Notification on the reissuing of 2022 and 2023 ALPHA® data in the UK National Ammonia Monitoring Network (June 2025)

The following statement is issued to notify NAMN data users of a reissuing of the concentration for the years 2022 and 2023 for this method.

The Adapted Low-Cost Passive High Absorption sampler (ALPHA ®) is deployed at 94 sites within the National Ammonia Monitoring Network (NAMN), with the purpose of measuring the spatial concentrations of ammonia (NH_3) in the UK and to monitor long-term trends.

Background information

The ALPHA® method is calibrated by determining the rate of air sampling by the ALPHA sampler, referred to as uptake rate, as set out in the standard EN17346:2020 "Ambient air - Standard method for the determination of the concentration of ammonia (NH3) using diffusive samplers" (CEN, 2020). The reference method for this calibration is the active sampler called the DEnuder for Long Term Atmospheric sampling (DELTA®) and is determined by co-locating both ALPHA and DELTA at 9 sites within NAMN.

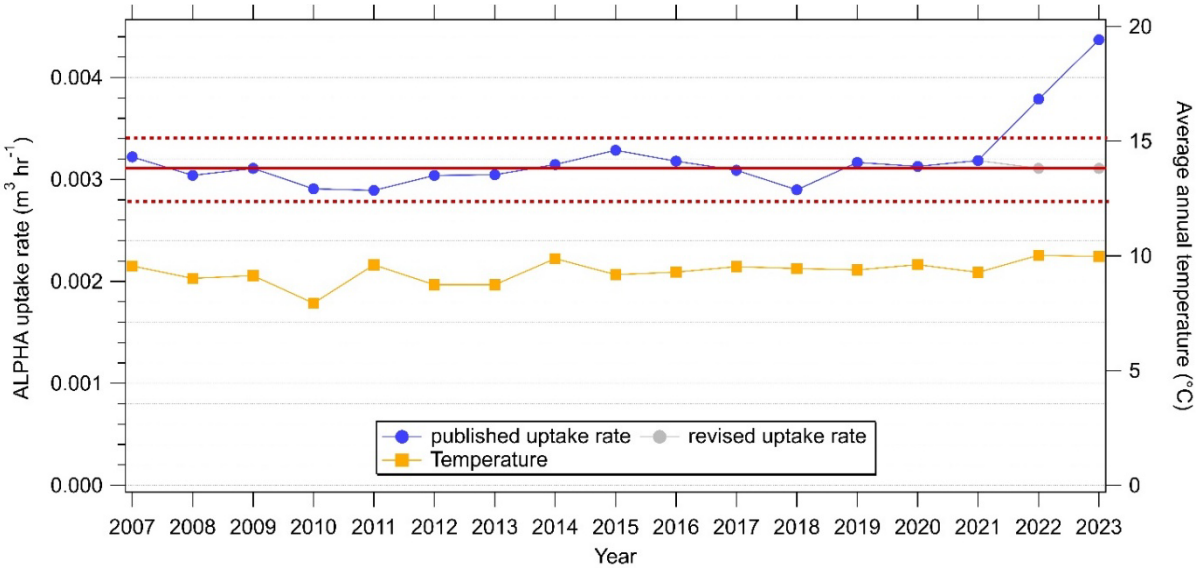

Figure 1: Uptake rate with additional of calculated quality control limits for 2022/23. The solid red line is the average, and the dashed lines are the calculated upper and lower limits ±3 σ based on the annual uptake rate for the period 2016 to 2021.

As outlined in the UKEAP annual report 2023 (Twigg et al. 2024), a step change in the uptake rate for years 2022 and 2023 had been noted for the ALPHAs in NAMN (refer to blue line in Figure 1). When compared to historical trends it found the 2 years were higher than the reported range of previous years. The higher uptake rate applied results in lower NH_3 concentrations to be reported. As such UKCEH undertook a study to investigate this reported increase in uptake rate.

Withdrawal and reissuing of ALPHA data in NAMN for years 2022 and 2023.

Following an extensive review by UKCEH it was concluded that the ALPHA calibration against the DELTA was less reliable in 2022 and 2023 compared with historical years. Though it was not possible to account for all the change in the calibration; both the lower data capture from the DELTA and reduction in performance of the DELTA system were identified as contributing factors.

As such it was determined that the NAMN ALPHA data should be reissued for the years 2022 and 2023, using the average uptake rate determined for the period 2016 – 2021, due to the stability and consistency between years (refer to grey line in Figure 1 and Table 1 for details of published and reissued uptake rate).

Table 1 Comparison of published and revised uptake rates for the years 2022 and 2023

Year	Published uptake rate $m^3\ hr^{-1}$ (NAMN version 1)	Revised uptake rate $m^3\ hr^{-1}$ (NAMN version 2)
2022	0.0037884	0.003108
2023	0.0043698	0.003108

References

CEN: EN 17346 Ambient air – Standard method for the determination of the concentration of ammonia using diffusive samplers, European Committee for Standardization, Brussels, https://www.en-standard.eu/dinen-17346-ambient-air-standard-method-for-the-determinationof-the-concentration-of-ammonia-using-diffusive-samplers/ (last access: 1 March 2022), 2020

Twigg, M.M. ; Braban, C.F. ; Stephens, A.C.M.; Espina Martin. P.; Leeson, S.R.; Jones, M.R.; Simmons, I.; Harvey, D.; Yeung, K.; van Dijk, N.; Iwanicka, A.; Duarte, F. ; Nemitz, E. ; Leaver, D.; Andrews, C. ; Thacker, S.; Keenan, P.O.; Dos Santos Pereira, M.G. ; Guyatt, H.; Hunt, A.; Salisbury, E.; Chetiu, N.; Grant, H.; Warwick, A.; Rylett, D.; Teagle, S.; Lord, W.; Bannister, G.; Sutton, M.A. ; Conolly, C.; Vincent, K.; Sanocka, A.; Ritchie, S.; Knight, D.; Donovan, B.; Jackson, T.; Dyer, M; Osborne, E.. 2023 UK Eutrophying and Acidifying Atmospheric Pollutants (UKEAP) Annual Report 2023. Didcot, UK, Defra, 128pp. (UKCEH Project no. 07709)

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