Meghalaya State Pollution Control Board

Forests & Environment Department, Government of Meghalaya
'ARDEN' Lumpyngngad, Shillong - 793014
Website : http://megspcb.gov.in

No. MPCB/TB-92(Pt-XIII)/2023-2024/ **Dated Shillong the, 7th November 2023**

QUOTATION NOTICE

Sealed quotations accompanied by non-refundable fee of Rs 2000/- (Rupees two thousand) only, by Demand Draft pledged in favour of the Member Secretary, Meghalaya State Pollution Control Board are hereby invited from reputed manufactures or their authorized suppliers/or agents for supply of the following equipments/instruments conforming to the specified technical specifications. The last date for receipt of quotations is on the 24th November 2023, upto 1:00PM.

Sl.No	Name Of The Equipment/Instrument	Make
1.	Inductive Coupled Plasma Spectrophotometer (ICP-OES)	Imported/Indigenous
2.	Microwave Digester	Imported/Indigenous
3.	Respirable Dust Sampler	Imported/Indigenous
4.	PM2.5 Fine Particulate Sampler	Imported/Indigenous

The quotations received will be opened by the undersigned on the same date and hour in presence of the suppliers or their authorized representatives, who likes to be present, if any.

The general Terms & Conditions of supply and the tentative technical specifications of the equipment / instruments are attached as Annexure-I and Annexure-II respectively.

(Dr. G.H. CHYRMANG, MFS)
MEMBER SECRETARY
MSPCB,SHILLONG

No. MPCB/TB- TB-92(Pt-XIII)/2023-2024/ 25-A. **Dated Shillong the, 7th November 2023**

Copy to:

1. The Chairman, MSPCB, Shillong, for favour of information.
2. The Notice Board, MSPCB, Shillong.
3. Board's website.

(Dr. G.H. CHYRMANG, MFS)
MEMBER SECRETARY
MSPCB,SHILLONG

Annexure-I

DETAILED PARTICULARS, TERMS AND CONDITIONS

GENERAL TERMS & CONDITIONS OF QUOTATION:

1. The Detailed Specification of the Equipment/instruments including Brand name, Make, Model etc should be clearly indicated in the Quotation.
2. The rates quoted should be exclusive of taxes and shall remain firm and fixed.
3. Taxes shall be paid as applicable.
4. No packing, forwarding, handling, insurance, delivery charges, etc. will be paid.
5. Delivery of the items including installation / commissioning should be made within 1 (one) month from the date of issue of the Supply Order.
6. The items should be delivered to the Member Secretary, Meghalaya State Pollution Control Board, Shillong – 793014 and receipt obtained thereon. No claims shall be entertained if items are delivered to any unauthorized person.
7. The Instrument with all its accessories is to be installed and commissioned at the Laboratory.
8. The supplier should provide on-site demonstration of the equipment. Authorized Calibration Certificate shall be provided during installation
9. Calibration facility should be made available and should be done at site as and when required.
10. Warranty/Guarantee period for each instrument should be at least for a period of 2(two) years
11. The supplier /dealer will have to replace the defective materials / items, if found, free of cost and other charges during warranty period. Free maintenance during the warranty period, prompt after sale service including technical support and availability of spares and consumables as and when required.
12. In case the quotation is being submitted by authorized agent/dealer of the principal manufacturing company, the authorized sales agency/ dealership certificate from the principal manufacturer should be furnished along with the quotation. Quotations without this authorization certificate will be rejected.
13. Payment shall be made only after receipt of items in full and good condition as per specifications and successful installation and commissioning of the equipment to the full satisfaction of the Board.
14. The supplier (if a non-tribal) should possess a valid Trading License issued by a competent authority.
15. In case of any dispute between the supplier and the consignee, the matter should be referred to the Chairman, Meghalaya State Pollution Control Board, Shillong – 7930104, whose decision shall be final and binding on all concerned.

MEMBER SECRETARY
MSPCB, SHILLONG

Annexure-II

TENTATIVE TECHNICAL SPECIFICATIONS OF EQUIPMENT/INSTRUMENT

1. Inductive Coupled Plasma Spectrophotometer (ICP-OES)

Make: Imported/Indigenous

System	The ICP spectrometer system should be a bench top model with compact size, able to determine trace and measure elements in diverse kind of samples including food,environment,Soil,Sludge, sediments etc.System should be able to determine, major, minor and trace elements in single run measurement. Spectrometer: Fully PC controlled ICP-OES with following specifications. Complete system should have extensive safety & service diagnostic facility.

ITEM	Detail Specification
Spectrometer	The instrument must be DUAL VIEW (Radial, Axial& Dual) ICP-OES system with capability to perform analysis in both Axial, Radial & Dual View modes in a single method to avoid re-run of the samples due to unknown limit of concentration range of the elements. ➢ The instrument should have Fast Startup time and Low gas consumptionmax. 8-10liters/min. ➢ Instrument should be equipped with echelle-based optics and solid-state detector. Startup time of maximum 15 mins from cold start/instrument switch off condition.
Sample Introduction system	ICP system should have integrated Sample Introduction system with minimum four channels peristaltic pump with variable speed from 0.2 ml to 7ml per minute with 0.1 ml/min for maximum flexibility or better.
TDS capability	System should come with required accessories to address high TDS samples up to 2-3% or better.
Gas flow control	System should be equipped with MFC/Electronic flow controllers for precise control of variable gas flow rate. ICP-OES instrument should have capability to view/measure Plasma Radically, Axially and Dual View mode both in single method.
Detector and wavelength range	➢ Instrument should be equipped with Charge Coupled device (CCD) Detector/Charge injection Device (CID). ➢ The actual resolution (not the pixel resolution) of the system must be less than 0.009 nm at 200 nm or better. ➢ The spectrophotometer must cover full spectral range from 165-900 nm or better. ➢ The system should have capability to measure more than 6000 emission wavelengths. ➢ The detector should have minimum integration time of 1 seconds or better. ➢ The Echelle Grating should be with ruling density should be more than 76 lines/mm.
Plasma View	➢ The system should include complete dual viewing optics under computer and software control or better version. ➢ Any wavelength needed can be used in radial,axial,mixed viewing modes or synchronous dual view in a single run.

	➢ Cocentration from ppb to high ppm should able to run with axial and radial view in single run. ➢ The system should be able to ignite the plasma automatically and should shut off automatically after the run.
RF generator	➢ Free running solid state RF generator must run at frequency of 27.12 MHz or 40 MHz with suitable power wattage adjustable from 1000 to 1500 watts in 1 watt increment. ➢ The power efficiency of RF generator should be greater than 75% with < 0.1% variation in output power stability.
Back Ground correction and Spectral interference	➢ System should have the facility of online/Simultaneous background correction. ➢ The system must be able to read and apply manual or automatic spectral interferences correction in addition to background correction. ➢ The system should correct or automatically stabilize the wavelengths in whole wavelength range.
Startup and Gas consumption	➢ System should have the least total Argon gas consumption10L/min or less. (Please mention complete Argon consumption in L/min including Plasma, Auxillary, Nebulizer, purging gas flows). ➢ Vendor has to mention the consumption of various gases during standby mode and routine analysis mode. ➢ Any other gas required should be clearly mentioned and cylinders should be provided. ➢ System should have the least warm up time within 15mins from cold start. (Please mention time in minutes from switching off from main switch to the first sample aspiration). ➢ System should have the maintenance free provision to remove the tail plume of plasma. If consumables /Spares required that should be quoted.
Hydride Generator	Hydride generator kit should be included for hydride forming elements like As, Hg, Se, Sb etc. in main item. The hydride kit should have gas liquid separator to remove liquid waste and only hydride gas should enter to plasma. The basic T type hydride kit or cyclonic spray chamber type will not be accepted.
Auto Sampler	➢ System should be equipped with auto sampler with minimum 180 sample positions. ➢ The autosampler should have movement in three axes to acceleration and deceleration speed or better.
Software	➢ System software should control all peripherals. ➢ Software should have automated interference correction facility. ➢ It should control third party accessories like autosampler, Auto dilution, auto-calibration, accessories' ➢ Software should enable for quantitative analysis, method of standard addition etc. ➢ Quality control protocols including preparation blanks, multiple quality control standards, calibration, check samples, spike recoveries, duplicates calibration failure and QC limits ➢ Linear through zero, Linear Intercept, Weighted linear, Standard additions methods, addition calibration. ➢ There should be flexibility to export data to excel from instrument software.

Accessories	➢ Vendor should supply suitable Chiller re-circulator of appropriate capacity along with the system with warranty of minimum. ➢ Coolant based processed fluid. The system should not use water to retain life of chiller and instrument. It should be imported or branded coolant. ➢ Operation and maintenance manual should be provided in both hard and soft copies. ➢ Other accessories like air compressor, Argon cylinders (qty 2), Nitrogen cylinders (qty 2) having suitable dual stage regulator and purification panels should also be included. Appropriate 24inch monitor and a laser printer are essential. ➢ Suitable Fume exhaust system should be quoted. ➢ UPS of 10KVA with 30 min. backup should be quoted. ➢ Instrument Warranty to be quoted for minimum of 5 Years.
Others	➢ Organic kit should be quoted for organic sample analysis. ➢ Pre installation requirements- Complete technical details of pre installation requirement should be furnished along with the technical bid. ➢ At least 10 government Installation PO to be attached with Technical Bid. ➢ Suitable PC for instrument operation to be quoted. ➢ Pre installation requirements- Complete technical details of pre installation requirement should be furnished along with the technical bid. ➢ Manpower training on operation & maintenance of the instrument ➢ Third party certification of the instrument, condition on demonstration if any doubt arises on manufacture.

2. Microwave Digester

Make: Imported/Indigenous

Microwave Digester Specification	Microwave digestion system capable of simultaneous processing of multi reaction vessels for digestion all kind of samples using all types acids including HF through pressure active control on reference vessel with pressure rate increase control and direct temperature control on all vessels.
Loading of vessels	Top loading with hardware and software safety interlocks. Sample vessels should be inserted individually from top for easy sample access.
Cavity and Lid	Stainless steel construction with heat-bonded fluoropolymer (PFA - Perfluoro alkoxy) coating
System control and Interface	Touchscreen control, inbuilt software, memory for method parameters and digestion data with USB interface
Software	Built-in software featuring screen display of temperature, weight, method search, power profile, method set up, cook-book methods for various matrices, graphic display of routine operations etc. System should have option to operate using PC. Software should have separate User login and Admin login to secure method developed.

Digestion vessels	• Vessels should be made from massive TFM or PTFE-TFM for easy handling. • The rotor should have capacity of 16 or more vessels to run samples in same batch/run. • Volume of vessel should be 50 mL or more • Vessel operating pressure should be 60 bar or better • Vessel operating temperature should be up to 230^0 C or more.
Microwave Oven	• The system should have Power output of 1500 W or more using dual magnetrons 2000W from 2 magnetrons (2 x 1000W) • System should have circular oven for homogeneous irradiation with PFA-coating for corrosion protection & gas collection system for protection from reaction gases. • Built-in integrated cooling system for removal of gases (vapours) and cooling of vessel without a use of external chiller/thermostat in less than 20 minutes
Reaction Control	• The system must have direct Temperature Control in real-time, measures the actual sample temperature in each individual vessel quipped with Floor Mounted IR Sensors. • The system should pressure control sensor for reference vessel in real time. • The Temperature and pressure sensors supplied should be maintenance-free without cable connections.
Temperature Measurement	• Measurement range ambient to 230^0C or more
Pressure Measurement	• Measurement range 0 to 40 bar or better, contact-free, optical sample pressure measurement.
Safety Features	• Interlocks to avoid opening of vessels during hot condition • Release of over pressure to protect vessels from damage. • The system must have automatic safety shut-down at overheat / over pressure. • CE Safety and EMC emissions compliance
Input power supply	• 230-240 V, 50/ 60 Hz

3. Respirable Dust Sampler

Parameters	Technical Specifications
Flow Rate	0.8 to 1.4 cubic meters per minute free flow with flow stabilization by constant Electronic Feedback flow control device with auto shut off feature if flow rate drops by 15% as per BIS standard IS 5182 – Part 23
Design Compliance	Equipment should conform to design as per BIS standard IS: 5182-part- 23-2006. This should be certified by a Govt approved Lab/Department
Suction pump/Blower	Brush less motor capable of giving flow up to 1.6 cubic meters per minute (free flow)
Size Selective Inlet and Particle Size	Cyclonic flow for cut off particle greater than 10 µm as per design of CSIR-NEERI. Particles of 10 microns and below collected on filter media

Filter holder	Designed to accept any standard glass fiber filter of 20.3 cm x 25.4 cm made out of fine finished Aluminium casting with Rubber gasket
Housing	Sturdy Aluminium cabinet to house Blower, Filter holder assembly, time totalizer, Programmable timer, Flow controller & flow measurement device. Cabinet must be made of sturdy Aluminium to take care of harsh weather conditions.
Sampling time	24 hours (Flexible to set any interval of time)
Time Totalizer	0 to 9999.99 hours. Time-totalizer circuit detects blower stoppage due to any reason.
Automatic Sampling	24 hour programmable timer to automatically shut-off the system after pre-set time intervals.
Power Supply	230 ± 10 V AC; 50 Hz ± 3% AC Mains
Gaseous Sampling Attachment	
Flow Rate	0 - 2 LPM (Least count 0.05 LPM)
Flow Control	Four inlet and one outlet manifold with built in needle valves and fitted with Silica Gel Tubes with locking facility for flow control of each inlet for running all types of impingers viz. Fritted, Midget and Muenke
Sampling Train	4 Nos. of 35 ml Borosilicate glass midget impingers kept in ice tray
Top Loading Orifice Calibration unit **(Optional)**	Top Loading Orifice Calibration unit with resistance plates, U-tube manometer and barometer (as per USEPA design) to fit on the filter support plate of the sampler
Instrument Performance Criteria	Instrument should have been in use with CPCB / 8-10 SPCB's for at least 5 years. Satisfactory performance reports from them must be provided. No adverse reports from these authorities should be against the instrument.
Calibration Certificate	A Certificate with NABL Logo should be provided to ensure reliability of Calibration
Manufacturer's Credibility	Manufacturer should be an Indian manufacturer with minimum 15 years of experience in manufacturing of air quality monitoring /sampling instruments in India. It should have adequate production capacity & supplied at least 300/350 Samplers per year to ensure consistency of the product. It should also have annual turnover of at least 5 crore in last 3 financial years.
After Sales Service Support	Manufacturer must have After Sales Service Support facilities available in NE India to ensure prompt maintenance support

4. PM2.5 Sampler

Parameters	Technical Specifications
Sampler	Manual Filter Based Sampler (filter diameter 47 mm) as per sampler design & performance criteria as mentioned at Section A, B, C & D in the document
Flow rate	1 m^3/hour (16.7 lpm) controlled by a suitable Flow Controller. The Flow Performance criteria should comply with BIS method 5182 (Part 24) 2019 Accuracy ± 2% of the reading.
Size Selective Inlets	Should have opposed jet impaction for PM10 cut-off and WINS impactor/VSCC for PM2.5 collection on filter paper
Height of the Inlet	The height of the inlet should be between 2 ± 0.2 m from the base of the sampler and the sampler should stand alone firmly at erected position
Time Totalizer	Operates only during operation of the pump, display time with a resolution of one second
Vacuum	Suitable pump with brushless motor for providing the designed flow rate, Pulsating

pump	pump should have built-in pulse dampeners.
Flowrate Control	Sampler should maintain designed volumetric flow rate (16.7 LPM) at inlet incorporating dynamic volumetric corrections with respect to temperature and barometric pressure. Necessary compensation of volumetric flow rate due to compensating pressure drop across the filter should also be ensured. Ambient temperature, barometric pressure during sampling must be displayed and recorded. Flow rate should be measured at least at 30 seconds interval and averaged over 5 minutes. The flow rate shall not vary more than 5% from the specified flow of 16.7 lpm.
Data Management	Memory-based recording for flowrate and total volume over five minutes should be downloadable to a computer through a suitable port and USB drive. Current/last logged data should be displayed. Logged data should have cloud connectivity and data of last sampling ten days must be available for crosschecking Data management requirements (other) & ready reference as mentioned in the document Sections C & D.
Power Supply	A stabilized power supply through suitable voltage stabilizer having display of input and output voltage should ensure an output voltage within 230±10 V, AC 50 Hz.
Supply of Accessories	Manufacturer's standard operation kit must include all required, fittings and accessories for the operation of sampler. Accessories to be supplied with each unit should include Leak check unit-1No., Filter cassettes-2Nos, Filter Cassette Holder- 1No., Blunt Tip Forceps-1No., Filter Carrier-3Nos., Silicon Grease10gm-1 box, Impaction Oil - 100 ml-1 bottle, One Set of O-rings and Cleaning Brush.
Documents	Operation and maintenance manual of sampler, along with data transfer protocols used with their technical description for data management and data transfer.
Certificates	Calibration certificates issued by the manufacturer with references used for Flowrate, Temperature, Barometric Pressure and Time Totalizer should be supplied with each instrument. A satisfactory performance check certificate as mentioned in section B (para 2) is provided along-with all the data-sets recorded in the system for data management etc.
Validation	Preliminary test report/validation issued by NPL to be submitted for respective make and model. Any changes in model or declared components of the equipment require revalidation by NPL. Submission of a preliminary test report/validation from NPL as per the set criteria of NPL is mandatory on or before 30th September 2023.

Section A: Sampler Design Criteria

Impactors of the sampler shall be designed as per specifications mentioned in Appendix L of 40 CFR part 50 Appendix L as defined in BIS 5182 part 24 and tolerances to be followed as specified for PM10 and PM2.5 impactor in L14 & L21.

The Material of Construction for the impactor assembly shall be strictly anodisedaluminium only

Sampler Body must be of two parts for ease of transport and fabricated by lightweight rust-free metal.

The door must open up to 180 degrees and be fitted with a master lock and key. A soft handle with metallic holder and lock should be provided on the machine for ease of handling.

The connectors shall be leak proof, preferably push fit type with engraved grove for gaskets at male parts.

Filter cassette loading mechanism and filter holder assembly shall be designed in user- friendly way and sufficient space must be provided to ensure proper handling of filter while loading and unloading it in

the sampler Pressure drop across the filter should be monitored during sampling and whenever it reaches above 200 mm of Hg, the sampler shall stop automatically with an error message recorded. Provision is required to limit the temperature rise of the sample filter from insolation & internal heat dissipation. The rise should not be more than 5-degree C above the ambient temperature during the sampling duration. The temperature error message should be recorded if temperature rise is more than 5 degrees C.
Section B: Sampler Performance criteria The coefficient of variation (CV) in sample flow rate (taken at every 30 seconds) should be calculated and if the %CV (in 24hours of operation) is found more than 4% error message should be displayed and recorded Satisfactory performance check (the variation in PM2.5 concentrations against sampler fitted with certified impactors should be within ±10 %) for a minimum of five samples should be undertaken for every sampler manufactured and a certificate for satisfactory performance to be provided
Section C: Data management requirements (other) The 5 minutes recording of the average Flow rate, Barometric Pressure, Ambient Temperature, Filter Temperature with the date and time stamp should be available with the sampler The software should be able to collect the flow sensor status every 30 seconds anddisplay on the screen and compare it with the set flow (i.e, 16.7 LPM). Deviation shouldnot be more than ± 5% of the set value (16.7 LPM). The software should have the capability to compare the recorded 5 minutes' average flow data with the set value of 16.7 lpm. If the deviation is more than 10% of set value for 6 consecutive readings instrument must be automatically switched off with an error message. Average flow should be derived by the cumulative volume data recorded (collected by integration of flow data at desired intervals) divided by the ON-Time of machine

Instrument Performance Criteria	Instrument should have been in use with CPCB / 8-10 SPCB's for at least 5 years. Satisfactory performance reports from them must be provided. No adverse reports from these authorities should be against the instrument.
Calibration Certificate	A Certificate with NABL Logo should be provided to ensure reliability of Calibration
Manufacturer's Credibility	Manufacturer should be an Indian manufacturer with minimum 15 years of experience in manufacturing of air quality monitoring /sampling instruments in India. It should have adequate production capacity & supplied at least 300/350 Samplers per year to ensure consistency of the product. It should also have annual turnover of at least 5 crore in last 3 financial years.
After Sales Service Support	Manufacturer must have After Sales Service Support facilities available in NE India to ensure prompt maintenance support

Section D: The Data Management requirements – ready reference

Parameters	Availability				Format & resolutions	
	Anytime on display	End of Period in download	Visual Display on screen	Data Output in download	Digital Reading	Units
Flow Rate, 30 Seconds interval	Required	Not Required	Required	Not Required	XX.X	L/min
Flow rate, average for the sample period	Not Required	Required	Required	Required	XX.X	L/min
Flow rate, Coefficient of variation (CV), for the sample period	Not Required	Required	Not Required	Required	XX.X	%
Flow rate, 5 minutes average	NA	Required	Not Required	Required	XX.X	L/min
Sample volume, Total	Required	Required	Anytime	Required	XX.XXX	m^3
Temperature, ambient, 30 seconds interval	Required	Not Required	Yes	Not Required	XX.X	^oC
Temperature, ambient Average for recording interval (5 min)	NA	Required	Not Required	For sampling period	XX.X	^oC
Barometric Pressure, ambient, 30 seconds interval	Required	Not Required	Yes	Not Required	XXX	mm Hg / mBar
Barometric Pressure, ambientAverage for recording interval (5 min)	Not Required	Not Required	Not Required	For sampling period	XXX	mm Hg / mBar
Filter Temperature, 30 seconds interval	Required	Not Required	Yes	Not Required	XX.X	^oC
Date & Time	Required	Required	Required	For sampling period	dd/mm/yy HH. MM.SS	D/M/Y HR:M:S
Sampling Start and Stop Time Setting	Not Required	Required	Not Required	For sampling period	dd/mm/yy HH. MM.SS	D/M/Y HR:M:S
Time Totalizer	Required	Required	Required	For sampling period	HH. MM.SS	HR:M:S
User enter information such as filter number and site identification	Required			At the start of sampling	As entered	