

## Annexure 2


### Status of National Ambient Air Quality of Mandya City, Karnataka



**CENTRAL POLLUTION CONTROL BOARD  
Zonal Office (South)**

Nisarga Bhawan, Thimmaiah Road  
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## 1. ABOUT MANDYA CITY

<b>State</b>	Karnataka
<b>Location</b>	Latitude: 12.52° N and Longitude: 76.9°E
<b>Area</b>	4,961 Sq.km
<b>Elevation</b>	678 m (2,224 ft.)
<b>Population</b>	Around 1, 808, 680 according to 2011 census.
<b>Climate</b>	The climate is tropical in Mandya. In winter, there is much less rainfall in Mandya than in summer. The average temperature in Mandya is 25.0 °C and the averages rainfall is 713 mm. The driest month is January, the most precipitation falls in October. April is the warmest month and December has the lowest average temperature of 22.2 °C.
<b>Geography</b>	The district headquarters is Mandya city, which is located on the Bangalore-Mysore Highway. Mandya city is around 100 Kilometres away from Bangalore City and Mysore city is around 40 Kilometres away from Mandya city. Mandya district comprises of 7 taluks namely Maddur, Malavalli, Srirangapatna, Nagamangala, Krishnaraj Pete and Pandavapura. The soils range from red sandy loams to red clay loam The soils in Mandya, Malavalli, Maddur and Nagamangala taluks are thin gravelly and underlain with a murrum zone containing weathered rock. The soils are highly leached and poor in bases. The water holding capacity is low.
<b>Industries</b>	The District has 2 KIADB industrial areas one at Tubinakere, near Mandya and another at Somanahali, near Maddur. The main industries located in this area are Sugar, Power Generation, Dry cells, Milk processing unit, Edible Oils, Bulk Drugs etc.
<b>Air Quality Stations</b>	01 (Residential)
<b>Location of Mandya City</b>	

## 2. DETAILS OF NAMP STATIONS

The Mandya city has One NAMP station and it is maintained and regularly monitored by Mandya Regional Office, KSPCB. The station is located at top of KSPCB Office Building covering Residential areas. The monitoring of these stations is carried out by KSPCB Staff, the monitoring of pollutants is carried out for 24 hours (4- hourly sampling for gaseous pollutants and 8 hourly sampling for particulate matter) with a frequency of twice a week. The parameters monitored are Sulphur dioxide (SO<sub>2</sub>), Nitrogen dioxide (NO<sub>2</sub>), Particulate Matter (PM<sub>10</sub>), Ammonia (NH<sub>3</sub>) and Lead (Pb).

## 3. DATA FOR AIR QUALITY INDEX (AQI) CALCULATION

The KSPCB on request had sent the NAMP station data for the month of October 2015 for the station. This data is used for preparing the AQI for that station. The parameters monitored at these stations are Sulphur dioxide (SO<sub>2</sub>), Nitrogen dioxide (NO<sub>2</sub>), Particulate Matter (PM<sub>10</sub>), Ammonia (NH<sub>3</sub>) and Lead (Pb). Only three parameters such as Sulphur dioxide (SO<sub>2</sub>), Nitrogen dioxide (NO<sub>2</sub>) and Particulate Matter (PM<sub>10</sub>) are considered for calculation of AQI.

## 4. CALCULATION OF AIR QUALITY INDEX (AQI)

The AQI is calculated as following:

- The data received from the KSPCB was in 4 - hourly concentration for SO<sub>2</sub> and NO<sub>2</sub> and 8 - hourly for PM<sub>10</sub> parameters. It was converted into 24-hourly average concentration.
- The Sub-indices for individual pollutants were calculated using its 24-hourly average concentration value and health breakpoint concentration range.
- The formula used for calculation of Sub-indices is:

$$I_p = \left\{ \frac{(I_{HI} - I_{LO})}{(B_{HI} - B_{LO})} \right\} * (C_p - B_{LO}) + I_{LO}$$

Where

BHI = Breakpoint concentration greater or equal to given concentration

BLO = Breakpoint concentration smaller or equal to given concentration

IHI = AQI value corresponding to BHI

ILO = AQI value corresponding to BLO; subtract one from ILO, if ILO is greater than 50

$AQI = \text{Max}(I_p)$  (where;  $p = 1, 2 \dots n$ ); denotes  $n$  pollutants

- The NAMP data received from the KSPCB was fed into the AQI calculator prepared in the Microsoft Excel sheet and the value of Sub-indices and AQI was calculated.

## 5. RESULT

Since manual stations measure  $PM_{10}$ , it was suggested that for manual station AQI for past days can be calculated as long as  $PM_{10}$  or  $PM_{2.5}$  is measured. It was proposed that for manual station, AQI is reported for at least three parameters and one of them should be  $PM_{10}$  or  $PM_{2.5}$  possibly on a week basis.

AQI has been calculated for the month of October 2015 for monitoring station KSPCB Bldg.

### KSPCB Bldg. Mandya

<b>AIR QUALITY INDEX (AQI)</b>					
<b>SUB INDEX</b>				<b>AQI</b>	
<b>Date/Month</b>	<b>NO<sub>2</sub></b>	<b>SO<sub>2</sub></b>	<b>PM<sub>10</sub></b>		
01-10-2015	27	13	77	77	SATISFACTORY
05-10-2015	28	13	30	30	GOOD
08-10-2015	27	13	44	44	GOOD
13-10-2015	26	13	36	36	GOOD
15-10-2015	28	13	58	58	SATISFACTORY
20-10-2015	27	13	41	41	GOOD
26-10-2015	29	12	53	53	SATISFACTORY
30-10-2015	26	13	33	33	GOOD

From the above interpretation of AQI for Mandya city, the responsible parameter for pollution is  $PM_{10}$ . It can be seen from the above AQI table that for  $SO_2$  and  $NO_2$  pollutants air quality is good, however it is  $PM_{10}$  which is in Satisfactory category. It is due to vehicular movement and burning of fossil fuels in the vicinity.