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Odour Assessments

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Introduction

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It should be noted that the paper focuses on assessments conducted at local authority level for non-licensed sites. Odour assessments at licensed sites (e.g. under Pollution Prevention and Control legislation) are carried out by the respective environmental agencies from the different jurisdictions.[1] And while, this paper does not consider assessments carried out by the respective regulatory agencies, it does make reference to guidance documents produced by the agencies which may be used and referred to by local authorities.

The paper is based on publicly available information, and therefore should not be considered as definitive due to internal process and details that may not be publicly published across the jurisdictions.

1 Local Authority odour assessments and sniff tests

This section uses information that is publicly available in relation to local authority odour assessments across jurisdictions. Information is taken from respective pieces of legislation (as detailed in Table 1), as well as information and guidance such as:

- England: Nuisance smells: how councils deal with complaints - GOV.UK and Environment Agency (2011) H4 Odour Management How to comply with your environmental permit[2].
- Wales: Odour and Dust Nuisance
- Scotland: Odour | Scottish Environment Protection Agency (SEPA) and SEPA Odour guidance 2025 and ANNEX 2: Guidance on Odour Assessment and Complaint Investigation - Olfactory Screening ('Sniff-

[1] Environment Agency (EA) , Natural Resources Wales (NRW), Scottish Environmental Protection Agency (SEPA) and the Environmental Protection Agency (EPA).

[2] DAERA also makes reference to this document on its website: Odour management (H4) | Department of Agriculture, Environment and Rural Affairs.

testing') - Assessment and control of odour nuisance from waste water treatment: code of practice - gov.scot

- Ireland - Odour Emissions Guidance Note (Air Guidance Note AG9) | Environmental Protection Agency and EPA Issues Guidance on Odour | Environet Solutions

A summary of the approaches used by local authorities in England, Wales, Scotland and Ireland are provided in Table 1.

Table 1: Comparison of odour assessment methods across jurisdictions

Aspect	England & Wales	Scotland	Ireland
Legal basis	Statutory nuisance under Part III Environmental Protection Act 1990[3]. Powers given to local authorities. EA for industrial odours under Pollution Prevention Control permits.	Part III Evironmental Protection Act 1990[4] as amended by Part 9 of the Public Health etc (Scotland) Act 2008.[5] Powers given to local authorities SEPA for major industrial odours under PCC[6].	S. 24-27 Air Pollution Act 1987 for non- licensed sites. Powers to local authorities. EPA for major industrial odours[7].
Trigger	Complaint-led.	Complaint-led[9] Complainent may be asked to keep a	Complaint-led

[3] Nuisance smells: how councils deal with complaints - GOV.UK

[4] Odour | Scottish Environment Protection Agency (SEPA)

[5] Guidance to Accompany the Statutory Nuisance Provisions of the Public Health etc (Scotland) Act 2008 (p.1) and SPICe (2024) Nuisance complaints - some frequently asked questions (p.32).

[6] sepa-odour-guidance-2025.docx (p.8)

[7] AG5-2021.pdf

[9] sepa-odour-guidance-2025.docx (p.8)

	Complainant may be asked to keep smell/odour diary.[8]	smell/odour diary.[10]	Complainant may be asked to keep a log[11].
Sniff tests	This is the standard approach used by local authority officer site visits.[12]	Standard approaches used by local authority officer.[13]	Most common approach used for statutory nuisance[14].
Enforcement	Abatement notice as a statutory nuisance by local authorities.	Abatement notice as a statutory nuisance by local authorities.	Abatement under Air Pollution Act by local authorities.

[8] England: Nuisance smells: how councils deal with complaints - GOV.UK Wales: Odour and Dust Nuisance

[10] ANNEX 2: Guidance on Odour Assessment and Complaint Investigation - Olfactory Screening ('Sniff-testing') - Assessment and control of odour nuisance from waste water treatment: code of practice - gov.scot (s.8 step 7)

[11] Odour Control - Kildare County Council

[12] England: Nuisance smells: how councils deal with complaints - GOV.UK Wales: Odour and Dust Nuisance

[13] ANNEX 2: Guidance on Odour Assessment and Complaint Investigation - Olfactory Screening ('Sniff-testing') - Assessment and control of odour nuisance from waste water treatment: code of practice - gov.scot (s.8 step 6)

[14]EPA Air Guidance Note 5 AG5-2021.pdf (p.5).

In summary:

- Statutory nuisance is the main legislative tool used for non-licensed sites and odour (Ireland uses air pollution law).
- Jurisdictions explored rely on public complaints. There does not appear to be routine odour monitoring, other than requirements for local authorities to inspect their area from time to time for statutory nuisances, as stated in Scottish guidance[15].
- Complainants may be asked to keep smell diaries recording their perception of the smell and the effect it has on them[16].
- Officer visits and sniff testing are the standard tool used for odour assessment by local authorities. See the blue information box on the approach used by DEFRA as an example.
- Odours from larger Pollution Prevention Controlled (PPC) licensed sites are assessed by the respective regulating body/agency, who will conduct more scientific/lab-based assessments, including diffusion modelling (as detailed in s.2 and s.3 of the paper).
- Enforcement by local authorities is conducted through abatement as a statutory nuisance (E&W, Scotland) and air pollution legislation (Ireland).

[15] sepa-odour-guidance-2025.docx p.8

[16] Nuisance smells: how councils deal with complaints - GOV.UK

How nuisance smells are assessed – DEFRA

According to DEFRA guidance local authorities may consider one or more of the following:

- where the smell is coming from
- the character of the area
- the number of people affected nearby
- if the smell interferes with the quality of life of people nearby (for example, if they avoid using their gardens)
- how often the smell is present
- the characteristics of the smell

Councils usually use at least two human 'sniffers' to work out:

- the strength of the smell
- how often it's detectable and for how long
- when it's recognisable
- its offensiveness
- its character (using descriptions like 'fruity' or 'fishy')
- the emission rate

Wind direction and weather conditions should be taken into account as this can cause variations in smells.

Councils can also ask people to keep smell diaries, recording their perception of the smell and the effect it has on them.

2 Technologies

The following section considers different technologies and techniques used in relation to odour assessments. The examples provided are in no way definitive, and purely aim to provide a sense of the types that are available.

According to the Institute of Air Quality Management (IAQM 2018), because the various assessment tools have different applications, strengths and limitations, they can often be used in combination[17].

2.1 Olfactometry

Olfactometry is the measurement of odour concentration using human panels and specialised equipment. It appears to be the main quantitative method for assessing odour, particularly from industrial sources, as assessed by the respective regulatory agencies across the UK and Ireland.

As described in the next sections, the core technique used in the UK is dynamic olfactometry which uses human sniffers and a lab olfactometer. However, there has been demand for more objective analytical methods which has encouraged the development of more sensor-based machine olfaction.[18]

As such, human based techniques may be supported by technology e.g. portable field olfactometers for on-the-spot checks (s.2.1.2). E-nose technology (s.2.1.3) is supplementary and mostly used for continuous indicative monitoring.

2.1.1 Dynamic Olfactometry (lab- based)

This is used across the UK in line with EU standard BS EN13725 Determination of Odour Concentration by Dynamic Olfactometry. The EU Standard describes how to collect air samples and dilute them with odour-free air (using a dynamic

[17] IAQM odour-guidance-2014.pdf (2018)

[18] Odour Detection Methods: Olfactometry and Chemical Sensors (May 2011) https://pmc.ncbi.nlm.nih.gov/articles/PMC3231359/

olfactometer) until a panellist of human assessors can detect the odour. The panel is made of certified and validated human sniffers[19].

The process may include:

- Air samples are collected at the source/receptor point.
- Samples are brought to a dynamic olfactometer in a lab.
- The olfactometer dilutes the odorous air with neutral (odour-free) air.
- A trained panel of human sniffers inhales the diluted samples through sniffing ports.
- The panel identifies the point at which the odour becomes detectable.

For further information see Olfactometry - dynamic olfactometry - Olfasense

However, while this method may provide the odour concentration, according to SEPA, the offensiveness of the odour, and its potential as a nuisance also needs to be considered[20].

According to SEPA guidance, it is more difficult to quantify the offensiveness of an odour due to subjectivity (what may be considered acceptable by one, may not by another). Therefore the FIDOL approach (frequency, intensity, duration, odour description/character, location) tends to also be used by the different jurisdictions to try and remove subjectivity when determining offensiveness and making assessments.[21]

[19] Panelists must be continuously screened and trained and they must observe a simple behaviour code. Panelists impaired by illness caused by a cold etc are excluded from measurements. For mire information see Odour Detection Methods: Olfactometry and Chemical Sensors (May 2011) https://pmc.ncbi.nlm.nih.gov/articles/PMC3231359/

[20] SEPA Odour Guidance (2025) sepa-odour-guidance-2025.docx (p.12-14)

[21] SEPA Odour Guidance (2025) sepa-odour-guidance-2025.docx (p. 12/14) EA How to comply (p.7) and EPA AG5-2021.pdf (p.9)

2.1.2 Field Olfactometry

This involves direct measurement at the emission source/site using portable equipment[22]:

- Portable hand-held olfactometers (e.g. scentometer) can be used on-site for direct sniff testing by a trained operator.
- Device lets the user inhale ambient air through a filter/dilution system to estimate the ratio.
- These give an approximate dilution-to -threshold ratio, used for quick site checks, complaint investigations etc. Or when lab analysis isn't practical.

However, this method may be considered less robust than lab dynamic olfactometry as it can be impacted by wind, temperature etc. Also, samples must be analysed within a short time (usually <30 hours) to prevent degradation[23]. According to Olfasense, field olfactometers don't meet the technical requirements of EN13725, and are excluded from its scope.

2.1.3 Electronic Nose (E-nose)

- This is more of an emerging technique/instrument, especially since the 1990s[24].
- It uses an array of gas sensors (e.g. metal oxide sensors) to "mimic" human smell[25].
- E-noses are one of the only forms used for continuous monitoring at some sites[26].

[22] Odour Detection Methods: Olfactometry and Chemical Sensors (May 2011) https://pmc.ncbi.nlm.nih.gov/articles/PMC3231359/ (Section 3.1) and Advancements and Prospects of Electronic Nose in Various Applications: A Comprehensive Review

[23] ibid

[24] University of Warick (online) Electronic noses

[25] Odour Detection Methods: Olfactometry and Chemical Sensors (May 2011) https://pmc.ncbi.nlm.nih.gov/articles/PMC3231359/ (Section 4) and High-speed odor sensing using miniaturized electronic nose | Science Advances

[26] Evolution of Electronic Noses from Research Objects to Engineered Environmental Odour Monitoring Systems: A Review of Standardization Approaches - PMC

- It's considered a supplementary technique alongside human-based dynamic olfactometry[27].

2.2 Dispersion Modelling

This method tends to be used across the UK and Ireland by regulatory agencies for industrial odour[28]. It predicts how odour may spread, helping to assess the likely nuisance at receptors[29]. It uses equations and computer software to produce concentration maps showing how odours change at different distances, directions and various weather conditions[30].

It combines data such as[31]:

- odour emission rate, point source and volume, height of release
- meterologoical data: wind speed, direction, temperature, rainfall etc
- terrain data
- receptor points - where people might be exposed e.g. home, schools, work etc.

Atmospheric Dispersion Modelling System (ADMS) is widely used in the UK and Ireland for industrial odour. However, according to the IAQM there are some types of odour source that are not easily modelled (e.g. diffuse sources) and so model results may not give a complete picture of the odour risk on site[32].

The UK has the Atmospheric Dispersion Modelling Liaison Committee tasked with reviewing approaches.

[27] Advancements and Prospects of Electronic Nose in Various Applications: A Comprehensive Review (Section 3.2)

[28] Air Dispersion Modelling | ADMS | Environmental Permitting | Arthian

[29] Evolution of Electronic Noses from Research Objects to Engineered Environmental Odour Monitoring Systems: A Review of Standardization Approaches - PMC

[30] Atmospheric Dispersion Modelling, Assessments & Monitoring

[31] Air Dispersion Modelling | ADMS | Environmental Permitting | Arthian

[32] IAQM (2014) Guidance on the assessment of odour for planning (p.33)