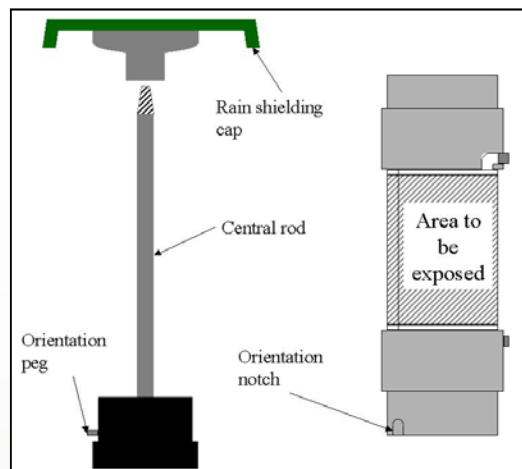


## Sampling System

The Directional Gauge is easy to use and provides a simple method to obtain precise dust measurements. The stand is aligned to north when first installed using the compass system provided. This ensures repeatable dust sampling each time the dust monitoring heads are changed. The diagram to the right shows the key features of the system.

The pictures below show the typical process and actions required for field sampling.



The dust monitoring head samples continuously whilst installed on site. It is normally left exposed for generally 1 to 2 weeks. At the end of the sampling period, the head is removed and placed in the protective carrying flask and a replacement head fitted. Used sampling heads are sent to the DustScan offices for computer analysis in the transport boxes provided.



## Processing

Each directional sample is sealed and processed by us. The samples are processed by computer scanning and entered into a client database.

Directional dust levels are measured on the collection slides using the DustScan software. Two measures of nuisance dust are determined:

- **Absolute Area Coverage (AAC%):** dust coverage irrespective of colour; and
- **Effective Area Coverage (EAC%):** dust soiling ,or loss of reflectance.

AAC% is used as a measure of the significance of a dust source, and EAC% is used as a measure of the potential nuisance of the dust. It may be possible to infer the mass of dust flux from these measurements, although this must not be confused with dust mass deposition. Please ask us for more information if required.

## Measurement

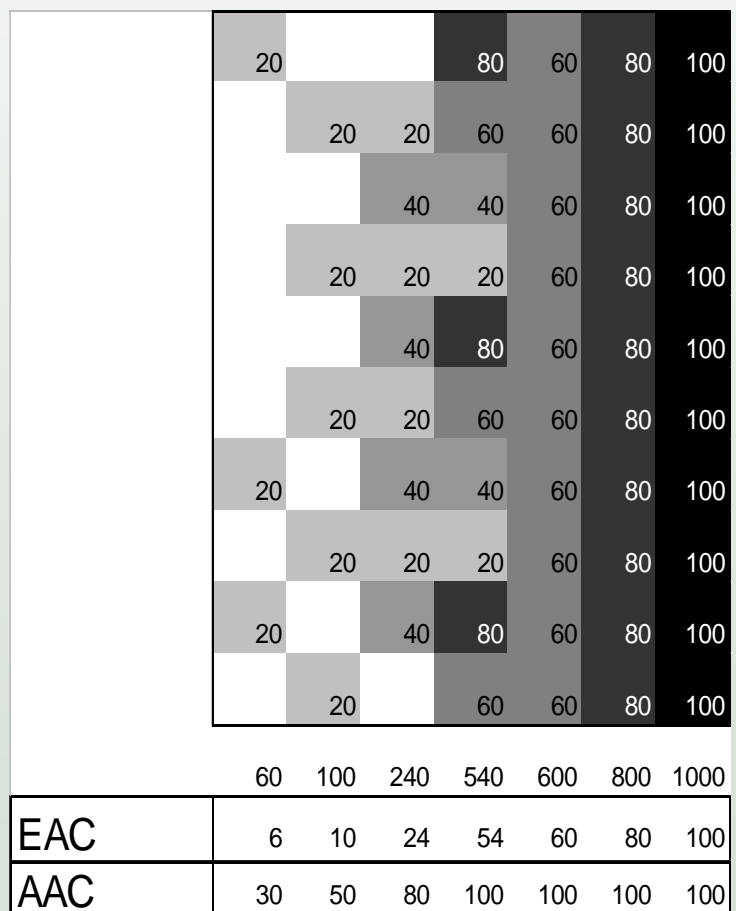
This is a very simple example of how AAC and EAC differ and how they can provide two different pictures. Each square with a number represents a particle, the number represents the darkness of the particle; the higher the number the blacker the particle. The analysis is conducted in strips (or columns in the example opposite) which corresponds to a given direction.

### AAC

AAC is a presence or absence measure and will reach 100% when all squares are filled even if they are filled with pale particles.

### EAC

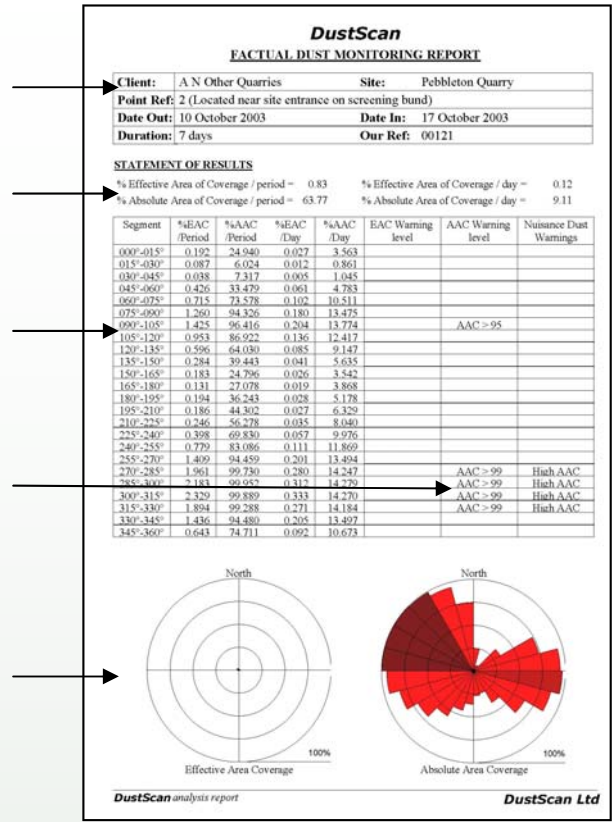
EAC is the average level of discolouration from the particles present; a measure of the lightness or darkness of the dust present.



### Data reporting

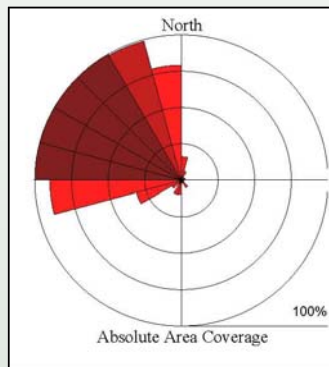
A standard report is issued for each directional sample processed. This can be in paper or electronic formats. The standard report provides a statement of overall AAC% and EAC%, directional data for each 15° segment and directional 'dust rose' plots for each of these measures.

- Site, point date information
- Average dust levels
- EAC and AAC levels per 15° sector
- Warning indicators for high AAC, EAC and cumulative levels

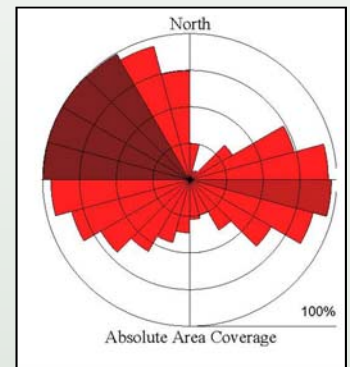


### Dust roses

A 'dust rose' works very much like a wind rose, in that the length of the bars represents the magnitude of the dusting. In the example below, most of the dust came from the north-west, so it was heading in a south-easterly direction.



Left: Dust rose indicating a single dust source  
 Right: Bi-directional dust source  
 Below: Dust detection plot showing dust provenance and general dust movement



### Site plans

The directional system provides 360° directional monitoring to enable observation of particulate flux onto, across and out of a site. The results can be related to 15° arcs around the gauge and can therefore indicate whether dust is coming, for example, from the site or from neighbouring land. The results from a number of gauges can be used to show how dust is moving in relation to operations on a site.

