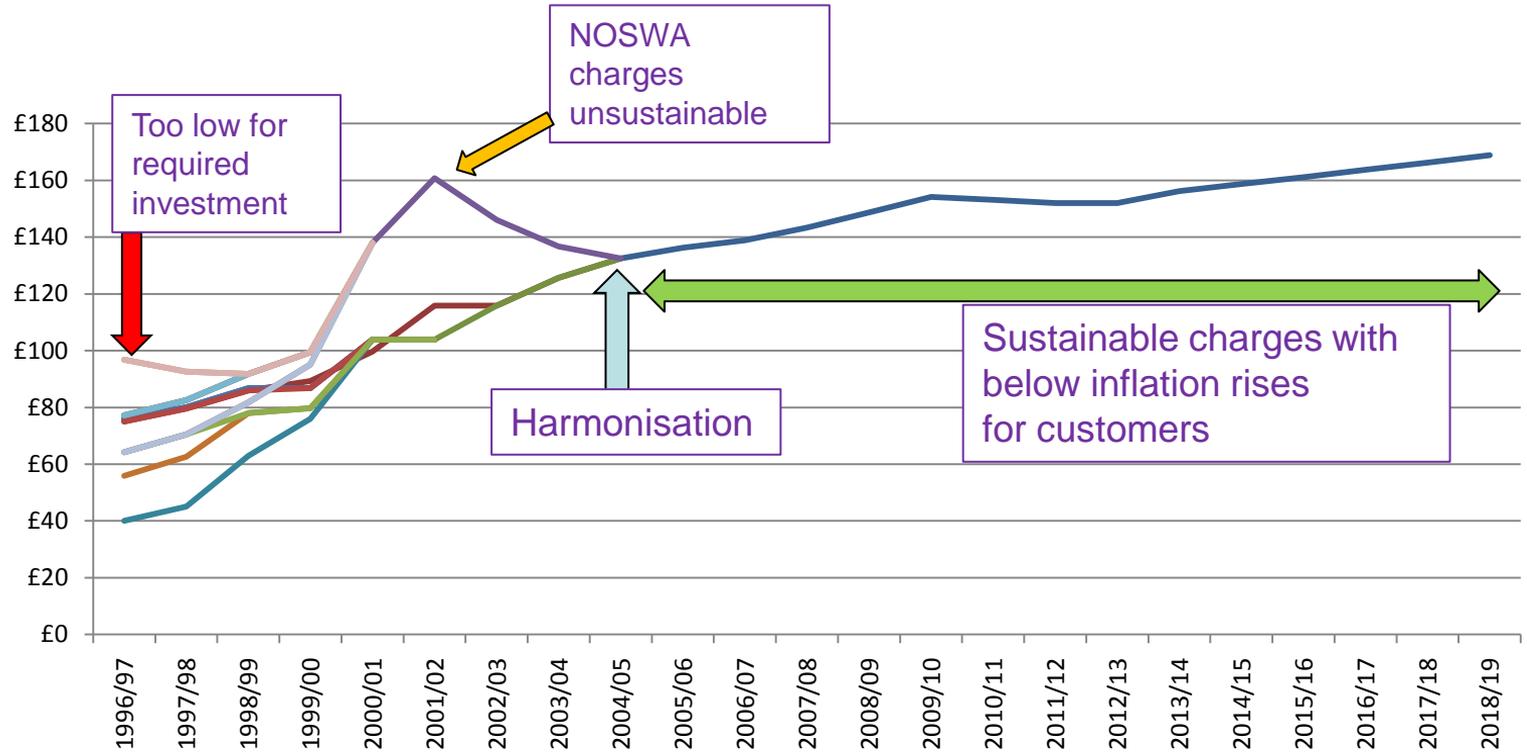


# Who Pays for this Investment



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# Average Household Water Charges since 1996



Comparison with English & Welsh water companies based on water.org.uk published average charge

Great value for money

Water and Sewerage Companies	Average household bill for 2018–19
South West Water	£491
Wessex Water	£479
Welsh Water	£439
Southern Water	£436
United Utilities	£435
Anglian Water	£428
England and Wales Average	£405
Northumbrian Water	£402
Yorkshire Water	£385
Thames Water	£383
Scottish Water	£363
Severn Trent Water	£348

Comparison with English & Welsh water companies based on water.org.uk published average charge



## Scotland's Water Supplies have improved greatly through:

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- **Strong & Effective regulation**
  - **The Right Powers**
  - **Creative tension**
  - **Ratcheting improvements**
  - **Evidence based**
  - **Risk Management**
- **The Right Investment**
- **Alignment to what's best for Scotland**



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# Trusted to care for the water on which Scotland depends



## Serving

We delight our customers by showing that we care



## Committed

Together we are Scottish Water



## Responsible

We always do the right thing for Scotland



## Growing

We enable a thriving Scotland



## Strong

We work hard to keep our customers' prices low



## Leading

We shape our future for the benefit of customers



Trusted  
Putting  
customers first

Serving  
Delivering for  
Scotland 24/7

THANK  
YOU!



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## Questions & Answers



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