TENDER DOCUMENT

For

FIELD SAMPLING, CHEMICAL COMPOSITION ANALYSIS, TOXICITY ASSESSMENT OF AIR POLLUTANTS FROM WASTE BURNING SOURCES ACROSS DELHI, NCR (Trunkey Job)

No. No. NIAS/FW-C/GB/2026 dated 24 June 2026

NATIONAL INSTITUTE OF ADVANCED STUDIES

INDIAN INSTITUTE OF SCIENCE CAMPUS

BENGALURU, 560012

INDIA

National Institute of Advanced Studies (NIAS):

The National Institute of Advanced Studies (NIAS) was conceived and founded in 1988 by the late Mr. J. R. D. Tata, who sought to create an institution to conduct advanced multidisciplinary research. The Institute is unique in its integrated approach to the study of intersections between science and technology, philosophy, and the social sciences. The objective is to nurture a broad base of scholars, managers and leaders who would respond to the complex challenges that face contemporary India and global society with insight, sensitivity, confidence, and dedication. Please visit our website (https://www.nias.res.in) for more details.

ABOUT PROJECT:

The Energy, Environment and Climate Change Program (EECP) at NIAS is currently implementing a project to *"**Study to Determine Chemical Composition and Toxicity Analysis of Air Pollutants from Waste Burning Across Delhi, NCT**,"*.

SCOPE OF THE WORK (SUMMARY)

The selected agency shall undertake field monitoring, sample collection, laboratory analysis and data compilation for the project. The work shall include field sampling: Deployment and operation of $PM_{2.5}$ low-volume samplers at selected monitoring locations, collection of particulate matter samples using approved sampling protocols, collection of VOC samples using thermal desorption tubes, measurement of methane concentrations using portable methane analysers, measurement of Total Volatile Organic Compounds (TVOCs) using suitable analysers, field documentation, metadata recording and QA/QC procedures.

The monitoring shall be carried out across representative locations belonging to the following categories: open waste burning in slum areas, open leaf burning locations, areas adjacent to small-scale industries and landfill and waste-transfer facilities. Approximately 20 locations will be monitored with repeat sampling as required by the project. Other than monitoring, the laboratory analysis has to be also carried out by the agency, which includes gravimetric determination of $PM_{2.5}$ mass concentration, elemental analysis of particulate samples using ICP-MS/XRF or equivalent methods, Polycyclic Aromatic Hydrocarbon (PAH) analysis using GC-MS, VOC speciation using Thermal Desorption-GC-MS, data validation and quality assurance, data processing and reporting. The agency shall compile and quality-check all field and laboratory data, prepare pollutant concentration databases, provide analytical results in digital format and support interpretation of toxicity indicators and source characteristics.

Note: ***The is a Trunkey job and all required instruments, transport, manpower, monitoring, analysis, electricity (if needed), consumables, etc. need to be met by the bidder and there will be no liability of NIAS in terms of any component and material except facilitation the monitoring site permissions,***

SCOPE OF THE WORK (DETAILED)

(1) **Implementation Plan:**

(2) Sampling and monitoring in four different categories of waste within NCR (Table-1).
(3) Each category will have 5 sites /location.
(4) Accordingly, monitoring needs to be carried out across around 20 selected sites, with a maximum of two sampling days per location for all the parameters as stated later in the bid.
(5) Maintaining log book for Field documentation and routine QA/QC checks.

(2) Monitoring and Chemical Analysis

Field instruments and laboratory analysis to capture pollutants from the selected sites.

(1) Low-volume samplers equipped with pre-conditioned filters to collect $PM_{2.5}$ samples and impingers to be deployed to gather soluble gases.

(2) For volatile organic compounds, active sampling to be conducted using thermal desorption (TD) tubes filled with Tenax or Carbograph, followed by TD–GC-MS analysis to quantify key compounds including BTEX and landfill-related VOCs.
(3) Portable methane analyzer to record CH_4 concentrations and a TVOC analyzer for real-time measurements of total VOCs.
(4) *Laboratory analysis* Gravimetric measurements of particulate mass, elemental profiling via ICP-MS or XRF after acid digestion, PAH quantification using GC-MS and TD-GC-MS for detailed VOC speciation and any other CPCB approved methodology.

(3) Toxic Elements:

- Oxygenated volatile organic compounds,
- Sulfur-based VOCs; range of hydrocarbon, a
- Solvent-related VOCs,
- Methane, ammonia, foul-odour gases and dense toxic fumes.
- Particulate matter and soot, heavy metals such as lead, cadmium, chromium, and mercury, etc.
- Different toxin elements and their properties with respect to Human health in Table-2.

Table-1**:** The stated MSW categories and tentative sites /locations are listed below:

A	*Category A:* *Open Burning in Slum Areas*: Potential sampling locations under this category include Sanjay Colony in Okhla Phase II, the Seemapuri slum cluster, the Rangpuri Pahari area near Vasant Kunj, the JJ cluster in Madanpur Khadar and the Mangolpuri slum area, where open burning of mixed municipal waste is frequently observed.
B	*Category B:* *Open Leaf Burning:* Sampling for leaf-burning emissions may be carried out along the Lodhi Road green belt (particularly the edge areas), within selected parks in Rohini Sectors 13 or 18 and in parks located in Dwarka Sectors 10–11, green belts along the Ring Road corridor and selected parks in South Delhi (e.g., Hauz Khas or Saket).
C	*Category C:* *Near Small Industries:* Representative industrial locations include the Mundka Industrial Area, the Mayapuri Industrial Area, Bawana Industrial Area, Wazirpur Industrial Area and Naraina Industrial Area, covering a range of small-scale manufacturing, processing and reprocessing activities.
D	*Category D:* *Khachra Depot / Landfill-Associated Waste Points:* With landfills integrated as key waste-handling environments, sampling will be conducted around the peripheries of the Ghazipur, Bhalswa Okhla landfill sites, along with the Punjabi Bagh waste transfer station and the Narela waste sorting and transfer facility. These landfill peripheries act as major waste transfer and handling nodes, aligning well with the "khachra depot" category while providing higher policy relevance.
Note	These proposed stations may vary based on availability of monitoring permission

Table 2: MSW Categories and Associated Toxic Pollutants

MSW Category	Description	Expected Toxic Substances Released
1. Biodegradable / Wet Waste	Food waste, vegetable waste, yard waste; undergoes anaerobic and aerobic decomposition	Methane, ammonia, hydrogen sulfide, simple oxygenated VOCs (ethanol, methanol, acetaldehyde and acetone), sulfur-containing VOCs, foul odours, bioaerosols
2. Recyclables	Paper, cardboard, metals, glass; may contain inks, dyes, adhesives, coatings	VOCs from inks/adhesives (alcohols, hydrocarbons, esters), trace metals from coated packaging, microplastics (from coated paper)
3. Plastics and Rubber	Single-use plastics, packaging materials, synthetic rubber products	VOCs (benzene, toluene, xylene, styrene), PAHs, particulate matter (PM/soot), chlorinated VOCs (from PVC), dioxins & furans, sulfur and nitrogen-containing fumes (from rubber)
4. E-Waste / Hazardous Household Waste	Batteries, phones, computers, wires, LEDs, chargers, electronic appliances	Heavy metals (Pb, Cd, Cr, Hg), brominated flame retardants (PBDEs), acid fumes, halogenated organics
5. Chemical Waste	Paints, thinners, solvents, oils, pesticides, household cleaners	VOCs (ketones, alcohols, hydrocarbons), semi-volatile organics, chlorinated solvents, phenols, organophosphate pesticide residues, corrosive gases
6. Biomedical Waste (when mixed with MSW)	Discarded bandages, syringes, medicines, contaminated materials mixed with municipal waste	Biological pathogens, chemical disinfectants, pharmaceuticals, microplastics, toxic fumes (dioxins/furans, acid gases) if burned
7. Construction & Demolition Waste	Concrete, bricks, tiles, paints, asbestos sheets, insulation	Asbestos fibres, crystalline silica dust, heavy metals from paints/coatings
8. Leachate from Dumpsites / Landfills	Liquid formed when rainwater percolates through mixed waste	High BOD/COD, ammonia, heavy metals, chlorides, phenols, organic acids, salts, nitrates, sulfates, chlorinated organics, microbial contaminants

Table-3: PROFORMA FOR BIDDER (Commercial Bid)

S. N.	Scope of work	Cost (INR)
1	**Measurement Campaign Logistics**	
	HVS rental charges	
	PM2.5 sampler rental	

	VOC sampler rental	
	CH4, TVC analyser rental	
	Electricity and rental for running above instruments	
	Vehicle hiring charges	
	Manhour cost	
2	**Consumables**	
	EPM 2000 filters for HVS (Metals and B(a)P	
	PM2.5 filters	
	Charcoal tubes	
	SOx and NOx reagents	
3	**Toxicity analysis**	
	Elemental analysis	
	PAHs-GCMS (Filters)	
	TD-GCMS (VOCs)	
3.	Rest other work not covered above	
4	Data compilation	
5	**GRAND TOTAL**	
	Report Preparation: A detailed report with all information including campaign planning, sampling, methodology, scientific results, etc along with a summary for ULBs.	

TIMELINE OF PROJECT WORK:

As the project time is for a short duration, the work should be completed within stipulated time. The tentative schedule is field monitoring from the acceptance of the order and sample collection during first two months and laboratory analysis and data processing parallelly or during the next two months. The company should specify how much time it will take for the completion of this field work along with the characterization part and all the deliverables as part of their bids.

ELIGIBILITY CRITERIA

The bidder shall:

1. Be a registered company, laboratory, research organization or environmental consultancy.
2. Have a minimum of five years' experience in air quality monitoring and environmental analysis.
3. Have access to required monitoring instruments and analytical facilities.
4. Demonstrate prior experience in $PM_{2.5}$, VOC, PAH or elemental analysis.

FORMAT OF TENDER BIDS

The bids shall be submitted in two parts: a technical bid and a financial bid.

A. TECHNICAL BID

The technical bid shall include:
i. Proof of valid registration of company/firm.
ii. List of key personnel and their qualifications.
iii. Details of monitoring instruments proposed.
iv. Experience certificate (proof to be enclosed).
v. Methodology and work plan.
vii. Names and contact information of key people involved, including agency head.
viii. Contact details for communication.

B. FINANCIAL BID

The financial bid shall clearly indicate:

i. Provide a breakup of the bid as requested under 'Scope of Work', above.
ii. Logistics and travel charges.
iii. Applicable taxes.
iv. In case of selection, the tenderer is required to furnish their Permanent Account Number (PAN) issued by the Income Tax Department and GST registration certificate.

TERMS & CONDITIONS

1. The tender bids must be submitted in separate sealed envelopes addressed to:
   The Head (Administration)
   National Institute of Advanced Studies (NIAS)
   Indian Institute of Science Campus
   Bengaluru 560012
2. Last date and time for the receipt of the completed tender is August 1st , 2026, 12 noon.
3. Tender must be valid for at least **30 days** from deadline.
4. Technical bid should not include any financial aspects strictly
5. Financial bids will be opened ONLY if the technical bid meet the required criteria.
6. This tender is not transferable.
7. The prices quoted should be firm and irrevocable and not subject to any change whatsoever.
8. The tender must be completed in easily understandable terms.
9. The tender must be clearly typed.
10. Page numbers must be clearly indicated in the proposal (e.g., Pg. 1 of 12, Pg. 2 of 12).
11. Partial, incomplete, or conditional tenders will not be considered.
12. The tender must be received at the office in hard copy.
13. NIAS will not be responsible for late submissions due to delivery delays.
14. NIAS will not be responsible for deliveries of tender to any place.
15. NIAS reserves the right to reject any or all tenders without assigning any reason.

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PARAMPALLI SRINIVASA AITHAL

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Date: 2026.06.24 12:43:05 +05'30'

Sd/-
Head Administration
National Institute of Advanced Studies,
Bengaluru – 560012

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