**ACTION PLAN**

**FOR**

**THE CONTROL OF AIR POLLUTION**

**IN**

 **LUCKNOW CITY**

****

**REGIONAL OFFICE**

**UTTAR PRADESH POLLUTION CONTROL BOARD**

**IVTH FLOOR, PICUP BUILDING VIBHUTI KHAND, GOMTI NAGAR, LUCKNOW-226021**

**1. INTRODUCTION**

 Lucknow is situated on the North western bank of Gomti River, is not only the largest but also the capital city of Uttar Pradesh. The city is bounded on the east by Barabanki, on the west by Unnao, on the south by Raebareli, and on the north by Sitapur & Hardoi. Modern Lucknow spread evenly on both sides of River Gomti initially the city was situated along the right bank of the river but now a days city is spreading very fast towards all sides & specially on the left side of river Gomti. Lucknow has a Humid subtropical climate with cool, dry winters from mid –November to February and dry, hot summer from late March to June. In winter, maximum temperature is around 250C and minimum is in the range of 30C- 70C is quite common from mid December to late January.Lucknow's coordinates are 26.840N 80.940 E and its population (2011) census 28,15,601 . Approximate area is 470.7km2 and population density is 5981per km2.

 Like other cities, Lucknow is also developing very fast due to rapid increase in urbanization, industrialization & population growth. As reported by the census of India, 2011, Lucknow has a population of 2,815,601. There was an increase of 25.36% compared to 2001 figures. The initial provisional data suggests a population density of 5981per km2 in 2011. As the total area covered by the Lucknow city is only about 470.7 sq. km., the population density was much higher than the 690 persons per km2recorded at state level. There are 04 designated Industrial sites in and around Lucknow city viz., Amausi Industrial Area, Talkatora Udyog Asthan, Sarojini Nagar Industrial Area & Deva Road Chinhat Industrial Area where 10 large, 15 medium & 15 small industries of Red category are in operation, 03 large, 04 medium, 65 small scale Orange category industries are in operation and 01 medium, 131 small scale Green category industries are in operation. Besides these, different category industries including 255 brick kilns are also in operation around Lucknow City.

 Two major Indian National Highways have their intersection at Lucknow's Hazratganj intersection NH-24 to Delhi, NH-30 to Allahabad. Multiple modes of public transport are available such as taxis, city buses, auto, tempos, Rickshaws, Jeeps cars and others. A number of different categories of vehicles registered with R.T.O, Lucknow is 1864556 as on 31 March 2016. UPSRTC also introduce bus services under the banner of "Lucknow Parivahan Seva" for different routes of Lucknow city. There are 125 filling stations of petrol/ diesel and 06 filling stations of CNG in 2015-16. As per oil marketing companies IOC, BPCL, HPCL the consumption/ sale of petrol & diesel was 173617 & 182481 Kilo Liter respectively as on 31 March 2016 and 30246000 kg approximately CNG in the year 2015-16.

 Presently the city has more than 18 lakhs vehicles which are increasing at an average annual rate of about 9%. Also huge ongoing construction activities, metro rail construction, Roads and fly over construction, Multistory apartment construction have also been contributing to the air pollution in addition to domestic, commercial, industrial & vehicular sources in the city. Considering all the factors Ambient Air Quality of Lucknow city is being monitored by the Board at 07 locations manually and at 01 location by CAAQMS with respect to PM10, PM2.5, SO2, NO2 and other parameters.

 Population growth, Urbanization, needs and rapid increase in energy consumption are major driving force of air pollution in large cities like Lucknow. The consequences of pollution have led to poor urban air quality in Lucknow. The air pollution can be attributed to emissions from transportation, industrial & domestic activities, Re-suspension of road dust, Construction activities, Burning of Biomass/Crop residues/municipal solid waste/garbage & unapproved fuel, operation of Diesel generator sets during power failure.

 Air pollution has been viewed seriously by the Hon'ble Supreme Court, Hon'ble High Court & Hon'ble National Green Tribunal and issued specific directions from time to time for the improvement the air quality of the city. Central Pollution Control Board has also issued direction under section 18 (1)(b) of the Air (Prevention & Control of Pollution) Act 1981, regarding prevention, control or abatement of Air pollution in various cities of Uttar Pradesh including Lucknow.

**2. ACTION TAKEN BY THE BOARD**

 Board has issued directions to Principal Secretary Urban Development, Principal Secretary Forests, Principal Secretary Transport, Principal Secretary Agriculture, Managing Director Central U.P. Gas Ltd., Managing Director Indraprastha Gas Ltd, and Managing Director Green Gas Ltd. under section 31 (A) of the Air (Prevention and Control of Pollution) Act, 1981 regarding prevention and control of air pollution in Lucknow city on dated 05.09.2016 in compliance of directions issued by Central Pollution Control Board, Delhi under section 18(1) (b) of the Air (Prevention and Control of Pollution) Act, 1981. Board has also issued directions under section31(A) of the Air (Prevention and Control of Pollution) Act, 1981 as amended regarding prevention and control of air pollution in Lucknow city on dated 14.11.2017.

 Ambient Air is being monitored regularly by the Board. At source emission monitoring i.e. stack monitoring of industries is also being done regularly and action is being taken accordingly on the basis of analysis report. If any industry is found violating the standards firstly show-cause notice is issued to the industry followed by closure under Air (Prevention and Control of Pollution) Act, 1981.

**3. ANNUAL AVERAGE DATA OF AMBIENT AIR QUALITY PM10 (µg/m3) (YEAR 2013-2018)**

 U.P. Pollution Control Board is monitoring ambient air quality of Lucknow city manually at 07 locations viz. Aliganj, Chowk, Mahanagar, Hazratganj, Talkatora, Ansal Technical campus & Gomtinagar for PM10, SO2 and NO2 parameters. Annual Average data of Ambient Air Quality particularly PM10 (Particulate Matter size less than 10 microns) were observed during the year 2013-18 are as given below.

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| **S.No.** | **Name of Location** | **Category** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| 1 | Nagar Nigam Building, Hazratganj | Commercial | 185.9 | 171.9 | 168.0 | 217.7 | 315.5 | 244.95 |
| 2 | Forensic Lab, Mahanagar  | Residential  | 185.8 | 167.7 | 160.0 | 198.1 | 212.1 | 204.50 |
| 3 | DIC Office, Talkatora  | Industrial  | 202.3 | 184.6 | 179.7 | 219.7 | 214.1 | 229.43 |
| 4 | Vishnupuri, Aliganj  | Residential  | 193.9 | 170.8 | 163.3 | 208.8 | 199.3 | 174.72 |
| 5 | Sarai Mali Khan, Chowk  | Commercial  | 188.9 | 179.5 | 171.3 | 216.3 | 243.3 | 230.27 |
| 6 | ATC, Sultanpur Road  | Commercial  | - | - | 146.1 | 219.7 | 197.1 | 208.84 |
| 7 | Nagar Nigam Building, Gomti Nagar  | Commercial  | - | - | 159.0 | 184.1 | 233.5 | 218.26 |
|  | STANDARD(annual average)  | 60 µg/m3   |  |

 It is clear from the data that the pollution levels are increasing year by year and the air quality index is getting worst. If we do not take steps now, this can lead to severe consequences. In spite of all the effort to control air pollution by regulatory authorities the data summarized above suggest that the air pollution level in Lucknow is on higher side. Lucknow has witnessed significant growth during last one & half decade and recorded similar trends of Air pollution to other cities in Northern Indian planes in India.

**4. SOURCES OF POLLUTION IN LUCKNOW**

 Based on Spatial and Temporal GIS Based Emission Inventory of Air Pollutants and Green House Gases in Three Major Cities of Uttar Pradesh, the main sources of air pollution in Lucknow city are Vehicular (5%),Road dust (87%), Construction & Demolition activities, Industries (Point source & Areas source), Garbage burning (2%) & Agriculture waste burning (2%) etc. Data obtained from Continuous Ambient Air Quality Monitoring System (2018) at Nishatganj, Lucknow showed values of CO 2.43 (mg/m3); O3 44.7 (µg/m3); NO2 40.0(µg/m3); SO2 11.5 (µg/m3); PM2.5 95.0 (µg/m3); and Benzene 2.28(µg/m3).

 During 2001 to 2011 city recorded a growth of approximately 25 % population & 160% number of vehicles. The present review based on monitoring conducted in Lucknow identified particulate matter as main pollutant in the city. High traffic densities and abnormal meteorological factors adversely influenced Ambient Air Quality of Lucknow in winter. Degraded Air Quality has adverse effect on buildings, materials, Human health, Plants, historical monuments and material surface get degraded and decolorize due to air pollutants. Clean air is a "matter of right" and the steps are urgently required to improve air quality and also the steps require a multi prolonged, sustained and integrated approach including close monitoring of implementation. Hence a short term and long term action plan is an urgent need to control air Pollution of Lucknow city.

**5. Short term & Long term Action Plan**

1. **Vehicle emission control**

**(a)Long Term Action Plan: Reduce congestion**

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| **Sl. No** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| i | Plying of Public transport for public transport including establishment of sufficient charging stations. | 360 days | Transport Department |
| ii | Prepare plan for construction of expressways/bypasses to avoid congestion due to non-destined vehicles. | 360 days | N.H.A.I. /PWD |
| iii | Construction of peripheral road around the city to avoid congestion. | 360 days | N.H.A.I./PWD |
| iv | Arrangement of Multilevel Parking Facilities | 360 days | Nagar Nigam/Development Authorities |
| vi | Development/Strengthening of Bike zone/Cycle zone at metro/railways/bus stations from where travelers hire bi- cycle to reach the destination. | 360 days | Nagar Nigam/Development Authorities |
| vii | Initiate steps for retrofitting of particulate filters in diesel vehicles, when BS-VI fuels are available | 360 days | Vehicle Manufacturing Companies/Ministry of Road Transport & Highways (MoRTH) |
| viii | Use of Bio-Ethanol in the city/urban transport system/waste to energy. | 360 days | Transport Department |

**(b)Short Term Action Plan**

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| **Sl. No** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| i | Launch extensive drive against polluting vehicles for ensuring strict compliance | As regular activity | R.T.O/Traffic Police |
| ii | Launch public awareness campaign for air pollution control, vehicle maintenance, minimizing use of personal vehicles, lane discipline, etc. | As regular activity | R.T.O/ Traffic Police |
| iii | Prevent parking of vehicles in the non-designated areas | As regular activity | Traffic Police/ Nagar Nigam |
| iv | Prepare & implement action plan to check fuel adulteration and random monitoring of fuel quality data | 30 days | District Supply Officer/Oil companies |
| v | Prepare & implement plan for widening of roads and improvement of infrastructure for decongestion of road | 90 days | Nagar Nigam |
| vi | Prepare plan for construction of expressways/bypasses to avoid congestion due to non-destined vehicles. | 180 days | N.H.A.I. /PWD |
| vii | Steps for promoting battery operated vehicles including establishment of charging stations. | 120 days | Transport Department/Nagar Nigam & Development Authorities |
| viii | Install weigh in motion bridges at the borders of cities/towns and States to prevent overloading of vehicles | 180 days | Transport Department |
| ix | Synchronize traffic movements/Introduce intelligent traffic systems for lane-driving | 180 days | Traffic Police |
| x | Installation of remote sensor based PUC system | 180 days | Traffic Police |

1. **Suspension of road dust and other fugitive emissions control**

 **(a)Long Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Implementation of maintaining at least 33% forest cover area in the city in master plan. | 360 days | Nagar Nigam/LDA/Forest Department |
| **ii)** | All the canals/nullah's side roads should be brick lined. Proper plantation also carried out.  | 360 days | Irrigation Department/ Forest Department/NMCG |

 **(b)Short Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Prepare plan for creation of green buffers along the traffic corridors. Plantation of specific types of species of plants which are helpful in pollution control. | 90 days | Forest Department/Horticulture/Nagar Nigam & Development Authorities |
| **ii)** | Maintain potholes free roads for free-flow of traffic | 90 days & as regular activity afterwards. | Nagar Nigam/ Development Authorities |
| **iii)** | Introduce water fountains at major traffic intersection, wherever feasible | 90 days | Nagar Nigam |
| **iv)** | Greening of open areas, gardens, community places, Residential welfare associations/societies (RWAS), schools and housing societies | 90 days | Forest Department |
| **v)** | Blacktopping of metalled road including pavement of road shoulders | 180 days | Nagar Nigam |
| **vi)** | Use of treated effluent of STPs in Pollution Control Measure such as watering of Plants, sprinkling for dust suppression purposes. | 90 days | Nagar Nigam |
| **vii)** | Wall to Wall pavement for control of dust from road. Design the footpath pavement/tiles having capacity to grow grass in between.  | 180 days | Nagar Nigam |

1. **Control of emissions from biomass/crop residue/garbage/municipal solid waste burning**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Launch extensive drive against open burning of bio-mass, crop residue, garbage, leaves, etc. | 90 days | Nagar Nigam |
| **ii)** | Regular check and control of burning of municipal solid wastes Availability of fire extinguisher for control of fire in municipal solid waste and bio mass. | Nagar Nigam |
| **iii)** | Proper collection of horticulture waste (bio-mass) and its disposal following composting-cum-gardening approach | Nagar Nigam |
| **iv)** | Ensure ban on burning of agriculture waste and crop residues and its implementation | 180 days | Agriculture Department & U.P. Pollution Control Board |
| **v)** | Door to Door collection of segregated waste by agency and then its disposal directly in plant without dumping it on land. | 90 days | Nagar Nigam |
| **vi)** | Establishment of composting pits in Parks/ residential societies etc for management of biodegradable waste. | 90 days | Nagar Nigam/LDA |
| **vii)** | No plot should be left open more than 02 years and planting of trees must be mandatory on vacant plots. | 90 days | Nagar Nigam/LDA |

1. **Control of industrial emissions**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| i) | Identification of brick kilns and their regular monitoring including use of designated fuel, and closure of unauthorized units. Adoption of cleaner technology like zigzag in brick kilns. | 60 days | U.P. Pollution Control Board/ Nagar Nigam |
| ii) | Conversion of natural draft brick kilns to induced draft | 120 days | U.P. Pollution Control Board |
| iii) |  Monitoring of industrial emission including real time online monitoring through OCEMS (Online Continuous Emission Monitoring System) and live camera feed to take action against non-complying industrial units. | 60 days, and thereafter, regular activity | U.P. Pollution Control Board  |
| iv) | Bank guarantee should be taken for the compliance of conditions imposed in CTO/CTE for control of Environmental Pollution from industries. The bank guarantee shall be forfeited in case of any violation. Verification of these conditions to be carried out by UPPCB/selected Third Party Institutions/Quality control agencies etc. | 60 days, and thereafter, regular activity | U.P. Pollution Control Board  |
| v) | Shifting of Air polluting industries to conforming zone i.e., Aishbagh area & Tiwariganj Road, Plywood industries | 360 days | UPPCB/DIC/UPSIDC/ District Administration |
| vi) | Installation of web cams and OCEMS in Grossly Polluting Industries.  | 60 days | U.P. Pollution Control Board |

1. **Control of air pollution from constructions and demolition activities**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
|  i) | Enforcement of Construction & Demolition Rules 2016. Fine should be imposed on defaulters.  | 15 days , and thereafter, continue as regular activity | Urban Development/Development Authorities |
| ii) | Control measures for fugitive emissions from material handling, conveying and screening operations through water sprinkling, curtains, barriers and dust suppression units; | Urban Development/Development Authorities |
| iii) | Ensure carriage of construction material in closed/covered vessels.  | Development authorities/ Regional Transport Department |
| iv) | Environmental aspects should be included during preparation of master plan for development of city.  | Proposed Master Plan for Lucknow City 2021 | Urban Development/Development Authorities |
| v)  | Builders should leave 33% area for green belt in residential colonies. Plantation should be done as per Office order No. H16405/220/2018/02 dated 16.02.2018 available on website of the Board .i.e.,www.uppcb.com. | Within a reasonable timeframe | Urban Development/Development Authorities/ housing companies |
| vi) | All construction areas must be covered to avoid dispersion of particulate matter | 30 days | Nagar Nigam/Development Authorities |

1. **Other Steps to control Air Pollution**

**(a)Long Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Dead Bodies of Animals should be disposed through proper treatment facility like rendering plant etc | 360 days | Nagar Nigam |
| **ii)** | Installation of CAAQMS by polluting units/institutions etc. under "Polluters Pay Principles". | 360 days | U.P. Pollution Control Board |
| **iii)** |  Source Apportionment, Emission Inventory & Carrying Capacity Assessment  | Source Apportionment Study has been done by IIT Kanpur funded by DOE. | U.P. Pollution Control Board |
| **iv)** | Tree Plantation for mitigation of air pollution based open location of pollution sources and Wind rose data | 360 days | Forest department/Development Authority/IMD/Regional Office & UPPCB |

 **(b)Short Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Air Quality Index to be calculated and disseminated to the people through website and other media (on maximum fortnightly basis for manually operated monitoring stations and real time basis for continuous monitoring stations). | 15days, and thereafter, continue as regular activity | U.P. Pollution Control Board |
| **ii)** | Establish an Air Quality Management Division at SPCB/PCC Head Quarters to oversee air quality management activities in the State and interact with CPCB | 30 days | U.P. Pollution Control Board |
| **iii)** | Set-up and publicize helpline in the city/town as well as SPCB/PCC HQ for complaints against reported non-compliance | 30 days | U.P. Pollution Control Board |
| **iv)** | Engage with concerned authorities on continual basis for maximizing coverage of LPG/PNG for domestic and commercial cooking with target of 100% coverage | 30 days | District Supply Officer |
| **v)** | Monitoring of DG sets and action against violations. Fine should be imposed on defaulters. | 30 days | U.P. Pollution Control Board/ Nagar Nigam |
| **vi)** | Street vendors are to be controlled strictly in respect of removing their wastes and debris before leaving the site of operation | 30 days | Nagar Nigam/Development Authorities |
| **vii)** | Complete ban on littering of streets with municipal solid wastes (MSW). Segregation & source collection at source of MSW to be implemented. | 30 days | Nagar Nigam/Development Authorities |
| **viii)** | If Air Quality Index found severe or above grade, ensure availability of masks to public for protection.  | 90 days | Nagar Nigam |