

Summary of Shropshire Council guidance notes on assessing the impact of ammonia and nitrogen on designated sites and Natural Assets from new and expanding livestock units (LSUs).

In April 2018 Shropshire Council issued an interim guidance note of 27 pages, assessing the impact of ammonia and nitrogen on designated sites and Natural Assets from new and expanding livestock units. (*SC Interim Guidance Note GN2. This is turn was based on Natural Resources Wales Guidance Note GN020*).

The document explains how to assess the impact of ammonia emissions and nitrogen deposition.

Included in the guidance notes is a lengthy validation checklist which must be submitted with a planning application to allow the LPA to consider noise and odour impact on local people.

(The report defines 'Sensitive Receptors' as Special Areas of Conservation (SAC'S), Special Protection Areas (SPA'S), Ramsar Sites, Site of Special Scientific Interest (SSSI'S), National Assets such as Local nature reserves(LNR'S) Priority habitats and ancient woodland.)

Screening Distances: planning applications for new livestock units (LSUs) or variations to existing LSUs situated between 250m and 5Km from a sensitive receptor will require a detailed assessment. Proposed livestock units do not need detailed assessment for their planning application to be determined if they meet one of the following criteria:

- The proposed LSU is more than 5Km away from an international or national designated site, or 2km from a Natural Asset;
- the Process Contribution (cumulative nitrogen or ammonia emissions) from the LSU, in combination with PCs of other projects or plans, is less than 1% of the critical load or critical level for sensitive receptors identified within that radius.

In the guidance notes there is an assessment procedure flow diagram to follow. (See below).

When assessing potential impact on ecological receptors, ammonia concentration is usually expressed in terms of micrograms of ammonia per metre cubed of air ($\mu\text{g-NH}_3/\text{m}^3$) as an annual mean. Ammonia in the air may exert direct effects on the vegetation, or indirectly affect the ecosystem through deposition which causes both hyper-eutrophication (excess nitrogen enrichment) and acidification of soils. Nitrogen deposition is usually expressed in kilograms of nitrogen per hectare per year ($\text{kg-N}/\text{ha}/\text{y}$). Acid deposition is expressed in terms of kilograms equivalent (of H^+ ions) per hectare per year ($\text{keq}/\text{ha}/\text{y}$).

Critical Levels and Critical Loads are a benchmark for assessing the risk of air pollution impacts to ecosystems. It is important to distinguish between a Critical Level and a Critical Load. The Critical Level is

the gaseous concentration of a pollutant in the air, whereas the Critical Load relates to the quantity of pollutant deposited from air to the ground.

Critical Levels are defined as, "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". (UNECE)*

Critical Loads are defined as, "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". (UNECE)*

For ammonia concentration in air, the Critical Level for higher plants is 3.0 $\mu\text{g-NH}_3/\text{m}^3$ as an annual mean. For sites where there are sensitive lichens and bryophytes present, or where lichens and bryophytes are an integral part of the ecosystem, the Critical Level is 1.0 $\mu\text{g-NH}_3/\text{m}^3$ as an annual mean.

I have been informed by Mike Kelly Shropshire ANOB that Shropshire have modelled ammonia deposition and conclude that many Shropshire SSSI's and Ancient Woodlands now exceed the Critical Load for Ammonia. In some cases this is up to 4 times the acceptable load required to maintain ecosystem integrity. I understand this modelling only considers the loads from poultry sheds and does not take into account ammonia from poultry litter spread to land. To assess impact there would need to be a separate study, but it is undoubtedly adding to overall load.

There are various approved models available to download which can be used to calculate the levels of ammonia and nitrogen.

Taking the above guidance note I assume that the moratorium on poultry farms has been removed.

Bill Ware

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* UN Economic Commission for Europe