

NOTE**Air Quality of Mandideep Industrial Estate of
Madhya Pradesh, India**

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In the present work the author has analysed the air quality of Mandideep industrial estate of Madhya Pradesh.

Air is a precious natural resource without which life cannot be sustained for more than a few minutes. Human activities like industrial production, motor transport and domestic burning of fuel are adding large amount of harmful pollutants to the atmosphere triggering off a host of global and regional environmental problems. Ambient air monitoring had been carried out at various places in premonsoon season. The analytical work was carried out by UV-VIS spectrophotometer and by colorimeter. High volume air sampler was used to monitor air for SO₂, NO_x, S.P.M. concentration.

Mandideep Industrial Estate is situated near village Mandideep in Raisen district on 77°3' longitude and 23°6' latitude at a distance of 22 km. from Bhopal on National Highway No. 12, having 500 industries divided in Sectors A, B and C.

The site was selected at the points of maximum and minimum pollutant concentration, the points of maximum population, no local obstruction. The height of the monitoring site was 5 to 15 m. Sampling period of SO_x, NO_x was fixed up to 4 h and for SPM (suspended particulate matter) for 8 h. 8 sampling stations were selected. The monitoring was done twice in a month in pre-monsoon season from 11 a.m. to 6 p.m. The samples were stored in presterilized stoppered glass bottles, put in an ice box and analysed by UV-VIS spectrophotometer within time as prescribed by APHA¹. The results are summarised in Tables-1 and 2.

In the industrial area of Mandideep Industry No. 1 (Hindustan electrographite) has contributed pollutants by baking and graphitization units. It manufactures electrodes for industrial applications. Emission from the baking units includes SO_x in large concentration. The maximum concentration of SPM and SO_x was noticed to be 5245.4 mg/nm³ and 99.9 mg/nm³ while minimum values are recorded to be 290.0 mg/nm³ and 36.8 mg/nm³ for SPM and SO₂. The ambient air quality inside Hindustan electrographite premises was also beyond the limits showing highest values 2645.0, 5570 and 772 µg/mm³ of SPM, SO_x and NO_x while lowest values 102, 14.28 and 11.0 µg/nm³ for SPM, SO_x and NO_x

respectively. The analyses of pollutants in Porwal Carbide and Eastern Electrochemicals are almost same. The maximum concentrations of SPM, SO_x and NO_x were noted 562, 58.10, 118 and 402, 20.4 µg/nm³, nil, while lowest values 125, 12.8, 4.2 and 284.6, 18, 3.8 respectively. The dust borne flue gases are released through the stocks to the atmosphere. The worst conditions were found at Hindustan Electrographite and at other areas, e.g., Eastern Electrochemicals, Lupin Lab, United Soya and Kaushal Leather the air quality was found worse than the permissible limits.

TABLE-1
AMBIENT AIR QUALITY DURING YEAR 1992-93 AT MANDIDEEP

S. No.	Name of Industry	Highest (in µg/m ³)			Lowest (in mg/m ³)		
		SPM	SO ₂	NO _x	SPM	SO ₂	NO _x
1.	Hindustan Electrographite	2640.0	5570.0	772.0	102.0	14.28	11.0
2.	Eastern Electrochemical	562.0	58.1	118.60	125.8	12.80	4.2
3.	Porwal Carbide	402.0	20.8	Nil	284.6	18.00	3.8
4.	Lupin Laboratory	914.0	72.8	288.0	—	—	—
5.	MPEB Substation	172.8	426.2	44.6	108.6	18.80	Nil
6.	United Soya	880.4	63.8	118.0	—	—	—
7.	Kaushal Leather	566.0	74.8	150.0	441.1	24.06	Nil
8.	Insulators and Electricals	296.0	38.8	100.8	256.4	22.16	Nil

Stock emission quality during 1993-94 showed maximum concentration at Hindustan electrographite while lowest values at Lupin Laboratories.

As per data available above it can be judged that there is a slight increase in the quality of ambient air in the coming years. It can further be improved by intensive plantation and good pollution control equipments.

Tolerance limits recommended by B.I.S. for pollutants are given in Table-3.

TABLE-2
STOCK EMISSION QUALITY DURING 1993-94 AT MANDIDEEP

S. No.	Name of industry	Maximum (µg/nm ³)		Minimum (µg/nm ³)		
		SPM	SO ₂	SPM	SO ₂	NO _x
1.	Hindustan electrographite	1930.80	76.0	225.18	Traces	8.4
2.	Lupin Laboratories	495.90	—	474.00	—	6.2
3.	Oswal and Bindal	426.50	—	226.50	—	—
4.	United Soya	295.90	—	190.40	—	—
5.	Pahwa Rubber	338.60	—	189.60	—	4.4
6.	Eastern Electrochemical	450.00	—	—	—	—
7.	Optel	226.80	—	—	—	—

TABLE-3
TOLERANCE LIMITS RECOMMENDED BY B.I.S. FOR SPM, SO_x, NO_x

Region	Pollutants $\mu\text{g}/\text{m}^3$		
	SPM	SO _x	NO _x
Sensitive area	100	30	30
Industrial area	500	120	120
Rural area	200	80	80
Commercial area	500	120	120

It is concluded that automobiles and chimney stacks are the main source of air pollution. Particulates emitted by varieties of industries causes toxic effects on human health around the industrial area of Mandideep. Hence, preventive measures and efforts are needed to control air quality.

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