

Air Quality Standards and Targets

June 2007

Under the Resource Management Act (RMA), the Auckland Regional Council (ARC) is responsible for ensuring that outdoor air in the region is clean and healthy to breathe. Standards and guidelines have been developed nationally establishing minimum concentrations of air pollutants so that peoples' health is protected. In addition, the ARC has developed regional targets so that the level of pollution does not get worse.

National Environmental Standards

The Ministry for the Environment (MfE) has set National Environmental Standards¹ (NES) to improve air quality and protect the health of the general population. These standards are regulations issued under sections 43 and 44 of the RMA 1991 and apply nationally. They were introduced in October 2004.

The fourteen standards include:

- Five ambient air quality standards for the pollutants nitrogen dioxide (NO₂), carbon monoxide (CO), particles less than 10 microns in size (PM₁₀), sulphur dioxide (SO₂) and ozone (O₃).
- A design standard for new wood-burning appliances used for domestic home heating.
- Seven standards which ban various activities that discharge unacceptable quantities of dioxins and other toxics into the air. Prohibited activities include:
 - landfill fires
 - bitumen burning for road maintenance
 - burning of oil in the open
 - new high temperature waste incinerators
 - burning of tyres in the open
 - burning of coated wire in the open
 - school incinerators
- A design standard for the collection and destruction of landfill gas at large landfill

¹ MfE (2005), *Updated Users Guide to Resource Management (National Environmental Standards Relating to Certain Air Pollutants, Dioxins, and Other Toxics) Regulations 2004 (Including Amendments 2005)*, Prepared by the Ministry for the Environment

Ambient Air Quality Standards, effective from 1 September 2005, are shown in the following table. These standards apply to outside air everywhere, where people are likely to be exposed in the Auckland region. When the number of exceedences is more than the number listed in the table below, then this is known as a '*breach*' of the standard.

Pollutant	Standard	Time Average	Allowable exceedences per year
Fine Particles (PM ₁₀)	50 µg/m ³	24-hours	1
Nitrogen Dioxide (NO ₂)	200 µg/m ³	1-hour	9
Carbon Monoxide (CO)	10 mg/m ³	8-hours (running mean)	1
Ozone (O ₃)	150 µg/m ³	1-hour	0
Sulphur Dioxide (SO ₂)	350 µg/m ³	1-hour	9
	570 µg/m ³	1-hour	0

These standards are largely based on the World Health Organisation (WHO) Ambient Air Quality Guidelines for Europe (2nd Edition) 2000. They have recently been reviewed and expanded for the world as the WHO Ambient Guidelines Global Update 2005², with significant changes. The NES will need to be updated in future to account for the changes.

Ambient Air Quality Guidelines

The Ambient Air Quality Guidelines³ (AAQG) are the minimum requirements that outdoor air quality should meet in order to protect human health and the environment. The MfE published the AAQG as guidance under the RMA. The AAQG were updated in 2002 and the NES (above) uses a subset of these guidelines for a single averaging period for five of the pollutants. The pollutants included in the AAQG are:

- Nitrogen dioxide
- PM_{2.5} (monitoring guideline)
- Sulphur dioxide
- Ozone
- 1,3 Butadiene
- Formaldehyde
- Lead
- Mercury (organic and inorganic)
- PM₁₀
- Carbon monoxide
- Hydrogen sulphide
- Benzene
- Benzo(a)pyrene
- Acetaldehyde
- Chromium (VI, III and Cr metal)
- Arsenic and Arsine

Regional Air Quality Targets

Regional Air Quality Targets have been developed under the Proposed Auckland Regional Plan: Air Land and Water⁴ (PARP:ALW) for key ambient air pollutants. The targets are primarily based on the MfE's Ambient Air Quality Guidelines, which identify maximum acceptable concentrations for specified contaminants in order to protect the health of the general population. The regional targets aim to maintain air quality in areas of the Auckland Region where it is already good and to improve air quality in areas where it is degraded or unacceptable. These targets are detailed in Chapter 4.1.4 of the PARP:ALW.

² WHO (2006), *WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide: Global update 2005*, prepared by the World Health Organisation.

³ MfE (2002), *Ambient Air Quality Guidelines: 2002 Update*, Air Quality Report No. 32, Prepared by the Ministry for the Environment and the Ministry of Health

⁴ ARC (2004), *Proposed Auckland Regional Plan: Air Land and Water*, Prepared by the Auckland Regional Council

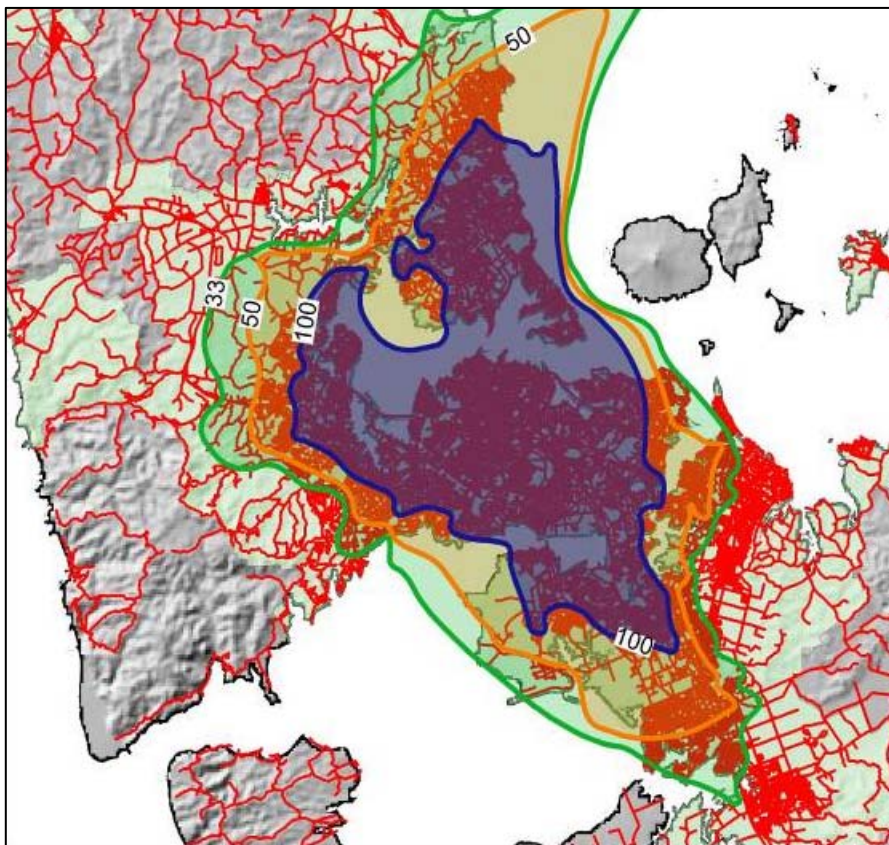
Implementing the NES for PM₁₀

To implement the requirements of the NES for PM₁₀, the ARC is required to take the following steps:

- Identify key 'airsheds' in the Auckland region
- Work out emissions strategies so that we can meet the NES by 2013
- Report any breaches of the NES in the newspaper

The concept of the 'airshed' in the NES is to recognize that different geographic areas will need different management approaches – depending on the effects of air pollution that occur within the airshed, and the emissions that cause these effects.

Modelling was undertaken to see how the emissions are dispersed over the Auckland urban area. From the modelling it appeared that the effect of the emissions were spread over the entire Auckland urban area. Therefore, the ARC decided that it would be appropriate to consider the Auckland urban area as one airshed under the NES.



Map showing output of modelling assuming the worst case for emissions and meteorology (the numbers represent concentrations of PM₁₀)

Other smaller urban areas (i.e. rural and coastal settlements) will also be gazetted shortly to be consistent with the urban air quality management areas in the PARP:ALW and because there is the potential for some of them to exceed the standards as they develop. The additional airsheds have been defined individually because they are separated geographically and the emissions sources may be different across those areas.

The Auckland region has 12 gazetted airsheds: one covers most of the urban area of Auckland (gazetted 1 September 2005) and the remaining 11 cover the urban areas of the larger rural and coastal settlements in the Auckland region (gazetted 1 July 2007). The gazetted airsheds are shown on the map on the right.

Recent Trends

The Auckland airshed is currently in breach of the standard for PM₁₀ (breaches are reported by public notice in the NZ Herald) and has

consistently exceeded this standard in the past. This means that the ARC must develop and implement reduction targets so that ambient concentrations will comply with the standard by 1 September 2013. Note, that NO₂ concentrations have also exceeded the standard in past years.

Future Reductions

ARC calculations show that annual PM₁₀ emissions in the Auckland airshed will have to reduce by 53% (compared to 2005 levels) to meet the PM₁₀ standard by 2013. This PM₁₀ reduction target is known as the '*straight line path*'. Current emission trends would only result in an 18% reduction. Of the three main emission sources, industry is a relatively small contributor to PM₁₀ (8%). Consequently, the Council decided that the industrial sector should achieve a zero percent net change in PM₁₀ emissions, while emissions from transport and domestic fires should each reduce by 58% before 2013.

For more information about exceedences and the NES refer to *Airfacts 4: State of the Region* and *Airfacts 11: Air Quality National Environmental Standards - Implications for Industry in the Auckland Region* available from our website www.arc.govt.nz or phone 09 366 2000.

Refer also to the MfE website www.mfe.govt.nz for more detail on air quality guidelines and standards in New Zealand.

FOR WAYS TO HELP THE ENVIRONMENT, JOIN THE BIG CLEAN
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