

# Air pollution

Since its foundation in 1972, the DCMR Environmental Protection Agency has been working towards reducing air pollution in the Rijnmond area. Considerable progress has been made in the last decades, mainly due to the reduction of industrial emissions. Recently the pace of progress is slowing down because technical innovation is partly nullified by the increase of both industrial production and traffic intensity. This fact sheet contains information about the steps the DCMR takes to measure and control air pollution.

## Air quality

Air quality concerns all of us directly, since each person needs approximately 15 m<sup>3</sup> of air every day. The quality of the ambient air is determined by so-called background concentrations and by local pollution. Background concentration refers to the quality of the air, which arrives with the prevailing wind. The air arriving from the south and east tends to be polluted even before it reaches the Rijnmond area and it is fairly clean if it arrives over the sea direct from polar regions. Local pollution is related to human activity in the Rijnmond area. This concerns industrial and domestic emissions and increasingly vehicle exhaust fumes. Some substances are directly emitted (NO, SO<sub>2</sub>, dust), others are formed in the air (NO<sub>2</sub>, O<sub>3</sub>). For example, smog during the summer months is produced by the action of sunlight on nitrogen oxides and hydrocarbons.

## Policy and strategy

The DCMR safeguards air quality in various ways.

### 1. Licences

The most important instrument is the system of licensing industrial companies. Imposing limits on the industrial emissions has been the root of the early improvements of the air quality. The legal basis for licences is national policy. National legislation in turn is based on international guidelines such as IPPC. Some examples are the Dutch Emission Guidelines (NER), the Emission Limits Decree for Combustion Installations (BEES) and the Waste Incinerators Decree (BLA). The guidelines indicate what is feasible using current technology and provide a clear and uniform legal framework for trade and industry.

### 2. Target group policy

Licensing is less successful for dealing with existing situations. For this purpose a target group policy was developed. In this initiative national and local government enter into joint agreements with various sectors of industry, detailing common environmental objectives. The companies concerned are then left to develop corporate environmental plans in which they outline how they intend to achieve the identified targets such as emission reductions relative to a reference year.

### 3. Traffic

Traffic is a major source of air pollution. Despite the fact that each individual car is becoming considerably less polluting, total vehicle emissions are decreasing only slowly due to increased traffic intensity. Traffic is hard to regulate but there are rules for fuel quality and engine efficiency. As a consequence, inner-city lead, SO<sub>2</sub> and benzene have gone down. Three-way catalytic converters, which remove nitrogen oxides and hydrocarbons from the exhaust fumes, have made a major contribution. Apart from technical innovation and promoting public transport, the spatial separation of housing and traffic is one of the few options to limit human exposure to poor quality air. Speed limits on certain roads was shown to be efficient under certain conditions.

### 4. Codes

The measures referred to above are aimed at the medium and long term. However, meteorological phenomena occasionally give rise to a temporary deterioration of the air quality. Low wind speeds and so-called temperature inversion are typical situations

when air pollution is not sufficiently dispersed. During such times the DCMR issues a code: a signal to relevant industries to reduce emissions or temporarily discontinue certain processes. The level of reduction is related to the severity of the situation. Codes exist for emissions of odours, reactive hydrocarbons and sulphur dioxide. The course of action in the case a code is issued is generally specified in the licences.

### Monitoring

Air quality is monitored continuously by the DCMR's own network of automatic instruments. Depending on the nature of the expected problems one or more components are monitored. The network started with 31 sites for SO<sub>2</sub> monitoring at the time the petrochemical industry was our main concern. Currently (2004) 8 sites are left for SO<sub>2</sub> and the attention shifts to traffic related pollution and general ambient air quality. Fine Dust (Particulate Matter < 10 µm PM<sub>10</sub>) is a substance, which increasingly receives attention, so the PM<sub>10</sub> network is being expanded. Apart from the DCMR network there are two other sources of information. Firstly the National Institute of Public Health and Environment (RIVM) runs a national monitoring network, including some observation sites in the Rijnmond area. Secondly, modelling of air quality is increasingly becoming a source of comparatively low cost information. Models are available to calculate the dispersion of industry emissions and to calculate air quality on the basis of traffic data. Measurements and calculations ensure that the authorities receive constantly updated air quality information and forecasts.

### Incidents and complaints

The DCMR operates an incident or alarm room on a 24 hour basis. Industries are supposed to report any incident with environmental bearing or likely to cause complaints to the incident room. If necessary technical specialists are available to assess the magnitude and impact of the incident and to indicate solutions or mitigation measures. In case of disasters they act as technical advisor to fire brigades, police, etc. The alarm room also responds to complaints by the public. The nature and source is investigated and if necessary measures are taken. The main sources of complaints are odour and noise. About half of the odour complaints can be attributed to industrial sources. Others are related to small industries, ships, bars & restaurants, neighbours, etc. Less than 1% of the complaints are directly caused by smog nuisance. The total number of odour complaints hovers between 6000 and 9000. Annual counts are greatly influenced by the severity of an incident (in 2001 one incident provoked over 1000 complaints) and as such it is not a good indicator of the environmental performance. The number of industrial incidents provoking odour complaints shows a strong downward trend over the past ten year with an exception in 2003 due to a major incident.

### Activities of the Air Quality Department

The DCMR's Air Quality Department operates the surveillance network. As measurements are expensive, dispersion models are increasingly used to estimate local air quality. The models are aimed at predicting industrial and road traffic related pollution. Following EU guidelines, town and major village councils have to report periodically on local air quality and the department is an important source of information for the concerned councils in the Rijnmond area. In addition to the ambient air programme the department has considerable expertise in (stack) emission measurements. License conditions are periodically verified by measurements executed by, or on behalf of the Department. In this line of work models are also starting to complement and/or replace actual measurements. This tendency has recently become a point of attention. Indoor air quality measurements are performed on demand if problems are suspected. A programme to monitor vapours of organic solvents in laundrettes and exposed houses has taken place and currently benzene levels in garages and exposed houses are being investigated. Internet is an increasingly common way of publishing air quality data. The public can watch the hour by hour results of the automatic network on [www.dcmr.nl/lucht](http://www.dcmr.nl/lucht).

### Environmental Monitoring

Most of the activities outlined above are directly or indirectly related to the protection of the population and the legal verification of licenses. In addition, the DCMR makes use of the collected data to assess the effectiveness of environmental policies in general. Annually the Monitoring Department publishes, in collaboration with all concerned authorities, a report entitled 'The Environment in the Rotterdam area'. The report combines quality indicators on soil, water and air with indicators on industrial and economic activities. As mentioned above, most concentrations show declining trends in absolute terms while economic activities have constantly grown. This indicates that the environmental policies are fairly effective and that all parties involved take the environment at heart. Concerning air quality, the main problems are NO<sub>2</sub> and PM<sub>10</sub>. Their concentrations are more or less equal to the legal limits whereas for most other substances concentrations are firmly below them. Especially in the couple of 100 m adjacent to traffic arteries, air quality is substandard and there is no time for complacency yet.

#### Colophon

##### Author

Sef van den Elshout

##### Bureau

Air Quality

##### Department

Centre for Environmental Expertise

##### Distributionnumber

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#### Environmental

Protection Agency

P.O. Box 843

3100 AV Schiedam

The Netherlands

T +31 10 246 80 00

F +31 10 246 82 83

E [info@dcmr.nl](mailto:info@dcmr.nl)

W [www.dcmr.nl](http://www.dcmr.nl)