Exploring the benefits of src willow planting for Water Quality Protection & Waste Water Management

5th March 2020

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

Interreg
Northern Ireland - Ireland - Scotland
European Regional Development Fund

An Roinn Tithíochta, Pleanála agus Rialtais Áitiúil
Department of Housing, Planning and Local Government

CatchmentCARE
Community Actions for Resilient Ecosystems

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Comhairle Contae Dhún na nGall
Donegal County Council

Armagh City Banbridge & Craigavon Borough Council

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

GSI

afbi Agri-Food and Biosciences Institute

Ulster University

Iascach Intíre Éireann
Inland Fisheries Ireland

Loughs Agency
Gníomhaireacht na Lochanna
Factrie fur Loughs

- €13.8 million over 5 years to October 2022
- EU Programme for N. Ireland, Border Region & Western Scotland
- Match funding provided by the
  - ❑ Department of Housing, Planning and Local Government in Ireland and the
  - ❑ Department of Agricultural, Environment and Rural Affairs in Northern Ireland
- CatchmentCARE is funded under Priority Axis 2 – **Environment**, Priority 2b – **Invest in Water Sector**, Objective 2.4 – **Improve freshwater quality in river basins**

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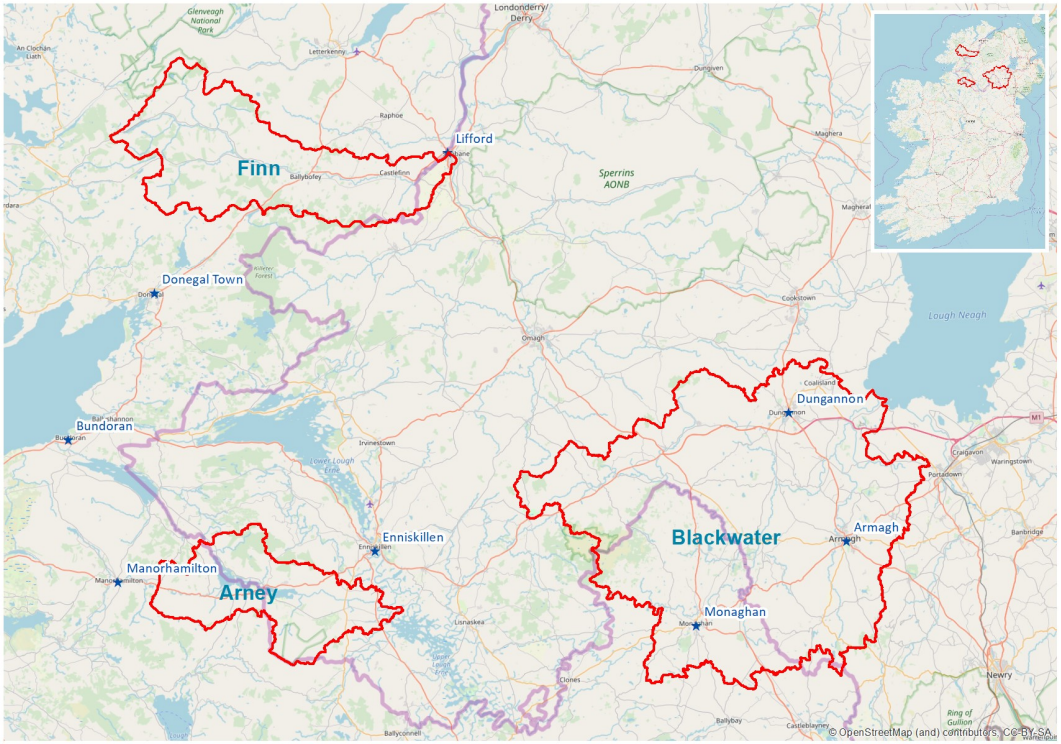

Project Outputs:

Establish 3 water quality improvement projects

1. **Arney** catchment
   (304km^2)

2. **Blackwater** catchment
   (1,500km^2)

3. **Finn** catchment
   (494km^2)

Install 50 groundwater monitoring stations across the region

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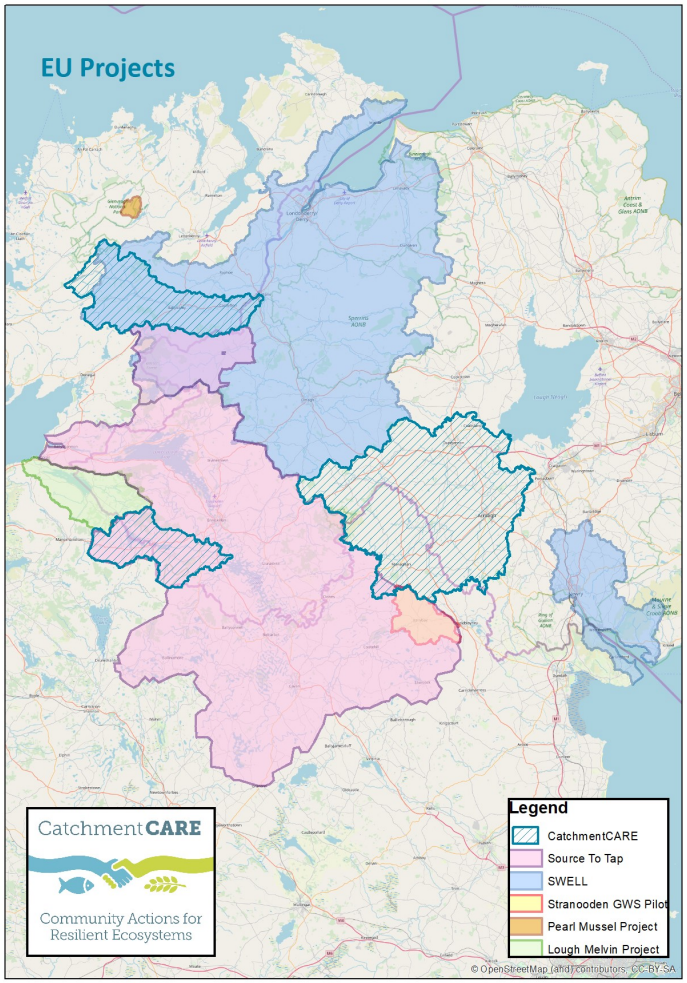

The Project will be delivered through a combination of . . .

- **policy actions**

- **catchment and water body actions**

- **enhancing the capacity of local stakeholders to contribute to improvements in water quality**

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Policy actions . . .

1. **Refining the current nutrient management advice** to farms through the implementation of a farm scale surveys on selected farms

2. Completion of **an evaluation of the cost and feasibility** of achieving the WFD objectives in the three catchments

3. Delivery of **a scoping study** on the feasibility of establishing a willow supply chain in the border region

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Catchment & Water body actions . . .

1. LA & IFI & ABC are focussed on **in-stream / riparian work,** using survey data / local knowledge to maximise the impact of actions in the catchments
2. Afbi in conjunction with UU – progressing small **WWTP upgrades using willow plantations** for bioremediation of effluent
3. UU are exploring the addition of **P binding materials to selected lakes** to reduce the internal loading of phosphorus
4. The GW Team are tasked with providing **50 boreholes** for groundwater profiling which will integrate with other actions implemented through the project
5. LA plan to reduce the risk posed by **chemical escapes from land use in the Finn catchment**
6. Linked to policy action already mentioned, the Project will provide **nutrient management advice to farmers** through farmer discussion groups, farm adviser workshops and open days

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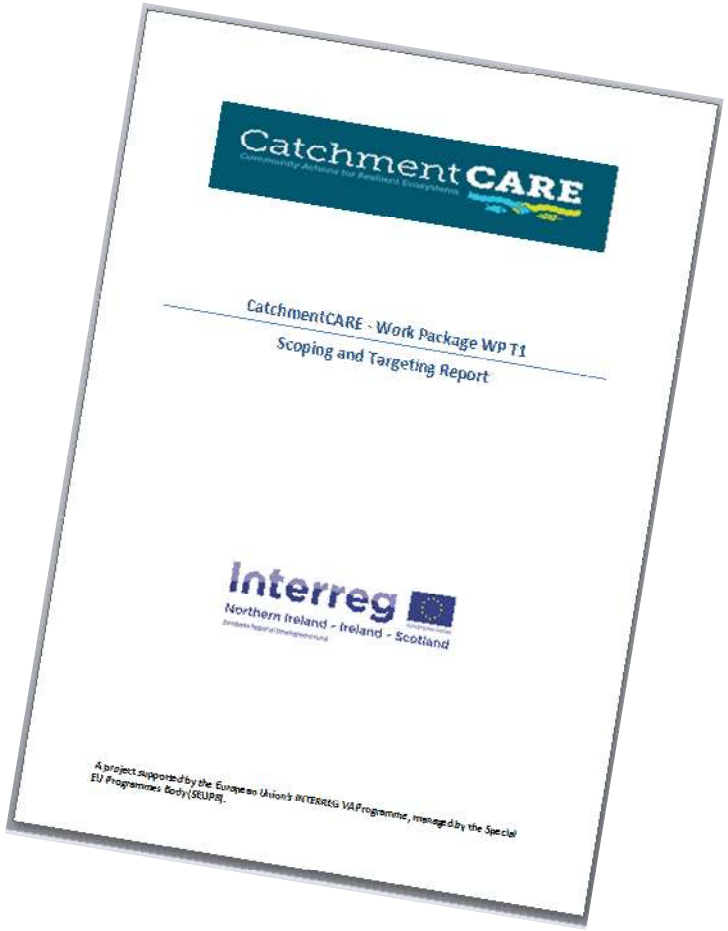

Scoping Study . . The following are links to summary 'story-maps' which describe the Catchment characterisations from the Scoping Report

Arney:
https://storymaps.arcgis.com/stories/ee37c6eeccb2485b89700304dd27ad24

Blackwater:
https://storymaps.arcgis.com/stories/ff27acf86b2c4b789bd697496829c3d9

Finn:
https://storymaps.arcgis.com/stories/21410fccb8894fce818a4330b6fc4a07

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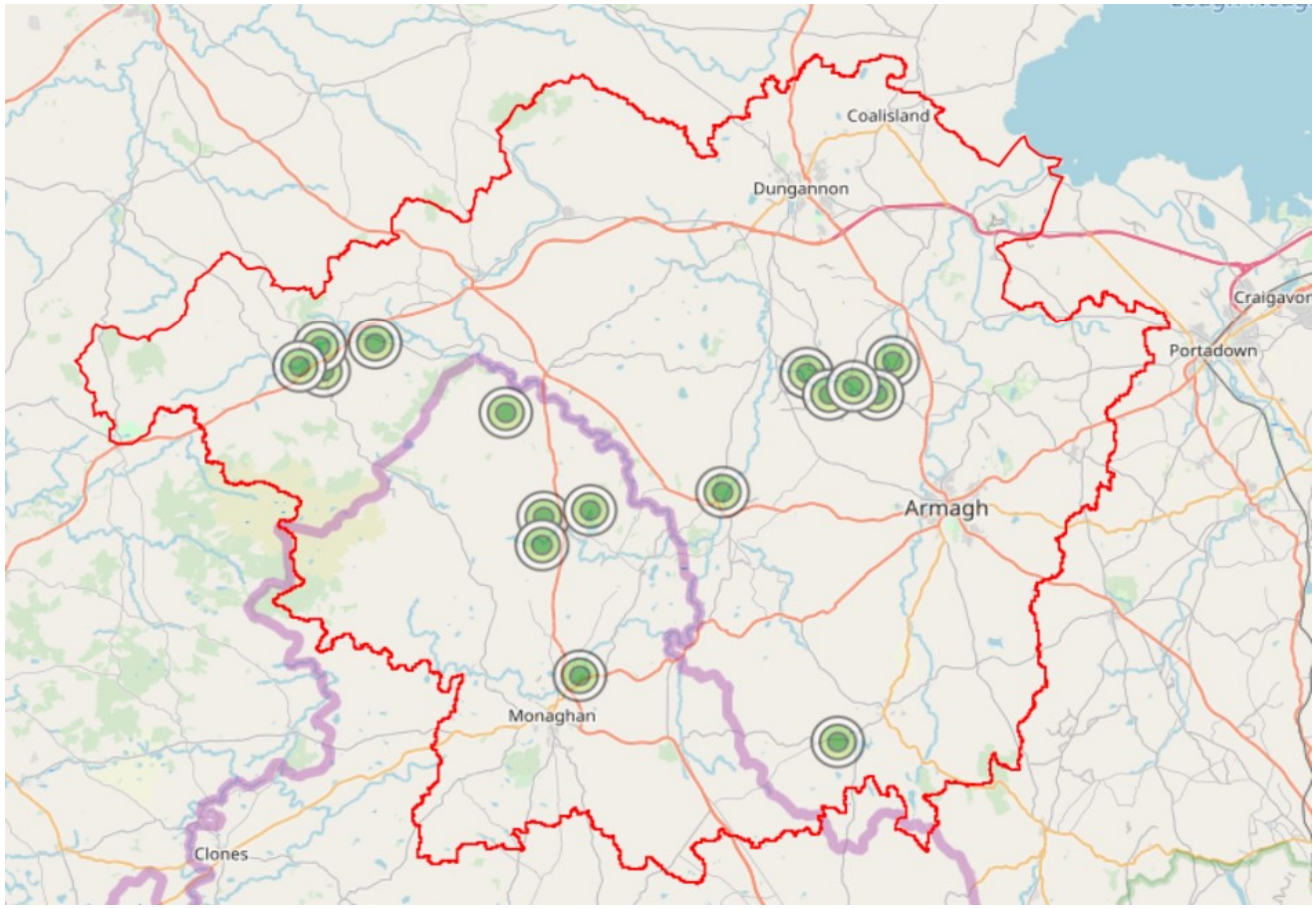

Project Outputs:

Agri-food & Biosciences Institute (Afbi) work . . within the Blackwater catchment

17 Farms selected for soil sampling and farm scale nutrient management studies

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Groundwater Team progress to note:

The Groundwater Team have been trying to identify sites which are suitable but also available to them.

Frameworks for drilling and associated monitoring / modelling are also being progressed

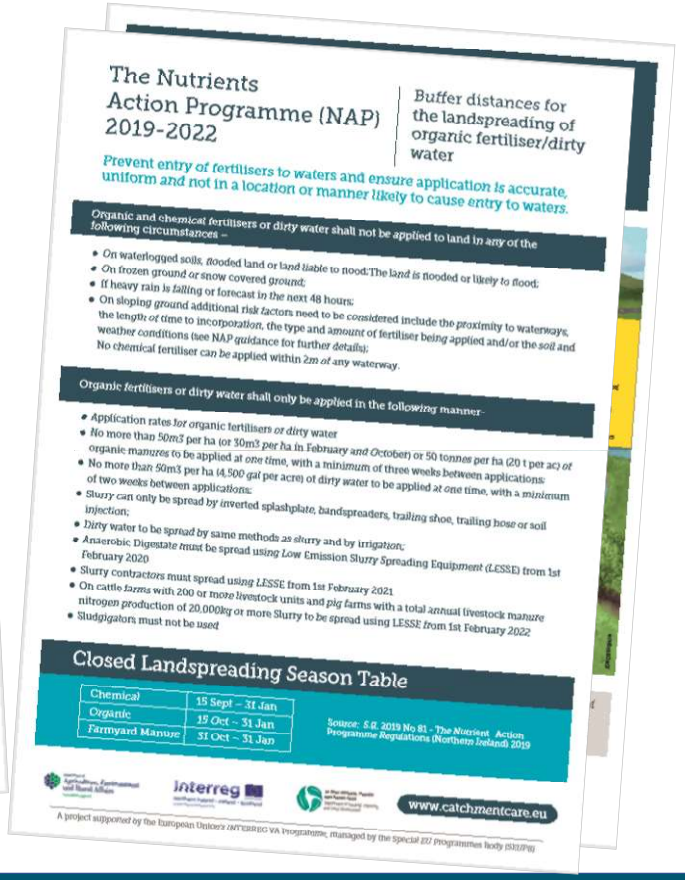
In August the GW Team commenced installed the first of their groundwater monitoring stations at a school site at Stranorlar (Finn)

T2 Wat… s in Catchments: T2.4 Control of Chemical E…

- …eted
- …armers
- I…

Upcc…

other branded Information Sheets to help with our messages . .



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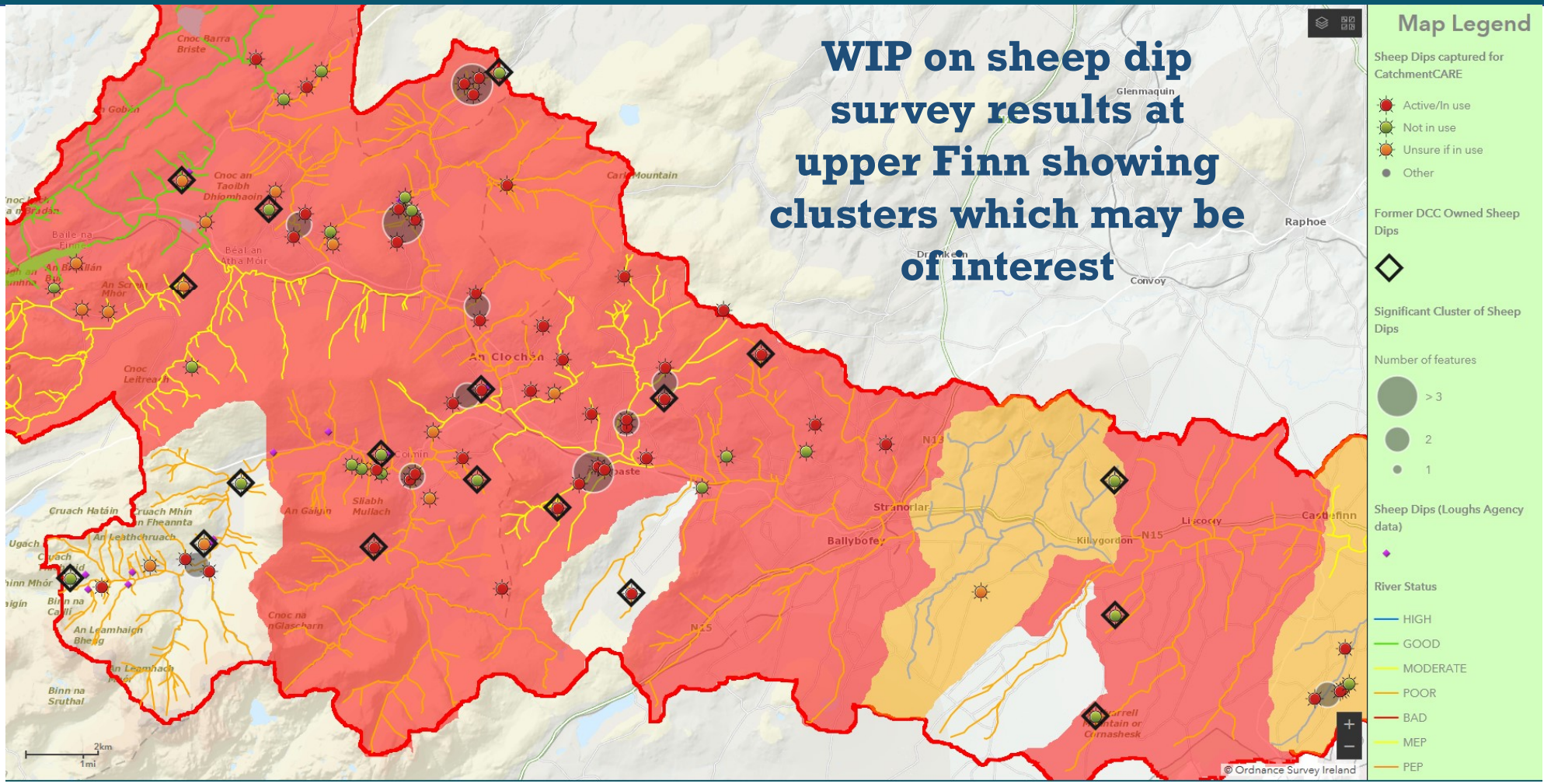

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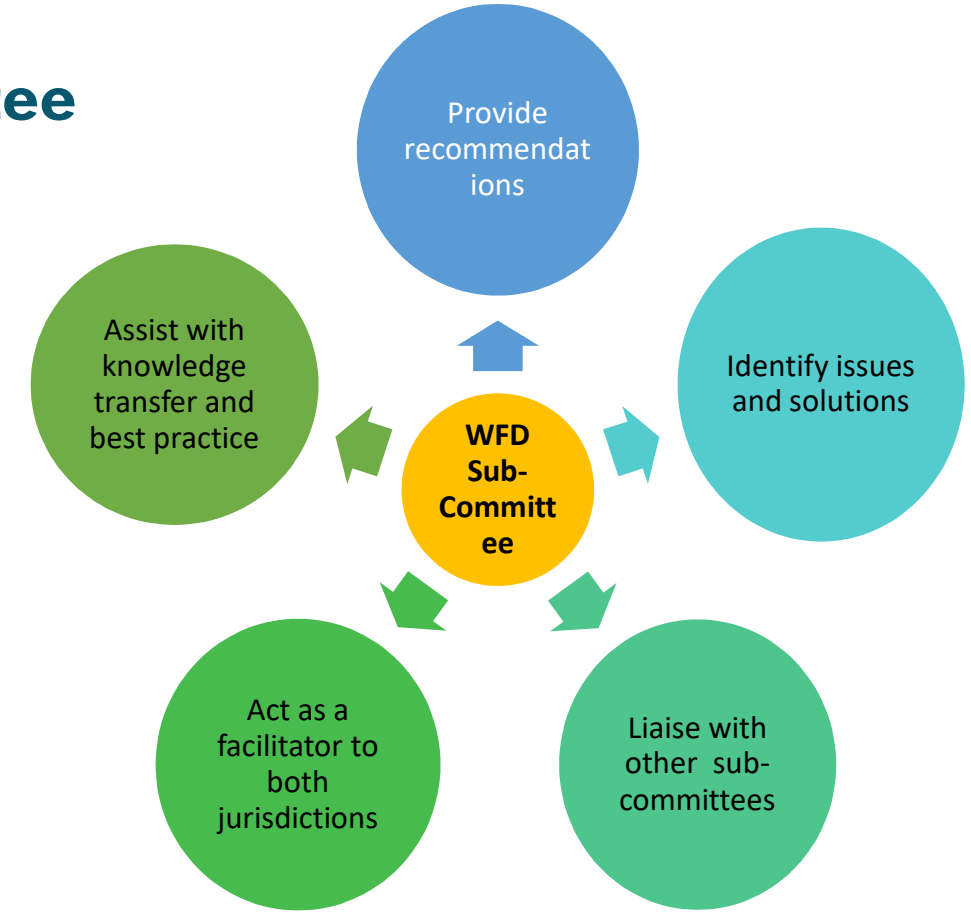
Steering Group:
WFD Co-ordination Sub Committee

X border representation from:

- **Loughs Agency (Chair)**
- **DCC**
- **EPA**
- **DAERA**
- **IFI**
- **DoAFM (Forestry/WFD/Agricultural)**
- **DoHPLG (Water Advisory Unit)**
- **OPW**
- **GSI**
- **DfI Rivers**



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Community Incentive Scheme

Visit www.catchmentcare.eu for more details.

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Department of Housing, Planning and Local Government

Community Incentive Scheme (CIS) is designed to:

- Support communities to take innovative approaches to looking after and caring for their local river systems including associated lakes.
- Approx €0.5m set aside within the Project for Community based projects
- Projects funded up to the amount of €25,000.
- First round of the CIS closed in October 2019
- Groups are now working with our 3 Catchment Officers re procurement / delivery of all approved works.

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Total

29

Applications Received

Last update: 3 minutes ago

Decisions Type

Last update: 3 minutes ago

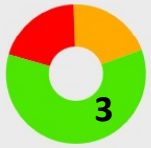
Arney

5

Applications Received

Last update: 3 minutes ago

Areny Catchment
CIS Application Decisions



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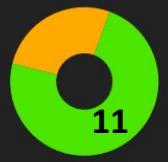
Blackwater

15

Applications Received

Last update: 3 minutes ago

Blackwater Catchment
CIS Application Decisions



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Finn

9

Applications Received

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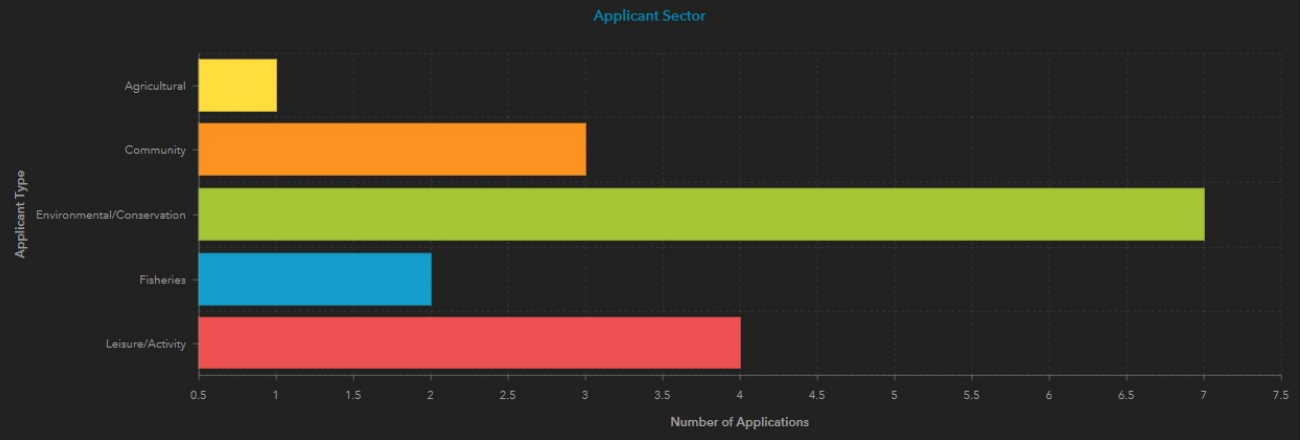
Finn Catchment
CIS Application Decisions

Last update: 3 minutes ago

Applicant Sector



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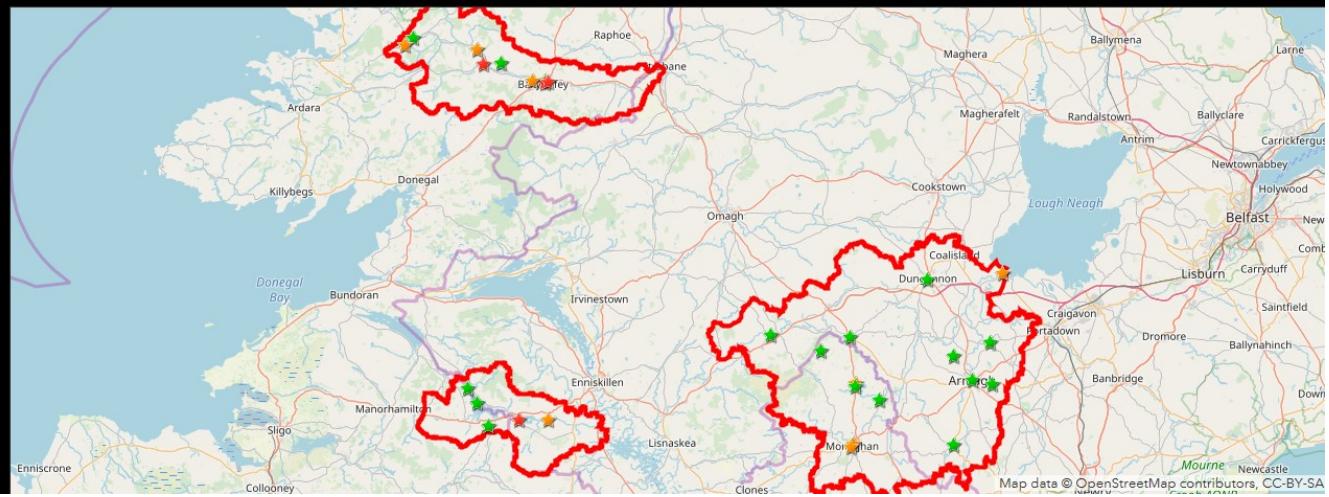
CIS Breakdown by project | CIS Breakdown by Works Type | CIS Applications by Sector



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Project Education Programme

Led by colleagues at ABC Council, the project completed a successful education pilot programme in 2019 in 8 schools across the 3 catchments which will be extended in the current year to 14 schools

A series of impressive Education Catchment Films were produced and can be viewed on our Facebook page or You tube Channel or via our website . .

catchmentcare.eu

www.youtube.com/watch?v=Vrhun6U7Pxg


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newsletter

Summer 2019 – Issue 2

Schools watching Catchment Films

Education Pilot Programme Celebration Day takes Flight

Following the completion of the CatchmentCARE education pilot programme, a celebration day was held in the Mellon Country Inn, Omagh on Wednesday 19th June.

The event saw the eight participating schools come together and showcase the excellent work carried out

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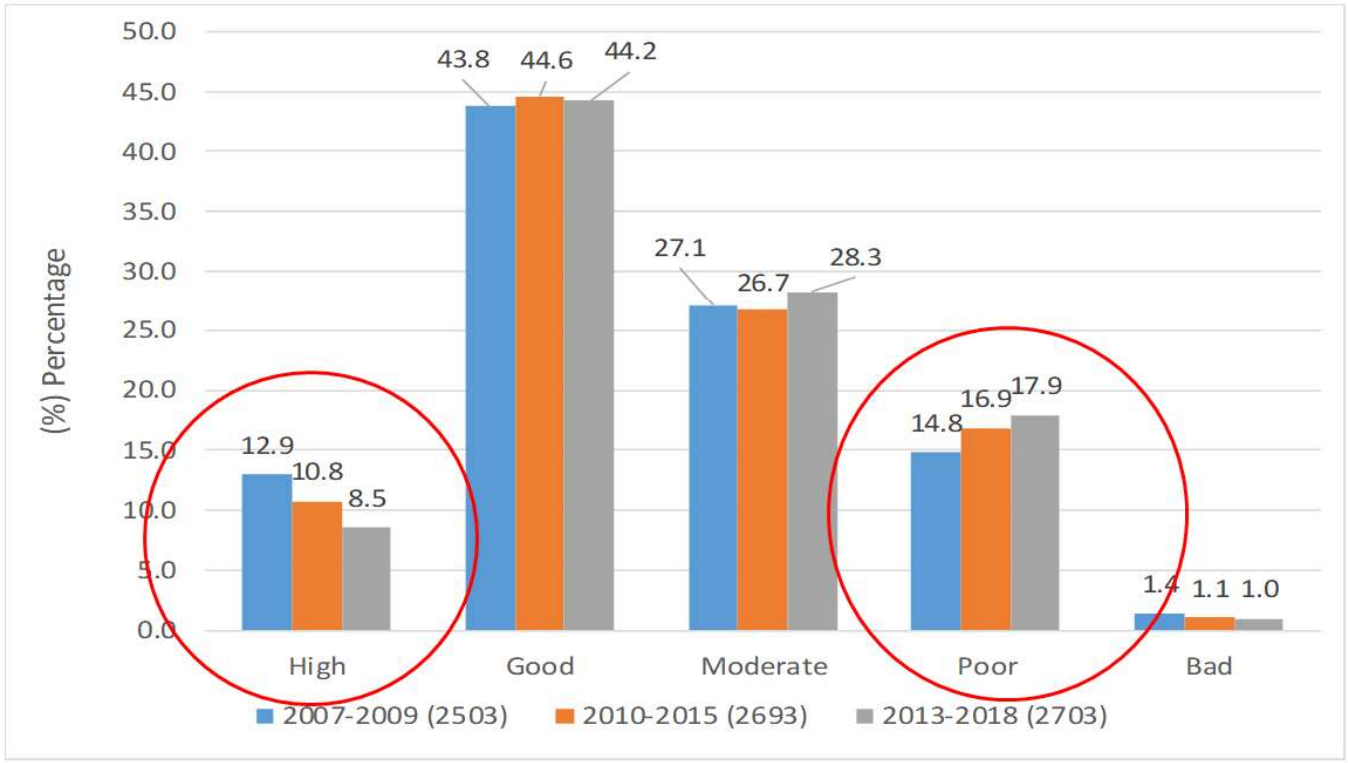
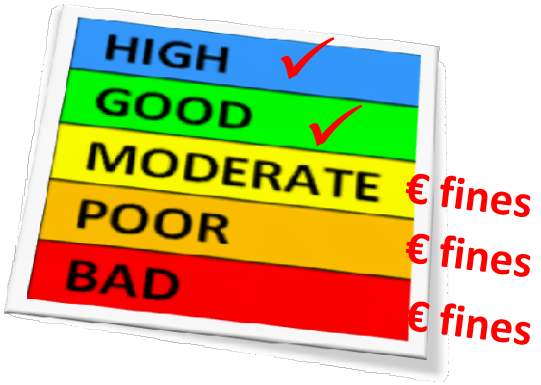
Water Quality trends in Ireland . .

Trend since WFD baseline (all WBs)

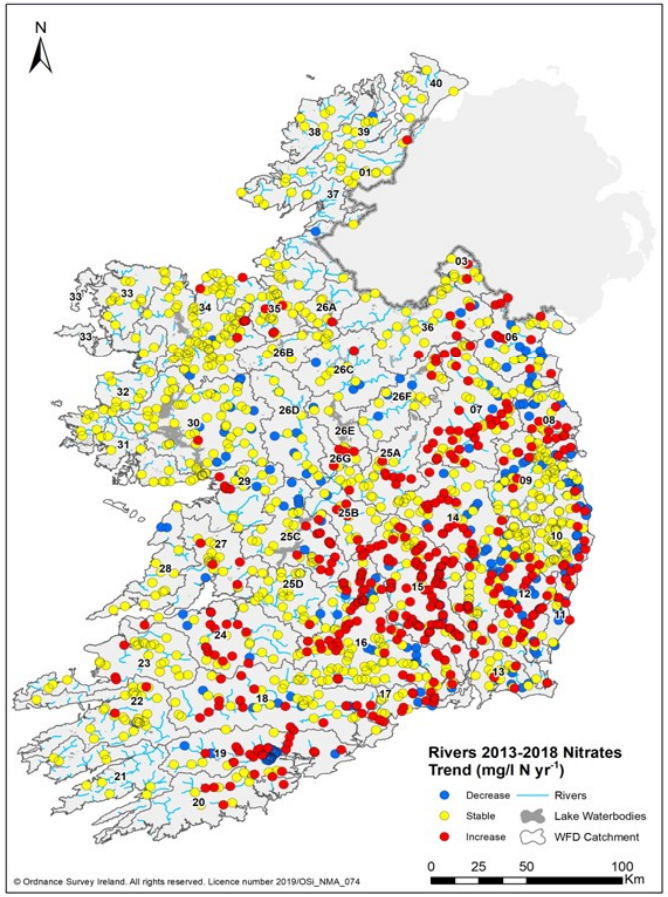


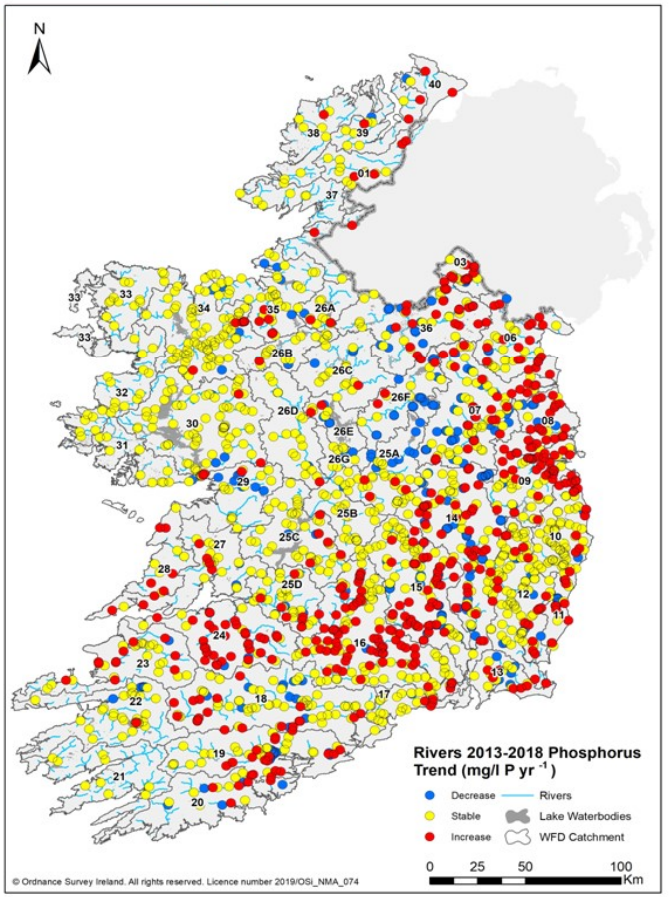


Mary Gurrie, EPA

Water Quality in Ireland 2013-2018

Trends in nutrient concentrations





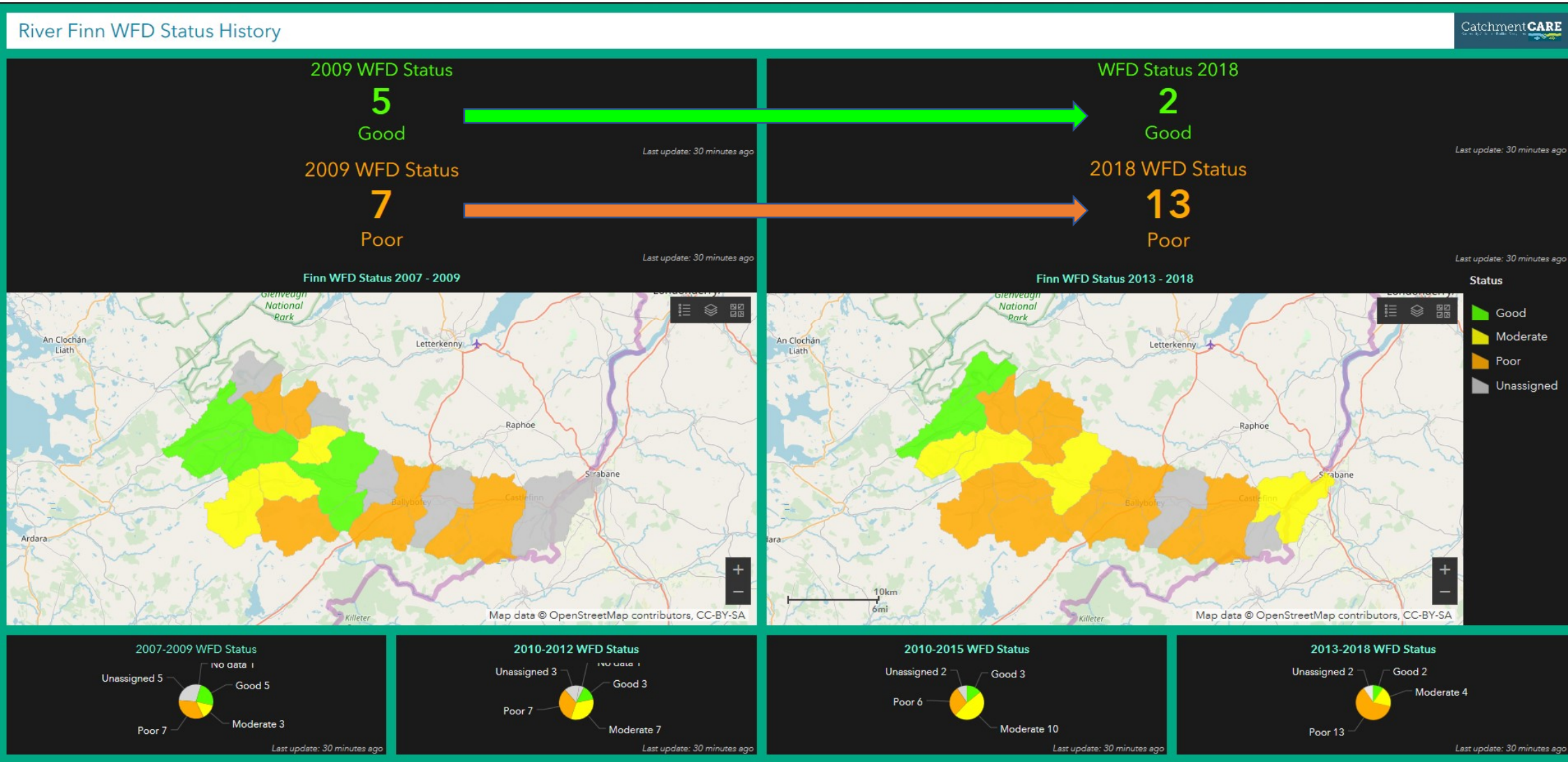
River nitrate changes

River phosphorus changes

Mary Gurrie, EPA

Water Quality in Ireland 2013-2018

GIS ‘Water Quality’ Dashboard – FINN (based on EPA data)



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The Climate Change agenda . .

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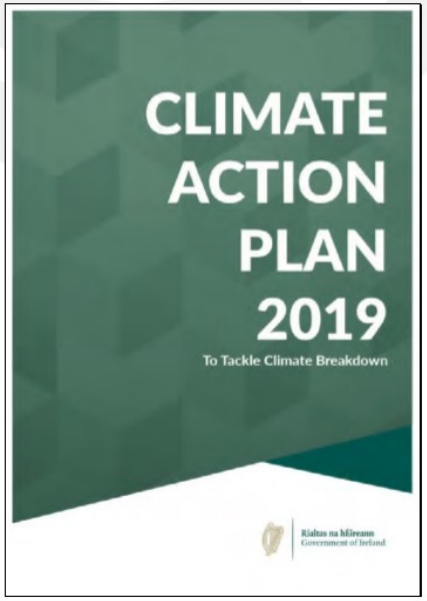
Climate Action Plan 2019 - Overview

Government published the Climate Action Plan 2019 on the 17th July 2019 to "Tackle Climate Breakdown"

- Identifies how Ireland will achieve it's **2030 carbon emissions** and puts us on a trajectory to achieve Net Zero Carbon Emissions by 2050
- **183 Actions** and 100s of Sub Actions across every relevant sectors; Electricity, Enterprise, Housing, Transport, Agriculture, Waste & Public Bodies.
- Plan also includes actions to ensure that all of us as citizens become more **engaged and mobilised**.



"Our approach will be to nudge people and businesses to change behaviour and adapt new technologies through incentives, disincentives, regulations and information" [An Taoiseach]

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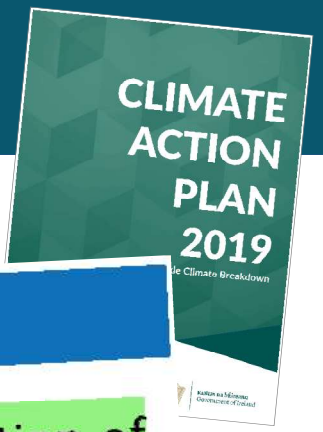
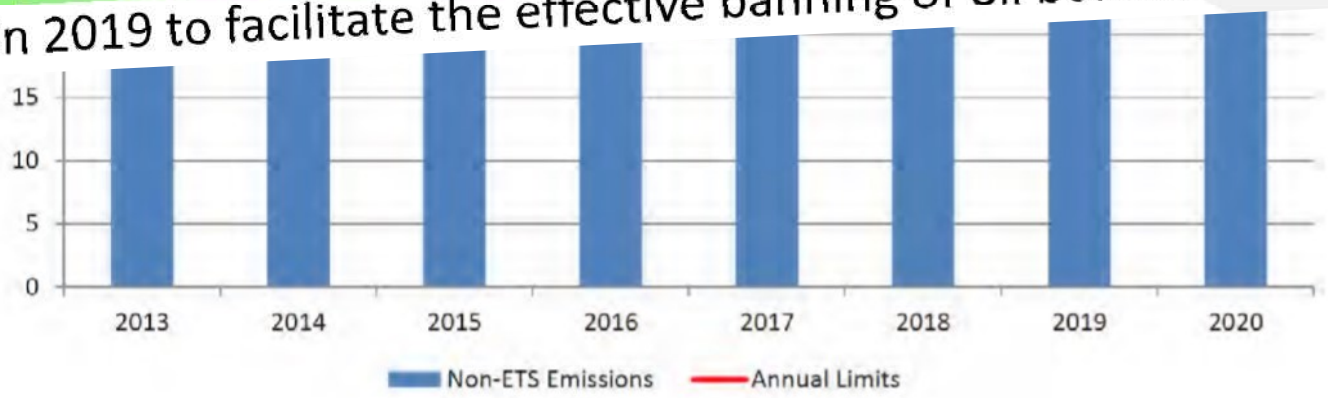


Where We Stand – 2020 Targets

Ireland's Actual & Projected non-ETS Emissions

Built Environment

Action 60: Effectively ban the installation of oil boilers from 2022 and the installation of gas boilers from 2025 in all new dwellings through the introduction of new regulatory standards for home heating systems, and ensure the supply chain for the installation of renewable heating systems is in place. Enact the NZEB performance requirements in regulation in 2019 to facilitate the effective banning of oil boilers



David Mellett, CARO

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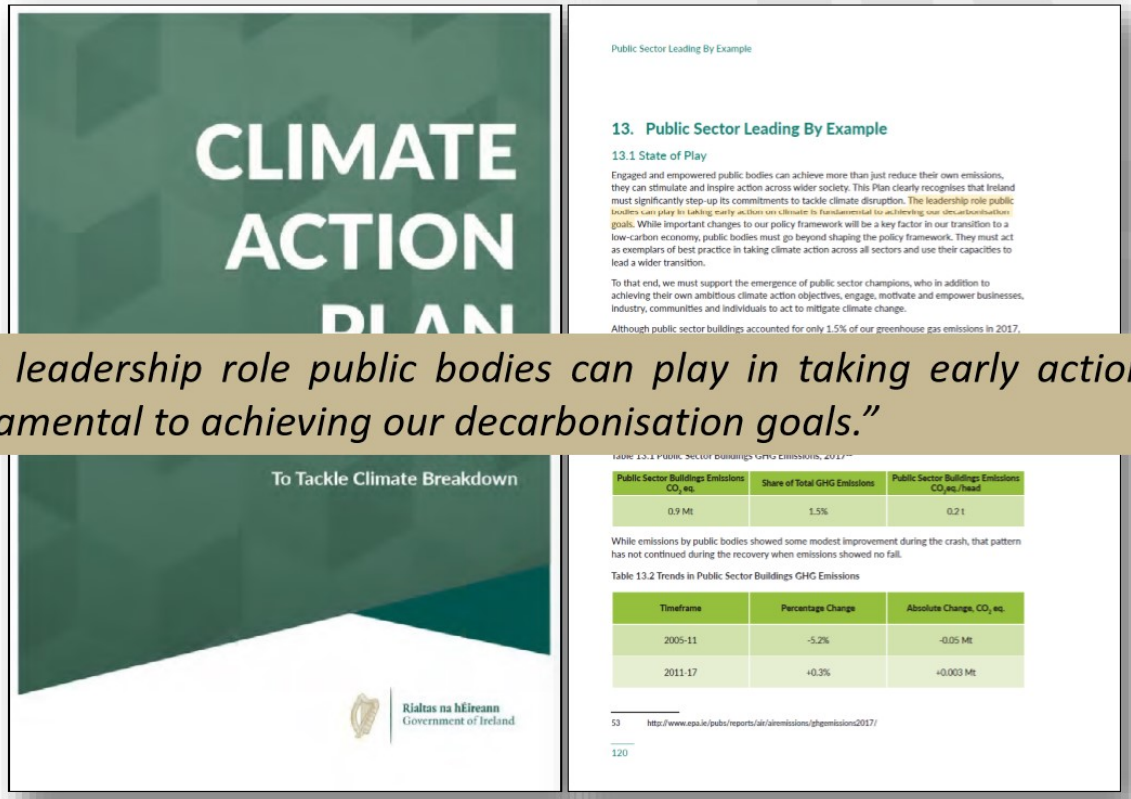
Public Sector Leading by Example



"The leadership role public bodies can play in taking early action is fundamental to achieving our decarbonisation goals."

David Mellett, CARO

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Some recent work with willows in Donegal ..

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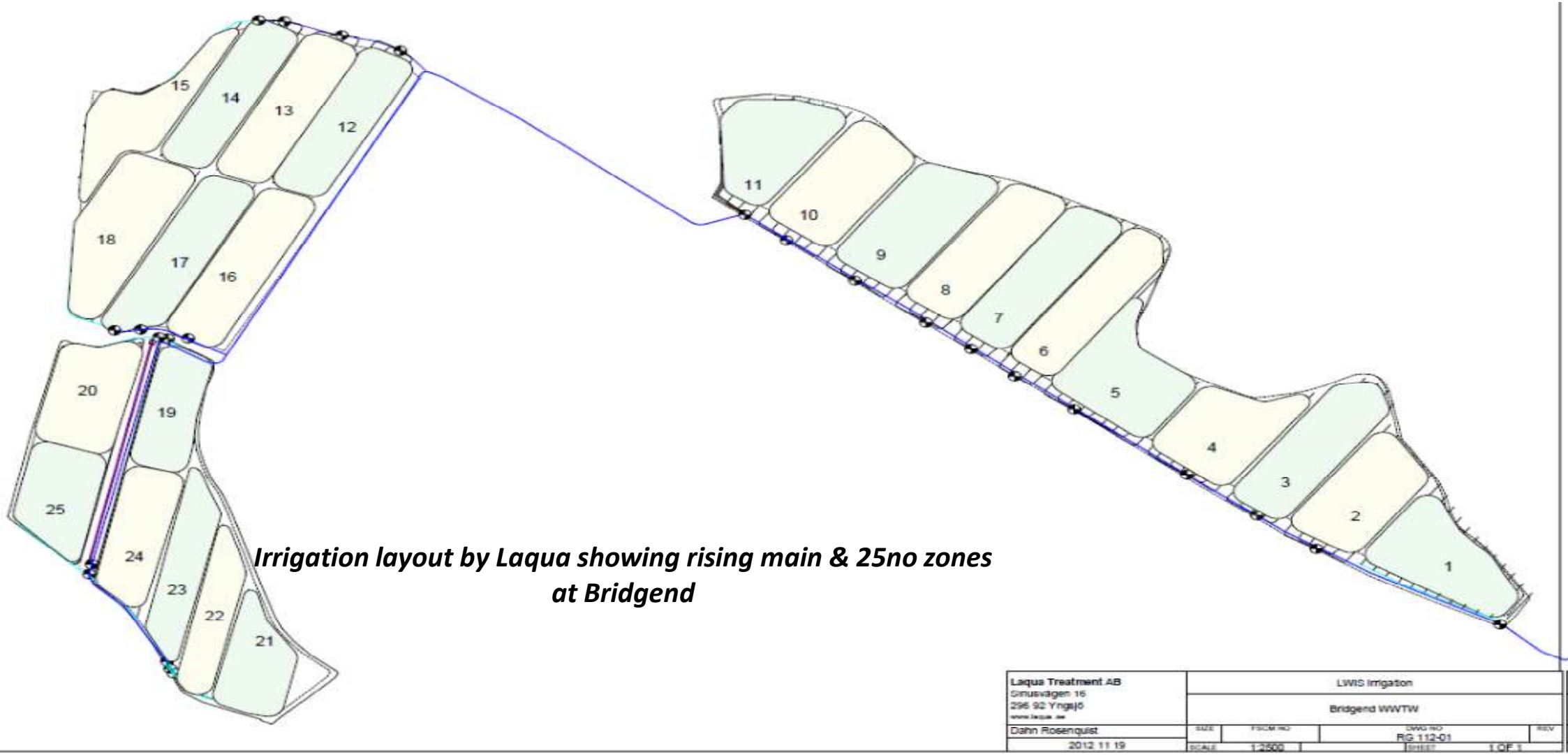
Willows used in 'proof of concept' as part of Bridgend Wastewater Treatment Works

(ANSWER Project, Interreg 4A)

Low pressure pumping of effluent to willow plantations

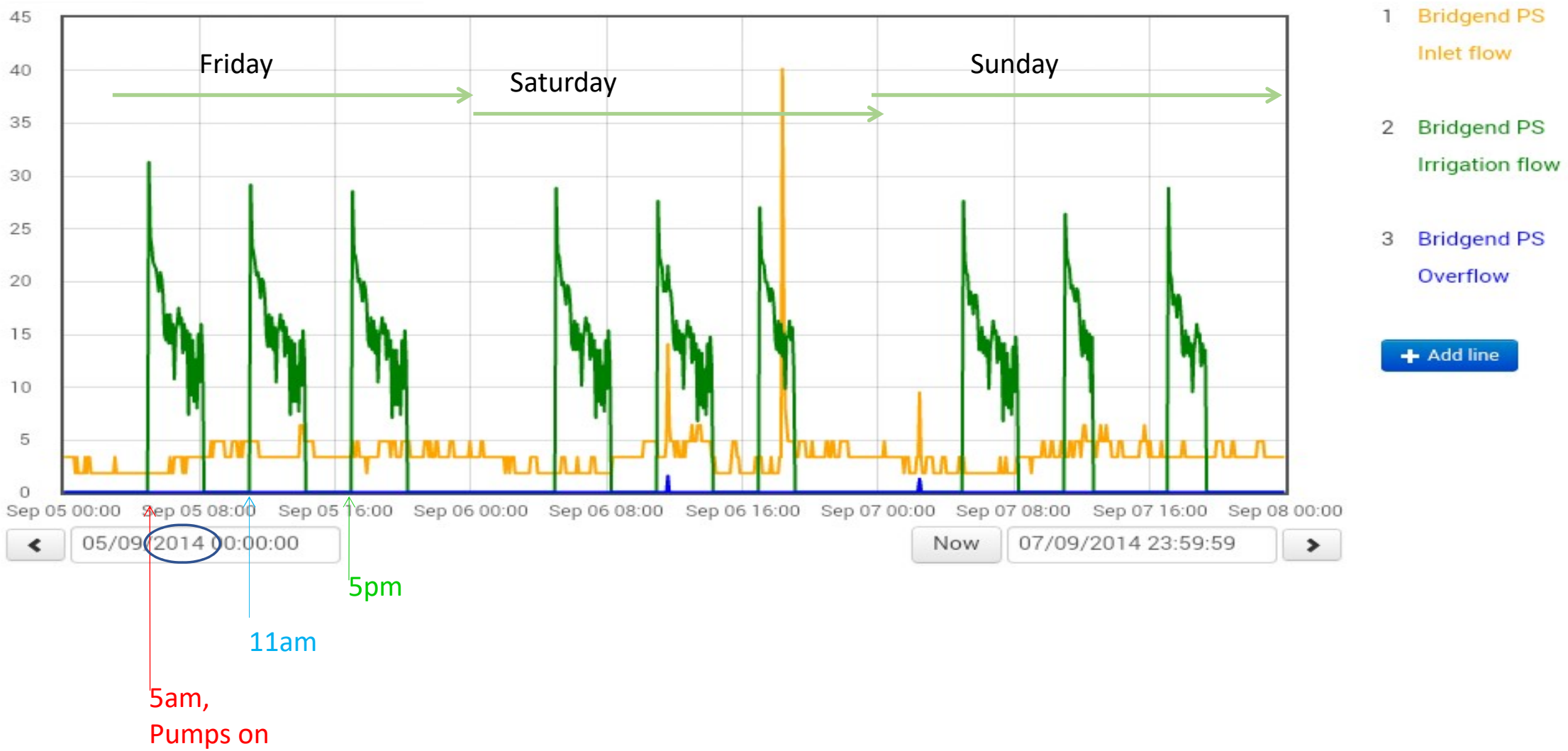
Stream

Bridgend WWTW



Irrigation layout by Laqua showing rising main & 25no zones at Bridgend

Irrigation zones at Bridgend



All data trended and available online, this example (2014) showing inlet flow, irrigation flow and no flow to river

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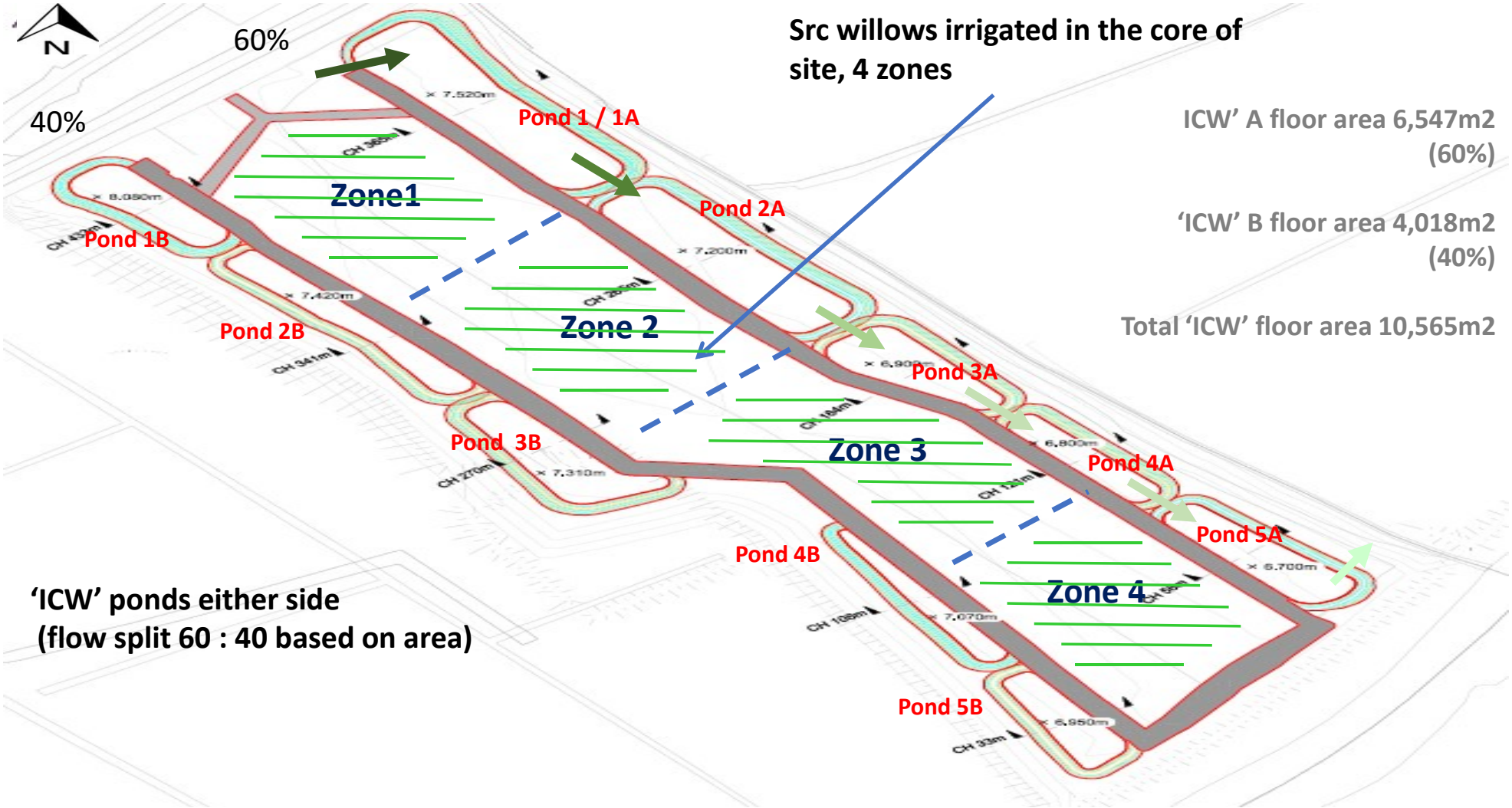
Churchtown Landfill site

Restoration works financed by :

- **Department of Environment, Community & Local Government**
- **The ANSWER Project** (Interreg 4A)

- **Construction managed by David Robb, Executive Engineer**

Churchtown Landfill Site Plan



Src willows irrigated in the core of site, 4 zones

ICW' A floor area 6,547m2 (60%)

'ICW' B floor area 4,018m2 (40%)

Total 'ICW' floor area 10,565m2

'ICW' ponds either side (flow split 60 : 40 based on area)

Monitoring at Churchtown Landfill

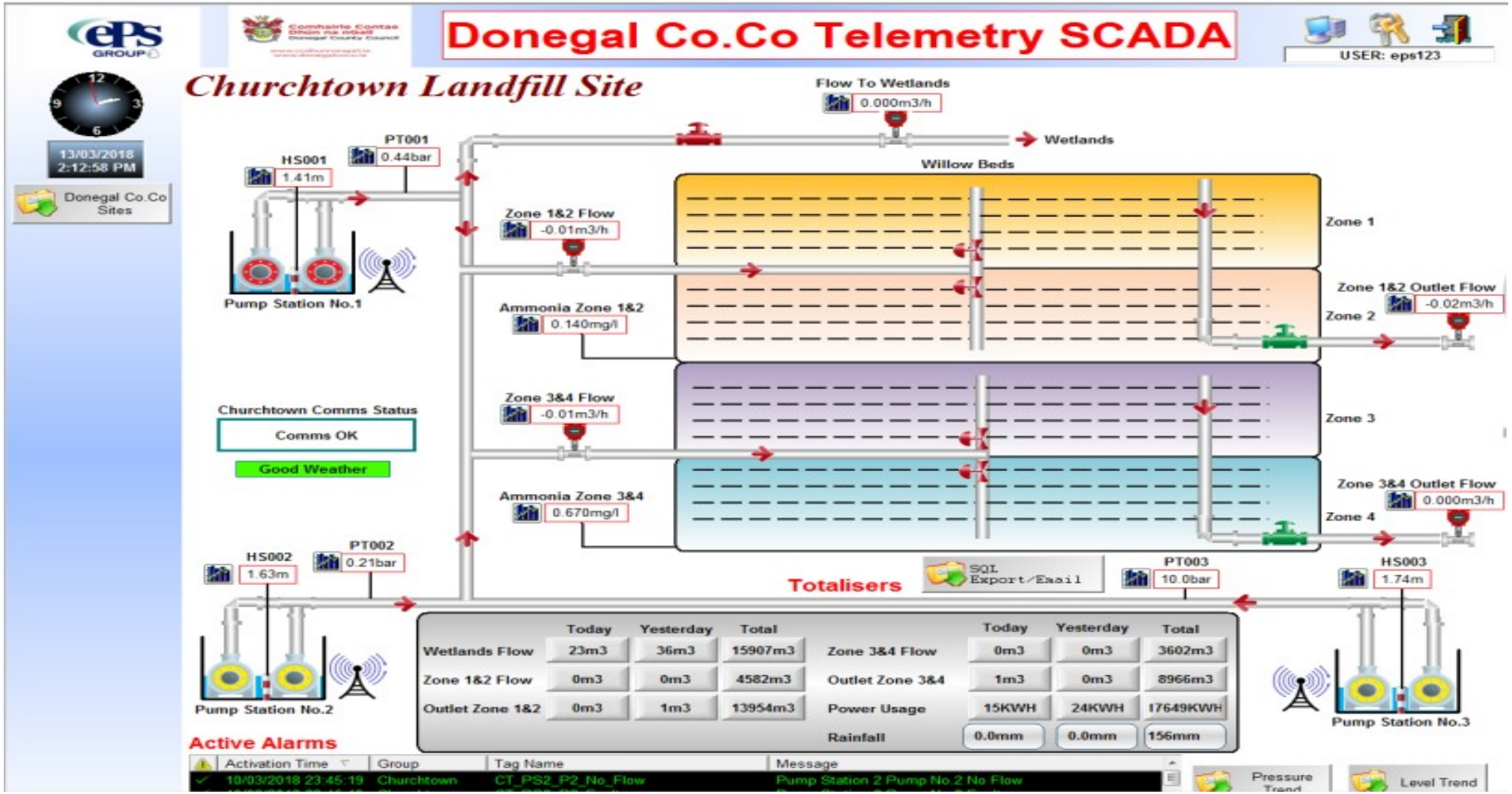
Pond outlet

Surface water

Collection sumps

Ammonia analyser

SCADA (Supervisory control and data acquisition)



Performance - Extract from monthly monitoring (January 2019)

Parameter	Limit
pH	6-9
BOD	20mg/l
Suspended solids	30mg/l
Total P (as P)	2mg/l
Total Ammonia (as N)	3mg/l

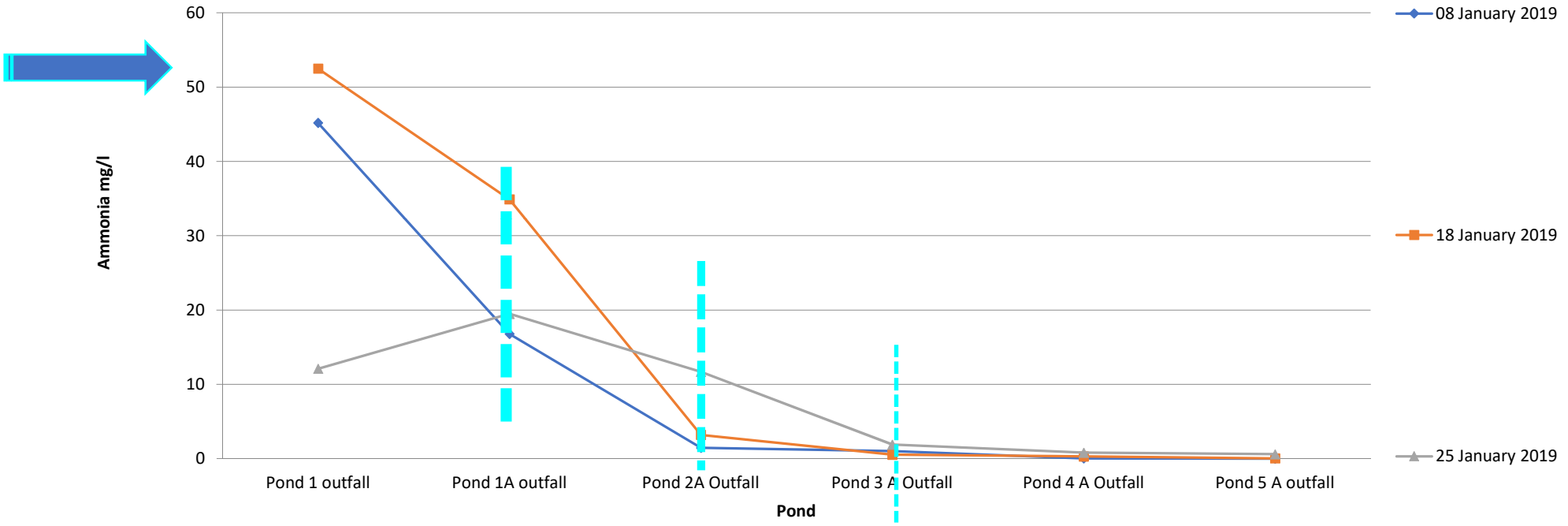
Table 1. Emission Limits Values

Emission Limit Values – as referenced in the approved Specified Engineering Works Report July 2014.

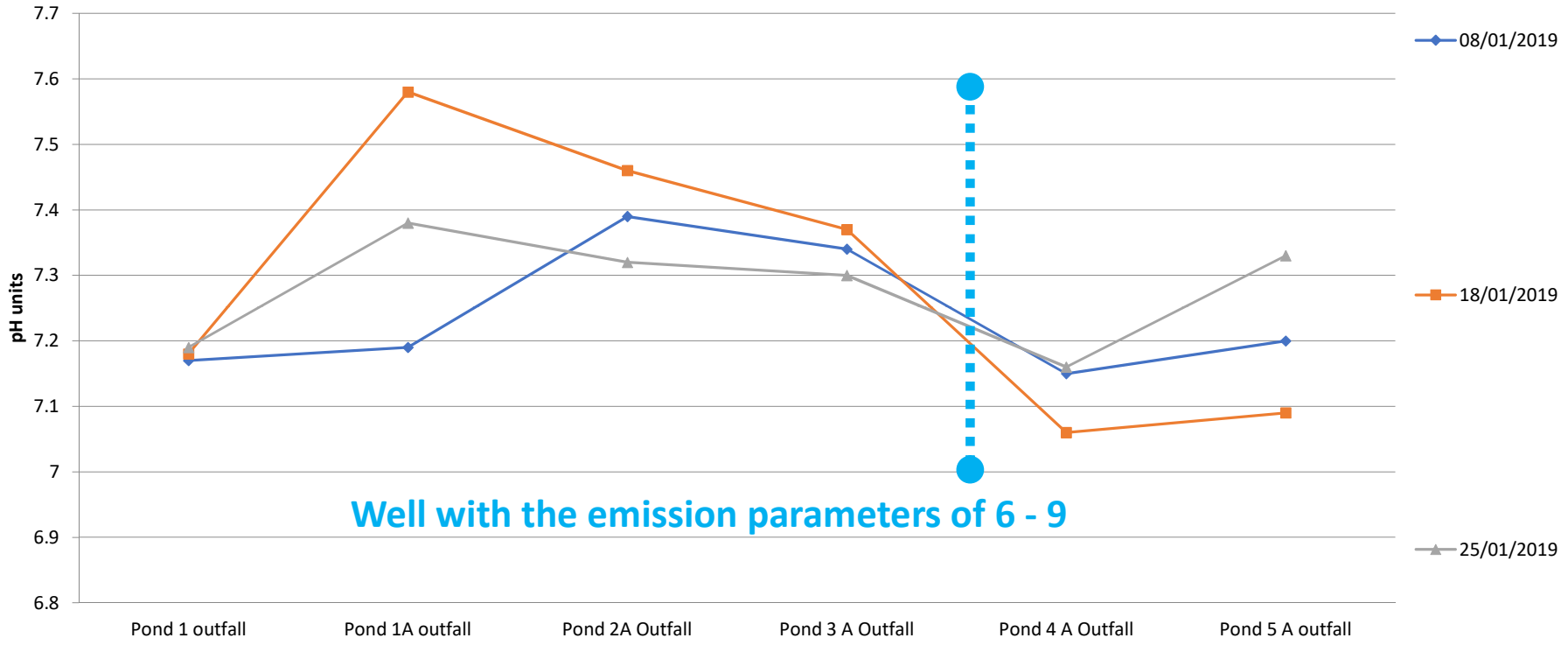
Location	Parameter	Peak concentration for month	Compliance with proposed ELV's	Length of time Non - Compliant	Comments
ICW – Pond 5A Discharge	Ammonia mg/l	**0.6**	Yes	N/A	No issues
ICW – Pond 5B Discharge	Ammonia mg/l	**0.009**	Yes	N/A	No Issues
Willows -Northern Discharge	Ammonia mg/l	**0.06**	Yes	N/A	No Issues
Willows - Southern Discharge	Ammonia mg/l	**0.45**	Yes	N/A	No issues

Table 2. Peak Concentrations of Ammonia from the four discharges.

Churchtown Landfill Monitoring January 2019
"A" series ponds



pH Monitoring (January 2019)
“A” series ponds



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Performance summary from 2018 (src willows + ICW's)

11,606m3 leachate collected & treated in combined willows + ponds system
2,400m3 leachate imported for treatment (prolonged dry periods)
14,000m3 or approx . . .

€'s + Carbon footprint!!

Onsite treatment has eliminated any transportation of leachate from the site for off-site treatment resulting in savings in haulage costs [est €150 - €200K pa]

Income from harvesting willow crop will offset some of the site Opex.

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To wrap up . .

CatchmentCARE Project - tackling water quality on various fronts

Water Quality trends are not healthy and need to be turned around

Climate Action Plan 2019 – actions which can be aligned with today's agenda! But also opportunities!!!

Natural based plant solutions including src willows need to be managed but can do a job for us

> *'It is important that this type of sustainable technology is actively encouraged in today's environmentally aware and financially constrained climate'*
>
> *John McMillen, Former Chief Executive, NIEA*

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