

**Guangdong-Hong Kong-Macao
Pearl River Delta
Regional Air Quality Monitoring Network**

January to March 2019

**Statistical Summary of the First Quarter
Monitoring Results**

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Report Prepared by : **Guangdong Provincial Environmental
Monitoring Centre
Environmental Protection Department,
Hong Kong SARG
Environmental Protection Bureau,
Macao SARG
Meteorological and Geophysical Bureau,
Macao SARG**

Approved by : **Quality Management Committee of
Guangdong-Hong Kong-Macao Pearl River
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Network**

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1. Foreword

Since the Pearl River Delta (PRD) Regional Air Quality Monitoring Network came into operation on 30 November 2005, the PRD Regional Air Quality Index (RAQI) was reported to the public on a daily basis. Starting from 2006, half-yearly and annual air quality monitoring reports were also published every year. The network was subsequently enhanced and expanded in September 2014 and renamed to “Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network” (the “Network”).

To cope with the enhancement of the network, the update of the national ambient air quality standards as well as the need for improving the reporting frequency of monitoring results, starting from 2014, the real-time hourly monitoring data was reported on a new internet platform to replace the daily RAQI, the half-yearly report was also replaced by a quarterly report while the annual air quality monitoring report was maintained. The quarterly report is a brief statistical summary of the regional air quality monitoring results in a quarter. The annual report, in addition to the reporting of the monitoring data, provides a more detailed analysis and comparison of the air quality in the year. From the fourth quarter of 2014, the statistical results of carbon monoxide (CO) and fine suspended particulates (PM_{2.5} or FSP) were added to the report in addition to those of respirable suspended particulates (PM₁₀ or RSP), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and ozone (O₃).

This report is the statistical summary of the monitoring results of the PRD Regional Air Quality Monitoring Network in the first quarter of 2019. It is the twenty-first report published in the form of a quarterly report and the eighteenth report with the statistical summaries of the six pollutants (i.e. PM₁₀, PM_{2.5}, SO₂, NO₂, O₃ and CO).

2. Introduction to Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network

The PRD Regional Air Quality Monitoring Network was jointly established by the Guangdong Provincial Environmental Monitoring Centre (GDEMC) and the Environmental Protection Department of the Hong Kong Special Administrative Region (HKEPD) from 2003 to 2005, and commenced its operation to report the Regional Air Quality Index (RAQI) on 30 November 2005.

With the growing concerns of air pollution control and economic development of the region, the GDEMC and HKEPD had worked in collaboration with the environmental protection cum meteorological authorities of Macao to enhance the network by extending the coverage of monitoring area to Guangdong, Hong Kong and Macao in September 2014. The enhancements included the addition of monitoring stations from 16 to 23 to further improve the spatial distribution and the inclusion of two new monitoring parameters, i.e. carbon monoxide (CO) and fine suspended particulates (PM_{2.5}), to enrich the air quality monitoring information. At the same time, the network was renamed to “Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network” (the “Network”) while the “Quality Management Committee of Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network”, which was jointly established by the GDEMC, HKEPD, Environmental Protection Bureau of Macao SARG and the Meteorological and Geophysical Bureau of Macao SARG, was responsible for quality management of the Network and dissemination of information.

The Network comprises 23 automatic air quality monitoring stations (see Figure 2.1) across the PRD region. Ten city stations are operated either by the Environmental Monitoring Centres of the individual cities in Guangdong or the operation-cum-maintenance agencies commissioned by the State. Eight regional stations are operated by the GDEMC, the four stations located in Hong Kong are managed by the HKEPD and the remaining one in Macao is operated by Meteorological and Geophysical Bureau of Macao SARG.

All stations are installed with monitoring equipment to measure the ambient concentrations of PM₁₀, PM_{2.5}, SO₂, NO₂, O₃ and CO.

Annexes A and B show the site information of the monitoring stations in the Network and the methods used for measuring air pollutant concentrations respectively.



Figure 2.1 : Spatial Distribution of Monitoring Stations in the Network

Remark: For the boundary of the administrative division of the Macao Special Administrative Region, according to the Decree n.°665 of the State Council of the People’s Republic of China, “the map of the administrative division of the Macao Special Administrative Region” was approved at the 116th Executive Meeting of the State Council on 16 December 2015.

3. Operation of the Network

The overall operation of the Network was smooth in the first quarter of 2019. The average data capture rate of hourly air pollutant monitoring data measured at all monitoring stations was 97.1% in the first quarter.

4. Statistical Results of Pollutant Concentrations

Tables 4.1a to 4.6b list the detailed statistical results of the six air pollutants (SO₂, NO₂, O₃, CO, PM₁₀ and PM_{2.5}) from January to March 2019. Per the amended *GB 3095-2012: Ambient Air Quality Standards*, starting from 2019, the concentrations of gaseous pollutants are calculated at a reference temperature of 298.15K and a pressure of 101.325 kPa, while the concentrations of PM₁₀ (with a nominal aerodynamic diameter of 10 µm or less) and PM_{2.5} (with a nominal aerodynamic diameter of 2.5 µm or less) are measured at real-time temperature and atmospheric pressure during monitoring.

Table 4.1a : The monthly maxima and minima of hourly averages of SO₂

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	4	16	3	11	3	15
Modiesha (Guangzhou)	7	23	7	17	8	31
Nansha-HKUST (Guangzhou)	10	67	5	15	5	78
Tianhu (Guangzhou)	1	89	1	11	1	17
Zhudong (Guangzhou)	5	32	1	65	4	41
Tongxinling (Shenzhen)	5	10	4	10	5	7
Jinjuzui (Foshan)	3	33	2	21	2	21
Huijingcheng (Foshan)	1	24	0	20	0	48
Tangjia (Zhuhai)	3	32	4	18	2	30
Donghu (Jiangmen)	4	26	3	22	3	45
Duanfen (Jiangmen)	5	29	4	14	4	21
Huaguoshan (Jiangmen)	1	48	1	23	1	30
Chengzhong (Zhaoqing)	4	78	5	33	5	72
Xiapu (Huizhou)	7	37	3	22	3	18
Xijiao (Huizhou)	1	18	1	59	1	12
Jinguowan (Huizhou)	1	12	4	10	6	13
Zimaling (Zhongshan)	2	26	2	14	3	120
Nanchengyuanling (Dongguan)	2	26	4	16	5	30
Tap Mun (Hong Kong)	0	8	1	13	3	8
Tsuen Wan (Hong Kong)	6	26	5	14	6	16
Yuen Long (Hong Kong)	3	18	1	9	0	8
Tung Chung (Hong Kong)	8	36	8	20	1	14
Taipa Grande (Macao)	4	16	4	15	4	13

Remark : All concentration units are in micrograms per cubic metre (µg/m³).

Table 4.1b : The monthly maxima and minima of daily averages of SO₂

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	11	4	7	4	8
Modiesha (Guangzhou)	7	14	8	12	8	17
Nansha-HKUST (Guangzhou)	11	21	5	11	5	13
Tianhu (Guangzhou)	2	20	1	4	1	9
Zhudong (Guangzhou)	7	16	4	11	6	25
Tongxinling (Shenzhen)	6	9	5	6	5	6
Jinjuzui (Foshan)	4	14	3	7	3	10
Huijingcheng (Foshan)	5	19	6	14	4	39
Tangjia (Zhuhai)	8	17	6	9	4	11
Donghu (Jiangmen)	5	13	3	10	4	11
Duanfen (Jiangmen)	6	16	5	8	4	10
Huaguoshan (Jiangmen)	2	14	1	11	2	14
Chengzhong (Zhaoqing)	4	17	5	18	6	25
Xiapu (Huizhou)	8	17	4	10	4	9
Xijiao (Huizhou)	2	7	1	5	1	4
Jinguowan (Huizhou)	4	9	5	7	6	8
Zimaling (Zhongshan)	3	12	3	6	3	9
Nanchengyuanling (Dongguan)	3	16	6	11	6	13
Tap Mun (Hong Kong)	1	5	5	11	3	7
Tsuen Wan (Hong Kong)	6	18	6	8	6	8
Yuen Long (Hong Kong)	4	12	1	5	1	5
Tung Chung (Hong Kong)	9	21	9	13	1	10
Taipa Grande (Macao)	6	10	4	7	4	8

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.1c : The monthly averages of SO₂

Monitoring Station	January 2019	February 2019	March 2019
Luhu (Guangzhou)	8	5	5
Modiesha (Guangzhou)	10	9	12
Nansha-HKUST (Guangzhou)	16	8	8
Tianhu (Guangzhou)	6	3	3
Zhudong (Guangzhou)	11	8	10
Tongxinling (Shenzhen)	7	5	5
Jinjuzui (Foshan)	7	4	6
Huijingcheng (Foshan)	10	9	14*
Tangjia (Zhuhai)	11	7	6
Donghu (Jiangmen)	9	5	7
Duanfen (Jiangmen)	9	6	7
Huaguoshan (Jiangmen)	8	4	7
Chengzhong (Zhaoqing)	9	8	12
Xiapu (Huizhou)	11	8	7
Xijiao (Huizhou)	4	2	2
Jinguowan (Huizhou)	7	6	7
Zimaling (Zhongshan)	6	4	5
Nanchengyuanling (Dongguan)	9	8	9
Tap Mun (Hong Kong)	3	7	5
Tsuen Wan (Hong Kong)	9	6	7
Yuen Long (Hong Kong)	7	3	3
Tung Chung (Hong Kong)	12	10	3
Taipa Grande (Macao)	7	5	5

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

* The capture rate of validated daily data per month is below 85%

Table 4.2a : The monthly maxima and minima of hourly averages of NO₂

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	16	186	8	138	16	130
Modiesha (Guangzhou)	14	162	1	157	18	207
Nansha-HKUST (Guangzhou)	1	176	1	103	10	123
Tianhu (Guangzhou)	2	37	3	40	3	57
Zhudong (Guangzhou)	9	92	5	64	9	96
Tongxinling (Shenzhen)	6	150	2	69	4	100
Jinjuzui (Foshan)	2	180	0	111	7	183
Huijingcheng (Foshan)	0	273	0	231	0	200
Tangjia (Zhuhai)	1	164	1	85	2	119
Donghu (Jiangmen)	9	180	2	105	5	137
Duanfen (Jiangmen)	3	87	1	53	0	80
Huaguoshan (Jiangmen)	1	118	1	120	1	120
Chengzhong (Zhaoqing)	13	144	5	103	10	139
Xiapu (Huizhou)	11	157	8	97	9	111
Xijiao (Huizhou)	6	35	4	40	3	39
Jinguowan (Huizhou)	5	63	1	33	2	48
Zimaling (Zhongshan)	5	176	1	143	1	108
Nanchengyuanling (Dongguan)	11	192	7	127	8	118
Tap Mun (Hong Kong)	5	130	3	36	4	46
Tsuen Wan (Hong Kong)	15	203	9	131	12	157
Yuen Long (Hong Kong)	9	189	8	119	9	135
Tung Chung (Hong Kong)	12	163	5	105	4	132
Taipa Grande (Macao)	1	161	0	75	0	127

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.2b : The monthly maxima and minima of daily averages of NO₂

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	27	107	14	76	29	80
Modiesha (Guangzhou)	26	100	5	93	35	124
Nansha-HKUST (Guangzhou)	24	114	2	63	31	78
Tianhu (Guangzhou)	7	25	4	20	4	32
Zhudong (Guangzhou)	20	58	8	39	21	60
Tongxinling (Shenzhen)	20	113	4	39	6	49
Jinjuzui (Foshan)	27	103	3	78	22	88
Huijingcheng (Foshan)	1	71	0	98	1	63
Tangjia (Zhuhai)	10	81	4	40	16	65
Donghu (Jiangmen)	20	89	6	64	14	59
Duanfen (Jiangmen)	7	55	2	30	1	49
Huaguoshan (Jiangmen)	14	73	2	52	5	53
Chengzhong (Zhaoqing)	21	90	6	76	17	86
Xiapu (Huizhou)	19	72	14	47	17	47
Xijiao (Huizhou)	12	20	6	21	7	22
Jinguowan (Huizhou)	10	39	3	15	9	23
Zimaling (Zhongshan)	19	114	2	68	4	50
Nanchengyuanling (Dongguan)	23	92	14	80	22	58
Tap Mun (Hong Kong)	9	53	5	20	6	21
Tsuen Wan (Hong Kong)	39	133	28	74	31	71
Yuen Long (Hong Kong)	37	129	20	54	28	62
Tung Chung (Hong Kong)	29	110	13	61	8	57
Taipa Grande (Macao)	16	93	7	44	10	63

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.2c : The monthly averages of NO₂

Monitoring Station	January 2019	February 2019	March 2019
Luhu (Guangzhou)	53	33	50
Modiesha (Guangzhou)	51	33	64
Nansha-HKUST (Guangzhou)	52	25	48
Tianhu (Guangzhou)	14	9	12
Zhudong (Guangzhou)	32	22	38
Tongxinling (Shenzhen)	41	15	22
Jinjuzui (Foshan)	59	26	43
Huijingcheng (Foshan)	28	18	17*
Tangjia (Zhuhai)	41	19	35
Donghu (Jiangmen)	49	25	36
Duanfen (Jiangmen)	27	10	17
Huaguoshan (Jiangmen)	39	20	30
Chengzhong (Zhaoqing)	46	28	44
Xiapu (Huizhou)	38	22	30
Xijiao (Huizhou)	15	10	14
Jinguowan (Huizhou)	22	9	12
Zimaling (Zhongshan)	53	21	29
Nanchengyuanling (Dongguan)	47	27	38
Tap Mun (Hong Kong)	18	10	12
Tsuen Wan (Hong Kong)	70	50	51
Yuen Long (Hong Kong)	66	40	44
Tung Chung (Hong Kong)	63	32	31
Taipa Grande (Macao)	47	26	37

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

* The capture rate of validated daily data per month is below 85%

Table 4.3a : The monthly maxima and minima of hourly averages of O₃

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	2	175	3	118	2	221
Modiesha (Guangzhou)	1	171	1	114	2	216
Nansha-HKUST (Guangzhou)	5	216	1	152	1	252
Tianhu (Guangzhou)	3	223	5	128	5	192
Zhudong (Guangzhou)	1	204	2	113	2	200
Tongxinling (Shenzhen)	4	152	5	123	5	143
Jinjuzui (Foshan)	3	193	3	143	3	217
Huijingcheng (Foshan)	0	183	0	129	0	216
Tangjia (Zhuhai)	18	246	12	172	10	210
Donghu (Jiangmen)	1	216	1	158	1	232
Duanfen (Jiangmen)	2	174	5	94	4	133
Huaguoshan (Jiangmen)	3	144	3	93	3	182
Chengzhong (Zhaoqing)	1	168	2	123	1	237
Xiapu (Huizhou)	3	174	4	119	3	176
Xijiao (Huizhou)	4	163	2	123	3	216
Jinguowan (Huizhou)	3	220	2	134	1	154
Zimaling (Zhongshan)	4	212	4	136	4	161
Nanchengyuanling (Dongguan)	1	187	2	120	2	219
Tap Mun (Hong Kong)	1	177	16	119	6	174
Tsuen Wan (Hong Kong)	1	116	1	85	1	133
Yuen Long (Hong Kong)	4	139	5	129	5	139
Tung Chung (Hong Kong)	3	161	4	103	4	145
Taipa Grande (Macao)	0	186	0	130	0	175

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.3b : Daily maximum 8-hour averages of O₃ (the monthly maxima, minima and the 90th percentile)

Monitoring Station	January 2019			February 2019			March 2019		
	Min	Max	90 th per	Min	Max	90 th per	Min	Max	90 th per
Luhu (Guangzhou)	5	124	113	8	91	83	8	145	126
Modiesha (Guangzhou)	4	134	116	6	94	82	8	156	132
Nansha-HKUST (Guangzhou)	10	181	151	19	141	104	10	163	103
Tianhu (Guangzhou)	16	204	145	20	120	94	28	151	129
Zhudong (Guangzhou)	6	157	135	10	94	89	20	174	109
Tongxinling (Shenzhen)	12	135	123	21	100	93	25	135	124
Jinjuzui (Foshan)	8	144	129	8	122	95	6	163	124
Huijingcheng (Foshan)	3	143	125	4	108	86	3	150	118
Tangjia (Zhuhai)	42	185	164	33	118	106	26	158	114
Donghu (Jiangmen)	4	181	133	8	136	87	5	178	150
Duanfen (Jiangmen)	14	137	127	20	88	75	17	115	98
Huaguoshan (Jiangmen)	5	115	94	6	85	71	7	141	113
Chengzhong (Zhaoqing)	5	147	116	10	108	100	10	186	127
Xiapu (Huizhou)	19	133	122	29	91	87	27	142	118
Xijiao (Huizhou)	21	138	116	18	92	86	30	151	127
Jinguowan (Huizhou)	40	203	166	31	100	90	21	129	119
Zimaling (Zhongshan)	5	179	135	12	125	91	5	129	115
Nanchengyuanling (Dongguan)	4	138	117	20	92	86	22	169	137
Tap Mun (Hong Kong)	18	158	137	35	109	102	51	160	141
Tsuen Wan (Hong Kong)	3	101	87	20	74	68	12	124	107
Yuen Long (Hong Kong)	12	118	97	18	81	75	21	125	108
Tung Chung (Hong Kong)	5	108	94	17	89	78	14	142	121
Taipa Grande (Macao)	3	140	122	8	99	86	12	122	119

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.3c : The monthly averages of O₃

Monitoring Station	January 2019	February 2019	March 2019
Luhu (Guangzhou)	31	28	30
Modiesha (Guangzhou)	31	28	29
Nansha-HKUST (Guangzhou)	46	42	33
Tianhu (Guangzhou)	67	50	69
Zhudong (Guangzhou)	34	28	36
Tongxinling (Shenzhen)	52	55	60
Jinjuzui (Foshan)	35	37	38
Huijingcheng (Foshan)	28	26	27*
Tangjia (Zhuhai)	71	62	57
Donghu (Jiangmen)	38	37	41
Duanfen (Jiangmen)	47	47	49
Huaguoshan (Jiangmen)	28	27	33
Chengzhong (Zhaoqing)	35	36	39
Xiapu (Huizhou)	48	46	55
Xijiao (Huizhou)	44	41	55
Jinguowan (Huizhou)	88	51	55
Zimaling (Zhongshan)	39	43	45
Nanchengyuanling (Dongguan)	37	36	42
Tap Mun (Hong Kong)	71	64	73
Tsuen Wan (Hong Kong)	39	37	46
Yuen Long (Hong Kong)	37	40	48
Tung Chung (Hong Kong)	35	41	55
Taipa Grande (Macao)	42	44	45

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

* The capture rate of validated daily data per month is below 85%

Table 4.4a : The monthly maxima and minima of hourly averages of CO

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.7	2.3	0.5	3.0	0.5	1.9
Modiesha (Guangzhou)	0.5	2.1	0.4	3.0	0.7	2.2
Nansha-HKUST (Guangzhou)	0.4	2.0	0.5	1.8	0.6	2.0
Tianhu (Guangzhou)	0.6	1.7	0.4	1.4	0.6	1.4
Zhudong (Guangzhou)	0.5	2.3	0.4	1.7	0.5	1.6
Tongxinling (Shenzhen)	0.4	1.7	0.5	1.4	0.5	1.5
Jinjuzui (Foshan)	0.4	2.3	0.4	2.4	0.4	2.1
Huijingcheng (Foshan)	0.3	2.4	0.2	2.7	0.2	2.5
Tangjia (Zhuhai)	0.3	2.1	0.4	1.4	0.2	1.5
Donghu (Jiangmen)	0.5	2.7	0.5	2.5	0.4	3.1
Duanfen (Jiangmen)	0.3	1.6	0.2	1.5	0.4	3.7
Huaguoshan (Jiangmen)	0.1	1.8	0.2	2.1	0.2	1.5
Chengzhong (Zhaoqing)	0.5	1.9	0.4	3.1	0.5	2.2
Xiapu (Huizhou)	0.6	2.2	0.4	2.3	0.4	1.9
Xijiao (Huizhou)	0.3	1.3	0.3	1.3	0.2	1.1
Jinguowan (Huizhou)	0.4	1.8	0.3	1.0	0.3	1.0
Zimaling (Zhongshan)	0.3	2.3	0.2	2.0	0.1	1.6
Nanchengyuanling (Dongguan)	0.4	2.5	0.3	1.5	0.4	1.8
Tap Mun (Hong Kong)	0.3	1.3	0.3	1.1	0.2	1.0
Tsuen Wan (Hong Kong)	0.5	1.9	0.5	1.4	0.5	1.3
Yuen Long (Hong Kong)	0.5	2.1	0.3	1.3	0.3	1.2
Tung Chung (Hong Kong)	0.3	2.2	0.1	1.0	0.1	1.2
Taipa Grande (Macao)	0.3	1.7	0.3	1.2	0.4	1.2

Remark : All concentration units are in milligrams per cubic metre (mg/m³).

Table 4.4b : Daily averages of CO (the monthly maxima, minima and the 95th percentile)

Monitoring Station	January 2019			February 2019			March 2019		
	Min	Max	95 th per	Min	Max	95 th per	Min	Max	95 th per
Luhu (Guangzhou)	0.9	1.8	1.5	0.7	1.8	1.6	0.6	1.4	1.2
Modiesha (Guangzhou)	0.6	1.5	1.3	0.5	2.0	1.7	0.8	1.6	1.4
Nansha-HKUST (Guangzhou)	0.5	1.4	1.4	0.5	1.3	1.2	0.7	1.5	1.3
Tianhu (Guangzhou)	0.7	1.4	1.3	0.5	1.3	1.2	0.7	1.3	1.1
Zhudong (Guangzhou)	0.7	1.4	1.4	0.6	1.3	1.3	0.7	1.4	1.2
Tongxinling (Shenzhen)	0.5	1.3	1.2	0.5	1.2	1.1	0.6	1.0	1.0
Jinjuzui (Foshan)	0.6	1.8	1.7	0.5	1.6	1.3	0.5	1.3	1.1
Huijingcheng (Foshan)	0.5	1.7	1.6	0.3	1.6	1.3	0.4	1.3	1.2
Tangjia (Zhuhai)	0.5	1.7	1.6	0.5	1.2	1.2	0.3	1.3	1.1
Donghu (Jiangmen)	0.6	1.6	1.6	0.6	1.4	1.3	0.6	1.3	1.2
Duanfen (Jiangmen)	0.4	1.4	1.3	0.3	1.2	1.0	0.6	1.2	1.1
Huaguoshan (Jiangmen)	0.5	1.3	1.3	0.5	1.3	1.2	0.5	1.0	1.0
Chengzhong (Zhaoqing)	0.6	1.5	1.4	0.5	1.9	1.4	0.7	1.5	1.4
Xiapu (Huizhou)	0.8	1.4	1.2	0.5	1.2	1.2	0.5	0.9	0.9
Xijiao (Huizhou)	0.5	1.1	1.1	0.4	0.9	0.9	0.3	0.7	0.6
Jinguowan (Huizhou)	0.5	1.2	1.1	0.3	0.9	0.8	0.5	0.9	0.8
Zimaling (Zhongshan)	0.4	1.7	1.7	0.3	1.2	1.2	0.2	0.9	0.9
Nanchengyuanling (Dongguan)	0.6	1.7	1.6	0.3	1.2	1.1	0.6	1.2	1.1
Tap Mun (Hong Kong)	0.4	1.0	1.0	0.3	1.0	1.0	0.3	0.8	0.8
Tsuen Wan (Hong Kong)	0.7	1.6	1.5	0.7	1.2	1.2	0.6	1.0	1.0
Yuen Long (Hong Kong)	0.7	1.6	1.4	0.5	1.2	1.1	0.4	0.9	0.8
Tung Chung (Hong Kong)	0.4	1.6	1.6	0.2	0.9	0.8	0.2	1.0	0.9
Taipa Grande (Macao)	0.4	1.3	1.2	0.4	1.0	0.9	0.4	0.9	0.8

Remark : All concentration units are in milligrams per cubic metre (mg/m³).

Table 4.4c : The monthly averages of CO

Monitoring Station	January 2019	February 2019	March 2019
Luhu (Guangzhou)	1.2	1.1	0.9
Modiesha (Guangzhou)	1.0	0.9	1.1
Nansha-HKUST (Guangzhou)	1.0	0.9	1.0
Tianhu (Guangzhou)	0.9	0.9	0.9
Zhudong (Guangzhou)	1.0	1.0	1.0
Tongxinling (Shenzhen)	0.9	0.8	0.8
Jinjuzui (Foshan)	1.2	0.9	0.8
Huijingcheng (Foshan)	1.1	0.9	0.8
Tangjia (Zhuhai)	1.0	0.8	0.7
Donghu (Jiangmen)	1.1	0.9	0.9
Duanfen (Jiangmen)	0.9	0.6	0.9
Huaguoshan (Jiangmen)	1.0	0.8	0.8
Chengzhong (Zhaoqing)	1.1	1.0	1.0
Xiapu (Huizhou)	1.0	0.8	0.7
Xijiao (Huizhou)	0.7	0.6	0.5
Jinguowan (Huizhou)	0.8	0.6	0.7
Zimaling (Zhongshan)	1.0	0.7	0.6
Nanchengyuanling (Dongguan)	1.1	0.8	0.8
Tap Mun (Hong Kong)	0.7	0.6	0.6
Tsuen Wan (Hong Kong)	1.0	0.9	0.8
Yuen Long (Hong Kong)	1.0	0.7	0.6
Tung Chung (Hong Kong)	1.0	0.5	0.5
Taipa Grande (Macao)	0.9	0.6	0.6

Remark : All concentration units are in milligrams per cubic metre (mg/m³).

Table 4.5a : The monthly maxima and minima of daily averages of PM₁₀

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	27	123	12	120	12	129
Modiesha (Guangzhou)	26	124	12	105	11	103
Nansha-HKUST (Guangzhou)	33	151	16	64	16	67
Tianhu (Guangzhou)	7	74	6	49	5	74
Zhudong (Guangzhou)	30	109	12	85	13	82
Tongxinling (Shenzhen)	30	130	14	55	15	56
Jinjuzui (Foshan)	35	144	14	111	16	84
Huijingcheng (Foshan)	34	119	16	147	17	116
Tangjia (Zhuhai)	44	165	18	84	18	72
Donghu (Jiangmen)	36	140	17	136	15	106
Duanfen (Jiangmen)	23	82	11	49	11	49
Huaguoshan (Jiangmen)	30	151	19	154	20	137
Chengzhong (Zhaoqing)	18	108	10	108	9	131
Xiapu (Huizhou)	21	89	11	60	9	65
Xijiao (Huizhou)	14	62	7	50	7	62
Jinguowan (Huizhou)	16	77	6	53	4	52
Zimaling (Zhongshan)	35	143	14	84	16	60
Nanchengyuanling (Dongguan)	22	125	13	79	10	77
Tap Mun (Hong Kong)	20	64	12	54	11	52
Tsuen Wan (Hong Kong)	21	123	10	45	8	48
Yuen Long (Hong Kong)	28	125	13	55	15	55
Tung Chung (Hong Kong)	27	123	12	47	10	53
Taipa Grande (Macao)	37	125	13	64	10	56

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.5b : The monthly averages of PM₁₀

Monitoring Station	January 2019	February 2019	March 2019
Luhu (Guangzhou)	62	39	47
Modiesha (Guangzhou)	60	37	48
Nansha-HKUST (Guangzhou)	70	31	41
Tianhu (Guangzhou)	36	25	31
Zhudong (Guangzhou)	57	36	45
Tongxinling (Shenzhen)	60	30	35
Jinjuzui (Foshan)	71	36	43
Huijingcheng (Foshan)	66	43	48
Tangjia (Zhuhai)	88	37	43
Donghu (Jiangmen)	77	41	52
Duanfen (Jiangmen)	53	26	29
Huaguoshan (Jiangmen)	80	50	56
Chengzhong (Zhaoqing)	59	40	49
Xiapu (Huizhou)	54	30	39
Xijiao (Huizhou)	40	28	32
Jinguowan (Huizhou)	44	23	28
Zimaling (Zhongshan)	70	32	36
Nanchengyuanling (Dongguan)	62	33	41
Tap Mun (Hong Kong)	38	26	27
Tsuen Wan (Hong Kong)	47	25	26
Yuen Long (Hong Kong)	52	28	34
Tung Chung (Hong Kong)	61	27	29
Taipa Grande (Macao)	63	31	33

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.6a : The monthly maxima and minima of daily averages of PM_{2.5}

Monitoring Station	January 2019		February 2019		March 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	19	95	7	58	9	61
Modiesha (Guangzhou)	12	68	3	53	6	50
Nansha-HKUST (Guangzhou)	20	88	11	38	10	43
Tianhu (Guangzhou)	4	49	4	40	4	55
Zhudong (Guangzhou)	21	66	10	46	9	51
Tongxinling (Shenzhen)	20	92	8	34	12	39
Jinjuzui (Foshan)	19	94	10	62	10	54
Huijingcheng (Foshan)	25	81	11	88	11	73
Tangjia (Zhuhai)	25	79	8	42	11	43
Donghu (Jiangmen)	15	73	7	58	8	62
Duanfen (Jiangmen)	16	51	6	32	5	31
Huaguoshan (Jiangmen)	23	96	12	91	14	76
Chengzhong (Zhaoqing)	16	93	8	102	8	110
Xiapu (Huizhou)	12	66	7	44	8	41
Xijiao (Huizhou)	11	51	6	36	8	37
Jinguowan (Huizhou)	10	51	6	40	6	34
Zimaling (Zhongshan)	20	80	8	47	8	35
Nanchengyuanling (Dongguan)	22	115	10	58	10	61
Tap Mun (Hong Kong)	10	44	5	32	6	27
Tsuen Wan (Hong Kong)	18	86	8	32	7	28
Yuen Long (Hong Kong)	17	81	4	25	8	29
Tung Chung (Hong Kong)	16	82	7	25	7	35
Taipa Grande (Macao)	15	70	4	31	3	33

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Table 4.6b : The monthly averages of PM_{2.5}

Monitoring Station	January 2019	February 2019	March 2019
Luhu (Guangzhou)	48	24	26
Modiesha (Guangzhou)	33	20	24
Nansha-HKUST (Guangzhou)	41	19	25
Tianhu (Guangzhou)	26	17	21
Zhudong (Guangzhou)	42	25	29
Tongxinling (Shenzhen)	38	19	23
Jinjuzui (Foshan)	44	23	26
Huijingcheng (Foshan)	47	29	31
Tangjia (Zhuhai)	47	21	25
Donghu (Jiangmen)	43	24	27
Duanfen (Jiangmen)	32	16	18
Huaguoshan (Jiangmen)	52	31	35
Chengzhong (Zhaoqing)	50	37	38
Xiapu (Huizhou)	38	22	25
Xijiao (Huizhou)	31	20	24
Jinguowan (Huizhou)	29	18	19
Zimaling (Zhongshan)	44	19	22
Nanchengyuanling (Dongguan)	52	26	30
Tap Mun (Hong Kong)	22	15	16
Tsuen Wan (Hong Kong)	34	18	18
Yuen Long (Hong Kong)	31	13	17
Tung Chung (Hong Kong)	39	16	19
Taipa Grande (Macao)	34	14	16

Remark : All concentration units are in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$).

Annex A: Site Information of Monitoring Stations

Monitoring Stations	Address	Area Type	Sampling Height (Above P.D.)	Above Ground	Date Commenced Operation
Luhu (Guangzhou)	Jufong Garden of Luhu Park (Big yard, No. 11 Luhu Park)	City	30m	9m	1993
Modiesha (Guangzhou)	Modiesha Street, Haizhu District	City	95m	45m	Dec 2011
Nansha-HKUST ⁽¹⁾ (Guangzhou)	HKUST Fok Ying Tung Research Institute, Nansha	Mixed educational/commercial and residential/industrial	54m	28m	Oct 2004
Tianhu (Guangzhou)	Tianhu Park, Conghua	Background : rural	251m	13m	Oct 2004
Zhudong (Guangzhou)	Zhudong Village Committee, Chini Town, Huadu District	Rural	19m	10m	Dec 2011
Tongxinling ⁽²⁾ (Shenzhen)	Shennan Zhong Road, Futian District	City	38m	12m	Sep 1997
Jinjuzui (Foshan)	Foshan City Communist Party School, Jinjuzui, Shunde District	Tourist and cultural /educational	27m	17m	Oct 1999
Huijingcheng (Foshan)	No. 127, Fenjiang Nan Road, Chancheng District	Urban: mixed residential/commercial/industrial	24m	14m	Feb 2000
Tangjia (Zhuhai)	Qiao Island Mangrove Monitoring Station, Tangjia Town	Mixed educational/commercial and residential/industrial	13m	13m	Jan 2010
Donghu (Jiangmen)	Donghu Park, Jiangmen	City	17.5m	5m	Nov 2001
Duanfen (Jiangmen)	Duanfen Middle School, Taishan	Rural	15m	12m	Dec 2011
Huaguoshan (Jiangmen)	Huaguoshan, Taoyuan, Heshan	Rural	25m	15m	Feb 2012
Chengzhong (Zhaoqing)	No. 63, Zhengdong Road, Duanzhou District	Urban: mixed residential/commercial	38m	16m	Jun 2001
Xiapu (Huizhou)	No. 4 Xiabuhengjiang Road No. 3, Huicheng District	Urban: commercial	49m	20m	Dec 1999
Xijiao (Huizhou)	Xijiao Village Committee, Boluo County	Rural	39m	12m	Dec 2011
Jinguowan (Huizhou)	Jinguowan Ecological Farm, Huizhou	Residential	77m	8m	Oct 2004

Monitoring Stations	Address	Area Type	Sampling Height (Above P.D.)	Above Ground	Date Commenced Operation
Zimaling (Zhongshan)	Zimaling Park, Zhongshan	Mixed residential/commercial	45 m	7m	Aug 2002
Nanchengyuanling (Dongguan)	Nanchengyuanling Community, Dongguan	Mixed residential/commercial/industrial	33 m	18m	Sep 2010
Tap Mun (Hong Kong)	Tap Mun Police Station	Background: rural	26m	11m	Apr 1998
Tsuen Wan (Hong Kong)	60 Tai Ho Road, Tsuen Wan	Urban: mixed residential/commercial/industrial	21m	17m	Aug 1988
Yuen Long (Hong Kong)	Yuen Long District Office, 269 Castle Peak Road, Yuen Long	New Town: residential	31m	25m	Jul 1995
Tung Chung (Hong Kong)	6 Fu Tung Street, Tung Chung	New Town: residential	34.5m	27.5m	Apr 1999
Taipa Grande (Macao)	Rampa do Observatorio, Taipa Grande	Rural	120m	10m	Mar 1999

Remarks:

⁽¹⁾ Nansha HKUST Station was originally named as Wanqingsha prior to 2019.

⁽²⁾ Tongxinling Station was originally named as Liyuan prior to 2019.

Annex B : Measurement Methods of Air Pollutant Concentration

Pollutants	Measuring Principles
Sulphur dioxide (SO ₂)	UV fluorescence / Differential Optical Absorption Spectroscopy
Nitrogen dioxide (NO ₂)	Chemiluminescence / Differential Optical Absorption Spectroscopy
Ozone (O ₃)	UV absorption / Differential Optical Absorption Spectroscopy
Respirable suspended particulates (PM ₁₀)	Oscillating microbalance (TEOM) / Beta particulate monitor
Fine suspended particulates (PM _{2.5})	Oscillating microbalance (TEOM) / Beta particulate monitor / Hybrid nephelometric / radiometric particulate mass monitor
Carbon monoxide (CO)	Gas filter correlation infrared absorption method / Non-dispersive infrared absorption method