AIR QUALITY
IN HONG KONG 2005

Air Science Group

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Environmental Protection Department

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The Government of the Hong Kong
Special Administrative Region

A report on the results from the Air Quality Monitoring Network (2005) (AQMN)

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Summary

This report summarises the 2005 air quality monitoring data collected by the Environmental Protection Department's monitoring network.

During 2005, Hong Kong saw less frequent photochemical smog incidents than the year before. All monitoring stations generally recorded decreases in the annual average concentrations of various air pollutants in 2005 as compared with 2004.

As in previous years, concentrations of sulphur dioxide, carbon monoxide and lead remained at levels well below their respective Air Quality Objectives limits in 2005.

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1. Introduction

The Environmental Protection Department (EPD) operates a network of 14 air quality monitoring stations for measuring concentrations of major air pollutants. It consists of 11 general stations for monitoring ambient air quality and 3 roadside stations for measuring street level air quality. Please refer to Table B1 in Appendix B for details of the monitoring stations.

Additional monitoring facilities specifically designed for collecting Toxic Air Pollutants (TAPs) samples have been installed at the Tsuen Wan and Central/Western monitoring stations since 1997.

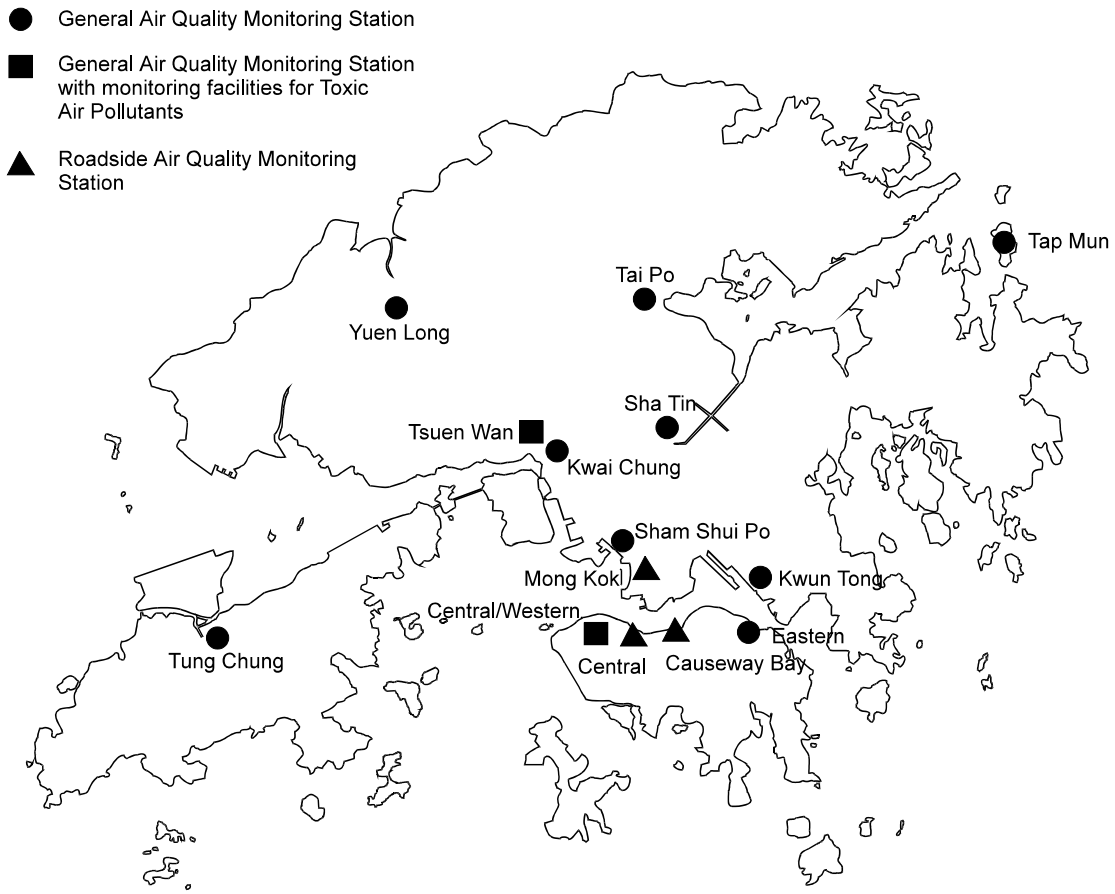


Figure 1: Location of EPD's Air Quality Monitoring Stations (2005)

Apart from EPD's network, the Hongkong Electric Co. Ltd. (HEC) and the CLP Power Hong Kong Limited (CLP) also operate a number of monitoring stations to assess the ambient levels of sulphur dioxide and nitrogen dioxide in the vicinity of their power generating stations. The locations of these monitoring stations and the relevant monitoring results in 2005 are at Appendix D.

2. Gaseous Pollutants

2.1 Sulphur Dioxide (SO_2)

Sulphur dioxide (SO_2) is formed primarily from combustion of sulphur-containing fossil fuels. In Hong Kong, power stations are the major sources of SO_2, followed by fuel combustion, marine vessels and vehicles.

Exposure to high levels of SO_2 may cause impairment of respiratory function and aggravate existing respiratory and cardiac illnesses. Prolonged exposure at lower levels may also increase the risk of developing chronic respiratory diseases.

Figure 2a: Sulphur Dioxide Monitoring 2005
(1-Hour Average Statistics)

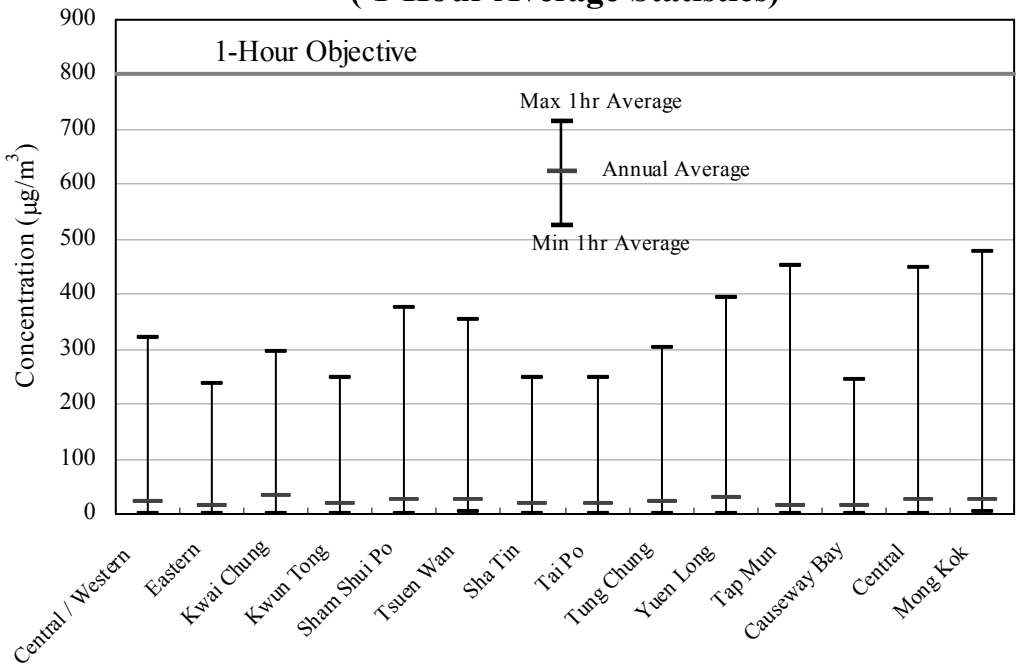


Figure 2b: Sulphur Dioxide Monitoring 2005
(24-Hour Average Statistics)

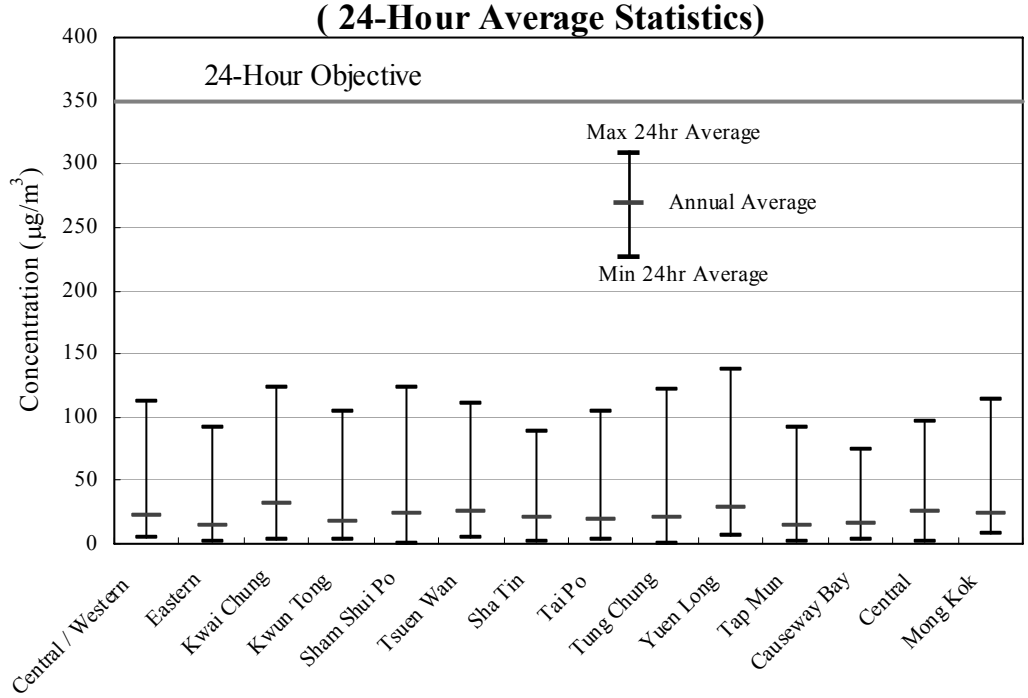
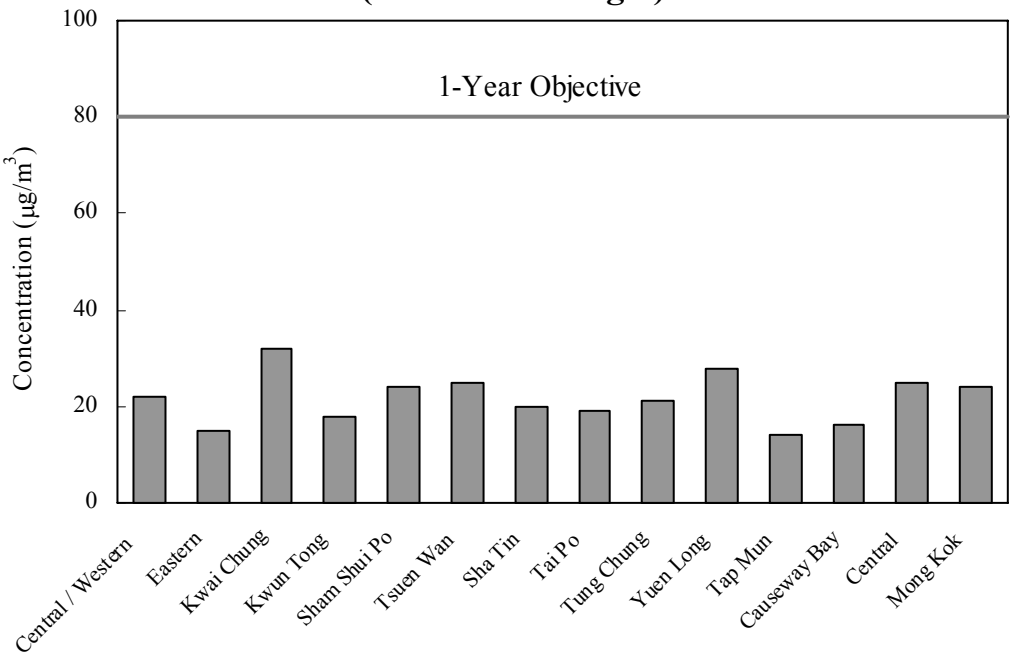


Figure 2c: Sulphur Dioxide Monitoring 2005
(Annual Average)



Sulphur dioxide was continuously measured at all 14 monitoring stations in the monitoring network during 2005. As in previous years, concentrations of SO_2 in Hong Kong remained low in 2005. All of the 14 monitoring stations complied with the relevant short and long term Hong Kong Air Quality Objectives (AQOs) for SO_2 during the year. The highest 1-hour average (476 μg/m^3) was recorded at Mong Kok roadside station while the highest 24-hour average (138 μg/m^3) was recorded at Yuen Long station. As for the annual average, Kwai Chung station recorded the highest value (32 μg/m^3) in the year. All these readings were well below their respective AQO limits.

2.2 Nitrogen Oxides (NO_x) and Nitrogen Dioxide (NO_2)

The various chemical species of the oxides of nitrogen are collectively termed as nitrogen oxides. From an air pollution standpoint, the most important nitrogen oxides in the atmosphere are nitric oxide (NO) and nitrogen dioxide (NO_2). These two gases, which are often mentioned jointly in the air pollution literature as NO_x, usually enter the atmosphere as a result of combustion processes. Emissions from power stations and motor vehicles (diesel vehicles in particular) are the two major sources of NO_x in Hong Kong. NO_x emissions from motor vehicles have greater impact on roadside air quality.

Nitrogen dioxide (NO_2) is formed from oxidation of nitric oxide (NO) emitted from fuel combustion. Long-term exposure to NO_2 can lower a person's resistance to respiratory infections and aggravate existing chronic respiratory diseases.

Nitrogen dioxide was continuously measured at all 14 stations in the monitoring network during 2005. In 2005, the highest 1-hour average (345 μg/m^3) and the highest 24-hr average (195 μg/m^3) were recorded at the roadside stations in Central and Causeway Bay, respectively. Among the general stations, only the Central/Western station had recorded exceedances of the 1-hour AQO limit for NO_2.

As in last year, all general stations complied with the annual AQO for NO_2 in 2005 while non-compliance was still observed at the three roadside stations. The Central roadside station recorded the highest annual average (99 μg/m^3).

Figure 3a: Nitrogen Dioxide Monitoring 2005
(1-Hour Average Statistics)

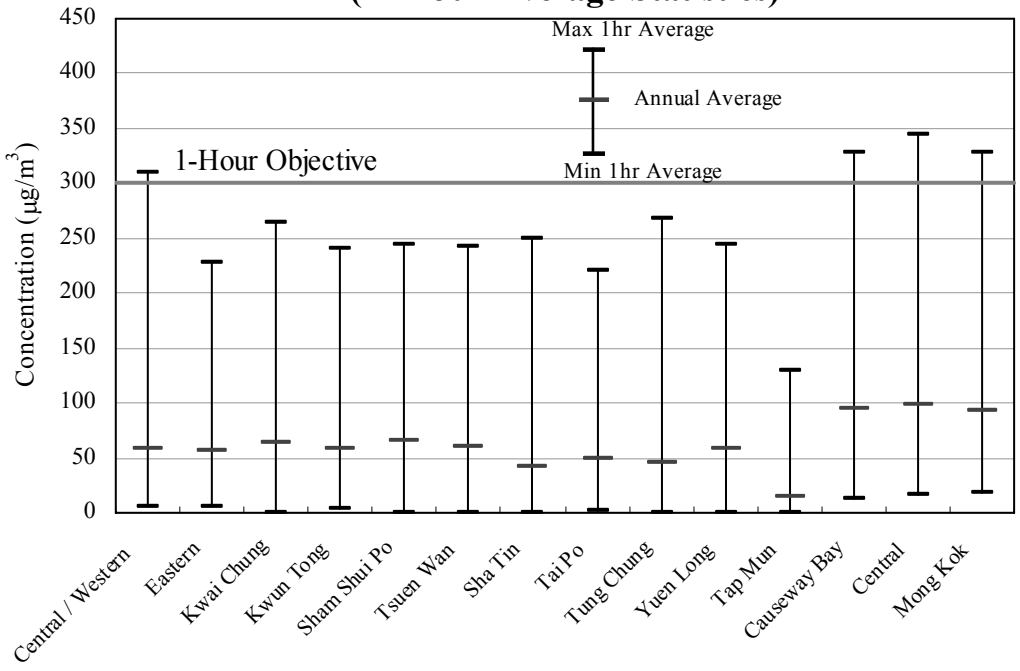


Figure 3b: Nitrogen Dioxide Monitoring 2005
(24-Hour Average Statistics)

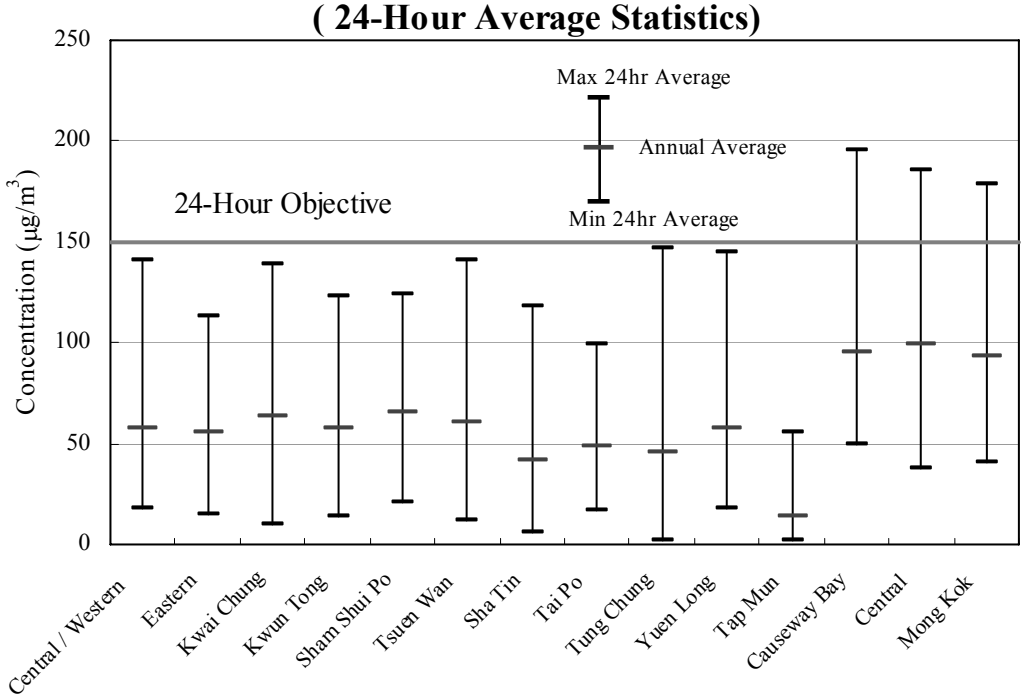
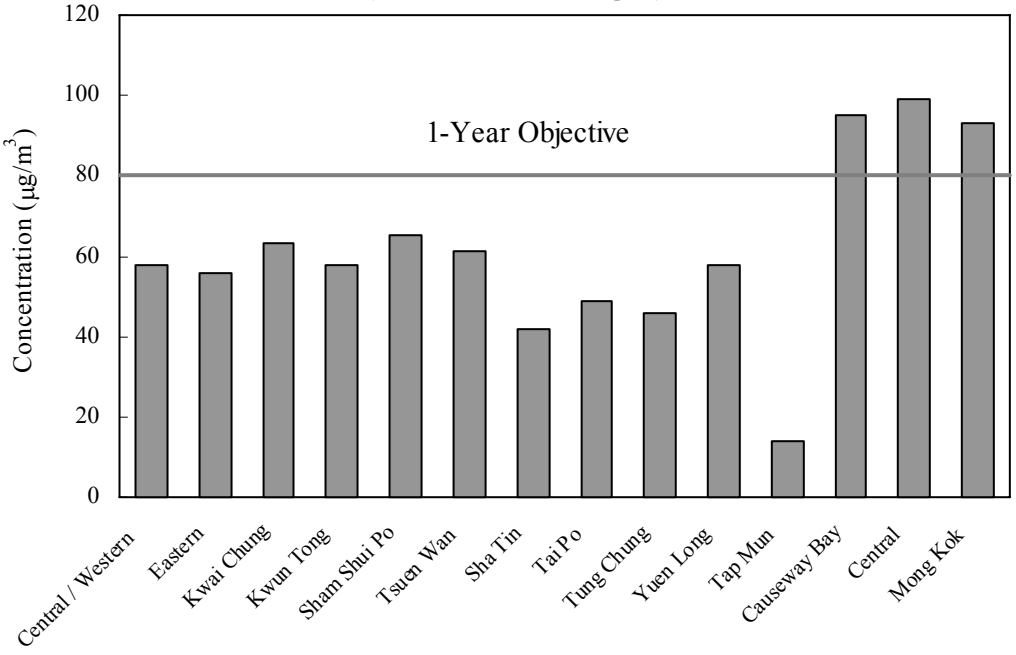


Figure 3c: Nitrogen Dioxide Monitoring 2005
(Annual Average)



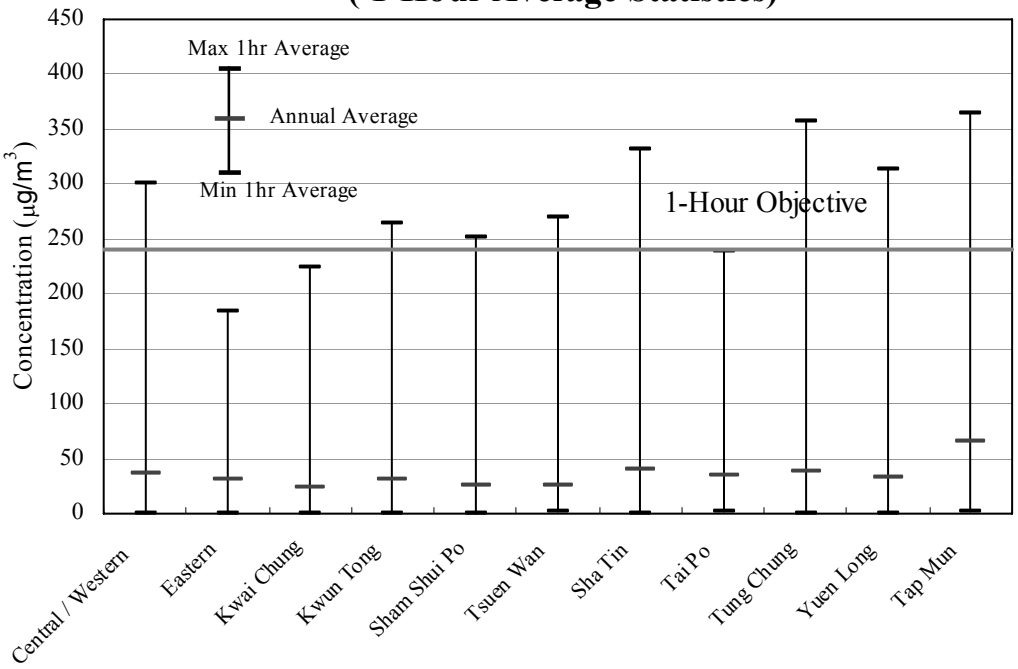
2.3 Ozone (O_3)

Ozone (O_3), a major constituent of photochemical smog, is formed by a series of complicated photochemical reactions of oxygen, nitrogen oxides and volatile organic compounds in the presence of sunlight and warm temperature. Being a strong oxidant, ozone can cause irritation to the eye, nose and throat even at low concentrations. At elevated levels, it can increase a person's susceptibility to respiratory infections and aggravate pre-existing respiratory illnesses such as asthma.

Among the 11 general monitoring stations measuring ozone in 2005, eight of them recorded exceedances of the 1-hour AQO limit. The highest 1-hour average of 365 μg/m^3 was recorded at the Tap Mun station.

While the mean air temperature in 2005 was comparable with that in 2004, both the mean daily global solar radiation and the total bright sunshine recorded in the year were less than those in 2004. The total amount of cloud and annual rainfall in 2005 were higher than those in 2004. With less sunshine and higher amount of cloud and rainfall, 2005 saw less photochemical smog events as compared with 2004. The total number of hours of exceedance of the ozone AQO limit recorded from all monitoring stations in 2005 (85 hours) also decreased by almost 30% from the 2004 figure (119 hours).

Figure 4a: Ozone Monitoring 2005
(1-Hour Average Statistics)



2.4 Carbon Monoxide (CO)

Carbon monoxide (CO) comes mainly from vehicular emissions although small amount of which may also come from incomplete combustion of fuels from factories and power stations. When it enters the bloodstream, CO can reduce oxygen delivery to the body's organs and tissues. Typical symptoms of CO poisoning include shortness of breath, chest pain, headaches, and loss of co-ordination. The health threat from CO is more severe for those who suffer from heart disease.

Carbon monoxide was continuously monitored at 7 stations including 3 roadside stations and 4 general stations during 2005. Similar to previous years, both the ambient and roadside CO concentrations remained very low in 2005. During the year, all of the 7 stations complied with the 1-hour and 8-hour AQOs. In 2005, both the highest 1-hour average (5730 $\mu g/m^3$) and the highest 8-hour average (4541 $\mu g/m^3$) were recorded at the Tung Chung station; these values were around one fifth and one half of the respective AQO limits.

Figure 5a: Carbon Monoxide Monitoring 2005
(1-Hour Average Statistics)

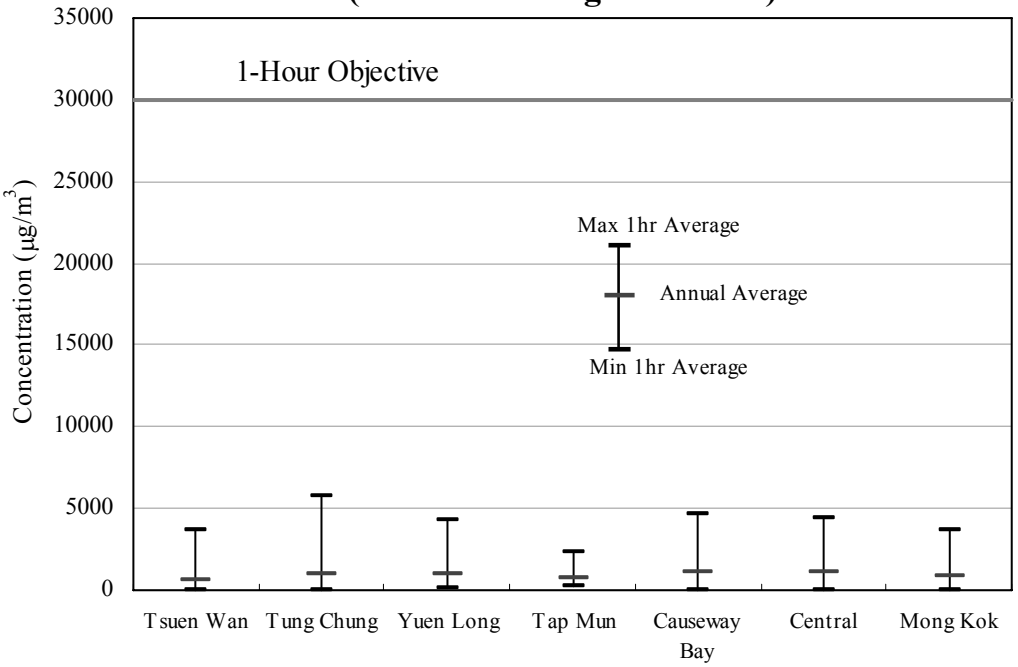
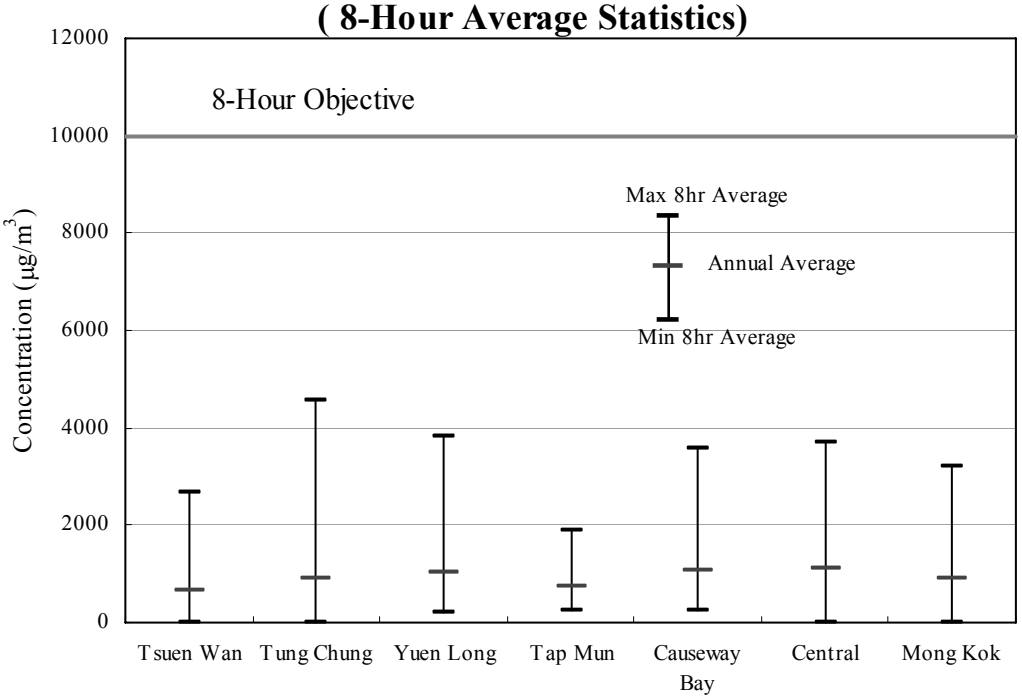


Figure 5b: Carbon Monoxide Monitoring 2005
(8-Hour Average Statistics)



3. Suspended Particulates

3.1 Total Suspended Particulates (TSP)

Total suspended particulates (TSP) are small airborne particulates such as dust, fume and smoke with diameters less than 100 micrometres. Major sources of TSP include power stations, construction activities and vehicle exhausts. TSP can be broadly divided into two major types. Suspended particulates with a nominal aerodynamic diameter of 10 micrometres or less are called respirable suspended particulates (RSP), or PM10 for short, and are usually of much greater health concern (see Section 3.2 below). On the other hand, suspended particulates that are larger than 10 micrometres in diameter mainly cause soiling and dust nuisance.

TSP measurement was conducted by sampling using High-volume samplers at 9 general and 1 roadside stations during 2005.

In 2005, the highest 24-hr average (322 μg/m^3) was recorded at Kwai Chung station. Exceedance of the annual AQO value of 80 μg/m^3 for TSP was observed at the Mong Kok roadside station and 5 other general stations. As in last year, the highest annual average (112 μg/m^3) was recorded at Mong Kok roadside station.

Figure 6a: TSP Monitoring 2005
(24-Hour Average Statistics)

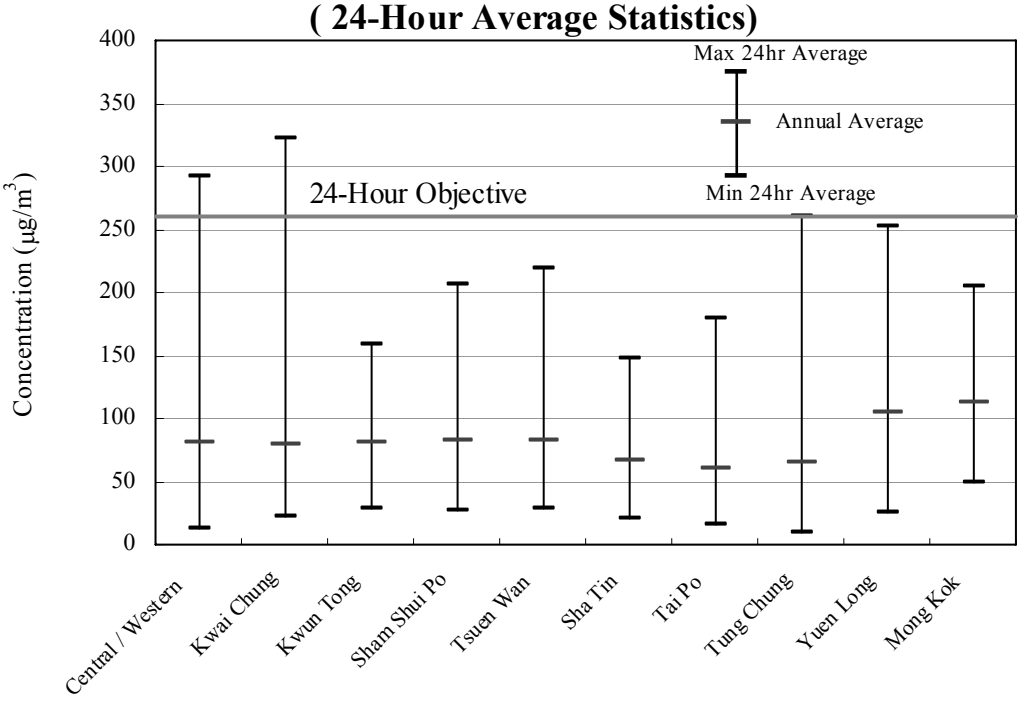
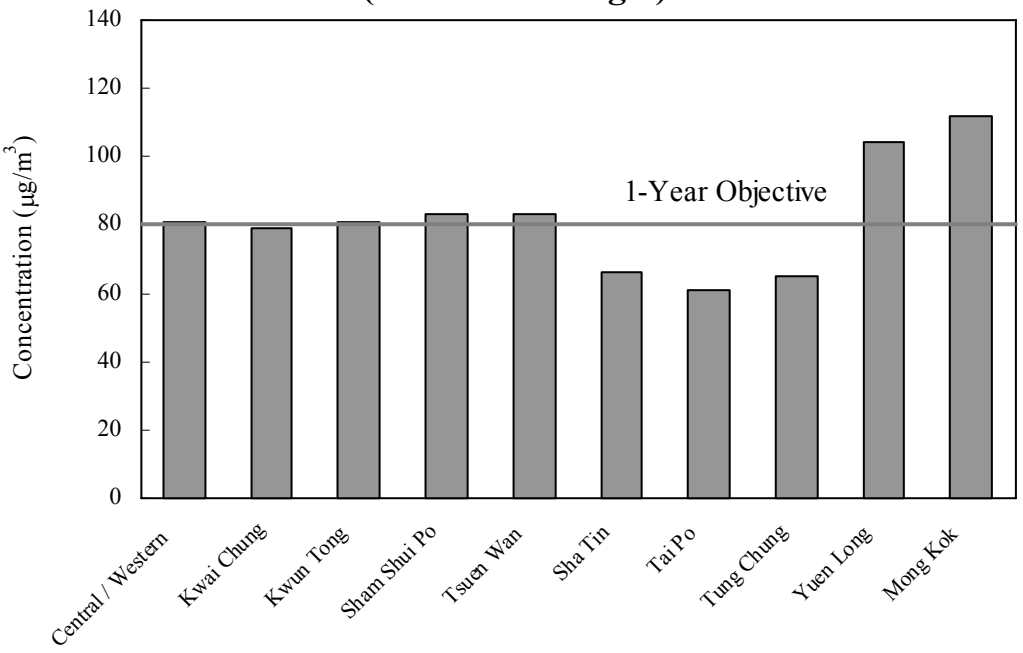


Figure 6b: TSP Monitoring 2005
(Annual Average)



3.2 Respirable Suspended Particulates (RSP)

Respirable suspended particulates (RSP) refer to those suspended particulates with nominal aerodynamic diameters of 10 micrometres or less. Combustion sources, in particular diesel vehicle exhaust and emissions from power plants, are the major sources of RSP in Hong Kong. Besides, RSP can be formed by atmospheric oxidation of sulphur dioxide and nitrogen oxides. Although to a lesser extent, crustal derived dust and marine aerosols are also sources of RSP.

RSP at high levels may cause chronic and acute effects on human health, particularly the pulmonary function, as they can penetrate deep into the lungs and cause respiratory problems. These effects are enhanced if high RSP levels are associated with higher levels of other pollutants, such as SO_2. The smaller particulates in RSP have a major impact on visibility.

RSP was measured at all the 14 stations in the monitoring network in 2005. Most of these stations were also equipped with high-volume sampler to collect particulate samples for chemical analysis.

Due to the higher total rainfall as well as less frequent photochemical smog incidents in 2005 as compared with last year, the annual average concentrations of RSP decreased across the whole territory in the year. Nonetheless, exceedances of the annual AQO value of 55 $\mu g/m^3$ for RSP were still recorded at 6 general stations and the 3 roadside stations. In 2005, the highest annual average (84 $\mu g/m^3$) was measured at Causeway Bay roadside station while Tung Chung station recorded the highest 24-hr average (217 $\mu g/m^3$).

Figure 7a: RSP Monitoring 2005
(24-Hour Average Statistics)

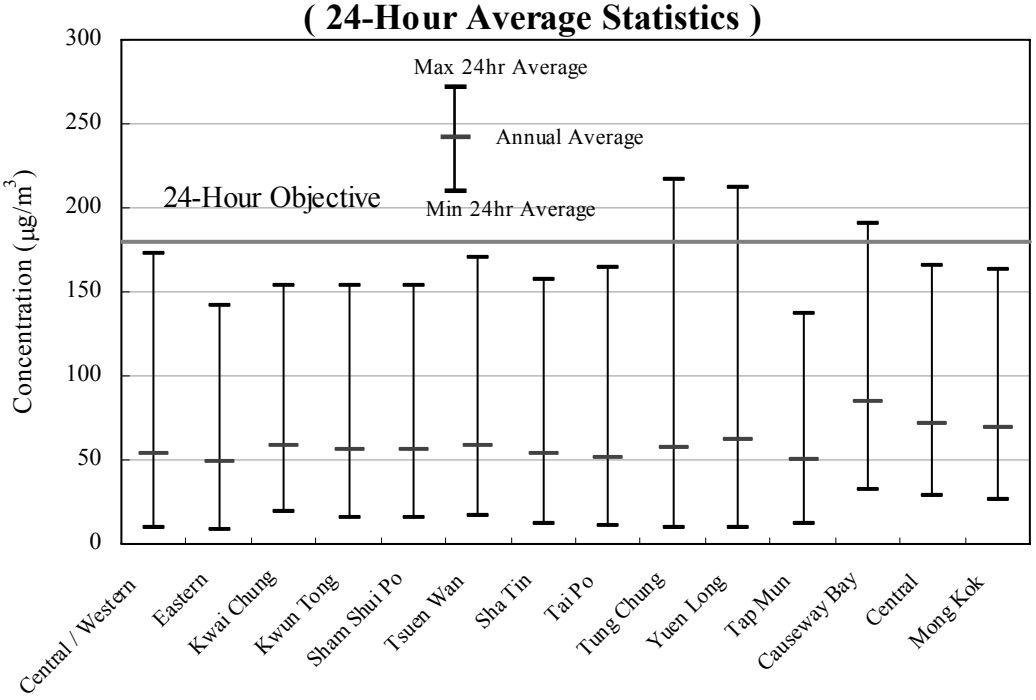
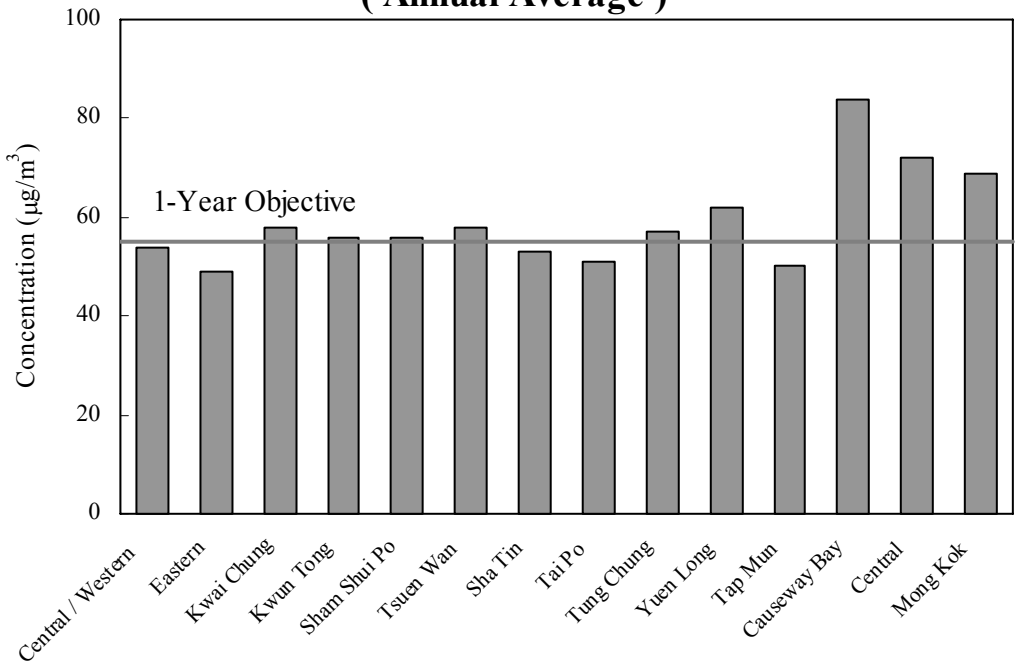


Figure 7b: RSP Monitoring 2005
(Annual Average)



3.3 Lead (Pb)

Lead is the only one criteria pollutant included in the AQO that is also a toxic air pollutant. In Hong Kong, the sale and supply of leaded petrol, which is a known major source of lead, was banned from 1 April 1999. As in previous years, the ambient lead concentrations continued to linger at very low levels during 2005. The overall 3-month averages, ranging from 17 ng/m^3 (second quarter) to 133 ng/m^3 (fourth quarter), were well within the AQO limit of 1,500 ng/m^3.

4. Toxic Air Pollutants (TAPs)

Two groups of toxic air pollutants (TAPs), viz. heavy metals and organic substances, were regularly monitored at the Central/Western and Tsuen Wan stations since mid 1997. Among the various TAPs monitored in 2005, 8 of them are considered more important in terms of their health impacts and their annual averages are summarised in Table C8. Detailed description of the TAPs monitoring operation is given in Appendix B4. The monitoring data collected so far indicate that the levels of toxic air pollutants in Hong Kong are comparable to those observed in other major cities.

5. Variation of Air Pollution Levels over Time

The concentrations of air pollutants in the atmosphere can change over a day, over the months of a year and in the period of several years.

5.1 Over a Day

The concentrations of most air pollutants generally follow the diurnal pattern of human activities and traffic. For instance, higher levels of NO_2 and RSP are usually observed in the early morning and the evening rush hours when there are more traffic and human activities. Likewise, the lowest concentrations often occur from midnight to dawn when the traffic is at its minimum. To no surprise, this type of traffic induced diurnal pattern is much more distinct for pollutant levels at roadside.

Figure 8: 2005 Diurnal variations of NO_2

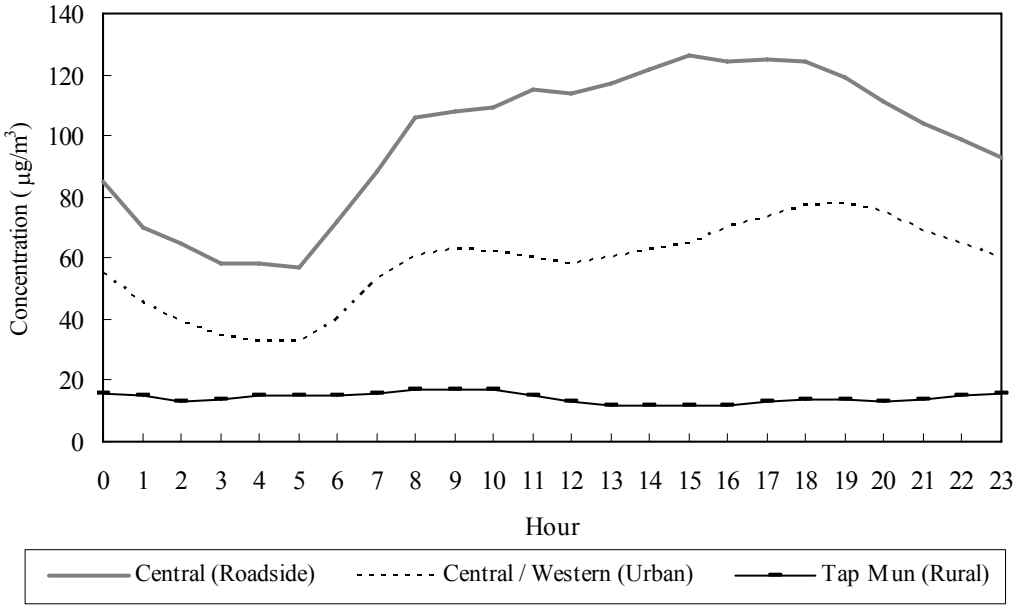
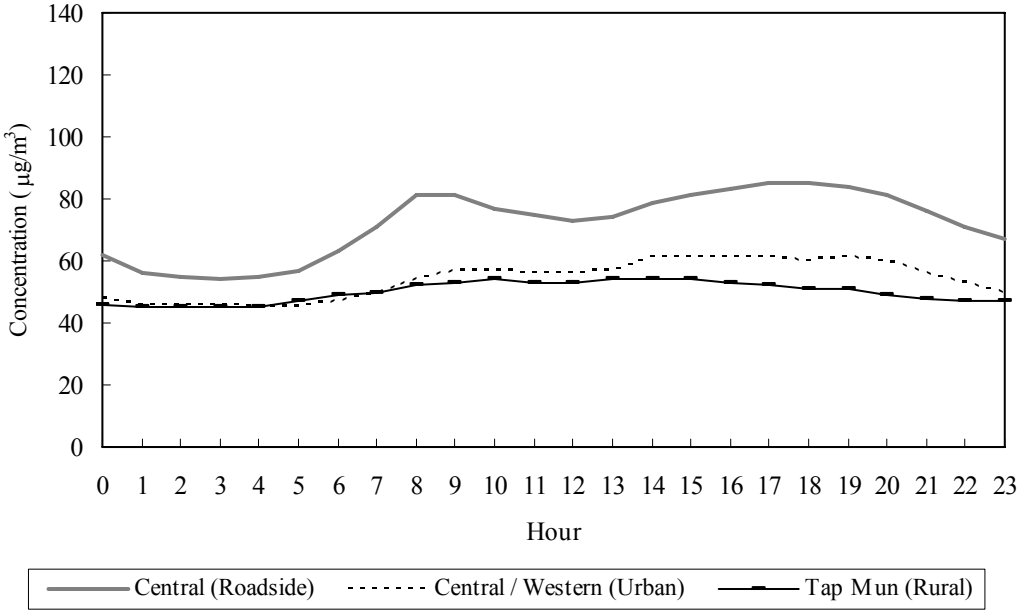
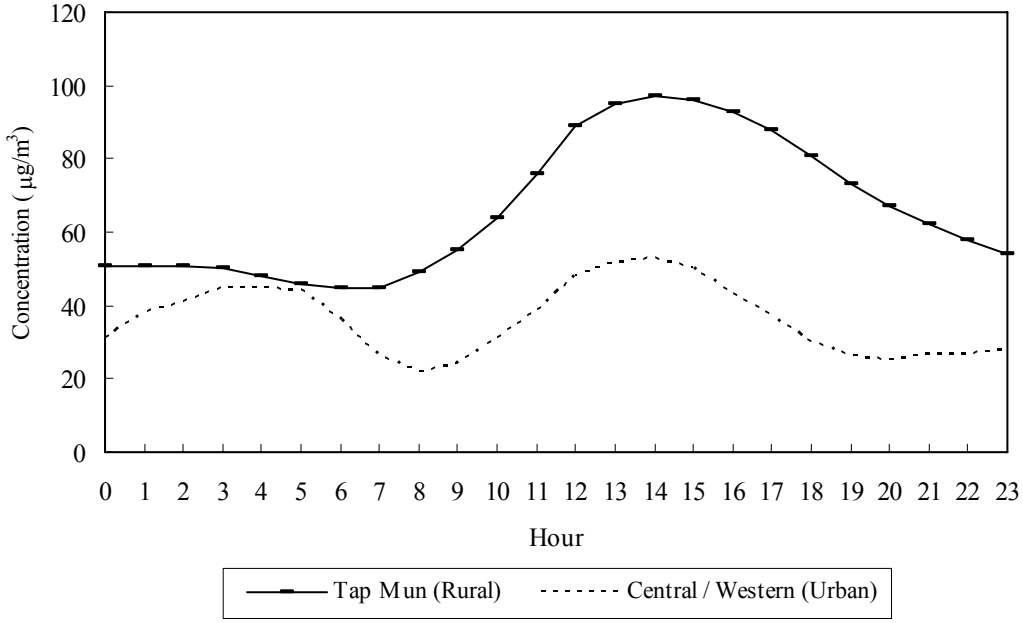


Figure 9: 2005 Diurnal variations of RSP



The diurnal pattern of ozone is different from that of NO_2 and RSP. Ozone is formed by photochemical reactions of its precursor pollutants such as NOx and volatile organic compounds (VOCs) under sunlight. Outside urban centres the ambient ozone levels start to build up before noon and peak in the afternoon, when precursor pollutants are accumulated and sunlight is strong. In urban areas, the lowest ozone concentrations are often observed during the rush hours. This is because a large amount of nitric oxide from the rush-hour traffic acts as an efficient scavenger of ozone, and sunlight is not strong enough for photochemical reactions to take place.

Figure 10: 2005 Diurnal variations of O_3



5.2 Over a Year

Concentrations of NO_2, RSP and O_3 are substantially lower in summer months (June to August) due to a number of reasons. The higher temperatures in summer months induce larger mixing heights, which favours the dispersion of pollutants. The rains in summer help to wash out pollutants more frequently. The south-westerly monsoon in summer also helps to replenish the region with cleaner oceanic air.

Figure 11: Monthly variations of NO_2 and RSP at Central / Western in 2005

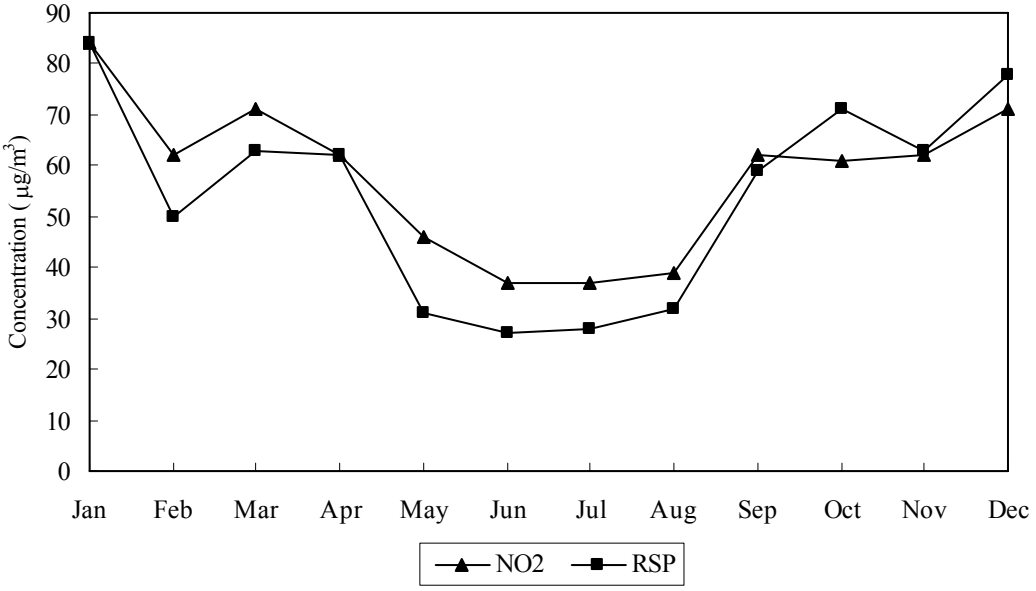
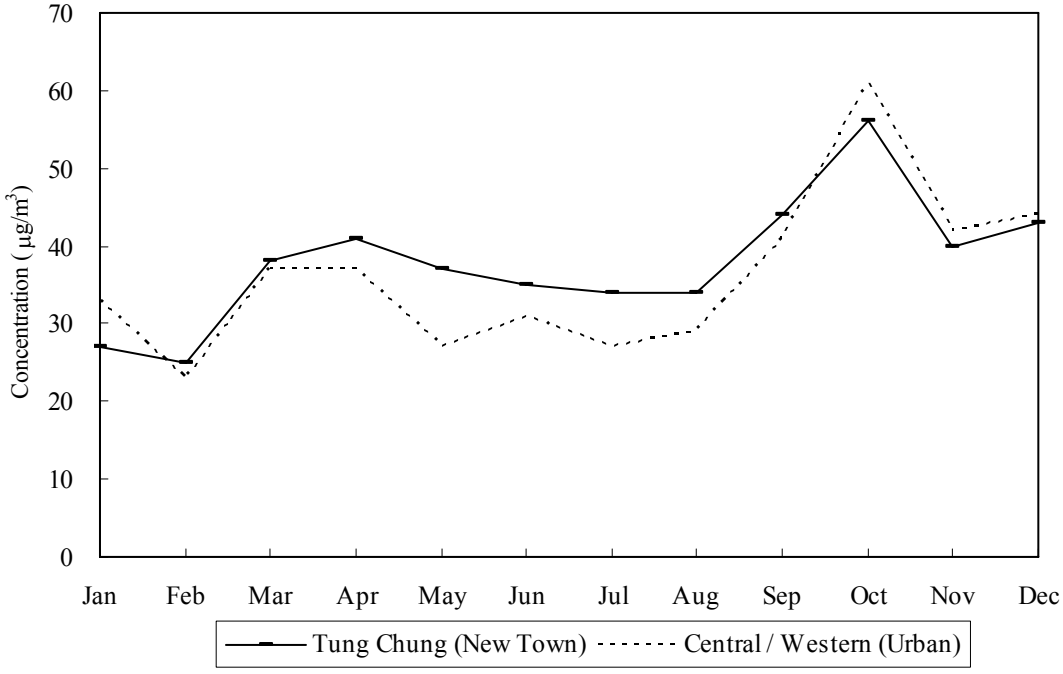


Figure 12: Monthly variations of O_3 in 2005



5.3 Long Term Trends

The long-term trends for various air pollutants presented in this section are based on annual average concentrations of pollutants recorded from various air quality monitoring stations categorised into 4 groups of land use types, namely Urban, New Town, Rural and Roadside as defined in Table 1 below.

Table 1: Classification of Air Monitoring Stations by Land Use Types

Land Use Type	Land Use Characteristics	Station
Urban	Densely populated residential areas mixed with some commercial and/or industrial areas.	Central/Western, Eastern, Kwai Chung, Kwun Tong, Sham Shui Po and Tsuen Wan
New Town	Mainly residential areas.	Sha Tin, Tai Po, Tung Chung and Yuen Long
Rural	Rural areas.	Tap Mun (background station)
Roadside[1]	Urban roadside in mixed residential/ commercial area with heavy traffic and surrounded by many tall buildings.	Causeway Bay and Central

5.3.1 Sulphur Dioxide (SO_2)

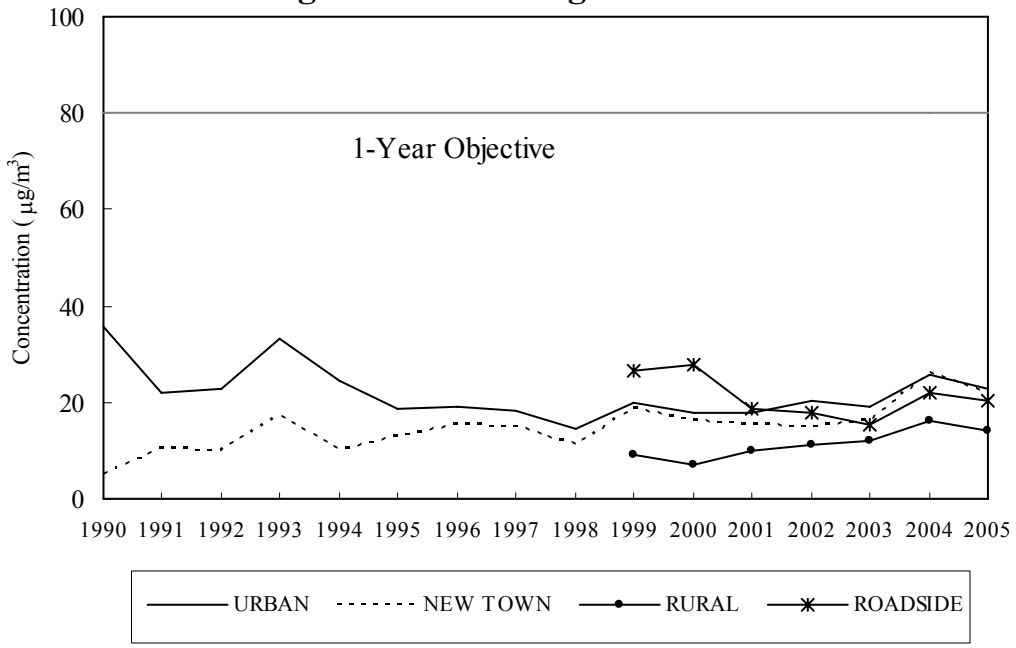
Since the implementation of the Air Pollution Control (Fuel Restriction) Regulations in 1990 for cutting sulphur content of industrial fuels and the Air Pollution Control (Motor Vehicle Fuel) Regulations in 1995 for controlling motor vehicle fuel quality, SO_2 concentrations in Hong Kong have reduced and remained at levels well below the annual AQO limit of 80 $\mu g/m^3$.

Although the ambient concentrations of SO_2 dropped slightly in 2005, they show gentle rising trends over the past several years which could be attributed to the increases in emissions from local power plants as well as from sources in the neighbouring region.

As a result of the introduction of ultra low sulphur diesel for vehicle fleet in late 2000, the average SO_2 concentration at roadside in 2005 (21 $\mu g/m^3$) dropped by 25% compared with the 2000 value (28 $\mu g/m^3$).

[1] The current Mong Kok roadside station was commissioned in 2001. The station is not included in the trend analysis due to its relatively short history of measurement as compared with other stations. Therefore, the long-term trends for roadside stations are only based on data from the remaining 2 roadside stations, namely Causeway Bay and Central roadside stations.

Figure 13: SO_2 long term trend

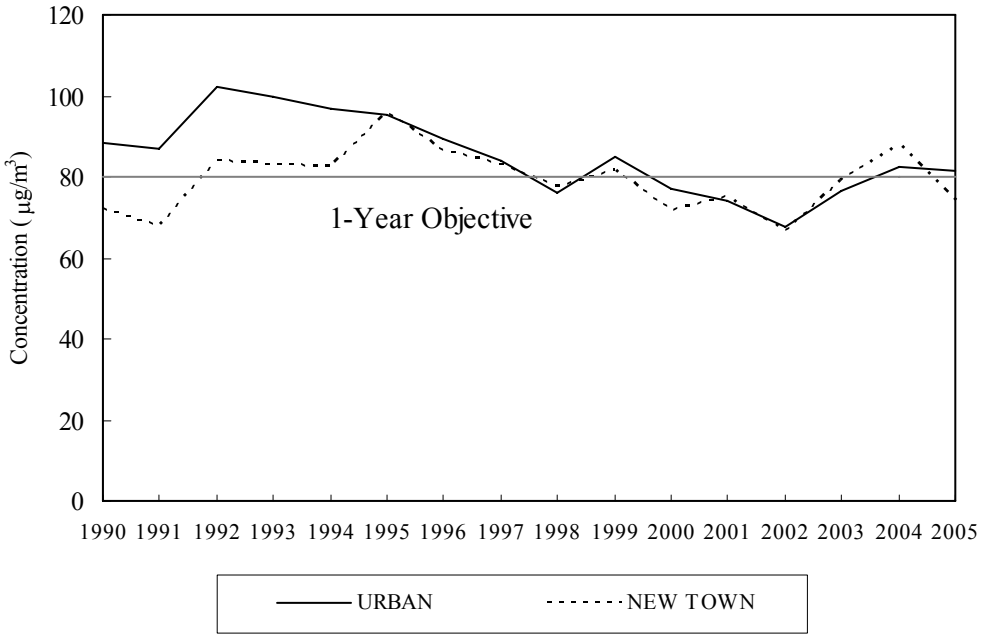


5.3.2 Total Suspended Particulates (TSP)

The TSP concentrations exhibited primarily declining trends from 1995 to 2002 but rebounded afterwards.

Despite a drop in 2005, the TSP concentrations in the territory have shown rising trends since 2002, which could be mainly attributed to the increase in regional background TSP levels.

Figure 14: TSP long term trend



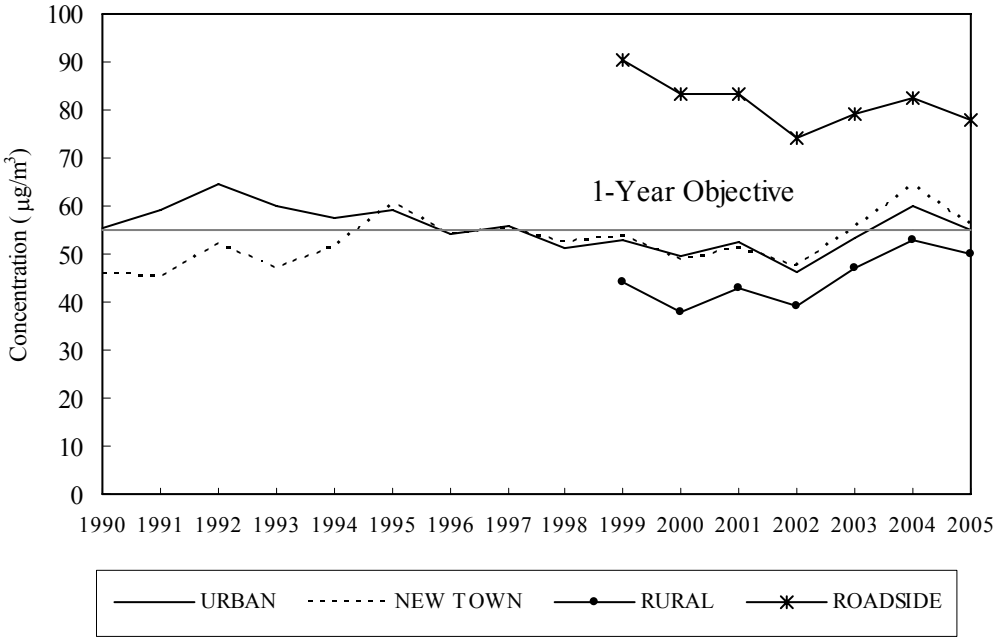
5.3.3 Respirable Suspended Particulates (RSP)

The RSP concentrations recorded in the territory showed a primarily downward trend between 1995 and 2002 but rebounded afterwards.

Due to higher rainfall and less frequent photochemical smog incidents, the RSP concentrations in the territory in 2005 reduced as compared with 2004. Nevertheless, the RSP concentrations recorded in all the urban, new town and rural stations have exhibited rising trends since 2002. Such territory-wide rise in RSP concentrations generally reflects an increase in regional background RSP levels in recent years.

Despite an increase in background RSP levels in recent years, the annual average of RSP at roadside in 2005 has reduced by 14% compared with 1999, thanks to the effects of various vehicle emission control measures implemented over the past few years.

Figure 15: RSP long term trend



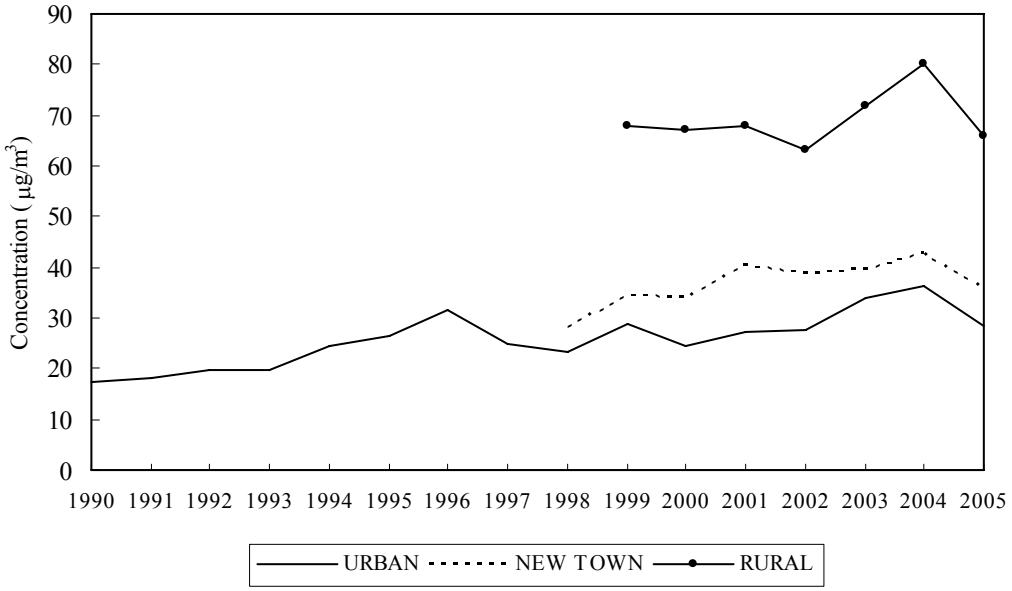
5.3.4 Ozone (O_3)

As nitric oxide emissions from motor vehicles can react with and remove ozone in the air, areas with heavy traffic normally have lower ozone levels than areas with light traffic. Hence, Tap Mun rural station has steadily recorded more than twice the ozone levels measured in urban areas since 1999.

Despite the drop in 2005, ozone levels in the territory have showed a general rising trend since 1990.

Ozone is a regional air pollution issue. The rising trend of ozone generally reflects deterioration in air quality on a regional scale over the past decade. The Hong Kong Special Administrative Region Government and Guangdong Provincial Government have formulated a regional air quality management plan to improve air quality in the Pearl River Delta region.

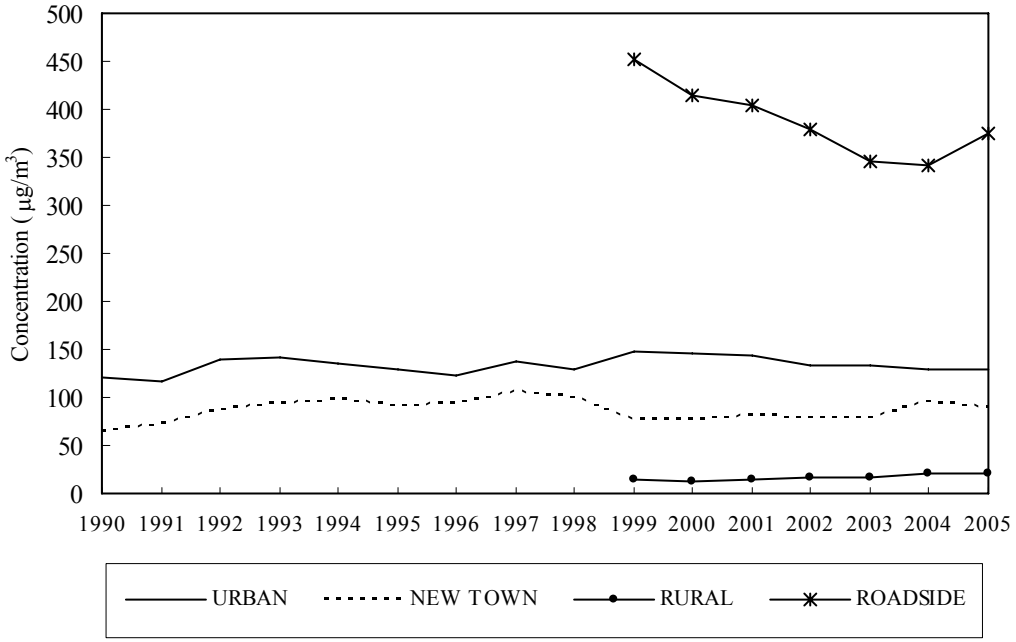
Figure 16: O_3 long term trend



5.3.5 Nitrogen Oxides (NO_x) and Nitrogen Dioxide (NO_2)

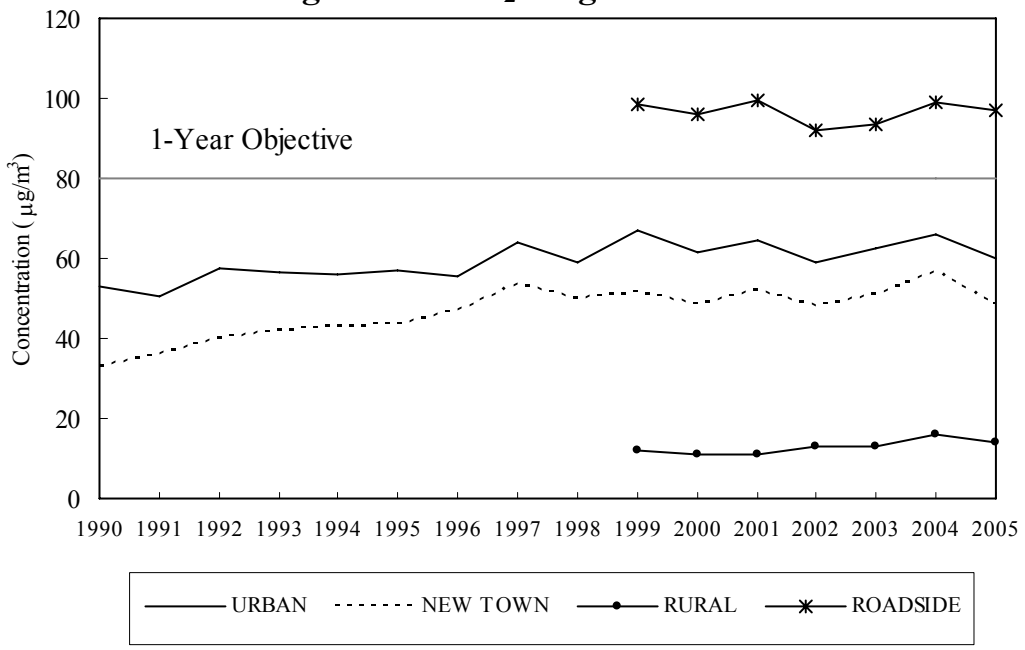
The annual average of NO_x in urban areas has remained quite constant over the past decade. Although there was a rise in 2005, the roadside NO_x concentration was still 17% lower than the 1999 level, which reflects a reduction in emission levels as a result of vehicle emission control measures implemented over the past years.

Figure 17: NOx long term trend



NO_2 is mainly formed from the oxidation of nitric oxide, a major component of NO_x. The concentrations of NO_2 are dependent on the levels of NO_x as well as the concentrations of ozone and VOCs in the ambient air which promotes the conversion of nitric oxide to NO_2. Since 1990, the NO_2 levels in urban and new town areas have exhibited slow rising trends similar to those of ozone.

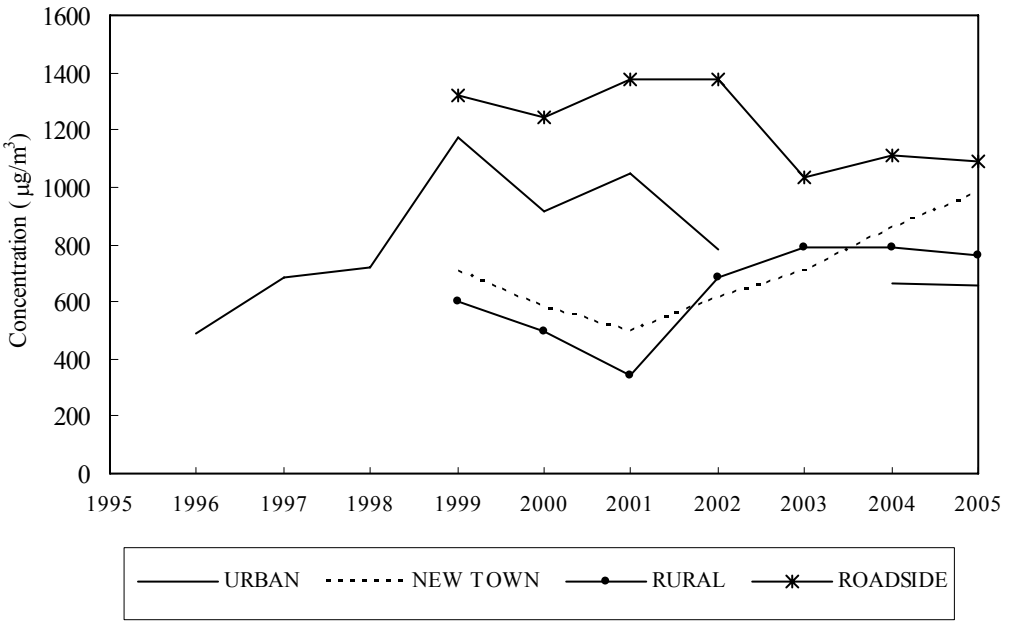
Figure 18: NO_2 long term trend



5.3.6 Carbon Monoxide (CO)

CO concentrations in Hong Kong remained very low in the past several years. Even at the roadside close to the vehicular emission sources, the CO levels were well within the 1-hour AQO (30000 $\mu g/m^3$) and 8-hour AQO (10000 $\mu g/m^3$).

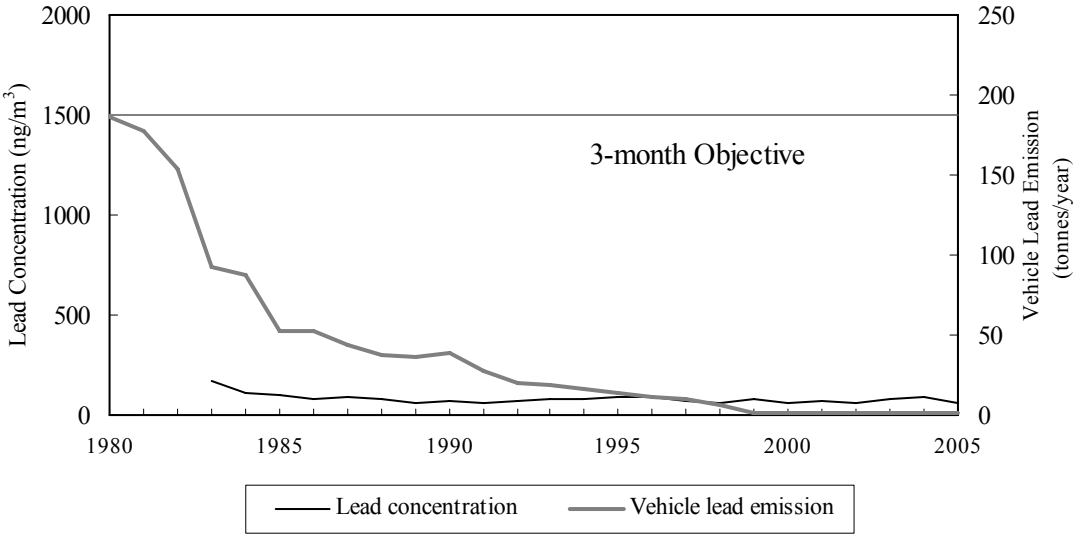
Figure 19: CO long term trend



5.3.7 Lead (Pb)

The ambient lead concentrations have been lingering at very low levels since the oil companies took voluntary action in reducing the lead content of petrol in the early eighties. Lead emissions from vehicles were further reduced as a result of the introduction of unleaded petrol in April 1992 and completely eliminated when the sale and supply of leaded petrol was banned in April 1999.

Figure 20 : Vehicle lead emission and lead concentration



Appendix A

Air Quality Objectives and their Compliance Status

Established in 1987, the Hong Kong Air Quality Objectives (AQO) for seven major air pollutants was set at levels to protect public health. The compliance status of the AQO has been used as the indicator of air quality in different districts in Hong Kong.

Table A1: Hong Kong Air Quality Objectives (AQO)

Concentration in micrograms per cubic metre [1]

Pollutant	Averaging Time				
	1 hour[2]	**8 hours[3]**	**24 hours[3]**	**3 months[4]**	**1 year[4]**
Sulphur dioxide (SO_2)	800		350		80
Total suspended particulates (TSP)			260		80
Respirable suspended particulates (RSP) [5]			180		55
Nitrogen dioxide (NO_2)	300		150		80
Carbon monoxide (CO)	30000	10000			
Photochemical oxidants (as ozone (O_3) [6])	240				
Lead (Pb)				1.5	

[1] Measured at 298K (25°C) and 101.325 kPa (one atmosphere).
[2] Not to be exceeded more than three times per year.
[3] Not to be exceeded more than once per year.
[4] Arithmetic means.
[5] Respirable suspended particulates mean suspended particulates in air with a nominal aerodynamic diameter of 10 micrometres or smaller.
[6] Photochemical oxidants are determined by measurement of ozone only.

Table A2: Percentage Time in compliance with Short-Term Air Quality Objectives in 2005

Station		O_3	NO_2		TSP	RSP	SO_2		CO	
		1-hr	**1-hr**	**24-hr**	**24-hr**	**24-hr**	**1-hr**	**24-hr**	**1-hr**	**8-hr**
General Station	Central/Western	99.90	99.98	100	98.36	100	100	100	--	--
	Eastern	100	100	100	--	100	100	100	--	--
	Kwai Chung	100	100	100	98.33	100	100	100	--	--
	Kwun Tong	99.99	100	100	100	100	100	100	--	--
	Sham Shui Po	99.98	100	100	100	100	100	100	--	--
	Tsuen Wan	99.98	100	100	100	100	100	100	100	100
	Sha Tin	99.88	100	100	100	100	100	100	--	--
	Tai Po	100	100	100	100	100	100	100	--	--
	Tung Chung	99.73	100	100	98.11	99.73	100	100	100	100
	Yuen Long	99.84	100	100	100	99.43	100	100	100	100
	Tap Mun	99.61	100	100	--	100	100	100	100	100
Roadside Station	Causeway Bay	--	99.93	99.35	--	99.72	100	100	100	100
	Central	--	99.88	96.68	--	100	100	100	100	100
	Mong Kok	--	99.99	99.17	100	100	100	100	100	100

Notes: "--" *Not measured*

Compliance with the short-term AQO

Table A2 shows the percentage time of compliance with the short-term AQO (i.e. 1-hr and 24-hr AQO) recorded at each of the monitoring stations in 2005. For NO_2, the compliance percentages of 24-hr AQO were between 96% and 100% at all stations; its 1-hr AQO compliance rates were above 99% at all stations. Regarding RSP, the compliance percentages for 24-hr AQO were above 99% at all stations. The compliance levels for 1-hr AQO for O_3 were over 99% at all monitoring stations. For TSP, the compliance percentage of its 24-hr AQO was between 98% and 100% at all stations. The compliance rates for the short-term AQO for both SO_2 and CO achieved 100% at all monitoring stations.

Compliance with the long-term AQO

Table A3 shows the compliance status of various stations with the long-term (annual) AQO in 2005. For those stations with sufficient data, sulphur dioxide and lead all complied with the long-term AQO. Compliance with the annual AQO for NO_2 was recorded at 11 out of 14 stations. The compliance rate for RSP in 2005 was low although it was slightly better than 2004. In 2005, 5 out of 14 stations met the annual AQO for RSP, as compared with 2 out of 13 stations* in 2004. The compliance rate for TSP was also low, with only 4 out of 10 stations meeting the annual AQO. The low compliance rates for TSP and RSP could be caused by high regional background particulates levels.

Notes: ** Tai Po station did not have sufficient data for the assessment of annual AQO compliance in 2004. As a result, there were only 13 stations which had adequate data for assessing long-term AQO compliance in that year.*

Table A3: Compliance Status of Long-Term (Annual) Air Quality Objectives in 2005

Station		NO_2	TSP	RSP	SO_2	Lead
		1-year	1-year	1-year	1-year	3-months
General Station	Central/Western	✓	×	✓	✓	✓
	Eastern	✓	--	✓	✓	--
	Kwai Chung	✓	✓	×	✓	✓
	Kwun Tong	✓	×	×	✓	✓
	Sham Shui Po	✓	×	×	✓	--
	Tsuen Wan	✓	×	×	✓	✓
	Sha Tin	✓	✓	✓	✓	--
	Tai Po	✓	✓	✓	✓	--
	Tung Chung	✓	✓	×	✓	✓
	Yuen Long	✓	×	×	✓	✓
	Tap Mun	✓	--	✓	✓	--
Roadside Station	Causeway Bay	×	--	×	✓	--
	Central	×	--	×	✓	--
	Mong Kok	×	×	×	✓	✓

Notes: "✓" *Complied with the AQO* "×" *Violated the AQO* "--" *Not measured*

Appendix B

Air Quality Monitoring Operation

B.1 Network Operation

The air quality monitoring network of 14 monitoring stations is operated by the Air Science Group of the Environmental Protection Department. The measurement of ambient concentrations of total suspended particulates (TSP), respirable suspended particulates (RSP), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3) and carbon monoxide (CO) have been accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) since August 1995.

In order to provide good representation of the air quality in areas of high population density, the locations of the 14 monitoring stations were carefully chosen by referencing to the United States Environmental Protection Agency's (USEPA) guidelines with practical consideration of the unique congested high-rise development of Hong Kong.

The details for the parameters monitored at each monitoring station and a list of equipment employed for measuring the air pollutants are summarised in Tables B2 and B3 respectively. In general, the concentration of gaseous pollutants and RSP are determined continuously by automatic analysers. Manually operated high volume samplers using the gravimetric methods are also used regularly to measure the TSP and RSP. In addition, meteorological parameters, including temperature and solar radiation, wind speed and direction, are also recorded continuously at each station as appropriate.

Wet and dry deposition samples are collected at 3 stations: Central/Western, Kwun Tong and Yuen Long. The parameters measured for all wet and dry samples include: pH, Na^+, K^+, NH_4^+, NO_3^-, SO_4^{2-}, Cl^-, F^-, Ca^{2+}, Mg^{2+}, formate and acetate in the filtrate.

B.2 Data Processing and Dissemination

At each monitoring station, signals from the continuous analysers and the meteorological instruments are first stored in a data logger and then sent back to the Data Processing Unit of the Air Science Group via dedicated telephone lines for further processing. After careful checking and validation, the monitoring data are disseminated to the public in the following manner:-

- Monthly release of the monitoring data recorded at the Mong Kok, Kwai Chung and Central/Western stations (up to June 1998)
- Monthly release of the Air Pollution Index (API) summary for all monitoring stations (since July 1998)
- Daily API reporting and forecast for three categories of land-use areas, viz., urban, industrial, and new development (from 6 June 1995 to 14 June 1998)
- Daily API reporting and forecast for individual station (from 15 June 1998 to 30 June 1999)
- Hourly API reporting for individual station (since 1 July 1999)
- Reporting of monitoring data in the annual reports "*Air Quality in Hong Kong"* and "*Environment Hong Kong"*
- Ad hoc provision of air quality data to the public, academics and environmental consultants upon request for the purposes of research and air quality assessment

- Establishment of the Environmental Protection Interactive Centre (EPIC) for the public to download air quality monitoring data (since March 2004)
  (http://www.epd.gov.hk/epd/epic/english/epichome.html)

The reporting and forecast of API will help the public (particularly susceptible groups such as the elderly, children and people with heart or respiratory illness) to decide on taking precautionary measures when necessary. The monitoring results are also regularly used to assist the formulation of air quality management plans and the evaluation on the effectiveness of the current air pollution control programmes.

B.3 Quality Control and Assurance

A quality policy is adopted to ensure that ambient air quality monitoring results from the monitoring stations attain a high degree of accuracy and precision. A quality system has been established in accordance with the HOKLAS criteria.

The accuracy of the monitoring network is assessed by performance audits. Similar to overseas standards, control limits of ±15% and ±10% are adopted for the gaseous pollutants and particulates respectively. In 2005, 434 audit checks were carried out on the stations' analysers and samplers. As shown in Figure B1 and based on the 95% probability limits, the accuracy of the network was within the specified control limits.

The precision, a measure of the repeatability, of the measurements is checked in accordance with EPD's quality manuals. In 2005, 1970 precision checks were carried out on the analysers and samplers. As shown in Figure B2 and based on the 95% probability limits, the precision of the network varied between -9.6 % and 8.3 %, which was again within target limits.

In addition to the above operation, a system audit to review the quality assurance activities is carried out on an annual basis on the monitoring network. A report outlining the deficiencies and corrective actions is compiled at the end of the audit.

B.4 Toxic Air Pollutants Monitoring Operation

The Air Science Group has installed in July 1997 additional monitoring facilities at the Tsuen Wan and Central/Western stations to measure regularly the levels of Toxic Air Pollutants (TAPs) in Hong Kong. The TAPs being monitored can be broadly classified as volatile organic compounds (e.g. benzene, perchloroethylene and 1,3-butadiene), dioxins and furans (e.g. 2,3,7,8-TCDF and 2,3,7,8-TCDD), carbonyl compounds (e.g. formaldehyde), polycyclic aromatic hydrocarbons (e.g. benzo(a)pyrene), and hexavalent chromium. Five distinct methods were used to analyse the collected samples for target TAPs (please refer to Table B4 for details). All these methods have stringent QA/QC criteria to ensure the data quality. Sampling media used include stainless steel canisters, Sep-Pak cartridges, polyurethane foams and bicarbonate impregnated filters. TAP samples are analysed by the Government Laboratory.

Table B1. Fixed Network Monitoring Stations: Site Information

Monitoring Station	Address	Area Type	Sampling Height (Above P.D.H.K.)	Above Ground	Date Start Operation
Central/Western (Upper Level Police Station)	1 High Street, Sai Ying Pun	Urban : Mixed residential/commercial	78m	18m (4 floors)	Nov 83
Eastern (Sai Wan Ho Fire Station)	20 Wai Hang Street, Sai Wan Ho	Urban : Residential	28m	15m (4 floors)	Jan 99
Kwai Chung (Kwai Chung Police Station)	999 Kwai Chung Road, Kwai Chung	Urban : Mixed residential/ commercial/industrial	19m	13m (2 floors)	Jan 99
Kwun Tong (City District Office)	6 Tung Yan Street, Kwun Tong	Urban : Mixed residential/ commercial/industrial	34m	25m (6 floors)	Jul 83
Sham Shui Po (Police Station)	37A Yen Chow Street, Sham Shui Po	Urban : Mixed residential/commercial	21m	17m (4 floors)	Jul 84
Tsuen Wan (Princess Alexandra Community Centre)	60 Tai Ho Road, Tsuen Wan	Urban : Mixed residential/ commercial/industrial	21m	17m (4 floors)	Aug 88
Sha Tin (Sha Tin Govt. Secondary School)	11-17 Man Lai Road, Tai Wai, Sha Tin	New Town : Residential	27m	21m (5 floors)	Jul 91
Tai Po (Tai Po Govt. Office Bldg.)	1 Ting Kok Road, Tai Po	New Town : Residential	31m	25m (6 floors)	Feb 90
Tung Chung (Tung Chung Health Centre)	6 Fu Tung Street, Tung Chung	New Town : Residential	28m	21m (4 floors)	Apr 99
Yuen Long (Yuen Long District Branch Offices Bldg.)	269 Castle Peak Road Yuen Long	New Town : Residential	31m	25m (6 floors)	July 95
Tap Mun (Tap Mun Police Station)	Tap Mun	Background : Rural	26m	11m (3 floors)	Apr 98
Causeway Bay	1 Yee Woo Street, Causeway Bay	Urban Roadside : Busy commercial/residential area surrounded by many tall buildings	6.5m	3m	Jan 98
Central	Junction of Des Voeux Road Central and Chater Road, Central	Urban Roadside : Busy commercial/financial area surrounded by many tall buildings	8.5m	4.5m	Oct 98
Mong Kok	Junction of Nathan Road and Lai Chi Kok Road	Urban Roadside : Busy commercial/residential area surrounded by many tall buildings	8.5m	3m	Jan 01

Note: P.D. = Principal Datum

Table B2. Summary of the Parameters Monitored in the Network (2005)

	PARAMETERS									
STATIONS	SO_2	NO_x	NO	NO_2	CO	O_3	RSP		TSP	MET[3]
							Cont [1]	Hi-Vol [2]		
Central/Western	✓	✓	✓	✓		✓	✓	✓	✓	✓
Eastern	✓			✓		✓	✓			✓
Kwai Chung	✓	✓	✓	✓		✓	✓		✓	✓
Kwun Tong	✓	✓	✓	✓		✓	✓	✓	✓	✓
Sham Shui Po	✓	✓	✓	✓		✓	✓	✓	✓	✓
Tsuen Wan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sha Tin	✓	✓	✓	✓		✓	✓		✓	✓
Tai Po	✓			✓		✓	✓		✓	✓
Tung Chung	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Yuen Long	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tap Mun	✓	✓	✓	✓	✓	✓	✓			
Causeway Bay	✓	✓	✓	✓	✓		✓			
Central	✓	✓	✓	✓	✓		✓			
Mong Kok	✓	✓	✓	✓	✓		✓	✓	✓	✓

Note:
[1] "Cont" denotes continuous monitoring.
[2] "Hi-Vol" denotes high-volume sampling.
[3] "MET" denotes meteorological parameters such as temperature, wind speed, wind direction, etc.

Table B3 List of Equipment Used in Measuring Air Pollutant Concentration

Pollutants	**Measurement Principle**	**Commercial Instrument**
SO_2	UV fluorescence	TECO 43A API 100E
NO, NO_2, NO_x	Chemiluminescence	API 200A Monitor Laboratories 8840
O_3	UV absorption	API 400, API 400A
SO_2, NO_2, O_3	Differential Optical Absorption Spectroscopy	Opsis AR 500 System
CO	Non-dispersive infra-red absorption with gas filter correlation	TECO 48C, API 300
TSP	Gravimetric	General Metals 2310
RSP	a) Gravimetric b) Oscillating microbalance	Graseby Andersen PM10 R&P TEOM Series 1400a-AB-PM10

Table B4 Sampling and Analysis Methods Used in Measuring Toxic Air Pollutants

Toxic Air Pollutants	Sampling and Analysis method	Sampling Instrument	Sampling Media	Sampling Schedule	Sampling Period
Benzene	USEPA Method TO-14A	Xontech 910A / RM 910A	Canister	Twice per month	24 hours
Perchloroethylene	USEPA Method TO-14A	Xontech 910A / RM 910A	Canister	Twice per month	24 hours
1,3-Butadiene	USEPA Method TO-14A	Xontech 910A / RM 910A	Canister	Twice per month	24 hours
Formaldehyde	USEPA Method TO-11A	Xontech 925 / RM 925	DNPH coated silica gel cartridge	Once per month	24 hours
Benzo(a)pyrene	USEPA Method TO-13	Graseby GPS1 / Tisch TE-1000	Polyurethane Foam and XAD-2 resin	Once per month	24 hours
Dioxin	USEPA Method TO-9A	Graseby GPS1 / Tisch TE-1000	Polyurethane Foam	Once per month	24 hours
Hexavalent Chromium	CARB SOP MLD 039	Xontech 920	Bicarbonate Impregnated Filter	Once per month	24 hours

Figure B1: Accuracy of Air Quality Monitoring Network, 2005

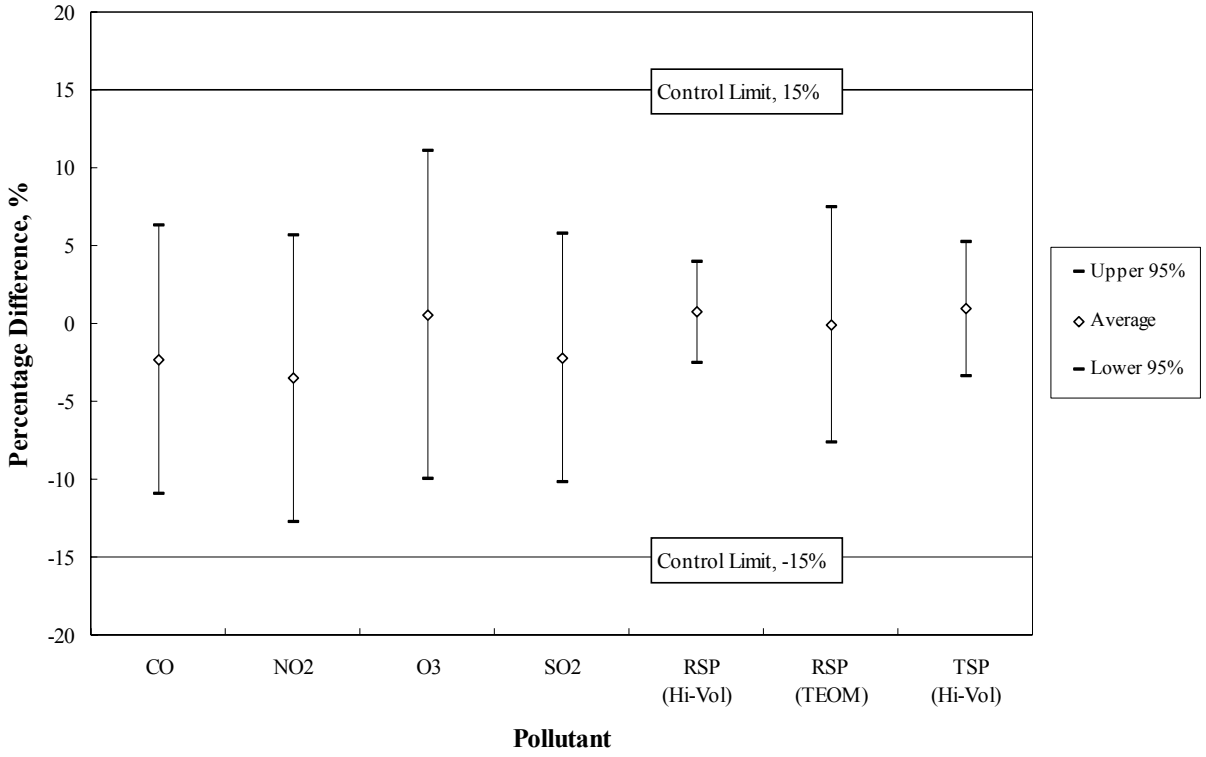
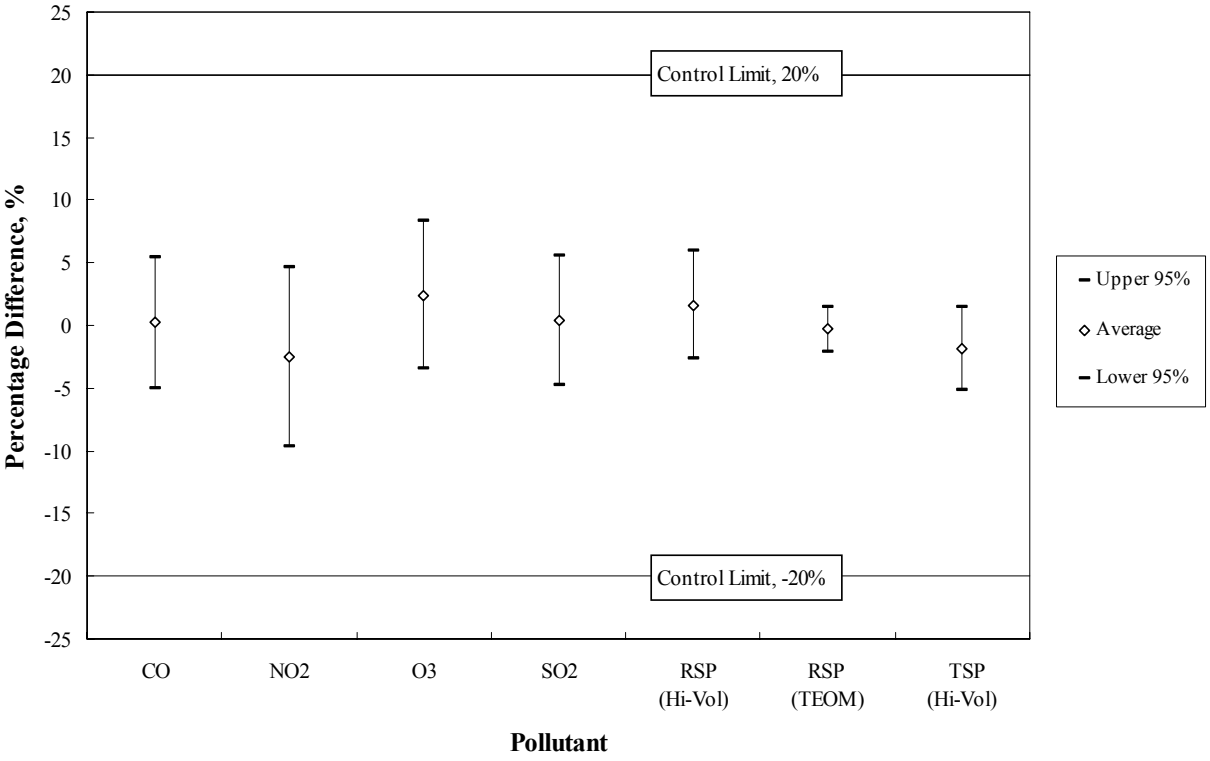


Figure B2: Precision of Air Quality Monitoring Network, 2005



Note: The Control Limits for RSP and TSP are ±10% for both Accuracy and Precision.

Appendix C

Tables of Air Quality Data

TABLE C1: THE HIGHEST 4 HOURLY POLLUTANT CONCENTRATIONS MEASURED IN 2005

Pollutant: Sulphur Dioxide *
(1-hour AQO = 800)

Station	1st High	2nd High	3rd High	4th High
Central / Western	321	319	309	290
Eastern	237	232	228	192
Kwai Chung	294	292	278	272
Kwun Tong	246	236	234	222
Sham Shui Po	375	298	288	277
Tsuen Wan	352	295	291	258
Sha Tin	246	213	208	205
Tai Po	247	240	226	222
Tung Chung	301	217	193	188
Yuen Long	395	364	358	342
Tap Mun	453	269	266	214
Causeway Bay	245	232	193	182
Central	447	334	322	321
Mong Kok	476	285	283	263

Pollutant: Nitrogen Oxides

Station	1st High	2nd High	3rd High	4th High
Central / Western	1290	1124	1080	1058
Kwai Chung	1615	1590	1502	1322
Kwun Tong	1170	1114	1110	1061
Sham Shui Po	1240	1116	1114	1090
Tsuen Wan	1611	1573	1449	1130
Sha Tin	811	745	671	656
Tung Chung	782	768	687	680
Yuen Long	882	741	735	729
Tap Mun	230	205	199	192
Causeway Bay	1472	1459	1420	1378
Central	2076	1904	1640	1627
Mong Kok	1401	1401	1293	1226

Pollutant: Nitric Oxide

Station	1st High	2nd High	3rd High	4th High
Central / Western	734	634	620	573
Kwai Chung	952	935	895	778
Kwun Tong	673	641	641	604
Sham Shui Po	691	621	618	617
Tsuen Wan	932	900	845	631
Sha Tin	455	415	368	358
Tung Chung	413	386	364	314
Yuen Long	440	432	392	388
Tap Mun	85	84	81	70
Causeway Bay	869	853	810	802
Central	1218	1115	944	943
Mong Kok	815	808	743	699

Note: 1. All concentration units are in micrograms per cubic metre.
2. Shaded 1-hour averages are above their respective AQO.
3. Only the asterisked pollutants have hourly AQO.

Pollutant: Nitrogen Dioxide *
(1-hour AQO = 300)

Station	1st High	2nd High	3rd High	4th High
Central / Western	309	307	293	253
Eastern	227	211	209	204
Kwai Chung	264	254	247	242
Kwun Tong	240	239	234	234
Sham Shui Po	245	233	230	227
Tsuen Wan	242	224	221	220
Sha Tin	250	239	218	214
Tai Po	221	207	195	180
Tung Chung	268	266	237	234
Yuen Long	245	242	240	238
Tap Mun	129	124	115	112
Causeway Bay	328	319	313	312
Central	345	344	338	327
Mong Kok	328	296	295	293

Pollutant: Carbon Monoxide *
(1-hour AQO = 30000)

Station	1st High	2nd High	3rd High	4th High
Tsuen Wan	3620	3280	3230	3190
Tung Chung	5730	5730	5370	5150
Yuen Long	4340	4110	4040	3910
Tap Mun	2350	2070	2050	2050
Causeway Bay	4710	3910	3910	3790
Central	4370	4370	4260	4260
Mong Kok	3680	3560	3450	3340

Pollutant: Ozone *
(1-hour AQO = 240)

Station	1st High	2nd High	3rd High	4th High
Central / Western	300	289	287	269
Eastern	184	174	157	156
Kwai Chung	224	216	201	194
Kwun Tong	265	217	208	207
Sham Shui Po	252	250	230	226
Tsuen Wan	270	250	237	225
Sha Tin	332	296	290	286
Tai Po	239	236	233	226
Tung Chung	357	309	309	301
Yuen Long	313	296	296	282
Tap Mun	365	353	331	327

Pollutant: Respirable Suspended Particulates

Station	1st High	2nd High	3rd High	4th High
Central / Western	268	265	254	252
Eastern	217	213	208	204
Kwai Chung	285	261	259	255
Kwun Tong	281	249	249	242
Sham Shui Po	233	232	224	222
Tsuen Wan	269	264	256	255
Sha Tin	244	224	224	213
Tai Po	256	221	212	207
Tung Chung	366	353	316	313
Yuen Long	354	312	303	290
Tap Mun	211	210	208	197
Causeway Bay	280	275	275	272
Central	270	266	258	245
Mong Kok	255	247	236	233

TABLE C2: THE HIGHEST 2 DAILY POLLUTANT CONCENTRATIONS MEASURED IN 2005

Pollutant: Sulphur Dioxide *
(24-hour AQO = 350)

Station	1st High	2nd High
Central / Western	113	108
Eastern	91	80
Kwai Chung	123	112
Kwun Tong	105	94
Sham Shui Po	123	109
Tsuen Wan	111	101
Sha Tin	88	87
Tai Po	105	104
Tung Chung	121	83
Yuen Long	138	131
Tap Mun	91	80
Causeway Bay	74	73
Central	97	93
Mong Kok	114	108

Pollutant: Nitrogen Dioxide *
(24-hour AQO = 150)

Station	1st High	2nd High
Central / Western	141	141
Eastern	113	106
Kwai Chung	139	137
Kwun Tong	123	122
Sham Shui Po	124	123
Tsuen Wan	141	123
Sha Tin	118	99
Tai Po	99	94
Tung Chung	147	130
Yuen Long	145	128
Tap Mun	56	46
Causeway Bay	195	163
Central	186	166
Mong Kok	179	156

Pollutant: Respirable Suspended Particulates *
(24-hour AQO = 180)

Station	1st High	2nd High
Central / Western	173	153
Eastern	142	138
Kwai Chung	154	154
Kwun Tong	153	148
Sham Shui Po	154	143
Tsuen Wan	170	157
Sha Tin	157	152
Tai Po	164	144
Tung Chung	217	173
Yuen Long	212	205
Tap Mun	137	134
Causeway Bay	191	176
Central	165	165
Mong Kok	163	160

Pollutant: Nitrogen Oxides

Station	1st High	2nd High
Central / Western	438	377
Kwai Chung	760	512
Kwun Tong	464	450
Sham Shui Po	394	389
Tsuen Wan	609	446
Sha Tin	304	269
Tung Chung	349	271
Yuen Long	353	338
Tap Mun	70	61
Causeway Bay	874	721
Central	848	843
Mong Kok	614	519

Pollutant: Nitric Oxide

Station	1st High	2nd High
Central / Western	220	183
Kwai Chung	439	266
Kwun Tong	237	233
Sham Shui Po	192	181
Tsuen Wan	329	243
Sha Tin	148	100
Tung Chung	153	126
Yuen Long	186	167
Tap Mun	18	15
Causeway Bay	497	377
Central	470	461
Mong Kok	310	273

Pollutant: Total Suspended Particulates *
(24-hour AQO = 260)

Station	1st High	2nd High
Central / Western	292	190
Kwai Chung	322	179
Kwun Tong	158	155
Sham Shui Po	206	204
Tsuen Wan	219	171
Sha Tin	147	142
Tai Po	179	143
Tung Chung	261	180
Yuen Long	252	222
Mong Kok	205	203

Pollutant: Ozone

Station	1st High	2nd High
Central / Western	127	116
Eastern	86	85
Kwai Chung	114	89
Kwun Tong	124	93
Sham Shui Po	109	96
Tsuen Wan	104	99
Sha Tin	166	136
Tai Po	119	103
Tung Chung	140	109
Yuen Long	133	130
Tap Mun	156	140

Pollutant: Carbon Monoxide *
(8-hour AQO = 10000)

Station	1st High	2nd High
Tsuen Wan	2684	2635
Tung Chung	4541	4401
Yuen Long	3810	3796
Tap Mun	1876	1876
Causeway Bay	3564	3549
Central	3693	3650
Mong Kok	3220	3191

Note: 1. *All concentration units are in micrograms per cubic metre.*
2. *Values for Carbon Monoxide are 8-hour averages.*
3. *Shaded 24-hour averages are above their respective AQO.*
4. *Only the asterisked pollutants have either 8-hour or 24-hour AQO.*

TABLE C3: 2005 MONTHLY AND ANNUAL AVERAGES OF GASEOUS POLLUTANTS

Pollutant: Sulphur Dioxide (Annual AQO = 80)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	24	15	15	18	26	20	25	24	31	19	20	23	22
Eastern	17	10	13	13	8	11	20	20	20	11	14	18	15
Kwai Chung	33	20	26	37	37	34	43	39	37	22	23	28	32
Kwun Tong	19	10	14	17	12	18	24	26	24	14	16	22	18
Sham Shui Po	28	17	16	26	28	17	28	27	34	20	20	27	24
Tsuen Wan	28	18	24	28	26	23	33	25	27	17	18	27	25
Sha Tin	23	12	17	21	19	12	24	22	28	19	16	21	20
Tai Po	17	10	14	15	16	16	30	26	26	17	16	23	19
Tung Chung	43	22	20	18	10	10	14	15	26	18	23	37	21
Yuen Long	41	26	27	26	17	20	29	32	32	25	27	36	28
Tap Mun	21	13	14	7	6	9	16	16	17	15	14	24	14
Causeway Bay	21	12	15	15 *	7 *	7	17	15	22	18	17	20	16
Central	32	24	29	27	16	18	27	30	26	20	22	29	25
Mong Kok	26	17	19	23	26	18	27	26	33	22	20	26	24

Pollutant: Nitrogen Oxides

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	145	127	125	103	78	65	75	70	90	77	92	98	95
Kwai Chung	196	183	182	175	169	182	159	159	127	112	142	151	161
Kwun Tong	175	141	127	126	118	130	117	132	110	98	112	122	126
Sham Shui Po	177	156	162	137	116	106	108	106	120	110	124	135	130
Tsuen Wan	177	167	182	146	120	118	108	106	98	89	111	142	130
Sha Tin	113	79	90	83	67	70	76	69	68	58	88	88	79
Tung Chung	140	103	80	68	43	41	48	44	66	63	88	112	75
Yuen Long	197	127	129	111	86	91	99	92	98	87	112	138	114
Tap Mun	33	27	27	18	11	17	18	20	17	16	13	18	20
Causeway Bay	437	414	431	366 *		366	377	377	347	328	361	402	383
Central	404	364	383	391	308	349	355	352	346	347	389	404	366
Mong Kok	365	348	353	315	315	309	277	285	297	310	320	332	319

Pollutant: Nitric Oxide

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	40	42	35	27	21	18	25	21	18	10	19	18	24
Kwai Chung	74	89	74	68	72	81	68	68	44	30	51	52	64
Kwun Tong	63	57	44	42	46	54	45	53	34	26	34	36	44
Sham Shui Po	59	60	53	42	40	38	44	40	36	25	35	37	42
Tsuen Wan	61	71	71	50	45	47	42	40	28	17	30	40	45
Sha Tin	35	27	28	24	21	24	27	23	17	12	28	25	24
Tung Chung	41	35	18	15	12	12	15	14	14	10	20	23	19
Yuen Long	71	48	43	34	25	32	38	33	29	19	34	37	37
Tap Mun	5	6	5	3	2	3	4	4	3	3	2	2	3
Causeway Bay	213	213	211	174 *		191	200	199	163	144	171	188	189
Central	189	179	180	187	152	178	184	179	159	148	181	185	175
Mong Kok	167	172	163	142	157	152	137	140	132	129	141	141	148

Pollutant: Nitrogen Dioxide (Annual AQO = 80)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	84	62	71	62	46	37	37	39	62	61	62	71	58
Eastern	73	58	69	63	45	40	41	42	54	55	60	64	56
Kwai Chung	83	47	70	72	59	57	55	54	60	65	64	71	63
Kwun Tong	80	54	60	62	48	48	49	52	58	58	60	68	58
Sham Shui Po	87	65	80	73	54	47	42	44	66	72	70	78	65
Tsuen Wan	83	58	73	69	51	47	43	45	55	63	66	80	61
Sha Tin	60	38	47	46	34	33	34	34	41	40	44	50	42
Tai Po	59	44	56	52	43	44	43	42	46	49	52	60	49
Tung Chung	78	50	53	45	26	22	25	23	44	48	57	77	46
Yuen Long	88	53	64	59	48	42	41	41	53	58	61	81	58
Tap Mun	25	19	19	12	9	12	13	14	12	12	10	15	14
Causeway Bay	110	88	109	101 *		75	71	72	97	108	100	114	95
Central	115	90	107	105	76	78	74	78	103	121	113	121	99
Mong Kok	110	85	105	98	75	76	69	70	96	112	104	117	93

Pollutant: Carbon Monoxide

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Tsuen Wan	750	760	870	730	500	360	460	550	530	880	750	770	660
Tung Chung	1470	1510	900	1110	540	680	600	730	620	910	920	1090	923
Yuen Long	1570	1330	1250	930	660	580	670	750	890	1120	1120	1500	1038
Tap Mun	1190	1240	840	950	400	440	550	690	810	650	590	790	759
Causeway Bay	1280	1400	1040	1140 *		950	740	970	920	1140	1090	1270	1088
Central	1330	1670	1240	1400	1120	980	920	630	830	1110	930	1030	1098
Mong Kok	1260	1180	800	1150	650	590	510	580	880	1060	1040	1340	917

Pollutant: Ozone

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	33	23	37	37	27	31	27	29	41	61	42	44	36
Eastern	27	17	34	34	30	28	24	23	36	52	36	32	31
Kwai Chung	23	10	27	29	19	15	11	16	30	46	26	18	23
Kwun Tong	33	22	39	36	22	19	15	17	36	49	38	43	31
Sham Shui Po	24	18	25	28	19	18	17	15	30	47	29	35	25
Tsuen Wan	21	17	26	25	19	19	17	16	31	47	28	31	25
Sha Tin	41	34	46	46	34	30	24	25	45	67	44	52	40
Tai Po	33	26	40	40	29	24	20	25	40	52	36	41	34
Tung Chung	27	25	38	41	37	35	34	34	44	56	40	43	38
Yuen Long	21	22	31	35	28	29	22	28	39	59	33	35	32
Tap Mun	71	51	40 *		85 *	51	47	48	72	95	75	80	66

Notes:

1. All units are in micrograms per cubic metre.

2. Asterisked values are below their respective minimum data requirement of 66% for number of data within the period.

3. Shaded monthly averages are below the minimum data requirements for number of data within a quarter.

4. Shaded annual averages are above their respective AQO.

TABLE C4: 2005 MONTHLY AND ANNUAL AVERAGES OF PARTICULATE POLLUTANTS

Pollutant: Total Suspended Particulates (Annual AQO = 80)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	130	81	100	128	31	33	35	34	66	94	112	162	81
Kwai Chung	103	75	77	64	48	49	53	45	78	105	88	164	79
Kwun Tong	123	81	103	80	38	43	49	59	77	80	93	136	81
Sham Shui Po	150	92	94	109	37	42	42	42	72	90	108	107	83
Tsuen Wan	130	67	82	88	52	44	56	66	75	112	84	138	83
Sha Tin	107	62	67	67	33	31	28	31	66	89	93	110	66
Tai Po	106	81	87	64	43	30	33	33	73				61
Tung Chung	102	51	61	52	28	21	23	30	68	91	77	161	65
Yuen Long	178	107	91	106	52	41	69	82	109	130	118	200	104
Mong Kok	169	109	122	108	66	64	58	68	112	140	147	171	112

Pollutant: Respirable Suspended Particulates (Annual AQO = 55)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	84	50	63	62	31	27	28	32	59	71	63	78	54
Eastern	73	45	59	57	28	24	26	29	53	64	58	67	49
Kwai Chung	86	52	62	64	40	40	38	41	60	74	65	77	58
Kwun Tong	78	42	63	63	36	35	34	39	63	72	67	77	56
Sham Shui Po	84	52	62	63	34	31	32	35	60	72	65	79	56
Tsuen Wan	92	54	65	65	37	34	35	37	59	73	63	80	58
Sha Tin	78	46	55	55	30	28	33	34	56	75	68	79	53
Tai Po	77	47	55	54	29	27	30	34	50	74	64	81	51
Tung Chung	104	58	55	54	27	25	28	31	59	77	68	96	57
Yuen Long	116	60	65	63	31	28	33	38	59	82	73	97	62
Tap Mun	74	43	55	50	28	27	30	32	51	68	61	77	50
Causeway Bay	107	72	84	90	66	64	69	67	93	100	93	101	84
Central	94	65	80	80	49	48	52	54	78	86	86	92	72
Mong Kok	91	60	77	76	49	47	48	50	75	85	78	86	69

Notes:

1. All units are in micrograms per cubic metre.

2. Asterisked values are below their respective minimum data requirement of 66% for number of data within the period.

3. Shaded monthly averages are below the minimum data requirements for number of data within a quater.

4. Shaded annual averages are above their respective AQO.

TABLE C5: 2005 HOURLY STATISTICS OF MAJOR AIR POLLUTANTS

Pollutant: Sulphur Dioxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8601	98.2	5	7	12	23	49	76	112	139	14	22	321	113
Eastern	7996	91.3	4	6	10	16	26	40	70	96	11	15	237	91
Kwai Chung	8605	98.2	8	11	19	39	75	100	137	162	21	32	294	123
Kwun Tong	8608	98.3	5	7	11	19	34	57	102	137	12	18	246	105
Sham Shui Po	8687	99.2	5	8	15	26	53	85	127	152	15	24	375	123
Tsuen Wan	8627	98.5	6	8	15	30	55	74	109	135	16	25	352	111
Sha Tin	8640	98.6	4	8	13	23	41	63	95	118	13	20	246	88
Tai Po	8179	93.4	6	8	12	20	35	55	101	134	13	19	247	105
Tung Chung	8407	96.0	5	7	13	26	49	69	103	122	14	21	301	121
Yuen Long	8426	96.2	10	13	20	32	50	73	119	174	21	28	395	138
Tap Mun	8454	96.5	4	5	8	17	30	43	69	90	10	14	453	91
Causeway Bay	7466	85.2	4	7	12	19	30	43	69	91	12	16	245	74
Central	8559	97.7	7	11	19	30	46	71	102	133	18	25	447	97
Mong Kok	8571	97.8	9	12	17	25	42	66	100	130	19	24	476	114

Pollutant: Nitrogen Oxides

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8590	98.1	27	44	74	113	179	236	361	491	71	95	1290	438
Kwai Chung	8637	98.6	50	86	137	204	292	358	472	568	129	161	1615	760
Kwun Tong	8605	98.2	38	72	110	160	220	269	346	417	102	126	1170	464
Sham Shui Po	8687	99.2	41	77	116	159	216	271	374	507	106	130	1240	394
Tsuen Wan	8628	98.5	40	75	110	156	228	306	423	525	104	130	1611	609
Sha Tin	8614	98.3	18	29	54	101	172	237	314	368	54	79	811	304
Tung Chung	8401	95.9	15	28	53	100	164	211	272	312	51	75	782	349
Yuen Long	8427	96.2	44	64	93	138	209	272	353	432	94	114	882	353
Tap Mun	8435	96.3	6	8	14	24	40	55	73	89	15	20	230	70
Causeway Bay	7406	84.5	156	251	361	485	622	730	890	987	336	383	1472	874
Central	8552	97.6	123	205	342	483	636	744	876	1006	306	366	2076	848
Mong Kok	8578	97.9	145	238	321	392	464	511	582	649	292	319	1401	614

Pollutant: Nitric Oxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8590	98.1	1	3	10	25	59	96	162	240	10	24	734	220
Kwai Chung	8637	98.6	9	23	47	85	136	173	246	312	41	64	952	439
Kwun Tong	8605	98.2	6	16	33	57	90	121	165	208	28	44	673	237
Sham Shui Po	8687	99.2	5	16	32	52	83	113	175	248	27	42	691	192
Tsuen Wan	8628	98.5	5	15	31	56	94	136	209	272	27	45	932	329
Sha Tin	8614	98.3	2	3	9	28	67	103	145	185	11	24	455	148
Tung Chung	8401	95.9	2	4	8	22	51	76	111	140	10	19	413	153
Yuen Long	8427	96.2	7	12	24	46	81	112	162	211	24	37	440	186
Tap Mun	8435	96.3	1	2	3	4	5	9	15	23	3	3	85	18
Causeway Bay	7406	84.5	61	109	170	248	330	399	493	545	155	189	869	497
Central	8552	97.6	41	83	156	239	330	396	483	562	133	175	1218	470
Mong Kok	8578	97.9	54	100	146	189	233	261	305	344	129	148	815	310

Pollutant: Nitrogen Dioxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8590	98.1	21	33	54	76	99	117	142	158	49	58	309	141
Eastern	7996	91.3	25	36	54	71	87	99	114	123	50	56	227	113
Kwai Chung	8637	98.6	31	42	58	77	102	124	156	178	56	63	264	139
Kwun Tong	8605	98.2	25	38	54	73	93	110	134	159	51	58	240	123
Sham Shui Po	8687	99.2	27	39	61	85	106	122	145	160	57	65	245	124
Tsuen Wan	8628	98.5	27	38	56	77	103	122	150	170	53	61	242	141
Sha Tin	8614	98.3	13	21	35	55	79	97	118	137	33	42	250	118
Tai Po	8179	93.4	23	32	44	61	81	95	115	126	43	49	221	99
Tung Chung	8401	95.9	9	19	39	63	92	112	139	160	33	46	268	147
Yuen Long	8427	96.2	26	36	51	72	97	116	142	165	51	58	245	145
Tap Mun	8435	96.3	3	5	10	18	32	42	54	65	10	14	129	56
Causeway Bay	7406	84.5	52	68	92	118	141	156	180	205	88	95	328	195
Central	8552	97.6	48	66	93	124	155	173	201	224	89	99	345	186
Mong Kok	8578	97.9	51	65	88	116	142	159	180	200	86	93	328	179

Pollutant: Carbon Monoxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 8 hour
			10	25	50	75	90	95	98	99				
Tsuen Wan	8595	98.1	300	440	610	840	1060	1210	1460	1660	582	660	3620	2684
Tung Chung	8474	96.7	480	620	830	1120	1430	1740	2230	2620	828	923	5730	4541
Yuen Long	8392	95.8	540	690	940	1290	1620	1900	2250	2620	941	1038	4340	3810
Tap Mun	8391	95.8	400	490	680	950	1210	1400	1660	1740	694	759	2350	1876
Causeway Bay	7123	81.3	580	800	1030	1270	1610	1960	2410	2640	1003	1088	4710	3564
Central	8510	97.1	460	690	1030	1380	1840	2070	2410	2760	975	1098	4370	3693
Mong Kok	8577	97.9	350	580	920	1150	1490	1610	1840	2070	813	917	3680	3220

Pollutant: Ozone

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8573	97.9	5	12	28	52	79	95	114	134	24	36	300	127
Eastern	7996	91.3	10	17	27	42	58	68	79	87	25	31	184	86
Kwai Chung	8577	97.9	3	6	14	32	54	70	89	104	14	23	224	114
Kwun Tong	8506	97.1	5	10	24	45	67	82	95	107	20	31	265	124
Sham Shui Po	8642	98.7	4	7	17	35	58	74	96	114	16	25	252	109
Tsuen Wan	8531	97.4	5	7	16	34	57	72	93	113	16	25	270	104
Sha Tin	8596	98.1	3	8	29	63	97	114	134	152	22	40	332	166
Tai Po	8179	93.4	4	10	25	49	75	91	110	123	21	34	239	119
Tung Chung	8461	96.6	4	13	31	52	79	99	135	177	24	38	357	140
Yuen Long	8371	95.6	5	9	21	43	73	95	130	159	21	32	313	133
Tap Mun	6420	73.3	19	36	57	90	121	139	164	190	51	66	365	156

Pollutant: Respirable Suspended Particulates (Continuous monitoring)

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8551	97.6	17	27	45	74	103	122	143	162	43	54	268	173
Eastern	8640	98.6	16	24	41	67	94	110	130	144	39	49	217	142
Kwai Chung	8649	98.7	24	34	50	75	105	127	153	169	50	58	285	154
Kwun Tong	8347	95.3	22	31	47	74	104	121	140	156	48	56	281	153
Sham Shui Po	8693	99.2	21	30	48	75	104	122	141	155	47	56	233	154
Tsuen Wan	8615	98.3	23	32	48	75	107	128	153	171	49	58	269	170
Sha Tin	8619	98.4	19	27	44	71	100	120	145	160	43	53	244	157
Tai Po	8209	93.7	17	26	41	68	99	117	142	156	41	51	256	164
Tung Chung	8599	98.2	17	25	42	77	116	148	182	206	44	57	366	217
Yuen Long	8420	96.1	20	30	51	83	120	146	184	217	50	62	354	212
Tap Mun	8415	96.1	17	26	41	67	96	113	130	142	41	50	211	137
Causeway Bay	8304	94.8	40	58	79	103	131	152	179	198	75	84	280	191
Central	8549	97.6	32	45	65	92	121	142	165	180	63	72	270	165
Mong Kok	8587	98.0	30	43	62	88	117	136	158	173	60	69	255	163

Note: *1. All concentration units are in micrograms per cubic metre.*
2. Annual averages calculated from less than 8 representative months are not published.

TABLE C6: 2005 TOTAL WET AND DRY DEPOSITION

(a) WET DEPOSITION

	Monitoring Station	Central / Western	Kwun Tong	Yuen Long
	WET DEPOSITION (TON/HA)	32675	32225	19769
	WEIGHTED MEAN pH (based on volume-weighted mean hydrogen ion concentrations ($[H^+]$)	4.68	4.55	4.50
	WEIGHTED MEAN pH (based on volume-weighted mean pH)	4.91	4.71	4.65
	NO. OF SAMPLES	103	115	91
Filtrate (Kg/Ha)	**NH_4^+**	8.09	9.95	7.44
	NO_3^-	19.00	22.94	17.13
	$SO_4^=$	45.53	55.13	38.59
	Cl^-	33.96	40.14	11.88
	F-	1.09	1.12	0.79
	Na^+	15.85	20.96	6.79
	K^+	8.11	8.12	4.88
	Formate	7.47	7.69	4.18
	Acetate	6.86	6.77	4.11
	Ca^{++}	6.06	3.45	2.89
	Mg^{++}	2.23	2.71	0.98

(b) DRY DEPOSITION

	Monitoring Station	Central / Western	Kwun Tong	Yuen Long
	NO. OF SAMPLES	26	26	26
Filtrate (Kg/Ha)	**NH_4^+**	0.50	0.80	0.92
	NO_3^-	11.53	12.13	9.44
	$SO_4^=$	14.12	10.87	14.66
	Cl^-	14.83	10.92	5.59
	F-	0.193	0.186	0.294
	Na^+	9.27	6.78	3.30
	K^+	1.04	0.74	0.70
	Formate	0.20	0.19	0.19
	Acetate	0.20	0.19	0.19
	Ca^{++}	9.17	7.24	9.09
	Mg^{++}	1.31	1.03	0.68

** Note: The weighted mean pH is calculated from the pH values measured by the Government Laboratory.*

TABLE C7: 2005 DIURNAL VARIATIONS OF AIR POLLUTANTS

Pollutant: Sulphur Dioxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	17	16	16	18	17	17	18	20	23	24	25	25	27	26	28	26	24	23	22	22	23	22	20	18
Eastern	14	13	13	13	11	12	13	16	16	15	16	18	16	16	15	15	14	15	15	15	16	17	15	14
Kwai Chung	25	25	25	24	21	21	23	27	31	33	35	36	37	39	40	41	43	42	40	37	32	30	28	26
Kwun Tong	15	14	13	13	13	14	15	17	20	20	21	22	21	22	23	23	22	21	20	19	18	17	17	16
Sham Shui Po	21	19	19	21	20	21	22	23	24	24	25	26	28	28	27	27	26	26	26	26	26	24	23	22
Tsuen Wan	19	17	16	17	17	17	18	21	25	27	28	31	30	31	33	32	34	33	29	27	25	23	21	20
Sha Tin	15	15	14	14	14	14	15	17	20	22	23	22	23	23	24	25	25	26	25	23	20	18	18	17
Tai Po	14	14	14	14	14	15	16	18	20	21	22	22	22	22	22	22	22	22	22	22	20	18	17	16
Tung Chung	17	17	17	18	18	17	17	17	20	24	25	26	26	27	28	28	26	25	22	21	20	20	19	19
Yuen Long	21	21	21	22	21	21	22	24	30	33	34	36	36	36	34	36	38	34	31	29	27	25	24	23
Tap Mun	12	12	11	13	13	13	13	15	19	21	21	20	18	17	16	15	14	13	12	12	11	11	12	12
Causeway Bay	12	13	12	13	13	13	14	17	21	21	20	19	19	20	22	20	19	17	15	15	15	14	13	13
Central	19	18	17	19	17	17	19	24	33	32	30	32	30	30	30	30	29	28	27	25	27	25	23	21
Mong Kok	20	19	19	20	20	20	21	22	24	25	26	27	28	28	28	28	28	26	26	25	25	24	21	21

Pollutant: Nitrogen Oxides

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	91	68	59	51	48	47	62	94	124	124	113	101	93	93	96	98	105	110	120	129	128	121	112	103
Kwai Chung	132	102	88	79	74	83	130	184	217	205	183	170	168	167	179	188	201	209	220	210	183	170	167	158
Kwun Tong	111	75	63	55	52	62	111	158	178	164	144	134	125	126	132	138	150	167	174	165	140	130	134	128
Sham Shui Po	118	84	73	65	61	68	107	149	170	163	144	136	132	130	133	140	148	157	167	168	159	149	150	141
Tsuen Wan	115	78	63	56	55	63	103	143	171	172	156	148	138	137	141	142	156	167	174	169	155	145	143	138
Sha Tin	91	71	61	54	49	52	77	106	104	87	75	63	56	54	59	63	70	79	94	106	107	104	106	102
Tung Chung	79	61	51	49	48	54	71	85	88	84	83	81	73	73	73	71	72	75	88	90	89	87	86	85
Yuen Long	119	97	84	70	66	73	111	148	140	122	110	100	94	95	95	103	118	131	145	151	142	143	142	135
Tap Mun	20	19	18	19	19	20	21	23	25	26	25	22	18	17	17	17	17	17	18	18	17	18	20	20
Causeway Bay	325	243	226	194	179	177	280	436	499	493	448	420	403	424	421	434	433	457	478	462	454	439	457	408
Central	297	211	183	156	155	151	231	362	520	502	451	433	403	404	411	437	439	470	496	476	448	412	392	361
Mong Kok	309	206	190	164	152	144	257	356	388	386	345	321	323	335	359	363	387	416	423	380	342	346	375	372

Pollutant: Nitric Oxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	23	15	13	11	10	10	14	27	41	40	34	27	23	21	21	21	23	24	28	34	35	34	31	28
Kwai Chung	52	38	31	27	24	30	54	82	100	91	77	68	65	62	66	70	76	81	88	85	72	68	68	64
Kwun Tong	38	23	19	16	14	18	41	65	76	68	56	49	42	42	43	44	49	57	61	58	48	44	47	45
Sham Shui Po	38	24	21	18	16	19	35	56	67	63	52	46	42	39	40	41	44	47	52	54	52	49	51	48
Tsuen Wan	40	23	17	15	14	18	35	56	72	71	61	56	48	44	44	44	49	55	59	59	54	50	51	50
Sha Tin	32	23	19	16	14	15	27	41	39	30	23	18	14	14	15	15	15	17	23	31	34	34	37	36
Tung Chung	23	15	12	11	11	14	22	29	29	26	24	22	18	16	14	13	12	13	18	20	21	22	24	25
Yuen Long	41	31	26	20	20	22	42	61	55	43	36	31	27	26	25	26	30	36	43	48	46	49	50	48
Tap Mun	3	3	3	3	3	3	4	5	5	5	5	4	4	3	3	3	3	3	3	3	3	3	3	3
Causeway Bay	157	112	103	87	80	79	136	226	262	256	228	207	195	204	201	207	207	223	236	230	226	220	232	205
Central	139	92	78	64	63	61	104	179	271	258	224	208	189	187	189	204	206	226	243	233	221	202	192	176
Mong Kok	147	89	81	67	60	56	120	178	195	191	163	146	144	147	160	161	176	195	200	178	158	163	182	182

Pollutant: Nitrogen Dioxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	55	45	39	35	33	33	40	53	61	63	62	60	58	60	63	65	70	73	77	78	75	69	65	60
Eastern	53	44	38	35	33	36	48	58	60	58	56	56	55	56	58	62	69	71	71	69	67	64	60	58
Kwai Chung	53	45	40	37	36	38	48	59	65	66	66	67	69	73	78	82	85	85	85	80	72	67	63	60
Kwun Tong	53	40	35	32	30	34	49	59	62	61	59	60	60	62	66	70	75	80	80	76	67	63	62	59
Sham Shui Po	60	46	41	38	37	38	53	63	67	66	65	66	67	70	73	77	81	85	88	85	79	74	71	67
Tsuen Wan	55	43	37	34	33	36	48	57	61	63	62	63	65	69	73	75	81	83	84	79	73	68	65	62
Sha Tin	42	36	31	29	27	29	37	43	45	42	40	36	34	34	37	41	47	53	58	59	56	52	50	47
Tai Po	49	42	37	34	33	34	44	52	52	48	43	41	41	41	42	45	53	62	70	69	64	61	58	54
Tung Chung	44	37	33	32	30	33	37	40	43	45	46	47	46	48	51	51	53	55	61	59	56	52	49	47
Yuen Long	56	49	44	38	36	39	47	54	56	56	55	53	53	56	58	64	72	77	80	78	71	68	65	61
Tap Mun	16	15	13	14	15	15	15	16	17	17	17	15	13	12	12	12	12	13	14	14	13	14	15	16
Causeway Bay	85	71	68	61	58	57	71	91	99	102	99	103	105	113	115	118	116	117	117	110	108	102	102	95
Central	85	70	65	58	58	57	72	88	106	108	109	115	114	117	122	126	124	125	124	119	111	104	99	93
Mong Kok	85	70	66	61	60	59	74	85	90	94	95	98	104	110	115	117	118	119	117	108	100	98	97	94

Pollutant: Carbon Monoxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Tsuen Wan	630	580	550	520	530	540	600	670	730	730	700	660	650	650	660	660	680	700	750	770	760	740	710	680
Tung Chung	890	870	870	880	880	890	900	920	940	940	950	960	960	970	960	950	930	920	940	940	940	930	920	910
Yuen Long	1030	990	980	930	930	930	980	1070	1090	1050	1030	1000	990	990	980	1000	1020	1060	1120	1160	1150	1150	1150	1110
Tap Mun	740	740	740	750	750	760	780	790	790	790	780	770	770	760	760	750	750	750	750	750	750	750	750	750
Causeway Bay	1280	1300	1260	1110	1020	910	820	860	980	1050	1060	1040	1030	1060	1040	1080	1070	1080	1150	1200	1220	1190	1170	1150
Central	1060	900	790	710	690	670	720	840	1050	1240	1290	1210	1180	1260	1250	1270	1190	1280	1340	1300	1430	1370	1210	1150
Mong Kok	930	970	920	810	850	870	890	860	900	910	860	860	840	850	910	960	960	950	1010	1030	1000	990	970	920

Pollutant: Ozone

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	31	38	41	45	45	44	36	26	22	24	31	39	48	52	53	50	43	37	30	26	25	27	27	28
Eastern	28	32	35	36	36	33	26	20	21	25	30	35	40	43	42	40	36	32	30	28	27	26	26	27
Kwai Chung	21	28	29	30	30	28	20	15	14	16	21	26	30	32	31	28	24	20	17	16	17	18	18	18
Kwun Tong	28	37	39	41	41	37	24	18	18	22	29	34	41	43	42	40	34	27	23	22	25	26	24	25
Sham Shui Po	21	30	33	35	35	32	20	14	14	18	24	31	36	39	39	36	29	22	16	15	17	17	17	17
Tsuen Wan	19	29	32	33	33	29	19	15	15	19	24	30	35	38	38	37	30	23	17	16	16	16	16	16
Sha Tin	30	35	37	38	37	34	27	23	26	33	42	54	64	69	67	64	56	46	37	32	31	30	29	29
Tai Po	25	27	29	30	30	28	21	18	22	29	38	48	54	59	59	56	49	38	28	25	24	24	23	23
Tung Chung	28	33	34	35	35	31	27	25	26	30	36	44	54	62	66	66	60	49	36	30	28	28	27	27
Yuen Long	20	25	27	29	30	26	21	18	20	27	36	47	58	63	63	58	48	36	25	21	21	19	18	19
Tap Mun	51	51	51	50	48	46	45	45	49	55	64	76	89	95	97	96	93	88	81	73	67	62	58	54

Pollutant: Respirable Suspended Particulates (Continuous Monitoring)

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	48	46	46	46	45	45	47	50	54	57	57	56	56	57	61	61	61	61	60	61	60	56	53	50
Eastern	45	44	43	43	44	44	45	47	49	50	50	49	51	49	51	53	53	54	54	54	53	51	48	46
Kwai Chung	50	48	47	47	47	49	52	56	60	60	59	57	59	61	64	67	72	72	71	70	66	61	57	53
Kwun Tong	50	48	47	47	47	48	51	55	59	59	59	58	58	59	61	62	63	63	64	65	61	58	55	52
Sham Shui Po	50	48	47	47	46	47	50	54	56	57	57	56	57	59	60	61	63	64	65	66	63	58	55	52
Tsuen Wan	51	48	47	47	46	47	50	54	58	60	61	62	60	63	66	67	69	70	68	66	64	59	56	53
Sha Tin	50	48	47	46	46	47	49	52	53	53	53	53	52	54	55	56	58	59	59	60	58	57	54	52
Tai Po	48	46	45	45	45	45	48	51	52	52	51	51	50	52	53	53	55	56	56	57	55	53	51	50
Tung Chung	51	49	48	48	48	50	50	52	55	57	59	62	62	68	70	69	67	64	62	60	58	56	54	52
Yuen Long	55	53	52	51	52	53	56	61	65	67	67	66	65	68	68	69	72	70	71	70	67	64	61	58
Tap Mun	46	45	45	45	45	47	49	50	52	53	54	53	53	54	54	54	53	52	51	51	49	48	47	47
Causeway Bay	72	59	56	54	54	54	65	79	88	92	90	89	85	94	94	97	101	102	106	106	103	93	90	83
Central	62	56	55	54	55	57	63	71	81	81	77	75	73	74	79	81	83	85	85	84	81	76	71	67
Mong Kok	59	51	50	50	50	52	58	67	71	73	72	70	70	76	79	79	81	82	84	84	80	75	70	64

Note: All concentration units are in micrograms per cubic metre.

TABLE C8: 2005 AMBIENT LEVELS OF TOXIC AIR POLLUTANTS

Toxic Air Pollutants	Concentration Unit	Annual Averages [1]	
		Tsuen Wan	Central/Western
Heavy Metals [2]			
Hexavalent chromium	ng/m^3	0.13	0.17
Lead	ng/m^3	69	63
Organic Substances			
Benzene	$\mu g/m^3$	3.34	2.68
Benzo[a]pyrene	ng/m^3	0.42	0.24
1,3-Butadiene	$\mu g/m^3$	0.24	0.20
Formaldehyde	$\mu g/m^3$	5.62	4.92
Perchloroethylene	$\mu g/m^3$	1.09	2.12
Dioxins [3]	$pgI\text{-}TEQ/m^3$	0.071	0.082

Note:

[1] For TAP concentrations that are lower than the method detection limit (MDL), one half of the MDL is used in calculating the annual averages.

[2] For lead the reported figures are the respective 2005 annual average concentrations in the elemental analysis of total suspended particulates.

[3] The ambient level of dioxins is expressed here as toxic equivalent (I-TEQ) concentration of 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) based on the International Toxic Equivalent Factors (I-TEF) of the North Atlantic Treaty Organisation (NATO/CCMS), 1988.

Appendix D

Monitoring Results of Sulphur Dioxide and Nitrogen Dioxide by HEC and CLP

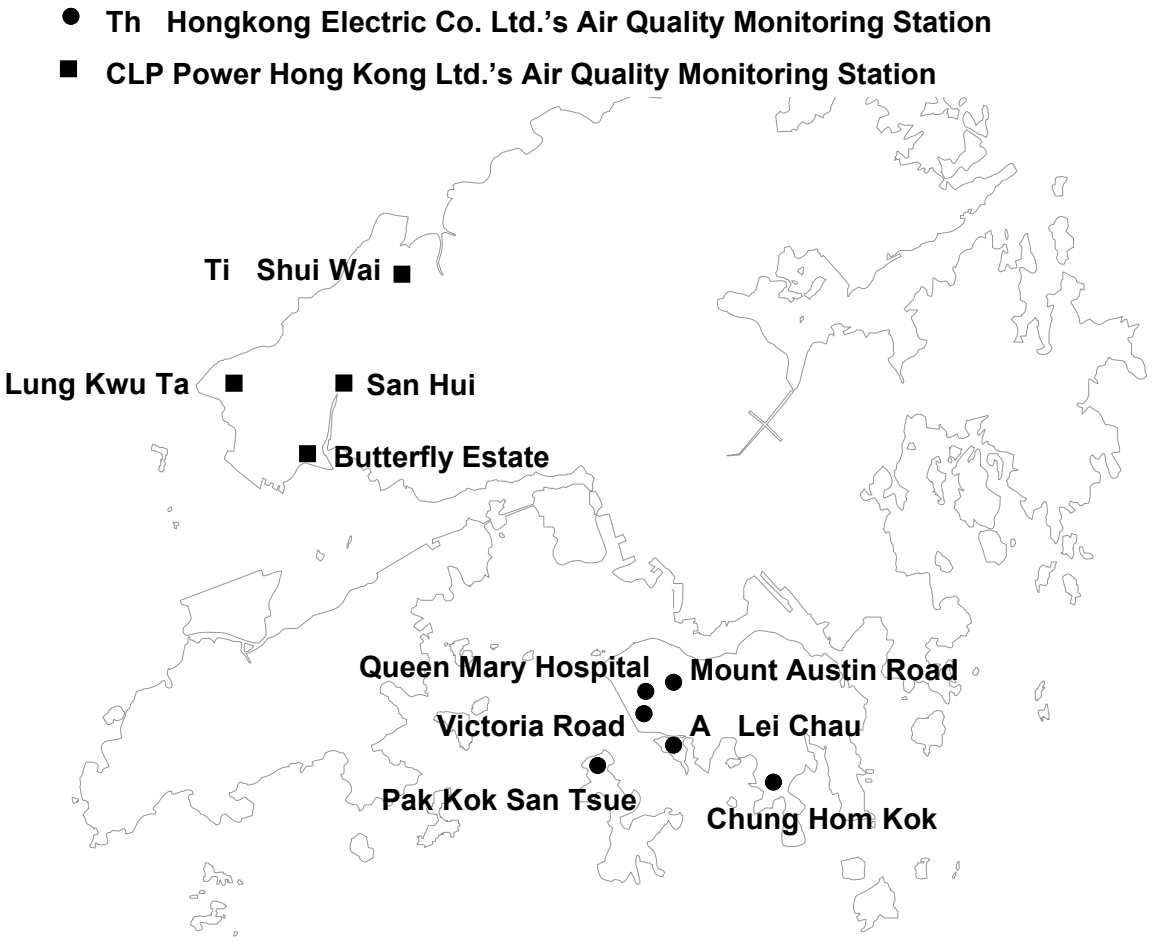


Figure D1 Location of HEC's & CLP's Air Quality Monitoring Stations for Sulphur Dioxide and Nitrogen Dioxide

D.1 The Hongkong Electric Co. Ltd. (HEC)

Air Quality Monitoring Stations	Annual Mean Concentration [1]	Range of Monthly Mean Concentration [1]
Sulphur Dioxide (SO_2) [2]		
Mount Austin Road	21	12 - 31
Chung Hom Kok	12	5 - 22
Victoria Road	18	11 - 27
Queen Mary Hospital	14	12 - 20
Ap Lei Chau	7	2 - 17
Pak Kok San Tsuen	14	8 - 21
Nitrogen Dioxide (NO_2) [3]		
Mount Austin Road	23	9 - 38
Chung Hom Kok	14	5 - 28
Victoria Road	37	24 - 57
Queen Mary Hospital	29	12 - 51
Ap Lei Chau	16	6 - 35
Pak Kok San Tsuen	24	11 - 40

D.2 CLP Power Hong Kong Ltd. (CLP)

Air Quality Monitoring Station	Annual Mean Concentration [1]	Range of Monthly Mean Concentration [1]
Sulphur Dioxide (SO_2) [2]		
San Hui	36	28 - 49
Tin Shui Wai	32	25 - 40
Butterfly Estate	13	3 - 29
Lung Kwu Tan	12	2 - 37
Nitrogen Dioxide (NO_2) [3]		
San Hui	57	31 - 101
Tin Shui Wai	24	13 - 44
Butterfly Estate	38	20 - 58
Lung Kwu Tan	36	20 - 68

Notes:

[1] All concentration units are in micrograms per cubic metre.

[2] There was no exceedance of AQO level for sulphur dioxide.

[3] There was no exceedance of AQO level for nitrogen dioxide.