

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

October to December 2022

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

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

**Approved by : Quality Management Committee of
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Delta Regional Air Quality Monitoring
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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 July to September, the third quarter of 2022. It is the thirty-sixth report published in the form of a quarterly report and the thirty-third 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 Former Guangdong Provincial Environmental Monitoring Centre¹ (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 GDEMC¹ 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 Ecological and Environmental Monitoring Centre of

¹ In 2003, when the network was established, the unit was named Guangdong Provincial Environmental Protection Monitoring Centre, which was renamed as Guangdong Provincial Environmental Monitoring Centre in 2008, and was renamed again as Ecological and Environmental Monitoring Centre of Guangdong in December 2020.

Guangdong (GDEEMC), HKEPD, Environmental Protection Bureau of Macau 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 Ecological and 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 GDEEMC, 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.

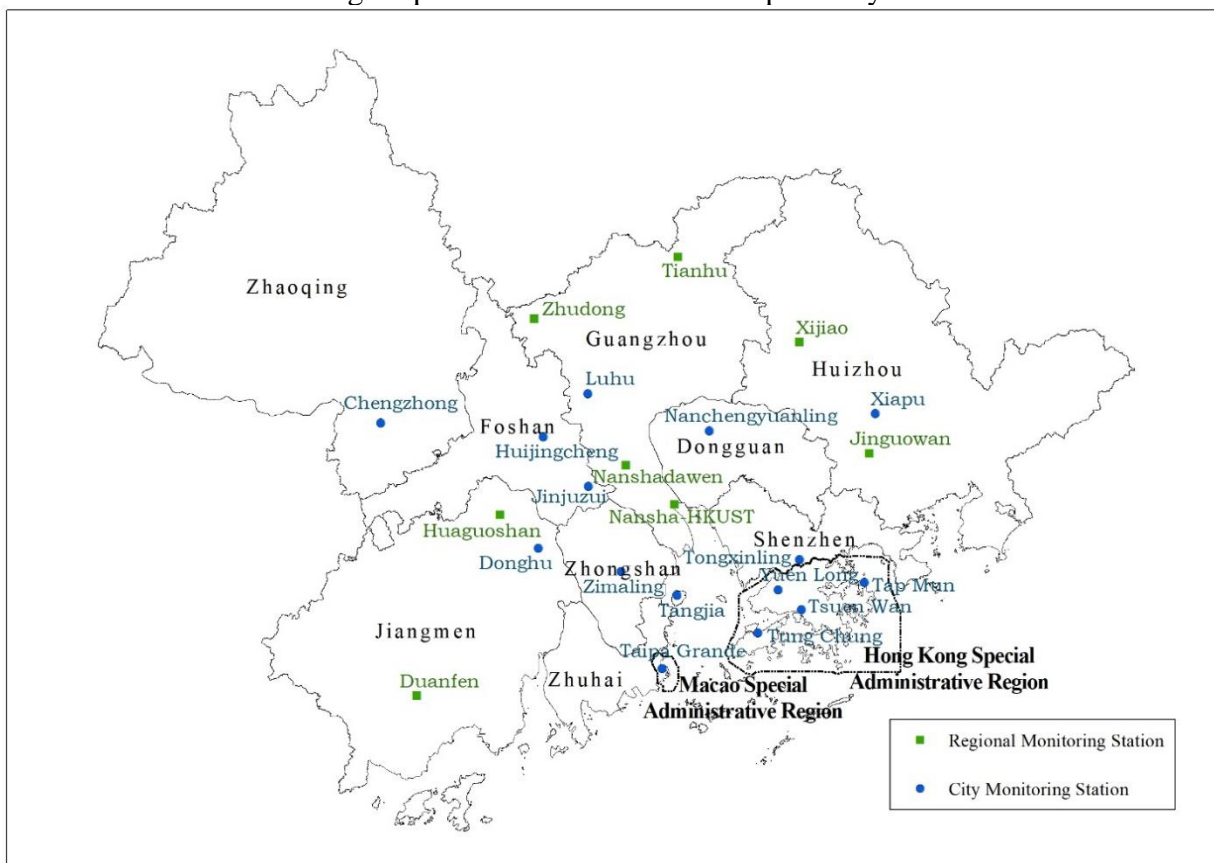


Figure 2.1: Spatial Distribution of Monitoring Stations in the Network

Remark: The above map was drawn with reference to the China National Standard Map "Map of the Pearl River Delta Region" (approval number: 粵S (2021) No. 169), and was re-submitted and approved for release. The approval number is GS粵 (2022) No. 378.

3. Operation of the Network

The overall operation of the Network was smooth in the fourth quarter of 2022. The average data capture rate of hourly air pollutant monitoring data measured at all monitoring stations was 93.7% in the fourth 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 October to December 2022. 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 and PM_{2.5} 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	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	2	10	2	10	2	12
Nanshadawen (Guangzhou)	1	30	3	18	4	20
Nansha-HKUST (Guangzhou)	4	20	4	15	4	16
Tianhu (Guangzhou)	3	22	2	17	3	18
Zhudong (Guangzhou)	3	28	3	19	3	20
Tongxinling (Shenzhen)	3	9	2	5	1	6
Jinjuzui (Foshan)	2	13	1	7	1	10
Huijingcheng (Foshan)	5	28	1	24	3	21
Tangjia (Zhuhai)	5	11	6	12	6	16
Donghu (Jiangmen)	5	25	4	14	4	14
Duanfen (Jiangmen)	3	28	3	18	3	14
Huaguoshan (Jiangmen)	2	84	2	45	3	29
Chengzhong (Zhaoqing)	6	116	6	73	4	48
Xiapu (Huizhou)	4	21	5	16	5	21
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	3	12	4	16	4	12
Zimaling (Zhongshan)	4	21	5	11	6	17
Nanchengyuanling (Dongguan)	7	20	7	19	5	17
Tap Mun (Hong Kong)	7	15	3	14	4	11
Tsuen Wan (Hong Kong)	8	14	6	17	6	16
Yuen Long (Hong Kong)	2	10	2	8	2	10
Tung Chung (Hong Kong)	4	19	4	11	5	16
Taipa Grande (Macao)	0	8	2	6	3	11

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

-- No monitoring data for the corresponding period.

No data is available for Xijiao Station. Please refer to Appendix A for the reason. The same explanation can be found in the following references.

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

Monitoring Station	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	3	7	2	6	3	9
Nanshadawen (Guangzhou)	4	16	4	8	4	14
Nansha-HKUST (Guangzhou)	5	11	5	7	5	12
Tianhu (Guangzhou)	5	13	3	11	4	13
Zhudong (Guangzhou)	5	15	3	12	4	11
Tongxinling (Shenzhen)	3	7	3	4	2	5
Jinjuzui (Foshan)	2	7	1	4	2	7
Huijingcheng (Foshan)	6	12	2	13	3	11
Tangjia (Zhuhai)	6	9	6	8	7	11
Donghu (Jiangmen)	6	11	6	9	5	9
Duanfen (Jiangmen)	4	10	3	7	3	10
Huaguoshan (Jiangmen)	4	21	2	13	3	12
Chengzhong (Zhaoqing)	8	33	8	21	7	18
Xiapu (Huizhou)	5	12	6	9	6	11
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	4	8	4	5	4	8
Zimaling (Zhongshan)	5	11	6	8	7	12
Nanchengyuanling (Dongguan)	9	12	8	12	7	13
Tap Mun (Hong Kong)	8	12	4	10	5	8
Tsuen Wan (Hong Kong)	8	11	7	10	7	10
Yuen Long (Hong Kong)	3	6	3	5	3	7
Tung Chung (Hong Kong)	4	9	5	7	6	10
Taipa Grande (Macao)	1	6	2	4	3	8

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

-- No monitoring data for the corresponding period.

Table 4.1c : The monthly averages of SO₂

Monitoring Station	October 2022	November 2022	December 2022
Luhu (Guangzhou)	5	3	5
Nanshadawen (Guangzhou)	8	6	9
Nansha-HKUST (Guangzhou)	8	6	7
Tianhu (Guangzhou)	8	4	7
Zhudong (Guangzhou)	9	6	7
Tongxinling (Shenzhen)	5	3	3
Jinjuzui (Foshan)	4	3	4
Huijingcheng (Foshan)	9	6	6
Tangjia (Zhuhai)	7	7	9
Donghu (Jiangmen)	8	7	7
Duanfen (Jiangmen)	6	4	7
Huaguoshan (Jiangmen)	10	6	8
Chengzhong (Zhaoqing)	13	12	11
Xiapu (Huizhou)	8	7	8
Xijiao (Huizhou)	--	--	--
Jinguowan (Huizhou)	5	4	6
Zimaling (Zhongshan)	8	7	9
Nanchengyuanling (Dongguan)	10	10	9
Tap Mun (Hong Kong)	10	7	6
Tsuen Wan (Hong Kong)	9	9	8
Yuen Long (Hong Kong)	4	3	5
Tung Chung (Hong Kong)	6	6	8
Taipa Grande (Macao)	4	3	6

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%

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	4	149	7	126	7	102
Nanshadawen (Guangzhou)	6	127	11	149	16	129
Nansha-HKUST (Guangzhou)	2	74	1	127	2	136
Tianhu (Guangzhou)	3	30	3	28	4	30
Zhudong (Guangzhou)	5	92	9	74	8	95
Tongxinling (Shenzhen)	2	89	4	66	7	92
Jinjuzui (Foshan)	3	107	6	103	6	98
Huijingcheng (Foshan)	5	155	12	144	15	140
Tangjia (Zhuhai)	3	52	3	80	8	83
Donghu (Jiangmen)	5	98	7	85	10	121
Duanfen (Jiangmen)	3	36	3	46	12	65
Huaguoshan (Jiangmen)	2	89	5	88	14	120
Chengzhong (Zhaoqing)	7	146	5	128	6	107
Xiapu (Huizhou)	5	48	7	80	8	91
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	1	30	3	31	4	72
Zimaling (Zhongshan)	1	81	1	75	7	86
Nanchengyuanling (Dongguan)	6	128	7	171	8	126
Tap Mun (Hong Kong)	1	24	1	26	4	62
Tsuen Wan (Hong Kong)	7	104	7	171	12	137
Yuen Long (Hong Kong)	6	94	3	134	18	135
Tung Chung (Hong Kong)	4	76	2	91	8	92
Taipa Grande (Macao)	5	56	5	93	9	77

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

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	14	72	16	61	17	61
Nanshadawen (Guangzhou)	18	61	24	70	27	73
Nansha-HKUST (Guangzhou)	8	36	6	48	10	54
Tianhu (Guangzhou)	5	17	6	17	6	14
Zhudong (Guangzhou)	15	46	15	44	17	39
Tongxinling (Shenzhen)	4	33	8	32	15	58
Jinjuzui (Foshan)	10	50	14	56	15	59
Huijingcheng (Foshan)	13	67	17	78	21	81
Tangjia (Zhuhai)	8	26	11	35	14	52
Donghu (Jiangmen)	12	40	16	44	16	63
Duanfen (Jiangmen)	6	24	8	33	16	47
Huaguoshan (Jiangmen)	9	53	18	49	23	71
Chengzhong (Zhaoqing)	10	64	12	63	13	63
Xiapu (Huizhou)	9	24	10	32	12	46
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	5	11	5	14	6	24
Zimaling (Zhongshan)	8	38	9	37	15	60
Nanchengyuanling (Dongguan)	10	51	12	78	13	60
Tap Mun (Hong Kong)	2	12	5	14	7	20
Tsuen Wan (Hong Kong)	20	48	17	60	26	61
Yuen Long (Hong Kong)	16	51	20	67	39	85
Tung Chung (Hong Kong)	9	41	8	43	16	53
Taipa Grande (Macao)	9	34	10	39	19	49

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

-- No monitoring data for the corresponding period.

Table 4.2c: The monthly averages of NO₂

Monitoring Station	October 2022	November 2022	December 2022
Luhu (Guangzhou)	28	34	31
Nanshadawen (Guangzhou)	38	44	44
Nansha-HKUST (Guangzhou)	17	27	28
Tianhu (Guangzhou)	9	10	9
Zhudong (Guangzhou)	24	27	24
Tongxinling (Shenzhen)	15	18	28
Jinjuzui (Foshan)	24	33	31
Huijingcheng (Foshan)	30	42	40
Tangjia (Zhuhai)	15	22	29
Donghu (Jiangmen)	24	32	37
Duanfen (Jiangmen)	16	19	29
Huaguoshan (Jiangmen)	27	36	41
Chengzhong (Zhaoqing)	29	31	27
Xiapu (Huizhou)	16	20	20
Xijiao (Huizhou)	--	--	--
Jinguowan (Huizhou)	8	10	12
Zimaling (Zhongshan)	20	26	35
Nanchengyuanling (Dongguan)	24	35	29
Tap Mun (Hong Kong)	7	8	13
Tsuen Wan (Hong Kong)	34	35	42
Yuen Long (Hong Kong)	32	42	56
Tung Chung (Hong Kong)	24	25	36
Taipa Grande (Macao)	20	25	36

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%

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	3	269	3	238	4	115
Nanshadawen (Guangzhou)	1	301	1	265	1	170
Nansha-HKUST (Guangzhou)	1	262	1	285	1	168
Tianhu (Guangzhou)	21	210	18	210	21	122
Zhudong (Guangzhou)	3	248	2	261	1	147
Tongxinling (Shenzhen)	4	198	1	135	1	163
Jinjuzui (Foshan)	2	271	2	206	2	121
Huijingcheng (Foshan)	2	297	1	263	1	111
Tangjia (Zhuhai)	6	261	3	296	3	170
Donghu (Jiangmen)	2	325	2	316	2	170
Duanfen (Jiangmen)	8	306	6	220	1	158
Huaguoshan (Jiangmen)	1	309	2	266	2	133
Chengzhong (Zhaoqing)	5	254	4	228	4	158
Xiapu (Huizhou)	5	177	4	161	5	119
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	4	156	1	137	1	116
Zimaling (Zhongshan)	1	306	1	233	1	165
Nanchengyuanling (Dongguan)	5	219	5	214	6	148
Tap Mun (Hong Kong)	12	194	9	155	6	151
Tsuen Wan (Hong Kong)	4	168	1	114	0	105
Yuen Long (Hong Kong)	3	198	0	157	1	131
Tung Chung (Hong Kong)	2	223	2	268	2	132
Taipa Grande (Macao)	20	267	2	292	2	169

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

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022			November 2022			December 2022		
	Min	Max	90 th per	Min	Max	90 th per	Min	Max	90 th per
Luhu (Guangzhou)	73	228	197	14	179	127	21	102	94
Nanshadawen (Guangzhou)	56	255	216	10	224	162	19	136	111
Nansha-HKUST (Guangzhou)	43	229	197	15	244	184	15	132	100
Tianhu (Guangzhou)	65	188	157	38	181	128	41	115	110
Zhudong (Guangzhou)	91	208	197	15	222	151	25	128	103
Tongxinling (Shenzhen)	48	172	153	15	121	96	18	104	101
Jinjuzui (Foshan)	53	238	184	15	170	159	23	99	90
Huijingcheng (Foshan)	75	244	221	7	217	173	21	97	91
Tangjia (Zhuhai)	43	204	189	20	231	135	20	135	115
Donghu (Jiangmen)	42	282	224	10	247	152	19	146	116
Duanfen (Jiangmen)	40	228	215	21	175	127	27	133	113
Huaguoshan (Jiangmen)	36	257	186	7	226	128	17	106	81
Chengzhong (Zhaoqing)	81	227	210	28	189	150	24	127	104
Xiapu (Huizhou)	55	165	152	22	141	130	24	109	93
Xijiao (Huizhou)	--	--	--	--	--	--	--	--	--
Jinguowan (Huizhou)	43	148	138	24	115	111	20	105	92
Zimaling (Zhongshan)	45	240	203	7	210	158	14	135	111
Nanchengyuanling (Dongguan)	101	203	185	23	183	160	26	126	109
Tap Mun (Hong Kong)	66	181	155	16	141	133	24	135	118
Tsuen Wan (Hong Kong)	30	135	123	18	94	86	13	84	79
Yuen Long (Hong Kong)	40	172	153	16	120	98	15	109	94
Tung Chung (Hong Kong)	46	166	152	4	165	92	9	107	73
Taipa Grande (Macao)	60	226	201	26	199	130	17	131	121

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

-- No monitoring data for the corresponding period.

Table 4.3c: The monthly averages of O₃

Monitoring Station	October 2022	November 2022	December 2022
Luhu (Guangzhou)	92	40	44
Nanshadawen (Guangzhou)	92	42	44
Nansha-HKUST (Guangzhou)	95	49	47
Tianhu (Guangzhou)	111	68	75
Zhudong (Guangzhou)	94	47	48
Tongxinling (Shenzhen)	88	50	42
Jinjuzui (Foshan)	90	49*	49*
Huijingcheng (Foshan)	105	43	42
Tangjia (Zhuhai)	95	54	52
Donghu (Jiangmen)	104	47	47
Duanfen (Jiangmen)	98	48	52
Huaguoshan (Jiangmen)	82	35	35
Chengzhong (Zhaoqing)	99	52	53
Xiapu (Huizhou)	95	55	53
Xijiao (Huizhou)	--	--	--
Jinguowan (Huizhou)	80	43	50
Zimaling (Zhongshan)	96	42	41
Nanchengyuanling (Dongguan)	98	53	53
Tap Mun (Hong Kong)	99	69	62
Tsuen Wan (Hong Kong)	73	44	36
Yuen Long (Hong Kong)	85	45	39
Tung Chung (Hong Kong)	76	48	31
Taipa Grande (Macao)	104	62	52

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%

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.3	1.1	0.4	1.6	0.3	0.9
Nanshadawen (Guangzhou)	0.3	1.1	0.5	1.3	0.4	1.2
Nansha-HKUST (Guangzhou)	0.2	0.8	0.3	1.0	0.3	1.1
Tianhu (Guangzhou)	0.4	1.0	0.2	1.2	0.5	1.2
Zhudong (Guangzhou)	0.4	1.0	0.4	1.3	0.4	1.6
Tongxinling (Shenzhen)	0.4	0.9	0.3	0.9	0.4	1.4
Jinjuzui (Foshan)	0.3	1.2	0.3	1.7	0.2	0.8
Huijingcheng (Foshan)	0.4	1.8	0.2	1.8	0.3	1.7
Tangjia (Zhuhai)	0.1	0.7	0.2	0.9	0.1	1.0
Donghu (Jiangmen)	0.4	1.6	0.3	2.2	0.4	1.8
Duanfen (Jiangmen)	0.3	1.0	0.4	1.2	0.4	1.0
Huaguoshan (Jiangmen)	0.3	1.4	0.4	1.7	0.1	1.1
Chengzhong (Zhaoqing)	0.3	1.0	0.4	1.3	0.2	1.0
Xiapu (Huizhou)	0.3	0.8	0.2	1.1	0.2	1.5
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	0.1	0.6	0.2	0.7	0.0	0.8
Zimaling (Zhongshan)	0.2	0.8	0.3	1.0	0.3	1.0
Nanchengyuanling (Dongguan)	0.4	1.2	0.5	1.7	0.2	1.5
Tap Mun (Hong Kong)	0.1	0.7	0.2	0.9	0.3	0.9
Tsuen Wan (Hong Kong)	0.2	0.8	0.3	1.0	0.1	1.2
Yuen Long (Hong Kong)	0.5	1.0	0.3	1.1	0.2	1.4
Tung Chung (Hong Kong)	0.3	0.7	0.0	0.7	0.1	0.7
Taipa Grande (Macao)	0.4	0.8	0.4	0.9	0.2	0.9

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

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022			November 2022			December 2022		
	Min	Max	95 th per	Min	Max	95 th per	Min	Max	95 th per
Luhu (Guangzhou)	0.4	0.8	0.8	0.4	0.9	0.9	0.4	0.8	0.8
Nanshadawen (Guangzhou)	0.4	0.9	0.9	0.7	1.0	1.0	0.4	1.1	1.0
Nansha-HKUST (Guangzhou)	0.3	0.6	0.6	0.4	0.8	0.8	0.3	1.0	0.9
Tianhu (Guangzhou)	0.4	0.8	0.8	0.2	1.1	0.9	0.6	1.1	1.1
Zhudong (Guangzhou)	0.4	0.8	0.8	0.5	1.0	1.0	0.5	1.0	1.0
Tongxinling (Shenzhen)	0.5	0.8	0.7	0.4	0.7	0.6	0.4	0.8	0.8
Jinjuzui (Foshan)	0.4	0.8	0.7	0.5	0.9	0.8	0.3	0.6	0.6
Huijingcheng (Foshan)	0.5	1.0	1.0	0.3	1.3	1.2	0.4	1.1	1.0
Tangjia (Zhuhai)	0.2	0.5	0.5	0.2	0.6	0.6	0.2	0.9	0.9
Donghu (Jiangmen)	0.5	0.7	0.7	0.4	1.1	1.1	0.4	0.8	0.8
Duanfen (Jiangmen)	0.4	0.7	0.7	0.4	1.0	0.9	0.5	0.9	0.9
Huaguoshan (Jiangmen)	0.4	0.8	0.8	0.5	1.0	0.9	0.2	0.7	0.7
Chengzhong (Zhaoqing)	0.4	0.8	0.7	0.5	1.0	1.0	0.3	0.8	0.7
Xiapu (Huizhou)	0.4	0.8	0.7	0.3	0.7	0.7	0.3	0.8	0.7
Xijiao (Huizhou)	--	--	--	--	--	--	--	--	--
Jinguowan (Huizhou)	0.2	0.5	0.4	0.2	0.5	0.5	0.0	0.6	0.5
Zimaling (Zhongshan)	0.3	0.6	0.6	0.3	0.8	0.7	0.4	0.9	0.8
Nanchengyuanling (Dongguan)	0.5	0.9	0.9	0.6	1.1	1.1	0.3	1.0	1.0
Tap Mun (Hong Kong)	0.2	0.6	0.6	0.2	0.7	0.6	0.4	0.8	0.8
Tsuen Wan (Hong Kong)	0.3	0.7	0.7	0.3	0.7	0.7	0.2	0.9	0.9
Yuen Long (Hong Kong)	0.5	0.7	0.7	0.4	0.8	0.8	0.3	0.8	0.7
Tung Chung (Hong Kong)	0.3	0.6	0.5	0.1	0.6	0.6	0.2	0.6	0.6
Taipa Grande (Macao)	0.4	0.7	0.7	0.4	0.9	0.9	0.3	0.8	0.8

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

-- No monitoring data for the corresponding period.

Table 4.4c: The monthly averages of CO

Monitoring Station	October 2022	November 2022	December 2022
Luhu (Guangzhou)	0.6	0.7	0.6
Nanshadawen (Guangzhou)	0.7	0.8	0.8
Nansha-HKUST (Guangzhou)	0.4	0.6	0.7
Tianhu (Guangzhou)	0.6	0.6	0.9
Zhudong (Guangzhou)	0.6	0.8	0.8
Tongxinling (Shenzhen)	0.6	0.5	0.7
Jinjuzui (Foshan)	0.6	0.6*	0.5*
Huijingcheng (Foshan)	0.8	0.9	0.8
Tangjia (Zhuhai)	0.3	0.4	0.5
Donghu (Jiangmen)	0.6	0.8	0.7
Duanfen (Jiangmen)	0.6	0.7	0.7
Huaguoshan (Jiangmen)	0.6	0.8	0.5
Chengzhong (Zhaoqing)	0.6	0.8	0.6
Xiapu (Huizhou)	0.5	0.5	0.5
Xijiao (Huizhou)	--	--	--
Jinguowan (Huizhou)	0.3	0.4	0.3
Zimaling (Zhongshan)	0.5	0.5	0.6
Nanchengyuanling (Dongguan)	0.7	0.9	0.6
Tap Mun (Hong Kong)	0.4	0.4	0.6
Tsuen Wan (Hong Kong)	0.5	0.6	0.7
Yuen Long (Hong Kong)	0.7	0.6	0.6
Tung Chung (Hong Kong)	0.5	0.4	0.4
Taipa Grande (Macao)	0.6	0.7	0.6

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

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

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	22	69	8	89	14	76
Nanshadawen (Guangzhou)	19	85	11	91	14	80
Nansha-HKUST (Guangzhou)	19	58	9	67	13	60
Tianhu (Guangzhou)	18	64	3	70	6	53
Zhudong (Guangzhou)	17	73	7	111	9	80
Tongxinling (Shenzhen)	14	59	9	39	13	88
Jinjuzui (Foshan)	17	70	9	98	16	81
Huijingcheng (Foshan)	19	89	9	113	20	89
Tangjia (Zhuhai)	11	57	10	50	17	76
Donghu (Jiangmen)	20	86	9	94	21	89
Duanfen (Jiangmen)	10	57	7	43	13	64
Huaguoshan (Jiangmen)	20	114	14	116	19	94
Chengzhong (Zhaoqing)	20	80	5	102	8	85
Xiapu (Huizhou)	22	63	9	60	10	71
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	16	49	7	45	9	56
Zimaling (Zhongshan)	16	62	14	58	15	66
Nanchengyuanling (Dongguan)	21	73	10	130	10	75
Tap Mun (Hong Kong)	12	41	7	30	5	72
Tsuen Wan (Hong Kong)	9	40	5	36	9	68
Yuen Long (Hong Kong)	9	46	5	43	14	81
Tung Chung (Hong Kong)	11	48	7	39	9	68
Taipa Grande (Macao)	19	63	15	61	16	91

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

-- No monitoring data for the corresponding period.

Table 4.5b: The monthly averages of PM₁₀

Monitoring Station	October 2022	November 2022	December 2022
Luhu (Guangzhou)	45	37	43
Nanshadawen (Guangzhou)	52	39	43
Nansha-HKUST (Guangzhou)	42	32	36
Tianhu (Guangzhou)	37	25	28
Zhudong (Guangzhou)	38	35	37
Tongxinling (Shenzhen)	37	24	38
Jinjuzui (Foshan)	46	34	47
Huijingcheng (Foshan)	56	49	55
Tangjia (Zhuhai)	37	27	43
Donghu (Jiangmen)	50	40	51
Duanfen (Jiangmen)	36	24	38
Huaguoshan (Jiangmen)	59	46	53
Chengzhong (Zhaoqing)	45	39	44
Xiapu (Huizhou)	43	34	36
Xijiao (Huizhou)	--	--	--
Jinguowan (Huizhou)	34	25	29
Zimaling (Zhongshan)	44	31	43
Nanchengyuanling (Dongguan)	46	43	40
Tap Mun (Hong Kong)	29	18	27
Tsuen Wan (Hong Kong)	28	19	28
Yuen Long (Hong Kong)	30	22	35
Tung Chung (Hong Kong)	31	19	31
Taipa Grande (Macao)	46	29	51

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%.

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022		November 2022		December 2022	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	12	41	5	59	7	53
Nanshadawen (Guangzhou)	13	45	4	44	4	37
Nansha-HKUST (Guangzhou)	7	37	6	51	7	46
Tianhu (Guangzhou)	7	36	3	49	4	39
Zhudong (Guangzhou)	8	36	5	72	7	54
Tongxinling (Shenzhen)	7	33	6	26	4	64
Jinjuzui (Foshan)	8	44	5	53	7	53
Huijingcheng (Foshan)	10	55	8	91	8	47
Tangjia (Zhuhai)	8	34	5	37	3	54
Donghu (Jiangmen)	8	43	5	48	3	51
Duanfen (Jiangmen)	4	39	5	34	10	49
Huaguoshan (Jiangmen)	10	72	7	70	4	65
Chengzhong (Zhaoqing)	10	44	3	67	3	59
Xiapu (Huizhou)	8	34	4	30	3	71
Xijiao (Huizhou)	--	--	--	--	--	--
Jinguowan (Huizhou)	11	34	6	28	5	45
Zimaling (Zhongshan)	7	39	6	32	4	41
Nanchengyuanling (Dongguan)	11	40	6	75	4	49
Tap Mun (Hong Kong)	7	23	4	21	4	57
Tsuen Wan (Hong Kong)	7	29	5	28	6	54
Yuen Long (Hong Kong)	5	24	4	27	7	64
Tung Chung (Hong Kong)	6	25	4	24	8	50
Taipa Grande (Macao)	11	33	7	48	8	53

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

-- No monitoring data for the corresponding period.

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

Monitoring Station	October 2022	November 2022	December 2022
Luhu (Guangzhou)	25	23	26
Nanshadawen (Guangzhou)	22	17	19
Nansha-HKUST (Guangzhou)	22	21	23
Tianhu (Guangzhou)	20	16	17
Zhudong (Guangzhou)	20	21	23
Tongxinling (Shenzhen)	18	14	21
Jinjuzui (Foshan)	23	19	27
Huijingcheng (Foshan)	29	34	26
Tangjia (Zhuhai)	20	18	26
Donghu (Jiangmen)	24	21	28
Duanfen (Jiangmen)	21	16	26
Huaguoshan (Jiangmen)	34	29	35
Chengzhong (Zhaoqing)	25	26	26
Xiapu (Huizhou)	19	17	22
Xijiao (Huizhou)	--	--	--
Jinguowan (Huizhou)	21	17	20
Zimaling (Zhongshan)	22	16	22
Nanchengyuanling (Dongguan)	21	25	23
Tap Mun (Hong Kong)	14	11	17
Tsuen Wan (Hong Kong)	17	15	20
Yuen Long (Hong Kong)	15	15	23
Tung Chung (Hong Kong)	15	12	19
Taipa Grande (Macao)	23	20	24

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%

-- No monitoring data for the corresponding period.

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
Nanshadawen ⁽¹⁾ (Guangzhou)	Shinan Road, Dongchong Town, Nansha	City	23m	10m	Jan 2021
Nansha-HKUST ⁽²⁾ (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 ⁽³⁾ (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 ⁽⁴⁾ (Huizhou)	Zhangbei Yaowei She Nationality Primary School, Henghe Town	Rural	44m	10m	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 ⁽⁵⁾ (Dongguan)	Dongguan administration center	Mixed residential/commercial/industrial	40 m	19m	May 2021
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) Modiesha station closed permanently owing to insufficient space after the extensive renovation work at station, whereas Nanshadawen station joined the network in the 1st quarter of 2021.

(2) Wanqingsha station was renamed as Nansha-HKUST station in the 1st quarter of 2019.

(3) Liyuan station was renamed as Tongxinling station in the 1st quarter of 2019.

(4) Xijiao station was relocated to Zhangbei Yaowei She Nationality Primary School, Henghe Town, Boluo County, in the 4th quarter of 2019. Due to potential safety hazards of site load-bearing issue, the station is out of service from 00:00 on August 23, 2022. Because of the impact of covid-19 pandemic, the station is still under construction.

(5) Nancheng-yuanling station was relocated to Dongguan administration center in May 2021. The distance between the old and new sites is about 600 metres.

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
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