

(2) Ambient Air Quality

1) Comparison with Ambient Air Qualities such as the World Bank Standard

The World Bank guideline standard, Mongolian standard (amended in 1997) and Japanese standard for air quality are shown in Table 6.3-8.

As for the features of the Mongolian standard, the numerical value is set up by the measuring method.

Table 6.3-8 Comparison of the Environmental Standards for Air Quality

Country	SO ₂ µg/m ³			NO ₂ µg/m ³			Dust (SPM) µg/m ³		
	Hourly Value	Daily Ave.	Annual Ave.	Hourly Value	Daily Ave.	Annual Ave.	Hourly Value	Daily Ave.	Annual Ave.
World Bank		150	80		150	100		150 (TSP 230)	50 (TSP 80)
Mongolia	*1 A 500 B 500	*1 A 30 B 70		*2 A 85 B 150	*2 A 40 B 60		*3 A 500 B 500	*3 A 150 B 200	
Japan	290 (0.1 ppm)	110 (0.04 ppm)			82~ 120 (0.04~ 0.06 ppm)		200	100	

*1 A: Russian method 30, B: Ultraviolet fluorescence method 70 (No.1 monitoring station),

*2 A: Russian method 40, B: Chemiluminescent method 60 (No.1 monitoring station)

*3 A: HVA method 150 (No.1 station) B: Russian method (Weight conc. method) 200

(Note) Mongolian hourly value means the maximum of one time measurement, and the standard follows the value by the measuring method.

2) Air Quality-Monitoring Station in Ulaanbaatar

The environmental pollution concentration in Ulaanbaatar City has been measured at four monitoring stations.

These stations were installed by the Ministry for Nature & the Environment and are managed by the Central Laboratory of Nature & Environment (CLNE).

As shown in Figure 6.3-3, No.1 station is located on the south side of the city (at about 6 km east of TES4), No.2 station in the center of the city (at about 7 km east-northeast of TES4), No.3 station on the west side (at about 3 km north-northeast of TES4) and No.4 station on the east side of city center (at about 10 km east-northeast of TES4), respectively.

The installation area of each station is as follows:

- No. 1: Factory area (near the CLNE)
- No. 2: Areas with much traffic density on a main road (near a crossing)
- No. 3: Residential area (gher residences exist on the periphery)
- No. 4: Residential area

As for the measurement devices, Japanese automatic equipment and a high volume air sampler are installed in No.1 station and Russian devices for SO₂, NO₂ in the other stations, respectively.

Fig. 6.3-4 shows the installation status of each monitoring station. Table 6.3-9 and Fig. 6.3-5 show the air pollution measurement results (annual average values) from 1985 to 2000.

In 1996 and later, the annual average value of SO₂ at each station fluctuated within the limits to 15 µg/m³N in general. As for NO₂, although the average value of the No.2 station varied considerably, the value of the other stations was less than 40 µ g/m³N without obvious fluctuation.

As for dust, it is difficult to grasp the data fluctuation for each station because of the great lack of data, but the dust concentration of the No.1 station reached 150 µg/m³N (daily average standard).

3) Air Quality in 2000

The measurement results (daily average, minimum and maximum values for each month, monthly average) for the air quality in Ulaanbaatar in 2000 are shown in Table 6.3-10 and Fig. 6.3-6.

(a) SO₂ Concentration

SO₂ concentration at the No.1 monitoring station was within the range from “less than 1” to 41 µg/m³N (monthly average: 6 to 20 µg/m³N), at No.2 station “less than 1” to 36 µg/m³N (monthly average: 3 to 21 µg/m³N), at No.3 station “less than 1” to 34 µg/m³N

(monthly average: 1 to 20 $\mu\text{g}/\text{m}^3\text{N}$) and at No.4 station “less than 1” to 32 $\mu\text{g}/\text{m}^3\text{N}$ (monthly average 1 to 20 $\mu\text{g}/\text{m}^3\text{N}$), respectively.

Compared with the Mongolian standard of a daily average of 30 $\mu\text{g}/\text{m}^3\text{N}$ (70 $\mu\text{g}/\text{m}^3\text{N}$ for the No.1 station), the SO_2 value of No.2 and No.3 stations exceeded the standard only on one day, respectively.

Moreover, the SO_2 concentration in winter was higher than the other seasons at each monitoring station.

(b) NO_2 Concentration

NO_2 concentration at No.2 monitoring station was within the range of 6 to 87 $\mu\text{g}/\text{m}^3\text{N}$ (monthly average: 30 to 60 $\mu\text{g}/\text{m}^3\text{N}$), at No.3 station 5 to 46 $\mu\text{g}/\text{m}^3\text{N}$ (monthly average: 13 to 23 $\mu\text{g}/\text{m}^3\text{N}$) and at No.4 station 8 to 75 $\mu\text{g}/\text{m}^3\text{N}$ (monthly average: 22 to 41 $\mu\text{g}/\text{m}^3\text{N}$), respectively.

Compared with the Mongolian standard of a daily average of 40 $\mu\text{g}/\text{m}^3\text{N}$ (60 $\mu\text{g}/\text{m}^3\text{N}$ for No.1 station), the NO_2 value of No.2 and No.3 stations exceeded the standard 109 days and 30 days in a whole year, respectively.

Although there is no obvious fluctuation of NO_2 values for each station in a whole year, the value of the No.2 station was a little higher than the other stations.

(c) Dust (SPM) Concentration

Dust measurement is carried out only at the No.1 monitoring station. Dust concentration was within the range of 61 to 377 $\mu\text{g}/\text{m}^3\text{N}$ (monthly average: 73 to 209 $\mu\text{g}/\text{m}^3\text{N}$).

Compared with the Mongolian standard of a daily average of 150 $\mu\text{g}/\text{m}^3\text{N}$, dust concentration of the No.1 station exceeded the standard 16 days in a whole year.

Moreover, compared with the Japanese standards of a daily average of 0.04 ppm (0.14 $\text{mg}/\text{m}^3\text{N}$) for SO_2 , 0.04 to 0.06 ppm (0.082 to 0.12 $\text{mg}/\text{m}^3\text{N}$) for NO_x and 0.10 $\text{mg}/\text{m}^3\text{N}$ for SPM, the SPM values exceeded the Japanese standard only.



Fig. 6.3-3 Power Plant and Ambient Air Quality Monitoring Station in Ulaanbaatar