Table 1: Comparison of CPCB and US EPA AQI systems

Criteria	**CPCB AQI**	**US EPA AQI**
No of parameters	Eight	Six
Methodology of AQI Reporting	Maximum Function	Maximum Function
Range of AQI values	0 – 500	0 - 500
No of categories	6	6
Distribution of classes	Uniform Intervals from AQI 100 to 500	Telescoping of classes towards higher values (fine classes for lower values)
Alert Level	CPCB reports that for AQI beyond 200, general public may start experiencing health issues	As per US EPA, for AQI above 150, general public may start feeling health issues
Units of measurement	CPCB measures all parameters in weight by volume format (mass/volume) units	Except PM, all parameters are reports as ratios (ppm/ppb)
Scale of comparison	CPCB allows for higher values for pollutant concentrations for similar AQI. For instance, for an AQI value of 101 – 200, range PM 10 is between 101 to 250 ug/m^3 for a 24 hour average.	US EPA has a more stringent range for pollutant concentrations for similar AQI. For instance, for an AQI value of 101 – 150, range PM 10 is between 35.5 to 55.5 ug/m^3 for a 24 hour average.
Time Weighted Averaging	CPCB has only one time weighted average for each parameter.	US EPA has multiple time weighted averages for different range of pollutant concentrations. For instance: Ozone values below 200 ppb have 8-hr TWA for AQI calculations, while 1-hr TWA values are used for values above 125 ppb.
Formula for calculation	Same for both (refer to figure 2)	Same for both (refer to figure 2)

O_3 (ppb)	O_3 (ppb)	$PM_{2.5}$ (µg/m^3)	PM_{10} (µg/m^3)	CO (ppm)	SO_2 (ppb)	NO_2 (ppb)	AQI	AQI
C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low}- C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	I_{low} - I_{high}	Category
0-54 (8-hr)	-	0.0-12.0 (24-hr)	0-54 (24-hr)	0.0-4.4 (8-hr)	0-35 (1-hr)	0-53 (1-hr)	0-50	Good
55-70 (8-hr)	-	12.1-35.4 (24-hr)	55-154 (24-hr)	4.5-9.4 (8-hr)	36-75 (1-hr)	54-100 (1-hr)	51-100	Moderate
71-85 (8-hr)	125-164 (1-hr)	35.5-55.4 (24-hr)	155-254 (24-hr)	9.5-12.4 (8-hr)	76-185 (1-hr)	101-360 (1-hr)	101-150	Unhealthy for Sensitive Groups
86-105 (8-hr)	165-204 (1-hr)	55.5-150.4 (24-hr)	255-354 (24-hr)	12.5-15.4 (8-hr)	186-304 (1-hr)	361-649 (1-hr)	151-200	Unhealthy
106-200 (8-hr)	205-404 (1-hr)	150.5-250.4 (24-hr)	355-424 (24-hr)	15.5-30.4 (8-hr)	305-604 (24-hr)	650-1249 (1-hr)	201-300	Very Unhealthy
-	405-504 (1-hr)	250.5-350.4 (24-hr)	425-504 (24-hr)	30.5-40.4 (8-hr)	605-804 (24-hr)	1250-1649 (1-hr)	301-400	Hazardous
-	505-604 (1-hr)	350.5-500.4 (24-hr)	505-604 (24-hr)	40.5-50.4 (8-hr)	805-1004 (24-hr)	1650-2049 (1-hr)	401-500	

Figure 3: Table for comparing pollutant concentrations to AQI range as prescribed by US EPA

$$I = \frac{I_{high} - I_{low}}{C_{high} - C_{low}}(C - C_{low}) + I_{low}$$

where:

I = the (Air Quality) index,

C = the pollutant concentration,

C_{low} = the concentration breakpoint that is $\leq C$,

C_{high} = the concentration breakpoint that is $\geq C$,

I_{low} = the index breakpoint corresponding to C_{low},

I_{high} = the index breakpoint corresponding to C_{high}.

Figure 3: Formula for calculation of AQI from a given value of pollutant concentration

AQI Category (Range)	PM_{10} 24-hr	$PM_{2.5}$ 24-hr	NO_2 24-hr	O_3 8-hr	CO 8-hr (mg/m^3)	SO_2 24-hr	NH_3 24-hr	Pb 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5 –1.0
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+	1800+	3.5+

Figure 3: Table for comparing pollutant concentrations to AQI range as prescribed by CPCB