Air Pollution

The World Health Organisation (WHO) defines air pollution as follows:

"Air is polluted when one or more pollutants are present in the atmosphere at such a concentration that they are harmful to man, animals, plants and property, cause harm or reduce well-being or disturb appreciably its application."

Particulate Matter $PM_{2.5}$

Particulate matter ($PM_{2.5}$) is a complex mixture of extremely small solids and liquid droplets suspended in air. PM may be composed of soil and dust particles, smoke, organic chemicals, metals, and acids (such as nitrates and sulfates). $PM_{2.5}$ (fine particulate matter) refers to microscopic particles having a diameter equal to or smaller than 2.5 micrometers, or about one-thirtieth the size of a human hair. Fine particulate matter poses a greater risk to human health than coarse particulates because it more easily enters the lungs.

Ozone

Ozone is a colorless gas found in the air we breathe. Ozone is good or bad, depending where it occurs. Good ozone is present naturally in the Earth's upper atmosphere—10 to 30 miles above the Earth's surface. This natural ozone shields us from the sun's harmful ultraviolet rays. Bad ozone forms near ground level when air pollutants (emitted by sources such as cars, power plants, and chemical plants) react chemically in the presence of sunlight. Ozone pollution is more likely to form during warmer months. This is when the weather conditions normally needed to form ground-level ozone (lots of sun) occur.

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HESSEQUA MUNICIPALITY AIR QUALITY MANAGEMENT

SOMETHING ABOUT THE HESSEQUA MUNICIPAL REGION

The varied natural resources in the Hessequa Municipal region led to the establishment of a diverse industrial sector, ranging from small manufacturing industries to big sawmills and even brick manufacturing works. This industrial diversity and its concomitant employee base are the cause of a wide diversity in air pollutants emitted across the municipal area on a daily basis. While this industry plays an enormous role in the economy of the region, it also results in a significant impact on localized air quality as a result of increased motor vehicle emissions.

A key step in protecting our environment is through management of the ambient air quality as it is a basic requirement for all living species. Parliament saw fit to pass the Air Quality Act (AQA), Act 39 of 2004, during 2005. This Act resulted in a paradigm shift in air pollution control in South Africa as its main aim is the protection of ambient air quality.

AIR POLUTION FACTSHEET

The sources of air pollution can roughly be divided into two groups, i.e. natural sources and man-made sources. It is incorrect to think that air pollution is a man-made activity only. The table below shows a typical comparison.

Compound	Natural	Man-made
SO_2	90% (volcanoes, oceans, decomposition)	10% (70% energy, 28% industry)
CO_2	90% (forest fires, oceans)	10% (combustion plants)
NO_x	94% (various, e.g. lightning)	6% (55% energy, 40% traffic)
NH_3	99% (decomposition)	1% (industry)
HCs	96% (methane, decomposition)	4% (65% traffic, 25% industry)
Dust	94% (salt from sea, dust in wind, volcanoes)	6% (40% energy, 60% industry)

From this table it is clear that by far the greatest quantity of air pollution is emitted from natural process, i.e. those over which man has no control. Although that sounds like a let-off for industry, the content of the table needs to be evaluated with care. Yes, it is true that man has no control over the oceans, volcanoes, wind, etc., but how many forest fires are started as a result of the careless activities of man?

Apart from air pollutants generated by continuous natural activity, e.g. wind, sea action, etc., most of the natural emissions occur sporadically. Man-made emissions, however, occur continuously.

They also occur in areas with high population densities and the emissions are relatively close to the ground from where little time is available for the emissions to disperse significantly.

There is no doubt that man's ever increasing search for more sophisticated materials and products to "improve quality of life" lead to the production of more sophisticated pollutants, regardless of whether it is air, water or waste pollution.

Air pollution emissions can be grouped into the following types:

Particulates (dust) - Particulates can be contained in either dry or saturated gas streams. The gas temperatures can be either high or low, depending on the process involved.

Gases - Gaseous pollutants can be emitted in gas streams at either high or low temperatures. The gas streams are usually dry (above dew point) and may or may not contain particulates.

Mists - A mist is defined as the presence of small droplets. This usually occurs at low temperatures (below dew point). Mists may be emitted with or without particulates or gases.