Haze Response Plan

1. Introduction

1.1 This Plan spells out the actions that the management and schools will be adopting to manage a haze situation. It ensures safe practices in relation to preventative and protective measures with regard to the risk of haze.

1.2 Each year Singapore can be affected by smoke haze from forest fires in the region. This usually occurs during the period of May to October. The prevailing winds blow the smoke from the fires in Singapore's direction and this can impact both the students and staff in our school.

1.3 Singapore uses an integrated air quality reporting index, where PM2.5 is incorporated into the Pollutant Standards Index (PSI) as its sixth pollutant parameter. The PSI reflects a total of six pollutants. These are:

- Sulphur dioxide(SO2)
- Particulate matter(PM10)
- Fine particulate matter(PM2.5)
- Nitrogen dioxide(NO2)
- Carbon monoxide(CO)
- Ozone (O3)

1.4 During haze episodes, the National Environment Agency (NEA) will provide an air quality forecast for the next 24 hours using the 24-hour PSI and a 1-hourly PM2.5 reading with their corresponding air quality values as follows:

Table 1: NEA Air Quality Descriptor Based on 24-Hour PSI Readings

24-Hr PSI Value	Air Quality Descriptor
<50	Good
51-100	Moderate
101-200	Unhealthy
201-300	Very Unhealthy
>300	Hazardous

Table 2: NEA Air Quality Descriptor Based on 1-Hour $PM_{2.5}$ Readings ($\mu g/m^3$)

1-Hour $PM_{2.5}$ Reading ($\mu g/m^3$)	Band	Descriptor
0-55	I	Normal
56-150	II	Elevated
151-250	III	High
Above 250	IV	Very High

Refer to **Appendix 1** for further elaboration.

2. Schools' Action Plan

24-hour PSI/ (1-Hour $PM_{2.5}$) Readings	**Action**
≤50/(0-55) (Good)	Monitor the situation - no impact on outdoor sport and play.
51-100/(56-100) (Moderate)	The ELT, SLT and Health & Safety Committee are informed of PSI/PM2.5 readings by the Admin Manager. Children with susceptible conditions monitored. Advise to drink more water. Recess indoors if necessary. Staff teaching a physical activity outside will: • Be aware of the children with medical conditions that can be affected by haze. • Monitor children with known medical issues such as asthma and cardiac conditions. • Adapt activity to ensure students get sufficient rest and water breaks; reduce periods of prolonged strenuous activity; encourage students to disclose feelings of 'wheeziness', 'chestiness' etc. • Refer to school nurse as appropriate. Staff on break/lunch duty should swap outside duties if they are affected by the air quality with a known medical condition.
101 – 125/ (101-125) (Unhealthy)	The ELT, SLT and Health & Safety Committee are informed of the PSI/PM2.5 readings at 1-2 hourly basis by the Admin Manager.

	Recess indoors for children with susceptible conditions In addition to the above, staff teaching outside should: • Significantly reduce all strenuous activities and if possible relocate activity indoors.
126 – 200/ (126-150) (Unhealthy)	The ELT, SLT and Health & Safety Committee are informed of the PSI/PM2.5 readings at hourly basis by the Admin Manager. Students and staff will be alerted when a PSI/PM2.5 reading exceeds 125 via a tannoy announcement immediately before a scheduled break. The advice will be to: • Cease all outside sports activities. • Offer alternative indoor seating areas during recess/lunch (to be staffed by SLT on Duty). All scheduled outdoor sports activities to be relocated inside or cancelled (classroom based or combined classes using indoor PE facilities). All outdoor CCAs cancelled.
201 – 300/ (151-250) (Very Unhealthy)	The ELT, SLT and Health & Safety Committee are informed of the PSI/PM2.5 readings at hourly basis by the Admin Manager. • All outdoor activities and events are cancelled. • To follow specific guidance from MOE/MOH.
>300/(>250) (Hazardous)	No outdoor activities. ELT to decide whether to close school.

Appendix 1

Understanding the 24-Hour PSI and 1-Hour PM2.5 Readings

Since 2014, the NEA has been providing readings of the hourly concentrations of PM2.5 at www.haze.gov.sg, but many did not know what to make of them. As a result, the NEA introduced bands and descriptors for one-hour concentration readings of PM2.5.

There are four bands, from normal to very high.

1-Hour $PM_{2.5}$ Reading ($\mu g/m^3$)	Band	Descriptor
0-55	I	Normal
56-150	II	Elevated
151-250	III	High
Above 250	IV	Very High

For instance, the range of 0 to 55 micrograms per cubic metre (mcg/m3) is described as "normal", while anything above 250 mcg/m3 is considered "very high".

These bands do not show health impact, unlike the five categories - good, moderate, unhealthy, very unhealthy, hazardous - determined by the 24-hour Pollutant Standards Index (PSI).

24-Hr PSI Value	Air Quality Descriptor
<50	Good
51-100	Moderate
101-200	Unhealthy
201-300	Very Unhealthy
>300	Harzadous

This is because there are no scientific studies to show the short-term impact of haze on health. But as a gauge, the hourly PM2.5 concentration bands will correspond to the air quality ranges determined by the PSI, provided they remain the same for 24 hours.

For instance, the one-hour PM2.5 concentration at 10am on Aug 30 ranged between 2 and 12 mcg/m3, which is in Band 1 and is described as "normal". If concentrations of PM2.5 persist in this same band for the next 24 hours, it will correspond to good air quality.

If the one-hour PM2.5 concentrations become "elevated", which means its hourly concentrations range between 56 and 150 mcg/m3, it will correspond to unhealthy air quality, as determined by a 24-hour PSI reading of 101 to 200.

In a nutshell, if hourly PM2.5 concentration bands are maintained for 24 hours:

- Band 1 (0 to 55 mcg/m3) readings will correspond to good air quality (24-hour PSI reading between 0 and 50) or moderate air quality (PSI: 51 to 100). Under good or moderate air quality conditions, normal activities can be carried out.

- Band 2 (56 to 150 mcg/m3) readings will correspond to unhealthy air quality (PSI: 101 to 200). Healthy people should reduce prolonged or strenuous outdoor activities.

- Band 3 (151 to 250 mcg/m3) readings will correspond to very unhealthy air quality (PSI: 201 to 300). Healthy people should avoid prolonged or strenuous outdoor activities.

- Band 4 (251 mcg/m3 and above) readings will correspond to hazardous air quality (PSI: above 301). Healthy people should avoid going outdoors.