

Fragrance, Fluctuations, Facts Or Fantasy – The Use, Abuse And Disuse Of Extreme Statistics In Odour Evaluations

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EXECUTIVE SUMMARY

Odour science is exasperatingly incomplete but rapidly evolving, yielding problems for integration with environmental management techniques. Odour risk management involves both deterministic and statistical features evaluated over a wide range of space and time scales. Detection and recognition occur within seconds; transparent and transferable models must therefore include emission and dispersion variability. Discomfort measures (e.g. annoyance, health impacts) involve the repeated interaction of physical measures with a social network and are influenced by both past history and social dependencies. Incorporation of these features and their quantification should emphasise stable and meaningful measures for odour response within a given type of community.

INTRODUCTION

Annoyance in the context of odour or noise pollution can be defined as “a feeling of displeasure associated with any agent or condition, known or believed by an individual or group to adversely affect them” (Koelega 1987). Other negative emotions associated with environmental stressors include anger, disappointment, dissatisfaction, withdrawal, helplessness, depression, anxiety, agitation or exhaustion (WHO 1999). Complaints registers may therefore not give a good indication of the effects of stressors on a given community when these more elusive indicators are not quantified.

Odour annoyance in communities depends on both the physical conditions for each source, dispersing medium and receptor and the nature of the social network of observers (e.g. personal sensitivity, the overall connectivity within the community and between potential complainants and supervisor of the annoyance producing sources). The conventional view of odour impact assessment in Australia (see Figure 4 of Cesca et al (2003)) has only minor attention being paid to community characteristics (e.g. population, land use and community expectations).

The recent British technical review of community response to odorous emissions (Environment Agency 2002) notes that a nuisance potential should be a function of emission characteristics, exposure, nuisance sensitivity and context. Nuisance sensitivity includes factors such as age, satisfaction with residential environment, coping strategy, perceived health risks of the odour source, prevalence of health complaints, economic conditions and economic relationships with the odorous activity. Context includes the presence of other sources and the contrast of odour quality with that of the background. Odour impact assessments are recommended to include both the “hard”, quantitative aspects (e.g. concentration criteria conditioned by annoyance potential) and “soft”, semi-empirical factors (e.g. nuisance sensitivity, context, general societal benefits/risks) rated qualitatively and weighted according to local regulators and community/industry