

# Appendix 16-3: Proposed Approach to Modelling Impacts on Ecological Receptors

## Calderdale Windfarm

PEIR Volume 3

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Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Reg 5 (2) (a).

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## A16 Appendix 16-3: Proposed Approach to Modelling Impacts on Ecological Receptors

### Road Traffic

- A16.1 The road traffic impacts upon ecological receptors will be considered using the same model approach as described for human receptors. Concentrations of NO<sub>x</sub> and ammonia, and nitrogen and acid deposition fluxes will be predicted for baseline and future year scenarios, taking into account the impacts in-combination with other plans and projects.
- A16.2 Background concentrations of NO<sub>x</sub> and NH<sub>3</sub>, and nitrogen and acid nitrogen deposition fluxes, have been taken from APIS<sup>1</sup>. The concentrations and deposition fluxes represent 1km x 1km averages. APIS currently presents 3-year mean values centred on the calendar year of 2021 and these have been taken to represent conditions in 2023.
- A16.3 Concentrations of NH<sub>3</sub> and deposition fluxes have been adjusted to represent the future using the rate of change predicted for this area using the Business-as-Usual assumptions of the Joint Nature Conservation Committees (JNCC's) Nitrogen Futures project<sup>2</sup>. Concentrations of NO<sub>x</sub> in 2029 have been predicted by multiplying the 2021 concentration taken from APIS by the relative change to concentrations (between 2021 and 2029) for each location predicted in Defra's latest (2021-based) national NO<sub>x</sub> maps published for Local Air Quality Management<sup>3</sup>. Background concentrations of nitrogen dioxide (NO<sub>2</sub>) are only needed to inform the conversion of NO<sub>x</sub> to NO<sub>2</sub>. These have been taken directly from Defra's maps for each relevant year.
- A16.4 Ammonia emissions will be calculated using AQC's Calculator for Road Emissions of Ammonia (CREAM) (v2A)<sup>4</sup>. Details of the model inputs and the model verification will be provided in the ES, along with the method for calculating deposition fluxes from the predicted concentrations of nitrogen dioxide and NH<sub>3</sub>.

### NRMM

- A16.5 The impacts of emissions from NRMM and any generators will be modelled using the ADMS-6 dispersion model. The air quality modelling will be carried out based

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<sup>1</sup> APIS (2025) APIS, [Online], Available: <http://www.apis.ac.uk/>.

<sup>2</sup> JNCC (2020) Nitrogen Futures <https://jncc.gov.uk/our-work/nitrogen-futures/>

<sup>3</sup> Defra (2025) *Local Air Quality Management (LAQM) Support Website*, [Online], Available: <http://laqm.defra.gov.uk/>.

<sup>4</sup> AQC (2025) Development of CREAM Emissions Model Version 2A <https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=ec071bfa-8d88-47a3-969e-874ab8f2f653>

on a number of necessary assumptions; where possible a realistic worst-case approach will be adopted. Depending on the level of detail available within the design, assumptions may need to be made about the number, capacity, and operational hours of proposed back-up generators. All assumptions will be identified in the ES. Deposition fluxes will be calculated from the predicted concentrations.

### Combined Impacts

- A16.6 The predicted NO<sub>x</sub> and ammonia concentrations as a result of emissions from road traffic and NRMM will be combined with background concentrations and used to calculate nitrogen and acid deposition fluxes. These results will be compared with Critical Loads and Levels presented in Error! Reference source not found. and Error! Reference source not found., and significance criteria published by Natural England.

