

# Lead Mitigation Programme Overview

**EPA National Water Event 2019**  
**Galway Bay Hotel**

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## Public Health

- Lead is a public health issue.
- **“Absence of a clear threshold below which a detrimental effect of lead on child development does not occur” – WHO**

## Regulation

- WHO guideline value of 10µg/l since 1992
- **EU Legal Limit for lead in drinking water of 10µg/l since December 2013**
- Irish Drinking Water Regulations (S.I. No. 122 of 2014) 10µg/l
- Proposed EU Drinking Water Directive will reduce this to 5µg/l

## Policies

- The Government published a National Strategy to Reduce Lead in Drinking Water in 2015
- Irish Water adopted the Lead in Drinking Water Mitigation Plan in 2017 after period of public consultation



# Lead in Drinking Water Mitigation Plan

## Problem

- Almost all drinking water is **plumbosolvent** (lead corrosive)
- Estimated **180,000 PUBLIC side lead services**
- No. of **PRIVATE** side lead services significantly greater
- Propose change in parametric limit from 10µg/l to 5µg/l

## Permanent Solution

*(Zero Lead)*

- Irish Water to replace all **PUBLIC side** lead services
- Customer to replace **PRIVATE side** lead services

## Interim Solution

*( <10µg/l)*

- Ortho-Phosphate treatment at Priority WTPs or reservoirs in line with International practice





# Establishing the Lead Problem

## Random Daytime Sampling

- 35,600 Random Daytime Samples
- Homes selected at Random from GIS
  - (Domestic, Single Occupancy, IW supplied)
- Max Lead Level recorded: 1,293µg/l
- Median Lead Level: 0.8µg/l

## Compliance with 10µg/l limit

- 1,310 Exceedances
- Compliance 96.3%

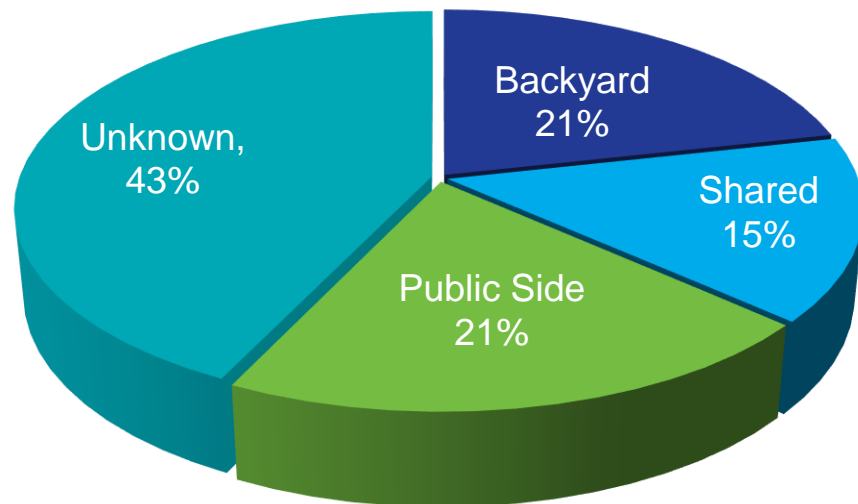
## Compliance with future 5µg/l limit

- 2,229 Exceedances
- Compliance 93.7%



# Lead Replacement (ZERO LEAD)

## Public Side Lead Services



### Private Side Challenges

- Lack of engagement by customers to remove private side lead.
- Cost
- Disturbance
- Consent forms required for Shared Services

### Initiatives

- Customer Opt In Scheme
- Study with ESRI Behavioural Research
- Department review of Grant Process

### Public Side Challenges

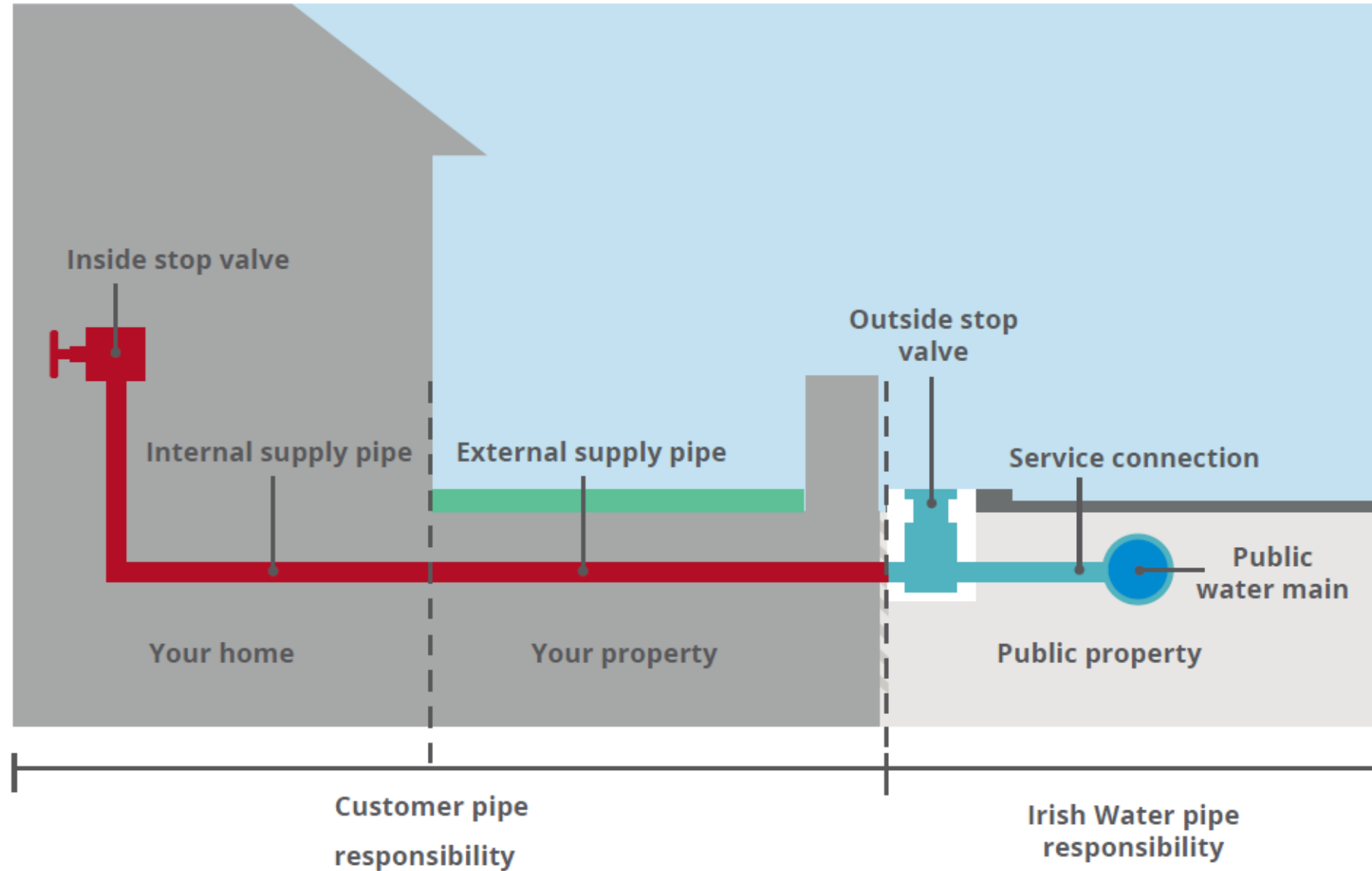
- Location and Identification of additional unknown lead services
- Quality of Data – Historic Data with people rather than systems. 60% Coverage from metering programme

### Initiatives

- Workshops have commenced with Local Authority Staff to map any additional lead services

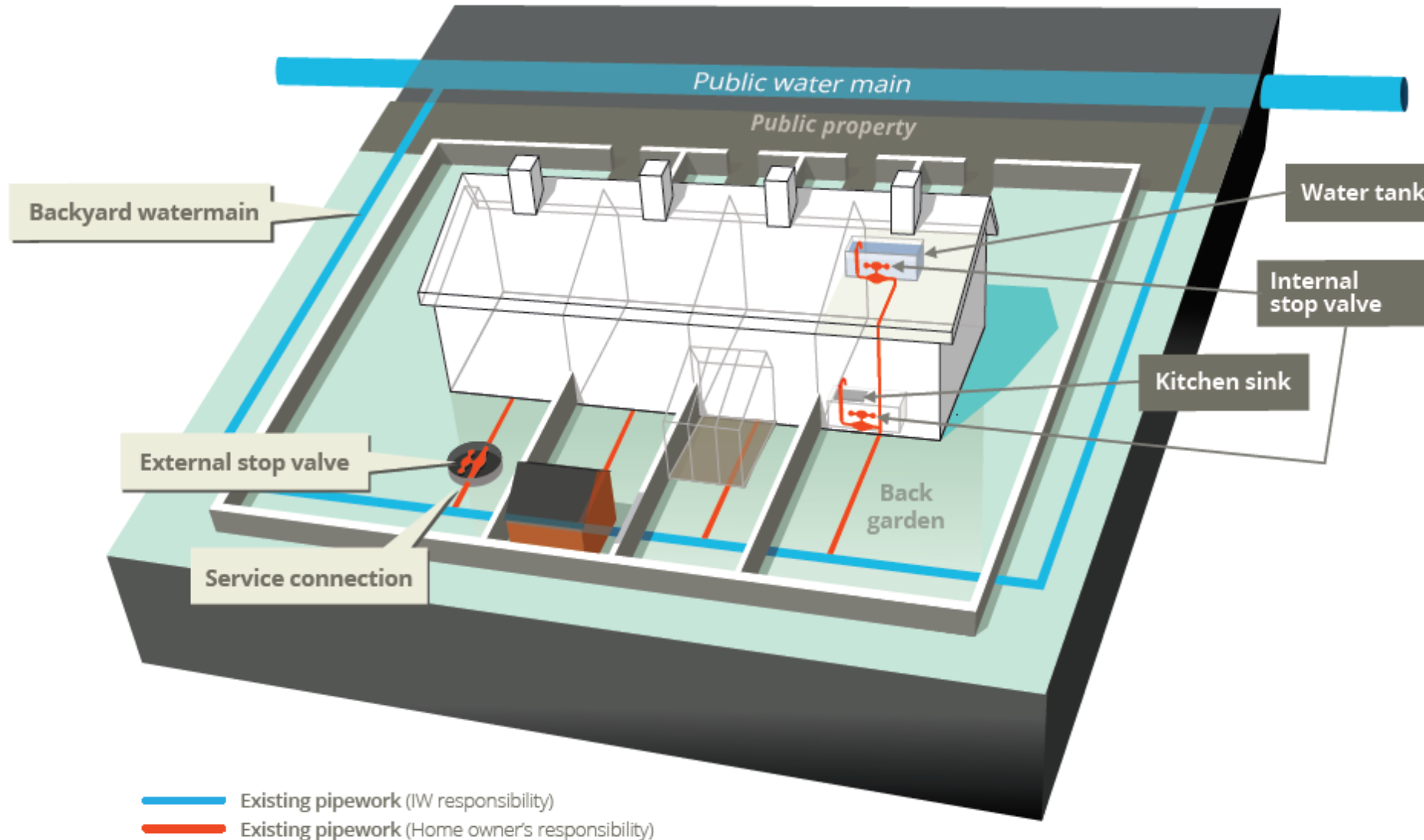


# Pipe Responsibility





# Shared Backyard Service





# Ortho-Phosphate in Drinking Water

**Ortho-Phosphate** is a **food grade additive** approved for use in food products. It is a **clear, odourless liquid** naturally occurring in milk, cheese, apples, potatoes, fish, and poultry.

Typical Levels	
Water	0.5 -1.5 parts per million
Soft Drinks	150 parts per milllion (100 + times)
Beer	250 parts per million (200 + times)
Milk	830 parts per million (500+ times)
Typical Adult Daily Intake	c.1,300 mg of which water would be 4.5 mg





# Ortho-Phosphate in other Countries

The United States Environmental Protection Agency (USEPA) has identified **orthophosphate treatment** as the most effective treatment method for reducing the presence of lead in drinking water.

- **World Health Organisation (WHO)** - recognised that orthophosphate treatment may be necessary to reduce plumbosolvency
- **Britain** – used in over 90% of water supplies (61 Million people) for last 20 years
- **Northern Ireland** – used in all public water supplies
- **Canada & United States** – widely used

## Ortho-Phosphate delivering 99% compliance with lead limit

Parameter	Standard (µg/l)	Number of samples	No. of exceedances	Percentage compliance
Lead	10	12,323	65	99.47%

*Compliance data for 2015 for England and Wales (DWI, 2016), based on random daytime sampling at consumers' taps*



# Prioritisation of Water Treatment Assets



Based on Random Daytime Sampling (RDT), Plumbosolvency of Water and estimated no. of lead connections.

## Priority Criteria

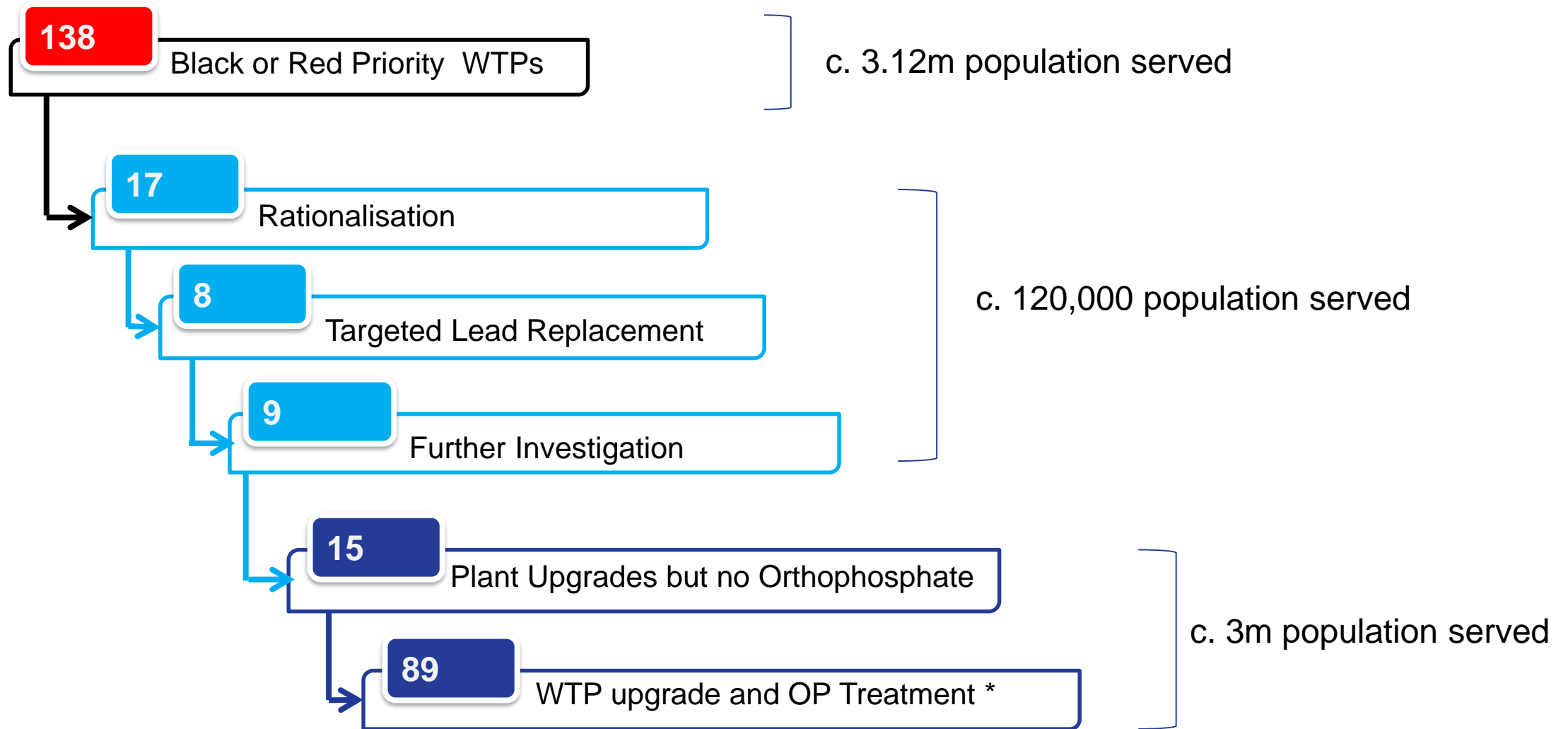
	Colour	Rating	No. of Lead Connections (>=)	RDT% (>=)	Plumbosolvency (>=)
●	5. Black	5	200	10.0%	500
●	4. Red	4	100	5.0%	100
●	3. Amber	3	75	2.0%	50
●	2. Yellow	2	50	1.0%	25
●	1. Green	1	0	0.0%	0

## Constraints

- Optimisation of WTPs
- Environmental Assessments
- Additional Design & Testing (Jar Test & THMFP)



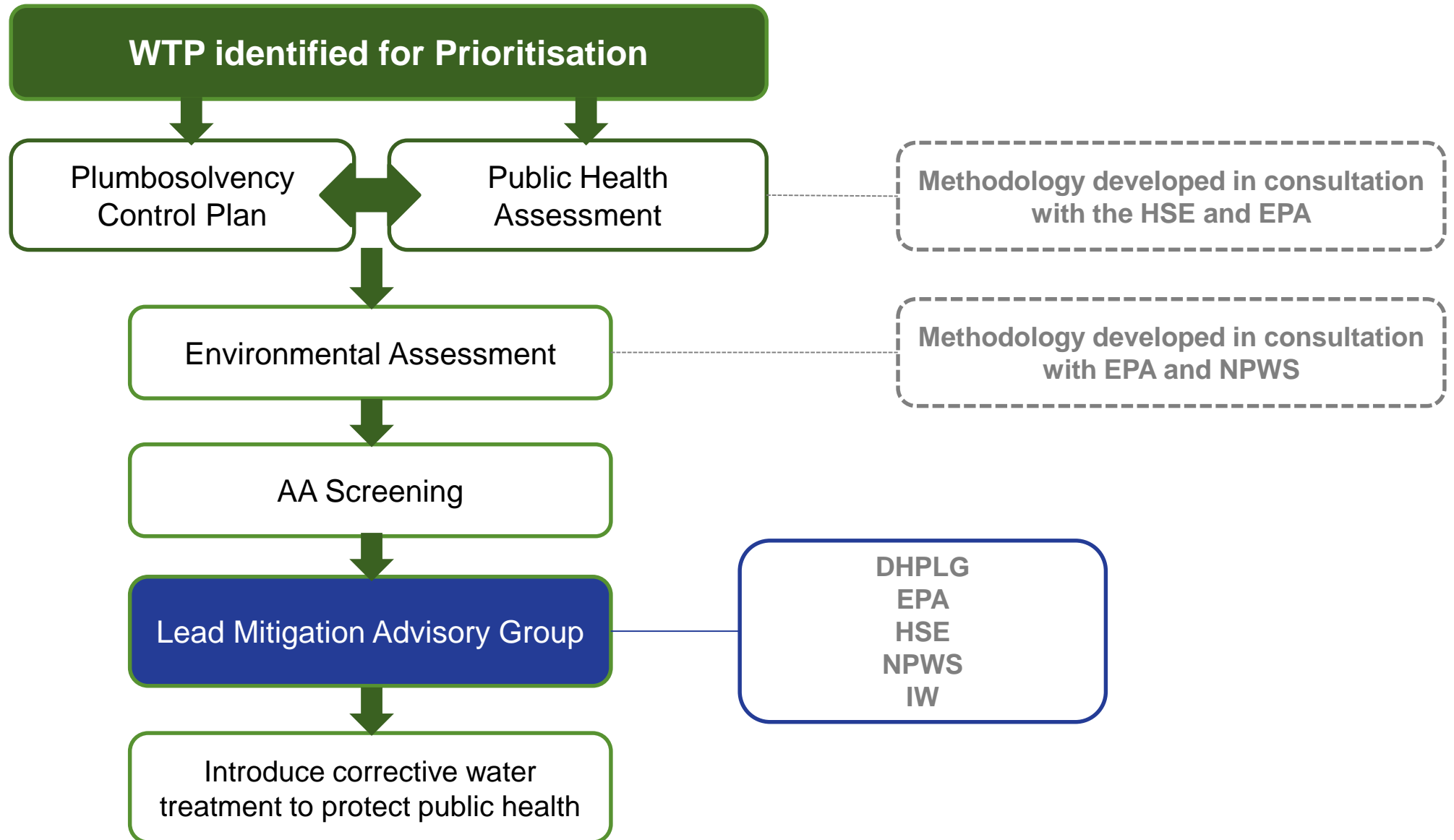
# Interventions Required



\* Subject to passing the Environmental Assessment



# Water Supply Zone Assessments

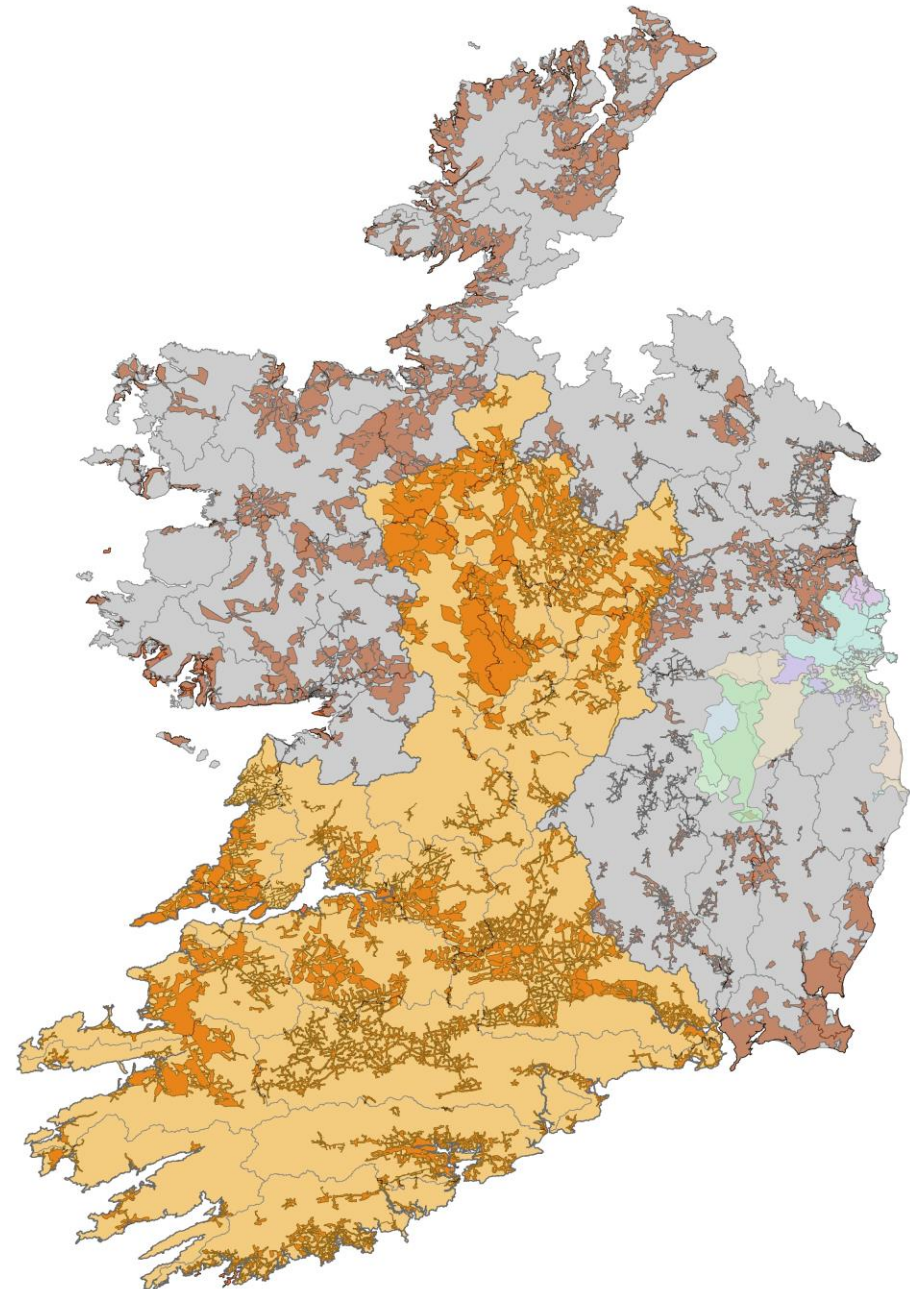




# Split of Country by Catchment

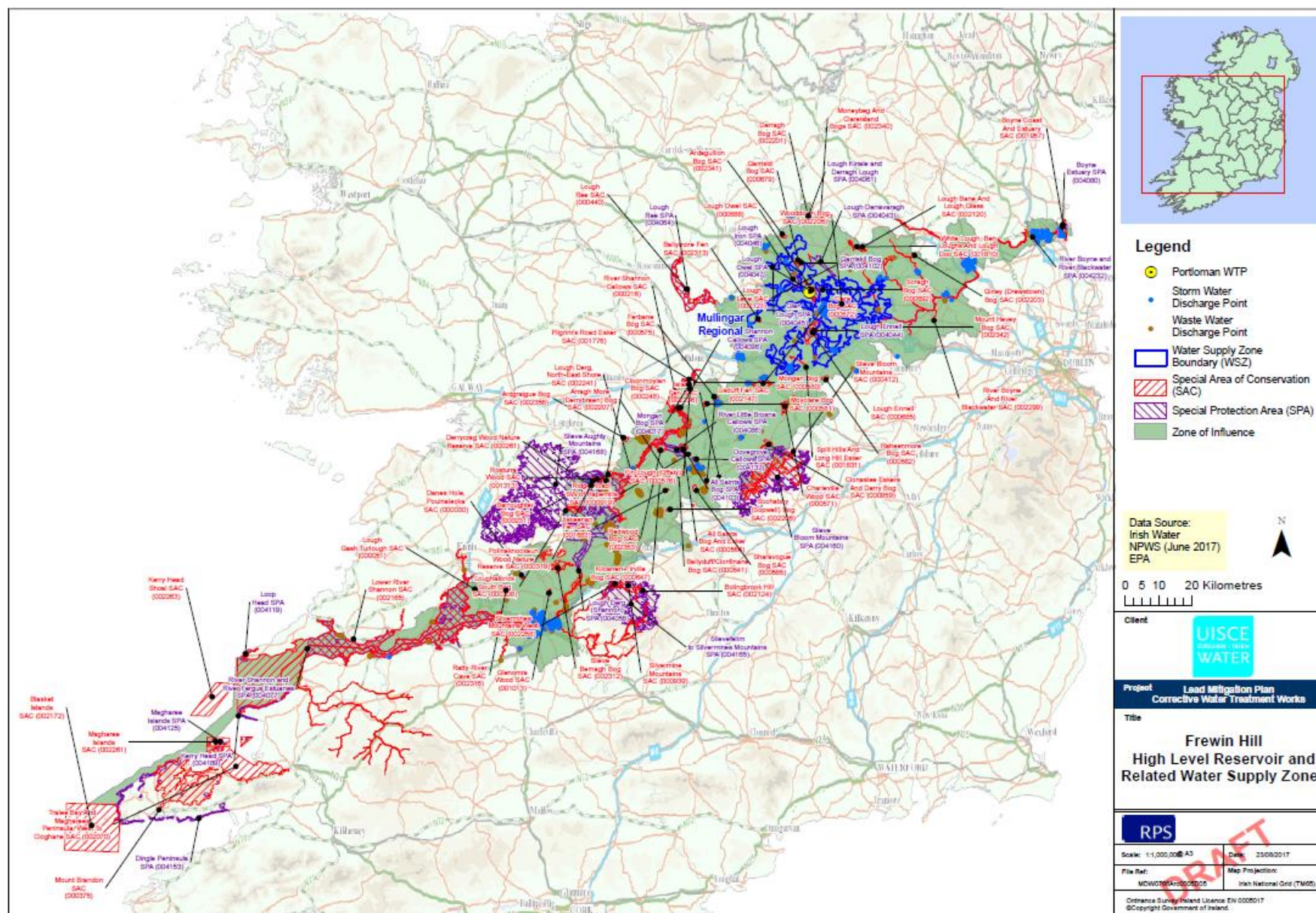
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- Area 1 Northwest and East
- Area 2 - Shannon Catchment and South



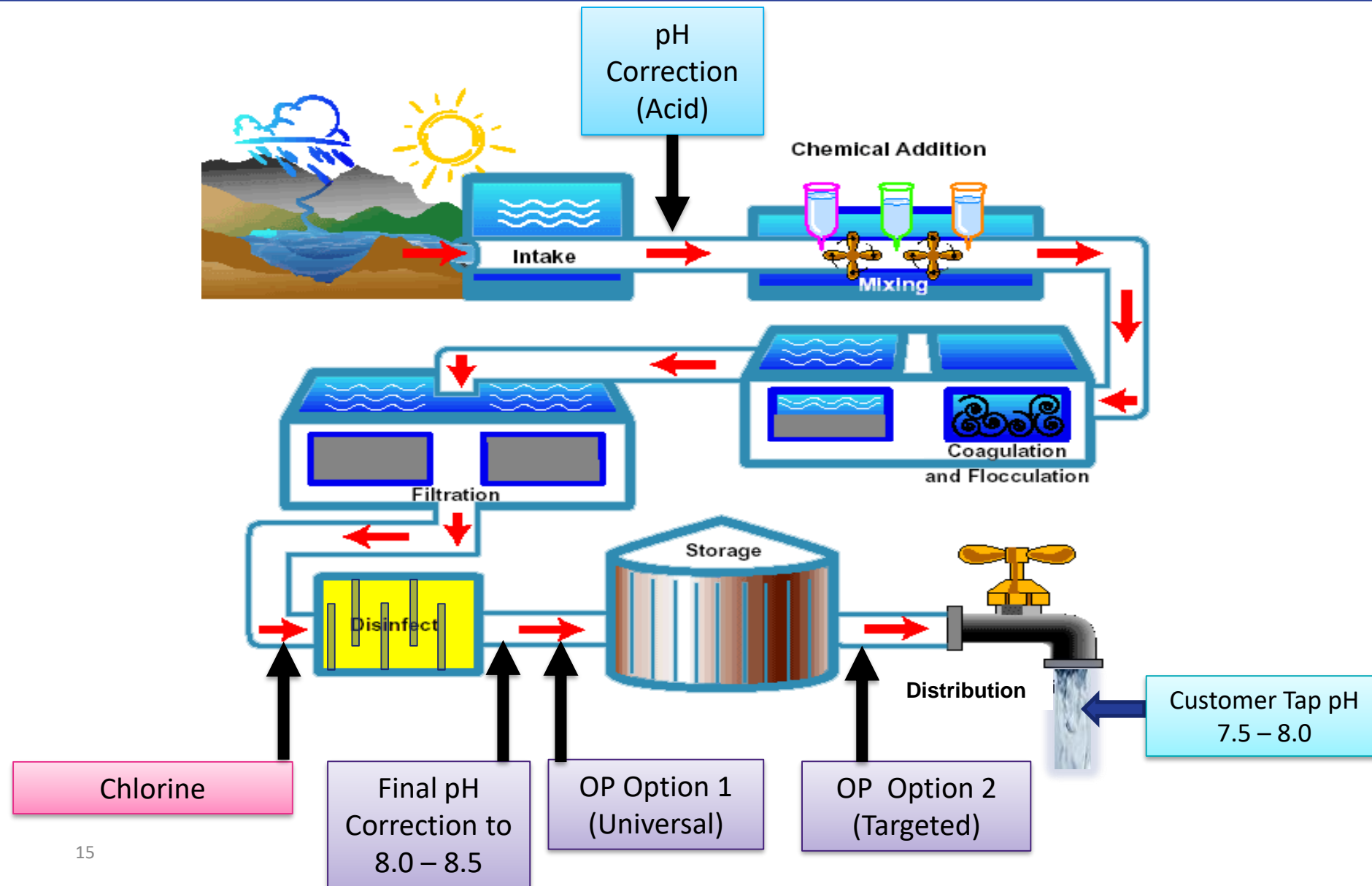


# Cumulative Impacts on Catchments





# OP in a Typical WTP Process





# Limerick Orthophosphate Pilot Progress

## RDT Operational Sampling

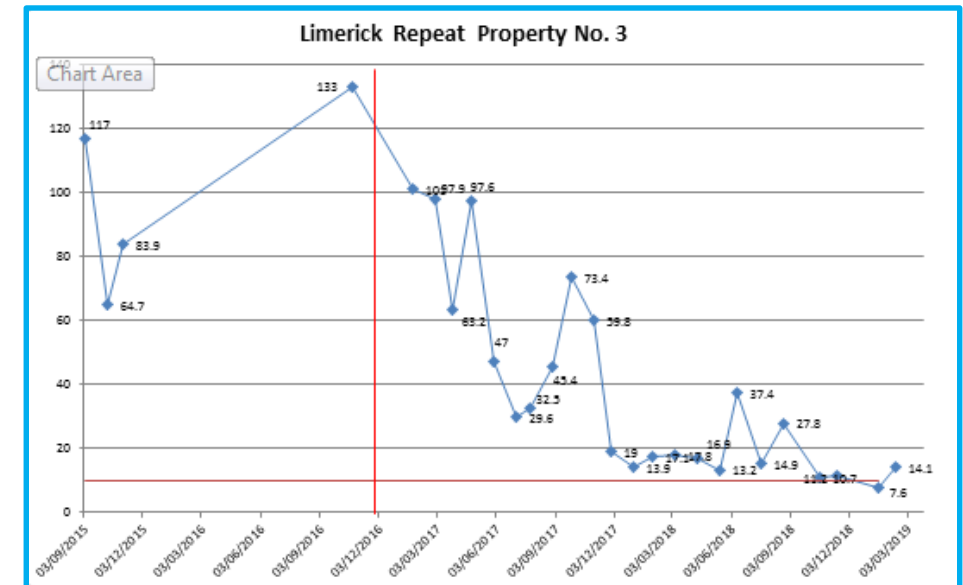
	11 months prior to OP introduction	22 months after OP introduction
% Compliance with 10µg/l Limit	94.8%	97.6%
% Compliance with 5µg/l Limit	92.1%	95.7%

## 6no. Control Properties

	Sept 2015 - Oct 2016	Jan-Feb 2019
Max	152 µg/l	20.3 µg/l
Average	49.3 µg/l	8.76 µg/l

## Summary

- No change for end user (Domestic and Industrial)
- Lead levels have seen an increase in compliance since the introduction of OP
- Room for improvement – pH at Clareville
- Plant needs to be optimised
- 2 years of monitoring have verified the EAM outputs ie. No impacts on receiving waters (Surface Waters and Boreholes)





- Carry out additional GIS work to identify other high priority areas for Lead Services – Hotspots
- Collect better data
- Finalise Environmental Assessments and AA Screenings
- Install treatment equipment
- Roll out communications by WSZ



# Thank you for your attention

[www.water.ie/water-supply/water-quality/lead-in-drinking-water/](http://www.water.ie/water-supply/water-quality/lead-in-drinking-water/)

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