

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

**October to December 2017**

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

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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<sub>2.5</sub> or FSP) were added to the report in addition to those of respirable suspended particulates (PM<sub>10</sub> or RSP), sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and ozone (O<sub>3</sub>).

This report is the statistical summary of the monitoring results of the PRD Regional Air Quality Monitoring Network in the fourth quarter of 2017. It is the sixteenth report published in the form of a quarterly report and the thirteenth report with the statistical summaries of the six pollutants (i.e. PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub> 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<sub>2.5</sub>), 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 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 PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub> 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.º665 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 116<sup>th</sup> Executive Meeting of the State Council on 16 December 2015.

### 3. Operation of the Network

The operation of the Network was smooth in the fourth quarter of 2017, but owing to the influence of Typhoon Hato, the operation of the PM<sub>10</sub> and PM<sub>2.5</sub> monitoring equipment were temporarily suspended at the Taipa Grande monitoring station in Macao from 23 August to 23 October 2017. The average data capture rate of hourly air pollutant monitoring data measured at all monitoring stations (The PM<sub>10</sub> and PM<sub>2.5</sub> data measured at the Taipa Grande monitoring station in Macao was included for the period of 24 August to 31 December only) was 97.1% in the fourth quarter.

## 4. Statistical Results of Pollutant Concentrations

Tables 4.1a to 4.6b list the detailed statistical results of the ambient concentrations of the six air pollutants (SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, CO, PM<sub>10</sub> and PM<sub>2.5</sub>) from October to December 2017.

**Table 4.1a : The monthly maxima and minima of hourly averages of SO<sub>2</sub>**

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	4	20	5	24	7	34
Modiesha (Guangzhou)	2	29	4	25	3	60
Wanqingsha (Guangzhou)	0	18	8	69	12	79
Tianhu (Guangzhou)	3	27	4	32	5	70
Zhudong (Guangzhou)	7	54	2	57	4	228
Liyuan (Shenzhen)	5	21	6	17	6	20
Jinjuzui (Foshan)	7	53	7	46	9	46
Huijingcheng (Foshan)	0	79	0	65	2	71
Tangjia (Zhuhai)	1	56	1	54	1	42
Donghu (Jiangmen)	2	60	2	69	1	76
Duanfen (Jiangmen)	3	30	3	39	5	56
Huaguoshan (Jiangmen)	8	91	8	78	10	162
Chengzhong (Zhaoqing)	6	86	6	103	8	92
Xiapu (Huizhou)	4	38	5	32	5	44
Xijiao (Huizhou)	5	42	4	48	3	59
Jinguowan (Huizhou)	4	35	5	36	7	26
Zimaling (Zhongshan)	3	36	2	46	4	46
Nanchengyuanling (Dongguan)	5	63	5	36	6	85
Tap Mun (Hong Kong)	5	19	5	19	5	27
Tsuen Wan (Hong Kong)	7	30	7	60	8	100
Yuen Long (Hong Kong)	6	27	6	33	6	70
Tung Chung (Hong Kong)	3	31	3	66	4	74
Taipa Grande (Macao)	0	24	0	30	2	42

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.1b : The monthly maxima and minima of daily averages of SO<sub>2</sub>**

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	14	6	15	8	23
Modiesha (Guangzhou)	3	17	5	15	5	24
Wanqingsha (Guangzhou)	3	9	8	36	16	45
Tianhu (Guangzhou)	4	15	4	16	7	26
Zhudong (Guangzhou)	9	26	9	31	12	106
Liyuan (Shenzhen)	5	12	6	13	7	15
Jinjuzui (Foshan)	8	26	8	22	11	34
Huijingcheng (Foshan)	2	19	3	33	6	34
Tangjia (Zhuhai)	4	17	6	21	3	24
Donghu (Jiangmen)	4	22	4	27	4	30
Duanfen (Jiangmen)	5	16	5	21	10	28
Huaguoshan (Jiangmen)	11	37	11	39	15	52
Chengzhong (Zhaoqing)	6	24	7	40	8	39
Xiapu (Huizhou)	6	17	7	18	6	21
Xijiao (Huizhou)	6	16	7	20	8	20
Jinguowan (Huizhou)	6	16	8	19	9	18
Zimaling (Zhongshan)	6	22	3	23	7	25
Nanchengyuanling (Dongguan)	7	26	8	19	9	37
Tap Mun (Hong Kong)	6	15	6	13	7	18
Tsuen Wan (Hong Kong)	7	15	8	18	9	32
Yuen Long (Hong Kong)	6	14	6	15	8	23
Tung Chung (Hong Kong)	4	12	5	21	6	40
Taipa Grande (Macao)	1	12	1	12	5	19

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.1c : The monthly averages of SO<sub>2</sub>**

Monitoring Station	October 2017	November 2017	December 2017
Luhu (Guangzhou)	8	10	14
Modiesha (Guangzhou)	9	9	13
Wanqingsha (Guangzhou)	7	12	26
Tianhu (Guangzhou)	8	9	15
Zhudong (Guangzhou)	17	17	30
Liyuan (Shenzhen)	8	8	10
Jinjuzui (Foshan)	13	14	20
Huijingcheng (Foshan)	8	13	19
Tangjia (Zhuhai)	10	13	16
Donghu (Jiangmen)	12	14	18
Duanfen (Jiangmen)	10	13	18
Huaguoshan (Jiangmen)	20	24	33
Chengzhong (Zhaoqing)	14	16	22
Xiapu (Huizhou)	10	11	13
Xijiao (Huizhou)	10	13	12
Jinguowan (Huizhou)	9	11	12
Zimaling (Zhongshan)	11	12	15
Nanchengyuanling (Dongguan)	12	13	20
Tap Mun (Hong Kong)	9	8	11
Tsuen Wan (Hong Kong)	10	11	16
Yuen Long (Hong Kong)	9	9	13
Tung Chung (Hong Kong)	7	8	13
Taipa Grande (Macao)	6	6	11

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.2a : The monthly maxima and minima of hourly averages of NO<sub>2</sub>**

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	10	125	21	151	18	186
Modiesha (Guangzhou)	13	171	21	219	10	203
Wanqingsha (Guangzhou)	4	179	14	167	15	337
Tianhu (Guangzhou)	0	22	1	48	1	44
Zhudong (Guangzhou)	0	96	13	96	14	101
Liyuan (Shenzhen)	6	116	8	105	7	183
Jinjuzui (Foshan)	6	153	12	173	12	218
Huijingcheng (Foshan)	6	228	16	240	14	205
Tangjia (Zhuhai)	1	107	1	125	8	154
Donghu (Jiangmen)	9	169	21	184	18	231
Duanfen (Jiangmen)	3	66	9	82	17	131
Huaguoshan (Jiangmen)	10	135	8	124	13	211
Chengzhong (Zhaoqing)	9	133	6	150	9	149
Xiapu (Huizhou)	2	165	10	148	10	167
Xijiao (Huizhou)	0	29	4	36	5	43
Jinguowan (Huizhou)	5	115	9	85	10	99
Zimaling (Zhongshan)	3	111	11	142	14	181
Nanchengyuanling (Dongguan)	8	136	15	172	14	188
Tap Mun (Hong Kong)	0	43	2	49	5	91
Tsuen Wan (Hong Kong)	5	145	8	217	11	231
Yuen Long (Hong Kong)	7	161	11	169	14	230
Tung Chung (Hong Kong)	6	138	12	243	16	203
Taipa Grande (Macao)	1	144	13	166	19	158

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.2b : The monthly maxima and minima of daily averages of NO<sub>2</sub>**

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	18	72	33	84	29	128
Modiesha (Guangzhou)	22	96	29	99	25	146
Wanqingsha (Guangzhou)	14	78	25	86	24	164
Tianhu (Guangzhou)	1	11	5	22	6	25
Zhudong (Guangzhou)	14	47	24	61	21	69
Liyuan (Shenzhen)	11	49	19	53	14	97
Jinjuzui (Foshan)	14	85	30	104	27	159
Huijingcheng (Foshan)	22	119	28	135	30	150
Tangjia (Zhuhai)	8	40	10	69	18	86
Donghu (Jiangmen)	24	93	33	108	28	163
Duanfen (Jiangmen)	7	36	16	55	27	79
Huaguoshan (Jiangmen)	18	62	29	73	35	139
Chengzhong (Zhaoqing)	17	70	13	77	17	100
Xiapu (Huizhou)	11	48	17	60	18	78
Xijiao (Huizhou)	5	15	8	18	10	25
Jinguowan (Huizhou)	9	38	16	33	17	40
Zimaling (Zhongshan)	13	54	30	89	28	97
Nanchengyuanling (Dongguan)	15	56	23	80	19	108
Tap Mun (Hong Kong)	2	16	4	20	8	30
Tsuen Wan (Hong Kong)	12	77	34	90	32	116
Yuen Long (Hong Kong)	22	81	31	83	27	110
Tung Chung (Hong Kong)	17	68	31	110	31	118
Taipa Grande (Macao)	3	71	30	96	34	113

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.2c : The monthly averages of NO<sub>2</sub>**

Monitoring Station	October 2017	November 2017	December 2017
Luhu (Guangzhou)	38	50	67
Modiesha (Guangzhou)	40	56	67
Wanqingsha (Guangzhou)	32	55	70
Tianhu (Guangzhou)	5	9	13
Zhudong (Guangzhou)	26	35	42
Liyuan (Shenzhen)	24	34	39
Jinjuzui (Foshan)	37	53	69
Huijingcheng (Foshan)	48	57	78
Tangjia (Zhuhai)	20	38	47
Donghu (Jiangmen)	42	53	65
Duanfen (Jiangmen)	22	34	45
Huaguoshan (Jiangmen)	38	51	68
Chengzhong (Zhaoqing)	37	35	50
Xiapu (Huizhou)	21	30	37
Xijiao (Huizhou)	9	12	15
Jinguowan (Huizhou)	18	22	26
Zimaling (Zhongshan)	31	50	59
Nanchengyuanling (Dongguan)	29	42	54
Tap Mun (Hong Kong)	7	11	14
Tsuen Wan (Hong Kong)	44	54	63
Yuen Long (Hong Kong)	40	47	57
Tung Chung (Hong Kong)	37	51	62
Taipa Grande (Macao)	31	55	61

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.3a : The monthly maxima and minima of hourly averages of O<sub>3</sub>**

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	2	224	2	216	2	164
Modiesha (Guangzhou)	2	162	1	164	0	166
Wanqingsha (Guangzhou)	8	316	5	291	6	275
Tianhu (Guangzhou)	15	152	6	147	10	150
Zhudong (Guangzhou)	1	224	4	224	4	234
Liyuan (Shenzhen)	6	237	5	240	6	221
Jinjuzui (Foshan)	4	276	4	231	4	252
Huijingcheng (Foshan)	4	282	4	226	3	159
Tangjia (Zhuhai)	10	314	6	305	2	266
Donghu (Jiangmen)	1	274	1	259	1	268
Duanfen (Jiangmen)	7	373	4	294	4	241
Huaguoshan (Jiangmen)	3	315	2	265	3	221
Chengzhong (Zhaoqing)	5	279	3	219	5	174
Xiapu (Huizhou)	7	185	3	170	3	160
Xijiao (Huizhou)	2	201	3	199	4	175
Jinguowan (Huizhou)	7	411	2	172	4	180
Zimaling (Zhongshan)	2	317	3	317	4	280
Nanchengyuanling (Dongguan)	3	219	2	201	2	178
Tap Mun (Hong Kong)	30	224	3	216	10	241
Tsuen Wan (Hong Kong)	5	229	1	185	0	163
Yuen Long (Hong Kong)	3	232	0	211	3	204
Tung Chung (Hong Kong)	4	227	3	220	3	167
Taipa Grande (Macao)	1	280	0	278	0	213

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.3b : Daily maximum 8-hour averages of O<sub>3</sub> (the monthly maxima, minima and the 90<sup>th</sup> percentile)**

Monitoring Station	October 2017			November 2017			December 2017		
	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per
Luhu (Guangzhou)	31	180	163	11	163	153	12	129	113
Modiesha (Guangzhou)	32	147	141	9	142	132	19	135	119
Wanqingsha (Guangzhou)	35	269	213	16	211	197	10	213	169
Tianhu (Guangzhou)	53	143	138	37	142	138	27	124	120
Zhudong (Guangzhou)	39	198	177	18	179	168	14	133	123
Liyuan (Shenzhen)	21	207	175	16	194	164	27	186	159
Jinjuzui (Foshan)	29	230	203	5	189	161	16	204	125
Huijingcheng (Foshan)	38	207	170	7	168	157	8	131	106
Tangjia (Zhuhai)	49	275	238	54	260	238	60	217	193
Donghu (Jiangmen)	24	242	206	2	215	198	19	208	134
Duanfen (Jiangmen)	27	284	234	13	260	228	35	193	150
Huaguoshan (Jiangmen)	32	277	205	7	211	175	11	179	118
Chengzhong (Zhaoqing)	42	247	181	20	176	161	13	143	113
Xiapu (Huizhou)	50	169	154	20	157	148	34	133	127
Xijiao (Huizhou)	55	177	163	33	164	156	49	154	139
Jinguowan (Huizhou)	39	170	147	15	154	134	42	152	138
Zimaling (Zhongshan)	22	270	233	15	209	195	25	213	162
Nanchengyuanling (Dongguan)	38	191	160	16	160	143	37	155	131
Tap Mun (Hong Kong)	61	216	194	23	188	175	53	199	185
Tsuen Wan (Hong Kong)	30	181	143	22	147	107	29	135	117
Yuen Long (Hong Kong)	14	183	168	18	170	163	34	156	134
Tung Chung (Hong Kong)	29	162	140	7	150	134	19	111	103
Taipa Grande (Macao)	35	254	211	5	222	178	16	160	139

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.3c : The monthly averages of O<sub>3</sub>**

Monitoring Station	October 2017	November 2017	December 2017
Luhu (Guangzhou)	61	37	42
Modiesha (Guangzhou)	59	38	51
Wanqingsha (Guangzhou)	87	54	66
Tianhu (Guangzhou)	85	66	78
Zhudong (Guangzhou)	72	45	53
Liyuan (Shenzhen)	80	63	79
Jinjuzui (Foshan)	81	42	51
Huijingcheng (Foshan)	67	37	40
Tangjia (Zhuhai)	104	87	90
Donghu (Jiangmen)	71	42	50
Duanfen (Jiangmen)	90	65	68
Huaguoshan (Jiangmen)	74	45	45
Chengzhong (Zhaoqing)	79	46	53
Xiapu (Huizhou)	79	53	63
Xijiao (Huizhou)	67	60	68
Jinguowan (Huizhou)	71	57	74
Zimaling (Zhongshan)	85	49	62
Nanchengyuanling (Dongguan)	80	45	57
Tap Mun (Hong Kong)	110	87	102
Tsuen Wan (Hong Kong)	68	51	61
Yuen Long (Hong Kong)	69	53	67
Tung Chung (Hong Kong)	66	47	51
Taipa Grande (Macao)	86	54	66

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

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

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.4	1.8	0.5	2.2	0.5	2.0
Modiesha (Guangzhou)	0.3	1.6	0.2	1.6	0.0	2.0
Wanqingsha (Guangzhou)	0.3	1.1	0.2	1.8	0.5	1.6
Tianhu (Guangzhou)	0.4	1.0	0.4	1.2	0.2	1.8
Zhudong (Guangzhou)	0.2	1.4	0.4	1.4	0.4	1.4
Liyuan (Shenzhen)	0.5	1.6	0.5	1.2	0.4	1.7
Jinjuzui (Foshan)	0.6	2.0	0.6	2.3	0.4	2.0
Huijingcheng (Foshan)	0.3	2.2	0.3	2.1	0.2	3.9
Tangjia (Zhuhai)	0.3	0.9	0.4	1.3	0.4	1.3
Donghu (Jiangmen)	0.5	2.6	0.5	3.2	0.4	4.3
Duanfen (Jiangmen)	0.3	1.6	0.4	1.2	0.3	1.5
Huaguoshan (Jiangmen)	0.1	1.6	0.1	1.6	0.1	2.0
Chengzhong (Zhaoqing)	0.6	2.3	0.5	2.6	0.5	2.1
Xiapu (Huizhou)	0.3	1.5	0.5	3.0	0.6	2.3
Xijiao (Huizhou)	0.3	1.1	0.3	1.2	0.5	1.4
Jinguowan (Huizhou)	0.4	0.9	0.3	1.2	0.2	1.3
Zimaling (Zhongshan)	0.2	1.6	0.2	2.3	0.1	1.7
Nanchengyuanling (Dongguan)	0.6	1.7	0.6	1.7	0.5	2.1
Tap Mun (Hong Kong)	0.4	1.0	0.5	1.2	0.6	1.3
Tsuen Wan (Hong Kong)	0.2	1.0	0.3	1.0	0.3	1.4
Yuen Long (Hong Kong)	0.2	1.4	0.2	1.0	0.2	1.5
Tung Chung (Hong Kong)	0.4	1.2	0.4	1.7	0.4	1.4
Taipa Grande (Macao)	0.4	1.2	0.4	1.5	0.3	1.3

Remark : All concentration units are in milligrams per cubic metre (mg/m<sup>3</sup>).

**Table 4.4b : Daily averages of CO (the monthly maxima, minima and the 95<sup>th</sup> percentile)**

Monitoring Station	October 2017			November 2017			December 2017		
	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per
Luhu (Guangzhou)	0.6	1.2	1.1	0.7	1.2	1.2	0.7	1.3	1.3
Modiesha (Guangzhou)	0.4	1.3	1.2	0.5	1.0	1.0	0.5	1.4	1.4
Wanqingsha (Guangzhou)	0.4	0.9	0.8	0.4	1.2	1.1	0.7	1.2	1.1
Tianhu (Guangzhou)	0.4	1.0	1.0	0.5	1.1	1.0	0.4	1.0	1.0
Zhudong (Guangzhou)	0.3	0.9	0.8	0.5	1.2	1.1	0.6	1.2	1.1
Liyuan (Shenzhen)	0.5	1.0	1.0	0.6	1.0	0.9	0.5	1.1	1.0
Jinjuzui (Foshan)	0.8	1.3	1.3	0.8	1.6	1.4	0.6	1.4	1.4
Huijingcheng (Foshan)	0.4	1.3	1.2	0.5	1.3	1.2	0.4	1.7	1.4
Tangjia (Zhuhai)	0.4	0.7	0.7	0.5	0.9	0.9	0.4	1.0	0.9
Donghu (Jiangmen)	0.6	1.4	1.3	0.6	1.5	1.3	0.5	1.7	1.5
Duanfen (Jiangmen)	0.4	0.9	0.9	0.5	0.9	0.9	0.4	1.2	1.0
Huaguoshan (Jiangmen)	0.6	1.1	1.0	0.7	1.2	1.2	0.6	1.5	1.3
Chengzhong (Zhaoqing)	0.7	1.4	1.3	0.7	1.4	1.3	0.7	1.5	1.4
Xiapu (Huizhou)	0.5	0.9	0.8	0.7	1.5	1.2	0.7	1.2	1.1
Xijiao (Huizhou)	0.4	0.9	0.7	0.4	0.9	0.8	0.6	0.9	0.8
Jinguowan (Huizhou)	0.5	0.8	0.7	0.3	1.1	1.0	0.4	1.0	0.9
Zimaling (Zhongshan)	0.4	1.3	1.2	0.6	1.6	1.6	0.3	1.1	1.0
Nanchengyuanling (Dongguan)	0.7	1.2	1.2	0.8	1.3	1.2	0.8	1.4	1.3
Tap Mun (Hong Kong)	0.5	0.9	0.9	0.6	1.1	1.0	0.6	1.1	1.1
Tsuen Wan (Hong Kong)	0.4	0.7	0.7	0.4	0.8	0.8	0.5	1.0	0.9
Yuen Long (Hong Kong)	0.2	0.8	0.7	0.3	0.8	0.8	0.3	1.0	0.9
Tung Chung (Hong Kong)	0.4	0.9	0.9	0.4	0.9	0.9	0.5	1.1	1.0
Taipa Grande (Macao)	0.4	1.0	0.9	0.5	1.1	1.1	0.4	1.2	1.1

Remark : All concentration units are in milligrams per cubic metre (mg/m<sup>3</sup>).

**Table 4.4c : The monthly averages of CO**

Monitoring Station	October 2017	November 2017	December 2017
Luhu (Guangzhou)	0.8	0.9	1.0
Modiesha (Guangzhou)	0.7	0.8	1.0
Wanqingsha (Guangzhou)	0.6	0.6	0.9
Tianhu (Guangzhou)	0.7	0.7	0.7
Zhudong (Guangzhou)	0.5	0.8	0.9
Liyuan (Shenzhen)	0.7	0.7	0.8
Jinjuzui (Foshan)	1.0	1.1	1.1
Huijingcheng (Foshan)	0.7	0.8	0.9
Tangjia (Zhuhai)	0.6	0.6	0.7
Donghu (Jiangmen)	0.9	1.0	1.0
Duanfen (Jiangmen)	0.7	0.7	0.8
Huaguoshan (Jiangmen)	0.8	0.9	1.0
Chengzhong (Zhaoqing)	1.0	1.0	1.1
Xiapu (Huizhou)	0.7	0.9	0.9
Xijiao (Huizhou)	0.5	0.6	0.7
Jinguowan (Huizhou)	0.6	0.7	0.7
Zimaling (Zhongshan)	0.7	1.0	0.7
Nanchengyuanling (Dongguan)	1.0	1.0	1.1
Tap Mun (Hong Kong)	0.7	0.8	0.9
Tsuen Wan (Hong Kong)	0.6	0.6	0.8
Yuen Long (Hong Kong)	0.5	0.6	0.6
Tung Chung (Hong Kong)	0.7	0.7	0.8
Taipa Grande (Macao)	0.7	0.8	0.7

Remark : All concentration units are in milligrams per cubic metre (mg/m<sup>3</sup>).

**Table 4.5a : The monthly maxima and minima of daily averages of PM<sub>10</sub>**

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	15	101	14	109	17	115
Modiesha (Guangzhou)	18	123	17	117	27	145
Wanqingsha (Guangzhou)	21	108	24	128	30	153
Tianhu (Guangzhou)	10	80	5	96	10	95
Zhudong (Guangzhou)	23	106	21	111	20	131
Liyuan (Shenzhen)	18	93	25	121	37	129
Jinjuzui (Foshan)	15	110	20	112	29	136
Huijingcheng (Foshan)	17	121	21	134	21	164
Tangjia (Zhuhai)	21	107	34	141	33	157
Donghu (Jiangmen)	17	145	30	152	29	205
Duanfen (Jiangmen)	15	106	20	117	36	155
Huaguoshan (Jiangmen)	19	144	30	140	27	220
Chengzhong (Zhaoqing)	9	130	15	112	18	156
Xiapu (Huizhou)	14	98	16	106	22	120
Xijiao (Huizhou)	9	68	7	98	15	82
Jinguowan (Huizhou)	11	94	8	149	15	127
Zimaling (Zhongshan)	14	100	23	107	33	118
Nanchengyuanling (Dongguan)	12	115	15	104	19	132
Tap Mun (Hong Kong)	18	76	18	96	26	88
Tsuen Wan (Hong Kong)	9	74	17	90	25	102
Yuen Long (Hong Kong)	15	90	20	111	29	91
Tung Chung (Hong Kong)	10	73	15	87	25	106
Taipa Grande (Macao) #	57	97	2	120	24	162

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

# Owing to the influence of Typhoon Hato, the operation of the PM<sub>10</sub> monitoring equipment was temporarily suspended at the Taipa Grande monitoring station from 23 August to 23 October 2017.

**Table 4.5b : The monthly averages of PM<sub>10</sub>**

Monitoring Station	October 2017	November 2017	December 2017
Luhu (Guangzhou)	48	54	69
Modiesha (Guangzhou)	57	58	81*
Wanqingsha (Guangzhou)	55	71	87
Tianhu (Guangzhou)	36	37	51
Zhudong (Guangzhou)	56*	59	77
Liyuan (Shenzhen)	49	56	77
Jinjuzui (Foshan)	48	61	76
Huijingcheng (Foshan)	52	64	82
Tangjia (Zhuhai)	57	70	87
Donghu (Jiangmen)	62	78	100
Duanfen (Jiangmen)	50	65	86
Huaguoshan (Jiangmen)	64	75	107
Chengzhong (Zhaoqing)	55	60	83
Xiapu (Huizhou)	51	59	72
Xijiao (Huizhou)	37	41	51
Jinguowan (Huizhou)	55	62	69
Zimaling (Zhongshan)	49	64	76
Nanchengyuanling (Dongguan)	51	60	77
Tap Mun (Hong Kong)	43	40	54
Tsuen Wan (Hong Kong)	37	40	55
Yuen Long (Hong Kong)	46	55	59
Tung Chung (Hong Kong)	35	45	60
Taipa Grande (Macao) #	84*	51	79

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

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

# Owing to the influence of Typhoon Hato, the operation of the PM<sub>10</sub> monitoring equipment was temporarily suspended at the Taipa Grande monitoring station from 23 August to 23 October 2017.

**Table 4.6a : The monthly maxima and minima of daily averages of PM<sub>2.5</sub>**

Monitoring Station	October 2017		November 2017		December 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	10	69	9	72	12	87
Modiesha (Guangzhou)	5	71	4	74	9	78
Wanqingsha (Guangzhou)	11	74	14	79	14	91
Tianhu (Guangzhou)	6	61	3	66	8	58
Zhudong (Guangzhou)	9	79	14	75	12	83
Liyuan (Shenzhen)	12	61	16	82	21	88
Jinjuzui (Foshan)	7	76	10	75	10	82
Huijingcheng (Foshan)	7	83	10	86	13	104
Tangjia (Zhuhai)	8	68	13	90	11	102
Donghu (Jiangmen)	10	89	16	93	7	115
Duanfen (Jiangmen)	6	74	10	77	7	96
Huaguoshan (Jiangmen)	8	113	17	119	14	147
Chengzhong (Zhaoqing)	7	94	12	75	13	132
Xiapu (Huizhou)	10	65	9	71	13	83
Xijiao (Huizhou)	6	58	5	67	10	63
Jinguowan (Huizhou)	8	51	7	65	10	58
Zimaling (Zhongshan)	10	72	11	78	14	98
Nanchengyuanling (Dongguan)	12	84	10	75	16	99
Tap Mun (Hong Kong)	8	45	9	56	10	47
Tsuen Wan (Hong Kong)	8	50	13	65	14	76
Yuen Long (Hong Kong)	8	47	12	63	11	77
Tung Chung (Hong Kong)	5	45	11	57	13	74
Taipa Grande (Macao) #	24	54	5	74	12	96

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

# Owing to the influence of Typhoon Hato, the operation of the PM<sub>2.5</sub> monitoring equipment was temporarily suspended at the Taipa Grande monitoring station from 23 August to 23 October 2017.

**Table 4.6b : The monthly averages of PM<sub>2.5</sub>**

Monitoring Station	October 2017	November 2017	December 2017
Luhu (Guangzhou)	29	37	49
Modiesha (Guangzhou)	28	34	48*
Wanqingsha (Guangzhou)	36	45	54
Tianhu (Guangzhou)	25	27	31
Zhudong (Guangzhou)	37	39	46
Liyuan (Shenzhen)	31	36	49
Jinjuzui (Foshan)	30	38	45
Huijingcheng (Foshan)	34	42	52
Tangjia (Zhuhai)	33	42	55
Donghu (Jiangmen)	37	46	58
Duanfen (Jiangmen)	30	39	47
Huaguoshan (Jiangmen)	48	55	73
Chengzhong (Zhaoqing)	38	42	60
Xiapu (Huizhou)	30	39	51
Xijiao (Huizhou)	29	31	36
Jinguowan (Huizhou)	28	30	37
Zimaling (Zhongshan)	31	41	51
Nanchengyuanling (Dongguan)	34	42	55
Tap Mun (Hong Kong)	22	22	28
Tsuen Wan (Hong Kong)	25	28	36
Yuen Long (Hong Kong)	24	26	38
Tung Chung (Hong Kong)	21	28	36
Taipa Grande (Macao) #	44*	27	40

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%.

# Owing to the influence of Typhoon Hato, the operation of the PM<sub>2.5</sub> monitoring equipment was temporarily suspended at the Taipa Grande monitoring station from 23 August to 23 October 2017.

## 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
Wanqingsha (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
Liyuan (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
Nancheng-yuanling (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

## Annex B : Measurement Methods of Air Pollutant Concentration

Pollutants	Measuring Principles
Sulphur dioxide (SO <sub>2</sub> )	UV fluorescence / Differential Optical Absorption Spectroscopy
Nitrogen dioxide (NO <sub>2</sub> )	Chemiluminescence / Differential Optical Absorption Spectroscopy
Ozone (O <sub>3</sub> )	UV absorption / Differential Optical Absorption Spectroscopy
Respirable suspended particulates (PM <sub>10</sub> )	Oscillating microbalance (TEOM) / Beta particulate monitor
Fine suspended particulates (PM <sub>2.5</sub> )	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