

# DustScan

## Dust Monitoring and Dust Consultancy Services

### Guidance Note No. 1: Nuisance Dust Monitoring

This guidance note is based on our experience in dust monitoring and consultancy. It is part of a series aiming to provide a basic guide to dust and dust monitoring.

DustScan Guidance Note No. 1 discusses 'nuisance dust': what it is, its significance and why, when, where and how it can be measured.

#### What is 'nuisance dust'?

'Dust' is a generic term used to describe particulate matter 1 – 75 µm (micron) in diameter, produced through the crushing and abrasion of materials. It is often considered in two categories:

- a) The size fraction up to 10 µm (PM<sub>10</sub>), which is used as an indicator of local air quality and forms part of National Air Quality Standards. PM<sub>10</sub> are measured to agreed standards, and usually expressed as a concentration over time: mg/m<sup>3</sup>/day.
- b) Nuisance dust. There are no standard definitions, or universal monitoring methods, for nuisance dust. It is now becoming accepted that dust above 10 µm may be considered nuisance dust. Nuisance dust can be long-term (or chronic) – such as the long-term soiling of paintwork – or short-term (acute) – such as a short-lived dust cloud. Dust nuisance is the *effect* caused by dust.

The effect of dust is a matter of human perception thus is difficult to quantify. How it is perceived varies according to characteristics of the dust such as its colour, contrast and rate of accumulation; and local factors such as socio-economic conditions and employment.

#### Why does nuisance dust matter?

Dust may be an inevitable consequence of primary industry such as quarrying and mineral processing. Other processes, such as landfill, demolition and agriculture can also lead to dust generation. Some activities, such as quarrying and waste management, are controlled by specific legislation and guidance. Specific guidance has been produced for particular industries, such as Minerals Policy Statement (MPS) 2, Annex 1: Dust (ODPM, 2005) and Technical Guidance Document M17: Monitoring of particulate matter in ambient air around waste facilities (Environment Agency, 2004).

The size range and amount of dust particles generated by different activities vary according to the processes taking place. Weak materials such as coal or chalk can crumble easily and produce dust, but dust may also be generated due to high energy activities such as drilling and blasting, or through the crushing of strongly cohesive materials.

At waste facilities, the types and amounts of dust generated can be very varied thus difficult to predict. Particle behaviour will be highly variable, and there is no simple correlation between particle size and deposition rate.

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For a site operator, the potential for dust nuisance can be addressed in consents and permits – permissions may have conditions like “...the operation will not lead to excessive dust nuisance...” or “...the operation will not cause pollution beyond the site boundary ...”. MPS 2, Annex 1 states: “... Where these effects [dust from surface mineral workings] cannot be adequately controlled or mitigated, planning permission should be refused. ...” (ODPM, 2005) and Technical Guidance Document (Monitoring) M17 states that: “...measures must be taken to minimise nuisance arising from the landfill due to dust...”. (Environment Agency, 2004). So to establish the effectiveness of control measures, monitoring is required.

Consequently how nuisance dust is monitored and assessed can be critical to the smooth running of an operation.

#### **When should nuisance dust be monitored?**

Ideally, baseline conditions should be established before an operation commences. This is recommended as the first stage of a Dust Assessment Study at mineral workings, and as part of an air quality monitoring programme before a new waste facility is established. Furthermore, the most appropriate methods to use for baseline testing are the simplest and least expensive.

Dust monitoring should continue during operations both to observe site emissions and ensure compliance with planning conditions. Liaison with local authorities and other regulatory bodies may require longer periods or continual monitoring. Frequency of monitoring should be sufficient to take weather conditions and seasonality into account; and observe changes in site practice through regular operations.

Most low-cost dust monitoring systems are of the periodic, interval-based type. Equipment is typically left out for periods of between a few days and a month. To keep costs down, equipment should be straightforward for site staff to use.

#### **Where should nuisance dust be measured?**

Whilst dust nuisance can be seen to be the impact of dust settlement at receptors, it is generally measured on or near site boundaries – i.e. on pathways, at or near sources of dust. Consequently the type and position of dust gauges is of paramount importance – equipment that is best suited to monitoring at receptors might not be appropriate on pathways, and vice versa.

#### **How can nuisance dust be measured?**

Nuisance dust is monitored either directionally (dust flux) or non-directionally (dust settlement). Directional gauges sample dust that is suspended in an airstream, such as on the pathway from source to receptor. Non-directional gauges sample dust falling out of an airstream, such as at a receptor.

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Directional and non-directional nuisance dust samples are quantified in one of two very different ways; either the mass deposition rate or the soiling effect. In the first case, the weight of material collected over a period of time is determined; in the second, changes in the optical properties of a surface (such as loss of gloss, or obscuration) are measured.

There are 'custom and practice' guidelines for dust flux and dust settlement, and for dust mass and dust soiling, although the units used by different methods are generally not interchangeable. Consequently care should be taken to apply the appropriate method for the monitoring requirement. Please refer to Guidance Note No. 3 "Directional Dust Data Assessment" for information on DustScan directional monitoring methodology.

### **What types of equipment are available for nuisance dust monitoring?**

DustScan Ltd supply directional and non-directional dust monitoring equipment to measure both dust mass and dust soiling. Please contact us for more information or visit [www.dustscan.co.uk](http://www.dustscan.co.uk).

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