

Graded Response Action Plan for Non-Attainment cities of Uttarkhand

In pursuant to the Hon'ble NGT order OA No. 681/2018 dated August 21, 2020 in the matter of News Item published in "The Times of India" authorized by Shri Vishwa Mohan titled "NCAP with multiple timelines to clear air in 102 cities to be released around August 15", a Graded Response Action Plan has been prepared for implementation under different Air Quality Index (AQI) categories namely, Moderate & Poor, Very Poor, Severe and "Severe+ or Emergency" as per National Air Quality Index.

In first phase, Emergency Response System to be applied in the form of the graded response action plan for priority areas of three non-attainment cities of Uttarakhand namely Dehradun, Rishikesh of District Dehradun and Kashipur of District Udham Singh Nagar. It is observed that the concentration of Sulphur di oxide and oxide of Nitrogen are normally found within the prescribed limit However, identified priority pollutants for all of these 03 cities are Particulate Matter both PM₁₀ and PM_{2.5}, which are observed above the prescribed limits. Daily and Annual average concentration for these pollutants as notified under Environment (Protection) Rules, 1986 by Government of India is as follows: -

S.No.	Name of Pollutant	Standards (24 Hr)	Standards (Annual average)
1.	PM10	100	60
2.	PM2.5	60	40
3.	Sulphur Di Oxide	80	50
4.	Oxide of Nitrogen	80	40

Air Quality Index is the tool to categorized the air quality to express in terms of human health. Air Quality index is calculated based on the any three air quality parameters which must include one parameter of particulate matter (either PM₁₀ or PM_{2.5}). Depiction of Air Quality Index (AQI) is presented in the following figure: -

Air Quality Index by Central Pollution Control Board

Air Quality Index	Category	Possible Health Impact
0-50	Good	Minimal Impact
51-100	Satisfactory	Minor Breathing discomfort to sensitive people
101-200	Moderate	Breathing discomfort to the people with lungs, asthma and heart diseases
201-300	Poor	Breathing discomfort to most people on prolonged exposure
301-400	Very Poor	Respiratory illness on prolonged exposure
401-500	Severe	Affects healthy people and seriously impacts those with existing diseases

Break-up of Concentration of Pollutants for the purpose of calculation of AQI is as follows: -
(Values are in microgram per cubic meter)

AQI Category, Pollutants and Health Breakpoints

AQI Category (Range)	PM ₁₀ (24hr)	PM _{2.5} (24hr)	NO ₂ (24hr)	O ₃ (8hr)	CO (8hr)	SO ₂ (24hr)	NH ₃ (24hr)
Good (0–50)	0–50	0–30	0–40	0–50	0–1.0	0–40	0–200
Satisfactory (51–100)	51–100	31–60	41–80	51–100	1.1–2.0	41–80	201–400
Moderately polluted (101–200)	101–250	61–90	81–180	101–168	2.1–10	81–380	401–800
Poor (201–300)	251–350	91–120	181–280	169–208	10–17	381–800	801–1200
Very poor (301–400)	351–430	121–250	281–400	209–748	17–34	801–1600	1200–1800
Severe (401–500)	430+	250+	400+	748+	34+	1600+	1800+

Since there are various levels of AQI and respective AQI has a significant health issue which is given in the table-1 above, so graded response plan is required to be prepared to address the enhanced air pollution level, its control and preventive measures during such situations. Each plan is aim to bring down the concentration of ambient air pollutant at any location in any of the above three cities to at least moderate level or better as per table -2 above.

Announcement of the initiation and termination of an Air Pollution Emergency will be made by the District Magistrate concern. Conditions justifying the proclamation of an internal episode watch, alert, warning, or emergency will be deemed to exist whenever the level of AQI in any place of these three cities is attaining or has attained levels above 200 i.e. above moderate category and if such levels are sustained for 72 hours and District Magistrate determines that such level in any place is threat to the health of the public and action is required.

Based on the AOI following preventive and curative measures will be taken: -

i) When Air Quality is on higher side within Moderate Category (AQI between 151-200): Declaration of AIR WATCH: AIR WATCH will be activated when

- i) there is an advisory from Indian Meteorological Department that an Atmospheric Stagnation is in effect or there is an equivalent local forecast of stagnant atmospheric condition and
- ii) PM10 concentration will be reported between 200-250 microgram per cubic meter and/or PM2.5 will be reported between 80-90 microgram per cubic meter by State Pollution Control Board for more than 108 hours.

During these conditions public advisory will be issued that the AQI may reach to Poor Category. Old age persons may not be allowed to do outdoor activities during early morning and evening (during foggy conditions).

ii) When Air Quality is in Poor Category (AQI between 201-300): Declaration of AIR ALERT: AIR ALERT will be activated when

- i) PM10 concentration will be reported between 251-350 microgram per cubic meter by State Pollution Control Board for more than 72 hours and/or
- ii) PM2.5 will be reported between 91-120 microgram per cubic meter by State Pollution Control Board for more than 72 hours.

During AIR ALERT Situation following preventive actions will be taken: -

- Car pool
- Use of public transport
- Early morning walks are better than evening
- People must wear mask outside their houses or wet handkerchief or clean cloth

Curative Measures during AIR ALERT: -

Activity	Curative Action	Agency Responsible/ Implementing Agency
Vehicular Emission	<ul style="list-style-type: none"> • Strict vigilance and no tolerance for visible emissions – stop plying of visibly polluting vehicles by impounding or heavy fine. • Deploy traffic police for smooth traffic flow at identified vulnerable areas • Strict vigilance and enforcement of PUC norms • Diversion of non-destined truck traffic and ensure only trucks registered after 2005 are allowed entry • Restriction of plying of private four wheelers during evening hours 	Traffic Police and Transport Department
Construction and Demolition	<ul style="list-style-type: none"> • Stringently enforce rules for dust control in construction activities and close non-compliant sites 	Urban Local Body/ Development Authority
During Festivals	<ul style="list-style-type: none"> • Strictly enforce and ban on firecrackers 	District Administration/ Police
Public Awareness	<ul style="list-style-type: none"> • Information dissemination Social media, mobile Apps should be used to inform people about the pollution levels, contact details of District Control Room, enable them to report polluting activities/sources to the concerned authorities, and actions that will be taken by government based on the level of pollution. • Alert in newspapers/TV/radio to advise people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement. 	State Pollution Control Board
Point Source of Air Pollution	<ul style="list-style-type: none"> • Stop the use of DG sets • Stop use of coal/firewood in hotels and open eateries • Provide electric heaters in place of wood during winter avoid open burning. 	Urban Local Bodies/ District Administration
Traffic Congestion	<ul style="list-style-type: none"> • Enhance parking fee by 3-4 times • Increase public transport services by augmenting contract buses and increasing frequency of service. 	Urban Local Body/ Development Authority/ Smart City

iii) When Air Quality is in Very Poor Category (AQI between 301-400): Declaration of AIR WARNING: AIR WARNING will be activated when

- i) PM10 concentration will be reported between 351-430 microgram per cubic meter by State Pollution Control Board for more than 72 hours and/or
- ii) PM2.5 will be reported between 121-250 microgram per cubic meter by State Pollution Control Board for more than 72 hours.

During AIR WARNING Situation following preventive actions will be taken: -

- Car pool
- Use of public transport
- Early morning walks are better than evening
- People must wear mask outside their houses or wet handkerchief or clean cloth
- Avoid high traffic hours
- Turn off lights and electronics when not in use.
- Avoid physical outdoor activity by senior citizens and children and pregnant women.
- People must wear N95 mask outside their houses or wet handkerchief or clean cloth.
- Staggering of school hours and office hours
- Enforce odd-even traffic movement.

Curative Measures during AIR WARNING: -

Activity	Curative Action	Agency Responsible/ Implementing Agency
Industrial Emission	<ul style="list-style-type: none"> • Close Brick Kilns, Hot Mix Plants, Stone Crushers and any other industry using solid fuel in their furnace or boiler. 	State Pollution Control Board/ District Administration
Traffic Congestion	<ul style="list-style-type: none"> • Horizontal gardening must be practiced at high polluting area • cycles and walking must be promoted • Increase frequency of mechanized cleaning of road and sprinkling of water on roads. Identify road stretches with high dust generation. • Use of CNG/PNG based public transports must be promoted • Introduce differential rates to encourage off-peak travel. • Intensify public transport services. 	Traffic Police/ Urban Local Body/ Development Authority/ Smart City
Vehicular Emission	<ul style="list-style-type: none"> • Ensure BS-VI compliant vehicles in cities • Deploy traffic police for smooth traffic flow at identified vulnerable areas • Strict vigilance and enforcement of PUC norms • Diversion of non-destined truck traffic and ensure only trucks registered after 2005 are allowed entry • Restriction of plying of private four wheelers during evening hours 	Traffic Police and Transport Department

iv) When Air Quality is in Very Severe Category (AQI between 401-500): Declaration of AIR EMERGENCY: AIR EMERGENCY will be activated when

- i) PM10 concentration will be reported between 431-500 microgram per cubic meter by State Pollution Control Board for more than 72 hours and/or
- ii) PM2.5 will be reported between 251-380 microgram per cubic meter by State Pollution Control Board for more than 72 hours.

During AIR EMERGENCY Situation following preventive actions will be taken: -

- People must wear N95 mask outside their houses or clean cloth
- People must skip morning or evening walk during such accident
- People must avoid unnecessary wandering in area
- Schools must be shut down for that period
- Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a time when air quality is better.
- Try to get Work from Home or alternate working day
- Enforce odd-even traffic movement.
- Turn off lights and electronics when not in use.
- Enforce left-right for opening of shops
- Car pool
- Market must be closed on weekends except essential commodities

Curative Measures during AIR EMERGENCY: -

Activity	Curative Action	Agency Responsible/ Implementing Agency
Industrial Emission	<ul style="list-style-type: none"> • Stop the industrial processes or set different days for the operation • Halt the process of industries having source of air pollution exception essential commodities • Persons operating fuel-burning equipment that requires boiler lancing or soot blowing should perform such operations only between the hours of 12 noon and 4 pm. 	State Pollution Control Board/ District Administration
Traffic Congestion	<ul style="list-style-type: none"> • Horizontal gardening must be practiced at high polluting area • PUC certificate of every vehicle must be ensured • Maximum use of CNG/PNG based public transport • Provide cycle centers in every corner of the city • Odd even strategy to be followed for all four vehicles 	Traffic Police/ Urban Local Body/ Development Authority/ Smart City

	<ul style="list-style-type: none"> • Alternate route for decongestion of traffic • Persons operating motor vehicles should reduce operations by the use of carpools and increased use of public transportation and elimination of unnecessary operation 	
Vehicular Emission	<ul style="list-style-type: none"> • Ensure BS-VI compliant vehicles in cities/ Diversion of non-destined truck traffic and ensure only trucks registered after 2005 are allowed entry • Deploy traffic police for smooth traffic flow at identified vulnerable areas • Strict vigilance and enforcement of PUC norms • Restriction of plying of private four wheelers during evening hours 	Traffic Police and Transport Department
Construction Activities	<ul style="list-style-type: none"> • Halt all type of construction works • Heavy Fine • Storage pile activity shall be reduced to avoid blowing of dust • Enclosure/coverings must be used for storage piles 	Police Department/ Urban Development Department/ Municipal authority
Forest Fire	<ul style="list-style-type: none"> • Contract fire • Water spray to curb the fire 	Fire Department/ Disaster Authority/ Forest Department
Crop Residue Burning	<ul style="list-style-type: none"> • Heavy fine on violators • Water spray to curb the fire • Crop residue must be used as alternative energy fuel for energy generation 	District Administration/ District Agriculture Officer / Fire Department
Garbage Burning (leaves, old tyres)	<ul style="list-style-type: none"> • Immediate fire extinguishers to stop fire • Heavy fine on violators • Garbage must be collected by Municipal authority on time 	Urban Development Department
