

Water Quality in Wales

Research Briefing

August 2023



The Welsh Parliament is the democratically elected body that represents the interests of Wales and its people. Commonly known as the Senedd, it makes laws for Wales, agrees Welsh taxes and holds the Welsh Government to account.

An electronic copy of this document can be found on the Senedd's website:
research.senedd.wales

Copies of this document can also be obtained in accessible formats including Braille, large print, audio or hard copy from:

Welsh Parliament
Tŷ Hywel
Cardiff Bay
CF99 1SN

Tel: **0300 200 6328**

Email: **Senedd.Research@senedd.wales**

Twitter: **[@SeneddResearch](https://twitter.com/SeneddResearch)**

Senedd Research: **research.senedd.wales**

Subscription: **[Real time updates](#) | [Weekly and monthly updates](#)**

© **Senedd Commission Copyright 2023**

The text of this document may be reproduced free of charge in any format or medium providing that it is reproduced accurately and not used in a misleading or derogatory context. The material must be acknowledged as copyright of the Senedd Commission and the title of the document specified.

Water Quality in Wales

Research Briefing

August 2023

Author:

Olivia Watts

This Research Briefing provides an overview of water quality in Wales. It outlines how water quality standards are implemented, monitored and upheld, and who's responsible. It also discusses some of the main challenges to water quality in Wales, and what the Welsh Government has been doing to tackle them.



Contents

i. List of figures.....	1
ii. List of tables	1
1. Water quality in Wales.....	2
Responsibility for water quality in Wales	2
Welsh Government water policy	2
Organisations with responsibility for water quality	3
2. Water quality legislation in Wales.....	4
Legislation.....	4
Summary	4
3. River basin management planning	6
4. Assessing environmental water quality	9
Assessing surface water quality.....	9
Current surface water quality in Wales.....	11
Assessing groundwater quality.....	13
Current groundwater quality in Wales.....	13

5. Bathing water quality	15
Monitoring bathing water quality	15
Current bathing water quality in Wales	15
6. Categories of protected waters	17
Shellfish waters	17
Special Areas of Conservation	17
Special Protection Areas	18
Wetland sites	18
Nutrient Sensitive Areas	18
Drinking Water Protected Areas	18
Water Protection Zones	18
7. Drinking water quality	19
Drinking water regulations	19
How is drinking water quality managed?	19
Current drinking water quality in Wales	20
8. Challenges to water quality in Wales	21
What are the most common water pollutants?	21
Where is water pollution coming from in Wales?	22

9. Nutrient pollution24

Nitrates24

What is nitrate pollution?.....24

How is agricultural nitrate pollution regulated?24

Phosphates25

Phosphate pollution in Wales25

Phosphorous targets and planning permission in SACs.....25

10. Water industry pollution.....26

What are storm overflows?.....26

How are storm overflows regulated in Wales?26

Why are storm overflows such an issue?26

11. Welsh Government action28

Efforts to improve drainage systems in Wales28

Nutrient pollution response28

The Wales Better River Quality Taskforce28

i. List of figures

Figure 1. River Basin Districts wholly or partly in Wales.	7
Figure 2. Percentage of surface water body types assigned to each EU WFD ecological classification category in Wales in 2021.	12
Figure 3. Bar chart showing classifications of Welsh bathing waters between 2017-2022.	16
Figure 4. Most frequently reported primary pollutants reported across pollution incidents since March 2016.....	21
Figure 5. Premises types of pollution incidents since March 2016.....	22
Figure 6. NRAGs reported by NRW in 2021.....	23
Figure 7. Numbers of storm overflows and spills recorded by EDM each year between 2016-2020.	27

ii. List of tables

Table 1. Overview of water quality legislation in Wales other than the WFD 2017.	4
Table 2. Monitoring regimes for WFD surface water quality elements.....	9
Table 3. Numbers of surface water body types with each EU WFD ecological classification category in Wales in 2021.....	11
Table 4. Numbers of surface waters under each EU WFD chemical classification in Wales as of 2021.	12
Table 5. Status of groundwaters in Wales in 2021.....	14

1. Water quality in Wales

Water is an essential resource. Whilst our natural waters form important ecosystems and are integral to the environment, water also plays critical roles in applications as diverse as sanitation, industry, navigation and recreation.

Water quality is therefore crucial to health, the economy, environment, and our ability to enjoy the natural world. Whilst water quality is often discussed in terms of how polluted a water resource is, it can also refer to any chemical, physical, and biological properties affecting its use.

Responsibility for water quality in Wales

Water quality in Wales is a devolved matter. The **Government of Wales Act 2006**, and subsequent **Wales Act 2017**, devolve water-related powers to the Senedd, including water supply, water resources management, water quality, flood risk, and sewerage. This means **the Senedd has legislative competence** over sewerage undertakers, water undertakers and water suppliers that operate “wholly or mainly” in Wales.

However, water is a complex area of the devolution settlement due to the cross-border nature of water bodies and water companies. The **2017 Intergovernmental Protocol on Water Resources, Water Supply and Water Quality** outlines a protocol for managing cross-border water issues.

Welsh Government water policy

The Welsh Government’s long term approach to managing water quality is set out in its **2015 Water Strategy for Wales**. Some of the priorities outlined include:

- economically and environmentally sustainable water protection and management, including approaches to reducing water pollution;
- drinking water quality;
- improving long-term planning for sewage and water management;
- modernisation and improvement sewerage and drainage systems; and
- regulatory and financial support for delivering these aims.

The Welsh Government’s wider approach to natural resource management is outlined in its **2017 Natural Resources Policy**, which prioritises localised and nature-based and approaches to water quality management.

Organisations with responsibility for water quality

Responsibilities for water quality management in Wales are spread across government and the water industry. These include:

- **Natural Resources Wales (NRW)**, - responsible for managing environmental water quality, including inland and coastal waters in Wales. It **enforces compliance to water-related regulations covered in The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017** (see page 8) and **reports on progress towards the Sustainable Management of Natural Resources, including environmental targets for water**;
- **Hafren Dyfrdwy (Severn Dee)** and **Dŵr Cymru (Welsh Water)** - the two water and sewerage companies operating mainly in Wales. They maintain and monitor the quality of the drinking water they supply, and treat water waste before returning it to the environment;
- Local authorities - responsible for monitoring water quality for private water supplies;
- **The Drinking Water Inspectorate (DWI)** - regulates drinking water testing standards in England and Wales, enforces drinking water regulations, and publishes reports on drinking water quality; and
- **Ofwat** - the commercial regulator for water and sewerage companies.

2. Water quality legislation in Wales

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 ('WFD 2017'), are the primary mechanism for assessing and managing the water environment in Wales. They transpose and implement water quality standards from the **EU's 2000 Water Framework Directive** ('EU WFD'), and place a statutory duty on the Welsh Ministers to prevent deterioration and improve all water bodies to 'good status' by 2027.

The WFD 2017 applies to:

...all surface freshwater bodies (lakes, streams, rivers), groundwaters, associated ecosystems, estuaries and coastal waters out to one mile from low water.

It includes:

- targets, standards and assessment regimes for water body quality classification;
- direction for identifying and managing special classes of protected waters;
- standards and objectives for reducing pollution and improving conditions of aquatic ecosystems; and
- regulations promoting sustainable water use.

NRW is responsible for monitoring and **implementing WFD water quality standards** in Wales.

Other legislation associated with managing water quality in Wales is listed below.

Table 1. Overview of water quality legislation in Wales other than the WFD 2017.

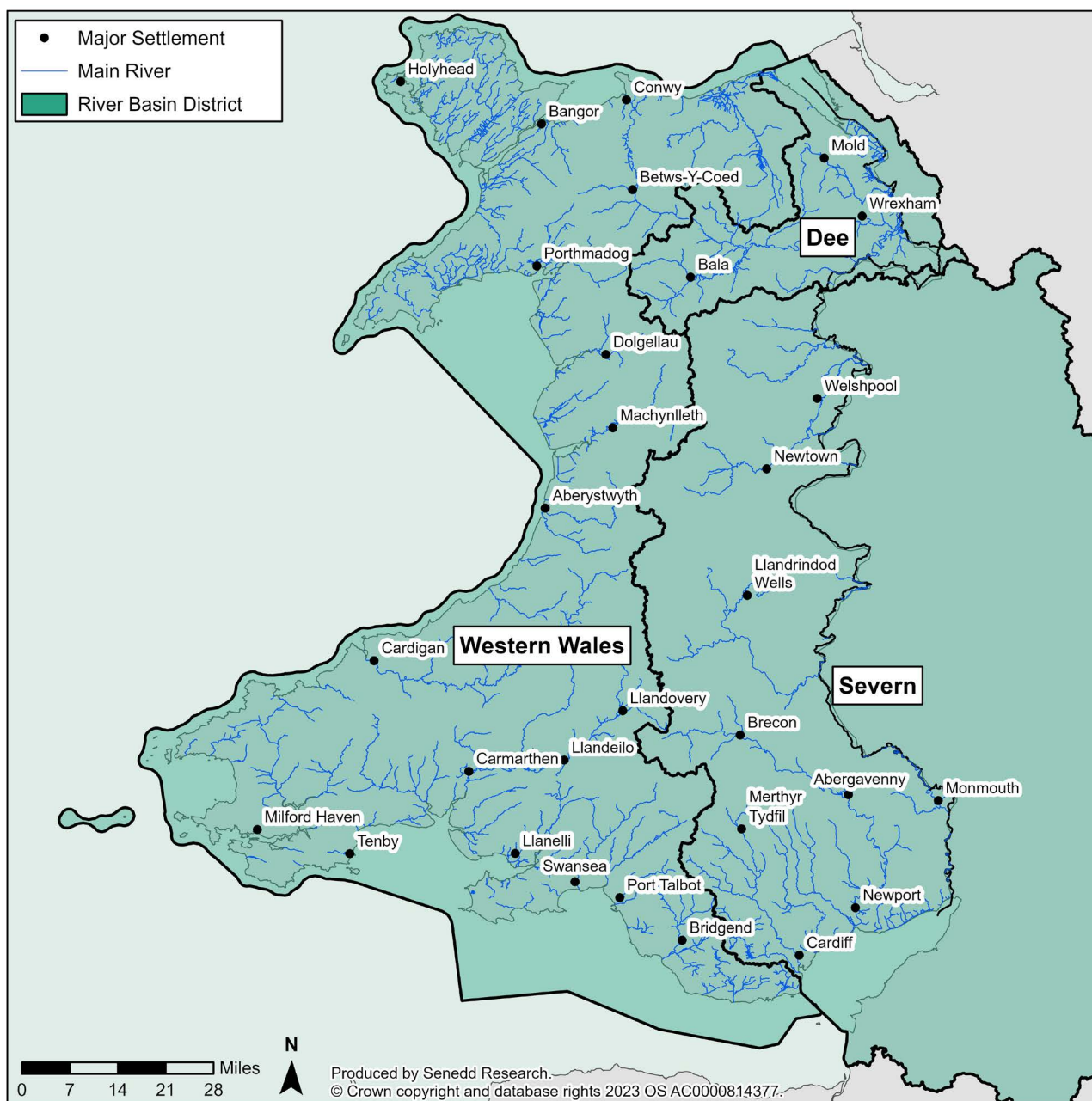
Legislation	Summary
<u>The Water Industry Act 1991</u>	Sets out the main powers and duties of the water and sewerage companies and their regulators in England and Wales.

<p><u>Part 5 of The Environment Act 2021</u></p>	<p>Strengthens regulatory powers for water quality management for the Welsh Ministers, NRW, and Ofwat. It also includes new regulations for sewerage companies and groundwater quality standards.</p>
<p><u>The Groundwater (Water Framework Directive) (Wales) Direction 2016</u></p>	<p>Additional standards for managing groundwaters (see page 15).</p>
<p><u>The Water Supply (Water Quality) Regulations 2018</u></p>	<p>Outlines how public drinking water supplies are to be managed (see page 21).</p>
<p><u>The Private Water Supplies (Wales) Regulations 2017</u></p>	<p>Outlines how private drinking water supplies are to be managed (see page 21).</p>
<p><u>The Bathing Water Regulations 2013</u></p>	<p>Standards for managing recreational waters (see page 17).</p>
<p><u>Conservation of Habitats and Species Regulations 2017</u></p>	<p>Contains protections for ecologically important water areas such as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) (see page 19).</p>
<p><u>Urban Waste Water Treatment (England and Wales) Regulations 1994</u></p>	<p>Sets out how sewage is collected and treated.</p>
<p><u>The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021</u></p>	<p>Nitrate pollution restrictions from agricultural sources (see page 26).</p>

3. River basin management planning

The **EU WFD** is implemented through **River Basin Management Plans** (RBMPs), which are applied in stages on river basins rather than national or political boundaries. RBMPs are developed for each River Basin District (RBD), or area of land comprising one or more neighbouring river basins and their associated coastal waters. This approach aims to integrate the management of water from source to sea.

The RBDs in Wales are the **Western Wales, Dee** , and **Severn River** Basins (figure 1). The latter two straddle the administrative border between England and Wales and are managed jointly with the Environment Agency. NRW leads on the development of the River Dee RBMP, whereas the Environment Agency leads on the Development of the River Severn RBMP.

Figure 1. River Basin Districts wholly or partly in Wales.

Source: [Water Framework Directive \(WFD\) River Basin Districts Cycle 3 | DataMapWales \(gov.wales\)](#), accessed 13/07/2023. Credit: Sam Jones.

RBMPs provide a strategic framework for water management in each RBD, and report on progress towards environmental water quality objectives. They include:

- actions taken and progress towards improving the water environment;
- data on current environmental water quality;
- environmental objectives - including achieving certain status classifications and preventing deterioration;

- a programme of measures for achieving environmental objectives;
- localised strategies for water quality management based on 'opportunity catchments';
- a list of protected areas in the RBD; and
- a **Habitats Regulations Assessment (HRA)**, which considers the potential effects of proposed developments on protected sites in the RBD (see pages 19 and 27).

RBMPs are reviewed and updated in six year cycles. The current RBMP cycle covers 2021-2027. They were consulted on in 2019 and **published in July 2022.**

4. Assessing environmental water quality

Water quality is assessed and reported for units called ‘water bodies’. Water bodies may be rivers, canals, lakes, groundwater, transitional (estuary), coastal waters, or parts of these systems. For each water body, data is collected covering a range of physical, chemical, and biological properties called ‘quality elements’. These are **specified in the EU WFD** according to the type of water body being assessed. This data is used to produce a classification for each water body, which is **updated by NRW every 3 years**.

Assessing surface water quality

For surface waters, the **EU WFD** specifies how frequently different quality elements should be assessed, as summarised in table 2 below:

Table 2. Monitoring regimes for WFD surface water quality elements.

Water quality element type	Examples	Monitoring interval
Physio-chemical properties	Levels of priority substances and major pollutants	1-3 months
	Acidity, oxygenation, salinity, nutrient content	3 months
	Temperature	3 months
Biological properties	Abundance and types of plankton inhabiting a water body	6 months
	Abundance and types of plant, animal species inhabiting a water body	3 years

Hydro-morphological properties	Tidal behaviour (coastal waters), water flow and distribution	Continuously (rivers), or 1 month (lakes)
	Continuity, i.e. how freely water can flow in a river	6 years
	Structure and physical dimensions of lake, river, tidal and coastal beds	

Source: **EC Water Framework Directive 2000**.

Each quality element is rated on a scale of high, good, moderate, poor or bad based on criteria outlined in the EU WFD. ‘High’ status indicates a water’s conditions are virtually unaffected by human activity, with other classifications indicating how much a water body deviates from ‘undisturbed conditions’.

Surface water body data is summarised into chemical, ecological and overall status:

- **Ecological status** summarises various biological, physio-chemical and hydromorphological quality elements. Possible classifications are high, good, moderate, poor or bad, usually **reflecting the status of the worst scoring quality element** included;
- **Chemical status** is either ‘good’ or ‘failing’, depending on compliance with environmental quality standards for pollutants; and
- **Overall status** combines ecological and chemical status, reflecting the poorest of the two ratings.

For surface waters subject to intensive human use, e.g. a harbour water undergoing regular maintenance dredging, achieving ‘good’ ecological status may be unrealistic. Such waters are categorised as ‘modified’ or ‘artificial’, and their ecological objective is achieving “good ecological potential”. This is the best ecology possible for a modified or artificial water under constraints required by human use.

Protected waters (see page 19) such as bathing waters (see page 17) and drinking water protected areas (see page 20) are subject to more stringent category-specific testing regimes and water quality standards.

Current surface water quality in Wales

The **2021-27 RBMPs** contain the latest set of classifications for water bodies in Wales. They reported that **40% of the 905 surface waters in Wales** have an overall status of good or better.

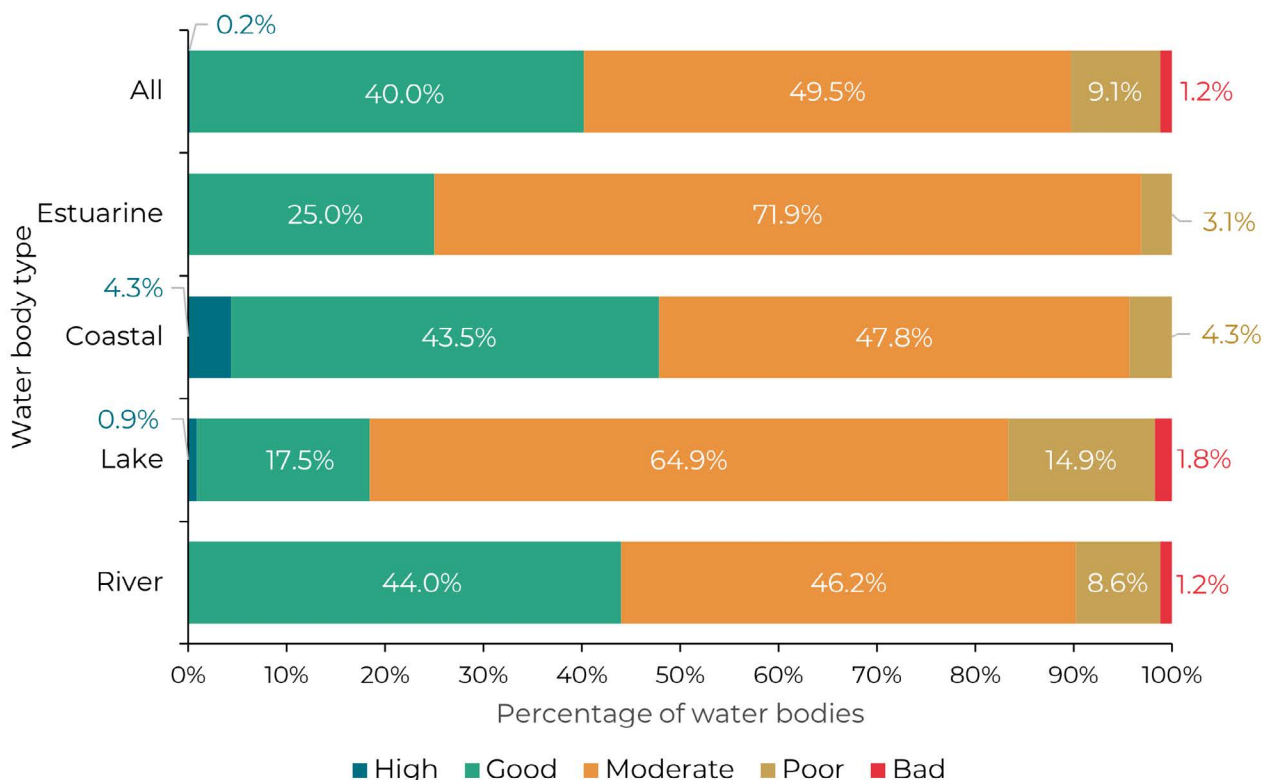
Table 3 and figure 2 below summarise the most recent **ecological status classifications** for surface water bodies across the Welsh part of the Severn, Dee, and Western Wales river basins. This shows coastal waters generally have higher ecological status than inland waters.

Table 3. Numbers of surface water body types with each EU WFD ecological classification category in Wales in 2021.

Water body type	Bad	Poor	Moderate	Good	High
River	9	63	340	324	0
Lake	2	17	74	20	1
Coastal	0	1	11	10	1
Estuarine	0	1	23	8	0
Total	11	82	448	362	2

Source: 2021-27 RBMPs for the **Dee, Western Wales** and **Welsh part of the Severn** river basins.

Figure 2. Percentage of surface water body types assigned to each EU WFD ecological classification category in Wales in 2021.



Source: 2021-27 RBMPs for the Dee, Western Wales and Welsh part of the Severn river basins.

The 2021 **chemical classifications** of surface waters in Wales are also shown in table 4 below. In contrast to ecological status data, coastal waters’ chemical status is generally worse than inland waters.

Table 4. Numbers of surface waters under each EU WFD chemical classification in Wales as of 2021.

Chemical	Failing	Good	Total	% Good
River	58	678	736	92.1
Lake	1	113	114	99.1
Coastal	9	14	23	60.9
Estuarine	10	22	32	68.8
Total	78	827	905	91.4

Source: 2021-27 RBMPs for the [Dee, Western Wales](#) and [Welsh part of the Severn](#) river basins.

Assessing groundwater quality

Groundwater is water trapped underground in systems of soil, rocks and sand called 'aquifers'. Groundwater is important for feeding water systems such as springs, rivers and wetlands, in turn supporting diverse ecosystems. It is also an important water source for industries and human consumption, supplying about [5% of public water](#) in Wales.

The EU WFD sets out regulations for groundwater, which is managed differently from surface water. They are supplemented by the [Groundwater \(Water Framework Directive\) \(Wales\) Direction 2016](#), which transposes more detailed EU [standards for groundwater quality protection](#).

These standards reflect groundwater's vulnerability to pollution and overuse. Groundwater quality is described by:

- **Quantitative status**, i.e. how much water is available. This is threatened if water abstraction from a source is faster than replenishment. Quantitative status also reflects whether abstraction is affecting the hydrology, chemical conditions or ecology of associated surface waters;
- **Chemical status**, i.e. if the groundwater's chemical composition is negatively impacting drinking water quality or the ecology of associated surface waters. Chemical status assessment also considers any saline water intrusion into groundwater; and
- **Overall status**, determined by the poorer of a groundwater's chemical and quantitative status.

Groundwater quantitative, chemical and overall status can be classed as either 'good' or 'poor'.

Current groundwater quality in Wales

The 2021 status of 39 groundwaters across the Dee, Western Wales and Welsh part of the Severn River Basins shown in 5 below. All 'poor' groundwaters were downgraded due to chemical status, suggesting pollution is a greater threat to Welsh groundwaters than over-abstraction.

Table 5. Status of groundwaters in Wales in 2021.

Status	Poor	Good	Total	% Good
Quantitative	0	39	39	100
Chemical	17	22	39	56.4
Overall	17	22	39	56.4

Source: 2021-27 RBMPs for the Dee, Western Wales and Welsh part of the Severn river basins.

5. Bathing water quality

Bathing waters are recreationally and economically important for Wales, contributing heavily to coastal tourism. As a special class of protected waters, in addition to **EU WFD** guidance they are managed according to the **Bathing Water Regulations 2013 (BWR)**. The BWR transpose identification, monitoring and water quality improvement practices from the **EU Bathing Water Directive 2006 (BWD)** into UK law, which aims to:

...preserve, protect and improve the quality of the environment, and protect human health.

The BWD outlines criteria for assessing bathing water status, which is additional to the chemical and ecological status assigned to surface waters under the EU WFD. Bathing water status can be 'excellent', 'good', 'sufficient', or 'poor', and must be signposted by local authorities next to bathing waters along with any appropriate advice. Implementation and compliance with bathing water standards is **overseen by NRW**.

Monitoring bathing water quality

NRW monitors the **109 coastal and inland sites currently designated as bathing waters** across Wales. Bathing waters are tested throughout the bathing season, which lasts from 15 May to 30 September each year. NRW says **it will test bathing waters at least 10 times** over the 2023 season.

Bathing waters are monitored for two types of bacteria, Escherichia coli (E.coli) and intestinal enterococci. These species are targeted as **they indicate faecal matter is present**, which can make bathers ill.

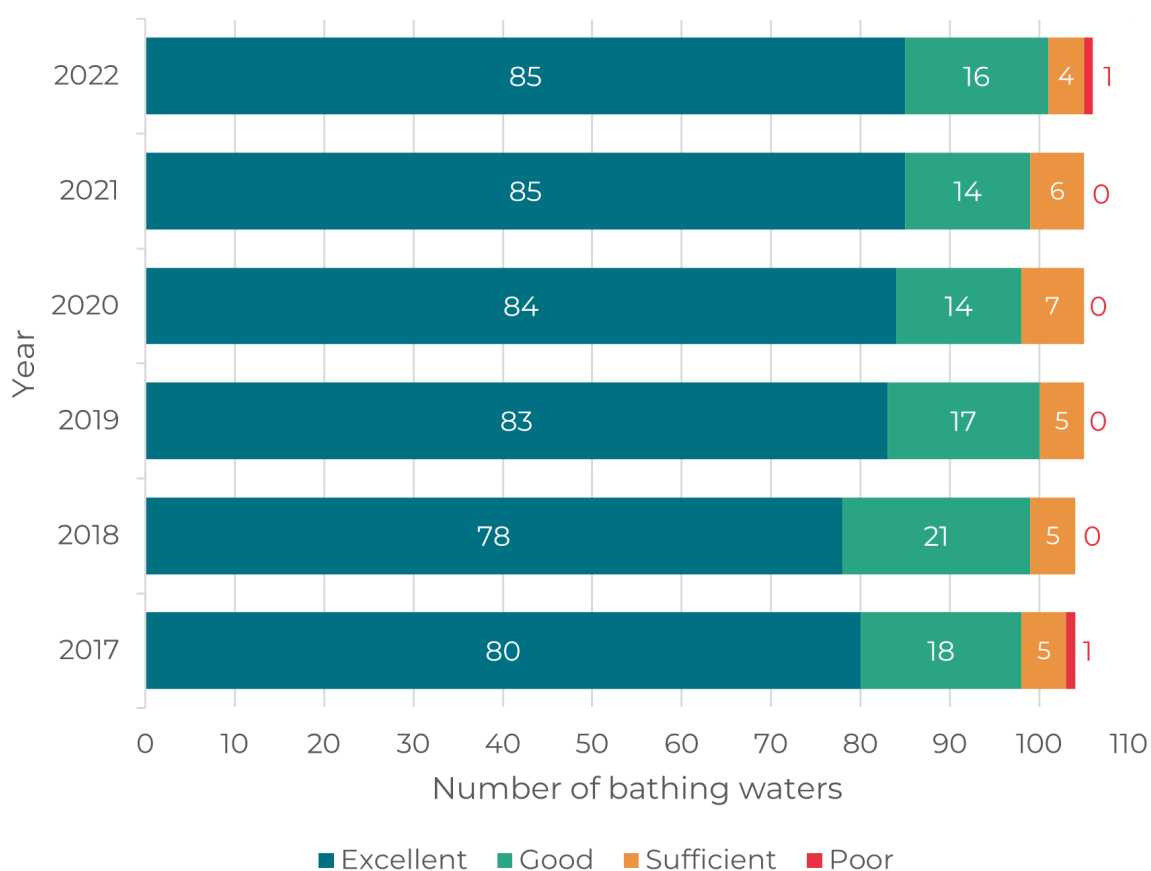
Bacterial contamination data from the past 4 years is then used to classify bathing waters against the BWD's standards. Poor waters are non-compliant with the BWD and contain unacceptable levels of bacteria, whilst sufficient, good and excellent classifications have their own bacterial threshold criteria. These results are published by NRW annually in a **bathing water quality report**.

Current bathing water quality in Wales

Bathing water quality in Wales has generally increased over recent years. Figure 3 depicts **NRW's annual Wales bathing water quality report data** from 2017-2022, showing the percentage of bathing waters classified as 'excellent' rose from 76.9% to 80.2% over that period.

In 2022, NRW reported **105 of 106 designated bathing waters met the minimum water quality standards**, representing 99% compliance with the BWR. Marine Lake, Rhyl, was classified ‘poor’ in 2022, and has been the only non-compliant bathing water assessed **since 2017**. NRW attributed the Marine Lake’s bacterial contamination to recent draining and refilling of the lake, and heavy rainfall necessitating sewer discharge into the lake before sample collections.

Figure 3. Bar chart showing classifications of Welsh bathing waters between 2017-2022.



Source: Wales bathing water quality reports from **2017, 2018, 2019, 2020, 2021** and **2022**.

6. Categories of protected waters

Aside from bathing waters, Wales has many other classes of **protected water bodies**. Each is managed according different designation and water quality management regulations, which NRW is responsible for implementing. They include:

- shellfish waters;
- Special Areas of Conservation (SACs);
- Special Protected Areas (SPAs);
- Nutrient Sensitive Areas (NSAs);
- wetland sites;
- Drinking Water Protected Areas (DrWPAs); and
- Water Protection Zones (WPZs).

Under the WFD 2017, **all protected water areas in Wales** are listed on registers. NRW maintains the protected area registers for the Western Wales and Dee River basins, whereas the Severn River Basin register is kept by the Environment Agency.

Shellfish waters

There are **13 shellfish waters** around coastal sites in Wales, which are designated and regulated according to the **EU WFD** and **The Shellfish Water Protected Areas (England and Wales) Directions 2016**. Shellfish waters must adhere to additional microbial standards to protect and develop areas of economically significant shellfish production.

Special Areas of Conservation

The Conservation of Habitats and Species Regulations 2017 set out rules for designating and conserving special areas of conservation (SACs). SACs protect habitats and wildlife identified by the **EC Habitats Directive 1992**, which protects some of Wales' rarest and most important species. These include Atlantic salmon, freshwater pearl mussel, white-clawed crayfish, and floating water-plantain.

Nine rivers in Wales are designated SACs: Afonydd Cleddau, Eden, Gwyrfai, Teifi, Tywi, Glaslyn, Dee, Usk and Wye. In 2021 NRW investigated phosphorous levels at SACs in Wales and **reported that the majority of** SACs failed phosphorous targets, leading to renewed efforts to control SAC nutrient pollution (see page 27).

Special Protection Areas

Many **coastal and estuary sites in Wales** are designated Special Protection Areas (SPAs), which protect rare and migratory bird habitats. Regulations for these sites are described in **The Conservation of Habitats and Species Regulations 2017**.

Wetland sites

Wetlands are areas of land seasonally or permanently inundated with water, such as marshes, fens, peatlands, bogs and shallow seas. They support unique and diverse ecosystems, and are important carbon sinks. **The Ramsar Convention** is an international treaty which protects wetland sites, including **10 sites in Wales**.

Nutrient Sensitive Areas

Nutrient Sensitive Areas (NSAs) are water bodies which are **eutrophic**, or deemed vulnerable to eutrophication due to phosphate and nitrate pollution (see page 26). They are designated under criteria outlined in **The Urban Waste Water Treatment (England and Wales) Regulations 1994**. This legislation also limits the quantity and nutrient content of waste discharged into these waters from sewage treatment plants. There are currently **6 NSAs in Wales**.

Drinking Water Protected Areas

The **EU WFD** contains regulations for designating and managing Drinking Water Protected Areas (DrWPAs). A water body is identified as a DrWPA if it supplies 10 m³ of drinking water per day, or more than 50 people. The WFD also requires more pollution testing for DrWPAs supplying over 100 m³ of drinking water per day, and increased testing for the most used sources. There are currently **172 DrWPAs in Wales**.

Water Protection Zones

Water Protection Zones (WPZs) are designated according to the **Water Resources Act 1991**. In WPZs, consent is needed to use or store certain substances at water treatment plants or industrial, storage and research sites. In **1999 the River Dee catchment was designated a WPZ** due **to its importance as a drinking water source and vulnerability to pollution**. It has remained the UK's only WPZ to date.

7. Drinking water quality

Drinking water regulations

Drinking water sources are protected by the **EU WFD**, which describes the designation and management of **Drinking Water Protected Areas** (DrWPAs – see page 20). Water abstraction is regulated by NRW through **water abstraction permits**, which are required to abstract over 20 m³ of inland water per day.

The management of drinking water is set out in:

- **The Water Supply (Water Quality) Regulations 2018**, which apply to Welsh water companies, i.e. **Hafren Dyfrdwy** and **Dŵr Cymru Welsh Water**; and
- **The Private Water Supplies (Wales) Regulations 2017**, which regulate water not supplied by water companies. In 2022, 14,933 private water supplies served **approximately 3% of people in Wales**. They are mostly found in rural areas, and rely on natural sources like boreholes and springs.

These regulations require water intended for human consumption to be ‘wholesome’, i.e. compliant with updated chemical and microbial contamination drinking water quality standards from the **EU Drinking Water Directive 1998 (DWD)**.

These regulations also lay out testing, monitoring and reporting requirements for drinking water quality. Drinking water is regularly checked for levels of harmful chemicals in water such as heavy metals, pesticides, and carcinogens, along with bacteria harmful to human health such as E.coli and enterococci.

How is drinking water quality managed?

Public drinking quality is regulated through self-monitoring and reporting by water companies, whilst private supplies are **managed by local authorities**. **The Drinking Water Inspectorate (DWI)** is responsible for ensuring water companies and local authorities meet testing and water quality requirements. The **DWI does this** by:

- regularly auditing water companies’ testing procedures and laboratories;
- enforcing drinking water regulations;
- providing scientific and technical advice to local authorities on implementing and enforcing drinking water standards;

- publishing annual and quarterly reports on **public** and **private supply** drinking water quality; and
- handling water quality incidents and complaints.

Current drinking water quality in Wales

Public drinking water quality in Wales is very high. In **its 2021 annual report**, the DWI found over 99.98% of public drinking water tests in Wales met quality standards.

Private supplies often have lower water quality than public supplies, **but this has improved over recent years**. In 2022, 3.8% of private water supply tests by Welsh local authorities did not meet standards for wholesomeness, compared to 6.1% of tests failed in 2018. Faecal bacteria is a particular concern in private water supplies, and was detected in 7.0% of private water supply tests in 2022. By comparison, usually only **0.01% of public water supply tests** detect faecal bacteria.

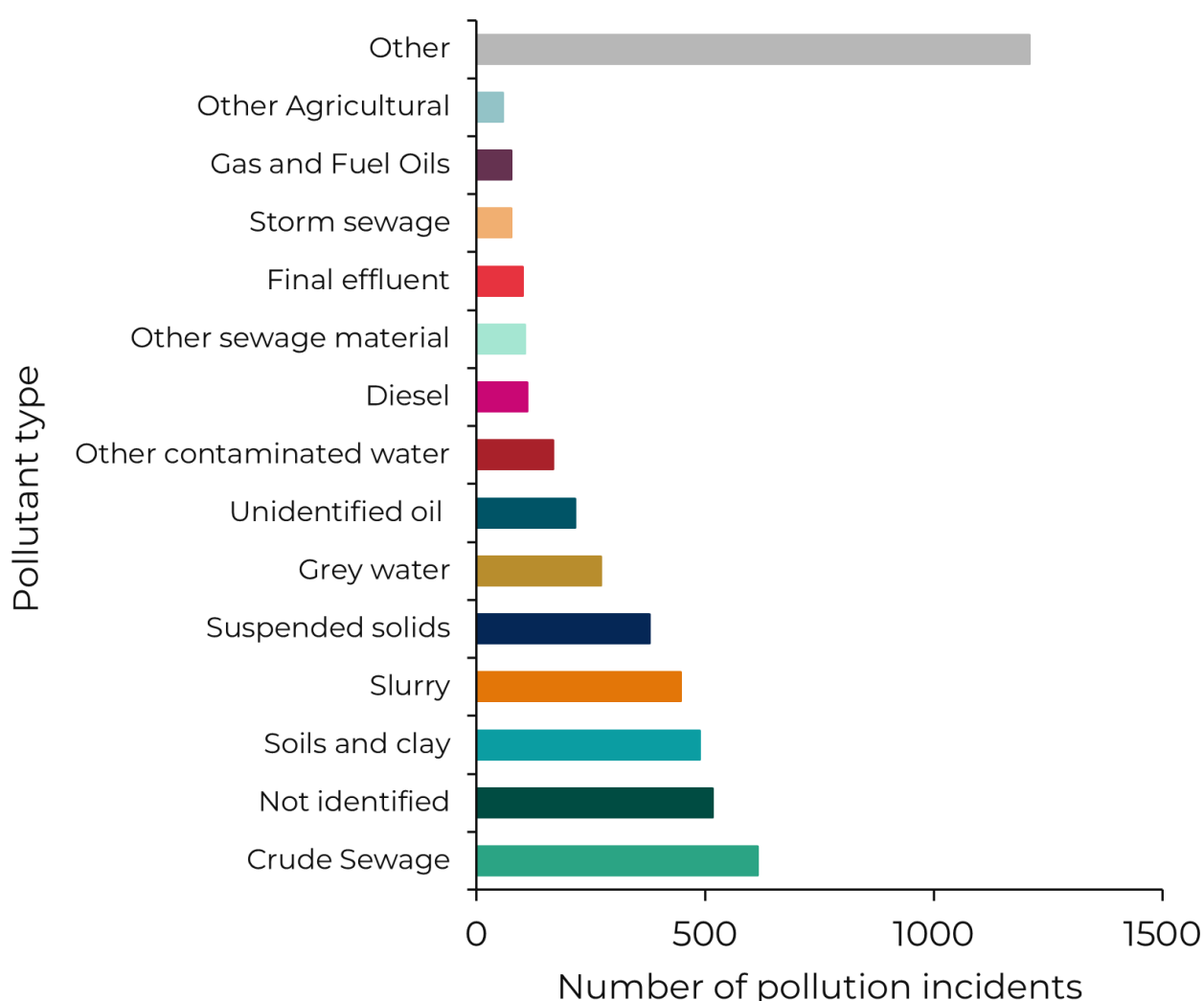
Local authority risk assessments are another issue in managing private water supply quality. Local authorities must assess private water supplies for human health and contamination risks every 5 years. However, **in 2022 the DWI reported** only 6 out of 22 local authorities in Wales complied with these rules. Furthermore, 35.9% of private supplies had never been assessed, leaving users unaware of their water supplies' vulnerability to faecal contamination.

8. Challenges to water quality in Wales

What are the most common water pollutants?

NRW has recorded **104 different primary pollutants across the 4,856 water pollution incidents** it has responded to since March 2016. Figure 4 below shows 75% of water pollution incidents share the 14 most common primary pollutants, and what proportion of incidents involve each pollutant.

Figure 4. Most frequently reported primary pollutants reported across pollution incidents since March 2016.



Source: [Wales Environmental Information Portal](#), accessed 05/07/2023.

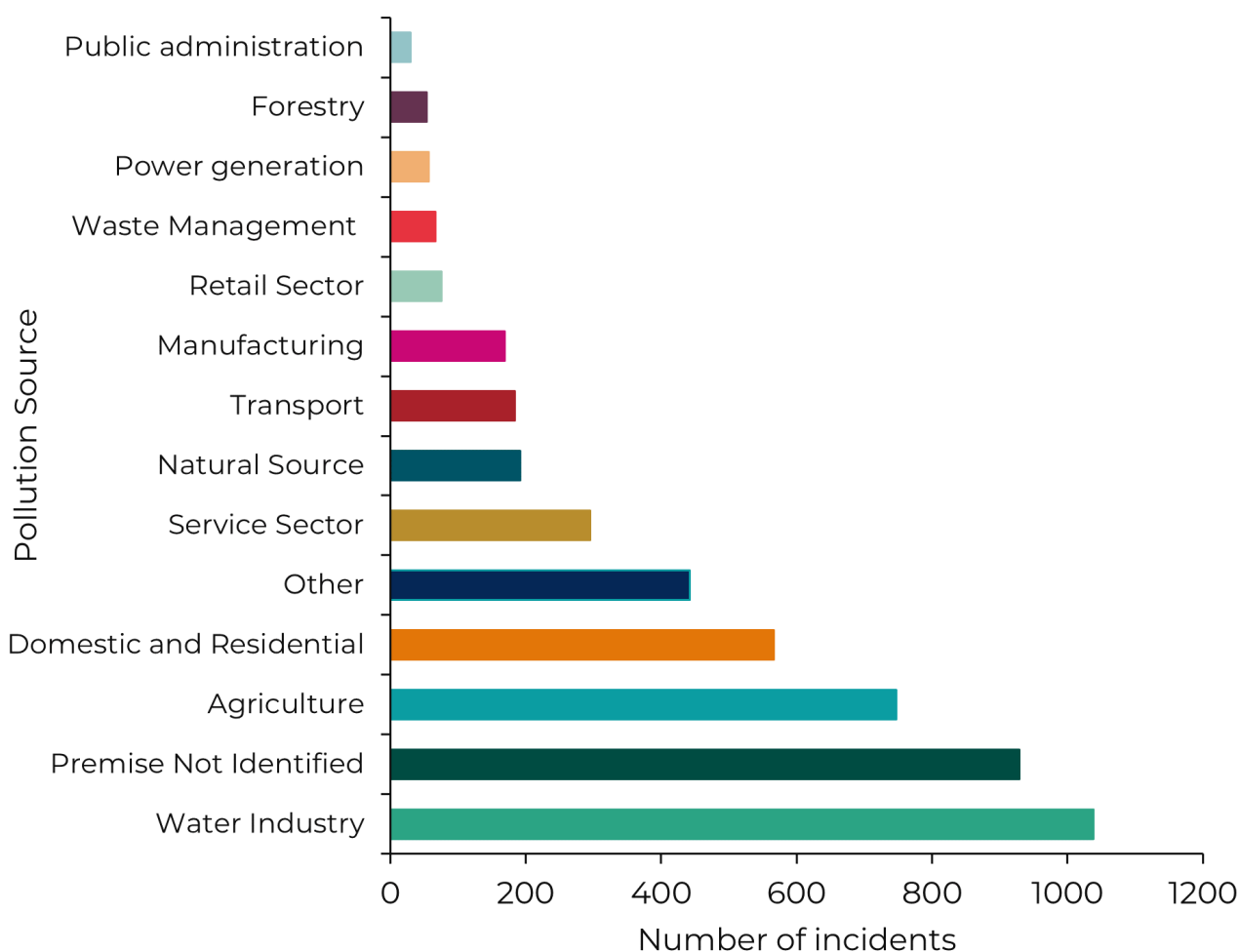
The top three types of pollution identified in water pollution incidents were crude sewage, soils and clay and slurry. Crude sewage pollution usually arises from storm overflows (see page 28) and sewage treatment plants spills. Soil, clay sediment and

slurry usually enter waterways through soil erosion by rain draining from nearby land. This carries any pollutants from soil and slurry into watercourses, or ‘surface run-off’. Improperly stored slurry can also leak into watercourses.

Where is water pollution coming from in Wales?

NRW’s pollution incident data also reveals the sources responsible for the most water pollution incidents. These include the water industry, agriculture, domestic premises and unidentified sources (figure 5). Source: **Wales Environmental Information Portal**, accessed 05/07/2023.

Figure 5. Premises types of pollution incidents since March 2016.

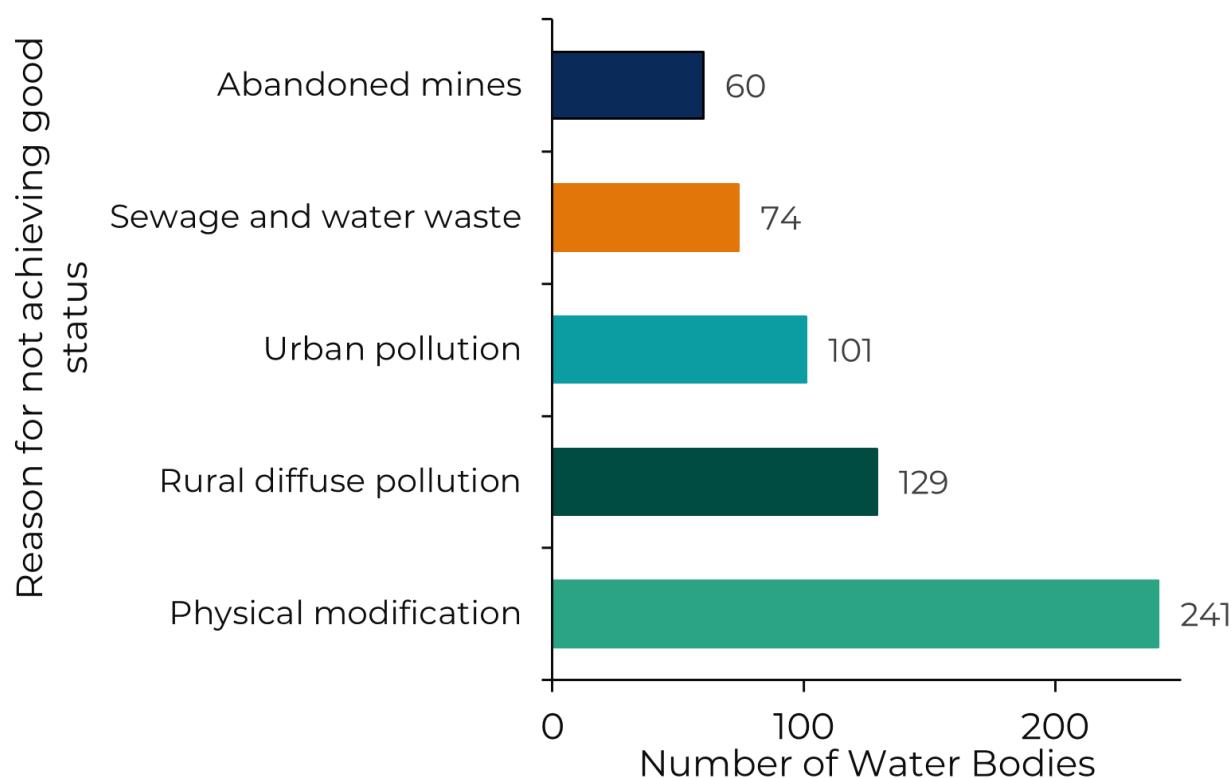


Source: **Wales Environmental Information Portal**, accessed 05/07/2023.

Pollution can come from ‘point sources’ or be ‘diffuse’. ‘Point’ pollution sources have single identifiable locations, such as sewage overflow points (see page 28). **‘Diffuse’ pollution** is the combined pollution that enters waters from multiple sources due to rainfall, soil infiltration and surface run-off. Diffuse pollution can come from both urban and agricultural areas.

The main causes of water pollution are also identifiable from Reasons for Not Achieving Good Status (RNAGS) recorded for water bodies. In December 2021, the Minister for Climate Change presented [data on RNAGs recorded by NRW](#) during its latest water body classification exercise to the Committee for Climate Change, Environment and Infrastructure (CCEI). Unlike pollution incident data, RNAGS data suggested agriculture contributed more to water pollution than the water industry.

Figure 6. NRAGs reported by NRW in 2021.



Source: [Minister for Climate Change's response to the Chair of CCEI Committee letter on sewage discharges, 03/12/2021.](#)

9. Nutrient pollution

Nitrates

What is nitrate pollution?

Nitrates are a class of compounds containing the element nitrogen, an essential nutrient for life. Nitrates are found in human and animal waste, and are heavily used by agriculture in crop fertilisers and animal feed.

Excess nitrate levels can severely damage a water body's **quality and ecology** by encouraging excess algae growth. This depletes water systems of oxygen and renders them uninhabitable for other organisms, a process called eutrophication. As well as disrupting the ecology and biodiversity of affected waters, eutrophication reduces the recreational value of waters and can make them harder to navigate.

Nitrate pollution also **poses risks to human health** if excess levels accumulate in groundwater sources of drinking water.

Diffuse pollution from agricultural land is a major source of nitrate pollution. In 2008, agriculture was estimated to contribute **60% of nitrogen pollution** (including non-nitrate nitrogen pollutants such as ammonia) **in Wales**. The next largest source, sewage leaks and discharges, was thought to contribute 17% of nitrogen pollution in Wales.

How is agricultural nitrate pollution regulated?

Nitrate levels are regulated in Wales according to **The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021** (CoAP regulations), which came into force in April 2021. This is phasing in nitrate controls across Wales by 2024, including:

- requirements for nitrogen fertiliser use planning and record keeping;
- restrictions on when, where and how fertilisers can be spread;
- limits on how much nitrogen can be spread on crops; and
- standards for storing manure and silage.

Similar measures were previously limited to 'Nitrate Vulnerable Zones' (NVZs). NVZs were designated according to the **EU Nitrates Directive** and covered 2.4% of Wales, making the introduction of blanket nitrate controls **controversial amongst farmers**.

Phosphates

Phosphate pollution in Wales

Phosphates are a class of compounds containing the element phosphorous, which like nitrates are essential biological nutrients. They are also heavily used in agriculture and in sewage. Phosphorous from **agriculture and water industries can enter water bodies** in similar ways to nitrates, through surface run-off and sewage discharges. It can also enter water supplies when **used as a protective additive** against lead contamination.

Phosphates have similar eutrophying effects to nitrates if they accumulate in waters. The prominence of phosphate pollution as a water quality issue has increased in recent years, after NRW followed **Joint Nature Conservation Committee (JNCC) advice** and started significantly tightening phosphorous targets in SACs in 2017.

Then in 2021, NRW **published a report on phosphate levels across** Wales' nine river SACs (see page 19). It reported that **61% of the 125 water bodies surveyed failed to meet the revised phosphorous targets**, including 88% of waters tested in the River Usk.

Phosphorous targets and planning permission in SACs

Following its river phosphorous pollution report, NRW advised local planning authorities in SAC catchments to adopt a policy of **'nutrient neutrality'** for managing new development and water discharge permit proposals. This meant planning permission would be denied if a proposal's **Habitats Regulations Assessment** (HRA) found it would likely increase nutrient levels in SAC waters.

The new phosphate control measures have stalled some housing projects, making them controversial **in Senedd debates** and **the media**. The Welsh Government sought to address these issues in its **SAC pollution Action Plan**. This committed to reviewing some housing developments delayed by nutrient controls, and prioritising water discharge permits for wastewater treatment works affecting social housing.

10. Water industry pollution

What are storm overflows?

Combined sewers take sewage and run-off water to treatment works for cleaning. If rain is heavy and exceeds a sewer's maximum capacity, excess water can be released into the environment at storm overflows. These discharges, called **'combined storm overflows' (CSOs)**, are sometimes necessary to prevent flooding elsewhere in sewerage systems. However, they can have **negative effects, including:**

- harm to river health - CSOs can introduce biological and chemical pollution into rivers, lowering their water quality;
- harm to public health - CSOs can introduce harmful bacteria into recreational waters; and
- social impact - from public concern.

How are storm overflows regulated in Wales?

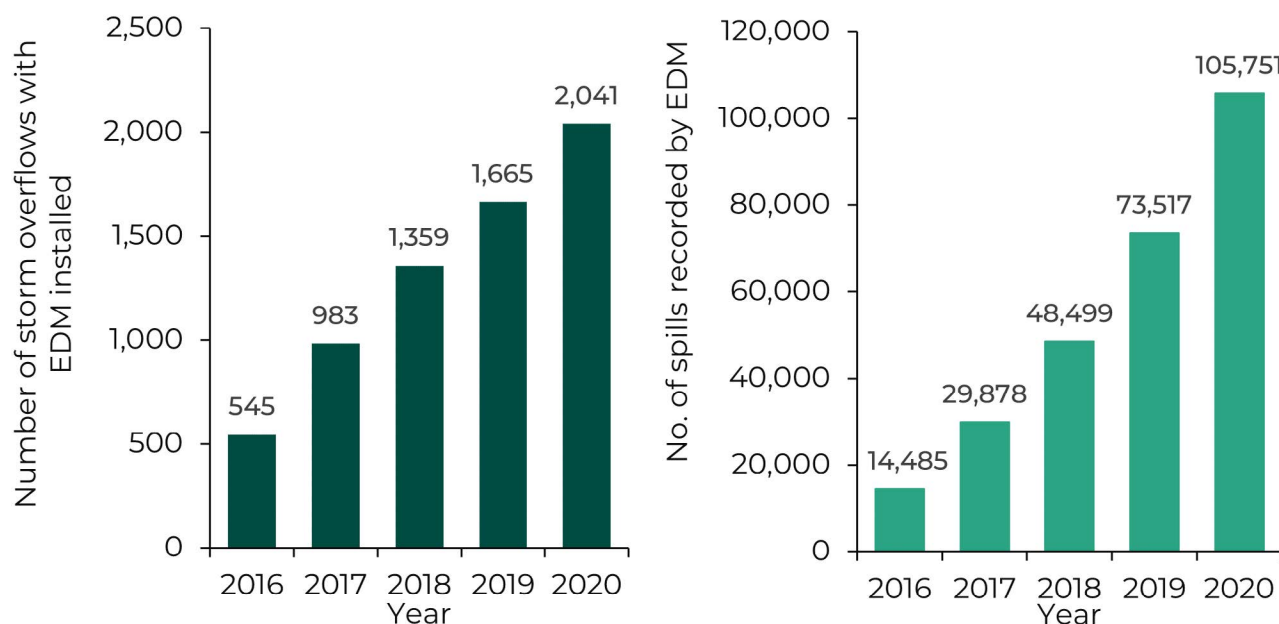
NRW **issues discharge permits**, which forbid water companies from discharging sewage during dry weather or degrading the quality of waters receiving overflows. Event duration monitors (EDMs) measure the frequency with which CSOs operate.

NRW publishes annual environmental performance reports for **Dŵr Cymru** and **Hafren Dyfrdwy**, based on the companies' self-reported data. It is also **responsible for investigating and taking action** if a storm overflow causes a pollution incident.

Why are storm overflows such an issue?

Storm overflows and their impact on water quality have been the subject of much public interest, along with inquiries by the Senedd's **CCEI Committee in 2022**, and the House of Commons **Welsh Affairs Select Committee in 2023**. This growing interest coincides with a sharp rise in the number of storm overflows and spills detected by EDM monitoring over recent years, as shown in Figure 7 below.

Figure 7. Numbers of storm overflows and spills recorded by EDM each year between 2016-2020.



Source: [Natural Resources Wales / Storm Overflows](#), accessed 05/07/2023.

The CCEI's [2022 inquiry report](#) highlighted several factors contributing to the increasing frequency of CSO operation, including:

- climate change and increases in the frequency of extreme weather events such as heavy rainfall;
- increased populations putting greater demand on sewerage systems;
- connections to sewer overflows which are misconnected or illegally installed;
- poor sewerage infrastructure; and
- blockages.

Despite the frequency of spill events, storm overflows are thought to be a minor contributor to low river quality. [Dŵr Cymru told the CCEI](#) inquiry that storm overflows are a confirmed or probable Reason for Not Achieving Good Status (RNAGS) for just 4.6% of water bodies. [Water companies](#) and the [Minister for Climate Change](#) highlighted other sources of water pollution such as agriculture (see page 26).

11. Welsh Government action

Efforts to improve drainage systems in Wales

The Welsh Government's **Water Strategy for Wales** outlined its focus on improving sewerage and drainage systems to reduce sewer flooding, leaking and water pollution.

In 2018 the Welsh Government made **sustainable drainage systems (SuDS) mandatory for all new developments**. SuDS are designed **to improve surface water drainage** away from developments by collecting, storing, and cleaning water, before gradually releasing it back into the environment. This decreases the amount of water containing sewage pumped to sewers for treatment, reducing the risk of overflows, flooding and groundwater contamination.

Nutrient pollution response

In response to NRW's investigation into SAC phosphorous pollution, the Welsh First Minister convened a **River Pollution Summit in August 2022**. Following this, extra funding and measures to tackle phosphate pollution in SACs were announced, and an **Action Plan** for tackling SAC nutrient pollution was published in March 2023.

Measures from the SAC Action Plan included:

- providing advice to the agricultural sector for managing nutrient pollution, and financial support such as the **Nutrient Management Investment Scheme**;
- extra funding to create and support nutrient management boards, which oversee planning and implementing nutrient pollution reduction measures;
- advising local authorities on pollution management, and developing an 'all-Wales nutrient calculator' to aid planning decisions; and
- exploring new ways of tackling pollution, such as 'cap and trade' policies, new water monitoring technologies and using citizen data.

The Wales Better River Quality Taskforce

The Wales Better River Quality Taskforce was established in July 2022 as a partnership between NRW, the Welsh Government, Ofwat, Dŵr Cymru and Hafren Dyfrdwy. It is independently advised by Afonydd Cymru and Consumer Council for Water. It initially focussed on managing and regulating storm overflows in Wales, but **its remit covers wider water quality issues**.

In 2022 the Taskforce announced several Action Plans for improving river water quality in Wales. These aim to:

- strengthen **environmental regulations around CSOs**;
- improve **sewage system capacity and drainage practices**;
- optimise sewage **discharge monitoring practices**;
- increase the **number of screens** installed at overflow points to prevent litter entering watercourses; and
- **inform and engage the public** about storm overflows and other water quality issues.

The **Taskforce has stated** it will meet fortnightly to oversee the implementation of these Action Plans.