



Chhattisgarh Environment Conservation Board

Paryavas Bhavan, North Block, Sector-19, Nava Raipur Atal Nagar,

District-Raipur, Chhattisgarh, PIN - 492002

E-mail: hocecb@gmail.com; Website: <http://www.enviscecb.org>

Advt. No.: 03/HO/CECB/SCI/CEL/E-Tender/2021-22

Date: 05.01.2022

Notice Inviting Expression of Interest for Supply of Laboratory Equipment

1. Foreword

Chhattisgarh Environment Conservation Board (CECB) hereby invites Expression of Interest from reputed Original Equipment Manufacturers or representatives authorised by them for supply of fully automatic, bench top, state of the art analytical equipment for the **Central Environment Laboratory**.

Purpose: Analysis of diverse environmental samples drawn from air, surface water, effluent, groundwater, drinking water, soil, solid wastes, hazardous wastes, vegetation, etc. for precise qualitative and quantitative estimation of diverse parameters related with environmental surveillance and management.

Scope: "Supply, installation, commissioning, operation & performance demonstration, training, warranty services and subsequent annual maintenance contract" for satisfactory performance of the equipment as follows:

1. Gas Chromatograph Tandem Mass Spectrometer, Liquid sampler, Purge & Trap system, Head Space sampler, Solid Phase Micro Extraction Arrow assembly, Flame Ionization Detector, Electron Capture Detector, Thermal Desorption system, etc.
2. Inductively Coupled Plasma Mass Spectrometer, Microwave Digester, etc.
3. Ultra High Pressure Liquid Chromatograph Tandem Mass Spectrometer, PDA detector, etc.
4. Ion Chromatograph, detectors, post column derivatization unit, etc.
5. UV-Visible double beam spectrophotometer

Member Secretary

Chhattisgarh Environment Conservation Board

Nava Raipur Atal Nagar, District-Raipur

2. Guidelines for expression of interest

1. An organisation can express interest for one or more of the equipment mentioned.
2. Expression of interest for each of the equipment shall be submitted in a sealed envelope.
3. The envelopes shall be super scribed as “EOI for the equipment”.
4. Each envelope shall contain only one duly filled-in, signed and sealed Annexure 1 in which the data furnished for units sold and recalled shall pertain to that particular equipment only. All valid supporting documents (non-returnable), e.g. audited financial statement, certificate from Chartered accountant, specifications sheet, product brochure, certificates, etc. shall be enclosed in order to furnish complete information.
5. Organisations submitting interests for both one and multiple equipment need to furnish details of only one designated representative (Single Point of Contact) in Annexure 1.
6. Communications may be made by the designated representatives through e-mail for clarifications, if any. Do mention the subject line as “Central Environment Laboratory – Clarification”.
7. Submission of interests: Both online and offline submission.
 - 1) **Online submission:** Upload scanned images of duly filled-in Annexure (i) Organisational details form (bearing signature and seal) and enclosures required with it only to the e-procurement portal <https://eproc.cgstate.gov.in>. Please integrate all of the scanned images for one equipment into a single PDF file and upload that single file. Other documents, e.g. product brochure, specification sheets, etc. need not be uploaded.
 - 2) **Offline submission:** Submit hard copies of all documents viz. duly filled-in Annexure (i) Organisational details form (bearing signature and seal) and enclosures required with it, audited financial statement, certificate from Chartered accountant, product brochures, specifications sheets, certificates etc. all details in sealed envelopes in person or through courier/registered post/speed post to The Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhavan, North Block, Sector-19, Nava Raipur Atal Nagar, District-Raipur, Chhattisgarh, PIN 492002.
8. The deadline for submissions is 3.00 PM IST of 27.01.2022.
9. CECB shall not be liable for delayed receipt and non-receipt of submissions.
10. Organisations selected on the basis of the interests submitted shall be requested for submission of proposals.

3. Annexures

Annexure (i) Organizational details form
(To be printed on the letterhead of the organisation)

Sl. No.	Particulars	Details																																																
1	Name of the organisation																																																	
2	Country of incorporation																																																	
3	Legal status in India*																																																	
4	Year of first establishment in India																																																	
5	Complete address of Registered office in India																																																	
6	Details of designated representative																																																	
6.1	• Name																																																	
6.2	• Designation																																																	
6.3	• Address of Office																																																	
6.4	• Contact phone number																																																	
6.5	• Electronic mail identity																																																	
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*(Public or Private or Partnership or Limited Liability or Sole Proprietorship, etc.)

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Signature of authorised signatory

Seal

Annexure (ii) Brief description and specification of equipment

a. GC – Tandem MS

Scope: Supply of one fully automated, bench top, state of the art system including Gas Chromatograph, Tandem Mass Spectrometer, Liquid sampler, Purge & Trap system, Head Space sampler, Solid Phase Micro Extraction Arrow assembly, Flame Ionization Detector, Electron Capture Detector, Thermal Desorption system, Rotary Vacuum Evaporator, Ultra Sonicator and accessories required for analysis of Aromatic hydrocarbons, Aliphatic hydrocarbons, Halogenated organic compounds, Organosulphur compounds, Organophosphorous compounds, Polycyclic Aromatic Hydrocarbons, Trihalomethanes e.g. Bromoform, Dibromochloromethane, Bromodichloromethane, Chloroform, etc., Chloramines (as Cl₂), Trichloroethane, Trichloroethylene, Poly Chlorinated Biphenyles, Pesticides, etc.

1	Detector	
1.1	Detector Type	Electron Multiplier Tube (EMT)
1.2	Electronic dynamic range	1x10 ⁶ or higher.
1.3	EI Scan rate	20000 u/s without compromising sensitivity at higher scan rate.
2	Temperature regulated oven	
2.1	Column removal and fixing	Removing and fixing column inside oven shall be possible without venting vacuum, with MS-MS in power on-standby condition in order to eliminate non-deliberate system downtime in order to have hassle-free operation.
3	Ionisation	
3.1	Cleaning of ion source	Shall be possible without venting vacuum, with MS-MS in power on-standby condition in order to eliminate non-deliberate system downtime.
3.2	Removal and maintenance of ion source	Shall be preferably possible without venting vacuum, with MS-MS in power on-standby condition in order to eliminate non-deliberate system downtime.
4	Detection limit	
4.1	Instrument detection limit (EI-MRM split less mode)	≤ 0.5 fg on injecting 2 fg of Octa Fluoro Naphthalene and monitoring for 272u to 222u.
4.2	EI Sensitivity (Scan mode), S/N	≥ 1500:1 for 272u upon injection of 1 pg/μl of Octa Fluoro Naphthalene and scanning between 50u and 300u

b. ICP – MS

Scope: Supply of one fully automated, bench top, state of the art system including Inductively Coupled Plasma - Mass Spectrometer and Microwave Digester with accessories required for analysis of metals and metalloids including Aluminium (Al), Arsenic (As), Barium (Ba), Chromium (Cr), Manganese (Mn), Cobalt (Co), Boron (B), Copper (Cu), Iron (Fe), Lead (Pb), Nickel (Ni), Mercury (Hg), Zinc (Zn), Lithium (Li), Magnesium (Mg), Selenium (Se), Silver (Ag), Cadmium (Cd), Molybdenum (Mo), Vanadium (V), Antimony (Sb), Thorium (Th), Tin (Sn), and Uranium (U) at trace levels.

ICP - MS

1	Oxide ratio	
1.1	(CeO/Ce)	≤ 2%
2	Detection limit	
2.1	Low mass (Be/Li)	≤ 0.5 ppt
2.2	Mid mass (Y/In)	≤ 0.1 ppt
2.3	High Mass (Tl/Bi/U)	≤ 0.1 ppt
3	Sensitivity	
3.1	Low mass (Be/Li)	≥ 50 mcps/ppm
3.2	Mid mass (Y/In)	≥ 150 mcps/ppm
3.3	High mass (Tl/Bi/U)	≥ 80 mcps/ppm
4	Stability	
4.1	Short-time stability	≤ 3% Related Standard Deviation (RSD) for 10 min or longer.
4.2	Long-time stability	≤ 4% RSD for 2 hour or longer
5	Doubly charged ratio	
5.1	Ce ²⁺ /Ce ¹⁺ or equivalent	≤ 3%
6	Isotope ratio precision	
6.1	For Ag107/Ag109	≤ 0.2% RSD
7	Abundance sensitivity (at Cs or at U for the entire mass range)	
7.1	Low mass side	≤ 5 x 10 ⁻⁷ at low mass side of peak
7.2	High mass side	≤ 1 x 10 ⁻⁷ at high mass side of peak
8	Mass Resolution	Variable mass resolution 0.4 - 1.0u or narrower for the entire mass range
9	Mass range	5 – 260u or wider
10	Quadrupole	
10.1	Radio frequency	3 MHz

Microwave digester

1	Type	Dual Magnetron system with good diffuser
2	Service	capable to digest various samples like filter paper, thimble filter, wastewater, sludge, soil, sediment, rock, vegetation, etc. without loss of heavy metals from sample solution
3	Rating	1800 – 2000W from 2 magnetrons (2 x 900 - 1000W) or higher
4	Number of vessels	12 or more
5	Maximum working pressure	30 bar and higher
6	Maximum working temperature	200°C and higher

c. UHPLC - Tandem MS

Scope: Supply of one fully automated, bench top, state of the art system containing Ultra High Pressure Liquid Chromatograph, PDA detector, Triple quadrupole Mass Spectrometer and all accessories required for analysis of Aromatic hydrocarbons, Aliphatic hydrocarbons, Anionic detergents (as MBAS), Phenolic compounds, Halogenated organic compounds, Organosulphur compounds, Organophosphorous compounds, Polycyclic Aromatic Hydrocarbons, Poly Chlorinated Biphenyles, Pesticides, etc.

1	Pump	
1.1	Type	Quaternary/Binary Gradient pump with gradient mixer
1.2	Flow rate	0.01 - 2 ml/min and wider in 0.001 ml increments
1.3	Flow rate precision	≤0.08% RSD
1.4	Pressure	≥ 15,000 psi
2	Auto-Sample Injector with Sample Cooler	
2.1	Capacity	90 vials or more of 1.5 or 2 ml capacity
2.2	Carry over	≤ 0.005%
3	Degassing Unit	
3.1	Number of channels	Compatible online membrane degassing unit with 4 channels or more.
4	Column Oven	
4.1	Type	Peltier or Forced air circulation type for temperature uniformity
5	Ionisation	
5.1	ESI and APCI source	System shall have both 1. One set of Electro Spray Ionization (ESI) source able to handle 0.001 - 2ml/min flow rate and wider installed, and 2. One set of Atmospheric Pressure Chemical Ionization (APCI) source installed.
5.2	De-solvation/Heating temperature	≥ 600 ^o C in both ESI & APCI
5.3	Ionization source cleaning, removal, and maintenance	Ionisation source should be easily removable from the system to facilitate cleaning without venting vacuum, with MS-MS in power on-standby condition in order to eliminate non-deliberate system downtime.
6	Mass analyser	
6.1	Mass range m/z	10 - 1200 or wider
6.2	Scan speed	≥ 17000 u/s in QQQ mode.
7	Collision cell	
7.1	Design	Use of off-axis ion guide or curved cell design to prevent entry of neutrals in to detector region to minimise interference and maintenance.
8	Detector	
8.1	Polarity switching time	≤ 25 ms
8.2	MRM Sensitivity (ESI +ve)	S/N ≥ 5,00,000 : 1 on injection of 1pg of Reserpine on column; OR IDL ≤ 2.5 fg on injection of 4 fg/1 fg of Reserpine on column.
8.3	MRM Sensitivity (ESI -ve)	S/N ≥ 5,00,000 : 1 on injection of 1pg of Chloramphenicol on column; OR IDL ≤ 2.5 fg on injection of 20 fg/1 fg of Chloramphenicol on column.

d. Ion Chromatograph

Scope: Supply of one fully automated, bench top, state of the art ion chromatograph system containing UV-VIS detector, Electrochemical detector, Post column derivatization unit, and suppressors able to analyse wide variety of environmental samples for trace level estimation of anions e.g. Sulphides(as S^{2-}), Cyanides (as CN^-), Sulphates (as SO_4^{2-}), Chlorides (as Cl^-), Phosphates (as P), Fluorides (as F), Nitrates (as N and NO_3^-), Nitrites (as NO_2^-), etc. and cations e.g. Hexavalent Chromium, Trivalent Chromium, etc.

1	Pump	
1.1	Type	High pressure serial dual piston type
1.2	Flow rate range	0.01 – 10 ml/min and wider without changing pump head
1.3	Flow rate reproducibility/accuracy	$\leq \pm 0.1\%$
1.4	pressure range	0 - 5000 psi or wider
2	Auto sampler	
2.1	Number of positions	50 or more
3	Column	
3.1	Guard column	Columns shall have guard columns
4	Conductivity detector	
4.1	Measurement range	0 – 15000 $\mu S/cm$ or wider
5	UV-VIS detector for speciation of Chromium	
5.1	Wavelength range	190 - 900 nm or wider
6	Electrochemical detector for determination of Cyanide, Sulphide in ppb levels	
6.1	Voltage Range	-2 to +2 V
6.2	MOC of Electrode	Gold
6.3	Electronic noise at Wet condition	≤ 50 pico Coulomb using gold electrode
7	Post Column Derivatization unit	
7.1	Complete compatible set	Compact Post Column Derivatisation unit with complete set of reagent delivery pump, mixing T joint and reaction coils.
8	Suppressor	
8.1	Service	Suitable hardware of suppressors to boost sensitivity for estimation of both anions and cations, if required.
8.2	Suppression Capacity	High loading
8.3	Suppression Mode	Electrolytic or Chemical

e. UV - Visible Double Beam Spectrophotometer

Scope: Supply of two fully automated, bench top, state of the art system for analysis of diverse environmental samples for precise identification and quantitation of Oxides of Sulphur, Oxides of Nitrogen, Copper, Iron, Lead, Manganese, Mercury, Zinc, Boron, Total and hexavalent Chromium, Cyanide, Chloride, Fluoride, Ammonia, Nitrogen, Kjeldahl Nitrogen, Nitrate, Nitrite, Phosphate, Turbidity, etc.

1	Wavelength Range	190 – 1100 nm
2	Light source	Xenon flash lamp
3	Spectral Bandwidth	Variable minimum up to 2 nm
4	Stray light	≤ 0.03% Transmittance @ 220 nm of NaI, 340 nm of NaNO ₂ , and ≤ 0.50% Transmittance @198 nm of KCl
5	Baseline flatness variation	≤ ± 0.001 Absorbance
6	Upgradability	System should have flexibility for future attachment of 'Integrating sphere for measurement of powder and air membrane filters'.
		System should have flexibility for future attachment of optical fiber probe for ex-situ sample analysis.

*Dream for a laboratory
to safeguard
the generations to come*