Wildlife and Countryside LINK

Air Quality: draft Clean Air Strategy 2018

Consultation response from Wildlife and Countryside Link
August 2018

Wildlife and Countryside Link (Link) is a coalition of 48 voluntary organisations concerned with the conservation and protection of wildlife and the countryside. Its members practice and advocate environmentally sensitive land management, and encourage respect for and enjoyment of natural landscapes and features, the historic and marine environment and biodiversity. Taken together its members have the support of over 8 million people in the UK and manage over 750,000 hectares of land. We welcome the opportunity to respond to this Defra consultation on the Clean Air Strategy.

This response is supported by the following organisations:

- Amphibian and Reptile Conservation
- Buglife
- Butterfly Conservation
- ClientEarth
- CPRE
- Greenpeace
- People's Trust for Endangered Species
- Plantlife
- RSPB
- The Wildlife Trusts
- Wildfowl and Wetlands Trust
- Woodland Trust

This submission has been prepared by the Link Agriculture Working Group and therefore primarily focuses on air quality in relation to agriculture. However, an effort has been made to bring in wider air quality issues where they are relevant to Link members and consistent with the aims of the working group.

1. Understanding the problem

Q1. What do you think about the actions put forward in the understanding the problem chapter? Please provide evidence in support of your answer if possible.

We welcome the government's commitment to maintaining and improving the evidence base on air quality and to increasing transparency and public access to this information.

As a part of this process, there is a need to dedicate increased resources and priority in two areas:

1. **Improving the evidence base on the impacts of air quality on the natural environment.**

There is a clear need for further research to improve our understanding of the ecological impacts of air pollution and the potential benefits of mitigating these impacts and restoring ecosystem functioning. In 2015, the Inter-agency Air Pollution Group (IAPG), led by JNCC, published 'A framework for UK research and evidence needs relating to air pollution impacts on ecosystems' which sets out a number of specific areas requiring further research. This includes better evidence of the cumulative impacts of nitrogen deposition on sensitive habitats, the impacts on flora, fauna and fungi species, updated critical loads and levels as well as development of new critical loads for sensitive habitats where these do not exist. The need for revised critical loads has been confirmed by

recent research, for example van der Linde, S. *et al* (2018) *Environment and host as large-scale controls of ectomycorrhizal fungi*, Nature 558, 243–248.

This evidence is particularly important for full and effective assessment of planning and permitting applications by local authorities and statutory agencies. These are the primary routes for the assessment and control of new sources, contributing to overall reductions in air pollution.

We recommend that Defra's new Strategic Evidence Leadership Group on Air Quality and the existing Air Quality Expert Group make it a priority to increase investment in strategic research in the areas identified in this paper, in close consultation with the IAPG, the academic community, non-governmental conservation groups and other interested parties. Guidance to local planning authorities should be regularly reviewed and updated to reflect the latest evidence and metrics.

Long term monitoring of air quality and its ecological impacts are fundamental to understanding the scale and change of air quality in the UK. We welcome the strategy's recognition of the importance of 'citizen science' initiatives, both in providing valuable data and in engaging individuals in action on air quality and nature conservation. However, continued funding for strategic monitoring is also important, providing a national, comparative and long term data set. Better evidence is crucial to our understanding of the impacts of air pollution on wildlife species and habitats. Citizen science has delivered substantive results, contributing to the scientific evidence base; see, for example, Citizen science identifies the effects of nitrogen deposition, climate and tree species on epiphytic lichens across the UK (N.A.Welden, P.A.Wolseley, M.R.Ashmore, Environmental Pollution, Volume 232, January 2018, Pages 80-89). Although still at an early stage of data collection, in future the National Plant Monitoring Scheme is expected to provide important evidence of trends in the impacts of nitrogen deposition on plant diversity.

We recommend that adequate resources are allocated to monitoring air quality and its ecological and social impacts. This should include a framework incorporating nationally collected data, third party data and citizen science, encouraging and supporting citizen science initiatives and enabling the resulting evidence to build the wider evidence base on air quality and influence decision makers.

2. **Integrating evidence of ammonia emissions and environmental impacts fully into the wider evidence base on air quality, alongside evidence relating to other sources of pollution and their impacts on public health.**

The wealth of evidence on ammonia emissions and environmental impacts of nitrogen (N) deposition is often considered and published separately from the evidence relating to public health impacts and other sources of pollution. Yet air pollution is a rural and urban issue, with the same pollutants affecting people and nature across local, national and international boundaries.

The Clean Air Strategy provides a crucial opportunity to integrate all parts of the air quality evidence base through one accessible portal. Given the low level of public and political awareness about the environmental impacts of air pollution, it is important to set out the environmental impacts clearly in Chapter 1. For many people, this understanding will also provide additional motivation to take action to improve air quality, including engagement with citizen science.

These impacts are not set out clearly in the current text and we suggest the following amendments:

- In the description of Ammonia (NH_3) on page 13, the short-range ecological impacts of emissions through dry gaseous N deposition must be recognised, in addition to the long distance impacts. There is a wealth of evidence that concentrated ammonia emissions have

a significant direct impact on local ecosystems (e.g. *European Nitrogen Assessment*, Chapter 9, 2011), as recognised in Chapter 3 of the strategy;

- In the description of Nitrogen oxides (NO_x) on page 14, there is no mention of the ecological impacts of NO_x emissions in the text, although it does appear in the diagram. Despite the significant reductions since 1970, NO_x emissions are still the main UK source of reactive N in the atmosphere – three times greater than ammonia. We recommend that this be added to the text on page 14 with a clear cross-reference to the section on ammonia emissions.

Q2. How can we improve the accessibility of evidence on air quality, so that it meets the wide-ranging needs of the public, the science community, and other interested parties?

A wide range of evidence on the environmental impacts of air pollution is publicly available online from the Air Pollution Information System, the National Atmospheric Emissions Inventory, the Joint Nature Conservation Committee (JNCC), other statutory conservation agencies and the Centre for Ecology and Hydrology (CEH).

However, this variety of sources makes it difficult and confusing for the public, local planning authorities and other interested parties to access the evidence, and to relate it to the information presented on the UK-AIR website. In addition, the UK-AIR website does not enable everyone to access or understand the evidence on agricultural emissions and the ecological impacts of air pollution, for example:

- 'Effects of air pollution' content is focused solely on public health impacts (only mentioning 'the environment' once);
- 'Causes of air pollution' content does not mention agricultural sources or ammonia emissions;
- The UK-AIR library contains certain reports on ammonia emissions, but these are not connected to other content on the website for ease of public access.

This evidence is a vital resource for local planning authorities (LPAs) in assessing planning applications and developing local air quality strategies and plans. JNCC is currently leading the **Integrated Tools for Air Pollution Assessment (ITAPA) Discovery Project** in collaboration with DAERA-NI, Natural England, Natural Resources Wales and Scottish Environmental Protection Agency. This will provide tools to facilitate the work of LPAs and ensure that air pollution impacts are fully taken into account in decision-making.

Improved access to evidence of the environmental impacts of air pollution, including ammonia, will also raise wider public and political awareness of these issues, motivating people and governments to take action and helping to secure resources for mitigation.

We recommend that the UK-AIR website be updated to fully integrate the evidence base on ammonia and other pollutant emissions from agriculture, as well as the impacts of air pollution on the natural environment.

We recommend that the ITAPA project should be fully supported by Government and parliament, to help develop effective tools for air pollution assessment across the UK.

We recommend that all the data on the UK-AIR website should be accessible and easily transferable to or importable into other platforms to facilitate map-based analysis including, where possible, the ability to analyse relationships between, for example, land uses and pollution or pollution and habitat degradation.

2. Protecting the nation's health

Q3. What do you think of the package of actions put forward in the health chapter? Please provide evidence in support of your answer if possible.

We welcome the stated intent to set ambitious targets for reducing air pollution, including a new goal on particulate matter (PM).

Q4. How can we improve the way we communicate with the public about poor air quality and what people can do?

The large contribution of distant sources to the build-up of $PM_{2.5}$ (as shown in section 2.4) is striking. Ammonia emissions from agriculture make a significant contribution to the formation of secondary PM in urban air pollution, and yet this is still poorly understood by local planning authorities, farm businesses and the general public. Urban air pollution is still widely understood as being solely caused by urban sources such as road traffic or industrial sites. This lack of awareness makes it less likely that those stakeholders will take action to cut air pollution.

We recommend that public communications on air quality be improved by publishing a more detailed breakdown of the distant sources of PM, including ammonia from agriculture, and raising public awareness of these.

As stated above, increased awareness of the impacts of air pollution on the natural environment is also needed in public communications. There is a widespread understanding that trees and other vegetation can help to capture and reduce air pollution in urban areas, but this is only half the story. Greater understanding of the negative impacts on wild plants, lichens, pollinators and all the other wildlife that depend on them will provide an additional reason for people to take action to improve air quality in both rural and urban areas.

We recommend that public communications highlight the impacts of air pollution on the natural environment as an additional reason to take action.

3. Protecting the environment

Q5. What do you think of the actions put forward in the environment chapter? Please provide evidence in support of your answer if possible.

We welcome the information set out in Chapter 3, in particular the recognition that "human health and a thriving natural environment are concepts that go hand in hand" and that "clean, green and healthy environments in urban and rural areas are an essential component of progress, not a barrier to economic development", alongside a commitment to enhance environmental standards in a "Green Brexit". The UK government, its agencies and the scientific community have played leading roles at the international level in recognising the impacts of air pollution on the environment and coordinating action by governments around the world.

Atmospheric nitrogen deposition is now one of the greatest threats to biodiversity and semi-natural habitats in the UK and around the world. The impacts on soil quality and the balance of species are causing fundamental changes to these ecosystems and the services that they provide. There is a wide range of scientific evidence and technical analysis of these issues. Although there is still much

to be done to improve our understanding of the impacts on biodiversity and ecosystems, sufficient evidence already exists to provide a firm basis for action.

Despite the evidence, this issue remains poorly understood by many key stakeholders, including politicians and other policy-makers, local planning authorities and the farming industry. Plantlife and the Plant Link network (including many Link members) have raised awareness of this, including through the 2017 report 'We need to talk about nitrogen'.

There is also significant evidence[1] that ozone, resulting from NO_x emissions, disrupts plant atmospheric semiochemical communication and reduces pollinator foraging efficiency – this impact has been shown to occur at levels of 80 and 60 ppb, well below the EU permitted level of 120 ppb. We recommend that the protection of plant atmospheric semiochemical communication is incorporated into permissible levels for air pollutants, including reducing the current limit for ozone to below 60 ppb.

In light of this, **the proposed actions in Chapter 3 are disappointing**. They fail to translate the importance and urgency of this issue into tangible, adequate actions and will do little to help meet either the ambitions of the 25 Year Environment Plan or legally-binding biodiversity targets.

The proposed actions for further monitoring and reporting, and new planning guidance are welcome and should remain in the strategy. New regulation to control ammonia emissions from farming and other actions proposed elsewhere in the strategy will also help to reduce the environmental impacts of air pollution, although do not go far enough. We have elaborated on this in answer to Question 17 below, although do not go far enough. We have elaborated on this in answer to Question 17 below.

Q6. What further action do you think can be taken to reduce the impact of air pollution on the natural environment? Where possible, please include evidence of the potential effectiveness of suggestions.

In order to reduce the impact of air pollution on the environment, the actions in Chapter 3 must reflect the urgency and seriousness of this issue and provide a clear commitment to funded mechanisms for protecting and restoring biodiversity across the country.

We call on the government to add the following actions to Chapter 3:

- **Prioritise resources to enable prompt and full delivery of Natural England's Natura 2000 Thematic Action Plan on Air Pollution: Nitrogen Deposition and Site Improvement Plans.** In England and Wales, the statutory nature conservation bodies have produced Thematic Action Plans on nitrogen deposition as part of a wider programme to restore European 'Natura 2000' sites. However, many of the identified actions are not being delivered due to a lack of funding and prioritisation from national governments and their agencies.

[1] Girling, R.D., Lusebrink, I., Farthing, E., Newman, T.A. & Poppy, G.M. (2013) Diesel Exhaust Rapidly Degrades Floral Odours Used by Honeybees. Sci. Rep. 3, 2779; DOI:10.1038/srep02779.
Farré-Armengol, G., Peñuelas, J., Li, T., Yli-Pirilä, P., Filella, I., Llusia, J. and Blande, J. D. (2016) Ozone degrades floral scent and reduces pollinator attraction to flowers. New Phytol, 209: 152–160. doi:10.1111/nph.13620
Fuentes, J.D., Roulston, T., Zenker, J. (2013) Ozone impedes the ability of a herbivore to find its host. Environ. Res. Lett. 8 014048
Fuentes, J.D., Chamecki, M., Roulston, T., Chen, B., Pratt, K.R. (2016) Air pollutants degrade floral scents and increase insect foraging times. Atmospheric Environment doi: 10.1016/ j.atmosenv.2016.07.002
Lusebrink I, Girling RD, Farthing E, Newman TA, Jackson CW, Poppy GM (2015) The effects of diesel exhaust pollution on floral volatiles and the consequences for honey bee olfaction. J Chem Ecol 41:904–912

Within statutory agencies and local planning authorities, knowledge, skills and resources are all lacking to tackle this issue effectively. The strategy should commit to increasing capacity, training and resources for site managers and assessors, permitting, advisory and compliance staff, as well as local planning officers, to minimise and mitigate the impact of nitrogen deposition in line with applicable legislation and regulation.

Given their vital role in development control, we recommend that all local planning authorities have access to personnel with specialist understanding of air quality issues, including environmental impacts. This is a specialist area where it may not be possible or efficient to expect all planning officers to maintain adequate skills and knowledge, in addition to the wide range of other complex issues that must be addressed.

- **Produce a national framework and allocated funding for the prompt delivery of Shared Nitrogen Action Plans (SNAPs) for the worst affected sites without further delay**. This is one of the main actions identified in Natural England's 2015 Thematic Action Plan but progress has been slow and opaque. Three years later, SNAPs are still at a pilot stage, as set out in the answer to Written Parliamentary Question 140659 in May 2018. Very little information has been published about the pilots and there are no clear timeframes or targets. A large proportion of the funding for this work is from the EU LIFE programme and the government must commit to replacing this funding from other sources once the UK leaves the EU. Natural England and the other statutory agencies are massively under-funded and resources must be identified to enable this work to proceed without further delay. The SNAP framework should:
    - include clear timeframes, measurable targets and lead partners;
    - identify additional resources and funding to enable swift progress;
    - provide public information to raise the profile of this work, help engage stakeholders and demonstrate progress;
    - engage local farm businesses and other stakeholders in delivering emissions reductions and mitigation measures;
    - take inspiration and learn lessons from river catchment partnerships.

- **Incorporate atmospheric nitrogen deposition levels and impacts into the monitoring, assessment and management of Sites of Special Scientific Interest (SSSIs).** Currently, nitrogen deposition is not systematically taken into account in Common Standards Monitoring for SSSI condition assessments which are used to develop site management plans. In 2016, JNCC published a paper proposing "A decision framework to provide a means of attributing nitrogen deposition as a threat to, or cause of, unfavourable habitat condition on protected sites" (JNCC Report No. 579, L. Jones *et al*). To our knowledge, this framework is still under consideration within the statutory agencies and has not been adopted in practice. However, it provides a clear mechanism for adapting SSSI management to reduce nitrogen levels and restore biodiversity and healthy ecosystems at the most important wildlife sites across the country.

- **Integrate targets for mitigation and restoration measures into the Government's forthcoming 'strategy for nature' as outlined in the 25 Year Environment Plan.** The new biodiversity strategy post-2020 is a key mechanism for mitigating and reversing the impacts air pollution on the environment. As a cross-government policy initiative, the Clean Air Strategy should make a clear commitment to addressing this through the Defra and agency staff responsible for biodiversity conservation, as well as those responsible for air quality. The 'strategy for nature' should include specific targets for the rollout of measures, both at

protected sites and more broadly (such as through training and guidance for local planning authorities).

- **Produce an assessment of the impact of air pollution on natural capital, ecosystem services and the economic case for action**. This would help to present the evidence base on atmospheric nitrogen deposition in the context of the natural capital approach used in the 25 Year Plan and taken forward by the Natural Capital Committee. It would highlight the evidence around the cost-efficiencies and cross-benefits of action to reduce NO_x emissions from transport and ammonia emissions from farming, helping to achieve other government targets on public health, water quality and greenhouse gas emissions.

- **Invest in further research to improve the evidence base for policy makers, local planning officers and site managers.** There is a clear need for further research to improve our understanding of the ecological impacts of air pollution and the potential benefits of actions to mitigate these impacts and restore ecosystem functioning. The Clean Air Strategy should commit to investment in the areas identified in the IAPG paper 'A framework for UK research and evidence needs relating to air pollution impacts on ecosystems'. In addition, JNCC Paper No. 579 on a decision framework for SSSIs identifies a number of uncertainties which also need to be addressed with further research and analysis, including establishing nitrogen 'critical loads' for some habitats.

- Continue to support the **Integrated Tools for Air Pollution Assessment (ITAPA) Discovery Project** led by JNCC in collaboration with DAERA-NI, Natural England, Natural Resources Wales and Scottish Environmental Protection Agency. This project should be fully supported by Government and parliament, to help develop effective tools for air pollution assessment by relevant stakeholders across the UK.

- Introduce robust air quality baseline standards for agriculture as per our response to Questions 16 and 17. Beyond this baseline, targeted measures are needed in areas where concentrated ammonia emissions from agriculture continue to negatively impact local habitats and species beyond the areas covered by SNAPs.

4. Securing clean growth and innovation

Q.7. What do you think of the package of actions put forward in the clean growth and innovation chapter? Please provide evidence in support of your answer if possible.

The 'clean growth' initiatives and strategies described in this chapter and the government's wider Clean Growth Strategy will be ineffective as long as other government policies continue to allow and promote the hydraulic fracturing of shale oil and gas, mining for coal and unnecessary road building (see CPRE reports Better Not Bigger and The End of the Road). These policies will all lead to significant increases in harmful air pollutants and greenhouse gas emissions. Government house-building policy also embeds patterns of low-density, car-dependent development that lead to increased vehicular and domestic emissions as well as the loss of green space that can help combat the impacts of emissions.

As part of the package of innovative technologies we believe 'soft' technologies, such as improved green infrastructure, well sited trees and groups of trees, and green roofs[2]/walls can all contribute to mitigating poor air quality, as well as providing wider benefits for surface water flood mitigation and improving the environment more generally.

[2] Berardi, U., GhaffarianHoseini, A. H. & GhaffarianHoseini, (2013) A. State-of-the-art analysis of the environmental benefits of green roofs. *J. Applied Energy* 115, 411-428, doi: 10.1016/j.apenergy.2013.10.047.

New development as part of economic activity should have green infrastructure and green 'soft' technologies built in from the design stage and be part of planning consents and regulation. These should form part of a wider strategic view of green infrastructure to improve air quality and wider environmental improvement.

Q9. In your view, what are the barriers to the take-up of existing technologies which can help tackle air pollution? How can these barriers be overcome?

Green infrastructure and green technologies are not seen as an integral part of tackling air quality and other environmental issues (such as flood mitigation). Too often they are at best a late consideration in development and designed to mitigate the visual impact of development rather than a key design element in mitigating air quality. Consideration of air quality mitigation needs to be explicit in development planning, including the use of green infrastructure.

5. Action to reduce emissions from transport

Q11. What do you think of the package of actions put forward in the transport chapter? Please provide evidence in support of your answer if possible.

Air pollutants are a problem in both rural and urban areas, and greater action is needed to reduce emissions from transport across the country, not just in urban areas. We encourage local and national government to be ambitious and creative in reducing air pollution sufficiently to safeguard public and environmental health, not only within statutory ceilings.

We welcome the commitment to tackle air pollution from all forms of transport, including new strategies on aviation and shipping. These should contribute to reducing greenhouse gas emissions as well as improving air quality.

Action to reduce NO_x emissions from road transport will benefit the natural environment on roadside verges and over longer distances. We welcome the emphasis in section 5.7 on reducing emissions by modal shift, particularly through encouraging walking, cycling and other active travel. However, there is no recognition of the role of green infrastructure or options to reduce the need to travel, which is a missed opportunity to deliver multiple benefits through the Clean Air Strategy. The shift to electric vehicles will help to improve air quality and reduce greenhouse gas emissions, but will not solve the problems of road congestion or inactive, unhealthy lifestyles. Furthermore, the government's proposed ban on petrol and diesel vehicles by 2040 is not ambitious enough. We recommend that government brings the ban forward by ten years to 2030 to bring the UK in line with the international community.[3]

High-quality green infrastructure brings benefits to people, the environment and the economy by helping to absorb air pollution, encourage active travel, cohesive communities, wildlife and habitats, increased tourism and climate change adaptation (e.g. trees providing shade and green space reducing flood risk). Reduced road traffic also helps to create a better quality of places to live, work and visit, and reduces travel times.

However, the provision of green infrastructure does not and should not entail low-density suburban development, High-quality green infrastructure should be combined with high density mixed-use urban developments which reduce emissions by reducing the need to travel and increasing opportunities for more efficient communal space heating. Reducing the ownership and use of private vehicles will help to avoid subsequent road-widening schemes (associated with large new developments) and reduce the incidence of residents paving or building over front gardens to create off-road parking.

[3] Green Alliance, March 2018: How the UK can lead the electric vehicle revolution

We recommend that Chapter 5 includes new actions on investment in green infrastructure and reducing the need to travel.

6. Action to reduce emissions at home

Q13. What do you think of the package of actions put forward to reduce the impact of domestic combustion? Please provide evidence in support of your answer if possible.

We welcome the package of actions to reduce the impact of domestic combustion. These will help to reduce carbon dioxide emissions and mitigate climate change, as well as improving public health and the natural environment.

7. Action to reduce emissions from farming

Q16. What do you think of the package of actions put forward in the farming chapter? Please provide evidence in support of your answer if possible.

The package of actions in Chapter 7 is a significant step forward in tackling ammonia emissions from farming, one of the main sources of environmental impacts from air pollution. A robust regulatory approach is urgently needed, alongside activity to encourage good practice, to reduce ammonia emissions quickly and effectively. Too often, the environmental impacts of new development and farming practices are disregarded in the spatial planning and regulatory spheres. Environmental protections are considered as a barrier to economic 'progress' (and political expediency). Air quality is a clear example of a public good which the market will not provide and so government intervention is required. Well-established environmental principles for public policy and decision-making include the 'polluter pays' and precautionary principles, and these must be applied in the Clean Air Strategy.

Progress in cutting ammonia emissions from agriculture and other sources has been slow, just ten per cent from 1980 to 2016, compared to a 70 per cent cut in NO_x emissions over the same period. The graph in section 1.1 of the strategy highlights the lack of progress compared to the other main pollutants. Worryingly, ammonia emissions actually increased by ten per cent between 2008 and 2016. The UK is likely to miss national, EU and UN targets to reduce ammonia emissions by 8% by 2020 and 16% by 2030 (from a 2005 baseline) without more effective action.

It is clear that **voluntary measures** – such as training and advice to farmers, capital grants and new technologies – **are insufficient** to reduce ammonia emissions at the necessary speed and scale.

For too long, the **'polluter pays' principle has been disregarded** in relation to ammonia from farming; the main sources of emissions – dairy and beef cattle and fertiliser application – are entirely unregulated. A system whereby only the largest pig and poultry units need a permit creates an uneven playing field for the industry. Cross compliance rules on water pollution help to control ammonia emissions from fertilisers, but even these are at risk when Basic Farm Payments are withdrawn post-Brexit.

For these reasons, we support the proposed action to require and support farmers to make **investments in the farm infrastructure and equipment** that will reduce emissions. This should be integrated with actions to reduce greenhouse gas emissions and water pollution, so that farm investments will help to reduce all forms of pollution and improve resource efficiency.

The strategy proposes to use the **future environmental land management scheme** to protect habitats impacted by ammonia. Although we support this proposal the future environmental land management scheme must be supported by a strong regulatory baseline (see Q17). The use of public funds should be prioritised to fund the restoration and management of those impacted

habitats (including species-rich grasslands, heaths and woodlands) and not to reward farm businesses and other land managers for simply complying with (current or future) regulations and not polluting the environment. We support the approach of the current Improving Farm Productivity scheme in meeting 40% of the eligible costs of a farm project. In this way, the 'polluter pays' principle will be reinforced and limited public funds used most effectively to support the delivery of public goods.

Finally, the strategy should commit to **increased resources for government agencies and local authorities** to deliver reductions in ammonia emissions. They currently lack the skills, tools and resources to do so. Many local authorities no longer employ an ecologist and planning officers are in need of more training and other support in assessing the air pollution impacts of agricultural and other rural developments. Experience shows that, for regulation to be effective, it needs monitoring, advice for businesses and – if necessary – the ability to take legal action. Without additional resources, this new regulation of ammonia emissions will add pressure onto the already-stretched Environment Agency and local authorities.

Q17. What are your preferences in relation to the 3 regulatory approaches outlined and the timeframe for their implementation: (1) introduction of nitrogen (or fertiliser) limits; (2) extension of permitting to large dairy farms; (3) rules on specific emissions-reducing practices? Please provide evidence in support of your views if possible.

The three approaches outlined in section 7.4.2 are all important elements of an effective regulatory system for ammonia emissions. These **must be introduced in combination, along with the additional permitting measures we propose below,** to provide a clear framework for the farming sector and to address all the major aspects of farm management responsible for generating emissions.

In order to provide clarity and simplicity for farm businesses, these measures should be **integrated with the development of the future environmental land management scheme** post-Brexit. The timing of their introduction should be aligned with the new scheme as soon as possible to assist farm business planning in this period of change and uncertainty.

(1) introduction of nitrogen (or fertiliser) limits

We strongly support regulation to limit fertiliser inputs; this is necessary to minimise not only air pollution, but also water pollution and greenhouse gas emissions from farming. Fertiliser and manure application account for 48% of agricultural ammonia emissions and the voluntary measures taken to date have been insufficient to deliver the necessary reductions in emissions.

An integrated approach to air quality, water quality and greenhouse gases is essential to provide a coherent, single framework for farm businesses and to make the most of cost-efficiencies and cross-benefits. This regulation should also be integrated as part of the future environmental land management system after the UK leaves the EU, along with the Farming Rules for Water. Overall, these regulations and requirements should be equivalent or stronger than the cross-compliance rules currently in place as part of the Basic Farm Payment scheme.

(2) extension of permitting to large dairy farms

We strongly support the extension of permitting to large dairy herds and recommend that this proposal is extended to include large beef herds and to lower the permitting thresholds for pig

and poultry units. Intensive and indoor management of farm animals generates large quantities of manure and slurry which must be managed, stored and disposed of in ways that minimise ammonia emissions. This strategy provides a key opportunity to rectify the anomaly of the current permitting system which applies only to the largest pig and poultry units, and not to other intensive livestock units. This creates an uneven playing field within both the pig and poultry sectors and the wider livestock industry. Extending the permitting requirement to all intensive dairy and beef herds, and to a broader range of pig and poultry operations would raise standards, create a level playing field for the industry and deliver significant reductions in ammonia emissions, as well as diffuse water pollution and greenhouse gas emissions.

The environmental permitting system applied to large pig and poultry units has been effective in raising operating standards and reducing emissions from those units. Analysis by Natural Resources Wales (NRW) shows that poultry units below the permitting threshold of 40,000 birds have significantly higher ammonia emissions. The development of clusters of these non-permitted units is now responsible for concentrated ammonia emissions and highly damaging levels of atmospheric nitrogen deposition on nearby wildlife sites (Powys Pilot Study: Assessment of cumulative atmospheric releases: Evidence Report No: 218, Khalid V. Aazem and Simon A. Bareham, National Resources Wales, July 2015). It appears that certain poultry businesses may be applying for planning permission for units of less than 40,000 birds to avoid the requirement for an environmental permit.

The poultry industry has become highly concentrated and commercialised with a small number of companies accounting for a large proportion of the whole sector through contracts with farmers. The permitting threshold of 40,000 birds creates an arbitrary division within the sectors which can be exploited by those companies that may seek to avoid the bureaucracy and costs associated with the requirements of an environmental permit. We recommend that the permitting threshold be lowered to a level which will be more effective in reducing emissions and raising standards across the poultry sector.

The reasons given in the strategy for extending the permitting system to larger dairy herds can all be equally applied to larger beef herds. While the trend towards larger, intensive dairy herds has been well documented in Defra's June Survey and elsewhere, there is now evidence of an increase in large, intensive beef herds in England (Bureau of Investigative Journalism, 2018). It would therefore be most effective and efficient to develop appropriate emissions limits and Best Available Techniques for the cattle sector as a whole, rather than arbitrarily separating dairy and beef herds.

(3) rules on specific emissions-reducing practices

We support the introduction of the rules set out in the strategy as soon as possible. These are vital steps in reducing ammonia emissions significantly and quickly. Their effectiveness is set out in the Options for Ammonia Abatement published by the UNECE Task Force on Reactive Nitrogen.

The demand for slurry store covers was clearly established in the response to the 2017 Farming Ammonia Reduction Grant scheme for dairy and beef farmers in England. The minister's answer to Written Question 129072 in February 2018 stated: "345 farms received one-to-one advice from a farm adviser on ways to reduce ammonia emissions and conserve nitrogen which could increase the efficiency of the farm system. 427 farms applied for grants to fund the installation of slurry store covers and 53 farms received grants."

The target date of 2027 is proposed for introducing requirements for low-emission spreading equipment and for slurry, manure and digestate covers. As these two measures can deliver significant reductions in ammonia emissions, we strongly recommend that **their introduction be brought forward to an earlier date** and integrated with the new environmental land management scheme post-Brexit well before 2025.

Q18. Should future anaerobic digestion (AD) supported by government schemes be required to use best practice low emissions spreading techniques through certification? If not, what other short-term strategies to reduce ammonia emissions from AD should be implemented? Please provide any evidence you have to support your suggestions.

We strongly support the introduction of a requirement to spread digestate from AD using low-emissions techniques. Given the anticipated growth of the AD industry, this requirement should be introduced as soon as possible. Any certification scheme or other approach should ensure that the requirements and compliance mechanisms extend to all those involved in the management and spreading of digestate, including the recipient landowner / farm business, not just the AD company itself.

9. Leadership at all levels (local to international)

Q25. What do you think of the package of actions put forward in the leadership chapter? Please provide evidence in support of your answer if possible.

We support the strategy's ambitions to make the UK a world leader in air quality, enhance EU standards in domestic legislation post-Brexit, tackle emissions from aviation and shipping, and build international collaboration. These are all fine ambitions and they create an opportunity to set UK air pollution targets based on the needs of public health and a healthy environment, beyond EU and United Nations Economic Commission for Europe (UNECE) requirements.

Q26. What are your views on the England-wide legislative package set out in section 9.2.2? Please explain, with evidence where possible.

We support the government's intention to bring forward primary and secondary legislation to tackle air pollution. In order to be effective in the long term, the targets set out in this strategy must be enshrined in domestic legislation and the new independent statutory body must have the power to hold the government to account in meeting them. As we prepare to leave the European Union, it is vital to replace the compliance and enforcement mechanisms currently provided by European institutions with equivalent or stronger domestic mechanisms.

We recommend that the new statutory body should have a role in the scrutiny of air quality policy and in holding the government to account for meeting legally-binding targets. Link has published a detailed response to the government consultation on environmental governance and principles after the UK leaves the EU, including establishment of an effective new statutory body. We refer to the response for further details (Link response to Environmental Principles and Governance consultation August 2018).

Q29. What improvements should be made to the Local Air Quality Management (LAQM) system? How can we minimise the bureaucracy and reporting burdens associated with LAQM?

We recommend that the LAQM system be improved by taking greater account of rural and long-range sources of pollution. This should include ammonia emissions from agriculture, not least due to their significant contribution to poor air quality in urban areas and the public health impacts of this.

Within statutory agencies and local planning authorities, knowledge, skills and resources are all lacking to tackle this issue effectively. The strategy should commit to increasing capacity, training and resources for site managers and assessors, permitting, advisory and compliance staff, as well as local planning officers, to minimise and mitigate the impact of nitrogen deposition in line with applicable legislation and regulation.

Local authorities have a vital role to play through the spatial planning system in controlling potential new sources of agricultural pollution and they require the support, training and tools to do so effectively, as part of the local authority's wider air quality strategy.