

<b>Report on</b>	DAERAs call for evidence on the Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment..
<b>Date of Meeting</b>	5th Sept 2023
<b>Reporting Officer</b>	Melvin Bowman
<b>Contact Officer</b>	Dr Chris Boomer.

<b>Is this report restricted for confidential business?</b>	Yes	
If 'Yes', confirm below the exempt information category relied upon	No	x

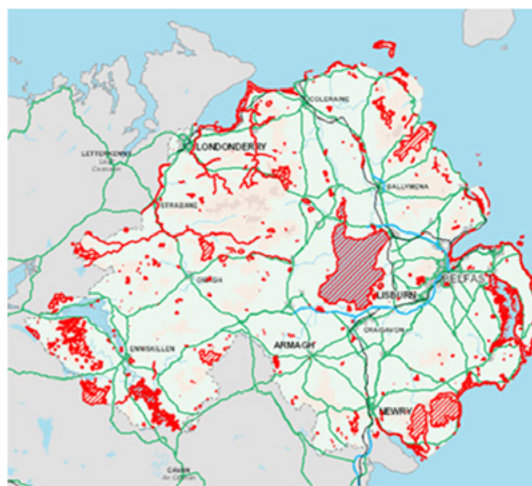
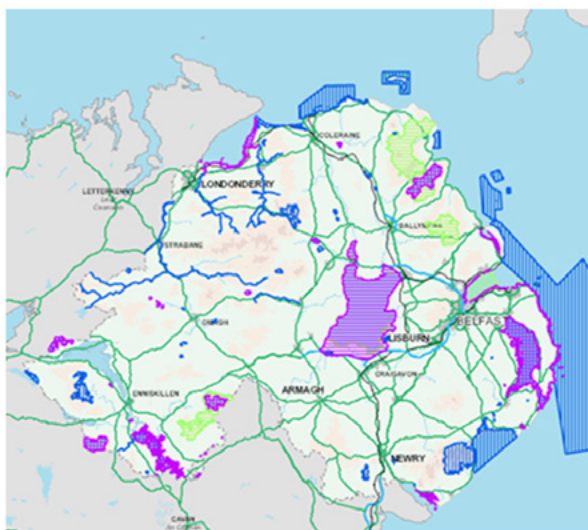
<b>1.0</b>	<b>Purpose of Report</b>
1.1	The purpose of this report is to inform and seek members agreement on a response to DAERA that will contribute to the development and delivery of a scientifically robust Operational Protocol to protect the natural environment and ensure sustainable development for consideration by an incoming Minister and future Executive.
<b>2.0</b>	<b>Background</b>
2.1	The Department for Agriculture, Environment and Rural Affairs (DAERA) has launched an eight-week Call for Evidence on its Future Operational Protocol to assess the impacts of air pollutants, such as ammonia, on the natural environment.
2.2	The recent consultation on the draft Ammonia Strategy was part of this programme of work and responses to the consultation are currently being considered by DAERA. The Call for Evidence is the next step in this programme of work.
2.3.	DAERA, in its role as the appropriate nature conservation body in Northern Ireland has a duty to provide advice to planning authorities and other competent authorities on the potential impacts of air pollution, including ammonia, from plans and projects on designated sites and protected habitats. The Northern Ireland Environment Agency (NIEA) performs this function for terrestrial/freshwater environments, on behalf of DAERA. This advice is provided through the use of an Operational Protocol.
2.4	The Call for Evidence closes on 15 September 2023.

<b>3.0</b>	<b>Main Report</b>
3.1	<p>DAERA state that it is ‘committed to doing everything it can to tackle the challenging and growing problem of ammonia emissions from agricultural activities and the impact on sensitive habitats and biodiversity across Northern Ireland. Current policy is to deliver a solution which achieves both a protected and improved environment and a sustainable agriculture sector. To achieve that balance is challenging and requires us to make sure we are providing policy advice to ministers on their return that is informed by robust evidence’.</p>
3.2	<p>A copy of the Call for evidence paper is attached in the Appendix with this report. It sets out the background to ammonia in NI, relevant Legislation, DAERAs current Operational Protocol for the assessment of ammonia, Options for new projects, options for the assessment of existing facilities and ‘like for like’ projects, PPC permits, Mitigation measures and Environmental economics.</p>
3.3	<p>The paper invites responses to specific questions and indicates areas where the provision of additional evidence is felt applicable. In reviewing this particularly scientific paper we feel that our response should instead focus on reinforcing the following:</p> <ul style="list-style-type: none"> <li>- That so far the Operation of a protocol and its interpretation has provided problematic for Local Councils as decision makers on planning applications.</li> <li>- That conflicting positions on previous operational protocols relating to ammonia and the impacts of Air Pollution between different Departments and bodies has only led to more uncertainty for applicants and delays in the determination of planning applications as well as the increased potential for legal challenge.</li> <li>- That Habitat assessments relating to the current state of designated sites potentially impacted upon by planning applications submitted to Mid-Ulster Council can be provided with clear ammonia concentrations and nitrogen deposition levels above Critical levels and loads.</li> <li>- Greater clarity and certainty is required for proposed developments which offer ‘betterment’ to ammonia levels or represent ‘like for like’ development proposals.</li> <li>- That instead of reliance on Operational protocols, that Strategic Planning Policy sets out clear Policy requirements for these types of developments thus providing at the outset assurance and clear direction for applicants and decision makers.</li> </ul>
3.4	<p>In concluding, the Council recognises that there is a growing problem relating to ammonia emissions in NI but the Department must deliver a solution which achieves both a protected and improved environment and a sustainable agricultural sector, a sector which is particularly important for the rural livelihood and economy</p>

	of Mid-Ulster. It is also of increasing concern that the planning process is becoming embroiled in a separate regulatory process which is overseen by other bodies.
<b>4.0</b>	<b>Other Considerations</b>
4.1	<b>Financial, Human Resources &amp; Risk Implications</b>
	Financial: N/A
	Human: N.A
	Risk Management: N/A
4.2	<b>Screening &amp; Impact Assessments</b>
	Equality & Good Relations Implications: N/A
	Rural Needs Implications: N/A
<b>5.0</b>	<b>Recommendation(s)</b>
5.1	That members agree the suggested response to the call for evidence as set out above and that the Service Director is delegated to finalise the response.
<b>6.0</b>	<b>Documents Attached &amp; References</b>
6.1	Appendix A – copy of DAERA call for evidence paper.

# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment

## A Call for Evidence



*Sustainability at the heart of a living, working, active landscape valued by everyone.*



Department of  
**Agriculture, Environment  
and Rural Affairs**

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**INVESTORS  
IN PEOPLE**

# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence

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The cover page shows (clockwise, from top left): 1. SACs, SPAs, & Ramsars; 2. *Drosera intermedia* (oblong leaved sundew) 3. Healthy sphagnum moss - a key ecological indicator; 4. ASSIs. From DAERA's Natural Environment Map Viewer, <https://www.daera-ni.gov.uk/services/natural-environment-map-viewer>

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## 1. Introduction

The Department for Agriculture, Environment and Rural Affairs (DAERA) has been developing a way forward to tackle the challenging and growing problem of ammonia emissions in Northern Ireland. The Department's key objective is to deliver a solution which achieves both a protected and improved environment and a sustainable agriculture sector.

This Call for Evidence on the Operational Protocol is part of the ongoing programme of work within the Department to seek stakeholder views to help inform and shape proposals to address the issue.

Atmospheric nitrogen pollution, particularly ammonia emissions from agricultural activities, actively damages sensitive habitats and biodiversity across Northern Ireland. Latest NI statistics show agricultural ammonia emissions continue to increase.

Urgent action is required to prevent rising ammonia concentrations and deposition at sensitive habitats to avoid further deterioration in their condition. DAERA has a statutory duty to be proactive in addressing Northern Ireland's high ammonia emissions to protect our natural environment.

A draft Ammonia Strategy was developed under the leadership of the former DAERA Minister to help plan the way forward to reduce ammonia emissions from agriculture. A consultation sought views on the ammonia reduction programme of measures and the conservation actions to protect and restore nature. The consultation closed on 3 March 2023 and the responses are currently being considered.

DAERA, in its role as the appropriate nature conservation body in Northern Ireland has a duty to provide advice to planning authorities and other competent authorities on the potential impacts of air pollution, including ammonia, from plans and projects on designated sites and protected habitats. NIEA performs this function for terrestrial/freshwater environments, on behalf of DAERA. This advice is provided through the use of an Operational Protocol.

Before leaving office, the former Minister instructed officials to issue a Call for Evidence to enable any additional evidence to be provided for consideration alongside the relevant legislation in the development of an updated Operational Protocol for the assessment of air pollution. While ideally it would have been preferable to issue the Call for Evidence alongside the consultation on the draft ammonia strategy, it has taken longer than expected to finalise the Call for Evidence document.

This Call for Evidence presents available scientific evidence, taking account of legal requirements, and drawing upon expertise from subject area specialists. DAERA recognises that it may not have access to all evidence of relevance in the development of the future Operational Protocol.

## **Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence**

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The aim of this Call for Evidence is to provide stakeholders with an opportunity to submit additional evidence that will contribute to the development and delivery of a scientifically robust, evidence-informed, Operational Protocol to protect our natural environment and ensure sustainable development, for consideration by an incoming Minister and future Executive.

This is your opportunity to help inform and shape the proposals to the next Minister for Agriculture, Environment and Rural Affairs.



## 2. Overview of the Call for evidence

### What is DAERA's Operational Protocol?

DAERA, in its role as the appropriate nature conservation body in Northern Ireland as set out in The Conservation of Habitats and Species Regulations 2017, Section 5, has a duty to provide advice to planning authorities and other competent authorities on the potential impacts of air pollution, including ammonia, from plans and projects on designated sites and protected habitats. NIEA performs this function for terrestrial/freshwater environments, on behalf of DAERA. This advice is provided through the use of an Operational Protocol. The Operational Protocol is also used by NIEA in consideration of the air quality impacts on designated sites from intensive agricultural and industrial activities requiring a Pollution Prevention and Control (PPC) permit.

The Operational Protocol provided to competent authorities must be in line with legislation for protected sites including:

- (a) The Conservation (Natural Habitats etc.) Regulations (NI) 1995: Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), Ramsars<sup>1</sup>.
- (b) The Environment (NI) Order 2002: Areas of Special Scientific Interest - ASSIs<sup>2</sup>.

### Why is a new Operational Protocol required?

The current Operational Protocol used by DAERA was developed in 2012, and a supplementary note was issued in 2018<sup>3</sup>. Since 2012, the body of scientific evidence on the impacts of air pollution on designated sites and protected habitats has greatly increased. Recent case law also must be taken into consideration. These factors underpin the need for a new Operational Protocol.

### What types of projects will be assessed under the new Operational Protocol?

DAERA's new Operational Protocol (Sections 8 and 9) must include routes for assessment of both new projects (proposals for new developments), and existing projects (proposals for expansion of existing facilities, replacement 'like for like' projects, and variations and reviews of Pollution Prevention and Control Permits).

### What is the purpose of the Call for Evidence?

The purpose of this Call for Evidence is to set out the evidence currently available to DAERA to inform the development of the new Operational Protocol to be used in the provision of advice and assessment of air quality impacts on the natural environment. Through the Call for Evidence stakeholders are invited to provide input into the development of the guidance by supplying any additional evidence and feedback for consideration.

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<sup>1</sup> <https://www.legislation.gov.uk/nisr/1995/380/contents/made>

<sup>2</sup> <https://www.legislation.gov.uk/nisi/2002/3153/part/IV/crossheading/areas-of-special-scientific-interest>

<sup>3</sup> <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/PRT%20-%20Supplementary%20Note%20to%20Standing%20Advice%20on%20Livestock%20Installations%20and%20Ammonia%20-%20Feb%202021.DOCX>

# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence

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## What will happen following the Call for Evidence?

Following this Call for Evidence, DAERA will review all available evidence relating to the assessment of air quality impacts on designated sites and protected habitats. DAERA will then develop a new Operational Protocol to inform DAERA's planning advice and decision-making processes in the assessment of plans and projects, for an incoming Minister and new Executive to consider.

## How is this Call for Evidence Presented?

This Call for Evidence sets out each of the factors for consideration in the development of DAERA's Operational Protocol and provides information on economics.

Areas where any additional evidence beyond that currently available to DAERA is sought are **shaded in yellow**. Areas where the provision of additional evidence is not applicable are **shaded in green** and are provided for information (e.g. internationally agreed Critical Levels and Critical Loads). Any feedback being provided on the areas shaded in green can be submitted as an answer to Question 17.

Stakeholder views are sought on options for assessment of new projects, and options for assessment of existing projects in sections 8 and 9. Further questions are asked in sections 10 to 12 on Farm Enterprise Economic Case Studies; Farm Mitigation Measures Case Studies and Costs; and Environmental Economics.

## Additional Information

This Call for Evidence will last for 8 weeks, commencing on **Friday 21st July 2023**. Please ensure that your response reaches us before the closing date of **Friday 15th September 2023**. You may also wish to consider the following information sources:

1. DAERA's consultation on a draft Ammonia Strategy for Northern Ireland, available at <https://www.daera-ni.gov.uk/consultations/draft-ammonia-strategy-northern-ireland-consultation>
2. Reports/Case Studies presenting the outcomes of ongoing monitoring at eight Special Areas of Conservation (SACs) are available at: <https://www.daera-ni.gov.uk/articles/air-pollution-and-natural-environment-science-and-evidence>

Thank you for taking the time to consider this Call for Evidence. The Department welcomes your input on the development of DAERA's Operational Protocol for assessing the impacts of air pollution on the natural environment.

### 3. How to respond

This Call for Evidence uses the Citizen Space Hub, accessible via the relevant page on the DAERA website, as the primary means of response, in order to make it as accessible as possible. You may also reply by e-mail to: [ammonia@daera-ni.gov.uk](mailto:ammonia@daera-ni.gov.uk)

When responding please provide the following information:

- Your name.
- Contact details (preferably email).
- The organisation you represent (if applicable).
- Your main area of interest.

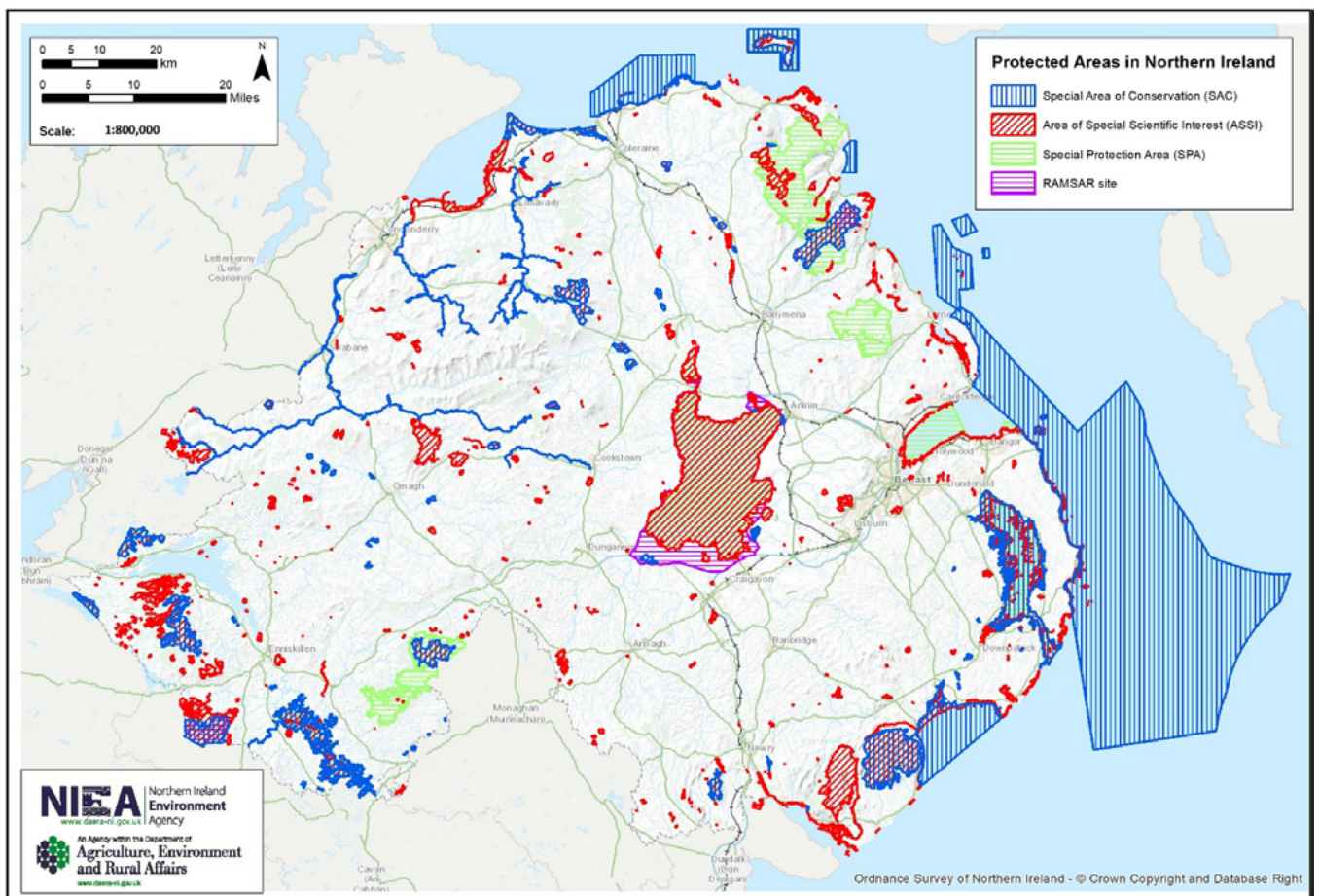
The consultation will run for an **8-week period from Friday 21st July 2023 to 15th September.**

The deadline for responses to this consultation is **23.59 on Friday 15th September 2023.** All responses should be received by then to ensure they can be fully considered.

If you require any further information, contact Kieran McManus on 028 9052 4528.

## 4. The background to ammonia in Northern Ireland

Northern Ireland has 394 sites designated for their high nature conservation value and their protection<sup>4</sup>, shown in Figure 1. Almost 250 of these are sensitive to the impacts of ammonia and atmospheric nitrogen. The vast majority of designated sites are currently experiencing ammonia concentrations and nitrogen deposition levels above the Critical Levels and Loads<sup>5</sup> at which damage to plants and biodiversity will occur, illustrated in Figures 2 and 3. Priority habitats<sup>6</sup>, outside of designated sites are also experiencing exceedances.



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Figure 1. Map of Northern Ireland's designated site network.

4 <https://www.daera-ni.gov.uk/landing-pages/protected-areas>

5 Definition in Section 6.

6 <https://www.daera-ni.gov.uk/articles/northern-ireland-priority-habitat-guides>

# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence

## What are the latest ammonia and nitrogen deposition trends?

The NI Environmental Statistics Report 2023<sup>7</sup> shows a continuing rise<sup>8</sup> in total ammonia emissions in Northern Ireland to 32.0 kt in 2021.

The 'Trends Report 2022: Trends in Critical Load<sup>9</sup> and Critical Level<sup>10</sup> exceedances in the UK'<sup>11</sup> provides key information on UK ecosystems relating to air pollution targets and provides the means to develop targeted action for emission reduction policies. Key data from the Trends Report 2022 for designated sites in Northern Ireland are shown in Box 1 below. Figures 2 and 3 below show ammonia concentration figures from 2017-2019 and nitrogen deposition figures from 2018-2020 which are line with the most up-to-date modelling reported in the 2022 report (the 2022 report maps were not used due to a projection error).

### Box 1

- **98%** of Special Areas of Conservation (SACs) and **83.3%** of Special Protection Areas (SPAs) had nitrogen deposition rates exceeding their Critical Load. These are NI's most important habitats.
- **95.7%** of Areas of Special Scientific Interest (ASSIs), which are nationally important sites, had nitrogen deposition rates exceeding their Critical Load for at least one feature.
- **100%** of SACs, **100%** of SPAs and **99.7%** of ASSIs in NI had ammonia concentrations greater than  $1 \mu\text{g m}^{-3}$  (the long term annual average Critical Level for lichens and mosses and for ecosystems in which they are important).
- **27.8%** of SACs, **21.4%** of SPAs and **24.6%** of ASSIs in NI had ammonia concentrations greater than  $3 \mu\text{g m}^{-3}$  (the long term annual average Critical Level for higher plants including heathland, semi-natural grassland, and forest ground flora).

7 <https://www.daera-ni.gov.uk/sites/default/files/publications/daera-ni-environmental-statistics-report-2023.pdf> provisional data for 2021 to be finalised in the NAEI Air Pollutant Inventory Report in October 2023.

8 This is a material consideration in considering impacts from development.

9 Definition in Section 6.

10 Definition in Section 6.

11 [https://uk-air.defra.gov.uk/library/reports?report\\_id=1087](https://uk-air.defra.gov.uk/library/reports?report_id=1087)



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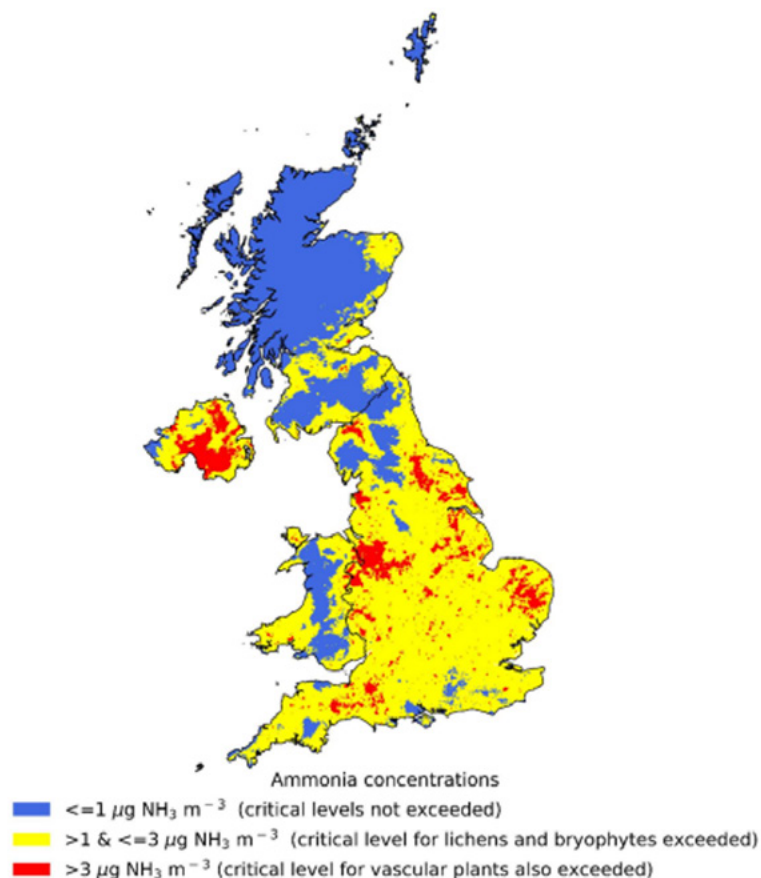


Figure 2. FRAME 1 x 1km ammonia concentrations for 2016-2018 (Trends Report, 2021).

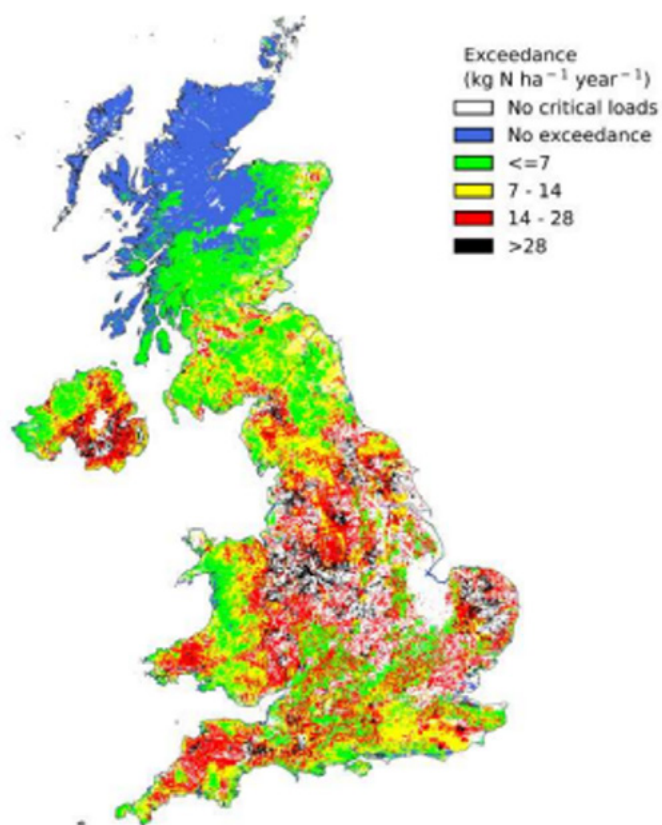


Figure 3. Average Accumulated Exceedance (AAE) in 2017-2019 of Critical Loads for nutrient nitrogen across the UK (Trends Report, 2021).

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## What is the current status of habitats in Northern Ireland?

The Northern Ireland Environmental Statistics Report 2023<sup>12</sup> stated that 38% of habitats are in favourable condition, shown in Figure 4, with woodlands, heathlands, and bogs having the lowest proportion of features in favourable condition.

Figure 4. Condition of features within terrestrial protected sites by type of feature, year ended March 2023.

Feature Type	Number of Features	Number of Features in Favourable Condition	Proportion Favourable %
<b>Habitats</b>			
Bogs	53	13	25%
Coastal	52	19	37%
Freshwater	58	17	29%
Grasslands	102	65	64%
Heathlands	43	6	14%
Inland Rock	16	11	69%
Marine	46	50	87%
Fen, marsh & swamp	89	26	29%
Woodlands	80	6	8%
<b>Habitats Total</b>	<b>539</b>	<b>203</b>	<b>38%</b>

## What are the ecological impacts?

Many ecosystems have evolved under low nitrogen inputs and, as a result, both species composition and ecosystem functioning are adapted to these nutrient-poor conditions. When nitrogen input exceeds the recommended Critical Levels and Loads, the effects can be significant, with observable species loss, changes in soil chemistry and habitat degradation resulting from nutrient enrichment (eutrophication), acidification (lower pH), or direct damage (toxicity)<sup>13</sup>.

Associated impacts include damage to and loss of sensitive species; changes to habitat structure; loss of species diversity and homogenisation of vegetation types; changes in flowering behaviour; and an increased sensitivity to abiotic and biotic stresses (such as disease, climate change, frost and drought)<sup>14</sup>.

There is also evidence that nitrogen deposition reduces the capacity of habitats, such as peat bogs, to store and sequester carbon. In addition to impacts on specific plant species and habitats, early evidence also suggests that habitat changes resulting from nitrogen deposition may also affect other taxonomic groups such as insects and birds<sup>15</sup>.

<sup>12</sup> <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ni-environmental-statistics-report-2023.pdf>

<sup>13</sup> Stevens, C.J., Smart, S.M., Henrys, P., Maskell, L.C., Walker, K.J., Preston, C.D., Crowe, A., Rowe, E., Gowing, D.J. & Emmett, B.A. (2011). Collation of evidence of nitrogen impacts on vegetation in relation to UK biodiversity objectives, JNCC Report 447.

<sup>14</sup> IPENS Atmospheric Nitrogen Theme Plan, (2015). Natural England. Available from: <http://publications.naturalengland.org.uk/publication/6140185886588928>.

<sup>15</sup> Feest, A., van Swaay, C. and van Hinsberg, A. (2014). Nitrogen deposition and the reduction of butterfly biodiversity quality in the Netherlands, Ecological Indicators 39: 115-119.

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*Figure 5. Left: Algal slime is a commonly observed impact of excess nutrient nitrogen on trees around bogs in intensive agricultural landscapes. Right: Healthy sphagnum moss on left, degraded sphagnum on right as a result of excess nitrogen.*

A Habitat Case Study of the Moninea Bog Special Area of Conservation (SAC) is presented in the draft Ammonia Strategy<sup>16</sup> and illustrates the nature of the ammonia threat to ecosystems where lichens and bryophytes are essential to their integrity.

Case Study Reports presenting the outcomes of ongoing monitoring at eight Special Areas of Conservation (SACs) are also provided on the DAERA website<sup>17</sup> alongside the draft Ammonia Strategy. Key findings of the monitoring included seasonal patterns being observed across all the sites. Land-spreading of slurries and manures caused an increase in measured concentrations at all sites (including upland sites), with a dominant peak in March/April and smaller secondary peaks in the autumn at some sites. Findings also showed that measured concentrations can be elevated over the summer months when ammonia emissions increase with warmer and drier conditions. Measured concentrations are generally lower during winter, which correlates with cooler, wetter conditions, and the closed spreading season under the Nutrients Action Programme Regulations.

<sup>16</sup> <https://www.daera-ni.gov.uk/consultations/draft-ammonia-strategy-northern-ireland-consultation>

<sup>17</sup> <https://www.daera-ni.gov.uk/publications/air-pollution-and-natural-environment-research-monitoring-reports>



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### **The draft Ammonia Strategy**

The draft Ammonia Strategy, which underwent an 8-week consultation period from 4 January to 3 March 2023, sets out ambitious and achievable targets to drive the ammonia reductions required to help protect nature from the harmful effects of atmospheric nitrogen (including ammonia) emissions. The long-term target is to reduce ammonia emissions to a point where Critical Loads of nitrogen deposition and Critical Levels of ammonia are at a more sustainable place.

The draft Ammonia Strategy proposes two pillars for achievement of its targets:

- Pillar 1 is an ambitious and verifiable ammonia reduction programme which comprises a series of NI wide measures as well as targeted measures around designated sites.
- Pillar 2 is a suite of conservation actions to protect and restore nature, including habitat restoration, management, and monitoring.

A long-term implementation plan will be developed following analysis of responses received during the consultation period, to inform a reworked draft Ammonia Strategy for an incoming Minister and new Executive to consider.

### **The role of DAERA's Operational Protocol to assess the impacts of air pollution on the natural environment**

The Operational Protocol is a further critical element to protect nature in Northern Ireland by informing planning advice and providing a decision-making framework for licensing and permitting assessments.

DAERA's approach to the assessment of impacts from air pollution on the natural environment must promote sustainability and prevent further damage to protected sites and sensitive habitats, ensuring no adverse impacts on the site selection features.

### 5. Legislation

The following legislation must be taken into consideration in the development of the future Operational Protocol to assess the impacts of air pollution. This list of legislation is not exhaustive; these are the main pieces of legislation pertinent to this document.

#### A. Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) (as amended) ('Habitats Regulations')<sup>18</sup>

DAERA is responsible for compliance with The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations') as amended by The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019, which is the relevant law with respect to habitats and species in Northern Ireland following EU Exit. A DAERA guidance document is available<sup>19</sup>. The Habitats Regulations set out legislative provisions for the protection of European sites (SACs and SPAs). These regulations require competent authorities, public bodies, and decision-makers to agree to a plan or project only after having ascertained that **it will not adversely affect the integrity of European site features**.

#### B. The Environment (Northern Ireland) Order (2002)<sup>20</sup>

This order sets out legislation involving pollution prevention and control, air quality and Areas of Special Scientific Interest (ASSI). Article 28 includes the provisions relating to declaration of an area that is of special interest by reason of any of its flora, fauna, or geological, physiographical or other features. Articles 38, 39, 40 outline the provisions relating to the duty on the Department and other public bodies 'to take reasonable steps, consistent with the proper exercise of the body's functions, to further the conservation and enhancement of the flora, fauna or geological, physiographical or other features by reason of which the ASSI is of special scientific interest'.

The legislation underpinning the protection of ASSIs requires a decision to be taken within the framework of **whether a proposal is 'likely to damage'** which requires a greater weight of evidence (concerning the potential for damage) when compared to the tests which apply to European sites which are concerned with excluding a risk of damage.

#### C. PPC (IE) Regulations (NI) 2013<sup>21</sup>

This requires industrial and agricultural activities with high pollution potential to hold and maintain an environmental permit and meet certain environmental conditions.

#### D. The Wildlife and Natural Environment Act (2011)<sup>22</sup>

This act sets out the duty of every public body, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions.

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<sup>18</sup> <https://www.legislation.gov.uk/ukxi/2019/582/made>

<sup>19</sup> <https://www.daera-ni.gov.uk/publications/guidance-conservation-natural-habitats-etc-amendment-northern-ireland-eu-exit-regulations-2019>

<sup>20</sup> <https://www.legislation.gov.uk/nisi/2002/3153/contents>

<sup>21</sup> [The Pollution Prevention and Control \(Industrial Emissions\) Regulations \(Northern Ireland\) 2013 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukxi/2013/15/contents)

<sup>22</sup> <https://www.legislation.gov.uk/ukxi/2011/15/contents>

**Question 1. Do you have any comments or feedback on the legislation listed above, or any other legislation you feel should be considered?**

### **E. Ramsar Convention<sup>23</sup>**

The Convention on Wetlands, called the Ramsar Convention, is an international intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. As part of the UK national site network, Ramsar sites are subject to the requirements of The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) .

### **F. The Strategic Planning Policy Statement for Northern Ireland (2015)<sup>24</sup>**

The Strategic Planning Policy Statement for Northern Ireland (2015) (SPPS) sets out ways in which the environment must be managed in a sustainable manner in accordance with the Executive's commitment to preserve and improve the built and natural environment and halt the loss of biodiversity. These are based on the types of designated sites and are as follows:

1. SACs, SPAs, Ramsar sites - Planning permission will only be granted for a development proposal that, either individually or in-combination with existing and/or proposed plans or projects, has been determined not to adversely affect the integrity of the site.
2. ASSIs: Planning permission will only be granted for a development proposal that is not likely to damage the site, including the value of the site to the habitat network, or special interest of an ASSI.
3. Protected habitats or species: Planning permission should only be granted for a development proposal which is not likely to result in the unacceptable adverse impact on, or damage to known: priority habitats; priority species; active peatland; ancient and long-established woodland; features of earth science conservation importance; features of the landscape which are of major importance for wild flora and fauna; rare or threatened native species; wetlands (includes river corridors); or other natural heritage features worthy of protection, including trees and woodland.

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<sup>23</sup> <https://www.daera-ni.gov.uk/topics/land-and-landscapes/ramsar-sites>

<sup>24</sup> <https://www.daera-ni.gov.uk/articles/assi-guidance-public-bodiescompetent-authorities>

## 6. The factors to be taken into consideration

In developing DAERA’s future Operational Protocol for the assessment of air quality impacts of plans and projects on the natural environment, to inform planning, licensing, and permitting decision-making processes, a series of factors must be taken into consideration due to legal tests, case law, and evidence. Each of these factors must form part of the future Operational Protocol.

A list of each of the factors is provided in Table 1 for reference.

**In Sections 6 to 9 of this document, areas where any additional evidence beyond that currently available to DAERA is sought are shaded in yellow.**

**In Sections 6 to 9 of this document, areas where additional evidence is not applicable are shaded in green and are provided for information (e.g. internationally agreed Critical Levels and Critical Loads). Any feedback being provided on the areas shaded in green can be submitted as an answer to Question 17.**

*Table 1. The factors to be taken into consideration.*

A	The Proposal
B	Critical Levels and Critical Loads
C	Zone of Influence
D	Process Contribution (PC)
E	Thresholds
F	Site Designation
G	Conservation Objectives
H	Site-specific Survey
I	Strategic Approach
J	Room for Development
K	In-combination Assessment
L	Mitigation Measures
M	Exceedance Level
N	Outcome (issue advice/decision)
O	Habitats Regulations Assessment (HRA)
P	Exemptions requiring site specific consideration

# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence

## A. The Proposal

The proposal contains the key details of a project such as: the location of the proposal; the pollutant potentially being released: ammonia (NH<sub>3</sub>), nitrogen oxide (NO<sub>x</sub>) or other; whether it is an agricultural, industrial, road transport, or other pollutant source; the specific type of development proposal category (new development, replacement of existing facility: 'like for like' with no change in capacity; expansion of an existing facility; or a variation of an environmental permit).

## B. Critical Levels and Critical Loads

Critical Levels and Critical Loads are a key policy tool for controlling pollution and determining the potential impacts on the environment. They have been established for habitats and vegetation types, based on the most up-to-date internationally agreed scientific evidence, to determine specific sensitivities to aerial pollutants. Definitions are:

- **Critical Levels<sup>25</sup> (CLe)** - “concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge”. They are a measure of the sensitivity of habitats to ammonia concentrations (and other gases such as NO<sub>x</sub> and SO<sub>x</sub>).
- **Critical Loads<sup>26</sup> (CLo)** - “a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge”. They are a measure of the sensitivity of habitat to nitrogen deposition. Deposition is the transfer of a pollutant carried in the atmosphere to the biosphere i.e., where a pollutant settles onto a surface (vegetation or the ground).

Internationally agreed empirical Critical Loads for nutrient nitrogen, and Critical Levels for ammonia were reviewed<sup>27</sup> in 2022 to reflect new scientific information. Critical Levels remained unchanged and Critical Loads were mostly revised downwards i.e., many habitats have been found to be more sensitive, with new evidence.

The Critical Level for non-vascular plants (e.g., lichens and bryophytes) is **1 µg m<sup>-3</sup> ammonia** as a long-term (several year) average concentration; for vascular plants the Critical Level is **3 µg m<sup>-3</sup> ammonia**. Critical Loads can range from **2-30 kg N/ha/year** depending on the habitat's sensitivity to nitrogen deposition. The Air Pollution Information System (APIS<sup>28</sup>) GIS map tool uses 1 km datasets to provide site-specific Critical Levels and Loads for habitats across the UK.

<sup>25</sup> [Critical Loads and Critical Levels - a guide to the data provided in APIS | Air Pollution Information System](#)

<sup>26</sup> [Critical Loads and Critical Levels - a guide to the data provided in APIS | Air Pollution Information System](#)

<sup>27</sup> [https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2022-10-12\\_texte\\_110-2022\\_review\\_revision\\_empirical\\_critical\\_loads.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2022-10-12_texte_110-2022_review_revision_empirical_critical_loads.pdf) and <https://unece.org/sites/default/files/2022-08/Item%20%20Conference%20Proceedings%20on%20Ammonia%20Dessau%202022%20FINALdraft.pdf>

<sup>28</sup> <https://www.apis.ac.uk/src/>

### C. Zone of Influence

The zone of influence, or screening distance, is a specific distance beyond which it is unlikely that a particular emission source would have harmful impacts on a sensitive habitat. The zone of influence approach is used to enable competent authorities to safely exclude a project from further environmental assessment for a particular pollutant. The current Northern Ireland Operational Protocol uses a 7.5 km zone for livestock emission sources of influence for European sites (SACs & SPAs) and ASSIs. Other screening distances are used for NO<sub>x</sub> emissions, for example, which are dependent on the pollutant's dispersion characteristics.

The zone of influence takes into consideration how emissions from a source disperse and are deposited in the surrounding area. This approach is used to ensure all plans or projects with the potential to have significant effects on sensitive habitats are considered appropriately. It must be evidence-based and in-line with the Precautionary Principle<sup>29</sup>.

As there are no available studies to establish distances beyond which no adverse effect would occur to sensitive habitat from a mixed range of activities and across all possible scenarios, UK environment and regulatory agencies use scenario modelling to establish suitable zones of influence. The screening distance is based on modelled estimates of damaging pollution levels from individual installations at different distances from protected sites.

Detailed air dispersion modelling, undertaken by NIEA on Pollution Prevention and Control (PPC) pig facilities, showed Process Contributions of 3% of the Critical Level at an ASSI located 7.4 km from the facility.

Analysis of the Process Contributions ((PC), see section D below) from 618 planning applications at varying distances from a designated site submitted to NIEA from January 2012 to December 2022 showed:

- 53% of applications at 0 to 1 km had PCs of 1% or more of Critical Level.
- 20% of applications at 4 to 5 km had PCs of 1% or more of Critical Level.
- 16% of applications at 6 to 7 km had PCs of 1% or more of Critical Level.
- 10% of applications at 7 to 8 km had PCs of 1% or more of Critical Level.

The number of applications with PCs between 0.1-1% of the Critical Level generally increases with increasing distance. The number with PCs of 1% or more of the Critical Level generally declines with increasing distance. Note that only plans or projects with a designated site within 7.5 km of the development are recorded by NIEA within an internal database, therefore the category of 7 to 8 km has fewer planning applications because of this. These detailed modelling results show that while PCs tend to decline with distance from a designated site, PCs above 1% of the Critical Level can still be found at distances as far as 7 to 8 km from a designated site.

<sup>29</sup> The Precautionary Principle is embedded within the Habitats Regulations Assessment process. Under Article 6(3) an assessment must be carried out in light of the best scientific knowledge in the field. The assessment must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the plan or project on the site. "Where doubt remains as to the absence of adverse effects on the integrity of the site linked to the plan or project being considered, the competent authority will have to refuse authorisation" (DTA Habitats Regulations Assessment Handbook - <https://www.dtapublications.co.uk/>).

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A modelling study was undertaken by the UK Air Quality Technical Expert Group (AQTAG) using SCAIL Agriculture (<http://www.scail.ceh.ac.uk/cgi-bin/agriculture/input.pl>) to investigate a precautionary screening distance for the protection of our most sensitive plants, lichens and bryophytes. The exercise was based on poultry units below the PPC threshold (less than 40,000 layers) and it tested the emission contribution of varying bird numbers (1,000 - 39,000 layers) on natural habitats ranging from 250 m - 7500 m from a source. The investigation took into consideration NI-specific prevailing wind conditions and recommended 7 km as the screening distance based on the Process Contribution falling below 1% of the lower Critical Level ( $1 \mu\text{g m}^{-3} \text{NH}_3$ ).

Other parts of the UK and Republic of Ireland currently use a screening distance of 5 to 10 km. Given the range of farm sizes, livestock types with higher emission factors<sup>30</sup> than laying hens, and varying sector types in NI (including larger PPC and non-PPC farms), DAERA consider that a **zone of influence of 7.5 km** facilitates the assessment of air pollution impacts in a consistent and proportionate manner across the NI farming sector.

Using a 7.5 km zone of influence for European sites (SACs and SPAs) and Ramsars includes 77% of Northern Ireland's landmass within the zone. Using a 7.5 km zone of influence for European sites (SACs and SPAs) and Ramsars includes 77% of Northern Ireland's landmass within the zone.

The zone of influence currently used by DAERA for mapped priority habitats outside of the designated site network under the current Operational Protocol is 2 km. Using of a 2 km zone of influence for mapped priority habitats in Northern Ireland includes 98% of NI's landmass within the zone.

A comparison of the zones of influence for designated sites in the UK and Ireland are shown in Annex A, Table 11.

### Summary

- **The current zone of influence for European sites, Ramsars, and ASSIs in NI is 7.5 km.**
- **The current zone of influence for priority habitats outside of the designated site network in NI is 2 km.**

**Question 2. Do you have any additional evidence that you can provide to be taken into consideration in the determination of appropriate zones of influence to be used within the Operational Protocol?**

<sup>30</sup> Emission factors are used to estimate emissions to the environment from a source. For a further detail on UK Emission Factors for agriculture refer to: [https://uk-air.defra.gov.uk/assets/documents/reports/cat07/2207140931\\_UK\\_Agriculture\\_Ammonia\\_Emission\\_Report\\_1990-2020\\_final.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat07/2207140931_UK_Agriculture_Ammonia_Emission_Report_1990-2020_final.pdf)



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### D. Process Contribution (PC)

The Process Contribution (PC) is the additional pollutant loading to a receptor (e.g., designated site) as a result of the plan or project subject to assessment.

The PC depends on a range of factors including the type and scale of a proposal, whether mitigation techniques are being utilised, the distance to the receptor(s), surrounding land type, as well as meteorological factors. It is expressed as a raw figure ( $\mu\text{g m}^{-3}$  or kg N/ha/yr) or as a percentage of the Critical Level/Load.

Out of a total of 618 planning applications received by DAERA from January 2012-December 2022, 22% had PCs of 1% of the CLe or above, 35% had PCs between 0.1-0.9% and 43% had PCs below 0.1% of the CLe. DAERA is aware that in many cases, planning applications are only submitted if they meet the current Operational Protocol thresholds so the figures presented will only be reflective of the applications received.

The PC is typically calculated by applicants/agents/consultancies using aerial dispersion modelling tools, which include both screening tools (e.g., SCAIL) and detailed models such as ADMS/AERMOD<sup>31</sup>.

A new UK Air Quality Assessment Service (previously known as UK AERIUS), led by the Joint Nature Conservation Committee (JNCC), is in development. This integrated tool will become a live government service that will enable the design and testing of different scenarios and accurate calculation of PCs from new and existing proposals, using detailed aerial dispersion modelling. The tool will be available for use by applicants, agents, consultancies, conservation advisers and decision makers.

Further information is available at the following links:

[UK AERIUS | JNCC - Adviser to Government on Nature Conservation.](#)

[UK AERIUS Pilot Tool - an integrated air quality assessment tool | Department of Agriculture, Environment and Rural Affairs \(daera-ni.gov.uk\).](#)

<sup>31</sup> <https://www.daera-ni.gov.uk/ammonia-emission-dispersion-modelling>



### E. Thresholds

Thresholds are used in environmental assessments in a number of different ways to determine if:

1. Further consideration is required;
2. There is potential for significant effects;
3. An effect is acceptable.

However, where thresholds are used, they must be supported by scientific evidence, which reflect the best available scientific knowledge in the field and which leave no room for doubt about environmental effects. This is reflected in the case law (e.g., Wealdon Judgement, 2017) which highlights that threshold-based approaches should be based on logical and empirical grounds.

Other important findings include:

- Likely in-combination effects should be taken into account at the screening stage;
- Existing conditions must be taken into account when conducting an in-combination assessment;
- Screening thresholds must be supported by sufficient scientific explanation i.e., professional judgment or instinct is not enough.

Annex A Table 11 sets out a comparison of air quality assessment guidance in UK and Ireland, including thresholds used.

**Different types of thresholds are outlined below in the sequence in which they are considered:**

#### i. De minimis/Nugatory Threshold

A de minimis effect can be described as 'inconsequential', 'nugatory' or 'trivial'. All such terms are synonymous and are used to describe contributions which can properly be ignored, irrespective of other considerations.

For DAERA's future Operational Protocol for the assessment of air quality impacts on designated sites, the figure of 0.1% of the Critical Level is proposed as the de minimis/ nugatory threshold. This is the level of contribution below which no conceivable impact on the designated site in question is likely to occur even when considered in-combination with emissions from other sources. Projects with emissions below this level would require no consideration.

#### ii. Significance Threshold

The Significance Threshold refers to the threshold above which there is potential for significant effects on the designated site. It requires an in-combination assessment.

### iii. Site Integrity Assessment Thresholds

Site Integrity Assessment Thresholds, when used, allow decision makers to determine if an impact on a protected habitat is acceptable. Similar to significance thresholds they are required to be used 'in-combination' and take account of existing conditions. Given the extent of Critical Level and Critical Load exceedance in Northern Ireland the use of such assessment thresholds will be necessarily limited.

#### Available Evidence

The Decision-Making Threshold project, commissioned by the Joint Nature Conservation Committee (JNCC) on behalf of the UK-wide Inter-agency Air Pollution Group (IAPG) and Department for Environment, Food and Rural Affairs (DEFRA), provides an evidentiary basis for decision making thresholds to inform the assessment of air quality impacts on designated sites. The Main and Technical reports are available on the JNCC website: [Guidance on Decision-making Thresholds for Air Pollution: Main Report and Technical Report | JNCC Resource Hub](#)

There are two main thresholds detailed within the reports which are only relevant to the preliminary steps in the decision-making process (i.e., to determine if the impact is considered nugatory and therefore can be ignored): the Decision Making Threshold and Site Relevant Threshold, the latter of which enables specific circumstances at the site concerned to be taken into account and can offer a degree of flexibility as a result.

Plans and projects with contributions below the relevant threshold can be 'screened out' on the basis that their combined effect will not undermine a designated site's conservation objectives. Those with contributions above the relevant threshold will require further assessment.

**Question 3. Do you have any additional evidence to be taken into consideration in the determination of thresholds to be used within the future Operational Protocol?**

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### F. Site Designation

The nitrogen-sensitive site designations covered by the current Operational Protocol are listed in Table 2 below. To ensure the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) were operable after the end of the EU transition period, changes were made by the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019<sup>32</sup>. The terms used to refer to some sites have changed following EU Exit and are detailed in Table 2<sup>33</sup>. Some sites will have more than one designation due to their characteristics. Legislation applying to the specific site designations is detailed in section 6.

*Table 2. Site designations and changes in terms used.*

Site designation	Old term	New term
Special Area of Conservation (SAC)	Were referred to as Natura 2000 sites.	Now referred to as part of the UK national site network or as <b>European sites</b> *.
Special Protection Area (SPA)	Were referred to as international sites alongside Ramsars.	
Ramsar sites	Were referred to as international sites alongside SACs and SPAs.	Now part of the UK national site network.
Areas of Special Scientific Interest (ASSIs)	No change	

\*In this document the term European sites will be used to refer to SACs and SPAs.

Under the current Operational Protocol, designated sites, i.e., European sites, Ramsar sites, and ASSIs, are treated in the same manner for air quality assessments.

Maintaining a coherent network of protected sites with overarching conservation objectives is required to:

- Fulfil the commitment made by government to maintain environmental protections.
- Continue to meet international legal obligations, such as the Bern Convention<sup>34</sup>, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions, and Convention on Biological Diversity (CBD).

Key summary principles of environmental protection according to site designation (further detail in section 6) are as follows:

For European sites and Ramsar sites, regulations require competent authorities, public bodies, and decision-makers to agree to a plan or project only after having ascertained that **it will not adversely affect** the integrity of European site features.

<sup>32</sup> <https://www.daera-ni.gov.uk/publications/guidance-conservation-natural-habitats-etc-amendment-northern-ireland-eu-exit-regulations-2019>

<sup>33</sup> <https://www.daera-ni.gov.uk/publications/terminology-interpretation-conservation-natural-habitats-etc-amendment-ni-eu-exit-regulations-2019>

<sup>34</sup> UK Government Ministers have confirmed that former UK Natura 2000 sites in the national site network will continue to be the UK contribution to the Emerald Network, as part of the UK's commitment to the Bern Convention.

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For ASSIs decisions must be taken on whether a proposal is **'likely to damage'** which requires a greater weight of evidence (concerning the potential for damage) when compared to the tests which apply to European sites which are concerned with excluding a risk of damage.

The protection of priority habitats includes a requirement under The Planning (General Development Procedure) Order (Northern Ireland) 2015, for consideration where a development proposal is **likely to have an adverse effect on a Northern Ireland priority habitat or priority species**.

The DAERA NIEA Natural Environment Map Viewer is available to view the location of designated sites and priority habitats and species at <https://www.daera-ni.gov.uk/services/natural-environment-map-viewer>

### G. Conservation Objectives

All European sites have Conservation Objectives. Article 6(3) of the Habitats Directive requires an assessment to be made in light of the Conservation Objectives for the site concerned. Conservation Objectives are determined by the overall status of the site defined by site 'Condition Assessment'. Condition Assessment monitoring follows the UK Common Standards Monitoring (CSM) approach to ensure NI monitoring is consistent with methods used throughout the UK. Further information on CSM can be found at JNCC (2004)<sup>35</sup>.

The JNCC Statement on Common Standards Monitoring (JNCC, 2022<sup>36</sup>) assesses interest features using one of the following condition categories: Favourable; Unfavourable; Unfavourable recovering; Partially destroyed; Destroyed.

The Conservation Objectives will either require the site features to be maintained in favourable condition or to be restored where damage has already occurred. Clearly defined **Conservation Management Plans (CMPs)** are currently being prepared for Northern Ireland's SACs<sup>37</sup>.

These CMPs consider pressures and threats to a site (e.g. past drainage, tree planting, scrub encroachment, over/under grazing, invasive species, burning, nitrogen deposition etc) and set out measures aimed at delivering against each site's conservation objectives. Where ammonia/nitrogen deposition is identified as a pressure from APIS and site surveys, the key conservation measure will be to reduce emissions at the site level. A combined approach of country-wide measures to decrease wider regional background concentrations and deposition in addition to locally targeted measures at sites subject to high levels of local atmospheric N input, will be required in order to meet site conservation objectives.

Obligations under the Habitats Directive (Article 6(1))<sup>38</sup> require the necessary conservation measures to be put in place to restore protected sites that satisfy the ecological requirements of protected habitats and species on each site (SACs, SPAs, Ramsar). The development of Conservation Management Plans (CMPs) for our designated sites is a key mechanism for defining the necessary conservation measures to move site features towards favourable condition.

35 Condition Standards Monitoring Introduction to the Guidance Manual - <https://data.jncc.gov.uk/data/f6fef832-93f0-4733-bf1d-535d28e5007e/CSM-Introduction-2004.pdf>

36 JNCC A Statement on Common Standards for Monitoring Protected Sites (2022) (version 2.1) <https://data.jncc.gov.uk/data/0450edfd-a56b-4f65-aff6-3ef66187dc81/csm-statement-2022-v-2-1.pdf>

37 <https://www.daera-ni.gov.uk/publications/management-special-areas-conservation-faq>

38 [https://ec.europa.eu/environment/nature/natura2000/management/guidance\\_en.htm](https://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm) [The Directive has been transposed into the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019].

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The necessary conservation actions are based on detailed assessment of the site features, their condition, and the key pressures on the site. The results of these condition assessments are used to inform the management required to remedy adverse condition. Further detail including examples of site management typically identified in CMPs are outlined in the Ammonia Strategy section 5.3.

The development of CMPs for all Northern Ireland SACs aims to deliver:

- Designated sites in a healthy and robust condition delivering a wide range of benefits to people and nature.
- Improved efficiency through the use of up-to-date data and evidence about sites to prioritise and target management actions.
- Better working relationships between all sectors by coming together wherever possible to reach management solutions that meet the key objective of the favourable management of site features.
- The identification and implementation of realistic and time bound management actions which will bring about favourable condition of features.
- Better co-ordination of funding sources to deliver management actions in years to come.
- An increased understanding and appreciation of these sites by all sectors.

### H. Site-specific Survey

A site-specific survey might be required to inform a decision where desktop-based information sources are insufficient to make an evidence-based judgement. Survey results will help a decision-maker better understand the level of risk that is presented to an ecological feature from a proposal alone or in-combination with others. Examples of when a site-specific survey might be required are listed below:

- To establish whether sensitive ecological features are actually located within a forecast pollution exceedance area. If so, a survey could establish how much of the feature is located within this risk area (e.g., % of the total habitat) so that the potential significance of an impact can be predicted.
- To determine whether there is evidence that an important feature already subject to a level of air pollution is being negatively affected.
- To determine, where pollution levels vary across a large designated site, whether negative effects begin to occur when certain levels of pollution are reached (i.e. identify a 'tipping point') - this might help to determine whether localised impacts of a project might push a specific area over that point.

New Projects Option 1 (Section 8) identifies the following scenarios where site-based survey data might be required:

- Where an ASSI only (excluding geological ASSIs) is affected.
- Where a European site is affected but the target against the air pollution objective is to 'maintain' or to 'restore' however there is uncertainty as the extent to which the proposal might undermine the delivery of the restore objective.

### I. Strategic Approach

Consideration is needed of whether a strategic approach to drive emission reductions is in place and is achieving appropriate emission reductions at the designated site in question. The strategic approach comprises the proposed measures in Pillars 1 and 2 of the draft Ammonia Strategy and includes locally targeted emission reduction measures around designated sites.

A strategic approach to nitrogen recognises that action on any single source is unlikely to bring concentrations and deposition below critical levels and loads and restore a site to meet its conservation objectives. As a result, there is a need to consider the effects of a number of different sources acting together.

Site Nitrogen Action Plans provide one mechanism to understand the problem at an appropriate geographical scale and to work with stakeholders to implement mitigation and improvement approaches that are site specific. The Action Plans would draw on existing evidence and consider appropriate mitigation measures that can be implemented at the key source(s) in order to drive a reduction in atmospheric pollutant concentrations at the sensitive receptor (e.g., a habitat). These plans would aim to provide a timetabled trajectory towards favourable condition status and provide a firmer basis to undertaking environmental assessments for new developments.

The SNAP concept was developed under the Improvement Programme for England's Natura 2000 Sites (IPENS)<sup>39</sup> project, where it received support from a range of stakeholders. The Welsh Government is also putting in place plans to use SNAPs as a tool to define practical steps to reduce and mitigate atmospheric nitrogen impacts at a site level<sup>40</sup>.

A SNAP approach will not be needed for all protected sites in NI and the need for one will be determined by the risk to the habitat from nitrogen deposition, particularly from local sources. For some sites, the SNAP approach is an optimal way forward. SAC Conservation Management Plans will indicate where nitrogen deposition is recognised as a key threat to achieving favourable conservation status. For other protected areas, site specific consideration will be required.

### J. Room for Development

This concept originated from the Dutch nitrogen model, whereby reductions in background emissions can potentially provide 'room for development' for new facilities. In the New Projects Option 1 (Section 8) 'room for development' refers to capacity within the source group for sustainable development.

For example, if there is a strategic approach for the site it is necessary to identify whether the approach allocates any 'room for development' for new plans and projects if sufficient reductions have been made. If it does, and the proposal can be accommodated in this 'source group capacity' (through suitable reductions to the background), there might be a low risk allocated. If the strategic approach does not allocate a 'source group capacity', or if suitable reductions have not been made to background emissions, there is likely to be a high risk allocated.

<sup>39</sup> <https://publications.naturalengland.org.uk/search?q=atmospheric+nitrogen+theme+plan&num=100>

<sup>40</sup> <https://naturalresources.wales/media/676006/life-n2k-thematic-action-plan-air-pollution-nitrogen-deposition.pdf>



## K. In-combination Assessment

A formal assessment of the effects of ‘other plans and projects’ which are relevant at the point at which a specific plan or project is subject to assessment. Under the Habitats Regulations, an assessment needs to take account of the effects from a plan or project ‘either alone or in-combination with other plans and projects’. Only when a proposal is considered potentially acceptable ‘alone’ does the need to consider its effects in-combination with other plans and projects arise.

A summary of relevant case law concerning in-combination assessments is included in Table 3 below (amended from Table 2.2. within the DMT Main Report <sup>41</sup>):

*Table 3. Summary of case law relevant to in-combination assessments*

<b>Court Decision</b>	<b>Implications</b>
<b>European Commission Parliamentary Question (2005)</b>	An in-combination assessment must be practically feasible, and the in-combination provisions must be interpreted and applied in a proportionate manner.
<b>Walton [2011] CSOH 131</b>	A decision maker is entitled to exercise judgment over which other plans and projects to take into account and there must be a degree of flexibility to an in-combination assessment.
<b>Sweetman (AG Opinion) Case C-258/11 (2012)</b>	The need to avoid ‘legislative overkill’ and proposals with no appreciable effect can be excluded from further assessment.
<b>Newry [2015] NIQB 65</b>	It is possible to eliminate the need to undertake an in-combination assessment on the basis of professional judgement, having regard to advice from the Statutory Nature Conservation Body (SNCB).

In developing a new Operational Protocol, the following plans and projects may be relevant to an in-combination assessment:

- Application lodged but not yet determined.
- Projects subject to periodic review e.g. annual licences, during the time that their renewal is under consideration.
- Refusals subject to appeal procedures and not yet determined.
- Projects authorised but not yet started.
- Projects started but not yet completed.
- Known projects that do not require external authorisation.
- Proposals in adopted plans.
- Proposals in finalised plans formally published or submitted for final consultation, examination or adoption.
- Plans or projects which became operational after the most recent update of APIS background levels.

<sup>41</sup> CHAPMAN, C. & KITE, B. 2021. Guidance on Decision-Making Thresholds for Air Pollution. JNCC Report No.696 (Main Report), JNCC, Peterborough, ISSN 0963-8091

**Question 4. Do you have any additional evidence that you can provide to be taken into consideration in relation to in-combination assessments for use within the future Operational Protocol?**

**Question 5. Do you have any additional information on other types of plans and projects that should be considered in the future Operational Protocol?**

### L. Mitigation Measures

#### Definition

A mitigation measure is a measure which is intended to avoid or reduce harmful effects upon a designated site or protected habitat. The measures must relate directly to the proposal and seek to reduce or avoid an adverse effect which is otherwise anticipated to arise.

#### Key considerations:

- The need for documented evidence of the effectiveness of the proposed mitigation measures.
- The time taken for measures to become effective, reach their maximum effectiveness, and the timeframe over which they will remain effective without maintenance, remedial action or replacement e.g.:
  - Changes to slurry spreading techniques can be delivered in a short timescale and have an almost immediate effect.
  - Tree shelter belts can take longer to become effective but are an accepted mitigation measure and where included in a development will be given appropriate credit; further detail is provided in Section 4.1.8 of the draft Ammonia Strategy.

The Draft Ammonia Strategy<sup>42</sup> details, in Pillars 1 and 2, a proposed series of voluntary and mandatory mitigation measures across NI and at designated sites with additional evidence provided via AFBI seminars (links on the draft Ammonia Strategy consultation page). Emerging technologies with potential to reduce ammonia emissions and deliver are detailed in Section 4.1.2 of the draft Ammonia Strategy. DAERA's Science Workstream, established within its Project Board on Ammonia Reduction, incorporates leading scientific experts on ammonia from across the UK and advises on novel ammonia reduction technologies.

DAERA's 'Code of Good Agricultural Practice for the Reduction of Ammonia Emissions'<sup>43</sup> is a guidance document which explains how farmers, growers, land managers, advisers and contractors can minimise ammonia emissions from agriculture.

<sup>42</sup> <https://www.daera-ni.gov.uk/consultations/draft-ammonia-strategy-northern-ireland-consultation>

<sup>43</sup> <https://www.daera-ni.gov.uk/publications/code-good-agricultural-practice-reduction-ammonia-emissions>



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The 'Best Available Techniques (BAT) Reference Document for the Intensive Rearing of Poultry or Pigs'<sup>44</sup> provides information on techniques and technologies for on-farm processes and activities.

The 2022 UNECE Guidance Document on Integrated Sustainable Nitrogen Management provides further information on mitigation measures<sup>45</sup>.

Further detail on Farm Mitigation Measures Case Studies and Costs is provided at Section 11 of this Call for Evidence alongside initial results from the DAERA commissioned AFBI Horizon Scanning project examining mitigation measures and technologies for ammonia reduction.

### M. Exceedance Level

The degree to which the levels of a pollutant are greater than the Critical Load or Level for the specific habitat is called the level of exceedance.

Figure 6 shows the Critical Level exceedance of  $1\mu\text{g NH}_3 \text{ m}^{-3}$  and  $3\mu\text{g NH}_3 \text{ m}^{-3}$  at ASSIs based on the most recent data available. The map illustrates that the Critical Level for the majority of ASSIs is  $1\mu\text{g NH}_3 \text{ m}^{-3}$  which is determined by the type of vegetation present. The map also illustrates that ammonia levels across almost all ASSIs are exceeding the Critical Level above which damage to plants is likely to occur.

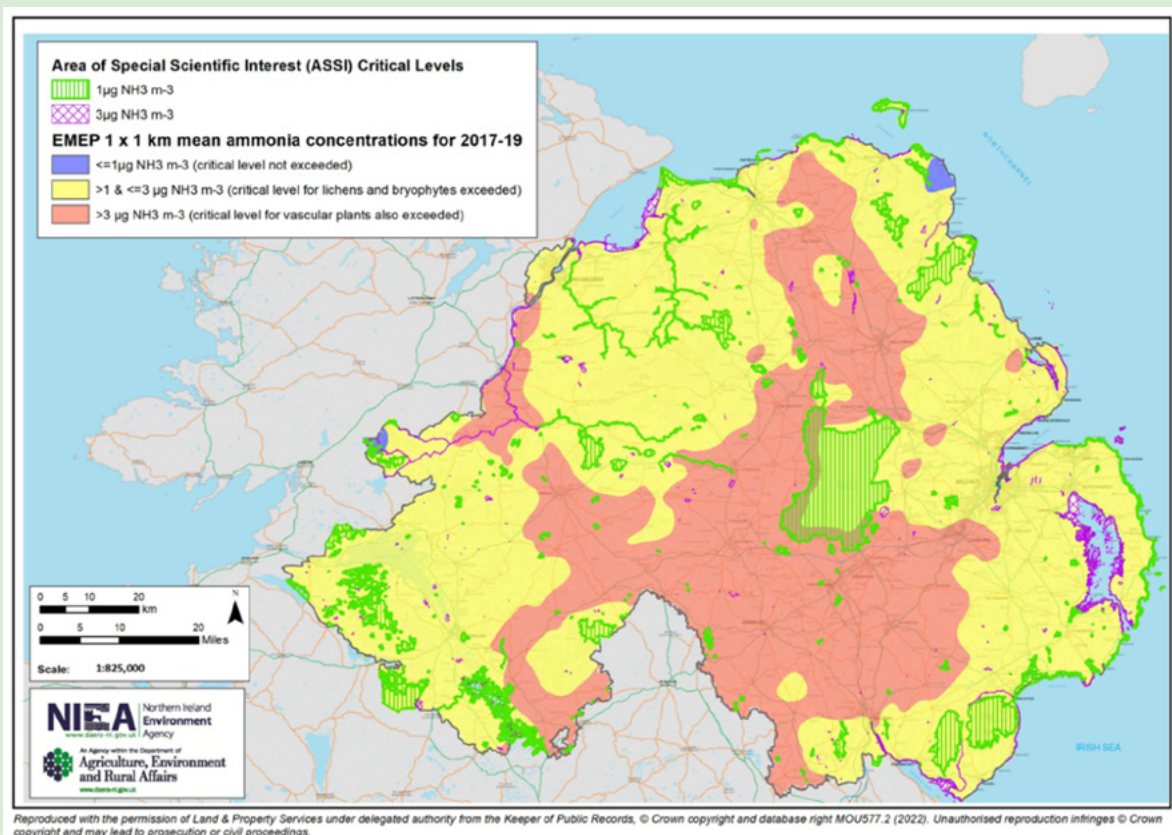


Figure 6. Spatial representation of the levels of exceedance of Critical Levels of ammonia at ASSIs in Northern Ireland 2017-19.

44 <https://publications.jrc.ec.europa.eu/repository/handle/JRC107189>.

45 <https://unece.org/environment-policy/publications/guidance-document-integrated-sustainable-nitrogen-management>

# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence

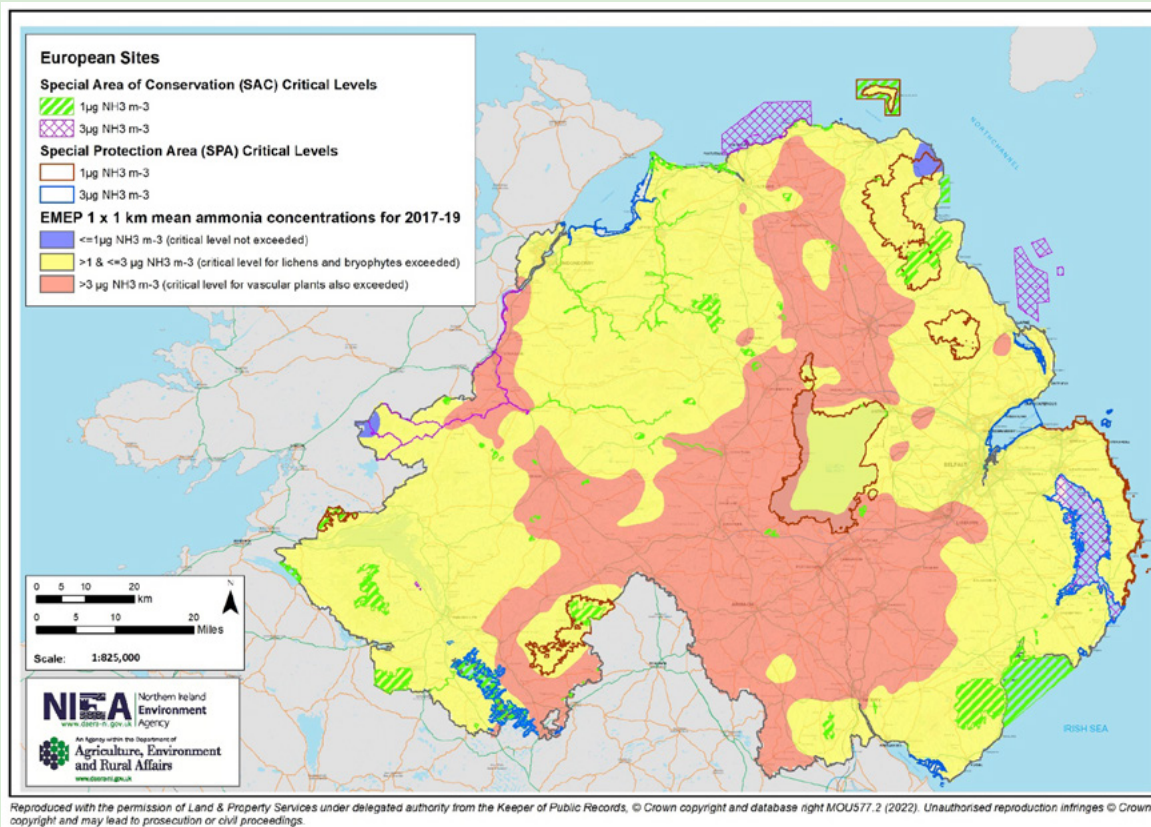


Figure 7. Levels of exceedance of the Critical Level of 1µg NH<sub>3</sub> m<sup>-3</sup>, and 3µg NH<sub>3</sub> m<sup>-3</sup> at European sites across Northern Ireland based on the most recent data available.

Figure 7 shows the Critical Level exceedance of 1µg NH<sub>3</sub> m<sup>-3</sup> and 3µg NH<sub>3</sub> m<sup>-3</sup> at European sites across Northern Ireland based on the most recent data available. The map illustrates that majority of SACs have a Critical Level of 1µg NH<sub>3</sub> m<sup>-3</sup>. SPAs have of a Critical Level of 1µg NH<sub>3</sub> m<sup>-3</sup> or 3µg NH<sub>3</sub> m<sup>-3</sup> depending on the type of vegetation present. The map also illustrates that ammonia levels across almost all European sites are exceeding the Critical Level above which damage to plants is likely to occur.

## M. Outcome (issue advice/decision)

This will be in the form of advice from the appropriate nature conservation body (NIEA Natural Environment Division) to a competent authority (e.g., Planning Authority) or a decision on potential air quality impacts from a competent authority.

There is a legal requirement for competent authorities to carry out a Habitats Regulations Assessment (HRA) for plans and projects with European/Ramsar sites within their zone of influence. This process determines if the emission source under consideration could infringe on the conservation objectives of a European site or significantly impact its current quality.

The Operational Protocol will serve as NIEA Natural Environment Division's advice on carrying out a HRA or environmental assessment (for ASSIs), providing a scientifically robust process that competent authorities can follow to consider potential air quality impacts on designated sites in their decision making.

The level of risk to a receptor associated with the project will form part of the outcome. A high, moderate, or low risk category is assigned as part of the advice issued through the New Projects Option 1 approaches presented in Section 8.

### **O. Habitats Regulations Assessment (HRA)**

A Habitats Regulations Assessment (HRA) refers to the several distinct stages of Assessment which must be undertaken in accordance with the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended), and changed by the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019. A HRA is used to determine if a plan or project may affect the protected features of a habitats site before deciding whether to undertake, permit or authorise it.

All plans and projects (including planning applications) which are not directly connected with, or necessary for, the conservation management of a habitat site, require consideration of whether the plan or project is likely to have significant effects on that site. This consideration - typically referred to as the 'Habitats Regulations Assessment screening' - should take into account the potential effects both of the plan/project itself and in-combination with other relevant plans or projects.

Where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view of the site's conservation objectives. The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site. Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured.

### P. Exemptions requiring site specific consideration

Under the future Operational Protocol, a limited number of designated sites may be subject to exemptions such as those listed below and require site specific consideration <sup>46</sup>. When assessing new proposals, where an exemption scenario applies, further consideration and a more detailed assessment may be required. This will be informed by data on ammonia concentrations and nitrogen deposition, habitat and species records and surveys, where appropriate.

Exemptions include:

- ‘Clean’ or ‘pristine’ sites (i.e., those with very low existing levels of air pollution) where there is reason to doubt the improving background trend.
- Sites with sensitive epiphytic or epilithic components that are, or form an important part of, a qualifying feature of the site and which are at or just below their Critical Load/Level.
- Sites with an existing exceedance of Critical Loads/Levels where there is evidence of an impending risk of extinction (due to air pollution) of a species that forms an important part of a qualifying feature.

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46 Caporn, S., Field, C., Payne, R., Dise, N., Britton, A., Emmett, B., Jones, L., Phoenix, G., Power, S., Sheppard, L. & Stevens, C. (2016) Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports Number 210. <http://publications.naturalengland.org.uk/publication/5354697970941952>

Payne, R., Campbell, C., Britton, A., et al. (2019). What is the most ecologically-meaningful metric of nitrogen deposition? Environmental Pollution pp 319-331.

Rowe, E., Stevens, C., Vieno, M., Dore, A., Hall, J., Sutton, M., Mills, G., Evans, C., Helliwell, R., Britton, A., Mitchell, R., Caporn, S., Dise, N., Field, C. & Emmett, B. (2014) Measures to Evaluate Benefits to UK Semi-Natural Habitats of Reductions in Nitrogen Deposition. Final Report on REBEND Project (Defra AQ0823; CEH NEC04307). [https://ukair.defra.gov.uk/assets/documents/reports/cat10/1511251351\\_AQ0823\\_REBEND\\_Final\\_report.pdf](https://ukair.defra.gov.uk/assets/documents/reports/cat10/1511251351_AQ0823_REBEND_Final_report.pdf)

## 7. DAERA's current Operational Protocol for assessment of air pollution

### DAERA's current Operational Protocol (2012) criteria:

- A **zone of influence of 7.5 km** from a designated site (Natura 2000/Ramsar sites and ASSIs) within which developments must be screened to determine likely significant effects, and a **2 km zone of influence for priority habitats outside of designated sites**.
- For a proposal within the 7.5 km zone of influence, a **threshold of 1% of the Critical Level** for the designated site was set. Where the Process Contribution from the proposal at the designated site is equal to or above this, then it is considered that there is the potential for negative impacts from air pollution.
- Where a proposal alone contributes less than 1% of the Critical Level then it could be considered for approval, irrespective of whether or not the pollution levels are exceeded for the designated site.
- Where the Critical Level of the designated site is exceeded, and the ammonia contribution of the proposal is greater than or equal to 1% of the Critical Level, then the proposal is assessed 'in-combination' with other relevant plans or projects of ammonia contributing to the designated site.
- Where the Critical Level of the designated site is exceeded, then **an additional 10%** of this level is permitted as a Process Contribution from the proposal, in-combination with other ammonia-emitting plans or projects. This includes other plans and projects post January 2012 with a PC of 1% or above (of the Critical Level).
- For non-designated sites that contain priority habitats within 2 km of a proposed ammonia emitting facility, up to 50% of the ammonia damage threshold is permitted.



## 8. DAERA's Future Operational Protocol - Options for Assessment of New Projects

DAERA undertook a process of extensive development and review of options for the assessment of new projects. Following this process Options 1 and 2 are presented below for consideration in this Call for Evidence, in line with the legal and scientific principles set out in Sections 4 and 5.

### Option 1 Framework for Assessment of New Projects, and process flowchart.

- 1) Continued application of a **7.5 km zone of influence** around designated sites. Different zones of influence apply for sectors other than agriculture<sup>47</sup>.
- 2) Use of a **de-minimis threshold of 0.1% of the Critical Level or Load**, below which no further air quality assessment is required.
- 3) If the proposal contributes more or equal to 0.1% of the Critical Load or Level, a **Site Relevant Threshold** can be applied. This threshold will consider the risk of proliferation and local contribution from the source group (e.g., agriculture/transport etc) at the site. The Site Relevant Threshold can range from 0.1-1% of the Critical Level or Load (Table 4 below).

*Table 4: Site Relevant Thresholds*

<b>% local contribution from 'source group'</b>	<b>High risk of proliferation<sup>48</sup></b>	<b>Low risk of proliferation</b>
>50%	0.1%	0.5%
30-50%	0.2%	0.5%
20-30%	0.5%	1%
10-20%	0.8%	1%
0-10%	1%	1%

- 4) If the proposal contributes less than the Site Relevant Threshold (SRT), it is screened out of further assessment (low risk). If the proposal contributes more than the SRT, a **detailed assessment is required**, informed by:
  - Whether mitigation measures might reduce emissions to an acceptable level.
  - The site-specific conservation objectives for air pollution.
  - The use of available desk-based information such as designated survey information; or a site survey can be undertaken.
  - Whether a strategic approach is in place to help achieve the conservation objectives for the site concerned, or if it has provided 'room' for sustainable development.

<sup>47</sup> Dependent on emission profiles. Other types of air pollution can be considered using the framework e.g. NOx.

<sup>48</sup> Proliferation refers to the likelihood of expansion/increased development pressure in the NI agriculture sector.

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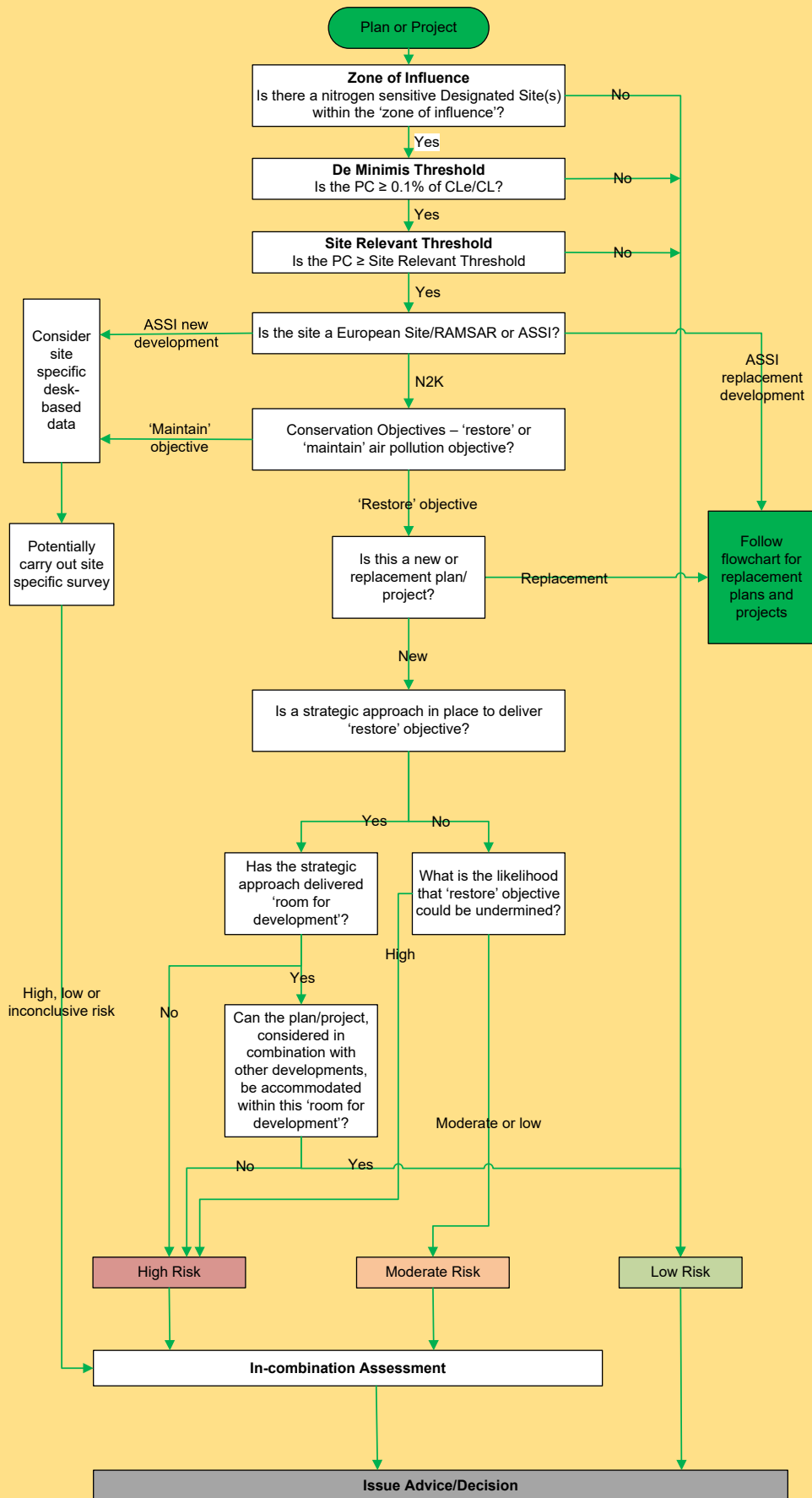
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- 5) The **in-combination threshold will likely be no greater than 1%** and will take into consideration the contribution from other relevant plans and projects if their effects have potential to act in-combination with those of the proposal. Only other plans and projects which, themselves, exceed the 0.1% and Site Relevant Threshold will be relevant to the in-combination assessment.
- 6) Following consideration of the likelihood that the proposal could undermine the conservation objectives/damage site features, advice will be issued, and **proposals will be assigned a risk category: high, medium, or low risk.**

# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence

## Option 1 Process flowchart for assessment of new projects

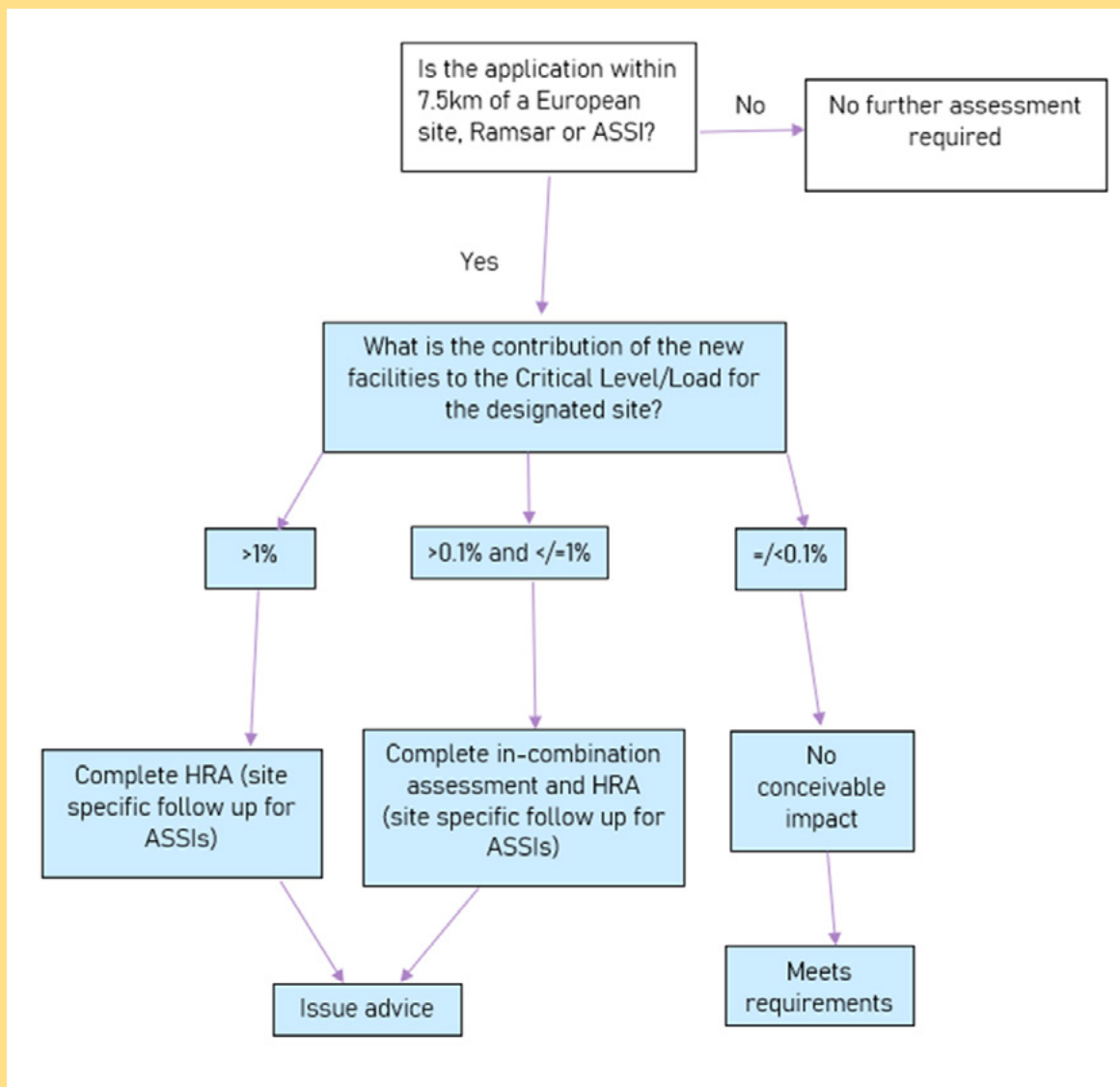




# Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence

## Option 2 Framework for Assessment of New Projects and process flowchart

1. Continued application of a **7.5 km zone of influence** around designated sites. Different zones of influence apply for sectors other than agriculture.
2. Use of a **de-minimis threshold of 0.1% of the Critical Level or Load**, below which no further air quality assessment is required.
3. If the proposal contributes more than 0.1% of the Critical Load or Level and less than or equal to 1% an **in-combination assessment and a Habitats Regulations Assessment/ Environmental Assessment (for ASSIs)** is required.
4. If the proposal contributes more than 1% of the Critical Load or Level a **Habitats Regulations Assessment/Environmental Assessment (for ASSIs)** is required.



Option 2 Process flowchart for assessment of new projects.

**Question 6. Do you have any comments, feedback, or evidence on:**

**Option 1 Framework for Assessment of New Projects, and process flowchart?**

**Question 7. Do you have any comments, feedback, or evidence on:**

**Option 2 Framework for Assessment of New Projects, and process flowchart?**

### **SUPPLEMENTARY QUESTION ON PRIORITY HABITATS**

#### **Background**

**Currently for non-designated sites that contain priority habitats within 2 km of a proposed ammonia emitting facility, up to 50% of the ammonia damage threshold is permitted. No change is currently proposed to this zone of influence or threshold.**

**Question 8. Do you have any comments, feedback, or evidence on priority habitats?**

## 9. DAERA's Future Operational Protocol - Options for assessment of replacement of existing facilities, 'like for like' projects, and variations including reviews of PPC permits

DAERA undertook a process of extensive development and review of options for the assessment of existing facilities, 'like for like' projects, and variations including reviews of PPC permits<sup>49</sup>. Options 1 and 2 were developed and presented below for consideration in this Call for Evidence, in line with the legal and scientific principles set out in Sections 5 and 6.

### Option 1 Framework for replacement of existing facilities, 'like for like' projects, and variations including reviews of PPC permits, and process flowchart.

1) Where a proposal relates to an expansion, variation or replacement to an existing operation or activity, consideration needs to be made of the likelihood that the proposal might undermine the ability to deliver the conservation objectives. Where there is an existing emission source relating to the proposal, the granting of permission might offer opportunities to reduce existing emissions which might actively contribute to the achievement of conservation objectives (explained in Section 6, part G).

The central question is **whether the continuation of the existing activity (at current or reduced emission levels) might undermine the ability to achieve the conservation objectives**. To maximise the potential for the most favourable assessment, the project will need to be designed to minimise emissions. However, it may not be assumed that a replacement facility with lower emissions would automatically gain a favourable risk assessment for the designated site(s) in question. This is because DAERA has a legal duty to not only prevent future environmental damage but to reduce existing pollution pressures to levels which avoid deterioration of the habitats and species in question. If an ongoing activity, albeit with a reduction in emissions, has the potential to compromise the objective of restoration, or make it appreciably more difficult to achieve favourable conservation status, it will not be possible following an appropriate assessment to dismiss the ongoing risk of an adverse effect on site integrity. Therefore, any reduction in emissions must be both reactive, i.e. sufficient to address existing levels and proactive, sufficient to prevent future damage. To grant a consent, permission or other authorisation that continues or legitimises existing environmental damage is unlawful.

2) The decision will be influenced by factors including:

- The distance and relative pollution contribution from the existing operation to the site.
- The scale of exceedance at the site concerned and the overall reduction in existing pollution which will be required to achieve the conservation objectives.

<sup>49</sup> <https://www.legislation.gov.uk/nisr/2013/160/regulation/17/made>

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- Action taken, or to be taken, on other sources which might be relied upon to secure the integrity of the site.

3) Two options are available to determine required emissions reduction. This approach considers the entire farm holding for calculation of emission reductions:

- Option A - A **flat-rate option** whereby all replacement facilities are required to reduce ammonia levels by a **minimum of 30%**.
- Option B - A **'distance from site' option** whereby the minimum reduction in emissions required is determined by the distance to a designated site, as presented in Table 5 below.

Table 5: Assign a minimum facility improvement requirement

Distance from site	Minimum improvement
< 0.5 km	60%
0.5 - 1 km	50%
1 - 2 km	40%
2 - 4 km	30%
4 - 7.5 km	20%

4) After the minimum improvement has been applied, the decision-maker needs to determine **the likelihood that the ability to deliver the conservation objectives will be undermined by the continuation of an ongoing, improved activity**, as per Table 6 below. The contribution from the existing source is that after any improvements/reductions have been taken into account.

Table 6. Assigning likelihood that ability to deliver restore objective will be undermined by continuation of an ongoing activity.

Contribution from existing source / activity as % of nitrogen Critical Load/Level	Reduction required to achieve nitrogen Critical Load		
	1-5 kg/ha/yr	5-10 kg/ha/yr	>10 kg/ha/yr
>50%			
30-50%			
20-30%			
10-20%			
0-10%			

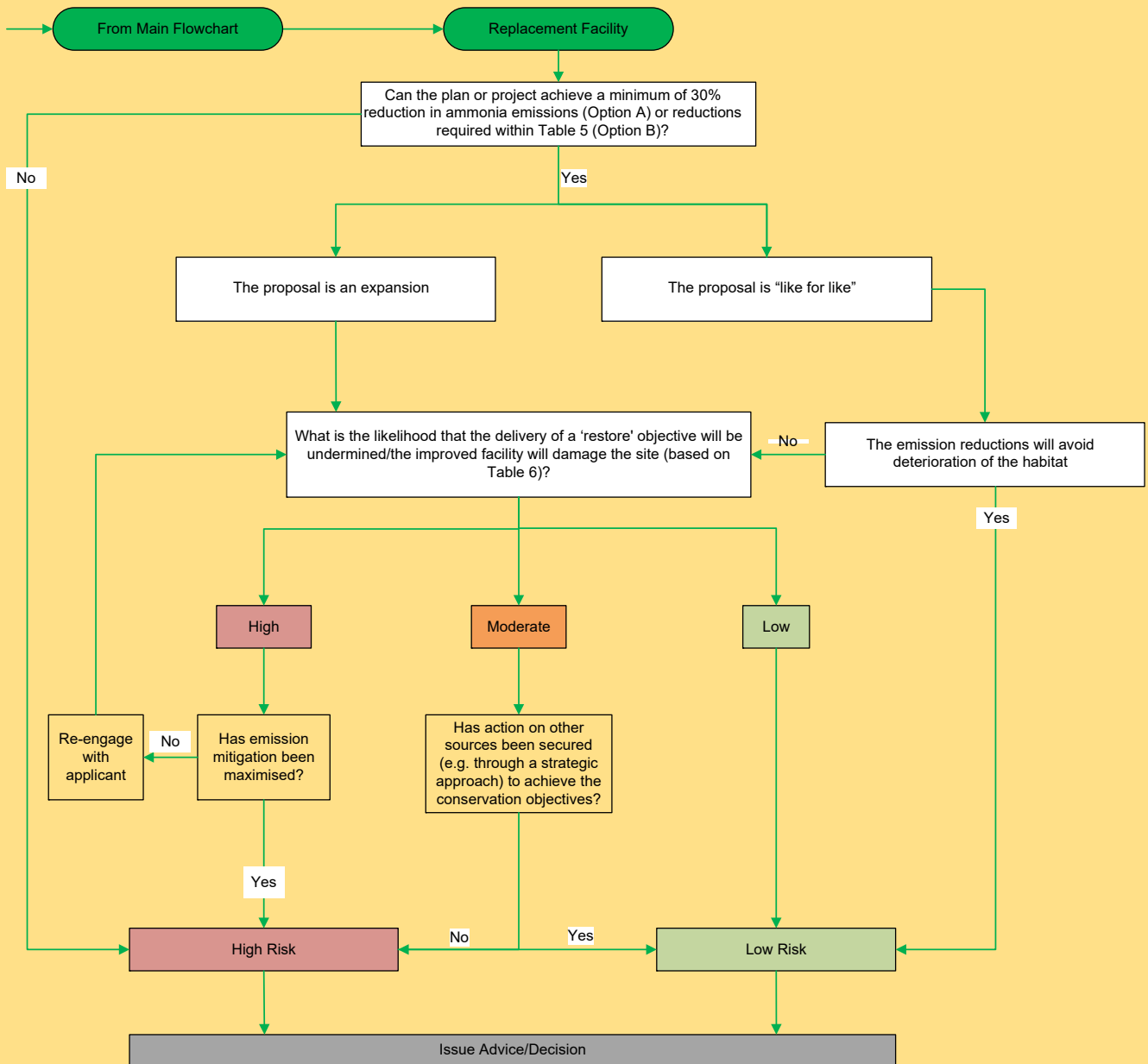
**High likelihood that the delivery of the conservation objectives will be undermined by the proposal.**

**Take account of action taken, or to be taken, on other sources which might be relied upon to secure the delivery of the conservation objectives.**

**Low likelihood that the delivery of the conservation objectives might be undermined by the proposal.**

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## Option 1 Process flowchart for replacement of existing facilities, 'like for like' projects, and variations including reviews of PPC permits.



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### Option 2 Framework for replacement of existing facilities, 'like for like' projects, and variations including reviews of PPC permits.

1. This option enables approval of replacement and expansion facilities, and existing PPC licensing through delivery of farm specific ammonia emissions reductions, determined by the farm's contribution to site Critical Level.
2. This approach only takes into consideration the source of emissions, i.e. the farm; it does not consider the site conservation objectives.
3. In this method the contribution of a specific farm/facility to the site is used to determine the required emissions reduction. The principle is that the facilities making the largest contribution to ammonia emissions at a site are required to make the largest reductions.
4. Table 7 below shows proposed reduction requirements according to contribution to site Critical Level of ammonia.

*Table 7. A farm-specific emissions reduction approach.*

Contribution of the facility* to site Critical Level	Reduction required from facility
>= 100%	Case by case consideration
50-100%	50%
25-50%	25%
<25%	12.5%

\*the facility is the entire farm holding for calculation of emissions reductions.

**Question 9. Do you have any comments, feedback, or evidence on:**

**Option 1. Framework for replacement of existing facilities, 'like for like' projects, and variations including reviews of PPC permits, and process flowchart?**

**Question 10. Do you have any comments, feedback, or evidence on:**

**Option 1A. Flat-rate emissions reduction approach (flat-rate option) whereby all replacement facilities are required to reduce ammonia levels by a minimum of 30%?**

**Question 11. Do you have any comments, feedback, or evidence on:**

**Option 1B. Distance from site emissions reduction approach ('distance from site' option) whereby the minimum reduction in emissions required is determined by the distance to a designated site, as presented in Table 5?**



## **Future Operational Protocol to Assess the Impacts of Air Pollution on the Natural Environment - A Call for Evidence**

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**Question 12. Do you have any comments, feedback, or evidence on:**

**Option 2. Framework for replacement of existing facilities, 'like for like' projects, and variations including reviews of PPC permits?**

**Question 13. Do you have any comments, feedback, or evidence on:**

**Option 2. Farm-specific emissions reduction approach whereby the facilities making the largest contribution to ammonia emissions at a site are required to make the largest reductions?**

# 10. Farm Enterprise Economic Case Studies

Data presented in the Farm Enterprise Case Studies are the most up to date available and are taken from the Statistical Review of Northern Ireland Agriculture 2021<sup>50</sup> for physical data, and from Farm Business Data 2022<sup>51</sup> for financial data unless otherwise stated. The financial data from the Farm Business Data report relates to the production year beginning January 2022 (unless otherwise stated) and is based on price information available at the time of preparation (Summer 2022).

The Farm Enterprise Case Studies set out the potential gross margin for the establishment of a new separate enterprise using average enterprise size figures. This approach is used to enable relative comparison between distinct sectors on the basis of the average size of enterprise within each sector. Fixed costs are not included in gross margin calculation and include farm running costs e.g. conacre, labour, depreciation, machinery running costs, electricity, repairs, insurance, miscellaneous costs.

### Limitations to the approach taken in Farm Enterprise Case Studies

The Case Studies aim to illustrate, in a simplistic manner, the economic impact of the specified enterprises not being established by the farm business due to not obtaining planning permission.

To assess the overall impact of a change to a farm business then either a whole or partial farm budget would be required to assess the overall financial impact of not introducing the new enterprise for the business. These budgets would cover extra income, costs saved, lost income, and extra trading costs.

In comparing a whole or partial farm budget against the Case Studies presented, only the extra income and some of the extra trading costs have been taken account of in the assessments. No consideration has been taken of the extra trading fixed costs; and the lost income and costs saved from the enterprise displaced by setting up the alternative enterprise (i.e., the net margin of the displaced enterprise already using the land, labour capital of the farm). These are the limitations of the Case Studies, and must be borne in mind.

The Case Studies also focus solely on the economic impact for the farmer and do not take account of the broader economic, environmental, and societal impacts of establishing the enterprises illustrated. The environmental economics section sets out further information for consideration in terms of the broader impacts of the enterprises.

### A. Dairy Case Study

The average number of dairy cows on NI dairy farms in 2021 was 98. Using the Farm Business Data report gross margin<sup>52</sup> data the potential gross margin for a 98-cow dairy farm was calculated for different calving patterns at an average level of performance, with associated variation in seasonality of milk production.

<sup>50</sup> <https://www.daera-ni.gov.uk/publications/statistical-review-ni-agriculture-2007-onward>

<sup>51</sup> <https://www.daera-ni.gov.uk/publications/farm-business-data-2022>

<sup>52</sup> Gross margin of an enterprise is its enterprise output less its variable costs. It does not include fixed costs.

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At a farm level, not taking into account fixed costs which vary significantly from farm to farm, there is a potential range of gross margin per annum not realised from £103,880 to £125,734 if farms wanting to commence this typical level of dairy production were not able to obtain planning permission to do so. This equates to a gross margin per cow from £1060 to £1283 per annum.

### B. Beef Case Study - suckler cows

The average number of beef cows on NI farms in 2021 was 17. Using the Farm Business Data report gross margin data, the potential gross margin for a 17-cow beef farm in this category was calculated across a range of suckler cow production systems with calves sold and not finished for beef.

At a farm level, not taking into account fixed costs, there is a potential range of gross margin not realised from £170 to £1819 for lowland suckler cows and £1411 for hill suckler cows, if farms wishing to commence this typical level of suckler cow production were not able to obtain planning permission to do so. This equates to a gross margin per cow from £10 to £107.

### C. Beef Case Study - finishing beef cattle

As data are not available for the average number of animals in a beef finishing unit the data are presented on a per head basis for systems requiring winter housing.

At a farm level, not taking into account fixed costs, there is a potential range of gross margin not realised from -£81 to £235 per head for the range of types of finishing beef cattle systems, if farms wishing to commence this typical level of beef production were not able to obtain planning permission to do so.

### D. Poultry Case Study - laying hens

The average flock size for laying hens was 9438 in 2021. Using Farm Business Data report gross margin<sup>53</sup> data the potential gross margin was calculated for a 9438-laying hen flock in this category at a typical performance level, for both enriched colony and free range.

For enriched colony laying hens miscellaneous costs are included in the gross margin calculation and include electricity, water, insurance, repairs, maintenance, and sundries. Labour, rent and depreciation are not included in miscellaneous costs<sup>53</sup>. For free range laying hens, miscellaneous costs are comprised of electricity, water, insurance, repairs, maintenance, litter and sundries. Labour, rent and depreciation are not included in miscellaneous costs.<sup>53</sup>

At a farm level the potential gross margin not realised at the typical performance level is £32,750 for an average sized enriched colony laying unit and £66,537 for an average sized free range laying unit if farms wanting to commence these types of systems were not able to obtain planning permission to do so. The gross margin per bird was £3.47 for the enriched colony laying unit and £7.05 for the free-range laying unit.

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<sup>53</sup> <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Farm%20Business%20Data%202022.pdf>

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### **E. Poultry Case Study - broilers**

The average flock size for broilers was 53,693 in 2021. Using the Farm Business Data report margin data, the potential margin was calculated for a 53,693-hen broiler unit in this category at a typical performance level.

For broilers miscellaneous costs are included in the gross margin calculation and include litter, medication, electricity, gas, cleaning and washing, insurance, maintenance, repairs and sundries. Labour, rent and depreciation are not included.

At a farm level, not taking into account fixed costs, the potential margin not realised is £29,090 if a farm wishing to commence this typical level of broiler production were not able to obtain planning permission to do so. The margin per 1000 birds was £541.79.

### **F. Pig Case Study - a sow unit rearing and finishing pigs**

The average number of sows (including gilts) on pig farms in 2021 was 186. Using the Farm Business Data report gross margin data, the potential gross margin was calculated for a 186 sow unit in this category at a typical performance level.

At an enterprise level, not taking into account fixed costs, the potential margin not realised is £91,884 if a farm wishing to commence this typical level of pig production were not able to obtain planning permission to do so. The typical gross margin per sow (including gilts) was £494.

**Question 14. Do you have any comments, feedback, or evidence on the Farm Enterprise Case Studies presented?**

# 11. Farm Mitigation Measures Case Studies and Costs

## 11.1 Farm Case Study Mitigation Modelling

Results of Farm Case Study Modelling examining the impact of implementing a combination of reduction strategies on emissions at individual farm level are available in Annex C of the draft Ammonia Strategy consultation document, available at <https://www.daera-ni.gov.uk/consultations/draft-ammonia-strategy-northern-ireland-consultation> A summary of the results of the Farm Case Study modelling is given below.

### A. Dairy Mitigation Measures Case Studies Summary

Mitigations applied were: reduction in Crude Protein (CP) of concentrate feed (18% to 16%); increase in scraping frequency; move from slurry storage under house to outdoor covered storage; move from slurry spreading by splashplate to trailing shoe; Substitute use of straight urea fertiliser with stabilised urea fertiliser; increase Days Grazing from 186 to 200 (Only applicable for the Grazing/Housing Systems modelled).

A minimum of 42% reduction in ammonia emissions was observed in all scenarios. Zero grazing systems produce more ammonia, and mitigation measures resulted in a 57% drop in ammonia emissions. The expected milk yield for fully housed systems is higher, so per litre of milk the modelled zero grazing systems produce around 33% more ammonia emissions than the grazing/housing systems.

### B. Beef Mitigation Measures Case Studies Summary

Mitigations applied were: increase in Days Grazing by 14 days; installation of slat mats with scrapers (achieving c. up to 49% reduction); moving to trailing shoe slurry spreading from inverted Splashplate; replacing straight urea application with stabilised urea (except in Less Favoured Area scenario where no fertiliser application modelled). Reductions in total annual ammonia emissions across the scenarios ranged from 34-42%.

### C. Pig Mitigation Measures Case Studies Summary

Mitigations applied were: 5% improvement in Feed Conversion Ratio for an 11% reduction in N excretion; manure Storage: outdoor covered stores; slurry spreading via trailing shoe, associated with a 60% reduction in landspreading emissions.

Results showed that the mitigation strategies outlined reduce ammonia emissions for the sow (250 places) and weaner (1125 places) system described from 3.9 tonnes to 2.1 tonnes NH<sub>3</sub> per annum, a 45% reduction. The finishing pig (1500 places) system had a baseline of 8.1 tonnes NH<sub>3</sub> per annum which was reduced to 3.6 and 1.7 tonnes, reductions of 55% and 79% respectively, under the two different mitigation scenarios tested.

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Reduction in N excretion, by both a reduction in dietary CP and Feed Conversion Ratio improvement, are a powerful and cost-effective strategy for reducing NH<sub>3</sub> emissions from the manure management chain. Significant reductions are also achieved by end of line techniques such as slurry spreading by trailing shoe.

A move from under-slat slurry storage to outdoor covered stores achieves proportionally more reductions in the pig sector than in the cattle sector, due to the higher total ammonia nitrogen content of pig slurry, compared with cattle slurry, and the fact that pig slurry does not crust as readily as cattle slurry which often forms a crust and a natural barrier to a proportion of the NH<sub>3</sub> emission from storage.

### **D. Poultry Mitigation Measures Case Studies Summary**

Mitigations applied were: reducing N excretion by 12% by achieving a 5% improvement in the Feed Conversion Ratio; reducing N excretion a further 10%, achieved by reducing crude protein (CP) by 1%; in-house litter drying to increase litter dry matter (DM) associated with a 30% reduction in Emission Factor.

Results showed that the mitigation strategies applied achieved a 24-26% ammonia reduction across all scenarios. A 5% improvement in broiler Feed Conversion Rate, applied across broilers / layers in all scenarios and which would result in a 12% reduction in N excretion, is seen as a realistic prospect within c. 5 years.

Air scrubbers offer significant reduction potential (up to 90% reduction of housing emissions) for both pigs and poultry facilities but were not modelled as these are seen as cost-inhibitive. Scrubbers are most effective in mechanically ventilated accommodation and not as effective in free-range systems.

Unless incorporated rapidly into tilled land it is difficult to reduce emissions from the landspreading of poultry manure, making NH<sub>3</sub> reductions during landspreading on grassland inherently difficult. Other options may include acidification of poultry manure by aluminium sulphate (alum), as used in the USA, which may incur reductions of over 70% from storage and landspreading.

### **11.2 The Cost of Ammonia Mitigation Measures - Dairy Cattle**

A recent AFBI Horizon Scanning Study (unpublished) used the National Ammonia Reduction Strategy Evaluation System (NARSES) model to conduct ammonia emission modelling for a dairy farm with different nutrient management scenarios and technologies. Nitrogen flows were modelled and ammonia emissions estimated from a number of different farm management / nutrient management systems for dairy slurry, to estimate the partitioning of nitrogen through the various fractions / outputs that the systems produce and through the subsequent management and landspreading of these. The cost of the mitigation measures were determined for each of systems per kilogram of ammonia abated. Initial results from the Horizon Scanning Study are shown below for three systems.



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### System 1 - The Baseline Scenario.

The baseline scenario used for comparison was a 100 cow dairy herd in a fully confined system.

The modelling assumptions for this baseline were:

1. 110.8 kg N excretion per cow per annum (51% assumed to be Total Ammoniacal Nitrogen).
2. 1993 m<sup>3</sup> slurry produced per annum (54.59 kg per cow per day).
3. Fully enclosed system 365 days housed.
4. 50% of slurry stored under house, 50% in outdoor stores (not lagoon).
5. 100% of slurry assumed to be 4 - 6% DM.
6. 100% of slurry spread to grassland.
7. 100% of slurry spread by splashplate.
8. No N fertiliser emissions considered in scenarios.

Table 8 shows the ammonia loss figures for System 1, with a total of 3604 kg NH<sub>3</sub>-N lost per year.

*Table 8. System 1 - The Baseline Scenario - ammonia losses per year.*

	House	Store	Landspreading	Total
NH <sub>3</sub> Loss (kg-NH <sub>3</sub> -N)	1919	291	1394	3604

### System 2 - The Baseline Scenario plus on-farm mitigations.

The following mitigations were applied to System 1:

1. Reduced crude protein diet (20% reduction in TAN excretion).
2. Increased scraping frequency in house (20% NH<sub>3</sub> reduction in housing emission factor).
3. Covered slurry stores (80% reduction in NH<sub>3</sub> with fixed store cover, only applies to outdoor store, i.e. 50% of slurry).
4. All slurry spread by trailing hose (dribble bar) (30% NH<sub>3</sub> reduction over splashplate).

Table 9 shows the ammonia loss figures for System 2, with the total loss of NH<sub>3</sub>-N reduced from 3604 kg/year to 2295 kg per year, which is a 36% reduction (1309 kg reduction).

*Table 9. System 2 - The Baseline plus on-farm mitigations - ammonia losses per year.*

	House	Store	Landspreading	Total
NH <sub>3</sub> Loss (kg-NH <sub>3</sub> -N)	1254	146	895	2295

The modelled costs for System 2 ranged from £2.98 to £4.79 per kg per year for ammonia abated, giving **a total cost range for 100 cows of £3901 to £6269 per year for the 36% reduction**. The range in cost is due to potential economies of scale in larger units.

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### System 3 - The Baseline Scenario plus on-farm mitigations and in-house acidification.

The following additional mitigation measures were applied to System 2:

1. In-house slurry acidification system with an outdoor store where slurry pH is monitored and acid added to regulate to a target pH (5.5 - 6). Slurry is pumped from store through the under house tank and circulates back to the store (50% reduction in housing NH<sub>3</sub> emission factor assumed).
2. Covered slurry store (95% reduction in NH<sub>3</sub> with fixed store cover on acidified slurry assumed).
3. Acidified slurry spread by trailing hose (dribble bar) (60% NH<sub>3</sub> reduction over splashplate assumed).

Table 10 shows the ammonia loss figures for System 3, with the total loss of NH<sub>3</sub>-N reduced from 3604 kg/year in System 1 to 979 kg per year, a 73% reduction (2625 kg reduction).

*Table 10. System 2 - The Baseline plus on-farm mitigations - ammonia losses per year.*

	House	Store	Landspreading	Total
NH <sub>3</sub> Loss (kg-NH <sub>3</sub> -N)	470	89	420	979

The modelled costs for System 3 ranged from £4.58 to £8.32 per kg per year of ammonia abated, giving **a total cost range for 100 cows of £12,023 to £21,840 per year for the 73% reduction**. The range in the cost is due to potential economies of scale in larger units.

### 11.3 The Cost of Ammonia Mitigation Measures - Pigs and Poultry

Air scrubber in pig housing - The total cost of an air scrubber system in pig housing, for a system which exhausts air through one point, to be 'washed' with acidified water then forced through a biological filter, is estimated at £250,000 to £300,000 (depending on the size of the unit), with running costs of the system estimated at £2 to £3 per pig per year (CAFRE).

Slurry acidification in pig housing - the cost will depend on the type of acidification system used (in house or in field, and whether it is a new build or is retro-fitted into an existing house).

Air scrubber in broiler housing - The cost of air scrubbers for broiler houses is estimated to be approximately £150,000 per house with a 20% increase in running costs (DAERA).

**Question 15. Do you have any comments, feedback, or additional evidence on the Farm Mitigation Measures Case Studies and Costs presented?**

## **12. Environmental Economics**

### **12.1 Cost of restoration of habitats**

Habitat restoration costs are provided for peatland restoration as they are more readily available than for other habitats at present. The mean estimate of restoration cost per hectare for peatland was £1712 (median £1026) in a March 2022 update based on the Peatland Action Programme in Scotland<sup>54</sup>.

DAERA's current figures for peatland restoration anticipate an average cost of between £1000 to £2000 per ha but the potential range of cost is wide due to site-specific variations in the range and type of work needing to be completed.

A further cost to be taken into consideration is the additional costs to landowners arising if stocking rates are reduced or farming activities are required to change on areas of peatland restoration.

Habitat restoration measures will not be effective if levels of ammonia continue to be exceeded at sites requiring restoration. Other cross-cutting DAERA strategies in this area include the Peatland Strategy and Biodiversity Strategy.

### **12.2 Use of a damage costs approach**

A number of methods are currently available in the UK for air quality appraisal<sup>55</sup>. These include: the impact pathways approach (IPA); the damage costs approach (a set of monetary impact values per tonne of emission); and an activity costs approach (monetary value per KWh energy used).

The IPA is the best practice approach to valuing changes in air quality, using atmospheric modelling to estimate the impact of changes in the ambient concentrations of air pollutants for a range of outcomes. Completion of a full IPA is resource and time intensive, requiring estimates of emissions, dispersion, population exposure, and outcomes.

The Department for Environment, Food and Rural Affairs (Defra) have developed 'damage costs' to enable proportionate analysis when assessing relatively small impacts on air quality.

Damage costs are a set of impact values, measured per tonne of emission by pollutant, which are derived using the more detailed IPA. These values estimate the societal costs associated with small changes in pollutant emissions. They can be combined with emission change forecasts to provide an approximate valuation of the aggregate impacts of a policy. The IPA 2023 damage cost value (central estimate, 2022 prices) for ammonia is £9,667 per tonne.

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<sup>54</sup> [https://sefari.scot/sites/default/files/documents/Peat%20Cost%20Report%202022\\_Glenk%20et%20al.pdf](https://sefari.scot/sites/default/files/documents/Peat%20Cost%20Report%202022_Glenk%20et%20al.pdf)

<sup>55</sup> <https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance>

### 12.3 Cost-benefit analysis of agricultural ammonia emission abatement options for compliance with air quality regulations

A 2019 paper (Giannakis et al, 2019<sup>56</sup>) in the Environmental Sciences Europe Journal using cost-benefit analysis of ammonia emission abatement options indicated that the costs of compliance by the agricultural sector with the commitments of the European air quality regulations were “much lower” than the economic benefit. The study’s conclusion was that “monetisation of the health benefits of NH<sub>3</sub> emission abatement policies and the assessment of the implementation costs can help policy makers devise effective air pollution control programmes.”

**Question 16. Do you have any comments, feedback, or additional evidence on the environmental economics information presented?**

**Question 17. Final Question - Do you have any other comments, feedback, or additional evidence on the information presented in this Call for Evidence?**

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<sup>56</sup> <https://enveurope.springeropen.com/articles/10.1186/s12302-019-0275-0>

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### Annex A

**Table 11 - Comparison of air quality assessment guidance in UK and Ireland.**

*(The table has been populated using published guidance documents and discussions with the relevant bodies. Please note, the application of these approaches may vary in practice. Several of the approaches are currently under review.)*

	Applicable Sites	Zone of Influence for Designated Sites	Screening Threshold for proposal alone (% of CLe/CL)	In-combination Assessment and Plans/Projects Included	In-combination Threshold (% of CLe/CL)	Distance from Designated Site in which Detailed Modelling Automatically Required
<b>NI (DAERA) Current Operational Protocol (est.2012, Standing Advice 2017).</b>	All designated sites (SACs, SPAs, Ramsar sites, ASSIs).	7.5 km	1%	Includes other sources of 1% or above the background post Jan 2012.	10%	-
<b>Scotland (SEPA, 2018).</b>	All designated sites (SACs, SPAs, Ramsar sites, SSSIs).	10 km	4% using screening tool. >4% alone detailed assessment required	Includes other intensive agricultural sources.	20% (using screening tool). >20% IC detailed assessment required.	-
<b>Scotland (Nature Scot).</b>	All designated sites.	10 km	<4% using screening tool. <1% with detailed modelling and PEC<CLe/CL.	All other sources not within the existing background levels.	No IC threshold. Applying a case specific approach considering the current background levels.	-
<b>England (Environment Agency, 2018).</b>	SACs, SPAs, Ramsar sites.	5 km	4% using screening tool.	Includes other intensive agricultural sources.	20% using screening tool. >20% - no set criteria. Applying a case specific approach, based on whether there is headroom.	250m
	SSSIs.	5 km	20% using screening tool.	Includes other intensive agricultural sources.	50% using screening tool. >50% - no set criteria. Applying a case specific approach.	250m

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	Applicable Sites	Zone of Influence for Designated Sites	Screening Threshold for proposal alone (% of CLe/CL)	In-combination Assessment and Plans/Projects Included	In-combination Threshold (% of CLe/CL)	Distance from Designated Site in which Detailed Modelling Automatically Required
<b>England (Natural England).</b>	SACs, SPAs, Ramsar sites.	Up to 15 km depending on nature of development.	Typically applying 1% for all sources - but 1% is applied in-combination if project alone generates <1%.	All other sources.	No IC threshold. Typically applying a case specific approach.	-
<b>Wales (NRW, 2018).</b>	All designated sites (SACs, SPAs, Ramsar sites, SSSIs).	Different Zol for different proposals.	1%	All other sources.	If PC + Other Sources is above 1% of the CLe/CL, the PEC is taken into consideration. If PEC exceeds CLe/CL control measures considered to reduce emissions. If no control measures, refusal. If PC + Other Sources below 1%, screened out.	SCAIL can only be used where a development is >250m from a site.
<b>ROI (EPA, 2023).</b>	SACs, SPAs.	0.5 km or 10 km for 3 sites; Slieve Beagh SPA, Kilroosky Lough Cluster SAC & Lough Oughter SAC & SPA.	PC of $\leq 0.3\text{kgN/ha/yr}$ (does not apply for proposals within 10km of the 3 sites listed to the left). $\leq 4\%$ of CLe and $\leq 5\%$ of CL (screening); $\leq 1\%$ of CLe/CL (detailed assessment).	All below threshold installations within 5 km of European Site; all licensed installations within 10 km of European Site; all installations (EPA licensed and unlicensed) within 10 km of 3 sensitive sites.	20%	500m



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## Information Sources for Annex A Table 10

### 1. Northern Ireland

NIEA Standing Advice Note 19. Livestock Installations and Ammonia (June 2017): [standing advice 19 - livestock installations and ammonia - final - june 2017.pdf](#) (daera-ni.gov.uk) and *Supplementary Note* (updated Feb 2021): [PRT - Supplementary Note to Standing Advice on Livestock Installations and Ammonia - Feb 2021.DOCX](#)

### 2. Scotland

SEPA IED-NCP-P-02 *Guidance on the Assessment of Ammonia Emissions from PPC Intensive Agricultural Installations on Designated Conservation Sites* (Sept 2018): [Guidance on the assessment of ammonia emissions from PPC intensive agricultural installations](#) (sepa.org.uk)

Scottish Natural Heritage (now NatureScot) *Considering air pollution impacts in development management casework* (April 2017): <https://www.nature.scot/sites/default/files/2018-08/Guidance%20-%20Considering%20air%20pollution%20impacts%20in%20development%20management%20casework.pdf>

### 3. England

DEFRA & EA *Intensive farming risk assessment for your environmental permit* (updated May 2018): [Intensive farming risk assessment for your environmental permit - GOV.UK](#) (www.gov.uk)

*Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001 - Published, 2018)*: <https://publications.naturalengland.org.uk/publication/4720542048845824>

### 4. Wales

NRW Guidance Note 20: *Assessing the impact of ammonia and nitrogen on designated sites from new and expanding intensive livestock units. Technical guidance for determining environmental permit application or responding to planning application consultations* (Published Oct 2017, reviewed Dec 2018): [NRW Guidance Note 20](#)

### 5. Ireland

EPA *Assessment of the Impact of Ammonia and Nitrogen on Natura 2000 sites from Intensive Agriculture Installations* (March 2023): [Assessment-of-Impact-of--Ammonia-and-Nitrogen-on-Natura-sites-from-Intensive-Agriculture-Installations-2023.pdf](#) (epa.ie)

## **Freedom of Information (FoI), Confidentiality of Responses and Sharing of Information**

DAERA are unable to reply individually to the points you may raise as part of your reply. Your response, and all other responses to the consultation, may be disclosed on request. The Department can only refuse to disclose information in exceptional circumstances. Before you submit your response, please read the paragraphs below on the confidentiality of consultations and this will provide you with guidance on the legal position about any information submitted by you in response to this consultation.

Section 8(e) of the Data Protection Act 2018 permits processing of personal data when necessary for an activity that supports or promotes democratic engagement. Information provided by respondents to this stakeholder engagement exercise will be held and used for the purposes of the administration of this current exercise and subsequently disposed of in accordance with the provisions of the Data Protection Act 2018 and the General Data Protection Regulation. For more information and to view the DAERA Privacy Statement please go to: <https://www.daera-ni.gov.uk/publications/daera-privacy-statement-document>

The FOI Act gives the public a right of access to any information held by a public authority, namely, the Department in this case. This right of access to information includes information provided in response to a consultation. The Department cannot automatically consider as confidential, information supplied to it in response to a consultation. However, it does have the responsibility to decide whether any information provided by you in response to this consultation, including information about your identity should be made public or be treated as confidential. If you do not wish information about your identity to be made public, please include an explanation in your response including any harm you believe such a disclosure might cause.

This means that information provided by you in response to the consultation is unlikely to be treated as confidential, except in very particular circumstances. The Lord Chancellor's Code of Practice on the FOI Act provides that:

- The Department should only accept information from third parties in confidence if it is necessary to obtain that information in connection with the exercise of any of the Department's functions and it would not otherwise be provided;
- The Department should not agree to hold information received from third parties "in confidence" which is not confidential in nature, acceptance by the Department of confidentiality provisions must be for good reasons, capable of being justified to the Information Commissioner.

For further information about confidentiality of responses please contact the Information Commissioner's Office or visit the ICO Website.

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