



Licence Application Instruction Note 1 (IN1)

Assessing the Impact of Ammonia Emissions and Nitrogen Deposition from Intensive Agriculture Installations on European Sites

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1. INTRODUCTION

This Instruction Note is to assist applicants/licensees, within the intensive agriculture sector, in assessing the impact of ammonia emissions to air and nitrogen deposition (from NH_3 and NO_x) on European Site(s) when preparing licence/licence review applications.

European Site(s) also known as Natura 2000 Sites are a European network of important ecological sites. The EU Habitats Directive (92/43/EEC) placed an obligation on Member States of the EU to establish the Natura 2000 network. The network is made up of Special Protection Areas (SPAs), established under the EU Birds Directive (2009/147/EC), and Special Areas of Conservation (SACs), established under the Habitats Directive itself. The European Communities (Natural Habitats) Regulations, 2011 as amended transpose these EU Directives into Irish national law. More information on the European site(s) in Ireland can be found on the National Parks and Wildlife Service (NPWS) webpage at *www.npws.ie/protected-sites*.

An Appropriate Assessment (AA) is an assessment of the potential adverse effects of a plan or project (either alone or in combination with other plans or projects) on European site(s). Regulation 42 of the Habitats Regulations requires the Competent Authority to undertake screening for AA and where necessary AA of any plan or project for which an application/ review for consent is received. In relation to the licence applications which are the subject of this Instruction Note, it is the EPA that undertake the AA screening and where required undertake the AA.

Potential impacts at European site(s) from pig or poultry intensive agriculture installations (IAI) are ammonia emissions to air and associated nitrogen deposition. These installations by their nature, generate quantities of these pollutants which require assessment to demonstrate they will not impact on European site(s).

This Instruction Note and flowchart in Appendix 1 are designed to assist in determining the course of action to be taken when evaluating the impacts on European Site(s) of ammonia emissions to air and nitrogen deposition from intensive agriculture installations. Each of the questions set out later in this document must be addressed sequentially, in the order presented in the flowchart in Appendix 1.

This Instruction Note focuses on ammonia emissions and nitrogen deposition but the approach may also be applied to NO_x and SO₂ specifically in the context of AA.

1.1 FIRST STEPS

Before using the flowchart, the applicant/licensee will need site specific information available to them and may need to carry out air dispersion modelling on the air emissions from the installation. Air dispersion modelling should be conducted in accordance with the EPA "Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)" or similar guidelines from a recognised authority.

The information the applicant/licensee will need includes key pieces of information in relation to European site(s), their qualifying interests and conservation objectives as well as relevant critical loads/levels and background concentrations at the European site(s). The applicant/licensee shall identify all the European Site(s) within the zone of influence of the activity and their appropriate critical levels for ammonia and the critical loads for nitrogen deposition. On-line tools, namely Air Pollution Information Systems (<u>APIS</u>¹) or Simple Calculation of Atmospheric Impacts Limits (<u>SCAIL</u>²) should be used to identify the critical levels and critical loads for each qualifying interest habitat or species in each European Site included in the assessment. Both APIS and SCAIL contain the same data in relation to critical loads/levels. The National Parks and Wildlife Service (NPWS) are the responsible authority for setting critical levels and loads in Ireland and have been part

¹ The Air Pollution Information System (APIS) provides a searchable database and information on pollutants and their impacts on habitats and species.

² http://www.scail.ceh.ac.uk/

of the development of the APIS application in Ireland. In relation to critical loads for nitrogen deposition, these are usually given as a range of values, and the lowest figure in the range (i.e. the most conservative), for that habitat/species, must be used unless otherwise justified.

This instruction note shall be reviewed and updated where necessary.

2. DEFINITION OF TERMS

Term	Definition
Activity	Any process, development or operation specified in the First Schedule of EPA Act 1992 as amended, and carried out in an installation.
Appropriate Assessment	An appropriate assessment (AA) is an assessment of the potential effects of a plan or project (either alone or in combination with other plans or projects) in view of the conservation objectives of Special Areas of Conservation and Special Protection Areas (European Site(s)).
Background concentration	Existing ambient levels/loads, including contributions from operational activities, developments etc.
Best Available Techniques (BAT)	As set in Commission Implementing Decision (CID) Ref: 2017/302.
Critical Level for ammonia (Cle) expressed as µg/m³	Concentration of ammonia in the atmosphere above which direct adverse effects on receptors, such as plants and ecosystems may occur according to present knowledge.
Critical Load for nitrogen deposition (CLo) expressed as kg/ha/year	A quantitative estimate of exposure to nitrogen deposition below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge.
Development	Has the meaning assigned to it in the Planning and Development Act 2000 as amended.
Installation	A stationary technical unit or plant where the activity concerned referred to in the First Schedule of EPA Act 1992 as amended is or will be carried on, and shall be deemed to include any directly associated activity, which has a technical connection with the activity and is carried out on the site of the activity.
Natura Impact Statement (NIS)	A report prepared by the applicant comprising the scientific examination of a plan or project and the relevant European Site or European Site(s), to identify and characterise any possible implications of the plan or project individually or in combination with other plans or projects in view of the conservation objectives of the site or sites, and any further information including, but not limited to, any plans, maps or drawings, scientific information or data required to inform the Appropriate Assessment.
Process Contribution (PC)	Contribution of a substance from the installation to atmospheric levels/ deposition, modelled at a receptor location.
Predicted Environmental Contribution (PEC)	All relevant PCs in combination plus the background at a receptor location.
Intensive agriculture installations (IAI)	Intensive agriculture installations as licensed under 6.1 and 6.2 of the First Schedule of the Environmental Protection Agency Acts 1992 as amended.

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Term	Definition
Zone of Influence	The zone of influence of a development/activity is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site.
	The zone of influence should be established using the Source-Pathway- Receptor model and not by arbitrary distances; however, the following exceptions occur (see question 1 later in this document), the installation is located within:
	500 m of any European Site, or
	10 km of one or more of the following named European site(s):
	 Slieve Beagh Special Protection Area (SPA) (004167),
	 Kilroosky Lough Cluster Special Area of Conservation (SAC) (001786),
	 Lough Oughter designated as both a SAC (000007), or
	▼ Lough Oughter SPA (004049).
	Reference may also be made to published guidance on this topic from authorities in other European jurisdictions where relevant.

3. INSTRUCTIONS ON THE USE OF THIS INSTRUCTION NOTE TOOL

3.1 APPROPRIATE ASSESSMENT

An appropriate assessment (AA) is an assessment of the potential effects of a plan or project (either alone or in combination with other plans or projects) in view of the conservation objectives of Special Areas of Conservation and Special Protection Areas (European Site(s)).

As stated previously, the EPA is required to undertake Stage 1 Screening for AA and where necessary, a Stage 2 AA of any plan or project for which an application/review for consent is received. The applicant/licensee must provide the EPA with the required information, as outlined below, to allow the EPA to conduct the AA screening and any subsequent AA and draw its conclusions.

In Addition to APIS and SCAIL, an AA mapping tool, i.e. the AA GeoTool application, helps with the data gathering process of Stage 1 and Stage 2 Appropriate Assessment. The EPA and the National Parks and Wildlife Service (NPWS) have worked together to develop the AA GeoTool.

The AA GeoTool can be found at the following link:

https://gis.epa.ie/EPAMaps/AAGeoTool

Details on the use of this GeoTool can be found at the link below:

http://www.epa.ie/terminalfour/AppropAssess/index.jsp

Questions 1 and 2 in the flowchart in Appendix 1, are related to the AA screening stage determining whether Appropriate Assessment is required. These questions are intended to guide applicants/licensees and do not result in formal screening conclusions. A formal AA screening determination will be carried out by the EPA in view of best scientific knowledge and in view of the conservation objectives of the European site(s) when an application is received.

3.2 CONFIRMATION OF BACKGROUND AMMONIA LEVELS AND NITROGEN LOADS AT EUROPEAN SITE(S)

Background levels are existing ambient levels/loads, and include contributions from operational activities, developments etc. Background concentrations/levels (BC) for ammonia and nitrogen deposition at the European site(s) shall be obtained by the applicant/licensee, as stated previously, from APIS or SCAIL. Please note that when retrieving background data levels from APIS or SCAIL, that the datasets are from different jurisdictions (i.e. Ireland and Northern Ireland). Therefore, when assessing potential impacts at a European site within Northern Ireland, then the Northern Ireland dataset should be selected on APIS/SCAIL. This is done by switching the country selected from Ireland to Northern Ireland.

The applicant/licensee should note the date of the background data used when considering what operational plans and projects are already included in the background. If the applicant/licensee is proposing to use other site-specific background data, clear scientific justification must be provided.

Where background levels already exceed critical levels/loads at sensitive receptors within the zone of influence, detailed modelling of emissions, including in-combination effects, a Natura Impact Statement (NIS) and additional mitigation measures will be required.

On-site assessments of the sensitive receptor (e.g. at specific locations within a European site), to demonstrate impacts have not already occurred, may be required as part of the assessment process.

3.3 SCREENING DISTANCE

Where an IAI is within **500 m** of a European Site, an AA assessment using detailed modelling and a NIS is automatically required for that development. In the case of an IAI within 10 km of the Natura sites: Slieve Beagh Special Protection Area (SPA) (004167); Kilroosky Lough Cluster Special Area of Conservation (SAC) (001786); or Lough Oughter designated as both a SAC (000007) and a SPA (004049), a detailed assessment using detailed modelling which includes cumulative impacts, and a NIS is also automatically required.

3.4 IDENTIFYING SENSITIVE RECEPTORS (EUROPEAN SITE(S))

Applicants/licensees should conduct screening assessments using the most up-to-date information available on the distribution of gualifying interests at European site. At the screening stage, the most conservative values, assigned to the most sensitive habitat/species for each European Site should be used, unless otherwise justified. For example, where large European site(s) are being considered, the most sensitive habitat/species may be located significant distances from the installation, and this would need be explained.

Additional Information on these sites can be found at:

http://www.epa.ie/terminalfour/AppropAssess/index.jsp https://www.npws.ie/protected-sites https://www.daera-ni.gov.uk/landing-pages/protected-areas

3.5 SIMPLE SCREENING AGAINST CRITICAL LEVELS AND CRITICAL LOADS

Notwithstanding the scenarios already described, screening carried out at the pre-application stage will assist the applicant/licensee to determine whether detailed modelling is required in support of a licensing application/review. This basic assessment can be completed using the free on-line SCAIL tool using the conservative model mode.

Other screening models are available should applicants/licensees wish to use them.

3.6 ASSIGNING CRITICAL LEVELS AND CRITICAL LOADS

At all European Site(s), the appropriate ammonia critical level and nitrogen critical load should be determined. As stated, the on-line tools Air Pollution Information Systems (APIS³) or Simple Calculation of Atmospheric Impacts Limits (SCAIL⁴) should be used to identify the critical levels and critical loads for each gualifying interest habitat or species in each European Site included in the assessment.

Information on the conservation objectives for each site must be obtained from either:

https://www.npws.ie/protected-sites

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

https://www.rivm.nl/bibliotheek/rapporten/680359002.pdf

For ammonia critical levels where:

- Lichens and bryophytes (moss and liverworts) are integral to the sensitive receptor and/or are a qualifying interest for the site, apply a critical level of $1 \mu g/m^3$.
- Lichens and bryophytes are not a gualifying interest for the site or integral to the sensitive receptor then apply a critical level of $3 \mu g/m^3$.

³ The Air Pollution Information System (APIS) provides a searchable database and information on pollutants and their impacts on habitats and species.

⁴ http://www.scail.ceh.ac.uk/

Nitrogen critical loads are based on the sensitivity of each habitat and differ accordingly. Nitrogen critical loads are expressed as a range (e.g. 10 - 20 kgN/ha/yr). As stated, at screening stage, the most conservative values, assigned to the most sensitive habitat/species for each European Site should be used unless otherwise justified with reference to data obtained from the NPWS or the Department of Agriculture, Environment and Rural affairs (DAEAA) in Northern Ireland DAERA.

3.7 DETERMINING IMPACT FROM THE IAI TO BE UNDETECTABLE

Based on research, a nitrogen deposition level of ≤ 0.3 kgN/ha/annum is undetectable. This is considered in this screening process. If an IAI can demonstrate, using a screening model (with no mitigation measures considered), (see Section 3.8 below), that emissions from the site meet this criterion, in addition to the PC from the installation being ≤ 4 % of the critical level for ammonia and ≤ 5 % of the critical load for nitrogen deposition, then the European site may be screened out for AA. This does not apply IAI within 10 km of the Natura sites: Slieve Beagh SPA, Kilroosky Lough Cluster SAC and Lough Oughter SAC & SPA.

3.8 DATA REQUIRED WITH YOUR APPLICATION/REVIEW DOCUMENTS

When using a screening model, such as SCAIL Agriculture, the applicant/licensee must ensure that for AA stage 1 (AA screening) submission to the EPA, the fan speeds at the discharge point(s) are set to zero and discharge height (for the discharge point(s)) are set to roof height in the model input parameters. This is to ensure mitigation measures are not considered during the AA screening process. When submitting the results of the screening model, the applicant/ licensee will need to include the following information with their licence application/review:

Screening Model Input data:

- flow velocity, (confirm it has been set to zero),
- fan diameter,
- number of animal units in assessment i.e. animal numbers,
- type(s) of animal housed in the installation,
- number of houses associated with each type of animal, where applicable,
- roof height, (confirm stack height not used),
- size & capacity of site manure store(s) or slurry tank(s), if applicable, and
- screen shots of the SCAIL input and output data or SCAIL input and output files.

If detailed modelling is conducted, information submitted in the modelling report should be sufficiently detailed to allow the regulator to determine whether the modelling has been undertaken in accordance with Air Dispersion Modelling from Industrial Installations Guidance Note (AG4). It should also be sufficiently detailed that an independent model user could replicate the modelling based on the information contained in the modelling report (and associated computer files).

3.9 OTHER SOURCES WHICH MAY ACT IN-COMBINATION WITH THE **APPLICATION/REVIEW INSTALLATION**

In the context of Question 5 the applicant/licensee must consider in-combination effects. In doing so they must consider site specific factors such as the location of the installation with regard to proximity to European Site(s) and other sources of ammonia and nitrogen. Caution is needed to avoid an overly conservative approach here when estimating the combined effects which arise from spatially discrete sources, attention needs to be paid to sources where the impact footprints are overlapping with the installation i.e. the in-combination assessment can be geographically constrained. Specific considerations include:

- sources and type/quantity of air emissions which may have in-combination effects, at the European Site(s), and
- sensitivity of the particular European Site(s) within the zone of influence and the particular vulnerability of the habitats/species within.

At the relevant European site(s), all IAIs, which meet the following criteria (in SCAIL) and which (with abatement in place), have a PC of \geq 4 % of the critical level for ammonia and/or \geq 5 % of the critical load for nitrogen deposition at the relevant European Site(s) must be included:

- (i) developments/activities that are not yet operational or developments/activities that are not included in the background concentration, including both those above and below licensing thresholds (i.e. operational/expanded after the date of collection/modelling of the background data), and
- (ii) developments/activities that have planning permission and/or licences but are not yet (fully) operating; including those both above and below licensing thresholds that may contribute to ammonia and/or nitrogen emissions.

The criteria to use to determine the geographical range of the installations, which meet the above criteria, to include in the in-combination assessment, is outlined below (See Figure 1).

- All below threshold developments/activities within 5 km of the European Site, [Blue lines on Figure 1].
- All licensed developments/activities within 10 km of the European Site [Red lines on Figure 1].
- In the case of the IAI within 10 km of any of the following European Site(s); Slieve Beagh SPA, Kilroosky Lough Cluster SAC or Lough Oughter SAC & SPA, the in-combination assessment shall include all developments/activities (EPA licensed and unlicensed) within 10 km of the Natura site.
- A clear justification of what PCs from other plans and projects are included or excluded shall be provided by the applicant/licensee.

Figure 1: Example of the range of IAI to be include in the in-combination assessment (illustration only, not to scale for location shown).



3.10 DEMONSTRATE THAT THERE WILL BE NO ADVERSE EFFECT TO SITE INTEGRITY

Where AA is required, consent can only be granted if it is possible to ascertain that the activity will not have an adverse effect on the integrity of European site(s) in view of the sites' conservation objectives.

In answering this question, the applicant/licensee will need to consider a range of factors specific to their circumstances including for example:

- the conservation objectives of the relevant European site(s),
- background pollution levels at the relevant European site(s),
- spatial scale and duration of predicted impact and ecological functioning of the affected area,
- site survey information, and
- any national, regional or local initiatives/trends which might be relied upon to reduce background levels at the European site(s).

All relevant National and European guidance on Appropriate Assessment should be consulted by the applicant/licensee. Specifically in respect of an assessment of air pollution impacts, the English nature conservation body (Natural England) has provided <u>guidance in respect of</u> <u>assessing air quality impacts in England in respect of road emissions</u>. Whilst not dealing with road emissions here, certain sections of Natural England's guidance are transferable to other air pollution sources so is referenced here by way of example.

If the BC of ammonia levels or nitrogen deposition already exceeds the critical level or critical load at a European Site within the zone of influence of the installation, no additional emissions that represents a risk of an adverse effect on the integrity of the European Site can be authorised. The applicant may wish to contact the EPA to discuss the details of the proposed application at a preapplication meeting at this stage.

Where an existing installation already contributes to an exceedance of the relevant critical level/ load, it will be necessary to demonstrate that a net reduction in emissions, will be achieved, to conclude that there will be no adverse effect on the integrity of the site.

THE ASSESSMENT PROCESS 4.

The applicant/licensee should answer the following questions in sequence. (Flow diagram, Appendix 1)

Question 1

- 1. Is my site within 500 m of a European site?
- 2. Are the background levels already exceeded for the ammonia critical level or nitrogen critical load at European site(s) within the zone of influence of my site (as reported by APIS/SCAIL)?
- Is my site within 10 km of Slieve Beagh SPA, Kilroosky Lough Cluster SAC, or Lough Oughter 3. SPA & SAC?

IF ANSWER IS	
Yes, to question 1	Proceed to Question 4.
Yes, to question 2	Proceed to Question 5.
Yes, to question 3	Proceed to Question 6.
No, to all questions	Proceed to Question 2.



Question 2

Using SCAIL Agriculture in conservative mode with ventilation fans set to zero and the full (existing & proposed) animal numbers onsite, obtain the following data:

- Is the impact from the installation (PC), at all Natura sites within the zone of influence of my site, ≤0.3 kgN/ha/annum for nitrogen deposition?
- Is the PC from the intensive agriculture unit ≤ 4 % of the critical level for ammonia and ≤ 5 % of the critical load for nitrogen deposition at all Natura sites within the zone of influence of my site?

IF ANSWER IS	
Yes, to all questions	Application/review potentially screened out for AA (in relation to air emissions only) and can be submitted to the Agency for assessment.
No, to either question	Proceed to Question 3



Question 3 – Appropriate Assessment (NIS) Required

At this point, a full AA is required including the assessment of effects on the integrity of a European site. A more detailed air dispersion modelling assessment is required in conjunction with producing a NIS.

Using SCAIL in conservative model with fan rate and stack height included, answer the following questions:

- ✓ is the impact from the installation (PC), at the Natura site is ≤ 0.3 kgN/ha/annum for nitrogen deposition? and
- ✓ is the PC from the intensive agriculture unit \leq 4 % of the critical level for ammonia and \leq 5 % of the critical load for nitrogen deposition?

IF ANSWER IS	
Yes, to both questions	The application/review may be determined and should be submitted (along with a NIS) to the EPA for assessment.
No, to either question	Proceed to Question 4.



Question 4

The applicant/licensee is required to complete detailed modelling and a NIS. Air dispersion modelling should be conducted in accordance with the EPA's guidance "Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)" or similar guidelines from a recognised authority.

Following completion of the NIS and modelling, the results can again be assessed using the criteria below.

Thresholds: Is the process contribution (PC)

- \checkmark ≤ 1 % of the critical level for ammonia?
- $\leq 1\%$ of the critical load for nitrogen deposition?

IF ANSWER IS	
Yes, to both questions	The application/review may be determined and should be submitted (along with a NIS) to the EPA for assessment.
No, to either question	Proceed to Question 5.



Question 5

At this stage the modelling must take account of effects which might arise in-combination with other plans and projects in addition to the background concentration (BC) to obtain a worstcase Predicted Environmental Concentration (PEC) at appropriate locations within each of the European Site(s) within the zone of influence. Air dispersion modelling should be conducted in accordance with the EPA's guidance "Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)" or similar guidelines from a recognised authority.

A clear justification of what is included and excluded in PCs from other plans and projects shall be provided by the applicant/licensee.

Thresholds: Is the PEC = [PC + Sum of PCs from other plans and projects + BC] less than the critical level, critical load the European site(s)?

IF ANSWER IS	
Yes	Submit assessment with application/review to EPA for consideration.
Νο	Proceed to Question 6.



Question 6

If the BC of ammonia levels or nitrogen deposition already exceeds the critical level or critical load at a European Site within the zone of influence of the installation, no additional emissions that represents a risk of an adverse effect on the integrity of the European Site can be authorised.

Are control measures available which:

Demonstrate that there will be no adverse effect on the integrity the European Site(s) and 1. demonstrate that there will be no damage to the qualifying interest(s) of the European Site(s).

or

Where an existing installation already contributes to an exceedance of the relevant critical 2. level/load, it will be necessary to demonstrate a net reduction in emissions, will be achieved in order to conclude that there will be no adverse effect on the integrity of the site.

IF ANSWER IS	
Yes, to any question	Assessments will be made on a case-by-case basis by the EPA considering all the material presented.
No, to any questions	The application/review may potentially be refused when all avenues to reduce the contributions are exhausted, and it cannot be shown that damage to the sensitive receptors will not occur*.

*Where a plan or a project is deemed to have an adverse effect on the integrity of a European site and no alternative solutions are available, the plan or project can only then proceed on the grounds of Imperative Reasons of Overriding Public Interest (IROPI). Refer to Article 6(4) of the EU Habitats Directive (92/43/EEC).

APPENDIX 1. FLOWCHART





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