Llywodraeth Cymru
Welsh Government

Statutory Review Evidence Document

The Review of the Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 – Evidence Pack

Supporting evidence pack regarding the effectiveness of the measures imposed by these Regulations as a means of reducing or preventing water pollution from agricultural sources

31 March 2025

Contents

Introduction

This evidence pack provides further information to supplement the 4-year Review. It's purpose is to provide further context to the information outlined in the review document.

The Regulations via Regulation 44 require a

> 'a monitoring programme to assess the effectiveness of the measures imposed by these Regulations as a means of reducing or preventing water pollution from agricultural sources'.

And

> 'When carrying out a review…, the Welsh Ministers must take into account –
>
> (a) available scientific and technical data, particularly with reference to respective nitrogen contributions originating from agricultural and other sources, and
>
> (b) regional environmental conditions.'

All information contained within this pack has been made available to the chair for the purposes of developing this the 4-year Review and therefore to Welsh Ministers as a result of this report.

Background to the Regulations

In 2016 the Welsh Government consulted upon a review of the Designated Areas and Action Programme to Tackle Nitrate Pollution in Wales[1]. Following the outcome of this consultation, and a prolonged period of stakeholder engagement on potential alternative approaches, a decision was made to introduce regulations on an all-Wales basis.

The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021[2] (CoAP Regulations) came into force on 1 April 2021 with a phased approach. The regulations introduced similar measures to those contained within the Code of Good Agricultural Practice (CoGAP) and the nitrates action programme into regulation and incorporated many of the requirements of the Water Resources (Control of Pollution) (Silage and Slurry) (Wales) Regulations 2010[3] on an all-Wales basis, which were originally introduced in 1991.

The CoAP Regulations include the following measures:

- Nutrient Management Planning;
- Sustainable fertiliser applications linked to the requirement of the crop;
- Protection of water from pollution related to when, where and how fertilisers are spread;

[1] 160929-nitrate-vulnerable-zones-consultation-en.pdf
[2] The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021
[3] The Water Resources (Control of Pollution) (Silage, Slurry and Agriculture Fuel Oil) (Wales) Regulations 2010 (revoked)

- Manure and silage storage standards; and
- A review clause enabling alternative proposals to be made.
- Transitional periods for most elements to allow farmers time to adapt and ensure compliance

Whilst the CoAP Regulations fulfilled obligations derived from the Nitrates Directive, they move away from a Nitrates Directive approach and take account of wider obligations and objectives. They are not Nitrate Vulnerable Zone (NVZ) regulations and do not establish a whole-Wales NVZ. The Welsh Government determined a discrete Nitrates Directive approach would not be effective in protecting waterbodies across Wales from failing to meet other safety and ecological standards, reducing atmospheric pollution or tackling and mitigating climate change.

Under the Co-operation Agreement 2021[4], the implementation of the limit on the amount of nitrogen from livestock manures which can be applied to the holding each year (an average of 170kg per hectare) was delayed until January 2025. An Enhanced Nutrient Management (ENM) approach was developed for the calendar year 2024. This approach allowed the application of livestock manures up to 250kg/N/ha in the 2024 calendar year, subject to additional requirements to reduce the risk of pollution, to provide farms with more time to transition to the 170kg limit.

Welsh Government's environmental obligations and objectives

The Welsh Government works to a number of commitments and duties which are relevant to this review, some of which are legislative requirements and others are policy positions or plans. This review necessarily takes these into account.

The Welsh Government introduced the Environment (Wales) Act 2016, providing a framework to ensure managing our natural resources sustainably is a core consideration in decision-making, a biodiversity duty to help reverse declines in biodiversity and secure its long-term resilience, and a duty on Welsh Ministers to set targets for reducing greenhouse emissions.

The Well-being of Future Generations (Wales) Act 2015 places a responsibility on the Welsh Government and other public bodies to ensure sustainable development is embedded in our policies.

In 2023, the Welsh Government introduced the Agriculture (Wales) Act 2023, which establishes four Sustainable Land Management (SLM) objectives

- Sustainable production of food and other goods
- Mitigating and adapting to climate change
- Maintain and enhance the resilience of ecosystems and the benefits they provide
- Conserve and enhance the countryside and cultural resources and promote public access to and engagement with them, and to sustain the Welsh language and promote and facilitate its use

[4] Co-operation Agreement: 2021

It places a duty on the Welsh Ministers to exercise certain functions in the way they consider best contributes to achieving the SLM objectives.

Other statutory obligations are directly relevant to this review, including the emissions targets established by regulations made under the Environment (Wales) Act 2016 and those included within the National Emission Ceilings Regulations 2018.

Welsh Government's International Commitments and Obligations

As a globally responsible nation the Welsh Government is committed to the delivery of a number of international commitments and obligations. Furthermore, the UK Government negotiates and enters into international obligations on behalf of the four nations. The devolved governments and legislatures must comply with these and are responsible for their implementation in devolved areas, including agriculture. In addition, the Welsh Government's Ministerial Code places a duty on the Welsh Ministers to comply with international law and treaty obligations.

International obligations which apply to the Welsh Government include the United Nations Framework Convention on Climate Change[5], the Convention on Biological Diversity[6], the UN's Sustainable Development Goals[7],the Gothenburg Protocol[8] and target 7 of the Kunming - Montreal Global Biodiversity Framework[9], which requires '*reducing excess nutrients lost to the environment by at least half*'.

The nutrient management challenge across the UK and Europe

Wales is not alone in limiting applications of nutrients to the land to mitigate the risks of pollution to waterways. Across the UK there are areas in which similar limitations apply.

In England, all farms must adhere to the Farming Rules for Water which include nutrient management planning for all nutrients, soil testing for pH, Phosphorous, Potassium (K), and Magnesium, rules on soil compaction and poaching and other pollution pathways[10]. In addition, designated Nitrate Vulnerable Zones also exist where additional requirements must be fulfilled. In Scotland all farms must adhere to the General Binding Rules[11], which include mandatory nutrient management planning for phosphorous and pH, additional restrictions on nutrient applications to shallow soils, rules on soil erosion, additional rules on pollution pathways, poaching and low emission spreading and increased storage requirements. Northern Ireland implements a Nutrients Action Programme[12] across the whole of its territory. In all four UK nations, environmental permitting Regulations apply to intensive agricultural

[5] What is the United Nations Framework Convention on Climate Change? | UNFCCC
[6] Home | Convention on Biological Diversity (cbd.int)
[7] THE 17 GOALS | Sustainable Development (un.org)
[8] Gothenburg Protocol | UNECE
[9] Target 7
[10] Farming rules for water from April 2018 - GOV.UK (www.gov.uk)
[11] Reduce Diffuse Pollution Risks in Farming. Know the regulations. (farmingandwaterscotland.org)
[12] Nitrates Directive | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)

systems[13] [14] [15]. A comparison of the regulatory regimes across the UK indicates that in some cases measures are more stringent than Wales and the differences across the UK are complex. Annex A provides a summary the different measures implemented across the UK.

However, the challenges of nutrient management and the appropriateness of approaches are not unique to the UK. The European Commission in December 2023[16] launched an evaluation of the Nitrates Directive to assess if the Directive remains 'fit for purpose'. There are also significant cross overs to other directives which impact water quality which remain applicable in Wales, including the Water Framework Directive[17] through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[18] and the Habitats Directive[19] through the Conservation of Habitats and Species Regulations 2017[20].

However, it is important to consider the relationship between the CoAP Regulations and the wider regulatory environment. Applying livestock manures or slurry in excess of crop nutrient requirements is considered a waste disposal activity and waste regulatory controls would apply. In August 2022 Natural Resources Wales published advice on how to use manures and slurries appropriately[21], outlining when manures and slurries are considered a waste material. It states *'When manure or slurry are applied to land with no demonstrable benefit to the soil or crop growth or when they exceed the nutrient requirements of the crop, they are considered waste materials.'* and confirms the importance of crop need as the defining line between beneficial application and waste disposal activity.

A recent study by ADAS for Welsh Government calculated an estimated 10 million tonnes of organic materials (i.e., livestock manure, compost, digestate, biosolids and material applied under permit) were applied to agricultural land in Wales in 2021. Most of the organic materials (88%) were livestock manures including handled manure from housed livestock subsequently spread to land and excreta directly deposited by grazing animals[22].

Impacts on trade

Consumers both domestically and across Wales' valuable export markets value Welsh produce for it's high standards for both environmental and animal welfare. This has been supported by voluntary standards such as Red Tractor[23] and Farm Assured Welsh Livestock[24] as well as the requirements contained with Cross

[13] The Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013
[14] The Pollution Prevention and Control (Scotland) Regulations 2012
[15] The Environmental Permitting (England and Wales) Regulations 2016
[16] Commission consults citizens and stakeholders on evaluation of the Nitrates Directive - European Commission
[17] Water Framework Directive - European Commission
[18] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
[19] The Habitats Directive - European Commission
[20] The Conservation of Habitats and Species Regulations 2017
[21] Natural Resources Wales / How to use manures and slurries appropriately
[22] An assessment of the current landbank in Wales | GOV.WALES
[23] Red Tractor Assurance | Assured Food Standards
[24] FAWL

Compliance[25] for eligible farms. However, for international trade there is a requirement for regulatory standards.

Continuity with the requirements of the European Union were taken into account in the design of the CoAP Regulations and this requirement remains. The approach addressed the risks associated with retrospective infraction proceedings and the level-playing field requirements of the EU-UK Trade and Co-operation Agreement[26]. The CoAP Regulations were designed to secure access to European and global markets by enabling the Welsh agricultural sector to demonstrate food in Wales is produced to recognised baseline standards.

Background to Agriculture in Wales

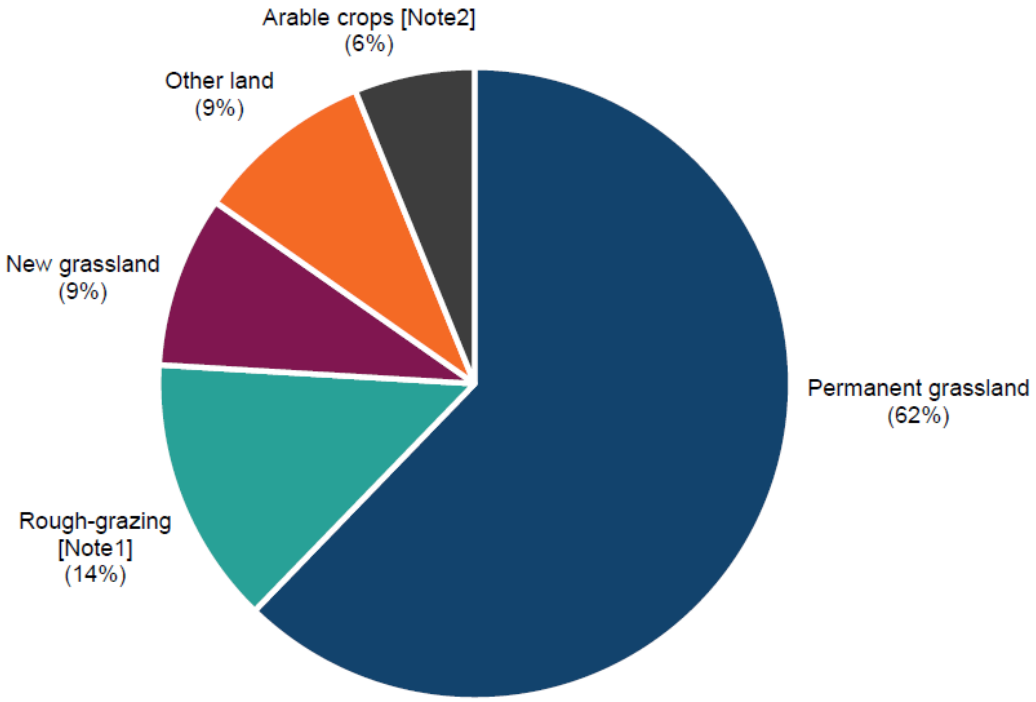
Wales' agricultural sector is predominantly grassland and livestock based, however there is significant geographic variation in relation to the types of grassland based around topographic, soil and climatic conditions. This means the suitability for individual livestock types also varies geographically.

Land use

The total amount of land on holdings was 1,775,200 hectares in June 2024 which represents a 0.4% increase from the previous year. When combined with the 180,300 hectares of common rough grazing, this means that land used for agricultural purposes accounts for around 90% of the total land area of Wales.

Figure 1: Split of land on agricultural holdings by usage, 2024

[25] Cross compliance 2024 | GOV.WALES
[26] The EU-UK Trade and Cooperation Agreement | European Commission (europa.eu)



[Note1] Rough grazing where holder has sole rights (i.e. excludes common rough grazing)

The chart shows that permanent grassland accounts for nearly two-thirds (62%) of the land on farms in Wales. The remaining land comprises new grassland (9%), rough grazing (14%), arable crops (6%) and other land (9%). Other land is made up of farm woodland, buildings and land not used for agricultural purposes.

Timeseries of agriculture

The Welsh Government's survey of Agriculture and Horticulture: June 2024[27] provides the latest survey-based record of livestock in Wales, published alongside is a historical timeseries of livestock numbers in Wales.

Dairy and beef

Estimates from the 2024 survey for cattle outlined the total number of cattle and calves in Wales was 1,089,800 – this represents a decrease of 2.4% from the figure for June 2023.

The number of dairy females aged 2+ years that had calved has fallen by 1.3% to a figure of 251,300. This definition is generally accepted as a measure of the dairy herd. Using the equivalent definition, the size of the beef herd decreased by 5.8% over the last 12 months to a figure of 140,700.

Since 2004, cattle numbers have been available from the Cattle Tracing System (CTS) which is managed by the British Cattle Movement Service (BCMS), primarily for animal health purposes.

[27] Survey of agriculture and horticulture: June 2024 | GOV.WALES

Over this period there is a contrast between the trends seen in the numbers of dairy and beef cattle. Whilst the dairy herd has increased slightly (3%), the size of the beef herd has fallen considerably (33%).'

Table 1: Cattle by type by year, Survey of agriculture and horticulture: June 2024

Cattle type	2004	2014	2024
Male under 1 year	169,860	131,953	129,124
Beef female under 1 year	135,184	101,274	113,824
Dairy female under 1 year	56,776	71,781	77,828
Male aged 1-2 years	126,901	97,693	95,559
Beef female aged 1-2 years	105,143	83,090	94,875
Dairy female aged 1-2 years	59,121	66,960	77,233
Male aged 2+ years	47,601	45,908	34,682
Beef Female 2+ no offspring	51,858	46,433	37,939
Dairy Female 2+ no offspring	58,616	55,572	36,800
Beef Female 2+ w/offspring	210,699	167,799	140,659
Dairy Female 2+ w/offspring	244,776	234,305	251,313
Total cattle & calves	**1,266,535**	**1,102,768**	**1,089,836**

Poultry numbers

The total poultry in Wales was 11,842,400 in June 2024 – the majority (90%) of these were either table chicken/broilers (6.3 million) or chicken kept for laying eggs (4.4 million). The greatest increase was in the number of chickens used for egg production which increased from 1.37m in 1998 to 4.38m in 2024.

Table 2: Poultry type by year, Survey of agriculture and horticulture: June 2024

Poultry type	1998	2008	2018	2024
Chicken used for egg production	1,370,528	1,193,260	2,337,116	4,377,888
Table chicken (broilers)	7,087,347	5,427,435	3,920,445	6,266,418
Chicken used for breeding	333,306	438,843	1,679,531	988,976
Turkeys	622,043	59,302	62,799	47,823
All other birds	130,788	50,820	180,653	161,333
Total poultry	**9,544,012**	**7,169,660**	**8,180,544**	**11,842,438**

Sheep

'The number of sheep and lambs in Wales began to grow during the 1970s, reaching a peak of 11.8 million in 1999. There was a gradual drop in numbers over the following 10 years, possibly reflecting changes to the operation of the EU Common Agricultural Policy (CAP) when schemes based on the number of livestock kept where phased out.'

Distributions

The analysis below, sourced from the Welsh Agricultural Survey (June 2024), provides a breakdown of the overall farm population in Wales. Table 1 shows the aggregate estimates of the farm population, while Table 2 shows each variable as a share of the Wales total.

Table 3: Aggregate estimates for Wales, Welsh Agricultural Survey (June 2024)

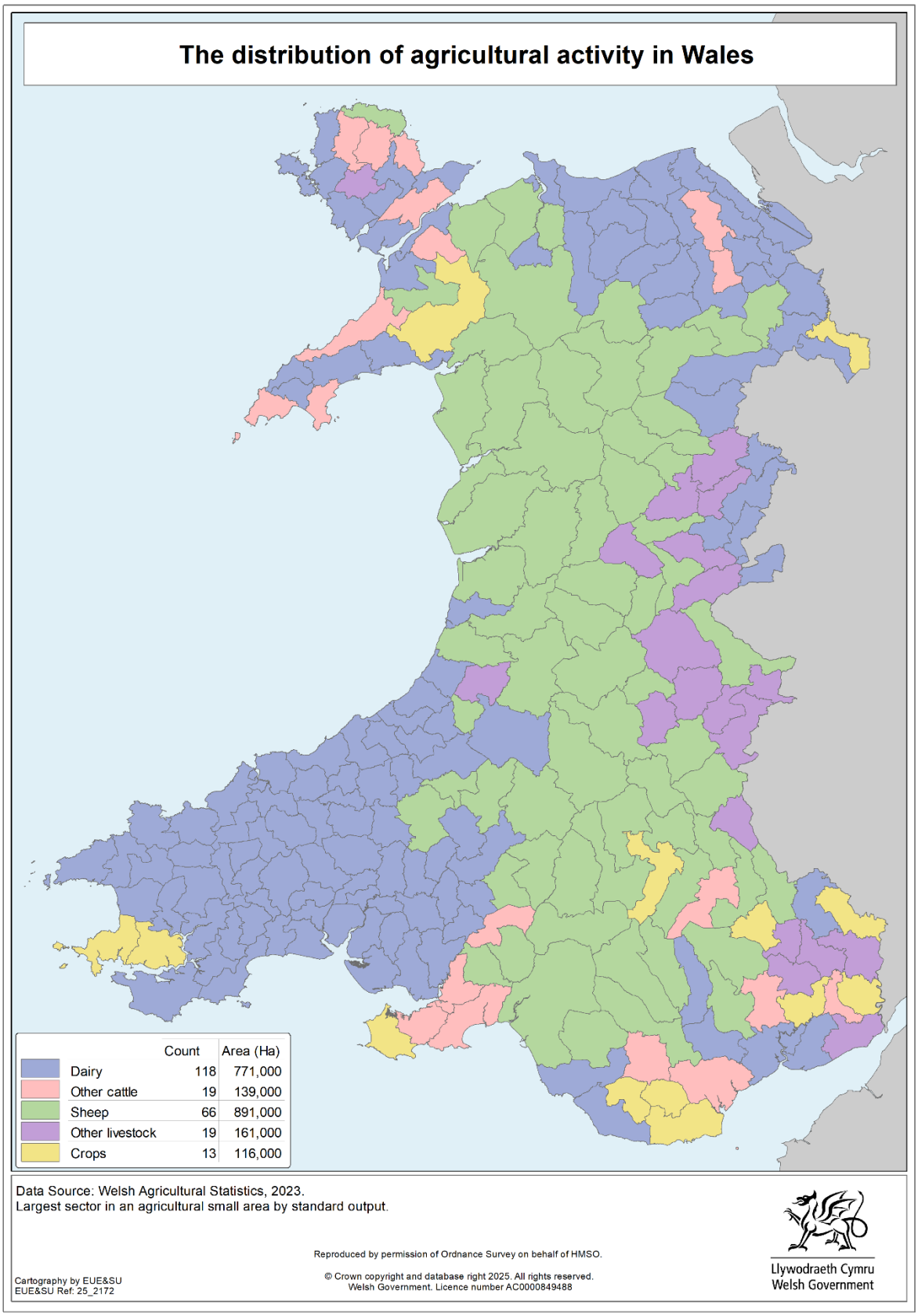
	Farms	Land on farms	Cattle	Sheep	Standard Output
Dairy	1,315	180	501	206	831
Significantly Disadvantaged Area (SDA) graze	4,100	608	232	5,732	373
Disadvantaged Area (DA) graze	1,795	166	156	1,138	142
Low graze	1,087	88	104	471	86
Arable/mixed	899	126	50	353	177
Specialists	399	36	8	104	247
Micro	14,759	221	40	746	101
All farms	**24,315**	**1,424**	**1,132**	**9,352**	**1,957**

Units - land in '000 hectares, livestock in '000 heads, and Standard Output in € millions

Table 4: Aggregate estimates as a share of Wales total, Welsh Agricultural Survey (June 2024)

	Farms	Land on farms	Cattle	Sheep	Standard Output
Dairy	5%	13%	46%	2%	42%
SDA graze	17%	43%	21%	66%	19%
DA graze	7%	12%	14%	13%	7%
Low graze	4%	6%	10%	5%	4%
Arable/mixed	4%	9%	5%	4%	9%
Specialists	2%	3%	1%	1%	13%
Micro	61%	16%	4%	9%	5%
All farms	**100%**	**100%**	**100%**	**100%**	**100%**

Map 1: Geographical distribution of agricultural activity in Wales by standard output, Welsh Agricultural Statistics, 2023



Water quality monitoring evidence

Natural Resources Wales (NRW) undertake water quality monitoring for a variety of purposes including for River Basin Management Plans and Special Area of Conservation required as part of the Water Framework Directive Regulations and Habitats Regulations respectively. It also provides this data to stakeholders and the public via a range of resources, including Geographic Information System (GIS) portals and reports.

This section does not intend to duplicate existing reporting of water quality data but to draw upon the range of data available to identify trends relating to water quality in Wales.

Limitations and assumptions

All monitoring programmes have confirmed and validated methodologies based upon scientific best practice. Additionally, all monitoring and modelling programmes will have a number of limitations and assumptions also contained within.

Physical sampling for water quality at a range of locations was significantly disrupted by the 2020 coronavirus pandemic and resulting restrictions which limited the ability to collect the physical water samples required.

However, for the purpose of this review and the ability to assess the effectiveness of the measures imposed the most significant limitation is the time periods covered. This includes both the timescales of the monitoring programmes and the transition periods contained within the regulations.

Nutrient review evidence

With the implementation of the new Regulations, NRW appointed consultants (Arup) to undertake a review of nutrients in water bodies across Wales to develop a national scale understanding of the current baseline nutrient water quality and assess potential nutrient risks[28]. The Nutrient Review covers both nitrate and phosphate, which are considered to be the key nutrients contributing to poor water quality. The review has assessed the following waterbodies in Wales:

- Groundwater;
- Surface water (rivers);
- Lakes; and
- Transitional and Coastal (TraC) waters.

The methodology used in the review broadly followed the previous method used for the 2017 NVZ review but has been adapted to incorporate the assessment of phosphate. The methodologies represent a consistent and practical approach to identification and potentially polluted waters across Wales. The model used for the Nutrients Review is primarily focused on looking at the risk of land based, diffuse

[28] Natural Resources Wales / Expanding our evidence on nutrient pollution of the water environment

nutrient pollution across the whole of Wales. It uses water quality data, extrapolated water quality data and nutrient leachate models based on land use.

The outputs from the review principally comprise a series of spatial datasets, culminating in a map indicating potential nutrient risk at a national scale for nitrate and phosphate. The datasets are intended to provide a consistent national baseline assessment of nutrient water quality, potential nutrient pollution sources and risks which can be used as a tool by to inform future projects.

Spatial outputs from the review are available to all via the nutrient review dashboard hosted on NRW's Wales Environmental Information portal[29]. Access to these individual spatial datasets mean the detailed results can be examined at a national, catchment and sub-catchment scale.

Additionally summary reports have been produced for each water type and detailed information on the methods used including full methodology reports are available from NRW on request.

Risk Maps

One of the key outputs of the Nutrient Review has been the production of Risk Maps for both nitrate and phosphate. A GIS-based risk model was used to determine potential risks to surface water bodies from nitrate and phosphate. The risk model combines national datasets of current and future nitrate and phosphate surface water concentrations and the leaching models. Each component is assessed using a scoring and weighting system, and the scores are combined to generate a national risk map for nitrate and phosphate at a scale of 1 km square grid scale. Areas with higher scores indicate potential risk to surface water from nitrate and/or phosphate.

For lakes the water quality data was combined with NRW's Weight of Evidence tool (WoE) to include ecological pressure indicators to assess the risk of eutrophication of the individual lakes.

Areas of potential high risk indicated on the nitrate map typically coincide with areas where NVZs were previously designated or recommended for designation. The risk maps and tables should be considered as a tool for identifying where there may be potential risk to surface water from nitrate and/or phosphate pollution.

Table 5: Surface and Ground water nitrate risk score classification

Score	Potential nitrate risk to surface water
1 - 3	Low – low risk that surface water nitrate concentration may exceed 11.3 mg/l threshold and land uses are considered unlikely to be a significant diffuse source
4 - 6	Medium
7 - 8	High – considered to be high risk that surface water nitrate concentration may exceed 11.3 mg/l threshold and diffuse agricultural and/or urban land uses may be a significant contributing source.

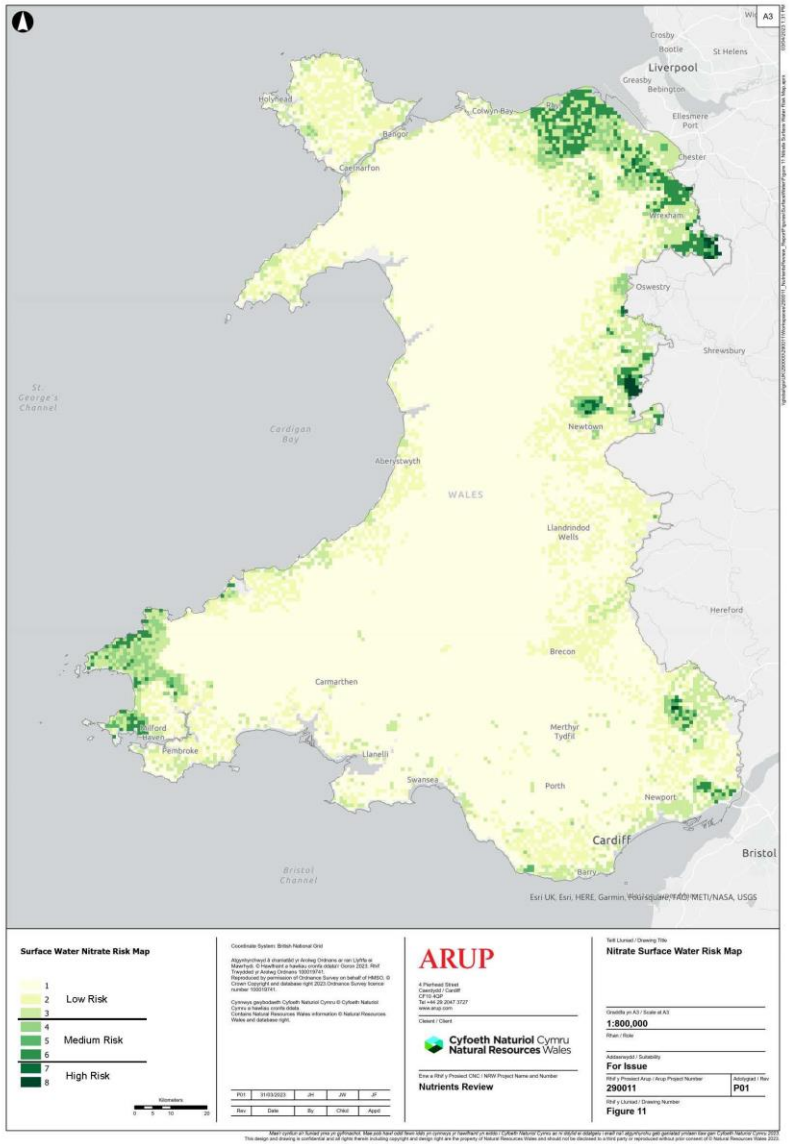
[29] https://smnr-nrw.hub.arcgis.com/apps/b3ae0327ed614fdda8745cab7870d0c9/explore

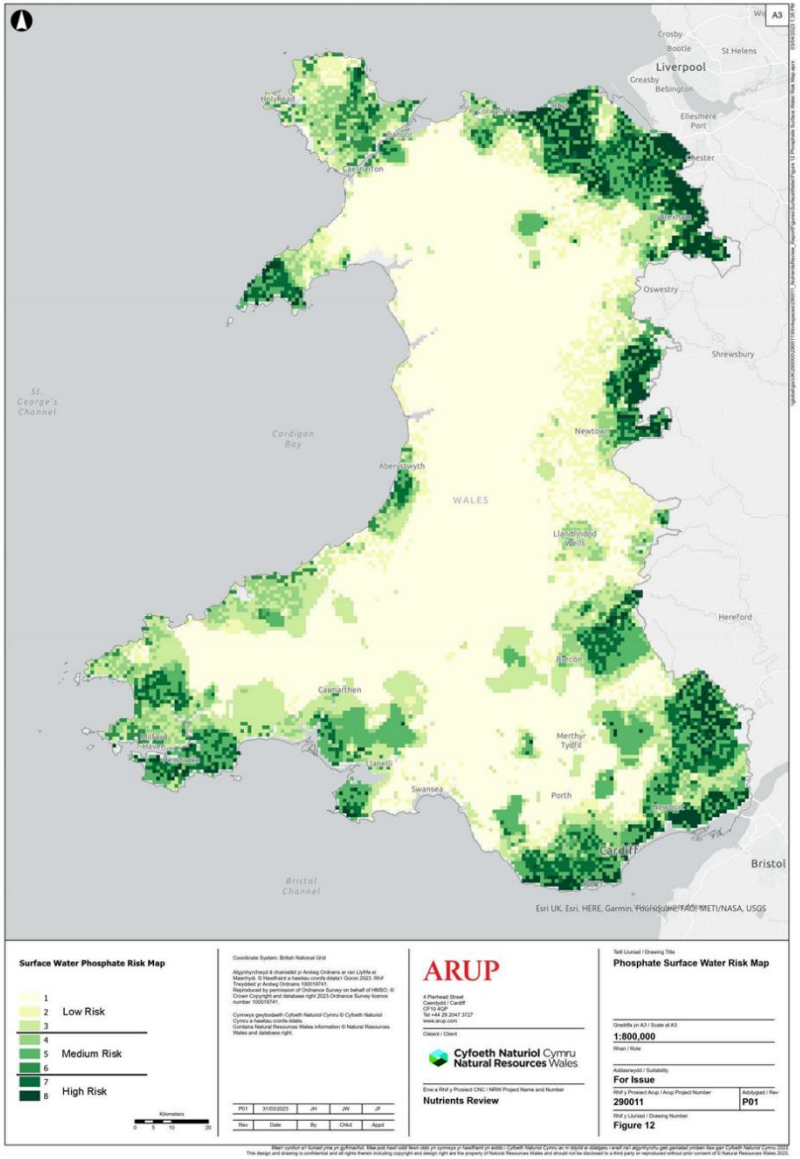
Table 6: Surface water phosphate risk score classification

Score	Potential phosphate risk to surface water
1 - 3	Low – low risk that surface water phosphate concentration may exceed 0.1 mg/l threshold and land uses are considered unlikely to be a significant diffuse source
4 - 6	Medium
7 - 8	High – considered to be high risk that surface water phosphate concentration may exceed 0.1 mg/l threshold and diffuse agricultural and/or urban land uses may be a significant contributing source.

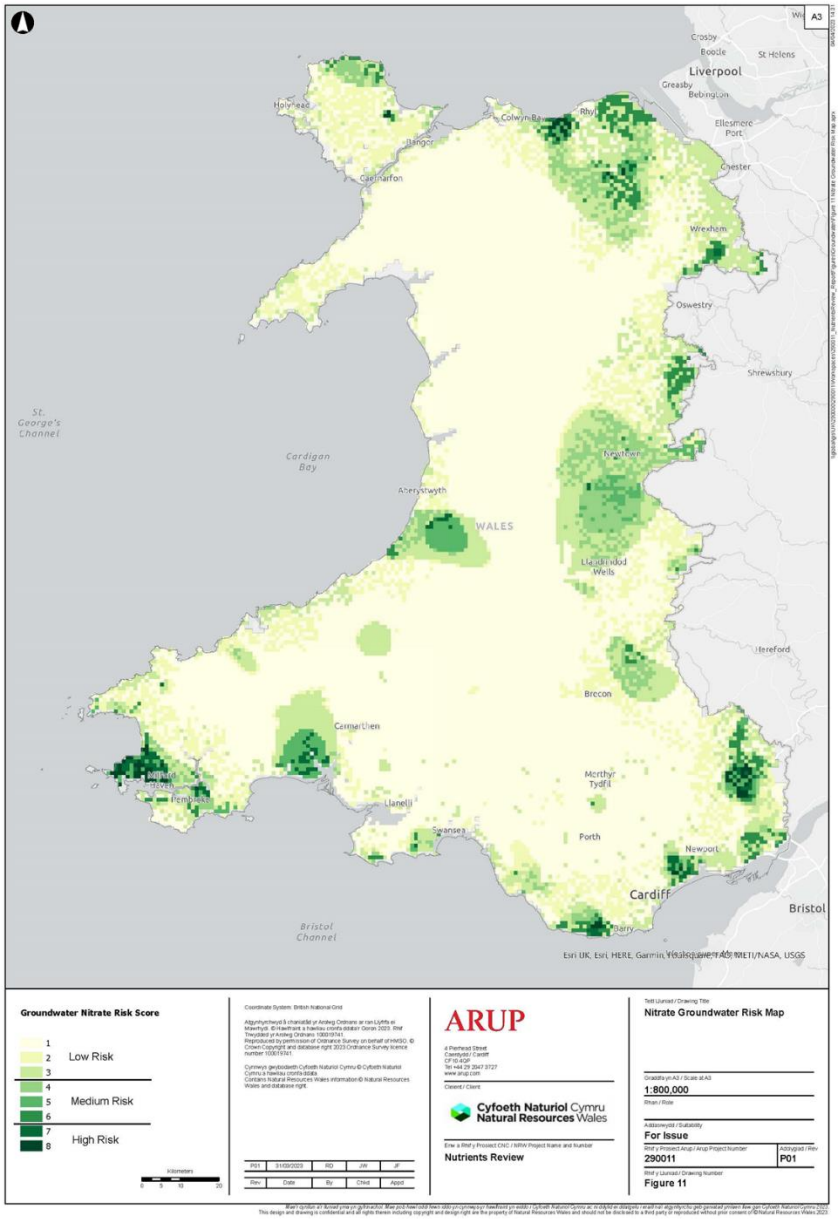
Modelling of nitrogen and phosphorus loading was also used to identify the significance of agricultural and urban land uses to any nutrient input to the water catchments

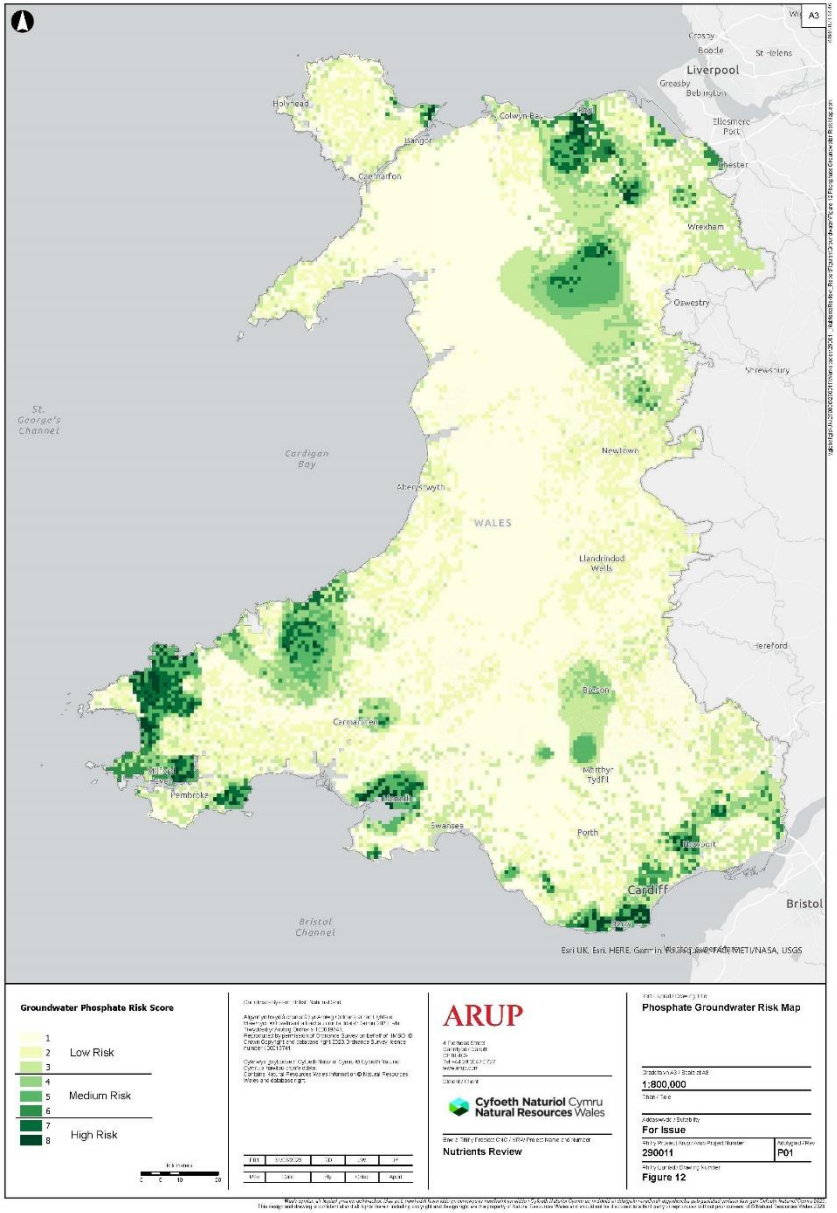
Map 2 (left): Surface Water Nitrate and **Map 3 (right):** Phosphate (right) risk





Map 4 (left): Ground Water Nitrate and **Map 5 (right):** Phosphate risk





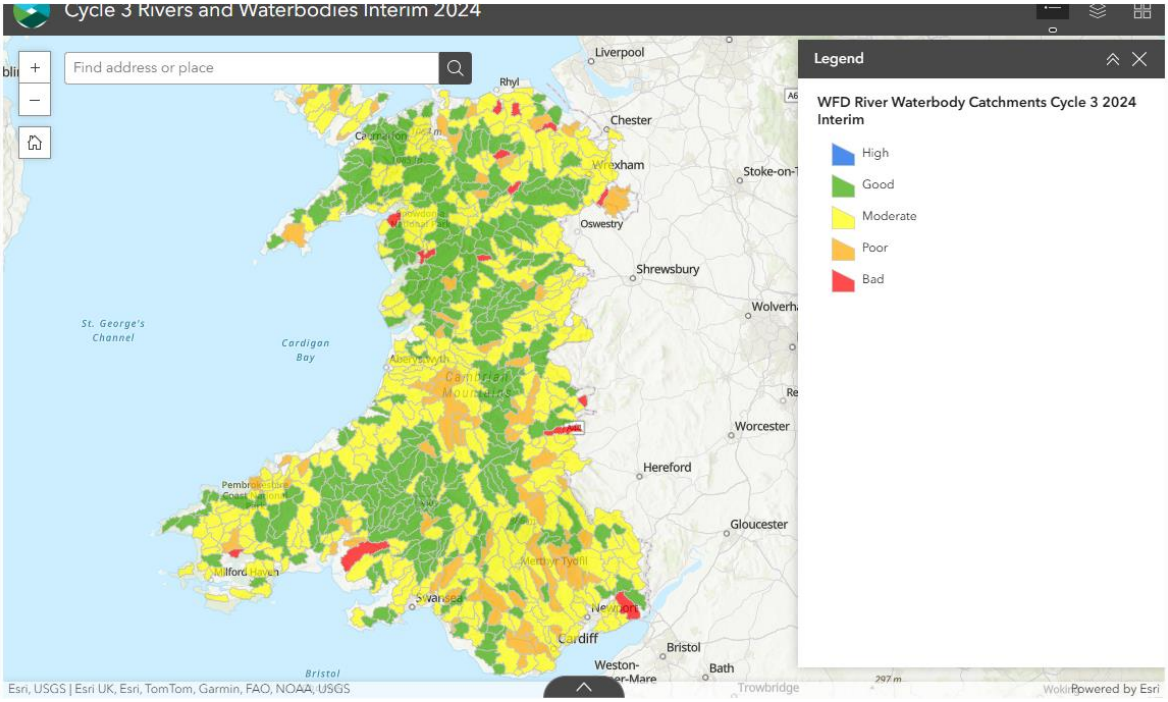
The above maps demonstrate risks vary geographically with both water and nutrient type. It also demonstrates a greater number of areas at higher risk from phosphate pollution than from nitrate pollution.

Water Framework Directive classifications

Every 3 years the status of all water bodies in Wales is classified in accordance with the requirements of the Water Framework Directive Regulations[30] and published in Excel and searchable via a map-based interface on Water Watch Wales[31]. Results are also reported in the River Basin Management Plans every 6 years. The classification includes status for nutrients in rivers, lakes, estuarine and coastal waters and groundwater. Note that Phosphorus is assessed for river, Total Phosphorus for lakes and Dissolved Inorganic Nitrogen is the nutrient of concern for marine areas.

If a waterbody is not meeting the objective of good or better status, then an investigation is carried out that aims to establish the reasons for not achieving good status (RNAG). This is also available to download from Water Watch Wales and may help an understanding of sources of nutrients and therefore where measures are most appropriate.

NRW published an updated Water Framework Directive Regulations interim classification (alongside the water quality compliance assessment for the Special Area of Conservation (SAC) Rivers) on 13 March 2025[32].

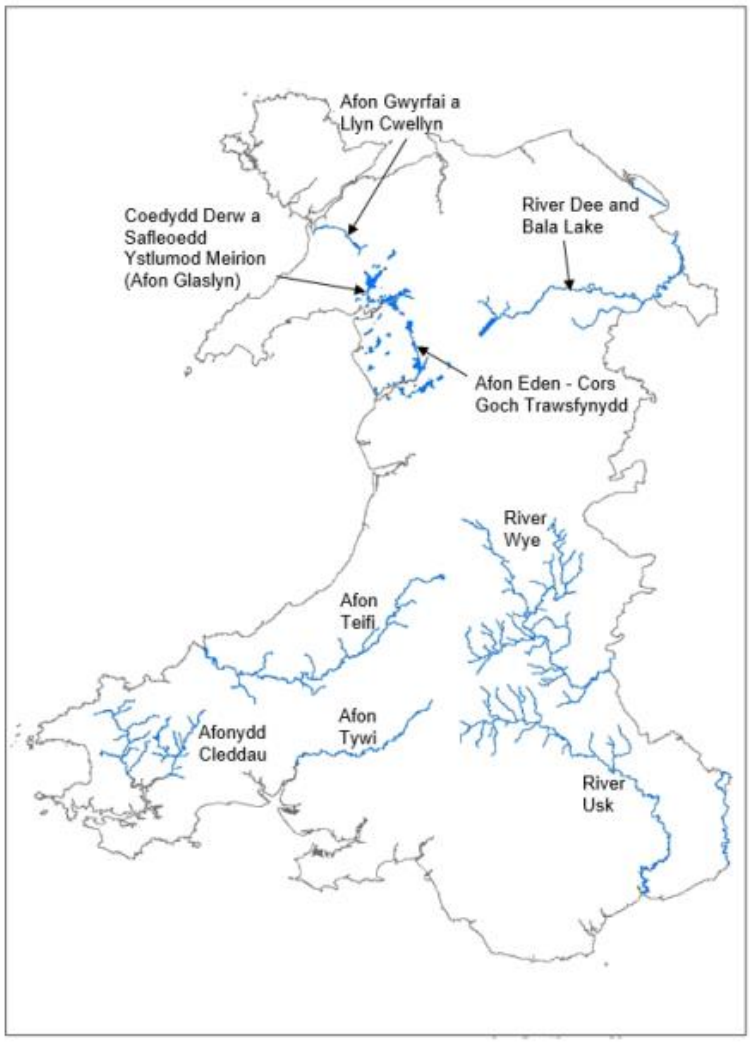


Map 6: Example of the publicly available interactive map of River Waterbody catchments from Water Watch Wales.

30 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
31 waterwatchwales.naturalresourceswales.gov.uk
32 Natural Resources Wales / New water quality data sheds light on health of Wales's waters

Special Areas of Conservation

There are nine river Special Areas of Conservation (SACs) in Wales – the Cleddau, Eden, Gwyrfai, Teifi, Tywi, Glaslyn, Dee, Usk and Wye. Each of these rivers are designated for a number of species and habitats protected under the Habitats Regulations[33], e.g. Atlantic Salmon, three species of lamprey, ranunculion, etc. Each of the features have Conservation Objectives which are published as part of the NRW Core Management Plans for the SAC. As part of the Conservation Objectives, NRW cite water quality targets which should be met for the feature to be in favourable condition.



Map 7: The nine river Special Areas of Conservation (SACs) in Wales

The Special Areas of Conservation (SAC) rivers compliance assessment report on the revised phosphorus targets was published in 2021 (Natural Resources Wales / Compliance Assessment of Welsh River SACs Against Phosphorus Targets). Of the nine SAC Rivers in Wales, five (Usk, Wye, Dee, Cleddau & Teifi) fail to meet the phosphorus targets from the 2021 compliance assessment. Overall, 107 waterbodies were assessed, 39% passed the new targets and 61% failed. In general, phosphorus

[33] The Conservation of Habitats and Species Regulations 2017

accumulates in rivers which means that a catchment management approach is required to address. The table below is taken from the report as a summary for each river SAC.

Table 7: Summary of the overall status of Welsh SACs in relation to phosphorus targets, as number of water bodies.

SAC Name	Passing	Failing (Episodic)	Failing (Consistent)	Not Assessed
River Dee & Llyn Tegid	5	2	1	1
Afon Gwyrfai a Llyn Cwellyn	2	0	0	0
Meirionnydd Oakwoods	3	0	0	0
Afon Eden – Cors Goch Trawsfynydd	3	0	0	0
Afon Tieifi	8	8	0	2
Afonydd Cleddau	5	5	5	4
Afon Tywi	2	0	0	1
River Usk	2	7	8	6
River Wye	14	11	17	3
Total	**42**	**33**	**31**	**18**

In 2022, NRW updated some of the targets, made some minor changes to the water bodies and reassessed data against any new targets. One additional water body failed after the reassessment[34].

The compliance assessment for the other water quality attributes in SAC rivers was published in 2024[35] but used the same data period as the phosphorus report. There are several failures of water quality indicators such as dissolved oxygen and biochemical oxygen demand across the SAC rivers. For nutrients there were four waterbodies in the Cleddau catchment which failed for total or unionised ammonia.

NRW published an updated SAC rivers water quality compliance assessment on 13 March 2025[36]. Preliminary results were shared with the chair of the review however as the results were not final at that point, previous assessments were used.

In the compliance assessment of Welsh River SACs Against Water Quality Targets[37] , the SACs with the most target failures were the Afonydd Cleddau, River Usk, River Wye and Afon Teifi. These results are consistent with issues related to organic pollution and nutrient enrichment, with widespread failures in the Cleddau, Usk and Wye catchments, and failures on the Teifi mostly in the lower catchment.

[34] Natural Resources Wales / Update to phosphorus targets for water bodies in Special Area of Conservation (SAC) rivers in Wales
[35] Natural Resources Wales / Assessment of water quality in protected rivers in Wales
[36] Natural Resources Wales / New water quality data sheds light on health of Wales's waters
[37] Compliance Assessment of Welsh River SACs Against Water Quality Targets

Marine assessments

In addition to riverine SACs Wales also has a number of marine SACs and Special Protection Areas (SPAs)[38] along the coast. The combination of riverine and marine conservation areas highlights the interconnected nature of the water ecosystem with land management practices. In 2018, NRW published indicative feature condition assessments for European marine sites[39]. These assessments used readily available evidence and expert judgement in an intensive, collective workshop process to provide an indication of feature condition at the site level.

Work is currently being undertaken on producing condition assessments for marine designated sites wholly in Wales. These reports are expected to be published later in 2025.

SAGIS Modelling

Additional Water quality modelling and reports not connected to the review have been produced by Dŵr Cymru Welsh Water (DCWW)[40] and were undertaken using the industry tool Source Apportionment Geographical Information System (SAGIS) for the nine SAC rivers. The tool is designed for informing wastewater planning decisions and as a result has received criticism when applied to an agricultural and land management context. However, the results indicate the majority of the phosphorus load for all failing SAC rivers is from rural land use, including agriculture.

Substantiated pollution incidents with impact to water

Natural Resources Wales collate data on the number of substantiated pollution incidents which impact water from agricultural sources. For an incident to be substantiated there must be evidence of the incident occurring and for it to confirmed as an agricultural source.

[38] Natural Resources Wales / Indicative feature condition assessments for European marine sites (EMS)
[39] Natural Resources Wales / Indicative feature condition assessments for European marine sites (EMS)
[40] SAC Rivers: Source Apportionment Reports | Dŵr Cymru Welsh Water

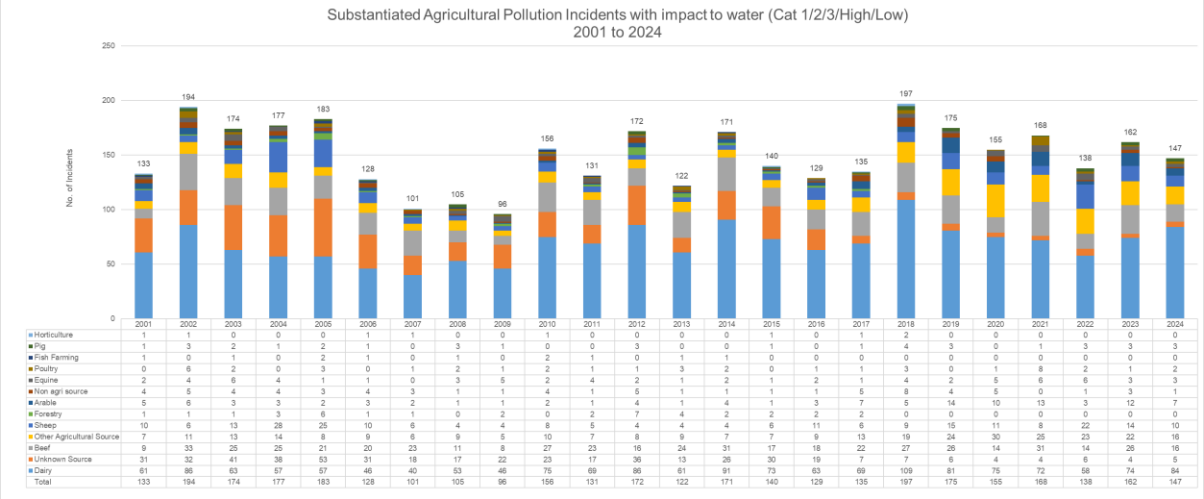


Chart 2: Substantiated agricultural pollution incidents with impact to water 2001 – 2024 *2024 values may be slightly undercounted due to outstanding investigation

The number of substantiated pollution incidents has not shown an improvement since the start of the time series in 2001 with an average of 150 incidents per year. There has been a decline since a peak in 2018 of 197 incidents however, it is only to 147, slightly below the long-term average and with potentially some incidents outstanding.

It is difficult to draw any firm conclusions from incident reporting alone as to the effectiveness of the regulations due to the wide variability of conditions such as weather, rate of reporting and ability to substantiate incidents could all impact on the trend.

Within the data the highest contributing sector to substantiated pollution incidents was the dairy sector, this highlights the risk associated with the inappropriate management of slurry.

Summary

Pollution from agriculture is not the only source of pollution in Wales' rivers, however it does contribute significantly to water bodies failing to meet good ecological status.

The impact of assessment periods covered by the water quality data and the transition periods contained within the CoAP regulations make it difficult to justify any correlation in the effectiveness of the regulations alone.

However, the risk posed by nutrients from manures to water quality is understood and is influenced by manure type, manure management (storage/spreading), catchment characteristics (soil type, topography, proximity to watercourses) and climate characteristics (principally amount/intensity of rainfall). These factors influence the mobilisation, delivery and overall impact of nutrients in receiving waters. Although the use of modelling is an important consideration models have been developed for different purposes but together they show the scale of the nutrient pollution issue.

Stakeholder experience

Throughout the review period the review chair engaged with a number of stakeholders on the implementation and impact of the regulations to complement the statistical evidence of the review. This included utilising existing stakeholder networks including the Wales Land Management Forum Subgroup on Agricultural Pollution, engaging directly with relevant organisations and speaking directly with farmers at the Royal Welsh Agricultural Society Winter Fair. A full list of engagements held between the chair and relevant stakeholders is available in annex B. The following headings summarise the discussion from this engagement activity.

Implementation

Many farmers and representative bodies highlighted the sector was not engaging with the requirements of the regulations because they did not understand the purpose of regulations and how they were meant to improve water quality. A number of conflicts with other ambitions were highlighted which are explored further below.

Some felt the agricultural sector was being targeted disproportionately and there was a strong frustration from all stakeholders that previous poor practice had not been sufficiently addressed prior to the introduction of the regulations. Therefore, within the agricultural sector there was a feeling the many were being punished for the actions of the few and the regulations were not proportionate to the risks or relevant to the geographies.

It is recognised from the engagement the implementation of the regulations has contributed to a negative impact on well-being for many farmers and contractors at a time of significant uncertainty. Challenges related to the implementation of individual aspects of the regulations are explored in more detail in the following sections.

There was significant concern amongst agricultural stakeholders for holdings under bovine TB (bTB) restrictions and the impact of restrictions on the ability to comply with the requirements of the regulations. It was felt the lack of a clear exemption or guidance for holdings under bTB restrictions added significant additional stress.

Environmental stakeholders welcomed the clarity the regulations provided in certain situations, such as closed periods and improvement to the enforcement environment, highlighting failures under the existing regime and a failure of farm assurance schemes and voluntary approaches to address poor practice. However, it was felt regulatory gaps remained, particularly in regards to soil management and erosion which is a major pathway for nutrient pollution and addressing high levels of Phosphorus from diffuse pollution.

Nutrient Management Plans

Nutrient Management Planning (NMP) was considered by most stakeholders to be beneficial to businesses both in terms of maximising the efficiency on nutrients on farm and reducing the risk to the environment. However, the nitrogen plans required by the regulations were viewed as overly complex and not reflective of how farm businesses structure their nutrient management and operate in practice.

As a result, a large number of agricultural stakeholders simply viewed the nitrogen management plans as a paper exercise with little real-world value. It was highlighted many farms simply outsourced the work to agents or another third party, with the resulting documentation relied upon for inspection purposes only, adding a further cost pressure to the business with no benefit in return. The workbook provided by Welsh Government was thought to be inadequate and the requirement to use pro-rata values invalidated the outputs of the plans.

These frustrations were compounded upon inspection, where many felt they were proving their innocence and, due to the complexity of records, some assessments were not able to be completed during the inspection visit.

It was generally agreed nutrient management planning and spreading to crop need, based on localised conditions where possible, had both business and environmental benefits for farms. It was, however, felt that both the regulations and the Enhanced Nutrient Management approach did not offer farms any business benefit in regards to nutrient management planning as they were not farm relevant. An example was cited where an established crop rotation cycle, based on environmental good practice and established nutrient management planning was impacted by the limit of 250kg/N/ha within any 12-month period.

Issues were raised by both the farming sector and the regulator regarding the definitions and terms used within the regulations. It was reported this made it difficult for farmers to understand either what was being asked or units contained within the regulations were not those being used in practice and conversions were difficult to undertake.

Additionally, concerns were raised in respect of low input and extensive farms having to undertake the same level of nutrient management planning as more intensive farms and this was not proportionate to the risk.

The impact of the 170kg/N/ha limit

There was significant opposition from agricultural stakeholders to the 170kg limit. Many felt it disproportionately impacted those within the dairy, beef and poultry sectors. Also, that the differentiation between livestock manure and other organic manures and a different in field limit of 250kg/N/ha did not make sense on-farm.

Changes were reported to the management of holdings as a direct result of the 170kg limit being introduced, but it was felt these changes came in most cases at an economic cost to the farmer. For example, in a survey undertaken by NFU Cymru 38% of farms which responded had been impacted by the 170kg limit, with the most common actions being to reduce livestock numbers or rent more land, although this does not take into account compliance with other regulatory requirements such as Environmental Permitting Regulations.

However, some environmental stakeholders felt the impact of diffuse pollution from phosphorus, which the 170kg limit is in part intended to mitigate, was poorly understood and many farmers believing they were operating in an environmentally responsible manner, as they had not had any point source incidents, may in fact be

polluting. There were also concerns the 170kg limit did not take into account any localised factors, such as existing phosphorus indexes on farms, soil types and catchment sensitivities.

It was also felt this aspect of the regulation conflicted with other ambitions of the Welsh Government, or those of the farming sector. A conflict between the 170kg limit for livestock manures and aspects the broader ambitions of Net zero and the circular economy was cited in this regard. This is due to farms not being able to apply livestock manures above the 170kg limit, even though grassland generally has a higher demand for nitrogen. As a result additional nitrogen is added in the form of manufactured nitrogen, which is carbon intensive both in its manufacture and transportation. This viewpoint, however, did not take into account if the additional phosphorus applied above 170kg/N/ha would exceed crop need, but did highlight a frustration that Welsh Government policy did not appear to be joined-up.

Biodiversity concerns were raised by agricultural and environmental stakeholders, regarding previous habitat land being intensified either to facilitate the spreading of additional manures, either on farm or as an export destination to comply with the 170kg limit. Additionally, concerns were raised by farming stakeholders about the reduction of cattle in upland environments and the impact on upland habitats.

Discussions with supply chain businesses highlighted concerns regarding the throughput of agricultural products and the resulting economic impacts. It was felt Welsh Government had invested in capacity building within the supply chain which would be impacted by a lower throughput of product, with detrimental impacts on economic output and jobs.

The closed period

The closed period for the spreading of manures with a high readily available nitrogen content attracted a significant criticism, in particular the notion that a farming by calendar approach does not work.

There was significant criticism of the impact of the closed period on the agricultural contracting sector, in particular relating to the staffing of specialist slurry spreading operations and the impacts on cashflow and availability of equipment post closed period. It was also noted these contractors had access to a larger array of low emission spreading equipment which would allow greater precision, but farms may not utilise it due to poor availability post closed period.

Many agricultural stakeholders and farmers were concerned about conditions not being suitable for spreading after the re-opening of the closed period. Some suggested there may be a ‘spike’ in pollution post closed period as farms seek to empty slurry stores.

Additionally, some stakeholders were of the opinion allowing spreading in the closed period negated the need for a minimum of 5 months storage of slurry, which would save farms potential additional costs. However, this viewpoint did not consider the suitability of conditions across the autumn winter period, or if there was suitable crop demand for the nutrients being applied.

However, environmental stakeholders believed the closed period to be beneficial by providing greater clarity to when the spreading of manures is higher risk. It also allowed for simplified reporting of bad practice and greater enforceability of the regulations.

Storage requirements

Several issues relating to the on-farm storage of manures and silage were raised through the engagement process.

Concerns were raised from several stakeholders and the regulator about the construction standards contained within the regulations and silage stores. It was noted a higher number of farms were non-compliant with the construction standards of the regulations, and many had been constructed post-1991 when the Silage, Slurry and Agricultural Fuel Oil Regulations[41] were introduced. Many of the non-compliances related to the drainage channels around the perimeter of the store and did not pose a significant risk of pollution. However as non-compliant stores they were subject to penalties under the cross-compliance regime and in a written statement published on 15 October 2024[42] more proportionate penalties were introduced. However, the need for a longer-term solution was identified by stakeholders. Additionally, the need for the schedules to accommodate a wider range of designs was reported.

The issue of non-compliance on tenanted farms was raised as an issue, particularly where the infrastructure was not sufficient and was the responsibility of the landlord, or where permissions required from the landlord for the upgrading are refused. There were also concerns about tenancy agreements and the impacts this can have with other measures of the regulations. Although it was recognised NRW's enforcement approach took tenancy agreements into account it was thought improvements to the regulations relating to responsibilities could make the regulations clearer for both tenants and landlords. It was recognised there was a need to understand how the regulations interacted with individual tenancy agreements, recognising they could be complex.

The planning process, when undertaking improvements to or replacements to slurry and silage stores, was a source of significant frustration for many stakeholders. Delays and additional screening requirements [43]were cited as the greatest concern. Although the planning requirements are outside the scope of the review, the impact of not having appropriate storage to meet the requirements of the regulations does limit their effectiveness.

Soil management and protection

The importance of minimising soil loss was recognised by a majority of stakeholders as ensuring soil remained on farm was beneficial for the economic performance of

[41] The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991
[42] gov.wales/written-statement-water-resources-control-agricultural-pollution-wales-regulations-2021-closed
[43] Natural Resources Wales / Ammonia assessments for developments that require a permit or planning permission

the farm and the environment. However, some agricultural stakeholders did not feel it needed to be a regulatory requirement and would be better addressed through voluntary measures or support schemes. There was also concern it could impact the ability to utilise crops, which would be more economically beneficial to the farm and so impact on the viability of the business.

Environmental stakeholders were concerned about the increased risk presented by bare soil resulting from cropping such as maize and stubble turnips and the risks of soils being less protected as a result of potential future changes to the cross-compliance regime.

Innovation

Many stakeholders highlighted the potential for innovation and technologies to provide better outcomes, this included technologies being developed at Gelli Aur College farm and further afield. However, it was felt the prescriptive nature of the regulations prevented farms from undertaking innovative activities which may deliver a better outcome as the regulations may prevent their use, e.g. nutrient management planning requirements. It was felt existing routes for innovation made it difficult for products or services to be brought to the market.

It was also felt where there had been innovation, such as feed additives to reduce phosphorus, manure treatments or alternative storage designs, there was no incentive to utilise these as the contents and values of the schedules were prescriptive, with no alternative regulatory mechanism.

NRW Enforcement outcomes

To support the introduction of the Regulations a new Service Level Agreement with Natural Resources Wales was developed for farm inspections. The data below covers the outcomes of these initial inspections up to the end of October 2024.

The initial phase of inspections was to focus on ‘higher risk’ farm types, these include any holding which produce, store or carry out land spreading activities of organic manures. In total 596 farms had been inspected by the end of October. Inspected farms in receipt of Basic Payments or any other grant support from the Welsh Government are covered by the Cross Compliance regime and any breaches of the Regulations may be eligible for a penalty.

On 15 October 2024 the Deputy First Minister issued a Written Statement[44] outlining some amendments to Cross Compliance Verifiable Standards ‘to place a greater emphasis by strengthening penalties on the activities known to cause pollution, whilst introducing more proportionate penalties where full assessments of records can be made and where technical non-compliances do not present a pollution risk’.

Farm Land Size (Ha)

[44] Written Statement: The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 Closed Periods and changes to the Cross Compliance Verifiable Standards SMR1: Water Protection (15 October 2024) | GOV.WALES

Farm Area (Ha)	Number	Percentage
More than 500ha	24	4%
201-500ha	187	31.4%
101-200ha	218	36.6%
51-100ha	125	21%
Less than 50ha	42	7%

Farm Ownership

Farm Ownership	Number	Percentage
Owner	471	79%
Owner but rents some land	45	7.6%
Tenant	71	11.9%
Tenant but owns some land	9	1.5%

Data collection was improved in September 2024 to identify where non-compliance occurred on a tenanted holding or land if the non-compliance was the responsibility of a third party e.g. a landlord. A total of 33 non-compliances have been identified as the responsibility of a third party.

Main Business

Main Business	Number
Dairy	369
Beef	178
Sheep	28
Free range poultry non-EPR	10
Free range poultry EPR	4
Arable/combinable crops	3
Housed poultry EPR	2
Housed poultry non-EPR	2

The majority of farms inspected were dairy farms followed by beef farms, a combined total of 18 poultry units were inspected of various sizes, a poultry unit over 40,000 birds requires an environmental permit under the Environmental Permitting Regulations 2016[45].

Animal Disease status

Animal Disease status	Number	Percent
Not under restriction	501	84
Under restriction	95	16

[45] The Environmental Permitting (England and Wales) Regulations 2016

In total 95, or 16% of farms inspected were under a form or restriction due to a animal disease on farm. These restrictions were most likely due to Bovine Tuberculosis (bTB).

Farm Assurance

Farm Assurance	Number	Percent
Yes	552	92.6
No	44	7.4

For the purposes of monitoring the farm assurance status of farms was collected, 92.6% of farms were participating in a farm assurance scheme.

Compliance with the Regulations

The table below outlines farm compliance with the Regulations. Farms must be in full compliance with the requirements of the regulations relevant at the time of inspection to be compliant. A non-compliant farm may have more than one non-compliance.

Compliant with all measures	Number	Percent
Yes	243	40.8
No	353	59.2

In total 353, or 59.2% of farms when inspected had a non-compliance with the Regulations. Some of the most common reasons for non-compliance are outlined below.

Common areas of non-compliance

Slurry storage	Number of farms carrying out activity	Compliant	Non-compliant
Slurry storages* post 91	596 (490 stated producing slurry)	433	62
Slurry storages* pre 91		398	68
Storage period capacity		453**	137

***Some farms will have more than one slurry store

** full requirements for the storage capacity came into force on 1 August 2024, data collected to identify storage capacity issues

Slurry storage non-compliances were identified for both the construction requirements and the storage capacity available. When combined 130 (15.6%) slurry stores did not comply with the requirements of the CoAP regulations. More than 50% of stores inspected were of pre-1991 stores which were exempt from the SAFFO construction requirements, of these 62 or 14.3% were non-compliant, this means they posed a risk of pollution or were inadequately maintained . For stores constructed post 1991 there was a need to meet the construction standards of the SAFFO regulations there was a higher failure rate of 17.1%.

In relation to storage capacity 30.2% of farms did not have the required level of storage at the time of inspection to meet the requirements of the CoAP regulations. Insufficient storage also impacts upon a farm's ability to comply with other requirements of the regulations such as the closed period.

Silage clamps	Number of farms carrying out activity	Compliant	Non-compliant
Farms with Silage clamps* post 91 (237 farms with one or more clamps)	386	354	235
Farms with Silage clamps* pre 91 (301 farms one or more clamps)		487**	61

***Some farms will have more than one silage clamp of differing ages

** clamps posed a significant risk of causing a pollution so required to meet CoAP regulations requirements

High rates of non-compliance have been found with silage clamps, primarily relating to the construction requirements, in particular the absence of external drainage channels. The construction standards remained consistent with the pre-existing SSAFO requirements. In recognition many of these stores were technically non-compliant but otherwise well-constructed, contained any effluent generated and did not pose a pollution risk the cross-compliance penalties were revised.

Record Keeping	Number of farms carrying out activity	Compliant	Non-compliant	No Data recorded
Risk Map	596	544	54	
Nitrogen Management Plan	596	499	99	
Nitrogen Spreading Records	596	110	9	477 (Pre-data recording changes)

The largest areas of non-compliance for the record keeping requirements were the nitrogen management plan with 16.6% of farms not having a compliant nitrogen management plan, with a further 9% of farms having non-compliant risk maps.

However, as explored above there has been strong criticism from the sector regarding both the complexity and relevance of the nitrogen management plans. Several stakeholders reported the nitrogen management plans and risk maps were being completed by third parties, such as agents, for the purpose of compliance.

Nitrogen spreading records	Number of farms carrying out activity	Compliant	Non-compliant
250kg/N/ha limit field limit	596	548	50

Manufactured fertiliser closed period	596	563	25
Maximum N	596	551	46

The most common non-compliance for nitrogen spreading records was failure to comply with the 250kg/N/ha 12-month limit for organic manure applied to individual fields.

Additional evidence relating to key areas of regulations

This section explores in greater detail the technical background to several key areas of the regulations and provides further context to issues discussed in Section 3 of the Review – Principles, synergies and conflicts. Many of the areas were originally explored in detail in the Regulatory Impact Assessment which accompanied regulations as part of the Explanatory Memorandum[46] when the regulations were originally laid. This section does not replace this assessment and seeks to build upon stakeholder experience and feedback.

Nutrient Management Planning

Nutrient management planning is well established good practice and has been a feature of the Code of Good Agricultural Practice since 2011[47] which highlighted the below benefits to good nutrient management planning.

> ‘following a nutrient management plan will ensure efficient use of fertilisers and organic manures and can:
>
> - limit nitrate leaching to surface and groundwater;
> - prevent the unnecessary accumulation of phosphorus in the soil and its potential transfer to the water environment;
> - reduce the risk of nitrous oxide (a greenhouse gas) being lost to the atmosphere;
> - improve soil structure.’

The RB209 nutrient management guide[48] published by AHDB provides further detailed guidance on nutrient management and highlights the need to manage in accordance with localised conditions such as soil type, cropping history, soil analysis of macro nutrients and winter rainfall. It also highlights the nutrient management planning has combined economic and environmental benefits and that ‘for good nutrient management, the total supply of nutrients from all sources must meet, but not exceed, crop demand’.

[46] Explanatory Memorandum to the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021
[47] Code of good agricultural practice | GOV.WALES
[48] NutManGuideRB209S1_230526_WEB.pdf

This is consistent with established requirements under the Environmental Permitting Regulations (England and Wales) 2016 and NRW statement on when are manures and slurry considered as waste[49]. Evidence in the original explanatory memorandum[50] from identified that more precise use and application of manufactured nitrogen fertiliser is likely to reduce nitrate losses from the combined fertiliser and soil nitrogen supply by between 5 and 10% for both arable and grassland. Additionally, evidence from the 2nd Welsh Farm Practice Survey[51] (Anthony et al., 2016) found a baseline of 56% of dairy farmers had a soil nutrient management plan, but only 25% of cattle and sheep farms in Severely Disadvantaged Areas. Farms in agri-environmental schemes at that time (Glastir, Tir Gofal or Tir Cynnal) were more likely to have soil nutrient management plans.

The nutrient management plan requirements of the regulations take the form of a nitrogen management plan, which is consistent with the approach previously utilised within the Nitrate Pollution Prevention (Wales) Regulations 2013[52]. It is also consistent with other requirements across the UK as demonstrated in annex A. In particular the Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018, known as the farming rules for water, places significantly greater requirements before the application of fertilisers, including organic manures.

The inclusion of a wider range of nutrient and soil considerations such as pH is particularly important when considering the application of organic manures, which naturally contain a wider range of nutrients than manufactured fertilisers.

Nitrogen application limits from organic manures

Within the Control of Agricultural Pollution regulations there are limits to the amount of nitrogen which can be applied. These take the three different forms,

- A limit of the amount of nitrogen which can be applied from livestock manure either through direct deposition by animals or by spreading across a calendar year of 170kg per hectare (170kg/N/ha) on a whole holding basis. The ‘170kg limit’.
- A limit on the amount of nitrogen from organic manure which can be applied to an individual hectare of 250kg in any 12-month period. The ‘250kg limit’.
- Individual crop limits for all fertiliser types.

The 170kg limit has been a feature of the EU’s Nitrates Directive and resulting Nitrates Action Programmes including the previous applied Nitrate Pollution Prevention (Wales) Regulations 2013[53].

The 170kg limit is consistent, in respect of grass and other crops with a high nitrogen requirement (circa 340kg/N/ha), with the nutrient management guide RB209[54]

[49] Natural Resources Wales / How to use manures and slurries appropriately
[50] Explanatory Memorandum to the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021
[51] (PDF) Glastir Monitoring & Evaluation Programme. Final report
[52] The Nitrate Pollution Prevention (Wales) Regulations 2013 (revoked)
[53] The Nitrate Pollution Prevention (Wales) Regulations 2013 (revoked)
[54] Nutrient Management Guide (RB209) | AHDB

recommending organic material application should supply no more than 50–60% of the total nitrogen requirement of the crop. Manufactured fertiliser should be used to make up the difference, with applications of organic manure being made in late winter to summer, which may also be beneficial in reducing phosphorus losses.

Following commitments made as part of the Co-Operation Agreement with Plaid Cymru in the Written Statement of 5 October 2022[55] a specific economic impact assessment has been undertaken on the 170kg limit from livestock manure. This assessment can be viewed in full in annex C. This assessment viewed the 170kg limit requirements in isolation from the other requirements of the regulations and utilised data from 2019, which was before any impacts of the regulations and did not consider compliance with any additional regulatory requirements, such as Environmental Permitting Regulations (EPR). The analysis showed the greatest impact was on larger farms primarily in the dairy sector and poultry sectors.

Similarly both the 250kg limit and the individual crop limits are intended to prevent the over application of organic fertilisers to prevent the risk of pollution from both nitrogen and phosphorus, taking into consideration crop requirements. For solid manures it is likely that applications will supply more phosphate and potash than is used by a crop in a single year. Consequently, annual applications of manure to the same field can increase soil phosphorus contents to levels where there is an increased risk of phosphorus losses to water[56].

Phosphorus (P) management

A key challenge relating to nutrient management is the management of phosphorus, in particular how it exists within soils where is it bound in forms which are not readily available to the plant and this is highly dependent upon factors such as soil type. This makes managing crop available phosphorus challenging, with a need to manage sufficient amounts in the soil for the needs of a crop rotation rather than an individual crop.

AHDB's Nutrient Management Guide (RB209) uses a soil P index system (based on the Olsen extractable P levels in topsoil) to provide guidance on P supply from manufactured fertilisers and organic materials. For grassland and most arable crops the target soil P index is 2 (16-25 mg/l Olsen P). For soils below the target index it is recommended to apply P at rates which exceed crop offtake to ensure optimum crop yields and to build up soil reserves. Where soils are at target index, fertiliser rates should match crop offtake to maintain soil fertility at optimum levels and where soil P levels are above target index, P fertiliser applications are not recommended as they represent an unnecessary cost and increase the risk of P losses to water.

[55] Written Statement: Cooperation Agreement: Agricultural Pollution (5 October 2022) | GOV.WALES
[56] Explanatory Memorandum to the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021

The overall challenges of utilising manures as a fertiliser source is summarised by Massey, R and Gedikoglu, H in the paper Manure application rules and environmental considerations (2021)[57].

> ‘the nitrogen (N) to phosphorus (P) ratio of manure does not match the N:P ratio needed by crops. Farmers must choose which nutrient to use to determine their application rate.
>
> ‘Applying manure to meet crop N needs frequently results in P being applied in excess of crop needs (Kellogg et al., 2000). Applying to meet only P removal results in supplying less N than needed by the crop (Lory et al., 2004). Phosphorus based applications are expected to reduce P runoff by ensuring that all P applied is removed by harvested crops. The environmental hazards of improper manure application have been well documented (Tang et al., 2018; Amann et al., 2018).’

The availability of uptake and fixation of phosphorus is linked to wider soil and environmental conditions, one of the most significant being the soil pH and how this reacts to other elements and mirco-nutrients within the soil. The longstanding principle of phosphorus availability being highest around neutral remain ‘generally sound’[58].

Within the challenges of managing phosphorus on holdings is the risk of surplus phosphate remaining within the soil. A combination of reducing the number of livestock and processing of livestock manures to recover renewable fertilisers that can substitute for imported P products is needed to effectively reduce the P surplus[59].

Soil pH

The soil pH is an important determinant of a crop’s ability to absorb nutrients as part of the growing cycle. The RB209 fertiliser manual[60] highlights the overapplication of some nitrogen fertilisers and other practices may lead to increased acidification of soils resulting in a detrimental impact on the crop’s ability to take up nutrients, including phosphorus.

Soils which are regularly outside of the optimum range of pH for both the crop and soil type may increase the risk of pollution. Recent assessments of soil sampling undertaken via the farming connect programme[61] highlighted less than half of soils were in the optimum pH range and 53.3% were below the optimum range, this included 58.9% of soils in the northwest and 58.6% in the southwest. Evidence from

[57] Manure application rules and environmental considerations - ScienceDirect
[58] A Critical Review on Soil Chemical Processes that Control How Soil pH Affects Phosphorus Availability to Plants Penn et al (2019) Agriculture 9(6):120
[59] Evidence provided by the RePhoKus project to 2021 Water Summit - Resilience Phosphorus UK – Re-focusing phosphorus use in the UK food system
[60] Nutrient Management Guide (RB209) | AHDB
[61] Summary of Farming Connect Soil Results 2023/2024 | Farming Connect

NRM Cawood[62] a national laboratory for soil sampling and analysis further demonstrates low pH values in grassland soils in Wales.

The Enhanced Nutrient Management approach

The Enhanced Nutrient Management approach was developed following a consultation[63] on a licensing scheme to provide a time limited approach to the end of 2024. The approach was designed to allow for a higher rate of application up to 250kg/N/ha of grazing livestock manure. With additional controls relating to soil sampling and Phosphorus as well as additional land management requirements.

During the consultation there was strong support for a scheme with over 1000 respondents to the consultation with the majority in support of a scheme. The Explanatory Memorandum[64] which accompanied the Regulations estimated 471 farms, or 1.9% likely to partake in the approach, predominantly from the dairy sector. In total 9 farms undertook the approach, significantly lower than anticipated.

As demonstrated in annex A opportunities to apply beyond 170kg/N/ha from livestock manures exist across the UK. Where previously when members of the EU derogations from the requirements were sought from the EU. The implementation of any limit above 170kg/N/ha or the removal of any limit would need to take into account the risks to the Trade and Co-operation Agreement and the requirement for equivalence.

Closed periods

Closed periods for the spreading of organic manures with a high readily available nitrogen content (RAN) have been a feature of the EU Nitrates Directive and resultant action programmes. It is also consistent with other areas of the UK as demonstrated in annex A. Spreading of other manures with do not have a high RAN, such as farmyard manure reflects the lower risk of nitrate leaching loss risk as a result of a lower RAN content. However, the risks of losses to the environment do remain when using lower RAN manures and this was explored further in the consultation on Designated Areas and Action Programme to Tackle Nitrate Pollution in Wales in 2016[65].

As demonstrated in the background section of this evidence pack the majority of Wales' agricultural area is grassland of various types. There are benefits to ensuring applications are undertaken when crop demand is greatest, with RB209 highlighting spring or early summer being the optimal time for application of nitrogen, when sward demand is the greatest[66].

There is also an economic benefit to farms to applying manures at optimum times. The nitrogen fertiliser replacement value of organic manures can be increased by applying manures in spring to reduce nitrate leaching losses. For slurries, the use of

[62] Soil Summary - NRM
[63] Nutrient management: managing the application of livestock manures sustainably | GOV.WALES
[64] Explanatory Memorandum - Enhanced Nutrient Management approach
[65] 160929-nitrate-vulnerable-zones-consultation-en.pdf
[66] RB209 Section 3 Grass and forage crops | AHDB

precision application techniques can reduce ammonia emissions and ensure that applications are spread evenly. In order to maximise the nitrogen value of slurry and poultry manures it is usually necessary to apply them in spring to minimise nitrate leaching losses. The use of low emission spreading techniques such as trailing hose on arable land and trailing shoe and shallow injection of grassland will reduce ammonia losses and further increase the nitrogen value of slurry[67].

Storage requirements

There have been requirements for the storage of slurry and silage since the introduction of the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991[68], known as the SSAFO regulations. The SSAFO regulations contained a provision for exempting previously constructed stores from the requirements, known as exempt structures. Welsh Government has long recognised that the exemptions to the construction standards of the pre-1991 silage and slurry stores, carried forward into the CoAP Regulations, represent an increasing risk of pollution as stores age. It previously consulted[69] on changes related to the exemption, amongst other matters, in which it also recognised that the replacement of older stores would be an unnecessary burden in some circumstances, with its own environmental consequences.

The SSAFO regulations included the requirement for a minimum of 4 months storage of cattle slurry, this was calculated on using M5 rainfall data, which is the maximum amount of rainfall expected in a 5-year period (which is greater than the average). The CoAP regulations however utilise 5-months average rainfall when calculating the requirement.

Within the explanatory memorandum[70] for the impacts of storage were considered under the definition “Do not spread slurry or poultry manure at high-risk times”. The methodology used to determine these figures uses soil moisture deficit as a measure of a ‘high-risk time’. As such, the range was determined for 6 months storage (October to March), as the soil moisture deficit in Welsh soils is unlikely to be sufficient for slurry or poultry manure applications until end March/early April.

However, whilst the CoAP Regulations mandate a minimum level of storage, in many cases, this level of storage may not provide sufficient capacity where the store cannot be emptied prior to the closed period. Sufficient storage would still be needed to ensure farms can store slurry until it is appropriate to apply it to the land in accordance with soil and weather conditions and crop need.

[67] Explanatory Memorandum to the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021
[68] The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991
[69] Review of the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (Wales) Regulations 2010
[70] Explanatory Memorandum to the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021

Ammonia NH_3

Ammonia (NH_3) is a major atmospheric pollutant which is harmful to human health and causes acidification and eutrophication of soils, habitats and fresh waters. In low concentrations on its own, ammonia has no direct impact to human health but combined with other industry pollutants e.g. carbon dioxide and sulphur dioxide, the particulate matter created can cause cardiovascular and respiratory diseases. This particulate matter can travel afar, contributing to air pollution background levels in urban areas. The Clean Air Plan for Wales, Healthy Air, Healthy Wales[71] highlights the importance of clean air for public health.

When deposited on land, ammonia can acidify soils and freshwaters, 'over- fertilising' natural plant communities. The extra nitrogen can increase the growth of some species such as rough grasses and nettles, which out-compete other species such as herb species which have lower nitrogen requirements.

Wales is bound by international and domestic law to reduce its ammonia emissions. The National Emission Ceilings Regulations 2018 sets a target for a reduction of ammonia emissions of 16% by 2030 from the 2005 emissions levels.[72]

Most agricultural soils in the UK contain little plant-available nitrogen, hence the need for supplementary nitrogen fertilisers and organic manures. Not all the nitrogen is taken up by plants; large amounts (about 50%) are lost to the environment as a pollutant through evaporation (or volatilisation), bacterial chemical conversion processes in the soil (known as nitrification and denitrification) or through run-off or leaching. This impacts air quality, water quality and contributes to climate change and biodiversity decline.

In Wales, the area of land adversely impacted by ammonia in Wales has increased by approximately 18% between 2010 and 2021. Defra UK Air Pollution Trends report, 2023[73] confirms ammonia pollution continues to be a significant issue.

The Control of Agricultural Pollution Regulations target agricultural activities which present a risk of pollution to reduce the level of environmental pollution caused by poor practice. The Regulations aim to protect water and air quality from poor agricultural practice by reducing losses of pollutants from nutrients across the whole of Wales. While the primary intention of the Regulations is to reduce water pollution from agriculture the approach is advantageous to other policy aims such as reduced atmospheric emissions.

The Regulations are designed to avoid pollution swapping and prevent or minimise increased losses of nutrients to the environment (including greenhouse gases, phosphorus and ammonia) as a result of measures primarily focussed on reducing losses of nitrogen.

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[71] Clean Air Plan for Wales: Healthy Air, Healthy Wales | GOV.WALES
[72] The National Emission Ceilings Regulations 2018
[73] Report: Air Pollution Trends Report 2023: Critical load and critical level exceedances in the UK - Defra, UK

Unfortunately, ammonia emissions in Wales have increased by 8% since 2005, with agricultural practices being the largest source of these emissions. 93% of ammonia emissions in Wales come from agriculture[74]. The biggest polluting sector in Wales is cattle: cattle manure management (livestock housing, manure storage and outdoor concrete yards) and its land application make 70% of all NH3 emissions[75].

Emissions from manures can occur at each stage of the manure management process, i.e. at source, storage and application. On farm practice can contribute to reducing ammonia losses to the environment at all stages, including:

- Livestock housing
- Storage
- Land application
- Inorganic fertilisers

The implementation of ammonia mitigation is most successful when it is targeted at each management stage.

Within the CoAP Regulations the following measures demonstrate a co-benefit for the mitigation of Ammonia NH3 emissions:

Precision spreading

Low Emission Slurry Spreading Equipment (LESSE)) reduces the volatilisation of ammonia when slurry is applied to land. Modelling[76] estimates 7% reduction in total agricultural ammonia emissions in Wales if precision spreading is implemented across dairy, cattle and poultry sectors.

Rapid incorporation

Ammonia volatilisation losses are greatest immediately after manure application, with up to 50% of total loss occurring within the first few hours. Incorporation is one of the few techniques to reduce ammonia loss from solid farmyard manure and poultry manure.

Inorganic fertiliser

Solid urea fertilisers release greater ammonia emissions than any other inorganic fertilisers, contributing 8% of the UK's ammonia emissions. The most dominant form of nitrogen fertiliser in the UK is ammonium nitrate. Following land application, urea undergoes hydrolysis and results in NH3 emission.

Manure storage

In Wales ammonia loss during manure management stages is responsible for 46% of all agricultural ammonia emissions 40% is from cattle and 6% from other species[77].

[74] Air Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 2005-2022 | National Atmospheric Emissions Inventory
[75] Air Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 2005-2022 | National Atmospheric Emissions Inventory
[76] Abatement of Ammonia Emissions from Agriculture in Wales, Document not published (ADAS 2019)
[77] Air Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 2005-2022 | National Atmospheric Emissions Inventory

Manure management includes livestock housing, manure storage and outdoor concrete yards. Any uncovered manure which receives precipitation hydrolyses and results in NH3 emissions. Slurry store covers can be impermeable or permeable, fixed (rigid) or floating. Floating covers could be used on both the constructed slurry stores, slurry pits and on slurry lagoons (earth-banked stores).

Livestock housing

Low emission livestock housing (cattle) - Emissions from housing are reduced by the frequent removal of slurry and by maintaining good conditions in the building (adequate ventilation and temperature). Regular removal of slurry to a (covered) outside store can further reduce NH3 emissions by limiting the emitting surface and the slurry storage temperature.

Low emission livestock housing (poultry and pigs) - Frequent removal of slurry from under house storage to a (covered) outside store can reduce NH3 emissions by limiting the emitting surface and the slurry storage temperature

Soil protection measures

Soil protection measures are not contained within the regulations for all farms. However, they were a requirement for farms undertaking the enhanced nutrient management approach and responses to the consultation[78] demonstrated broad support for the principle of protecting soils.

The consultation on Designated Areas and Action Programme to Tackle Nitrate Pollution in Wales in 2016[79] consulted on including soil protection measures within the action programme as the presence of soil cover can reduce the concentration of nitrate in leachate by 30-60% and phosphorus losses by 20-80%.

Currently the primary mechanism for protection of soil loss is undertaken via cross compliance[80] for claimants of the Basic Payments Scheme or other Welsh Government support under the Good Agricultural and Environmental Conditions (GAEC) requirements. It also remains a feature of the code of good agricultural practice.

Annex A demonstrates soil protection measures are contained within other regulations to reduce agricultural pollution within the UK, including the farming rules for water in England[81] and Scotland's general binding rules[82].

The geographic or risk-based approaches

The introduction of an all Wales based approach to nitrates management was originally published in 2016 as part of the Review of the Designated Areas and

[78] Nutrient management: managing the application of livestock manures sustainably - summary of responses
[79] 160929-nitrate-vulnerable-zones-consultation-en.pdf
[80] Cross compliance 2025 | GOV.WALES
[81] The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018
[82] The Water Environment (Controlled Activities) (Scotland) Regulations 2011

Action Programme to Tackle Nitrate Pollution in Wales[83]. It was identified as part of the review that 'A 'Whole Wales' designation would provide an opportunity to develop an integrated approach to a number of different, though related issues.

The explanatory memorandum to the regulations explored the options of an all-Wales approach and a designation-based approach. This demonstrated the greatest environmental benefit being an all-Wales approach albeit with higher costs[84]. When considered against the water quality information demonstrated above it highlights there are several areas where there are environmental pressures, which do not directly correlate to previous Nitrate Vulnerable Zone designations and would not have received additional protections under pre-existing methodologies. Analysis of approaches to diffuse pollution risks across the UK show various levels of protection, but all areas have at least some protection, annex A explores this in more detail, whereas the a designation based approach would have left Wales as the least protected nation of the UK.

Accessibility, Flexibility and Enforceability

In the Welsh Government's consultation response to the Law Commission whilst developing the Form and Accessibility of the Law Applicable in Wales[85] in 2016 it summarised *'For Welsh laws to be accessible it is essential that they are intelligible, clear and predictable in their effect'.*

In the UK Department for Business, Energy and Industrial Strategy research paper Goals-based and Rules-based approaches to regulation[86] the design of regulation was considered in greater detail. In particular it explored the differentiation between the two approaches and if the greater flexibility of a goals-based approach could in some circumstances deliver better outcomes than a rules-based approach as it facilitates greater buy in from the persons being regulated upon, through the ability to approach objectives in a different manner.

It should be considered that with flexibility there often comes additional complexity, which impacts both those enforcing requirements and those adhering to requirements. In this context there is a need ensure if any changes are made to the regulations to introduce more flexibility the requirements on individual farm holdings are still clear.

Regulations can be a driver for change, but this can take time, a small case study from Scotland's initial NVZ programme demonstrated that overall, the 16 farms were using 13% less N and 19% less P in 2011 compared with 2003[87] and while there was some significant opposition to some measures, benefits had begun to be realised over time.

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[83] 160929-nitrate-vulnerable-zones-consultation-en.pdf
[84] Explanatory Memorandum to the Water Resources (Control of Agricultural Pollution)(Wales) Regulations 2021
[85] Law Commission 366 Vol.1 English
[86] Goals-based and rules-based approaches to regulation
[87] (PDF) Evaluating the Impacts of Nitrate Vulnerable Zones on the Environment and Farmers' Practices: A Scottish Case Study

The Welsh Government previously consulted[88] upon the values contained within the schedules of the existing Nitrate Pollution Prevention (Wales) Regulations 2013[89] noting they were amongst the lowest in the EU at that time, and that updating the manure nitrogen efficiency standard values would help ensure the Action Programme is based on the most up-to-date evidence.

Alternative measures (Regulation 45)

The regulations contained a provision under regulation 45 for alternative measures to be proposed where they could 'deliver the outcomes more effectively than the measures contained in these Regulations'. In total 5 alternative measures proposals were received and assessed.

The then minister for Rural Affairs and North Wales, and Trefnydd Lesley Griffiths MS wrote to the chair of the Senedd's Economy Trade and Rural Committee on 25 May 2023[90]. The letter outlined that the minister was 'unable to determine with sufficient certainty whether the proposals received would be more effective in delivering the outcomes'. The letter also the intention for proposals which may have the potential to be more effective to be 'further assessed and consulted upon as part of the 4-year review of the Regulations'. Individual proposers were notified simultaneously of the minister's decision.

The following assessment considers the proposals in more detail, it is divided into 4 sections to cover the alternative measures set out and to discuss the current evidence levels for each to suggest if they should be looked at for adoption, dismissed or require further evidence to make an informed decision. The regulations have been split into four broad categories for ease of reference to cover clarification of terminology in reference to slurry, addition of other fertiliser compounds into legislation together with nitrogen, measures relating to environmental factors particularly soil and water and then regulations relating to storage solutions of slurry.

Alternative measures in relation to slurry management

Slurry is defined in the CoAP regulations as

> "slurry" ("slyri") means liquid or semi-liquid matter composed of—
>
> (a) excreta produced by livestock (other than poultry) while in a yard or building (including that held in wood chip corrals), or
> (b) a mixture wholly or mainly consisting of livestock excreta, livestock bedding, rainwater and washings from a building or yard used by livestock,
>
> of a consistency that allows it to be pumped or discharged by gravity at any stage in the handling process;

The below summarises alternative measures related to individual regulations

[88] 160929-nitrate-vulnerable-zones-consultation-en.pdf
[89] The Nitrate Pollution Prevention (Wales) Regulations 2013
[90] Letter to ETRA Committee on Alternative Measures

Regulation 3 – Clarify effluent from poultry manure is slurry, to aid compliance

There is some evidence suggesting that clarifying the definition of slurry to explicitly include effluent from poultry manure could aid compliance and improve environmental protection. The DEFRA Joint Government and Industry Slurry Management and Storage Project report highlights the importance of clear definitions and regulations to ensure proper management and storage of slurry. This report suggests that non-compliance with slurry storage rules can pose significant environmental risk[91]. Additionally, the Centre of Expertise for Waters (CREW) discusses the implications of different slurry management practices on water quality and emphasizes the need for clear guidelines to support sustainable farming practices[92].

The existing regulations and reports generally support the idea that clearer definitions and guidelines can help improve compliance and environmental outcomes.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation.

Regulation 16 – Define the meaning of ‘incorporated’ in respect of incorporating organic manure into the ground and include maize stubble in addition to bare soils.

There is some evidence supporting the inclusion of maize stubble in organic manure management. Some studies have shown that incorporating organic manures, including maize stubble, can significantly improve soil properties and crop yields[93] [94] [95]. For example, the integration of organic manures with inorganic fertilizers has been found to enhance maize growth and yield, as well as improve soil organic carbon and nutrient content[4]. Additionally, the application of organic manures like poultry manure has been shown to improve soil bulk density, porosity, and water holding capacity[5].

However, there is also evidence against the inclusion of maize stubble in organic manure management. Some studies suggests that the incorporation of organic matter can reduce the survival of certain pathogens in maize stubble, which might be a consideration for specific agricultural practices[96].

This regulation is classed as: More evidence is required prior to a decision on legislation being made. It is also recommended that the term "incorporated" is

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[91] Report of the Joint Government and Industry Slurry Management and Storage Project
[92] CRW2020_02_Main Report_FINAL.pdf
[93] Effects of organic and inorganic manures on maize and their residual impact on soil physico-chemical properties
[94] Effects of Organic Manures.pdf
[95] iscientific.org/wp-content/uploads/2023/07/22-IJCBS-23-23-2-22.pdf

[96] https://www.scielo.br/j/sa/a/VmqZgyT4sCcv7PwHYx6MFrM/?format=html

defined in legislation which could help standardise practices and improve the effectiveness of organic manure management.

Regulation 23 – clarify if any seepage is defined as slurry and must be contained, to aid compliance

There is some evidence supporting the need for clear definitions and containment of seepage to aid compliance. For instance, the Joint Government and Industry Slurry Management and Storage Project highlighted that non-compliance with slurry storage rules poses significant environmental risks. Proper containment of slurry, including seepage, is crucial to prevent pollution of watercourses and to protect soil and water quality[97] [98].

This regulation is classed as: More evidence is required prior to a decision on legislation being made.

Regulation 28 – To consider when the liquid portion of separated slurry should no longer be classified as slurry, taking into account of technological innovation

There is some evidence supporting the implementation of this regulation. Firstly around technological innovations, there are modern technologies, such as slurry separators which effectively divide slurry into solid and liquid components[99]. This separation allows for more efficient handling and utilization of both parts. The liquid portion, often nutrient-rich, can be used as a fertilizer, while the solids can be composted or used as livestock bedding.

In terms of environmental compliance, the introduction of clear classification could help ensure that the liquid portion is managed appropriately to prevent environmental contamination. Properly defining when the liquid portion is no longer considered slurry could aid in compliance with environmental regulations and reduce the risk of pollution[100]. Farmers could also benefit from clear guidelines on the classification of separated slurry. This introduction of this regulation could improve the efficiency of slurry management practices, reduce storage requirements, and optimize the use of nutrients in crop production[101].

Though there could be benefits to this classification, there is some evidence to suggest that implementation could provide challenges. The cost of machinery and infrastructure to allow this separation for farmers is expensive and could pose challenges for farmers in terms of adapting to new requirements and investing in the necessary technologies[102].

This regulation is classed as: More evidence is required prior to a decision on legislation being made. Particularly around the ability for farmers to be able to

[97] Report of the Joint Government and Industry Slurry Management and Storage Project
[98] Environmental land management and public money for public goods
[99] What Technologies Are Available to Improve Slurry Handling on My Farm? | Future Food Solutions
[100] The Environmental Permitting (England and Wales) Regulations 2016
[101] Nutrient Management Guide (RB209) | AHDB
[102] Are you prepared for new slurry legislation? - Farmers Guide

adapt to and afford and implement the new technology that could allow this legislation to become effective in a fair manner.

Regulation 29 – clarity to be provided to reflect sufficient storage is required to meet all requirements of the regulations, to include imported manures

The regulations outline the requirements for the manure produced on the holding, regulation 29 refers to the requirement to have sufficient storage for all slurry produced on the holding during the storage period, and all poultry manure produced in a yard or building on the holding during the storage period[103]. This does not include imported manures as they are not produced on the holding. The associated guidance for the regulations[104] emphasise the need for sufficient storage capacity to manage all types of organic manures, including those imported from other sources, to meet the all the requirements of the regulations.

There is some evidence to suggest the benefits of incorporating imported manures into regulation 29 as the benefits of proper storage of organic manures, is crucial to prevent nutrient runoff and water pollution. For example, the Joint Government and Industry Slurry Management and Storage Project highlighted the importance of adequate storage facilities to mitigate environmental risks[105].

The regulation could also aid compliance with regulations that require farmers to have sufficient storage capacity to manage all organic manures, including those imported, to comply with other environmental standards e.g. Environment Permitting Regulations[106]. This includes ensuring that storage facilities can handle wetter-than-average rainfall years and other variables which may limit the ability to spread manures at an optimum time

However, some evidence suggests that the cost and logistical challenges of expanding storage facilities to meet regulatory requirements can be significant for farmers. This includes the financial burden of constructing or enlarging storage facilities and the need for additional resources and support.

The effectiveness of some storage regulations can vary depending on individual farm practices and local conditions. Some farms may struggle to meet the storage requirements due to space constraints or other practical limitations.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly around the support available to farmers for implementation and around ensuring the legislation does not disadvantage farms with space constraints.

[103] The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021
[104] The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021: guidance for farmers and land managers | GOV.WALES
[105] Slurry management and storage: joint government and industry report - GOV.UK
[106] The Environmental Permitting (England and Wales) Regulations 2016

Alternative measures in relation to additional fertilisers to nitrogen

The main fertiliser referred to in reference to the Control of Agricultural Pollution Regulations (CoAP) is nitrogen. Additional fertilisers in this context refers to any compound other than nitrogen that is used for this purpose.

Regulations 6 to 10 – Inclusion of all fertilisers within nutrient management planning and crop limits. Allowing additional nitrogen applications to intensive, rotational grazing-based systems, as per grass cut 3 times per year

There is some evidence that including all fertilizers within nutrient management planning and crop limits, along with allowing additional nitrogen applications for intensive, rotational grazing systems, can have several benefits for farming but also require different considerations.

Including all fertilizers (not just nitrogen) in nutrient management plans ensures that potential sources of nutrient pollution are managed effectively. This can help prevent issues like phosphorus runoff, which can cause eutrophication in water bodies. Also by considering all nutrients, farmers can achieve a more balanced fertilization approach, optimizing crop yields and soil health[107].

There is some evidence to suggest intensive rotational grazing, where grass is cut multiple times a year, can benefit from additional nitrogen applications. Studies have shown that such systems can maintain high dry matter yields with appropriate nitrogen management[108]. Proper nutrient management in rotational grazing systems can also improve soil fertility over time, enhancing the sustainability of the farming practice[109].

It is also important to consider the environmental impact these regulations could have. Careful management is required to avoid excessive nutrient application, which can lead to nutrient leaching and water pollution[110].

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly evidence around how to implement with careful monitoring and management to prevent negative environmental impacts.

Regulations 12 and 13 – Requirements related to when to spread fertiliser and spreading near surface waters to apply to all fertilisers, not just nitrogen fertilisers

There is some evidence to support the idea that spreading requirements should apply to all fertilizers, not just nitrogen fertilizers, due to their environmental impact. All fertilizers, including those containing phosphorus and potassium, can contribute

[107] Nutrient Management Guide (RB209) | AHDB
[108] Nitrogen and white clover impacts on the management of perennial ryegrass–clover swards for grazing cattle | The Journal of Agricultural Science | Cambridge Core
[109] Mapping the Impact of Intensive Rotational Grazing on Soil Fertility Over Time on Greenbrier Farms in Pickens County, South Carolina
[110] Nitrogen efficiency in rotational grazing systems | AHDB

to water pollution if not managed properly. Runoff from fields can carry these nutrients into surface waters, leading to issues like eutrophication, which causes algal blooms and depletes oxygen in water bodies[111] [112].

The current regulations focus on preventing water pollution from agricultural sources. These rules already require farmers to manage the application of both organic manures and manufactured nitrogen fertilizers to minimize runoff and leaching. Extending these requirements to all fertilizers would ensure a more comprehensive approach to protecting water quality. Current research indicates that nutrients from various fertilizers, not just nitrogen, can have significant environmental impacts. For example, phosphorus is a major contributor to algal blooms in freshwater systems. Therefore, consistent regulations for all fertilizers could help mitigate these risks more effectively.

Introducing uniform spreading requirements for all fertilizers could simplify compliance for farmers and ensure that all potential sources of nutrient pollution are addressed. It is also important to consider the impacts of such regulations, including the need for flexibility based on local conditions and crop requirements.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly evidence around practical considerations that must also be considered to ensure that these regulations are feasible for farmers to implement.

Regulation 15 – Reduce the maximum height of the fertiliser spreading trajectory, for all fertilisers

There is some evidence that reducing the maximum height of the fertilizer spreading trajectory could have both environmental benefits and practical implications.

Low Emission Slurry Spreading Equipment (LESSE)) such as direct injection, dribble bars and trailing shoes reduces the volatilisation of ammonia when slurry is applied to land. Modelling* estimates 7% reduction in total agricultural ammonia emissions in Wales if precision spreading is implemented across dairy, cattle and poultry sectors.

Lowering the spreading height of fertiliser spreading trajectory could reduce the risk of fertilizer drift and ensure more precise application. This could minimize nutrient runoff into water bodies, thereby reducing water pollution and eutrophication[113]. A lower spreading height could also enhance the uniformity of fertilizer distribution, leading to better crop uptake and reduced wastage[114].

However, there is also some evidence that reducing the maximum height of fertiliser spreading trajectory could also affect the efficiency of spreading over larger areas, potentially increasing the time and labour required. There is also some evidence that

[111] Environmental Implications of Excess Fertilizer and Manure on Water Quality | NDSU Agriculture
[112] Fertilizers and nitrate pollution of surface and ground water: an increasingly pervasive global problem | Discover Applied Sciences
[113] Fertilizers and Environment: Issues and Challenges | SpringerLink
[114] Recent trends and technologies for reduced environmental impacts of fertilizers: a review | International Journal of Environmental Science and Technology

a lower spreading height could lead to uneven application, especially in windy conditions or with certain types of fertilizers that are more prone to clumping or dust formation[115].

This regulation is classed as: Look to adoption with greater evidence required prior to legislation

Regulation 18,19 and 22 – Alternatives to the closed periods for manufactured fertilisers and organic manures

There is some evidence both for supporting and contradicting the idea of having alternatives to the closed periods for manufactured fertilizers and organic manures:

There is some evidence that alternatives to closed periods could provide farmers with more flexibility to apply fertilizers based on crop needs and weather conditions, potentially improving crop yields and efficiency[116]. There is also modern technologies, such as precision farming tools which can help farmers apply fertilizers more accurately, reducing the risk of nutrient runoff even outside the traditional closed periods.

There is also some evidence in studies that suggest targeted applications based on real-time soil and crop data can be more effective in preventing nutrient leaching and runoff compared to blanket closed periods[117].

Currently closed periods are designed to prevent nutrient runoff during times when plant uptake is low and the risk of leaching is high. Removing these periods could increase the risk of water pollution[118]. They also provide a clear and simple framework for farmers to follow, ensuring consistent practices across the industry. There would also be regulatory challenges with implementing alternatives that require robust monitoring and enforcement mechanisms to ensure compliance, which could be challenging and costly[119].

This regulation is classed as: More evidence is required prior to a decision on legislation being made. Particularly around monitoring and enforcement challenges.

Regulation 21 – Spreading restrictions following the closed periods to be consistent for all organic manures with high readily available nitrogen

The regulations include restrictions for the spreading of slurry and poultry manure for a period of time after the closed period[120]. This does not include other organic manures with a high readily available nitrogen content.

Manures with high readily available nitrogen they are more likely to leach into watercourses, causing eutrophication and other ecological issues if not spread

[115] Diagnosing spread pattern problems on agricultural spinner spreaders - MSU Extension
[116] Nutrient Management Guide (RB209) | AHDB
[117] NO30012 - Evidence on Nitrate
[118] Nutrients Action Programme - CAFRE
[119] Nutrients Action Programme - CAFRE
[120] The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021

appropriately[121]. The inclusion of all organic manures with high readily available nitrogen, such as digestate, would simplify compliance for farmers and ensure a more uniform protection of water quality.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly evidence around practical considerations that must also be considered to ensure that these regulations are feasible for farmers to implement.

Regulation 36 to 40 – Provision of online data recording for records and inclusion of phosphorus within these requirements

There is some evidence supporting the provision of online data recording for fertilizer records and the inclusion of phosphorus within these requirements. Online data recording could streamline the process of keeping accurate records, making it easier for farmers to comply with regulations. This could help reduce the risk of non-compliance and associated penalties[122]. This could also improve the accuracy and accessibility of data, allowing for better monitoring and management of nutrient applications[123].

Including phosphorus in these requirements could also help address the environmental impact of phosphorus runoff, which is a significant contributor to water pollution and eutrophication[124] [125].

However the process of transitioning to online data recording systems may require significant investment in technology and training for farmers, which could be a barrier for some as well as raising concerns about data privacy and security, particularly if sensitive farm data is stored online[126]. Consideration should be given to links with voluntary measures or participation in the Sustainable Farming Scheme[127] regarding requirements as well as any nutrient management tools developed for use in the UK.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly evidence around removing any technology or financial barriers to farmers and consideration of a substantial transitional period and targeting to risk and links to existing requirements.

Alternative measures relating to the management of Soil and Water

This grouping of alternative measures refers to proposed regulations that cover protecting environmental impacts to Soil and Water in relation to CoAP.

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[121] Natural Resources Wales / How to use manures and slurries appropriately
[122] Keep fertiliser records up to date - Farmers Weekly
[123] NVZ record keeping guide – Tried & Tested
[124] What new phosphate fertiliser guidelines mean for growers - Farmers Weekly
[125] Phosphate and potash fertiliser recommendations for cereals: current issues and future needs | AHDB
[126] Retention and destruction of information | ICO
[127] Sustainable Farming Scheme | GOV.WALES

Regulation 11 – Groundwater Source Protection Zones (SPZs) to be marked on risk maps

There is some evidence supporting the marking of Groundwater Source Protection Zones (SPZs) on risk maps:

Marking SPZs on risk maps could help protect groundwater sources from contamination. Groundwater supplies a significant portion of drinking water in the UK, and protecting these sources is crucial for public health[128]. Currently Natural Resources Wales already uses SPZs to implement pollution prevention measures and monitor activities that could pose a risk to groundwater. Including these zones on risk maps could ensure that all stakeholders are aware of the areas that require special protection. This could also allow for better risk management and planning as it could aid farmers, and other land users to make informed decisions that minimize the risk of groundwater contamination.

The practical element of marking SPZs on risk maps would requires accurate data and regular updates to ensure the maps remain current and reliable. Using SPZs in this way would also require robust compliance and enforcement mechanisms to ensure that activities within these zones adhere to the necessary regulations[129]. It could also cause problems if SPZs are not accurately reflected on risk maps leading to incorrect decisions being made.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly evidence around the mechanisms for accurately updating the information on risk maps and enforcement.

Regulations 13 and 14 – Improved relationship between buffer zones and risk factors

There is some evidence supporting the improvement of the relationship between buffer zones and risk factors in the control of agricultural pollution. There is some evidence to suggest that buffer zones are effective in reducing agricultural runoff, which can carry pollutants like fertilizers, pesticides, and sediments into water bodies. By improving the relationship between buffer zones and risk factors, the effectiveness of these zones in protecting water quality can be enhanced[130] [131]. Some studies have shown that well-designed buffer zones can significantly reduce the concentration of pollutants in runoff. Factors such as buffer width, vegetation type, and soil characteristics play a crucial role in determining the effectiveness of buffer zones[132].

While improving buffer zones could be beneficial, it would require careful planning and resources. Farmers may need additional support and guidance to implement

[128] Source Protection Zones (SPZ) Locations
[129] The Environmental Permitting (England and Wales) Regulations 2016
[130] 3D buffer strips: Designed to deliver - Environment Agency 2020
[131] The use of buffer zones to protect water quality: A review | Water Resources Management
[132] A Comprehensive Review on Ecological Buffer Zone for Pollutants Removal

effective buffer zones that align with risk factors[133]. Managing of effective buffer zones would also require ongoing monitoring and maintenance to ensure they continue to function as intended. This includes managing vegetation, preventing erosion, and addressing any changes in land use.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly around the support available to farmers for implementation.

Regulation 24 - to provide consistency, field silage sites should be stored and/or opened or unwrapped 50m from a well, spring or borehole and not within a groundwater Source Protection Zone 1. Specify the design and construction of a store must be carried out by a qualified person.

There is some evidence supporting the idea that field silage sites should be stored and/or opened at least 50 meters from wells, springs, or boreholes, and not within a Groundwater Source Protection Zone 1 (SPZ1). Additionally, specifying that the design and construction of a store must be carried out by a qualified person is also supported by some evidence.

The current regulations already require that silage storage sites be located at least 50 meters from protected water supply sources and not within SPZ1[134]. Extending this consistency would help ensure that all farms adhere to the same standards, reducing the risk of pollution. There is evidence to support that storing silage away from water sources helps prevent contamination of drinking water supplies. Silage effluent is highly toxic and can cause significant environmental damage if it enters watercourses[135].

Ensuring that silage storage facilities are designed and constructed by qualified professionals could help prevent structural failures and leaks, which could lead to environmental contamination[136]. This does come with the consideration that it could require significant investment from farmers to comply with the standards. Support and guidance from the government could help ease this transition[137]. This regulation would also require increased monitoring and enforcement to ensure compliance with these regulations.

This regulation is classed as: More evidence is required prior to a decision on legislation being made. Particularly around the ability for farmers to be able to adapt to and afford the change in regulations as well as around associated costs and challenges of enforcement.

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[133] A Comprehensive Review on Ecological Buffer Zone for Pollutants Removal
[134] Natural Resources Wales / Silage, slurry and other livestock manure storage
[135] The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021: guidance for farmers and land managers | GOV.WALES
[136] Natural Resources Wales / What to provide with your planning application for an agricultural development
[137] Nutrient Management Investment Scheme: 15 July 2024 to 23 August 2024 | GOV.WALES

Introduce the requirements of GAEC 5 into Regulation - measures to protect soils from erosion

There is some evidence supporting the protection of soils from erosion based on Good Agricultural and Environmental Condition (GAEC) 5 of cross compliance. There is evidence that protecting soils from erosion helps maintain soil health, which is crucial for sustainable agriculture. Healthy soils support crop production, water regulation, and carbon storage[138] [139]. GAEC 5 also sets standards to minimise soil erosion, which are part of the cross-compliance requirements for farmers receiving subsidies under the Basic Payment Scheme. These standards help ensure that agricultural practices do not degrade soil quality[140].

There is also evidence that soil erosion can lead to significant economic losses due to reduced agricultural productivity and increased costs for soil restoration. Implementing measures to protect soils can help mitigate these economic impacts[141].

Healthy soils also support a wide range of environmental benefits, including biodiversity, water filtration, and climate regulation. Protecting soils from erosion could help preserve these vital functions.

Effective implementation of GAEC 5 requires adequate resources and support for farmers. This could include access to training, tools, and financial incentives to adopt sustainable practices. Ensuring compliance with GAEC 5 standards would require robust monitoring and enforcement mechanisms.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly evidence around the ability for farmers to be able to adapt to and afford the change in regulations as well as around associated costs and challenges of enforcement.

Storage solutions

The grouping of alternative measures refers to proposed regulations that cover the storing of slurry in an environmentally sound way.

Regulations 24 and 25 – Controls on below ground stores in relation to the unsaturated zone

There is some evidence supporting the implementation of controls on below ground stores in relation to the unsaturated zone. The unsaturated zone, which lies between the ground surface and the water table, plays a crucial role in filtering and attenuating pollutants before they reach groundwater. Proper controls on below

[138] SHI0023 - Evidence on Soil Health
[139] Summary of the state of the environment: soil - GOV.UK
[140] https://www.gov.wales/sites/default/files/publications/2024-11/cross-compliance-2025-verifiable-standards.pdf
[141] SHI0023 - Evidence on Soil Health

ground stores can prevent contamination of this zone and protect groundwater quality[142] [143].

Implementing controls on below ground stores could help manage the risks associated with potential leaks and spills. This includes regular inspections, maintenance, and adherence to design standards to ensure the integrity of storage systems.

This regulation is classed as: More evidence is required prior to a decision on legislation being made. Particularly around the benefits of additional measures and what these measures would entail.

Regulation 25 - greater clarity will be provided to reflect all types of slurry must be stored to aid compliance. Specify the design and construction of a store must be carried out by a qualified person.

There is some evidence supporting the need for greater clarity in slurry storage regulations and the requirement for qualified design and construction of slurry stores.

Clear regulations on slurry storage could help prevent environmental contamination. Proper storage of all types of slurry, including those with varying strengths and dilutions, is crucial to avoid pollution of water sources[144]. Ensuring that all types of slurry are included in these storage regulations could simplify compliance for farmers and reduce the risk of non-compliance.

Regulations requiring that slurry stores be designed and constructed by qualified professionals could ensure that they meet safety and environmental standards. This could prevent structural failures and leaks, which lead to significant environmental damage[145] [146].

Implementing these measures could involve additional costs for farmers. Providing financial support and guidance could help ease the transition and ensure compliance.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly around the support available to farmers for implementation and around the enforcement of the regulation.

Regulation 26 – Replacement of the exemption enabling silos and slurry stores built prior to 1991 to continue to be used, with a safety inspection regime required within appropriate timescales

There is some evidence supporting the replacement of the exemption for silos and slurry stores built before 1991 with a safety inspection regime.

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[142] Natural Resources Wales / Silage, slurry and other livestock manure storage
[143] Natural Resources Wales / How we can all help protect groundwater in Wales
[144] Natural Resources Wales / Silage, slurry and other livestock manure storage
[145] Natural Resources Wales / What to provide with your planning application for an agricultural development
[146] Nutrient Management Investment Scheme: 15 July 2024 to 23 August 2024 | GOV.WALES

Some evidence suggests that silos and slurry stores built before 1991 are aging and may not meet current safety and environmental standards. Regular inspections can identify structural weaknesses and prevent potential failures that could lead to environmental contamination[147] [148].This aligns with the broader goals of protecting the environment and public health. There is some evidence to suggest that replacing this exemption with a safety inspection regime would create a consistent regulatory framework for all storage facilities, regardless of their construction date. This could simplify compliance and enforcement.

Introduction of a safety inspection regime could involve costs for farmers, including inspection fees and potential upgrades to meet current standards. This may require additional funding; however these costs could be justified by the long-term benefits of preventing environmental damage and ensuring the safety of storage facilities.

Providing support and guidance to farmers during this transition to a safety inspection regime could help mitigate the financial and operational impacts. This could include financial assistance, training, and technical support.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly around the support available to farmers for implementation.

Regulation 27 - greater clarity provided in the regulations on filed heap requirements to aid compliance, including in relation to poultry manure without bedding.

There is some evidence supporting the need for greater clarity in regulations on field heap requirements, including those related to poultry manure without bedding. Current regulations require that poultry manure without bedding stored in field heaps must be covered with an impermeable sheet to reduce leachate production[149] [150]. The introduction of clear regulations to cover this could help prevent environmental contamination from field heaps. Poultry manure without bedding can produce leachates with high concentrations of pollutants such as ammonium, nitrate, and phosphorus, which can contaminate water sources if not managed properly. This introduction could also simplify enforcement for regulatory bodies.

The introduction of this regulation could mean that farmers require more guidance and support to implement them effectively. This could include additional support and guidance on the requirements for different types of manure and the best practices for storage and management.

[147] Slurry Inspection - Mick Moor Installations
[148] Natural Resources Wales / Silage, slurry and other livestock manure storage
[149] Review and recommendations of pollutant losses from solid manures stored in temporary field heaps
[150] The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021: guidance for farmers and land managers | GOV.WALES

This regulation is classed as: More evidence is required prior to a decision on legislation being made. Particularly around the benefits of additional measures and what these measures would entail.

Regulation 32 - Increased notice period for a new and silo or slurry storage system, to at least 30 days before construction work is to begin, with additional information to be provided on the design and capacity specifications and the exact location.

There is some evidence supporting the idea of increasing the notice period for new silo or slurry storage systems to at least 30 days before construction begins, along with providing detailed information on design, capacity specifications, and location. Current regulations require a 14-day notice period[151]. Extending this to 30 days would provide more time for thorough inspections and approvals, ensuring that all new constructions comply with the necessary regulations[152]. A longer notice period could allow regulatory bodies more time to review and assess the potential environmental impacts of new storage systems. This could help prevent pollution incidents and ensure that storage facilities meet safety and environmental standards.

Additional provision of support and guidance to farmers would also be required during the planning and construction phases which could help mitigate the financial and operational impacts of these requirements.

This regulation is classed as: Look to adoption with greater evidence required prior to legislation. Particularly around the support available to farmers for implementation and around the enforcement of the regulation.

[151] The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021: guidance for farmers and land managers | GOV.WALES
[152] Natural Resources Wales / Silage, slurry and other livestock manure storage

Annex A - Comparison table of Measures within UK Agricultural Pollution Regulations

Measure Description	**Wales – Control of Agricultural Pollution Regulations 2021**	**England – Farming Rules for Water (The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018) & Storge of Silage, Slurry and Agricultural Fuel Oil**	**England – NVZ Regulations (The Nitrate Pollution Prevention Regulations 2015) (Geographic designation approx. 55% of land area)**	**Scotland – General Binding Rules - Full - The Water Environment (Controlled Activities) (Scotland) Regulations 2011 – Amending regs 2021- The Water Environment (Controlled Activities) (Scotland) Amendment Regulations 2021**	**Scotland – NVZ Regulations (The Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2008) (Geographic designation approx. 14% of land area)**	**Northen Ireland – Nitrates Action Programme - The Nutrient Action Programme Regulations (Northern Ireland) 2019**
Nutrient Management Planning	Yes – Nitrogen only, P included in Enhanced Nutrient Management approach	Yes - application of organic manure and manufactured fertiliser to agricultural land must be planned so that the application does not exceed the needs of the soil and crop on land or give rise to a significant risk of agricultural diffuse pollution. This applies to all organic manures and all manufactured fertilisers.	Yes – Nitrogen only, P required for derogation	N/A	Yes – Nitrogen only, P required for derogation	Yes – N, P for high phosphorus manures and anaerobic digestate
Soil testing	No – Included within the ENM approach	Yes – pH, N (or SNS), P, K and Mg	No – Included within the derogation	N/A	No – Included within the derogation	Yes – For application of high phosphorus manures, anaerobic digestate and for derogation
Holding limit of 170kg/N/ha/yr of livestock manure across a holding	Yes	No	Yes	N/A	Yes	Yes
Ability to apply beyond 170kg/N/ha/yr	ENM up to 250kg/N/ha/yr for 2024 only	N/A	Yes – Derogation to 250kg/N/ha/yr	N/A	Yes – Derogation to 250kg/N/ha/yr	Yes – Derogation to 250kg/N/ha/yr
Field limit of application of no more than 250kg of N per hectare from organic manures applied within any 12 month period	Yes	No	Yes	N/A	Yes	No
Crop application limits – Including 'N-max' or other maximum application rates	Yes	No – However A land manager must ensure that, for each application of organic manure or manufactured fertiliser to	Yes	N/A	Yes	Yes

		agricultural land, the application— (a)is planned so that it does not— (i)exceed the needs of the soil and crop on that land, or (ii)give rise to a significant risk of agricultural diffuse pollution				
Risk map requirements	Yes – All holdings where organic manure is spread	N/A	Yes	N/A	Yes	No – Risk Assessments to be undertaken when spreading and methodology for sloping land
Assess ground conditions before spreading, including accounting for weather conditions	Yes	Yes	Yes	N/A	Yes	Yes
Slurry Storage capacity requirements	5 Month average rainfall (6 months pig and poultry)	4 Month M5 rain (highest likely 5-year rainfall)	5 Months (6 months pig and poultry)	(i) 26 weeks by housed pigs, or (ii) 22 weeks by housed cattle,		22 Weeks and sufficient to meet the other requirements of the regulations. 26 weeks for pigs and poultry.
Closed Period for spreading of organic manures with high readily available nitrogen (RAN)	Yes – 15 October to 15 January for most farms – i.e. grassland with non-sandy or shallow soil	No – Statutory guidance issued on the application of high RAN manures between 15 October and the end of February - Applying the farming rules for water - GOV.UK	Yes – 15 October to 31 January for most farms – i.e. grassland with non-sandy or shallow soil	N/A	Yes - 1) Organic manure with high available nitrogen content must not be applied– (a)on or between 1st September and 31st December, to grassland which is situated on sandy or shallow soil; or (b)on or between **[**F25 15th October and 31st January**]** to grassland which is situated on any other soil; (c)on or between 1st August and 31st December to land which is not grassland and which is situated on sandy or shallow soil; or	Yes – Also includes Farm Yard Manure - (3) The land application of organic manure, excluding farmyard manure and dirty water, to any land shall not be permitted from 15th October in any year to 31st January of the following year. (4) The land application of farmyard manure to any land shall not be permitted from 31st October in any year to 31st January of the following year.

					(d)on or between **[**F261st October and 31st January**]** to land which is not grassland, and which is situated on any other soil.	
Soil Protection/Erosion Rules	No – Included within the Enhanced Nutrient Management approach	Yes - rules on reducing poaching risks, requirements to undertake reasonable precautions– Statutory guidance issued on maintaining cover after 15 October unless conditions met	N/A	Yes - Measures relating to the reduction of risk from soil erosion caused by livestock and requirement for land to be cultivated in way which reduces risk of pollution to surface water or wetland	N/A	Yes – supplementary feeding and drinking locations. Winter cover requirements
Additional requirements for Anaerobic Digestate	No	No	No	Yes – Requirements for the storage of digestate	No	Yes – Additional nutrient management planning for all digestate
Civil Sanction provision	No	Yes – Provision for Civil Sanctions contained within Regulation	Yes – Provision for Civil Sanctions contained within Regulation	No	No	No

Annex B - Stakeholders Engaged by Dr Susannah Bolton

Events attended

Royal Welsh Agricultural Show – Winter Fair

- Show visits with NFU Cymru, TFA Cymru, CLA Cymru
- Direct engagement with show attendees

Location visit

Coleg Sir Gar – Gelli Aur Campus

- Discussion and demonstration of Tywi weather project

NFU Cymru multi stakeholder farm visit

- Representatives from NFU Cymru, chair and vice chair and chair of water quality review group
- Food supply chain representation including dairy producers, meat supply chain
- Services supply chain including agents, feed and fertiliser supply

Wales Land Management Sub-Group on Agricultural Pollution (Multi-stakeholder)

Attendance at meetings on, including substantive agenda items (minutes available)

- 16 September 2024
- 21 October 2024
- 18 November 2024
- 16 December 2024
- 20 January 2025

Multi-stakeholder meetings

- Farming Connect advisors and Farm Liaison Service
- ENGO's combined meeting via WEL including
    - WEL
    - WWF
    - Carmarthenshire Fisheries Federation
    - Wildlife Trusts Wales

Direct 1-2-1 Engagement (Either independent of supported by officials)

- Natural Resources Wales
- NFU Cymru
- FUW
- CLA Cymru
- WWF
- AHDB
- Leprino foods

- Association of Agricultural Contractors

Additional written evidence received and considered

- Wales Environment Link
- NFU Cymru