Technological Rules Concerned "Ambient Air Quality Daily Report"

(National Environmental Monitoring Centre, China 2007)

I. Monitoring Items: Three pollutants: SO2, NO2 and inhalable particulates.

II. Monitoring sites: 1. The city on the list of national monitoring network of ambient air quality must conduct monitoring according to the optimized monitoring sites ratified in the environmental monitoring No.108 Circular issued by State Environmental Protection Administration, and the ambient air quality report in such cities and regions will be based on that.

2. The city not on the list of state controlled should conduct monitoring according to the sites checked and confirmed by the state environmental comprehensive renovating ration, and the ambient air quality daily report will be based on that.

3. The configuration and sampling technique at the monitoring sites will enforce the regulations of "environmental monitoring technological specification (atmospheric air and exhaust air)"

III. Monitoring circle and frequency for daily report: The definition of a day in ambient air daily report is from 12:00 of the previous day to 12:00 of the current day. China Environmental Protection Monitoring Center releases ambient air quality daily report of key cities at the medias before 16:00 every day, which includes API (Air Pollution Indices), prominent pollutants and air quality grade, and so on.

IV. Auditing of monitoring data: The validity of monitoring data of various pollutant concentrations will enforce the regulations of the data statistic validity of “Environmental Air Quality Standard (GB3095-1996)” The valid digit, calculation and statistics of the monitoring data of pollutants concentration will enforce related rules of “Environmental Monitoring Technical Criterion”. The final API value will be integer, if any decimal number appeared after calculating, the decimal number will be discarded and the API value will be added one. The monitoring results from the background site should not be included in the city average calculation. In the case of the background site locates in the built-up area in a city and the monitoring value at the site has been approved to be included in the city average calculating when designing monitoring site in the city, the monitoring results may be included in the city average calculating as well as in the API calculating. For details, refer to the technological regulations of ambient air quality daily report for key cities.

V. The definition of Air Pollution Index and the air quality grading: API is the English short form for Air Pollution Index. The API grading standard of the urban air quality daily report in China are showed in Table One.

Table One: The API value and corresponding pollutant concentrations

Pollution Index	Pollutant Concentrations (mg/cubic meter)				
API	SO_2 (daily average)	NO_2 (daily average)	PM_{10} (daily average)	CO (hourly average)	O_3 (hourly average)
50	0.050	0.080	0.050	5	0.120
100	0.150	0.120	0.150	10	0.200
200	0.800	0.280	0.350	60	0.400
300	1.600	0.565	0.420	90	0.800
400	2.100	0.750	0.500	120	1.000
500	2.620	0.940	0.600	150	1.200

Table Two: API and air quality grading

API	Air quality Description	Grade	Effects to health	Measures suggested
0-50	Excellent	1	Daily activities not be affected	
51-100	Good	2		
101-150	Slightly polluted	3A	The symptom of the susceptible is aggravated slightly, while the healthy people will appear stimulate symptom.	The cardiac and respiratory system patients should reduce strength draining and outdoor activities.
151-200	Light polluted	3B		
201-250	Moderate polluted	4A	The symptoms of the cardiac and lung disease patients aggravate remarkably, and the exercise endurance drop lower. The healthy crowds popularly appear some symptoms.	The aged, cardiac and lung disease patients should stay indoors and reduce physical activities.
251-300	Moderate-heavy polluted	4B		
>300	Heavy polluted	5	The exercise endurance of the healthy people drops down, some appears strong symptoms remarkably. Some diseases appear earlier.	The aged and patients should stay indoors and avoid strength draining; the ordinary should avoid outdoor activities.

VI. API calculation methods:

1. Basic formula: Supposed I is the API of a certain pollutant, C is the concentration of the pollutant, the result is:

In which, ***C*** high & ***C*** low : in the API graded value limited table (Table 1), the two values most approaching to the value of ***C***, ***C*** high stands for the limited values higher than and ***C*** low stands for the limited values lower than ***C***. ***I*** high & ***I*** low : in the API

grading limited value table, the two values most approaching to Value ***I***, ***I*** high stands for the limited values larger than ***I***, and ***I*** low stands for the limited values lower than ***I.***

2. The calculation steps of API for the whole city:

a. To calculate the daily average value at each monitoring site for each pollutant.

In the calculation: ***Ci*** stands for the pollutant concentration at one monitoring site, N stands for the monitoring times at the site during a day.

b. To calculate the daily average value of a certain pollutant in the city

In the calculation: ***l*** stands for the number of the monitoring sites in the city.

c. The sub-API value for a pollutant can be calculated through the Basic Formula by using the city daily average of the pollutant.

d. The maximum of sub-API values will be selected as the city API.

3. To choose the primary pollutants in the city: After the sub-API of all pollutants are calculated, and the maximum of sub-APIs is taken as the API of this region or the city, then this pollutant will be the primary air pollutant in this region or the city.

$$API = \max (I1, I2 ... Ii ... In)$$

Supposed the daily average value of PM10 in certain region is 0.215mg/cubic meter, the daily average value of SO2 is 0.105mg/cubic meter, daily average value of NO2 is 0.080 mg/cubic meter, and the calculation of the pollutant index is as follows: According to Table One, the practical monitoring concentration of PM10 is 0.215mg/cubic meter, which is between 0.150 mg/cubic meter and 0.250 mg/cubic meter, calculating according to this linear relation between the pollutant index and the pollutants within the concentration limit, i.e., here the concentration limited value ***C***2= 0.150 mg/cubic meter, ***C***3 = 0.250 mg/cubic meter, and the corresponding sub index value ***I***2 = 100, ***I***3 = 200, then the pollutant sub index of PM10 will be as following:

$$\mathbf{I = [\ (200-100)/(0.250-0.150)]\ X\ (0.215 - 0.150) + 100 = 165}$$

Therefore the sub index of PM10 ***I*** = 165; and the sub index of other pollutants are respectively as: ***I***=76 (SO2), ***I*** =50 (NO2). The maximum of the pollutant index, 165, is selected to report as the API of this area.

$$API = \max (165, 76, 50) = 165$$

The primary pollutant is inhalable particulates (PM10) .

VII. Reporting contents: The reporting contents mainly include city name, API, primary pollutant and air quality grade.