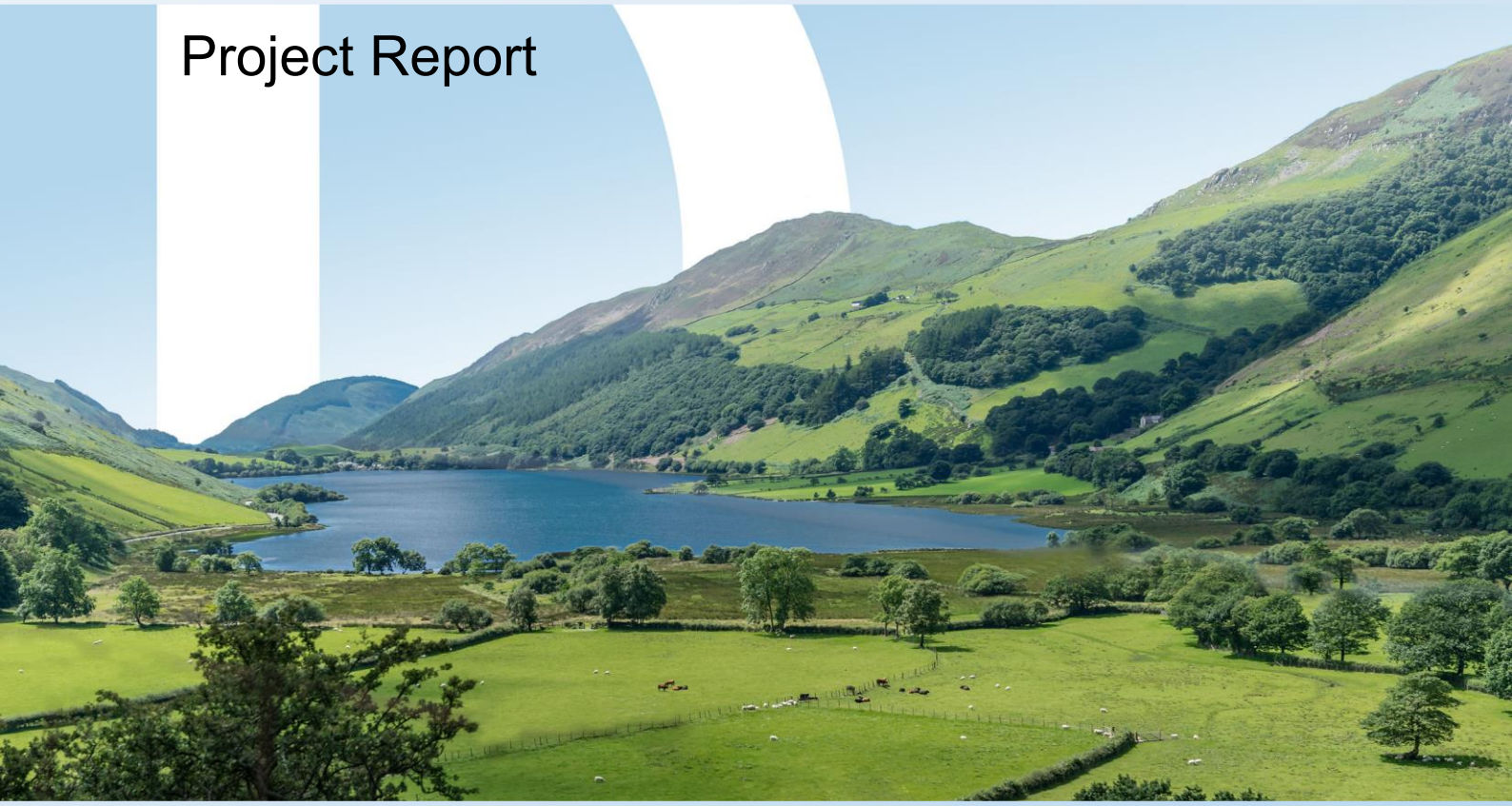
Office for Environmental Protection

A SCOPING REVIEW OF THE EFFECTIVENESS OF AGRICULTURAL DIFFUSE POLLUTION REGULATIONS IN ENGLAND

Project Report



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EXECUTIVE SUMMARY

Agricultural diffuse pollution remains a major challenge to achieving Good Ecological and Chemical Status of water bodies in England under Water Framework Directive (WFD). The 3rd WFD River Basin Management Plans (RBMPs) identified agricultural nutrient pollution as a major contributor to water quality failure affecting 40% of water bodies. The Environment Act 2021 sets ambitious targets to reduce nitrogen (N), phosphorus (P), and sediment inputs by 40% by 2038 to try and address the situation.

This report describes a review, conducted for the Office for Environmental Protection (OEP) by WSP, to assess the effectiveness of the implementation of the following three key regulations which aim to mitigate agricultural diffuse pollution:

- The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations (Farming Rules for Water, FRfW) (2018);
- Nitrate Pollution Prevention Regulations (NPP) (2015); and
- Silage, Slurry, and Agricultural Fuel Oil (SSAFO) Regulations (2010).

The OEP had identified that the effective implementation of these regulations could play a critical role in meeting the Environment Act goals and a review of the current effectiveness was needed. This review was completed prior to the publication of the Corry review (April 2025).

Focusing on implementation rather than enforcement of the Regulations to avoid duplication with parallel OEP projects, the approach consisted of:

- A review of available literature to assess the effectiveness and enforcement of the Regulations, focussing on credible sources within England;
- Surveying the opinions of experts identified in the previous task, through interviews and a workshop to explore regulatory clarity, enforcement challenges and identify future improvements; and
- A synthesis of findings by the key themes of effectiveness of the Regulations, ambiguity, implementation, enforcement and future proofing.

Effectiveness of Regulations

The regulations were generally found to be effective and fit for purpose, though some challenges were identified in the study. These included: low levels of compliance with the Regulations with a number of reasons suggested; the unintended consequences of closed periods required by the NPP; and that the overlap between the Regulations and competing guidance can lead to confusion around prioritisation of compliance actions.

Whilst limited quantitative evidence exists on the effectiveness of the FRfW and SSAFO, evidence from proxy measures suggest some positive impacts on pollution control. The NPP regulations have contributed to gradual nitrate reductions in English rivers, but long response times in groundwater mean that it is difficult to demonstrate an impact. SSAFO regulations are likely effective at reducing pollution, though enforcement remains challenging.

Ambiguity in language

Although the SSAFO and NPP regulations are considered clear, where the NPP overlaps with other regulations this was identified as creating confusion for landowners, such as around storage of manures. A variety of views were put forward on ambiguity in the FRfW with some stakeholders considering that the ambiguity created confusion, while others felt it provided flexibility which helped in application across different farm types, climates and geographies. It was identified that (perceived) inconsistency in guidance on the regulations is frustrating farmers. During the course of the project two stakeholders identified the recently published EA pocket book guidance on the Regulations which aims to clarify areas of regulatory overlap and reduce confusion.

Implementation

A number of challenges to compliant implementation were raised including the planning requirements and costs of investment in infrastructure, in particular for tenant farmers. It was identified that planned improvements may be rejected where they are combined with expansion in livestock numbers, especially in nutrient neutrality catchments. There are efforts underway to reform planning policies to promote “betterment” activities on agricultural land. The high risk of pollution posed by high levels of spreading prior to and after the closed periods set out in the NPP was also reported.

Enforcement

The historically low regulatory capacity was mentioned as a barrier to enforcement with 91 EA farm inspectors responsible for monitoring 100,000 farms, although this has increased in recent years. The most common areas of non-compliance are around process-based rules such as record keeping and soil testing, whilst there is relatively good compliance for action-based rules. The “Defence of Due Diligence” clause is seldom utilised, and its impact remains uncertain. While remote sensing and AI technology show promise in identifying issues, face to face farm visits continue to be a valuable part of compliance checking and improved understanding of what is required.

Future Proofing

Periodic effectiveness reviews were strongly supported across all regulations to ensure adaptability and evidence-based reviews at the local level to feedback what works, were agreed to be useful. Tools such as farm-specific nutrient monitoring strategies and risk maps may also be helpful in improving compliance. Climate change impacts on nitrogen transport remain an evidence gap, requiring further research. The exemption in the SSAFO regulations for pre-1991 slurry stores was raised as requiring re-evaluation, as most infrastructure has been modified in the interim 34 years. Finally, it was noted that a unified regulatory framework could reduce complexity for farms managing compliance across multiple regulations.

The following recommendations were made for **future research**:

- Systematic evidence review to quantify FRfW and SSAFO effectiveness (short-term);
- Improving farmer guidance accessibility and stakeholder engagement to increase compliance (short-term);
- Expanded monitoring data to track regulation effectiveness over time (long-term);
- Academic research on NVZ effectiveness at national and catchment levels (long-term);

- Assessing catchment management strategies as indicators of regulatory impact (long-term); and
- Reviewing the number of enforcement actions that convert into compliance outcomes (long-term).

1 INTRODUCTION

1.1 OVERVIEW

Diffuse pollution from rural areas in England provides a significant contribution to the failure of surface water and transitional and coastal bodies to meet Good Ecological Status and groundwater bodies to meet Good Chemical Status under the Water Framework Directive (WFD). The control of agricultural diffuse pollution is dispensed through both regulatory and incentivised voluntary measures by the responsible regulatory authorities. This report describes the outcomes of an initial review for the Office for Environmental Protection (OEP) of the effectiveness of implementation of the following regulations (henceforth the Regulations) in England:

- Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018, commonly known as the Farming Rules for Water (FRfW);
- Nitrate Pollution Prevention Regulations (NPP) 2015; and
- Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil – (SSAFO)) (England) Regulations 2010.

The Regulations set out criteria for management and mitigation of agricultural diffuse pollution. This review was completed prior to the publication of the Corry review of Defra's regulatory landscape (published April 2025) and does not take into account its findings[1].

As set out in the recently published OEP report on the Water Environment (WFD) (England and Wales) Regulations implementation and river basin management planning in England, the 3rd River Basin Management Plans (RBMPs) identify that nutrient pollution pressures from agricultural and rural areas lead to a large number of water bodies (40%) not achieving their Environmental Objectives[2]. The extent of England covered by Nitrate Vulnerable Zones (NVZs), one of the main tools through which the Nitrates Directive (91/676/EEC) and NPP are implemented, has remained at around 50% of England since 2017 (the whole of Northern Ireland (NI) is a designated zone). Recent assessment of the national evidence base in 2023-2024 suggests little change. The Environment Act 2021 set an "agriculture water target" of reducing total nitrogen (N), phosphorus (P) and sediment inputs from agriculture to the water environment by 40% by 2038. The OEP note that effective implementation of the three Regulations could help to meet these targets.

This report describes an initial review of the effectiveness of the regulations through their implementation. The OEP is currently investigating the Statutory Guidance provided by the

[1] Corry, D. 2025. *Delivering economic growth and nature recovery: An independent review of Defra's regulatory landscape.* Report published by Defra pp64. Available at https://assets.publishing.service.gov.uk/media/67ef87e9e9c76fa33048c7a9/dan-corry-review-defra-regulatory-landscape.pdf (Accessed 15/04/25).

[2] OEP, 2024. *A review of the implementation of the Water Framework Directive Regulations and River Basin Management Planning in England. OEP*, Worcester, England. ISBN: 978-1-5286-4757-1. Available at https://www.theoep.org.uk/report/oep-finds-deeply-concerning-issues-how-laws-place-protect-englands-rivers-lakes-and-coastal (Accessed 15/04/2025).

government on applying the FRfW. The project aims to avoid the duplication of this ongoing investigation by focussing on the implementation of the FRfW and not their enforcement.

The project outcomes will support OEP's decision on aspects of a further systematic evidence review.

1.2 AIMS AND OBJECTIVES

The project gathered evidence on the effectiveness of the regulations, through their implementation, on preventing agricultural diffuse pollution with the aim of assessing what further evaluation, if any, is feasible and desirable. The clarity and enforceability of the regulations, guidance and advice and their practical implementation were considered, along with how well land managers understand the requirements and the economic and external barriers to compliance such as climate change.

1.3 PRIMARY AND SECONDARY QUESTIONS

The project comprised a literature review followed by expert interview. The primary and secondary questions for the review were as follows:

Primary question:

- What evidence is available for the effectiveness of these regulations?

Secondary questions:

- How have the regulations been implemented in England (what guidance has been issued, which organisations are responsible for guidance and enforcement?); and
- Is there evidence of reasons for non-compliance with regulations?

1.4 LAYOUT OF THIS REPORT

The sections of this report are as follows:

- **Section 2: The Regulations** – provides an overview of the regulations and identifies which elements impact on diffuse agricultural pollution;
- **Section 3: Review of Regulations** – describes the approach taken to the review of the available evidence on the effectiveness of the implementation of the Regulations. Key themes for discussion with experts described in Section 4 are identified;
- **Section 4: Expert Interviews** – describes evidence gathered from experts from academic, regulatory and non-governmental organisations at individual interview and group workshop around the identified themes. A wider picture of the issues of practical implementation is developed, with unforeseen knowledge gaps and options for improvement identified; and
- **Section 5: Conclusions and Recommendations** – brings together the initial findings from the evidence review, expert interviews and workshop to develop options for next steps to understand if there is sufficient evidence for further review.

2 THE REGULATIONS

In this section the Regulations are described in terms of their specific requirements to provide context for the subsequent evidence review with a comparison made to identify overlapping or conflicting areas. It is not intended to be a definitive legal description of the regulations or their requirements.

2.1 THE REDUCTION AND PREVENTION OF AGRICULTURAL DIFFUSE POLLUTION (ENGLAND) REGULATIONS (2018)

The "Reduction and Prevention of Agricultural Diffuse Pollution Regulations (2018)"[3], also commonly referred to as the "Farming Rules for Water" (FRfW), were introduced in the United Kingdom (UK) in 2018 to mitigate and prevent diffuse water pollution from agricultural activities. Prior to the implementation of the FRfW similar requirements were set out in the Defra Code of Good Agricultural Practice for farmers (CoGAP) published in 2009.[4]

The FRfW regulations cover the application and storage of fertilisers, soil management, and livestock management practices through focussing on the following actions:

- Planning use of manures and fertilisers;
- Storing organic manures;
- Applying manures or fertilisers;
- Where not to apply organic manures;
- Where not to apply fertiliser;
- Reasonable precautions to prevent soil erosion;
- Protecting against soil erosion by livestock; and
- Position of livestock feeders these regulations cover the application and storage of fertilisers, soil management, and livestock management practices.

The Environment Agency (EA) is responsible for enforcing the FRfW, focussing on providing advice and guidance to farmers before taking enforcement actions where non-compliance is identified. Within the regulations, there is a "Defence of due diligence" clause[5] which allows the regulator to apply discretion in cases where a farmer has adhered to the rules above, but this has not successfully reduced agricultural diffuse pollution from their land.

The primary goal, and outcomes of these regulations is to protect water quality while promoting sustainable farming practices.

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[3] The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018, SI 2018/151. (2018). *Statutory Instruments*. Available at: https://www.legislation.gov.uk/uksi/2018/151/made (Accessed: 25 February 2025).

[4] Defra, 2009. *Protecting our Water, Soil and Air – A Code of Good Agricultural Practice for farmers, growers and land managers*. pp 124. ISBN 978 0 11 243284 5. Available at https://assets.publishing.service.gov.uk/media/5a7cbb27ed915d6822362336/pb13558-cogap-131223.pdf (Accessed: 28 March 2025).

[5] The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018, section 12 (1)

2.2 NITRATE POLLUTION PREVENTION REGULATIONS

The Nitrates Directive (Council Directive 91/676/EEC (Concerning the protection of waters against pollution by nitrates (NO_3) from agricultural sources or the "Nitrates Directive") has been implemented in the UK since 1991 and the Nitrate Vulnerable Zone (NVZ) Regulations have been in place since 1998. The latest NPP Regulations 2015[6] came into force on 1st May 2015 and continue to implement the Nitrates Directive and Commission Decision 2009/431/EC granting a derogation pursuant to that Directive.

The Regulations provide for the designation of land as NVZs and set out rules[7] that farmers and landowners must follow if their land is wholly or partly in an NVZ and used for growing crops in soil or rearing livestock for agricultural purposes. In summary, the rules specify:

- annual limits on the amount of nitrogen from organic manure that may be applied or spread on a holding;
- that a plan for the spreading of nitrogen fertiliser must be produced for the growing season (a "fertilisation plan") and the total amount of nitrogen spread on a crop or group of crops must not exceed specified values in any twelve-month period;
- a risk map of the holding must be produced;
- restrictions on where and when nitrogen fertiliser may be spread, including closed periods during which spreading is prohibited;
- how nitrogen fertiliser should be stored;
- which records must be kept; and
- the procedure for applying for a derogation, if 80% or more of the agricultural area of the holding is sown with grass.[8]

The Regulations require the EA to make recommendations to the Secretary of State every four years on which areas of land should be, or should continue to be, designated as NVZs and for the Secretary of State to publish proposals. The Regulations also establish the procedure for landowners to appeal against the designation of land as a NVZ, or the decision to refuse an application for a derogation.

The EA is responsible for enforcing the Regulations and the Secretary of State is responsible for reviewing the action programme. At least every four years the Secretary of State must review the effectiveness of the restrictions in NVZs imposed by the Regulations as a means of reducing or

[6] The Nitrate Pollution Prevention Regulations 2015, SI 2015/668. Available at: https://www.legislation.gov.uk/uksi/2015/668/contents (Accessed: 5 February 2025).
[7] Department for Environment, Food and Rural Affairs and Environment Agency. (2025). *Nitrate Vulnerable Zones. Rules farmers and landowners must follow if their land is in a nitrate vulnerable zone (NVZ)*. Available at: https://www.gov.uk/government/collections/nitrate-vulnerable-zones (Accessed: 12 February 2025).
[8] A grassland derogation permits the use of up to 250 kg of nitrogen per hectare from grazing livestock manure in a calendar year, instead of 170 kg per hectare. The temporary or permanent nature of the grassland is not specified in the Regulations.
Department for Environment, Food and Rural Affairs. (2024). *Grassland derogations for livestock manure in nitrate vulnerable zones*. Available at: https://www.gov.uk/guidance/grassland-derogations-for-livestock-manure-in-nitrate-vulnerable-zones (Accessed: 11 February 2025).

preventing water pollution caused by nitrates from agricultural sources and, if necessary, revise the restrictions.

2.3 WATER RESOURCES (CONTROL OF POLLUTION) (SILAGE, SLURRY AND AGRICULTURAL FUEL OIL) (ENGLAND) REGULATIONS (2010)

Farmers and landowners in England are required to adhere to the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (SSAFO) (England)[9] regulations and associated guidance[10] if they store silage, slurry or agricultural fuel oil. The SSAFO regulations came into force on the 6th April 2010. The Regulations were amended in 2013 by the Nitrate Pollution Prevention (Amendment) and Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (England). In this amendment Regulation 26 alters the notice period for slurry stores from 14 days before use to 14 days before construction was to begin.

These regulations superseded the previous regulations:

- The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991; and
- The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil (Amendment) Regulations 1997.

There are general rules which cover all three of these potential pollutants alongside individual rules for each. In simple terms, these rules require farmers to:

  - ensure their storage has an estimated lifespan of at least 20 years;
  - is located at a minimum of 10 m away from watercourses or coastal waters;
- For silage storage:
  - any in-field silage storage is required to be at least 50 m away from an abstraction point of a protected water supply;
  - have sufficient effluent tank capacity based on the silo capacity.
- For slurry storage:
  - have capacity for at least four months;
  - be able to accommodate likely quantities of rainfall that may fall or drain into the slurry storage tank during the likely maximum storage period;
  - provide at least 750 mm of freeboard for a tank with earth walls and 300 mm in all other cases.

Additional guidance within the regulations outlines the requirements for provisions for drainage of effluent and storage of such within an effluent tank. Structures are exempt from the regulations (unless structural changes have been made) if they:

- were installed before 1st March 1991;

[9] Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (England) Regulations 2010. Available at: https://www.legislation.gov.uk/uksi/2010/639/regulation/1 (Accessed: 19 February 2025).
[10] Department of Environment, Food & Rural Affairs and Environment Agency. (2023). *Guidance: Storing silage, slurry and agricultural fuel oil*. Available at: https://www.gov.uk/guidance/storing-silage-slurry-and-agricultural-fuel-oil (Accessed: 19 February 2025).

- constructed and not used before 1st March 1991;
- alterations in construction entered into before 1st March;
- completed before 1st September 1991.

Notice of construction for any new, or substantial changes to, silage or slurry stores, is required to be provided to the EA at least 14 days before construction begins.

2.4 OVERLAPS BETWEEN THE REGULATIONS

Table 2.1 provides an overview of the overlaps between the three Regulations broken down by the sources of pollution controlled, the pathways controlled and the receptors protected. The responsible regulator is identified and other organisations which may be involved in implementation of the regulations such as the Natural England Catchment Sensitive Farming scheme (CSF), water company farm advisors, research and advice organisations and farming industry groups.

The most significant area of overlap relates to:

- The types of receptors of diffuse agricultural pollution although SSAFO focuses on point source pollution control;
- Specified spatial and temporal restrictions on infrastructure and fertiliser / manure / slurry management and lack of clarity e.g. around prioritisation of implementation; and
- FRfW and NPP regulations both require planning of nutrient management.

The greatest divergence between regulations is in the pathways considered for pollutants to enter the water environment e.g. SSAFO regulations focus on integrity and capacity of storage as opposed to spreading or stockpiling on land which is considered in both the FRfW and NPP.

Table 2.1 Diffuse pollution regulation overlap

Topic	Farming Rules for Water Regulations (FRfW)	Silage, Slurry and Agricultural Fuel Oil (SSAFO)	Nitrate Pollution Prevention (NPP)
Source*	Application of organic manures and manufactured fertilisers. Storage of organic manures. Poaching by livestock.	Storage of slurry, silage and agricultural fuel oil.	Application of organic manures and manufactured chemical fertilisers. Storage of slurry and organic manures.
Pathway	Soil runoff, erosion and leaching. Factors considered include ground slope and ground cover, soil type and condition of the land, presence of any agricultural drains.	Spillage, leakage and surface runoff. Factors considered are soil coverage and condition for infield storage (of silage), sufficient drainage channels to an effluent tank through channel or pipe, material coverage of silage bales, construction material of storage facility (concrete, impermeable and not susceptible to corrosion), and for fuel oil be surrounded by a bund capable of retaining within the area.	• Spreading on fields and surface run-off, sub-surface flow or spreading directly to surface waters (flow through catchment). • Spillage and leakage of manures / slurries / fertilisers. • Drains (direct disposal and surface run-off). • Seepage into groundwater leading to a contaminated aquifer and discharge into surface waters. Factors considered for the risk map are soil type, soil depth, ground slope, run-off risk, presence of land drains (other than a sealed impermeable pipe) and distance from surface waters, boreholes, springs or wells. The suitability of sites for temporary field heaps must also be considered if this method of storage is to be used. Additional factors considered for spreading include any ground cover, weather conditions and soil conditions (e.g. waterlogged or flooded).
Receptor	Inland freshwaters (surface and groundwater), estuary and coastal waters, springs, wells, boreholes		
Planning and management of nutrients storage and spreading	The FRfW regulations outline planning requirements for applying organic manure or manufactured fertiliser to agricultural land. These regulations overlap with the NPP regulations, as both require consideration of soil and crop needs, risk of agricultural diffuse pollution and weather conditions. Additionally, both regulations consider factors like land slope, groundcover, proximity to water sources (inland freshwaters, coastal waters, wetlands, springs, wells, boreholes) and soil type and condition.	The SSAFO regulations focus on planning for infrastructure construction, including a 14-day notice requirement before work begins for alterations or new constructions. They require planning for infrastructure location in relation to inland freshwater, coastal waters, and abstraction sources, overlapping with the NPP regulations. However, they do not cover spreading considerations or the specifics of using the stored slurry, silage, or manure.	The NPP regulations overlap with the FRfW regulations regarding planning and consideration of each application of organic manure or manufactured fertilisers to agricultural land. The NPP regulations overlap with the SSAFO regulations regarding the storage requirements for organic manure and slurry (facilities and capacity).
Spatial constraints on storage and spreading of Fertilisers/Manures/Slurry	The spatial constraints in the FRfW regulations overlap with those of the SSAFO and NPP regulations. The FRfW specifies distances to water sources (inland freshwater, coastal waters, springs, wells, boreholes) for spreading organic manures and manufactured fertilisers, in line with the NPP regulations. The FRfW also makes specifications on the location of livestock feeders, which other regulations do not address, and specifies the use of precision spread equipment, similar to the NPP regulations.	The SSAFO regulations overlap with the FRfW and NPP regulations by specifying the same distances from water sources (inland freshwater, coastal waters, springs, wells, boreholes). However, these distances apply specifically to the storage of silage and slurry, not to spreading.	The spatial constraints in the NPP overlap with those of the SSFAO and FRfW regulations. The NPP specifies distances to water sources (inland freshwater, coastal waters, springs, wells, boreholes) for spreading organic manures and manufactured fertilisers, similar to the FRfW. Both regulations also require the use of precision spreading equipment. However, the NPP additionally considers the spatial extent of land at significant risk of nitrogen reaching surface water, as well as land conditions and management, topography, and soil conditions.
Temporal constraints on storage and spreading of Fertilisers/Manures/Slurry	The temporal considerations in the FRfW regulations focus on spreading and receiving land conditions, time since soil freezing, and the need for up-to-date soil sampling and analysis. Additionally, they specify periods for applying livestock manure to fields. These considerations are specific to the FRfW and do not overlap with other regulations.	The SSAFO regulations do not overlap with the FRfW and NPP regulations regarding temporal restrictions on spreading. The SSAFO regulations are specific to infrastructure lifespan, requiring at least 4 months of slurry storage, and providing 14 days' notice to the EA before work begins on any new construction or alterations to storage infrastructure.	Like the FRfW regulations, the NPP regulations outline windows for spreading manures and nitrogen fertilisers, with specific reference to closed periods. These closed periods are defined by soil type and tillage practice and up to five months in duration. Exemptions apply to organic holdings for spreading organic manure but there are also controls built into this.

Topic	Farming Rules for Water Regulations (FRfW)	Silage, Slurry and Agricultural Fuel Oil (SSAFO)	Nitrate Pollution Prevention (NPP)
			The NPP regulations require sufficient storage for all slurry produced during the storage period, and for all poultry manure produced in a yard or building during the storage period. In the case of pigs and poultry, the storage period is 6 months. In any other case, the period is 5 months.
Storage capacity Fertilisers/Manures/Slurries	None	The SSAFO regulations require sufficient safe storage and specify storage capacity requirements for infrastructure, detailing freeboard and effluent tank volumes. While there is no overlap with the FRfW, the SSAFO regulations overlap with the NPP by requiring storage capacity to account for inputs of rainfall, roof and yard run-off and other liquids.	The NPP regulations overlap with the SSAFO regulations regarding storage requirements, both considering capacity for additional inputs from rainfall or other liquids. The NPP regulations additionally require calculations based on daily manure production per animal and specify storage periods for pigs, poultry, and other cases, which are not detailed in the SSAFO regulations.
Record keeping requirements	None	None	Annual records relating to storage (*Regulation 26)* Record of nitrogen produced by animals on the holding (*Regulation 27)* Livestock manure brought on to or sent off the holding (*Regulation 28)* Sampling and analysis (*Regulation 29)* Records of crops sown (*Regulation 30)* Records of spreading nitrogen fertiliser (*Regulation 31)* Subsequent records (*Regulation 32)* FACTS advice (*Regulation 33)* Keeping records up to date (*Regulation 34)* Duration of records (*Regulation 35)*
Regulator	EA	EA	EA
Advisory bodies dealing with the regulations through guidance or on farm advice	The following provide advice and guidance (written or verbal) across all three Regulations: Farm advisors, from a range of organisations including CSF (Natural England), water companies, FWAG, ADAS and NFU. Farm Inspectors and Environment Officers from the Environment Agency. RPA (grant agency), AHDB. Agronomists. FACTS adviser (a member of the Fertiliser Advisers Certification and Training Scheme and qualified to advise on matters relating to crop nutrient management).		

3 TASK A REVIEW OF EFFECTIVENESS, COMPLIANCE AND BARRIERS TO COMPLIANCE WITH THE REGULATIONS

To understand the current state of effectiveness, enforcement and barriers to implementation of the three sets of regulations an evidence review was undertaken. The approach and outcomes are described here.

3.1 METHODOLOGY

The Quick Scoping Review (QSR) approach has been used to collate and categorise published evidence for each of the three pieces of legislation. However, the short project timescale meant that the evidence review comprised a literature review and expert interview, rather than a full QSR. Google and Google Scholar search engines were used to carry out the evidence search, and the list of sources was limited to 30 based on the scope and timeframe of the project.

The primary question, and secondary questions have been outlined in **Section 1.3**. A review of available evidence in response to these questions was undertaken, focussing on:

- The Regulations and associated government guidance documents;
- Reports from the Defra Nutrient Management Expert Group (NMEG);
- EA local studies and reviews of implementation of the Regulations in the Poole Harbour and River Axe catchments;
- The EA Compliance and Inspection Data of farm inspections carried out between January 2022 to September 2024;
- General media and trade articles on farmer experiences; and
- Funding programs like the Farm Investment Fund, which includes the Slurry Infrastructure Grant.

The geographic coverage of the review of evidence focussed on England only provided the limited sources outlined in the scope due to the short timeframe of the project. An assessment of the adequacy and robustness of evidence was carried out on each source which considered:

- Publication date;
- Independence of author;
- Evidence of peer review;
- Geographical coverage;
- Whether the source addresses the key research questions;
- Limitations of the source; and
- Evidence of real-life application or theoretical basis.

The Regulations and the underlying legislative instruments have existed since the 1990s (Water Resources Act and Nitrates Directive) but the latest versions of the Regulations have been in place for over 15 years with a number of guidance and impact assessment documents. To limit the scale of the evidence review, the 2015 to 2025 period has been focused on to understand how guidance and implementation has changed. For academic literature this has been limited to the 2020-2025 period. A total of four academic journal articles were found that fitted the criteria and were reviewed and included in the evidence review. Of the 35 sources identified for the evidence review, 23 were considered to have evidence of peer review or acceptance of criticism.

Search terms, key words and a searchable evidence reference list is provided in **Appendix A**.

3.2 THE REDUCTION AND PREVENTION OF AGRICULTURAL DIFFUSE POLLUTION (ENGLAND) REGULATIONS (2018) "FARMING RULES FOR WATER"

The FRfW were introduced in the UK in 2018 to mitigate and prevent diffuse water pollution from agricultural activities. These regulations cover all farmers and landowners and address the application and storage of fertilisers, soil management, and livestock management practices.

3.2.1 EFFECTIVENESS OF FRFW

There is evidence to suggest that the FRfW have limited effectiveness at reducing agricultural diffuse pollution. For example, the baseline targets for reducing nutrient pollutants such as phosphorus to meet WFD targets within RBMPs, would need a reduction of 28-43%, however, during consultation on FRfW in 2015 it was calculated that implementing the first seven rules of the proposed regulation would result in a 2.4% reduction, and a 6.6% reduction in phosphorous and other pollutants if all 11 rules proposed in the consultation were implemented.[11] A combination of these rules were taken forward and developed in the final regulations, though environmental groups still argue that the standards in the regulations are too low to achieve significant environmental improvements.[12]

The regulation also uses terms such as "reasonable precautions" which can be subject to interpretation by both farmers and regulators. Whilst this language enables greater flexibility in interpretation, for example to allow for differences between farm types or catchment geography, it can also result in ambiguity, leading to varied interpretations and non-compliance.[13]

Farmers have encountered challenges in understanding and applying the rules, resulting in non-compliance, and a review of the available evidence indicates a large amount of supplementary

[11] Department for Environment, Food and Rural Affairs. (2015). Consultation on new basic rules for farmers to tackle diffuse water pollution from agriculture in England. Available at: Available at: https://consult.defra.gov.uk/water/rules-for-diffuse-water-pollution-from-agriculture/supporting_documents/Consultation%20document_New%20basic%20rules%20for%20farmers.pdf (Accessed: 26 March 2025)

[12] Wildlife and Countryside Link. (2021). *Farming Rules for Water Regulatory Review: Wildlife and Countryside Link Response.* https://www.wcl.org.uk/docs/assets/uploads/WCL_Farming_Rules_for_Water_Regulatory_Review_Response_25_01_21.pdf (Accessed: 4 February 2025).

[13] Ambiguity in regulatory language, particularly in the FRfW regulations, is a key theme to have emerged from the workshop and interview responses.

guidance has been produced by industry to try to bridge this gap in understanding[14, 15] particularly following publication of the EA regulatory position statement in 2021[16] and the Defra statutory guidance in 2022.[17]

The "Defence of due diligence" clause (12(1))[18] of the Regulations also provides opportunities for non-compliance or continued agricultural diffuse pollution due to difficulty in enforcement and lack of guidance on further mitigation if the regulations themselves do not effectively reduce agricultural diffuse pollution[19]. However, whilst this mechanism is present in the regulations, there is currently a lack of evidence available to assess how widely this defence is applied in enforcement cases.

3.2.2 COMPLIANCE WITH THE FRFW REGULATIONS

The Agriculture Regulatory Taskforce programme (ART) is a part of the EA responsible for undertaking farm inspections to assess compliance with the FRfW, NPP and SSAFO regulations. ART uses a risk-based approach, to weight waterbodies and farms to produce a risk score on which inspections of high-risk farms in high-risk water bodies are prioritised.

Compliance and Inspection Data from the EA for January 2022 to September 2024 shows that in total, 7,943 farms were inspected under the FRfW Regulations with an overall FRfW compliance rate of 53% over this period. It should be noted that not all of the 7,943 farms were inspected against each rule within the FRfW.[20]

The areas of lowest compliance were those associated with process-based rules (record keeping and analysis), which were also subject to the highest number of inspections. Soil testing (6,818 farms inspected, 63% of farms compliant) was the least compliant, followed by the planning of application of organic manures and manufactured fertilisers (6,808 inspections, 66% of farms

[14] National Farmers' Union (2024) '*Farming Rules for Water – what you need to know*', NFUonline, 7 March. Available at: https://www.nfuonline.com/updates-and-information/farming-rules-for-water-what-you-need-to-know/#Rule1 (Accessed: 5 February 2025).
[15] Tried and Tested (2018) '*Farming Rules for Water – Q&A briefing*', Tried and Tested Briefing, 2 April. Available at: https://www.triedandtested.org.uk/farming-rules-for-water-qa-briefing/ (Accessed: 5 February 2025).
[16] Farming and Wildlife Advisory Group. (2021). *Farming Rules for Water – EA Regulatory Position Statement*. Available at: https://www.fwagsw.org.uk/news/farming-rules-for-water-ea-regulatory-position-statement (Accessed: 26 March 2025).
[17] Agriculture and Horticulture Development Board. (2022). *Farming rules for water: new guidance on manure applications*. Available at: https://ahdb.org.uk/news/farming-rules-for-water-new-guidance-on-manure-applications (Accessed: 26 March 2025).
[18] Which states "In any proceedings against any person for an offence under regulation 11(1), it is a defence for that person ("P") to show that P took all reasonable steps and exercised all due diligence to avoid committing the offense,"
[19] Department for Environment, Food and Rural Affairs. (2024). *Report of the Nutrient Management Expert Group (NMEG): Improving policy and practice for agricultural nutrient use and management*. Available at: https://www.gov.uk/government/publications/nutrient-management-expert-group-nmeg-report (Accessed: 4 February 2025.)
[20] During inspections compliance status can also be recorded as "Not applicable" or "Not assessed", in addition to "Compliant" or "Non-compliant".

compliant), and significant risk of causing agricultural diffuse pollution (6,480 inspections, 88% compliant), all of which come under Rule 1 of the FRfW.

Action based rules showed higher levels of compliance, with Rules 3 to 8 all having compliance of 95% and above based on inspections. This indicates that a lack of compliance with process-based rules may be hindering farmers from demonstrating good practice and achieving overall compliance with the FRfW.

Following a farm inspection, if non-compliance is found then appropriate enforcement actions will be put in place to bring farms into compliance. Once enforcement actions are completed, they are recorded as enforcement outcomes. In the case of FRfW non-compliance, enforcement actions relate to soil testing and nutrient management planning as the highest areas of non-compliance. Enforcement action data between 2022 and 2024 is combined for all three regulations and shows that 5,545 farms were issued with enforcement actions.

Enforcement action data for all three regulations shows that “Soil testing” (41% of farms) and “Nutrient Management Plan” (40% of farms) were the third and fourth most common enforcement actions respectively. Enforcement outcomes data indicate that over the same period the “Soil testing” (23% of farms) and “Nutrient Management Plan” (23% of farms) outcomes were fifth and sixth most common.

The gap between the number of enforcement actions and the number enforcement outcomes for these two actions is likely in part due to the lag time required for actions to be implemented. However, these enforcement actions would be expected to take less time to achieve than, for example, actions relating to additional storage requirements that are more likely to be delayed due to the need for planning permission. Therefore, it is not clear from the current data why there is a large gap between the number of actions and outcomes for these two actions where non-compliance with the FRfW is highest. This may be due to frequency of follow ups on farms with actions against them due to prioritisation of inspections on uninspected farms[21], though limited staff numbers may also be a factor.[22]

These results highlight the need for enough resource to inspect more farms and undertake follow up inspections.[23] Compliance with action-based rules which result directly in a reduction to agricultural diffuse pollution is generally high, and a lack of compliance with process-based rules is the main driver of non-compliance according to available inspection data. Additional data in subsequent years may provide further insight on the effectiveness of the current program of enforcement by the EA.

[21] Environment Agency. (2023). *Agriculture Regulatory Taskforce Programme Progress Report*.
[22] Environment Agency. (2021). *River Axe N2K Catchment Regulatory Project Report*. Available at: https://anglingtrust.net/wp-content/uploads/2021/04/Final-Axe-Regulatory-Report.pdf (Accessed: 19 February 2025).
[23] Environment Agency. (2021). *River Axe N2K Catchment Regulatory Project Report*. Available at: https://anglingtrust.net/wp-content/uploads/2021/04/Final-Axe-Regulatory-Report.pdf (Accessed: 19 February 2025).

When non-compliance is found, farm inspectors take a proportionate approach that uses advice and guidance first. However, if advice is not heeded then the EA will pursue whatever sanctions are necessary, including penalties, formal cautions or prosecutions.

3.2.3 BARRIERS TO ACHIEVING COMPLIANCE AND EVIDENCE GAPS

For the regulations to be effective, the regulator must have sufficient resource to enable monitoring, enforcement and evaluation of the delivery of the regulations to facilitate compliance.[24] The number of farm inspections will be limited by the current enforcement capacity, with 91 EA officers available to cover around 100,000 farms in England.[25] However, the risk based approach to farm inspections is considered to be pragmatic and enables inspections to target farms and areas where the most significant reductions in agricultural diffuse pollution can be achieved. It is also likely that non-compliance with the regulations may be higher than reported, as some aspects of the regulations, such as spreading of fertilisers, are not possible to assess unless an EA officer is present at the time (or soon after) the activity takes place.[26]

Finally, the loss of cross-compliance[27], as the regulation was removed, taking effect on the 31st of December 2023[28], is thought to have weakened the overall effectiveness of the Regulations, which in turn, reduces the likelihood of meeting environmental standards.[29]

Whilst the FRfW aim to protect water quality and promote sustainable farming, stakeholder evidence suggests that there are gaps that could be addressed to help ensure effective compliance and environmental protection.[30]

The review of available evidence here identified the following gaps in knowledge:

- Additional data on outcomes of enforcement to assess effectiveness of enforcement actions; and

[24] De Vito, L., Fairbrother, M,. Russel, D. (2020). *Implementing the Water Framework Directive and Tackling Diffuse Pollution from Agriculture: Lessons from England and Scotland.* Available at: https://www.mdpi.com/2073-4441/12/1/244 (Accessed 26 March 2025).
[25] Department for Environment, Food and Rural Affairs. (2024). *Report of the Nutrient Management Expert Group (NMEG): Improving policy and practice for agricultural nutrient use and management.* Available at: https://www.gov.uk/government/publications/nutrient-management-expert-group-nmeg-report (Accessed: 4 February 2025).
[26] Environment Agency. (2023). *Agriculture Regulatory Taskforce Programme Progress Report*.
[27] The term Cross-Compliance refers to the requirement for farmers to comply with a set of Statutory Management Requirements (SMRs) and keep their land in Good Agricultural and Environmental Condition (GAEC) in order to qualify for full payments.
[28] The Agriculture (Removal of Cross-Compliance and Miscellaneous Revocations and Amendments, etc.) (England) Regulations 2023, SI 2023/816. (2023). *Statutory Instruments.* Available at: https://www.legislation.gov.uk/uksi/2023/816/contents/made (Accessed: 10 February 2025).
[29] Wildlife and Countryside Link. (2021). *Farming Rules for Water Regulatory Review: Wildlife and Countryside Link Response*. Available at: https://www.gov.uk/government/publications/farm-inspection-and-regulation-review (Accessed: 4 February 2025).
[30] Wildlife and Countryside Link. (2021). *Farming Rules for Water Regulatory Review: Wildlife and Countryside Link Response*. Available at: https://www.gov.uk/government/publications/farm-inspection-and-regulation-review (Accessed: 4 February 2025).

- Further information on the frequency of use of the “Defence of due diligence” clause in the FRfW regulation.

3.3 NITRATE POLLUTION PREVENTION REGULATIONS (NPP) 2015

3.3.1 EFFECTIVENESS OF NVZS

NVZs were originally designated in 1996 and covered only 8% of England, for the protection of drinking water sources from agricultural pollution, and an action programme of measures has been implemented within these zones since December 1998[31]. 55% of England is now designated as a NVZ due to elevated nitrate concentrations in rivers and groundwater (breaching the 50 mg/l of nitrate as NO_3 threshold), or eutrophication in fresh surface waters, estuarial waters or coastal waters.[32]

Following the implementation of NVZs, there have been widespread but gradual declines in nitrate concentrations in English rivers. Estimates of the effectiveness of NVZs (based on the 2002 programme) put the overall national reduction of nitrate lost to the water environment in NVZs as between 2 and 7%, with reductions at a catchment scale varying between 2 and 20%. However, the current NVZ action programme, which began in 2016, is more stringent and expected to deliver greater reductions. The revised action programme requires all livestock farmers to provide storage for the slurry they produce which allows for optimum spreading and observing the closed periods for slurry spreading.[33]

Despite the overall decline in river nitrate concentrations, a study in 2009 into the effectiveness of NVZs for limiting surface water nitrate concentrations concluded that 69% of NVZs showed no significant improvement in surface water concentrations. In comparison to a control catchment, 29% of NVZs showed a significant improvement and 31% showed a significant worsening. The differences between NVZs could not be significantly related to the size of the NVZ, uptake of the scheme, extent of uptake, land use change or geology of the local aquifer.[34]

In 2019, groundwater nitrate concentrations reported in RBMPs were broadly stable, except for southern England where they were rising in some areas. The effectiveness of NVZs in supporting

[31] Barclay, C. and White, E. (2009). *Nitrate Vulnerable Zones Standard Note SN/SC/4552*. Available at: https://researchbriefings.files.parliament.uk/documents/SN04552/SN04552.pdf (Accessed: 19 February 2025).
[32] Environment Agency. (2019). *2021 River Basin Management Plan, Nitrates*. Available at: https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/nitrates-pressure-rbmp-2021.pdf (Accessed: 5 February 2025).
[33] Environment Agency. (2019). *2021 River Basin Management Plan, Nitrates*. Available at: https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/nitrates-pressure-rbmp-2021.pdf (Accessed: 5 February 2025).
[34] Worrall, F., Spencer, E. and Burt, T.P. (2009). The effectiveness of nitrate vulnerable zones for limiting surface water nitrate concentrations. *Journal of Hydrology*, Volume 370, Issues 1-4, Pages 21-28. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0022169409001152 (Accessed: 5 February 2025).

delivery of WFD objectives for nitrate in groundwater is difficult to assess due to the time lag between changes in agricultural practice and the resultant improvement in groundwater quality.[35]

3.3.2 COMPLIANCE WITH THE NPP REGULATIONS

In total, 9,176 farms were inspected by the EA for all three of the regulatory regimes between 2022 and 2024, based on the Compliance and Inspection Data from the EA, although not all three of the Regulations were assessed in every inspection. The selection process is not known, but it is understood that inspections are targeted to areas where they are most needed as not all farms are in places where they present a risk to water quality, and some farming sectors and practices have a much lower impact on the environment than others.[36] Remote sensing inspections were excluded from the data as they do not represent a full site inspection.

Of the farms inspected for relevant aspects of the NPP regulations, the Compliance and Inspection Data from the EA showed a high level of compliance (above 80%) with the requirements to produce a risk map, plan nitrogen spreading and adhere to nitrogen fertiliser limits (farm, field and crop limits) and closed periods.

Compliance with the requirements for slurry separation and solid manure storage was also high (93% and 84% respectively) but compliance regarding slurry storage capacity was lower (72%). Adherence to the NVZ action programme is compromised by inadequate slurry storage preventing the efficient and timely use of slurries.

Compliance with overall record keeping (process-based) requirements was below 70%, potentially preventing farmers or landowners demonstrating good practice and compliance with the action-based requirements of the regulations which lead directly to the reduction of agricultural diffuse pollution.

When non-compliance is found, farm inspectors take a proportionate approach that used advice and guidance first. However, if advice is not heeded then the EA will pursue whatever sanctions are necessary, including penalties, formal cautions or prosecutions.[37] The farm inspection data for 2022-2024 shows in total over 5,500 farms have been issued with actions following the inspections.

The NPP Regulations also place a number of duties on the Defra Secretary of State, including monitoring and reporting. A review by the OEP found that the Secretary of State did not meet his obligations to review the Regulations, and publish a report of that review, in 2020. The reason for the delay is not known. Defra may also have failed to comply with environmental law by continuing

[35] Environment Agency. (2019). *2021 River Basin Management Plan, Nitrates*. Available at: https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/nitrates-pressure-rbmp-2021.pdf (Accessed: 5 February 2025).
[36] Environment Agency. (2023). *Blog. Working with farmers to protect our future land*. Available at: https://environmentagency.blog.gov.uk/2023/12/28/working-with-farmers-to-protect-our-future-land/ (Accessed: 11 April 2025).
[37] Environment Agency. (2023). *Blog. Working with farmers to protect our future land*. Available at: https://environmentagency.blog.gov.uk/2023/12/28/working-with-farmers-to-protect-our-future-land/ (Accessed: 11 April 2025).

to offer grassland derogations in the period 2017 and 2020 when there was no legal basis for offering such authorisations. However, following the UK's European Union (EU) Exit there is a legal basis in domestic law for Defra to continue to offer authorisations for grassland derogations[38]. The number of grassland derogations granted by the EA in 2023 was 190, with the number having progressively fallen from 260 in 2018.[39]

3.3.3 BARRIERS TO ACHIEVING COMPLIANCE AND EVIDENCE GAPS

The cost to the agricultural sector for complying with the NVZ Regulations (2008 revised) was estimated at between £44 and £65 million per year[40], although this is likely to be higher now with the introduction of a more stringent action programme in 2016. The cost could therefore be a significant barrier for farmers to successfully implement all the requirements of the NPP Regulations.

On the regulatory side, barriers to successfully implementing the Regulations may include:

- Resourcing in relation to farm inspections to better understand levels of compliance, although it is noted that the number of farm inspections has risen in recent years following a significant increase in funding and the establishment of the EA's new team of agricultural inspection officers in 2021[41]; and
- Ability to monitor nitrate concentrations to support the required reviews of NVZ designations and the Regulations (identified by the EA as an evidence gap below).

Evidence gaps for nitrate that have been identified by the EA[42] which could impact the effectiveness of the Regulations in the future include:

- No formal nitrate standards for (surface) freshwaters within the WFD, although there is a national quality standard for groundwater (50 mg/l nitrate) and there are thresholds in the Defra/EA methodology for the Nitrates Directive;
- Understanding the impact climate change may have on nitrogen fate and transport;

[38] Office for Environmental Protection. (undated). *Defra Nitrates Regulations Review Casework Summary*. Available at: https://www.theoep.org.uk/sites/default/files/uploads/Defra%20Nitrates%20Regulations%20Review%20Casework%20Summary%20Report.pdf (Accessed: 7 February 2025).
[39] House Builders Federation. (undated). *Nitrogen exemptions for farmers*. Available at: https://www.hbf.co.uk/research-insight/nitrogen-exemptions-for-farmers/ (Accessed: 20 February 2025).
[40] Environment Agency. (2019). *2021 River Basin Management Plan, Nitrates*. Available at: https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/nitrates-pressure-rbmp-2021.pdf (Accessed: 5 February 2025).
[41] Environment Agency. (2023). *Blog. Working with farmers to protect our future land*. Available at: https://environmentagency.blog.gov.uk/2023/12/28/working-with-farmers-to-protect-our-future-land/ (Accessed: 11 April 2025).
[42] Environment Agency. (2019). *2021 River Basin Management Plan, Nitrates*. Available at: https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/nitrates-pressure-rbmp-2021.pdf (Accessed: 5 February 2025).

- How nitrate is monitored to assess nitrate pollution as monitoring networks are now smaller, including how nitrate is monitored in the unsaturated zone to help predict future nitrate concentrations;
- Greater evidence on how and where river base flow is affected by nitrate from groundwater, to support better spatial prioritisation of measures; and
- A review of nitrate leaching to groundwater as there is growing concern that recent changes in farming (e.g. spreading materials to land) may lead to an increase in nitrate leaching.

3.4 WATER RESOURCES (CONTROL OF POLLUTION) (SILAGE, SLURRY AND AGRICULTURAL FUEL OIL – (SSAFO)) (ENGLAND) REGULATIONS 2010

The SSAFO regulations for England, as with the FRfW and NNP regulations, are enforced and regulated by the EA.

3.4.1 EFFECTIVENESS OF SSAFO REGULATIONS

Although SSAFO regulations are considered by the stakeholders who spoke to us, to be clear in their conditions, pollution incidents related to containment and control failure (the clearest way to evaluate SSAFO regulation effectiveness) are still occurring based on a report from 2024[43]. In 2022, there were 45 serious pollution control incidents, of which 41 were serious incidents to the water environment[44]. The largest contributor was from dairy farming (31 of these incidents), of which 80% were the result of containment and control failures and were all related to the storage of silage and slurry.[45] In the River Axe catchment[46], it was found that on the majority of farms, there was inadequate storage for manures and slurries. During the project, three significant slurry spills occurred, which were all due to failures of stores and associated infrastructure.

[43] Environment Agency. (2024). *Review of activities regulated by the Environment Agency, 2022*. Available at: https://www.gov.uk/government/publications/review-of-activities-regulated-by-the-environment-agency-2022/review-of-activities-regulated-by-the-environment-agency-2022 (Accessed: 19 February 2025).
[44] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).
[45] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).
[46] Environment Agency. (2021). *River Axe N2K Catchment Regulatory Project Report*. Available at: https://anglingtrust.net/wp-content/uploads/2021/04/Final-Axe-Regulatory-Report.pdf (Accessed: 19 February 2025).

When it is badly managed, nitrates and phosphates (PO_4) in slurry end up in rivers and can cause damage to the natural ecosystem.[47] Ammonia (NH_3) is also released from slurry into the atmosphere and returns to land as nitrogen.[48] Enlarging and covering slurry stores was found to reduce 60% of nitrate pollution and 25% of phosphate pollution and 87% of ammonia emissions from the agriculture sector.[49]

The NMEG found evidence for the negative impact of closed periods and the impacts of high spreading before and after the closed periods.[50] This is considered to be driven by insufficient slurry storage capacity.[51] It has been identified that increasing the requirement for slurry storage and the covering of slurry stores with an engineered covering will reduce nitrate pollution.[52]

Beyond these considerations, there is a limited amount of information available on the effectiveness of the SSAFO regulations, but rather around the poor compliance and financial barriers which are discussed in the next two sections.

3.4.2 COMPLIANCE WITH REGULATIONS

Initial findings showed that the SSAFO regulations clearly state construction and location requirements. An indication of compliance levels can be drawn from the two catchments studies in Poole Harbour and the River Axe. In 2021, in the Poole Harbour catchment, 75% of farms were found to be non-compliant with the SSAFO Regulations, while the 2019, the River Axe study

[47] Department for Environment, Food and Rural Affairs and Rural Payments Agency. (2022). *Farmers given support to tackle water and air pollution from slurry*. Available at: https://www.gov.uk/government/news/farmers-given-support-to-tackle-water-and-air-pollution-from-slurry (Accessed: 19 February 2025).
[48] Department for Environment, Food and Rural Affairs and Rural Payments Agency. (2022). *Farmers given support to tackle water and air pollution from slurry*. Available at: https://www.gov.uk/government/news/farmers-given-support-to-tackle-water-and-air-pollution-from-slurry (Accessed: 19 February 2025).
[49] Department for Environment, Food and Rural Affairs and Rural Payments Agency. (2022). *Farmers given support to tackle water and air pollution from slurry*. Available at: https://www.gov.uk/government/news/farmers-given-support-to-tackle-water-and-air-pollution-from-slurry (Accessed: 19 February 2025).
[50] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).
[51] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).
[52] Department for Environment, Food and Rural Affairs and Rural Payments Agency. (2022). *Farmers given support to tackle water and air pollution from slurry*. Available at: https://www.gov.uk/government/news/farmers-given-support-to-tackle-water-and-air-pollution-from-slurry (Accessed: 19 February 2025).

identified that 95% of farms were non-compliant.[53,54] A review of the latest available EA farm visit dataset showed that of the 10,488 farms visited (noting not all are reviewed for SSAFO regulations), 28% non-compliance against the SSAFO regulations was found for slurry, 28% for Silage, and 13% for Agricultural Fuel Oil. This indicates that current compliance for the SSAFO regulations is high, however, it should be noted that this is a sample size of only around 10% of the circa 100,000 farms in England, and the compliance may be lower, as suggested by the two catchment studies, if all farms were inspected.

Slurry and silage storage has been identified as a significant source of pollution in the UK, due to damaged, undersized, or poorly maintained infrastructure.[55] Slurry storage issues, especially in the dairy industry, have led to non-compliance with SSAFO, NPP Regulations and FRfW, as there is insufficient capacity, particularly in winter, and slurry storage is not keeping up with growing herd sizes. This results in farmers spreading slurry during closed periods, leading to runoff and surface water pollution. In addition, spreading during the winter wet season impacts runoff and surface water pollution and may conflict with the NVZ and FRfW regulation compliance, depending on timing in relation to closed periods.[56] Regulations around closed periods have also resulted in concentrated periods of spreading right before the period begins, which is driven by insufficient slurry storage.[57] It was also identified that, historically, the most frequent causes of point-source water pollution were from land application of slurry and over-topping of slurry stores.

When non-compliance is found, farm inspectors take a proportionate approach that used advice and guidance first. However, if advice is not heeded then the EA will pursue whatever sanctions are necessary, including penalties, formal cautions or prosecutions.

[53] Environment Agency. (2021). *Agriculture and rural land management: challenges for the water environment*. Available at: https://www.gov.uk/government/publications/agriculture-and-rural-land-management-challenges-for-the-water-environment (Accessed: 19 February 2025).
[54] Environment Agency. (2021). *River Axe N2K Catchment Regulatory Project Report*. Available at: https://anglingtrust.net/wp-content/uploads/2021/04/Final-Axe-Regulatory-Report.pdf (Accessed: 19 February 2025).
[55] Environment Agency. (2021). *Agriculture and rural land management: challenges for the water environment*. Available at: https://www.gov.uk/government/publications/agriculture-and-rural-land-management-challenges-for-the-water-environment (Accessed: 19 February 2025).
[56] Environment Agency. (2021). *Agriculture and rural land management: challenges for the water environment*. Available at: https://www.gov.uk/government/publications/agriculture-and-rural-land-management-challenges-for-the-water-environment (Accessed: 19 February 2025).
[57] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).

3.4.3 BARRIERS TO ACHIEVING COMPLIANCE AND EVIDENCE GAPS

According to the River Axe Report[58], a significant barrier to achieving compliance is the knowledge that there is a lack of farm inspections, which has hindered their implementation, with reports of only 3,482 farm inspections being carried out in 2022.[59] This has increased with current farm inspection data indicating 10,488 inspections were carried out on 9,176 farms between January 2022 and September 2024, but this is still a small sample size of the circa 100,000 farms across England.

The cost to becoming compliant through new infrastructure was also identified as a significant barrier to the implementation of these regulations.[60] In the River Axe catchment, it was identified that the cost of compliance outweighs the risk of getting caught, as the risk of being selected for a farm inspection is low due to a lack of EA presence within the area. Farmers are, therefore, more willing to invest in infrastructure which increases profits. The Slurry Infrastructure Grant, administered by the Rural Payments Agency (RPA), aims to provide £13 million for livestock farmers to generate six months' worth of slurry storage capacity.[61] The grant can be used for building, replacing, or expanding storage infrastructure. However, once a grant is accessed, another barrier to compliance is the long processing times for planning approvals required to build the infrastructure to comply with the SSAFO Regulations which can lead to farmers to take a risk of not gaining approval before construction.[62]

The NMEG report for Defra highlighted that effective regulation requires support through training, targeted advice, and peer-to-peer exchange networks.[63] Farmers within the River Axe catchment who were found to be non-compliant, voluntarily agreed to become compliant after regulations were clearly explained alongside the enforcement repercussions, highlighting a potential lack of understanding or awareness from the farmers' side.

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[58] Environment Agency. (2021). *River Axe N2K Catchment Regulatory Project Report*. Available at: https://anglingtrust.net/wp-content/uploads/2021/04/Final-Axe-Regulatory-Report.pdf (Accessed: 19 February 2025)

[59] Environment Agency. (2024). *Review of activities regulated by the Environment Agency, 2022*. Available at: https://www.gov.uk/government/publications/review-of-activities-regulated-by-the-environment-agency-2022/review-of-activities-regulated-by-the-environment-agency-2022 (Accessed: 19 February 2025).

[60] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).

[61] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).

[62] Environment Agency. (2021). *River Axe N2K Catchment Regulatory Project Report*. Available at: https://anglingtrust.net/wp-content/uploads/2021/04/Final-Axe-Regulatory-Report.pdf (Accessed: 19 February 2025).

[63] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 19 February 2025).

Private schemes like Red Tractor Assurance have strengthened their standards for slurry storage, but the scheme is not effective at assuring member farms are compliant, as many non-compliant farms identified in the River Axe were Red Tractor certified. New approaches, such as remote sensing, have been used in the Defra-backed Testing Approaches to Regulation of Agriculture (TARA) project to assess slurry store capacity and construction.[64] This highlights the potential for technology to aid in increasing the number of farm inspections possible.

[64] Environment Agency. (2024). *Review of activities regulated by the Environment Agency, 2022*. Available at: https://www.gov.uk/government/publications/review-of-activities-regulated-by-the-environment-agency-2022/review-of-activities-regulated-by-the-environment-agency-2022 (Accessed: 19 February 2025).

4 TASK B EVIDENCE GATHERING FROM EXPERTS

Task B of the project focussed on the collection of evidence, from a set of selected experts and consisted of two methods:

- Hour-long individual interviews with experienced staff of stakeholder organisations (including a pre-interview questionnaire); and
- A two-hour group virtual workshop.

The approach taken to evidence gathering is discussed here, followed by the presentation of the consolidated evidence from both the interviews and workshop grouped by the themes of: the regulations, the guidance, implementation, enforcement and future proofing.

4.1 EXPERT SELECTION AND ENGAGEMENT

Based on the evidence review completed in Task A, a selection of experts (water quality and agricultural pollution experts, practitioners, regulators and academics) were invited for individual interview and to participate in the planned workshop (**Table 4.1**). The aim was to gather data through interviews and then to discuss and agree on responses and possible options for further review in the workshop. All interviews and the workshop were virtual and conducted over Microsoft Teams.

4.1.1 QUESTIONNAIRE

A questionnaire aimed at identifying experts' interaction with the Regulations, followed by their opinion on language used in the Regulations and guidance, the implementation and enforcement (including barriers), and future gaps was issued ahead of the interview along with a short note detailing the project aim and objectives.

The content and structure of the questionnaire was agreed with the OEP before distribution and is presented in **Appendix B**.

4.1.2 INTERVIEWS

For the invited organisations, each was provided the opportunity to allow for three experts to attend the interview. The topics in the questionnaire were used to structure the interview questions with some additional queries included which overlapped subjects including:

- Do farmers have enough information / understanding of how to protect water from pollution? Is it clear that that is what the regulations are aiming to do?
- Do you think that the number of potential schemes available to farmers to incentivise sustainable farming is confusing? Is it easy to understand which applies to your land and how to join?
- Our initial review suggests that the following reasons lead to low compliance: the cost of infrastructure improvements to comply; the perception of a low likelihood of getting caught due to low inspection rates and no more cross compliance checks; and a lack of clarity / understanding of what the regulations require. Would you agree or is there more nuance or other reasons?
- Should the regulations all have a monitoring and effectiveness review period like the NPP?
- There is some overlap between the regulations, where a farm comes under control of all three regulations (i.e. a livestock farm in an NVZ) how could compliance be ensured? Could this be simplified for the farmer i.e. some priority around which regulation kicks in and when?

There was flexibility in the interviews to mention points raised in previous interviews and to explore new areas to guide discussion. Where stakeholders could not attend an interview, they were provided the opportunity to complete and return the questionnaire.
All interviews were followed up with reports and key points for agreement to the interviewee to ensure correct interpretation. Interviews were attended by 10 organisations. This included the EA who were interviewed following all other interviews and the workshop, which allowed time for a fuller response to points raised by other experts.

4.1.3 WORKSHOP

The 2-hour virtual workshop made use of Mural software to allow participants to add comments in response to selected questions from the questionnaire. A summary of the individual questionnaire responses was shared with the group under each theme / question and attendees were asked to add further comments to the Mural board.

The workshop was attended by 15 experts, including some who had been interviewed previously and personnel from the OEP college of experts. The EA could not attend the workshop but could access the Mural and were interviewed subsequently.

Workshop outcomes were collated and synthesised. The completed Mural following the workshop is presented in **Appendix C**.

4.1.4 SYNTHESIS OF EXPERT EVIDENCE

The organisations represented by experts in Task B are listed in **Table 4.1** with an indication given on which aspects were contributed to.

The following sections summarise the key points made across questionnaires, interviews and workshop against the themes of Regulation, Implementation, Enforcement and Future Proofing. Extracts of sections of the Mural related to each question are presented and these summarise the key points made in questionnaires and interviews. This is followed by a synthesis of key points made by experts either in interviews or the workshop. Finally, each section provides a summary of responses to the questions from EA interview (regulator), along with responses to the key points raised by the experts.

Table 4.1 List of participants

Organisation	Questionnaire	Interview	Workshop
University of Gloucester	✓	✓	✓
Agriculture and Horticulture Development Board (AHDB)	✓	✓	✓
National Farmers Union (NFU)	×	✓	✓
Country Land and Business Association (CLA)	✓	✓	✓
Wessex Water	✓	✓	✓
Wildlife and Countryside Link	✓	✓	✓
World Wide Fund for Nature (WWF)	✓	✓	✓
Natural England Wessex Team	×	✓	×
Frontier Agriculture	✓	✓	×
Environment Agency	×	✓	×
Fresh Water Habitats Trust	×	×	✓
Anglian Water	×	×	✓
Agricultural Industries Confederation (AIC)	×	×	✓
Institute of Fisheries Management	×	×	✓
Natural England	×	×	✓
Maynooth University	×	×	✓

4.2 THE REGULATIONS

Is there is any ambiguity in the regulatory language?

An image from the workshop Mural of responses to this question is presented in **Figure 4.1** and includes a histogram of responses to the question from non-regulator interviewees/stakeholders.

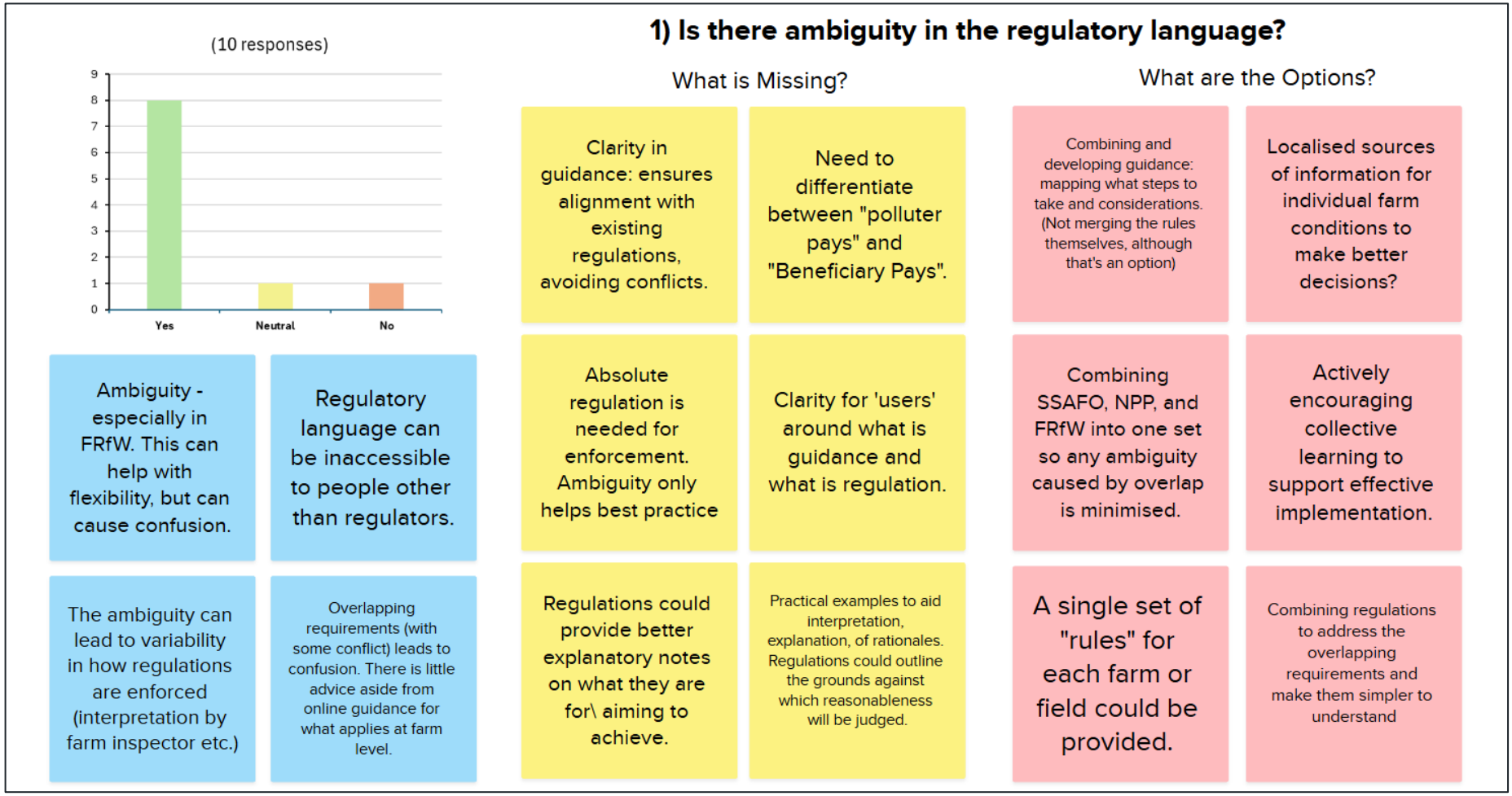
At interview, most stakeholders agreed that there is ambiguity in the regulatory language, especially the FRfW. The stakeholders told us that whilst this can help with flexibility for farmers and the regulator (to provide an advice-first approach) it leads to confusion and perceived inconsistency in how the regulations are enforced (e.g. interpretation by farm inspector may appear to vary from region to region). It should be noted that the regulator is confident on the consistency of training and enforcement policies, attributing variability to human factors. The stakeholders told us that where the regulations overlap farmers are confused around what applies to their land, for example where land is partly in an NVZ. The stakeholders said a single set of rules for each farm could help to resolve this and help build confidence that the farmer is doing the right thing. The stakeholders said that regulatory language can be inaccessible and there is not enough information (or clear enough information) in the online guidance for individuals to understand what they need to do. The majority of the stakeholder group liked the suggestion that overlapping regulations should be combined into a single set to minimise confusion, or that simplifying and mapping out guidance could also clarify steps and considerations for compliance without the need to combine regulations. On this point around simplification, one stakeholder and the regulators highlighted a summary pocket guide to the regulations, published in 2024 which does summarise what needs to be done to comply at the farm level[65].

Additionally, actively promoting collective learning was proposed by the stakeholders to improve understanding and support effective implementation of the regulations.

Following the workshop the regulators were presented with the same question and the outcome of the Mural and the points made by the stakeholders in interviews and as a group were also shared. The regulators view was that FRfW are purposefully non-prescriptive in some areas to allow farmers and the regulator flexibility to adapt practices and regulation to farm specific conditions, such as climate, soils and crops.

[65] Environment Agency, 2024. *Harvesting Success: Pollution-prevention rules for farmers*. Available at https://www.farmingadviceservice.org.uk/sites/default/files/2024-09/EA%20Pollution-Prevention%20Rules%20for%20Farmers%20booklet.pdf (Accessed: 28 March 2025).

Figure 4.1 Mural workshop section on "ambiguity in the regulatory language". Histogram shows responses from interviews, notes show workshop responses.



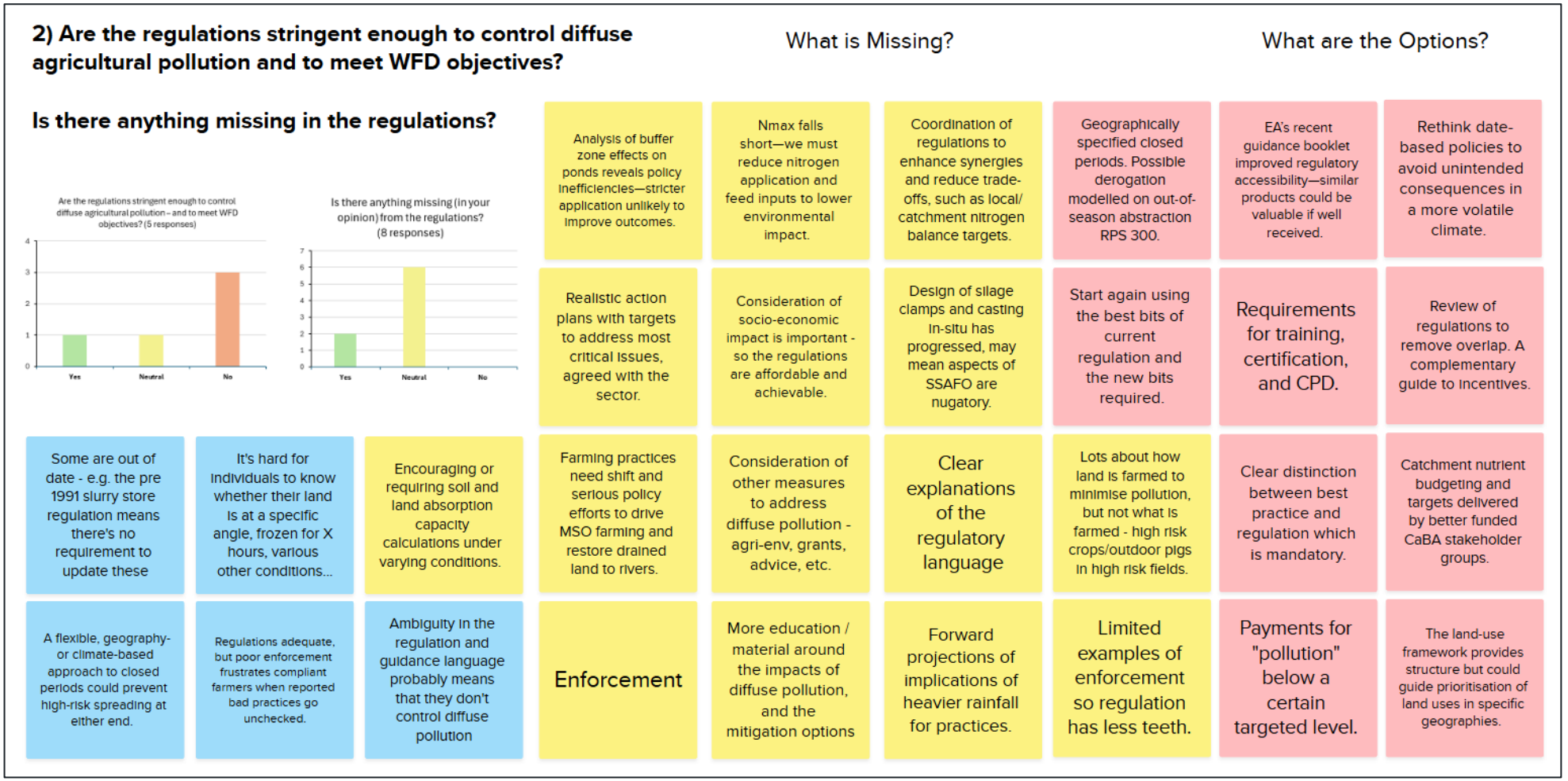
***Are the Regulations stringent enough to control diffuse agricultural pollution and to meet WFD objectives? Is there anything missing from the regulations*?**

As shown in the Mural extract in **Figure 4.2**, most of the interviewed stakeholders believed that the specific Regulations reviewed by this project are not stringent enough at reducing agricultural diffuse pollution, although they are a part of a wider toolkit of guidance and rules to help tackle diffuse agricultural pollution. In contrast some stakeholders believed that the Regulations are generally well-designed, but that their effectiveness is undermined by low levels of implementation and enforcement. Indeed, many stakeholders shared a common concern around the lack of compliance by farmers, which was variously attributed by the group to ambiguity in guidance materials, a partial understanding of requirements, financial constraints and lack of clear targets.

There was consensus amongst the stakeholders on the need to simplify and consolidate the regulations to improve clarity and compliance as a potential way forward (as noted under the previous question). In addition, the stakeholders identified the need for farm, catchment or region-specific approaches to account for varying environmental conditions and farming practices. Suggestions from the group included implementing geographically tailored measures, enhancing accessibility through guidebooks and incorporating training and environmental certification requirements for farmers. The stakeholders also highlighted additional strategies such as pollution-based payments (paid to those who are not polluting), catchment nutrient budgeting and better-funded stakeholder groups, as potential solutions to drive more effective, adaptive, and incentive-based approaches.

The regulators expressed confidence in the sufficiency of the regulations, in particular noting that FRfW are based on long-established codes of good agricultural practice (CoGAP). The regulators agreed with the stakeholders that non-compliance is a significant issue, which undermines the regulations and prevents achievement of their intended goals.

Figure 4.2 Mural workshop section on whether the regulations are stringent enough. Histogram shows responses from interviews, notes show workshop responses.



***Do farmers understand how to protect the water environment from pollution and is it clear what the regulations are aiming to do*?**

As shown in the Mural extract in **Figure 4.3**, in response to this question most stakeholders thought that the majority of farmers do not understand the connection between the regulations, their compliance and water quality protection. Further feedback from the workshop indicated that the stakeholders felt that many farmers still do not fully comprehend their role in preventing pollution. The stakeholders identified factors such as complexity, ambiguity and inconsistency in the regulations and guidance as contributing to farmers' lack of understanding of their connection to protecting the water environment.

A point raised in a few stakeholder interviews was the gap between application of guidance by the crop and livestock sectors. Some stakeholders told us that livestock compliance with animal health regulations takes preference with farmers speaking to their vet more frequently, whilst arable farmers are more likely to speak to agronomists. The stakeholders also said there is believed to be a disparity in how regulations are interpreted and enforced across regions (which could be related to the higher likelihood of one type of farming in some areas).

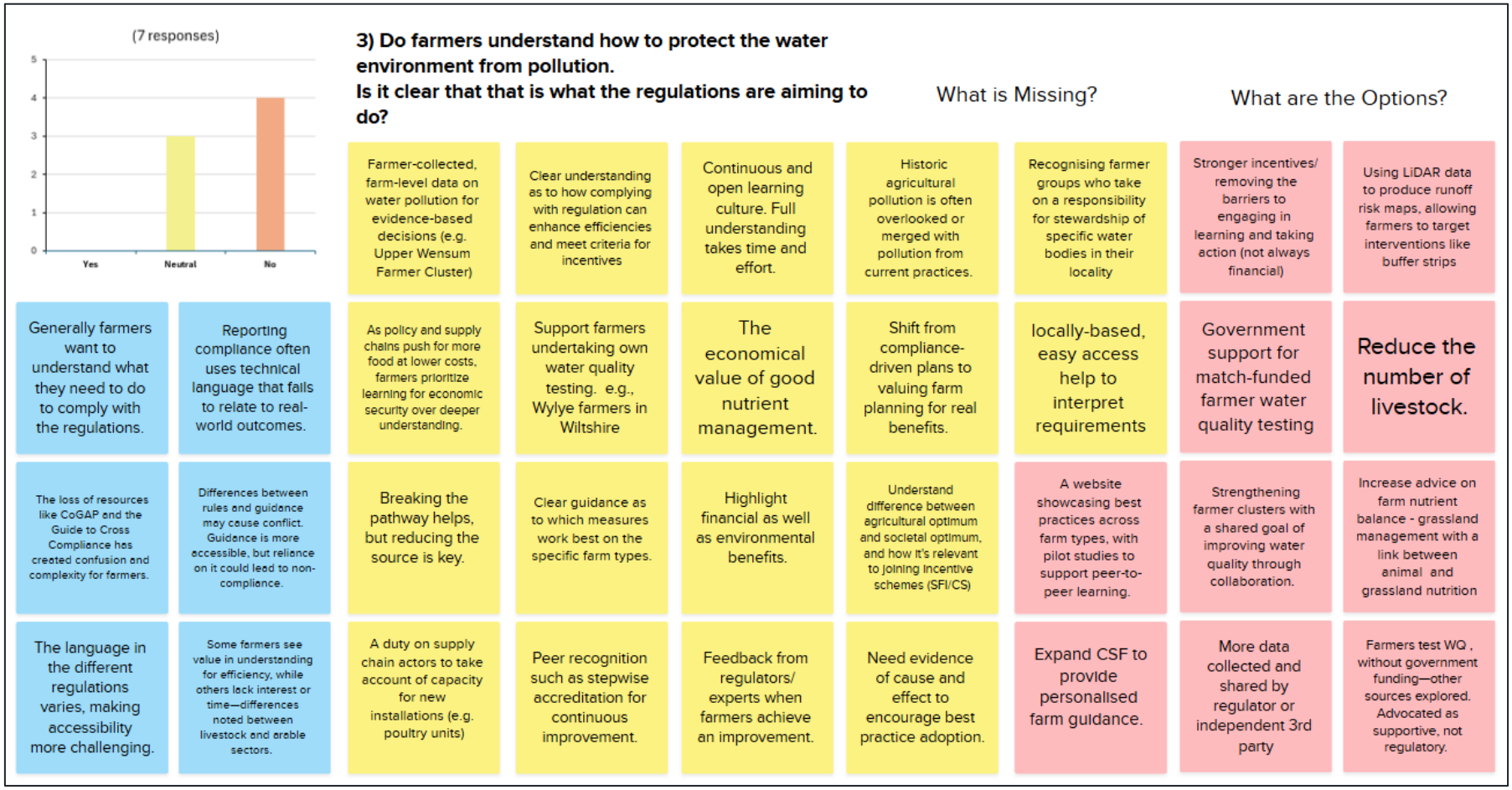
Some stakeholders told us that farmers feel disconnected from the water quality improvements resulting from their compliance as the results are not easily accessible (i.e. river basin plans scale is too large / the change is too slow to happen). The stakeholders said this impacts farmers' motivation to engage with the regulations and that when farmers get positive feedback on environmental improvements this encourages their continued compliance. A stakeholders said that a cultural shift in the farming sector toward continuous learning and proactive environmental planning, alongside recognition of the financial and societal benefits of sustainable practices was needed. The group also mentioned that in farmer peer to peer accountability to support good and discourage poor practice has helped to improve compliance. However, it was noted that a lack of visibility of the regulator could be discouraging to compliant farmers where poor practice of peers did not appear to be picked up.

Some stakeholders suggested that regulations need to be simplified, with clear communication on their environmental benefits through the use of tools such as risk maps. Stakeholders noted the positive reaction from farmers to individual advice given for their farm (e.g. during farm inspections or by farm advisors) and that the CSF program has become a trusted point of non-regulatory contact which should be expanded to include one-on-one guidance. The stakeholders agreed that there needs to be voluntary, proactive engagement by reducing barriers and encouraging collective responsibility (peer-to-peer accountability and learning).

Subsequently the same question and feedback from the group session was shared with the regulators, who noted that farmers should already have a good understanding of their land in order to successfully grow crops and livestock. However, the regulators were less confident that farmers are always fully aware of how their practices might contribute to pollution, especially concerning pathways to groundwater. Overall, the regulators noted that that there is often a disconnect between understanding soil management and recognising risks related to pollution by farmers. The regulators emphasised the need for the use of risk maps to help farmers visualise and understand the connection between their activities and water pollution.

The impact of economic incentives i.e. from the food supply chain (supermarkets, grain merchants etc.) and from the farm supply chain (cost savings through reducing nutrient losses) was also raised by the regulators, noting that these could be used to drive compliance. They also noted that if the same standards for meeting environmental regulations were held as for animal health then there would be the potential for significant change.

Figure 4.3 Mural workshop section on "Do farmers understand how to protect the water environment?" Histogram of interview responses and notes from workshop.



***Are the regulations flexible enough to deal with changes in modern farming practices and changing pressures such as climate change and energy costs*?**

Some stakeholders felt that FRfW offer sufficient adaptability to accommodate changing pressures. More rigid regulations such as closed periods were highlighted by the stakeholders as out of line with real-world farming dynamics. A common theme identified amongst the stakeholders was the need for more flexibility in terms of region-specific adjustments to account for varying local conditions. Precision and regenerative farming practices were highlighted by some stakeholders as challenging to integrate with the regulatory framework (although other stakeholders thought that there was enough flexibility to deal with these). Modern technologies such as GPS-controlled precision farming and data-driven monitoring were identified by the stakeholders as potential future avenues for improving compliance and adaptability. While some regulations demonstrate the ability to adapt, the responses from the stakeholders emphasise the need to align regulations more closely with contemporary agricultural practices and emerging pressures, while fostering farmer engagement and compliance.

Following a review of the mural and stakeholder responses, the regulators said that NPP and SSAFO are more rigid and focussed on specific issues (e.g. point-source pollution or nitrogen). The regulators said that FRfW are designed to tackle diffuse pollution comprehensively. The regulators said that although rarely utilised, there are tools available, like Slurry Wizard,[66] that incorporate climate change projections to help farmers calculate storage needs. The regulator stated that while regulations allow for flexibility, this can present a challenge for farmers in their understanding and application. The regulators said that while regulations can accommodate modern farming practices and environmental pressures, non-compliance undermines their effectiveness.

4.3 GUIDANCE

***Is there any ambiguity in the language of the guidance? Is there anything missing*?**

The responses to this question from the workshop (**Figure 4.4**) highlight the widespread concerns amongst the interviewed stakeholders about ambiguity in the guidance and gaps which hinder their effectiveness.

Stakeholders told us that the guidance often lacks specific and practical detail, leading to varying interpretations by enforcement officers and farmers. The stakeholders said this perceived inconsistency leads to frustration, as regulatory expectations appear to shift unpredictably e.g. from region to region or farm to farm. The group also noted that the more recent increased stringency of regulatory enforcement was also brought up by the stakeholders as an inconsistency. An example was mentioned of a change in previous acceptance of the use of slurry separators to free up storage capacity by the regulator to no longer being acceptable, although the regulator is simply enforcing

[66] Agriculture and Horticulture Development Board (2025) *Slurry Wizard*. Available at https://ahdb.org.uk/slurry-wizard (Accessed: 31 March 2025).

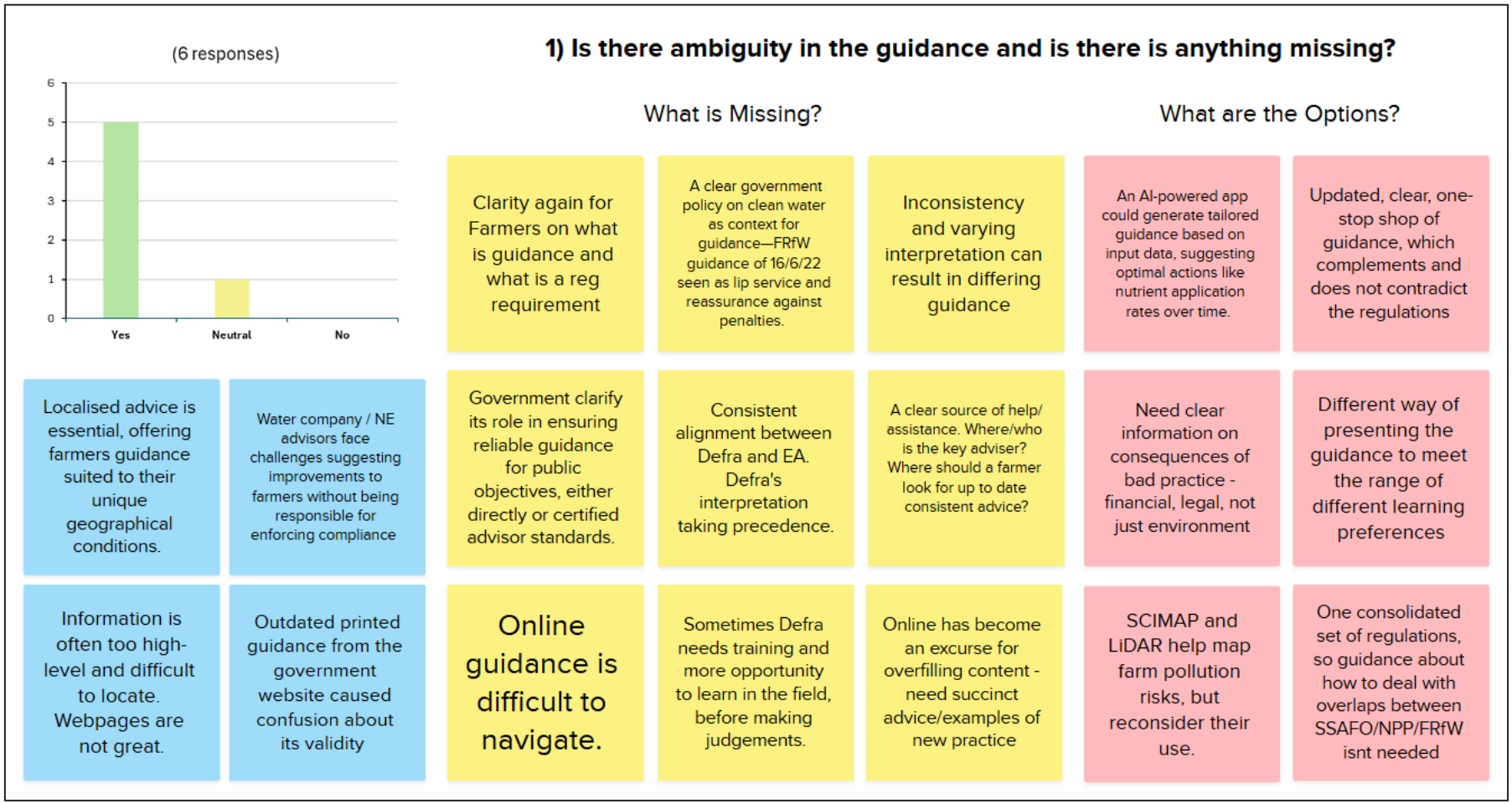
the Regulations. One stakeholder noted that older guidance on NVZs (which is now out of date) was much clearer on requirements and so was still being used to explain requirements.

The stakeholders also said that there is the need for standardised record-keeping systems and practical guidance resources. Ambiguity in the guidance such as undefined storage requirements and misaligned terminology was identified by the stakeholders as creating challenges to correct implementation. The stakeholders suggested that face to face advice, improved transparency (e.g. using visual aids and accessible material tailored to farm type or individual farms) would help farmers to navigate and understand expectations.

The same question was raised with the regulators following the workshop, and the Mural outputs and group's responses were shared. The regulators said that the guidance around FRfW is generally good but lacks depth in helping farmers connect specific practices with their land. The regulators emphasised the challenge of addressing farm-specific needs through written guidance alone and highlighted the importance of skilled advisors. The regulators suggested that the use of the out-of-date NVZs guidance (noted above) can create confusion. The regulators also acknowledged that confusion is created by various iterations of guidance available online, which provide different advice to that of the regulations. The regulators emphasised the need and importance of clear, accessible guidance, and highlighted efforts to distribute clear, concise materials, such as the EA's 2024 pocketbook guide which set out the requirements of the Regulations reviewed here.[67] The regulators also addressed the variability in advice and enforcement, attributing this to human factors such as level of experience and communication style, but expressed confidence in the consistency of training and enforcement policies, inviting feedback to address specific concerns.

[67] Environment Agency (2024) *Harvesting Success: Pollution-Prevention Rules for Farmers*. Available at https://www.farmingadviceservice.org.uk/sites/default/files/2024-09/EA%20Pollution-Prevention%20Rules%20for%20Farmers%20booklet.pdf (Accessed: 28 March 2025)

Figure 4.4 Workshop Mural section on "Is there ambiguity in the guidance available and is there anything missing?"
Histogram of interview responses and notes from workshop.



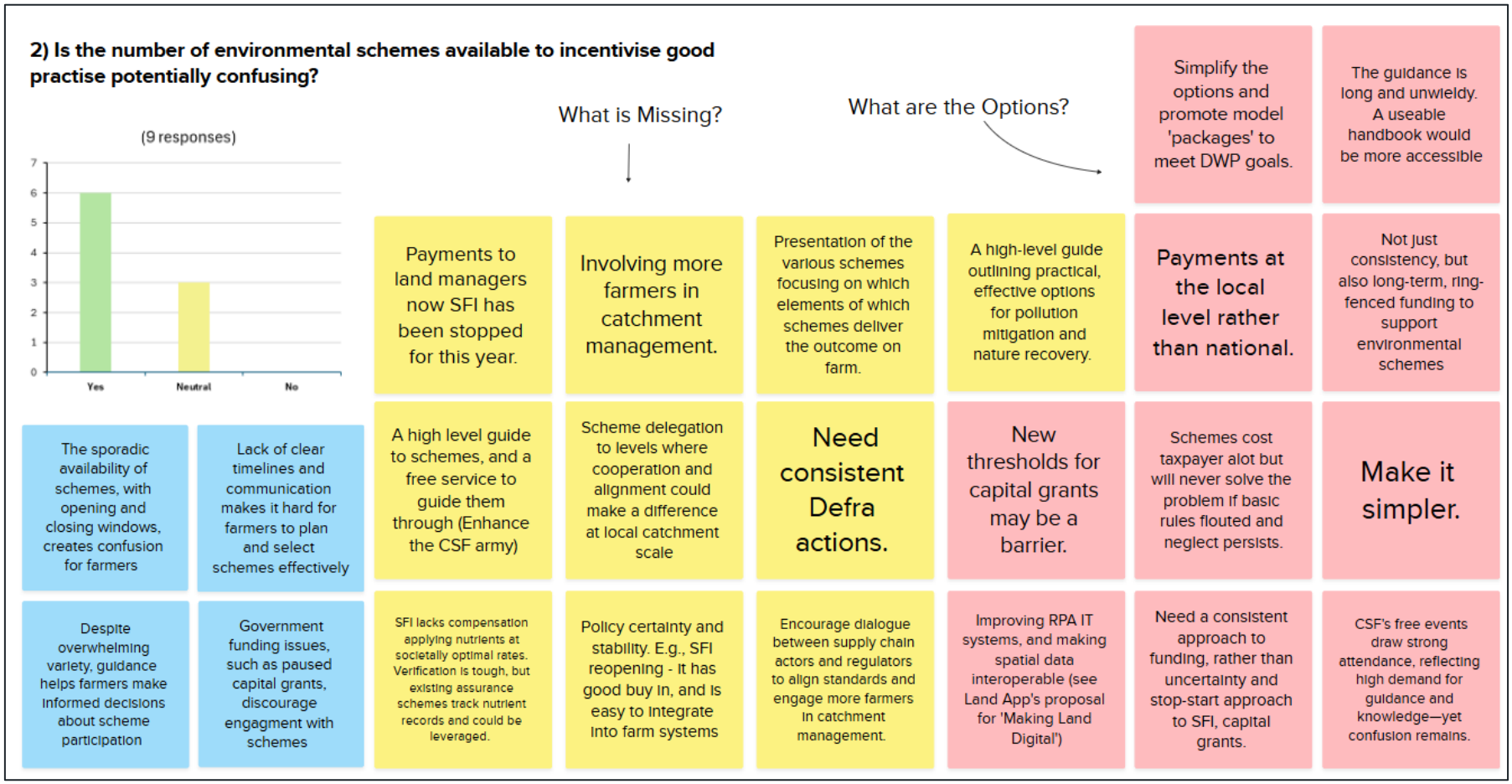
***Is the number of environmental schemes available to incentivise good practice potentially confusing to farmers*?**

As shown in **Figure 4.5** most stakeholders at interview and workshop told us that although farmers benefit from a wide array of schemes incentivising sustainable farming, the number, complexity and relatively short windows for access to these schemes can be confusing. Many stakeholders emphasised the challenge that farmers face in understanding which schemes apply to specific farms, navigating the options and joining the schemes. The stakeholders said that this was made especially challenging by unclear timelines, evolving requirements and administrative hurdles. The stakeholders said that these all undermine confidence in these programs.

The stakeholders said that assistance and guidance from advisors and organisations such as CSF plays an important role in making access easier noting that well-attended free events hosted by CSF showed that farmers are interested in receiving better guidance on what is available to them. The stakeholders said options for improvement included streamlining the processes, enhancing communication, peer-to-peer knowledge exchange and providing clear, user-friendly filtering tools to refine scheme options. Stakeholders thought that a holistic overview of how schemes, regulations and policies interconnect and collectively contribute to achieving environmental and agricultural targets would help. The stakeholders stated that simplifying access and tailoring schemes to farmers needs are seen as essential for fostering greater participation and achieving sustainable farming objectives, along with consistent schemes that do not have stop-start funding (as in the recently paused Sustainable Farming Initiative).

In response to the same question and stakeholder discussion outcomes, the regulators said that the schemes available are generally understandable and do not cause confusion for farmers. The regulators pointed out that the majority of schemes do not fund actions for regulatory compliance, except for specific initiatives like the slurry infrastructure grant. The regulators acknowledged the benefits to offering financial incentives to farmers to increase compliance, but did not agree with the logic of paying legitimate farm businesses to meet the regulatory requirements, as this is uncommon in other business sectors.

Figure 4.5 Workshop Mural section "Is the number of environmental schemes available to incentivise good practise are potentially confusing?" Histogram of interview responses and notes from workshop.



4.4 IMPLEMENTATION

Our evidence review suggests that the cost of compliance (infrastructure), a perception that enforcement levels are low (due to low inspection rates), lack of clarity/understanding of what the regulations require, loss of cross compliance to ensure implementation are the main barriers to implementation. Do you agree or is there more nuance or other reasons?

As shown in **Figure 4.6** the stakeholders generally agreed with the initial review outcomes and identified additional challenges and nuances.

On the cost of compliance, financial constraints were identified by the stakeholders as especially challenging for small and tenant farmers. In addition, the stakeholders feel difficulties in obtaining planning permission and limited access to grants are also compounded for tenant farmers. The stakeholders said low profitability within certain farming sectors restricts the ability to invest in infrastructure. Some stakeholders noted the introduction of inheritance tax for farming businesses as another risk to investment, although they agreed that this is yet to be seen to have an impact. A shifting baseline in terms of regulatory guidance was perceived by stakeholders to have led to uncertainty around what was coming in future and this was also identified as a factor restricting investment.

As noted earlier, stakeholders indicated that there are disparities in the level of professional advice provided to different farming sectors, where livestock farmers receive more investment and support than arable farmers.

As for previous questions, inconsistent and low levels of enforcement were identified by several stakeholders as barriers to implementation and the importance of enforcement visibility was reiterated by the group. Paperwork was also identified by the stakeholders as an issue, with farmers being found to be compliant but falling short in recording their activities (as already mentioned from the evidence review in Section 3). The stakeholders also said that resistance to external direction also plays a role, as some farmers prefer to address environmental concerns in their own way.

Workshop participants highlighted that clear communication, financial support, enhanced professionalism and streamlined processes were necessary to improve compliance and achieve environmental goals of the Regulations.

The same question was posed to the regulator, with the main outcomes of the discussion with stakeholders. The regulators argued that the cost of compliance for farmers through investments in infrastructure would lead to better business outcomes. They agreed with the stakeholders that low inspection rates were a challenge The regulator told us that recently increased farm visit numbers have improved enforcement and understanding, but inspections alone should not drive compliance. The regulators noted that the Regulations can also have unintended consequences, mentioning the closed periods for the NPP regulations which lead to unintended behaviours such as spreading nutrients based on permitted dates rather than to soil and crop need.

The regulators also acknowledged that the planning process provided constraints to implementation, giving the example of new or enlarged infrastructure that requires planning permission which may be rejected in nutrient neutrality catchments due to the risk of increasing emissions to protected habitats already in unfavourable condition. The regulator acknowledged that although applications may be for improved infrastructure which could improve nutrient management and reduce

environmental impact, where they include an expansion of activities then this may be refused. The regulator pointed out that efforts are underway to reform planning policy and promote “betterment” activities that improve a farm’s environmental performance.

The benefits of showing the impacts of compliance through water quality data (i.e. more monitoring) was discussed with the regulator who noted the prohibitive costs of extensive monitoring, with a preference for farmers seeing financial returns within three years from improved nutrient management as a method of education.

Figure 4.6 Workshop Mural section "What are the main barriers to implementation for farmers and regulators?" Histogram of interview responses and notes from workshop.

4.5 ENFORCEMENT

***Do regulators have the capacity to monitor and enforce these regulations effectively? Are there enough farm visits/checking of record keeping? Could things be done differently i.e. use of remote sensing data*?**

As shown in **Figure 4.7**, resources and therefore capacity of regulators were acknowledged by the stakeholders to be limited and this is a major challenge for monitoring and enforcing agricultural regulations. As of June 2023[68], there are currently only 91 EA farm inspectors nationally and this was acknowledged by the stakeholders as leading to gaps in compliance monitoring. While recent increases in inspections have improved visibility, the scale of the gap still requires substantial funding and support.

Farm advisor stakeholders noted that although poor practice and non-compliance were reported to the EA via the National Incidents Reporting database, as the reports were for a lower than a Category 1 or 2 incident, they were unlikely to be taken further. In follow up on this point with the regulator, the focus on the higher category incidents, such as fish kills, was considered to be appropriate. It is noted, however, that if there are a large number of unaddressed lower category incidents, then these are likely to be contributing to the issue of diffuse pollution.

Stakeholders emphasised the importance of trusted and knowledgeable advisors (such as CSF) to bridge the compliance gap. However, economic constraints (for example on CSF) limit the establishment of quality advisory networks. The regulator said that whilst remote sensing and artificial intelligence show promise, physical farm visits remain essential for effective enforcement.

It was noted by one stakeholder that in order to drive the demand for increased resource for compliance monitoring by the regulator, lessons can be learned from the wastewater sector. The stakeholder stated that public awareness of farm pollution should be heightened to the same extent as awareness around water company and sewage pollution to increase political pressure to find a solution.

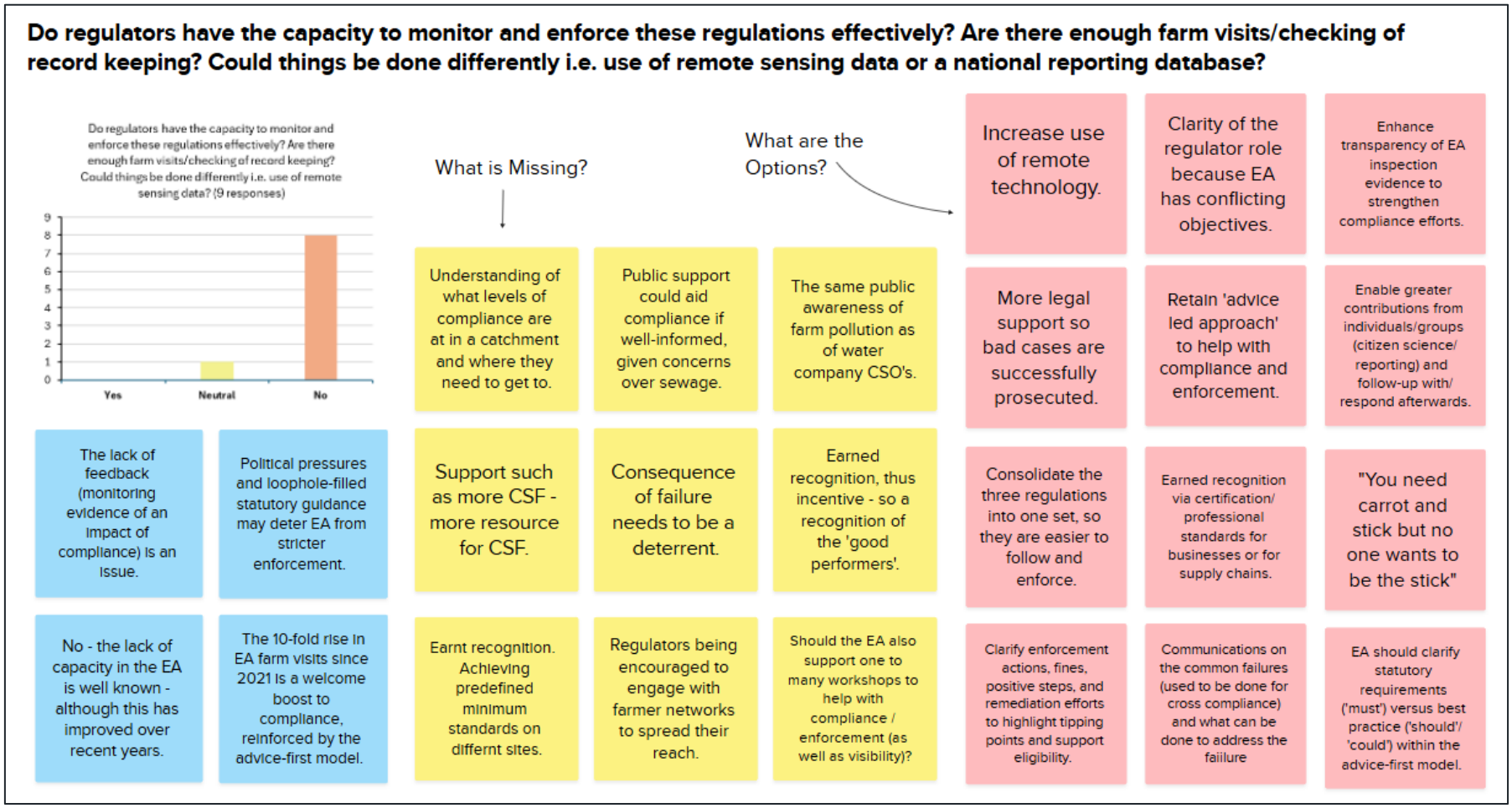
Suggestions from stakeholders for closing the compliance gap included establishing clear expectations, improving the accessibility of tools and processes and addressing funding and resource shortages. Additionally, creating a national database to track enforcement actions, fines and positive steps, was raised as an option. The increase in citizen science monitoring both by the public and farmer groups could also be used to drive change in compliance where this is shared (although fears of “weaponisation” of data are a barrier) not necessarily as direct evidence of non-compliance but to drive increased reporting and regulator follow-ups. Earned recognition of good practise through certifications or professional standards and balancing incentives with deterrents

[68] Nutrient Management Expert Group. (2024). *NMEG Report: Improving policy and practice for agricultural nutrient use and management*. Available at:https://eprints.glos.ac.uk/14135/1/Report_of_the_Nutrient_Management_Expert_Group.pdf (Accessed: 24 April 2025).

would enhance enforcement. Stakeholders noted that there needs to be more awareness of the consequences of non-compliance i.e. what is the deterrent and where has it been applied?

Following from the stakeholder interviews and workshop and presenting these findings to the regulators. The regulators emphasised that enforcement is reliant on resourcing levels, which are linked to funding from Defra and the Treasury. The regulator said there has been a recent increase in farm visits with up 4,000 annually, but is dependent on continued funding, with enforcement efforts vulnerable to budget changes. The regulator argued that enforcement should not be the primary mechanism for achieving compliance, as farmers should take initiative to adhere to regulations. There is an effort within the regulator to use remote sensing and artificial intelligence to enhance monitoring and enforcement (to identify outdoor pig operations and assess slurry storage and perform targeted enforcement). The regulator as stated that there is also the government funded Testing Approaches to Regulation of Agriculture (TARA). Defra is funding an online nutrient management planning tool (NMPT-GB), which is currently being developed as a tool to help with farm nutrient management planning.

Figure 4.7 Workshop Mural section "do regulators have capacity to monitor and enforce these regulations effectively?"
Histogram of interview responses and notes from workshop.



Is the "due diligence" clause within the FRfW regulations often used when farmers fail to hit agricultural diffuse pollution targets? How many times is this actually used?

Based on stakeholder responses, the due diligence clause is infrequently used. It was noted by the stakeholders that the application of the clause is challenging to quantify. The lack of knowledge around its use led to it not being discussed in the workshop.

The clause provides flexibility for farmers to take corrective actions without immediate penalties. The clauses effectiveness is constrained by ambiguities in defining "reasonable precautions", variability in enforcement and lack of consistent follow-up actions.

The regulator stated that a broader challenge is that the natural variability in farming environments makes it difficult to trace diffuse pollution to an individual farmer. Suggestions for improvement from stakeholders included fostering better communication between regulators and farmers, integrating evidence-based reviews, and employing a mix of flexible and fixed regulatory tools to address non-compliance effectively.

In the follow up interview the regulators noted that the due diligence clause within FRfW reflects the reality that some nutrient losses, such as nitrogen leaching from grass fields, are natural and unavoidable in farming, which operates in uncontrolled environments. If farmers comply fully with FRfW but diffuse pollution persists, the regulators lack the authority to enforce further actions under current regulations. It is hard to tell how often this clause is invoked but it was noted that more serious agricultural pollution incidents are often handled through other regulatory mechanisms.

4.6 FUTURE PROOFING

Can the current regulations cope with the dynamic baseline of changing climate and modern and / or regenerative farming practises?

As shown in **Figure 4.8** the majority of the stakeholders believed that the regulations are not adequately future-proofed, citing challenges including more intensive rainfall, shifting climate patterns (droughts and floods) and the limitations of process-based regulations, which may not address dynamic environmental conditions effectively. Other stakeholders, however, considered that the flexibility in the regulations meant that they were still appropriate against shifting weather patterns and farm practise. The overlaps and ambiguities within the regulations and guidance suggested a need for comprehensive review and updates to enhance clarity and resilience. While some regulations, like FRfW, encourage good practice, concerns in the group remained about their flexibility to address regional variations, date-based restrictions, and evolving agricultural systems.

Suggestions made by the stakeholders to improve this area include better data sharing (i.e. around the local impacts of climate change), collaboration with researchers, integrating alternative farming methods and fostering a strategic government direction for sustainable agriculture.

In response to the same question and to shared stakeholder feedback the regulator noted that the NPP and SSAFO regulations are highly specific, while FRfW is more flexible by design, but that the challenge lies in farmers' understanding of the rules and applying them effectively. The regulator said that whilst the regulations can accommodate changes in farming practices and environmental pressures they reiterated that non-compliance undermines their effectiveness.

Figure 4.8 Workshop Mural section "are the regulations are flexible enough to deal with changing farming practices and a changing climate?" Histogram of interview responses and notes from workshop.

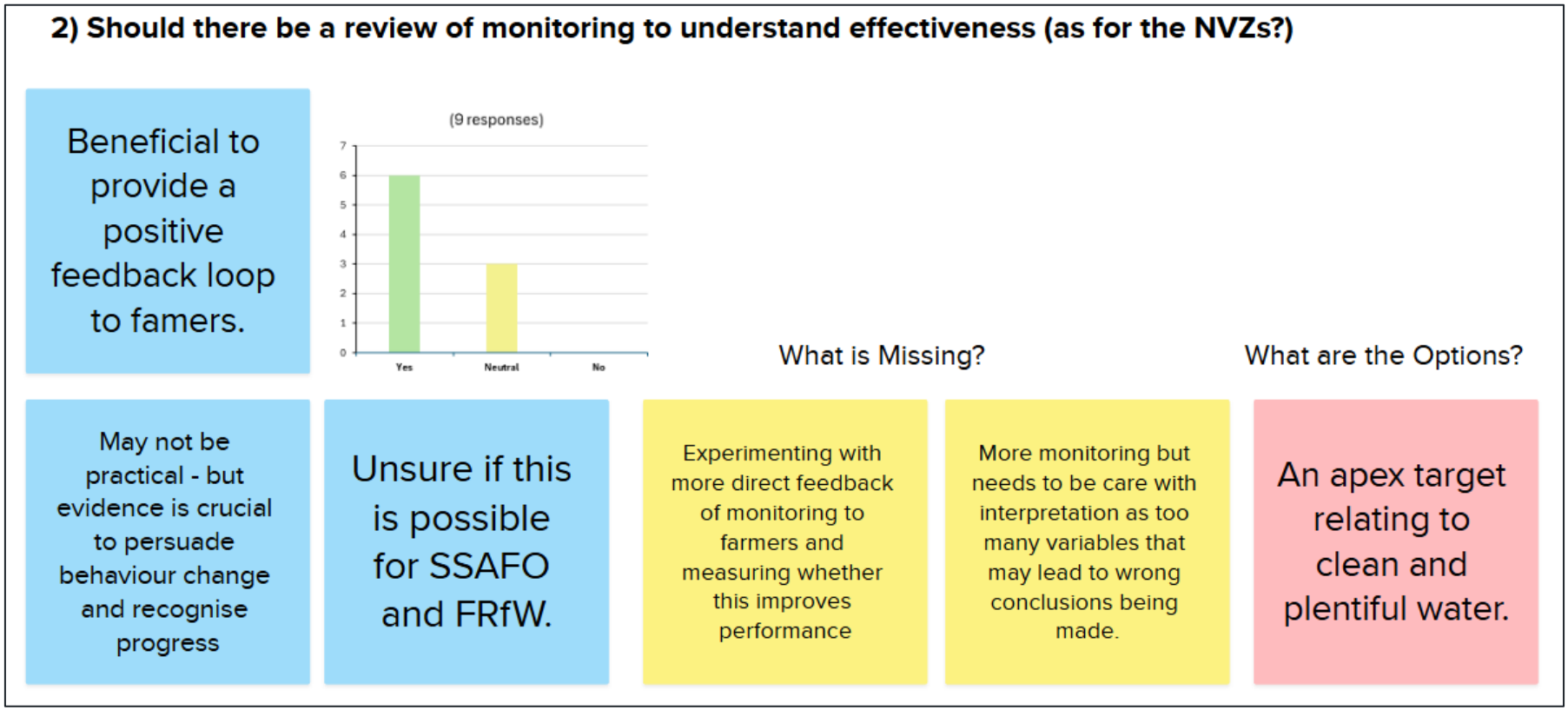
Should the regulations all have a monitoring and effectiveness review period like the NPP?

The stakeholders strongly support the idea of having a monitoring and effectiveness review period for all regulations, similar to the NPP regulations (**Figure 4.9**). The importance of periodic reviews was emphasised by the stakeholders to ensure regulations remain effective, relevant and fit for purpose, while allowing for necessary adjustments in response to evolving environmental and agricultural challenges. Some stakeholders cautioned against overly frequent reviews that could strain resources.

A common ground of opinion amongst the stakeholders was around the need for a balanced approach which aligns reviews with other water policy frameworks and ensures regulatory stability. Key suggestions from the stakeholders included employing a range of review methods, improving data sharing and quality and integrating localised monitoring approaches to make evaluations more practical and impactful. Evidence-based reviews, such as those involving clear feedback and tangible proof of impact (i.e. local water quality or ecology improvements) are seen by the stakeholders as key to ensuring compliance and validating farmers efforts. Stakeholders also stressed the importance of dynamic legislation to address outdated practices and changing conditions.

Following a review of the mural and the stakeholder responses, the regulators supported the idea of incorporating monitoring and effectiveness review periods into all regulations, to ensure they stay relevant and effective in addressing evolving agricultural and environmental concerns. In response to the stakeholder point raised around the need for a review of the Regulations themselves, in particular on the existing exemption for pre 1991 slurry stores, it was noted that in the interim 40-year period the number of stores which have not been modified (and therefore remain exempt) is likely to be negligible. It may be difficult for inspectors to assess or prove whether a store is exempt. The use of GIS and remote sensing techniques can help in some circumstances. The regulator also provided the additional example of the provision of field silage allowances under SSAFO, which was no longer suited modern farming practices, particularly given the scale of operations today (i.e. infield storage of silage in a heap is allowed under the SSAFO regulations, as in the past only small volume heaps were produced. However, much larger volumes of silage are generated today due to modern practices, which means farmers are storing thousands of tons of silage in heaps in a field and are allowed to do so, which should not be the case as this can cause diffuse pollution).

Figure 4.9 Workshop Mural section "Should there be a review of monitoring to understand the effectiveness of compliance (as for the NPP / NVZs)?" Histogram of interview responses and notes from workshop.



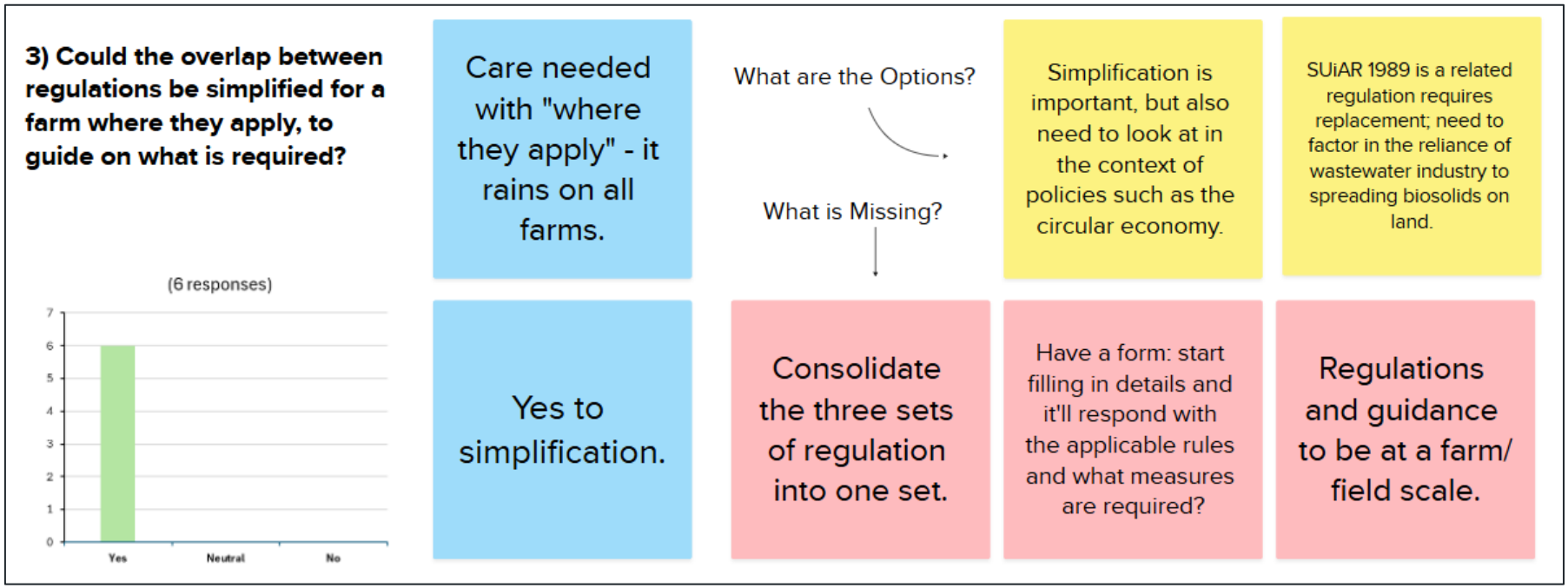
***Where there is overlap and farms come under control of all three Regulations (i.e. a livestock farm in an NVZ) how could compliance be ensured? Could this be simplified for the farmer (i.e. some priority around which regulation kicks in and when)*?**

The stakeholder interview responses highlighted a strong support for a unified and simplified approach to regulations to resolve the issues around the current complexities and overlaps among the existing regulations (**Figure 4.10**). The stakeholders said that combining these regulations into a single, holistic framework could reduce confusion and make compliance more accessible to farmers. Suggested solutions from the stakeholders included consolidated guidance documents, tailored advisory services, risk maps and simplified checklists to help farmers understand their responsibilities and take site specific actions. It was, however, noted by the stakeholders that merging regulations would present legal and logistical challenges, requiring a thoughtful approach to ensure effectiveness.

Following a review of the mural and the stakeholder responses, the regulators said that there is guidance available to help farmers navigate overlapping regulations (such as the 2024 pocket guide[69]). The regulators acknowledged that this guidance is not bespoke to individual farms and that personalised advice would typically come from farm inspectors or CSF advisors.

[69] Environment Agency (2024) *Harvesting Success: Pollution-Prevention Rules for Farmers*. Available at https://www.farmingadviceservice.org.uk/sites/default/files/2024-09/EA%20Pollution-Prevention%20Rules%20for%20Farmers%20booklet.pdf (Accessed: 28 March 2025)

Figure 4.10 Workshop Mural section on the potential for simplification of the regulations or guidance where multiple regulations apply. Histogram of interview responses and notes from workshop.

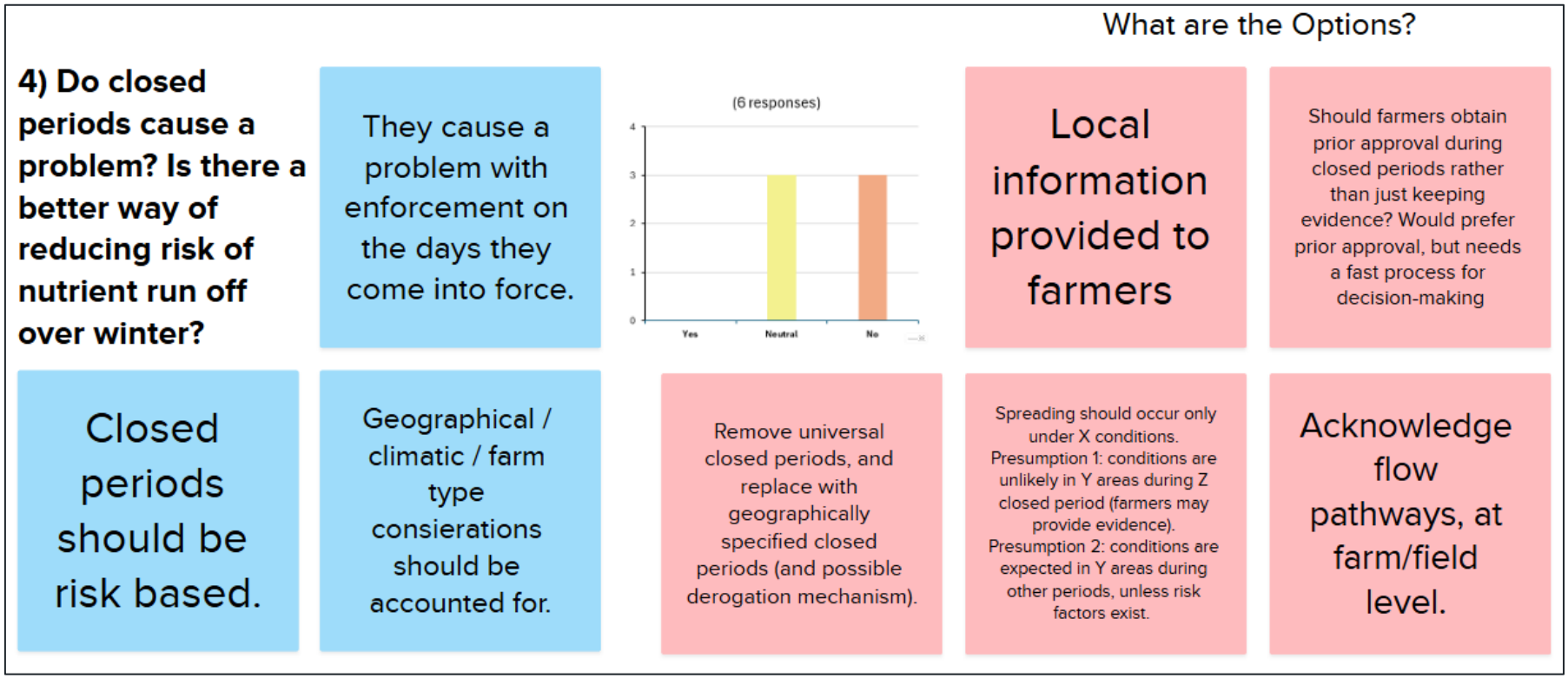


Are closed periods effective or do they cause a problem?

As shown in **Figure 4.11**, it was widely acknowledged by stakeholders that significant challenges are posed by date-based closed periods for nutrient application, with stakeholders highlighting their rigidity and one-size fits all approach as impractical and often environmentally counterproductive. Closed periods were noted by the stakeholders as leading to unintended consequences, such as intensified spreading before and after the set dates, increasing pollution risks. The stakeholders felt that regional and temporal variations in climate, geography and crop needs are not adequately addressed, resulting in regulations which fail to align with real-world conditions. For example, drier and sunnier periods in winter months (during closed periods) could be used for spreading at lower risk when crop growth occurs at unseasonally higher rates due to elevated temperatures (rather than length of day). Suggestions from the stakeholders for improvements included more dynamic, region-specific approaches, tailored to local climate and farming practices, to ensure effective environmental protection. These suggestions included creating nutrient plans, risk maps and rapid regulator approvals of spreading within the closed periods based on a regulator led assessment of risk.

Following a review of the mural and the stakeholder responses, the regulators responded to the same question and agreed that closed periods for nutrient applications can bring higher risks and complexities, particularly due to variations in climate, geography, farm types and crops across regions. The regulators highlighted that a rigid, prescriptive system might not accommodate these differences effectively. The regulator suggested that an improved approach might involve requiring all farmers to create comprehensive nutrient plans, risk maps, and farm gate substance flow analyses. The regulators said that these tools would allow better monitoring of nutrient inputs and outputs, ensuring farmers apply only what is necessary for their specific conditions. Drawing on examples from the Netherlands, the regulator described how such systems could enhance compliance and balance nutrients use more effectively, emphasising the importance of tailored, adaptable strategies over rigid timelines.

Figure 4.11 Workshop Mural section "Are closed periods cause a problem? Is there a better way of reducing risk of nutrient run off over winter?" Histogram of interview responses and notes from workshop.



5 TASK C INITIAL FINDINGS AND OPTIONS

5.1 OVERVIEW

Following the completion of the evidence review in Task A and the expert interviews and workshop in Task B, both evidence bases are brought together here to identify the key findings, evidence and options for a systematic review and any further work.

Our check of the Regulations (section 3) and the outcomes of stakeholder and regulator interviews and workshops (section 4) identified that they are generally effective and fit for purpose, although challenges have emerged including:

- Low levels of compliance which may be related to a lack of enforcement or visibility of the regulator. Both were linked by stakeholders to insufficient resourcing for enforcement. The regulator agreed that low levels of compliance are a barrier to achievement of intended goals of the regulations.
- The need for more flexibility in regulations, although it was acknowledged by some stakeholders and the regulator that the FRfW do include this, for region or farm specific differences. Time constrained closed periods for slurry and manure spreading were raised by stakeholders and the regulators noting that more flexibility here could take advantage of lower risk times for spreading during the closed periods, avoiding the unintended consequences that can result from spreading just before and immediately after the deadlines.
- Overlap between the regulations and uncertainty around prioritisation with competing guidance was noted as leading to confusion by farmers as to what applies for their farm (perhaps contributing to the already mentioned lower compliance).

5.2 EVIDENCE BASE FOR THE EFFECTIVENESS OF THE REGULATIONS

The review has indicated that there is limited quantitative evidence available which specifically assesses the effectiveness of the FRfW and SSAFO regulations, however, other evidence of similar measures is available and could be used as a proxy to measure their effectiveness.

The decline in nitrate concentrations in English rivers since the introduction of NVZs does provide some evidence of the effectiveness of the NPP regulations, although in the context of delivering WFD objectives this is difficult to assess due to the time lag between changes in agricultural practices and the resultant improvement for groundwater in particular. The literature reviewed indicates that both NPP and FRfW may be limited in their effectiveness even if farmers comply with the regulations. However, the SSAFO regulations are likely to be effective at reducing pollution (specifically point source pollution) if complied with.

5.3 AMBIGUITY OR FLEXIBILITY IN LANGUAGE

The outcomes from the stakeholder and regulator interviews and workshop supported the findings of the evidence review that the meaning of the SSAFO and NPP regulations are clear, but where the NPP regulations overlap with other regulations this creates confusion for landowners such as around the capacity for manure and slurry storage. There were varied stakeholder views on the ambiguity of regulatory language in the FRfW. Some stakeholders felt that the ambiguity led to confusion amongst farmers, but others felt that the flexibility in the regulations enabled judgement-

based enforcement and allowed farmers to adapt practices to site specific conditions. This view was also shared by the regulator.

The amount of supplementary guidance produced by industry to support farmers in understanding the interactions between the three regulations indicated that there was a level of ambiguity within the regulations, particularly where regulations overlap. A recently published Pocket Guide to the Regulations produced by the EA sets out the requirements, helps to clarify areas of regulatory overlap and aims to reduce confusion.[70]

5.4 IMPLEMENTATION OF THE REGULATIONS

Planning requirements and cost of infrastructure improvements have been identified as barriers to implementation, particularly for the NPP and SSAFO regulations. It was noted that planning applications have been rejected in neutrality catchments due to potential increases in emissions to protected habitats, even where improvements from the existing position are likely. Efforts by government are underway to reform planning policies to promote “betterment” activities that will improve farms’ environmental performance. Stakeholders also expressed the view that the shifting baseline in terms of regulatory guidance may lead to uncertainty in what is coming up and this could be a factor in dissuading farmers from the investment needed to become compliant.

It was also highlighted by multiple stakeholders that there is likely to be an increased risk of pollution being caused by the closed periods as a result of intensified spreading before and after the start and end dates, which is an important unintended consequence of the regulations.

5.5 ENFORCEMENT OF THE REGULATIONS

Based on farm inspection data, for the FRfW and NPP regulations, the most common areas of non-compliance are related to process-based rules such as record keeping and soil testing but are more compliant with the action-based requirements of the regulations which lead directly to the reduction of agricultural diffuse pollution. This could reflect the fact that it is easier to check process based actions (i.e. record keeping) compared to action based rule compliance during farm inspections.

From the expert interviews and workshop, the importance of trusted and knowledgeable advisors to bridge the compliance gap was highlighted by stakeholders. Funding, such as for CSF, and more widely for EA farm inspectors was also acknowledged as a challenge for monitoring and enforcing the regulations. Efforts are being made by the regulator to implement remote sensing and artificial intelligence methods to enhance monitoring and enforcement, whilst noting the value of in-person farm inspections and advice given (which was agreed by the stakeholders).

The “defence of due diligence” clause within the FRfW was identified in the literature review as an evidence gap. The workshop and interviews highlighted that there was limited knowledge or understanding of the use of the clause. The regulator concluded that the clause provides flexibility in

[70] Environment Agency (2024) *Harvesting Success: Pollution-Prevention Rules for Farmers*. Available at https://www.farmingadviceservice.org.uk/sites/default/files/2024-09/EA%20Pollution-Prevention%20Rules%20for%20Farmers%20booklet.pdf (Accessed: 28 March 2025)

circumstances where nutrient losses may be unavoidable. It was also noted that cases of serious agricultural pollution are more often addressed through other regulatory mechanisms.

5.6 FUTURE PROOFING

Several gaps were identified in the literature which could impact the effectiveness of the NPP regulations in future. These included the impact of climate change of nitrate fate and transport, how nitrate is monitored to assess nitrate pollution, an increased evidence base on how and where river base flow is affected by nitrate from groundwater to support better spatial prioritisation of measures, and a review of nitrate leaching to groundwater due to concerns that recent changes to farming practices may lead to increased nitrate leaching.

The regulator's opinion was that although the 1991 exemption for stores in the SSAFO regulations is outdated, given that the majority of stores have since been modified (and hence are no longer exempt) the number of exempt sites is actually likely to be negligible. It was also raised by the regulator that field silage allowances no longer suit modern farming practices given the scale of operations today.

There was strong support by the stakeholders of the implementation of a monitoring and review period for all the regulations, similar to the NPP, and the importance of periodic review was emphasised to ensure the regulations remain effective, relevant and fit for purpose. Other suggestions supported the use of evidence-based reviews, able to provide clear feedback and tangible evidence (i.e. local water quality or ecology improvements) to foster compliance and validate efforts by farmers.

5.7 OPTIONS FOR FUTURE RESEARCH BY THEME

Based on the evidence base collected over Tasks A and B, the initial options for future review are grouped by theme below. Distinction has been made between options for short- and long-term future research.

5.7.1 REGULATION EFFECTIVENESS

In the long term, options include more monitoring data to assess FRfW and SSAFO effectiveness and additional academic study of the effectiveness of NVZs.

- Systematic evidence review which attempts to quantify the "effectiveness" of the FRfW and SSAFO regulations or evaluates similar measures as a proxy;
- Academic assessments of the effectiveness of NVZs (national or catchment scale), although the effectiveness of the restrictions in NVZs imposed by the Regulations is already reviewed by the EA and Defra on behalf of the Secretary of State every four years;
- Measures implemented as part of catchment management and agri-environment schemes could be used as a proxy to assess the effectiveness of the regulations; and
- Additional monitoring data (water quality or other) is needed to assess the effectiveness of FRfW and SSAFO regulations.

In the short term a systematic review of evidence for FRfW and SSAFO could be undertaken and an assessment of measures implemented as part of catchment management and agri-environment schemes used as a proxy to assess regulation effectiveness.

5.7.2 IMPLEMENTATION

Options for future research on implementation can be carried out in the short term.

- Review of the presentation and accessibility of information and guidance for farmers;
- Stakeholder engagement to understand how to increase understanding and compliance amongst farmers; and
- Review of implementations of national databases for farmer upload of nutrient management data or other compliance data in other countries (e.g. European countries).

5.7.3 ENFORCEMENT

In the short term, the further understanding of the “Defence of due diligence” clause and a review of the number of actions being converted to outcomes could be undertaken. Additional compliance data collection in the long term could be collected to enable a review of the long-term outcomes of the enforcement programme.

- As the number of inspections completed annually increases and additional data is collected, a longer-term review of compliance and inspection data to evaluate the effectiveness of the enforcement programme and to reflect on any changes in terms of capacity or approach;
- Additional data to understand the application of the “Defence of due diligence” clause in enforcement cases; and
- Greater understanding of the enforcement action to outcome pipeline, the barriers that may exist and how these could be resolved.

5.7.4 FUTURE PROOFING

Options for research on future proofing the regulations could be carried out in the short-term including:

- The potential for the introduction of standard review period to the FRfW and SSAFO Regulations including the review of monitoring data (e.g. water quality or number of reported pollution events);
- The filling of evidence gaps to future proof the regulations:
    - Impact of climate change on nitrogen fate and transport;
    - Monitoring of nitrate with smaller networks, including how nitrate is monitored in the unsaturated zone to help predict future nitrate concentrations;
    - Greater evidence on how and where river base flow is affected by nitrate from groundwater; and
    - Impact of recent changes in farming (e.g. spreading materials on land) on nitrate leaching;
    - A review of mitigation methods currently used to understand effectiveness in controlling diffuse pollution using recent data.
- Potential for flexible closed periods (managed at a local / regional level by the regulator) which take into account low risk dry / sunny periods over winter and spring where crop uptake is higher than normal along with identification of the challenges communicating and regulating them.

Appendix A

EVIDENCE LIST REGISTER

Provided electronically.

Appendix B

QUESTIONAIRE

Provided electronically.

Appendix C

WORKSHOP MURAL

Provided electronically.

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