सीएसआईआर-केंद्रीय खनन एवं ईंधन अनुसंधान संस्थान
CSIR-CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
(Council of Scientific & Industrial Research)
बरवा रोड, धनबाद – ८२६ ००१, झारखंड, भारत
Barwa Road, Dhanbad – 826 001, Jharkhand, India

GSTIN No.20AAATC2716R1ZT E-mail: cospcimfr@cimfr.nic.in / cimfrspo@cimfr.nic.in Contact Nos.: 0326-2296003 Extn : 4336/4251/4349

PURCHASE ORDER

File No. CIMFR/PUR-1A(2)2023 **Dated: 27.06.2025**

From,	To,
Director CSIR-Central Institute of Mining and Fuel Research, Barwa Road Dhanbad- 826001	**M/s. ThermoFisher Scientific India Private Limited** **C/o. Toll Global Logistics, Mayashree Logistics Centre, Survey No. 38/4, 40/1, 40/2P, 45/A** **Kuksa Opp. NH-3,** **BHIWANDI-THANE – 421 302** **Maharashtra**

Sub: Award of Contract for Supply and installation of Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES).

Reference: 1. CSIR-CIMFR Tender No. CIMFR/PUR-1A(2)2023 (Published on CPP Portal with tender ID2024_CSIR_195794_1 dated 16.05.2024.
2. Your Quotation no Q/KOL/5/CIMFR/ICP/24 Dated 12.06.2024, Letter No. Lt/KOL/5/CIMFR/ICP/24 dated 12.06.2024, e-mail dated 05.06.2025 and other correspondences exchanged with you.

Dear Sir/Madam,

With reference to the bid submitted by you as referred above and after evaluation of bid, it is informed that Competent Authority of CSIR-CIMFR has approved you as the successful bidder for supply and installation of **Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES)**.

Accordingly, you are requested to arrange for supply and installation of the offered item/items as detailed below. As indicated in your offer, the equipment shall be covered by Extended Warranty / CMC/ AMC. The Extended Warranty / CMC/ AMC shall be rendered by you and shall be effective from the date of completion of Standard Warranty of the installed equipment.

S.No	Description of the Item	Qty.	Unit Price (Rs.)	Amount (Rs.)
1	**Part No: BRE731413** **Model: iCAP PRO XP Duo with Standard Aqueous Sample Introduction Kit, Theremo Scientific™ Qtegra™ Intelligent Scientific Data Solution™ (ISDS) Software and license** Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) **(Detailed Specification as per Annexure-II and Annexure-III)**	01 No.	53,90,190.00	53,90,190.00

Total	53,90,190.00
GST @ 18%	9,70,234.20
Total	63,60,424.20
(A) Total FOR, CSIR-CIMFR Stores, Price for Equipment (R/O)	**63,60,424.00**

The Purchase Order shall be governed by the General Condition of Contract (GCC) read with the relevant Special Conditions of Contract (SCC) as stipulated in CSIR-CIMFR Tender Document. The technical specifications and other allied features of the ordered goods and services shall strictly conform to those specified in the CSIR-CIMFR Tender Document. In case, any pre-dispatch inspection has been prescribed in the tender document, the same shall be conducted in the manner laid down in the tender document or as mutually agreed between the Purchaser and Supplier.

You are requested to send us the Order Acknowledgement immediately and in any case within 07 days of receipt of this Purchase Order.

You are also requested to deposit an unconditional performance bank guarantee of **Rs. 3,18,021.00 (Rupees Three lakh Eighteen thousand Twenty one only)** within 21 days from Scheduled commercial Bank valid till the contract period + 60 days issue of this award of contract in prescribed format.

As per the terms of our Tender Documents, you will have to execute an agreement with this institute in the prescribed format within 21 days from the issue of this communication. Till such time the said agreement is executed, this Purchase Order constitutes a binding contract between you as the Supplier and CSIR- Central Institute of Mining and Fuel Research as the Purchaser.

Yours faithfully,

27.06.2025

(Controller of Stores and Purchase/Stores and Purchase Officer)
For and on behalf of CSIR

Enclosures:

1. Term and condition (Annex-I)
2. Detailed specifications (Annex-II)
3. NIT Technical specification (Annex-III)

Copy to:

1. Dr. R. E. Masto, Chief Scientist (Indenting Officer)
2. Sr.CoFA/CoFA/FAO
3. Stores Officer
4. Office Copy

Budget Head:SSP-9229 (Capital)

Annexure-I

Terms and conditions

<table>
<tr><td>1</td><td>Price Basis</td><td>FOR CSIR-CIMFR, Dhanbad
Door Delivery: CSIR-CIMFR, Dhanbad</td></tr>
<tr><td>2</td><td>Delivery Period</td><td>Within 12 weeks from the date of Purchase Order</td></tr>
<tr><td>3</td><td>Delivery Site</td><td>Stores of CSIR-CIMFR, Digwadih Campus, Dhanbad-828108</td></tr>
<tr><td>4</td><td>Freight and Insurance</td><td>The ordered goods shall be shipped by Supplier on freight pre-paid and duly insured for 110% of CIP Kolkata value covering all risks including SRCC (Inland Transit)</td></tr>
<tr><td>5</td><td>Custom Clearance</td><td>The import consignment shall be cleared from Indian Customs by the Purchaser through their own clearing agent. In order to ensure timely customs clearance, Supplier shall provide the following details at least 7 days prior to arrival of cargo flight at destination airport:
(i) HAWB No and date
(ii) Flight No and date
(iii) Complete set of dispatch documents
(iv) Local agent of Supplier's nominated forwarder, from whom delivery of the cargo is to be requested.</td></tr>
<tr><td>6</td><td>Installation, Commissioning and Training</td><td>By the Supplier's engineers within 04 weeks from the date of delivery period stipulated in the Purchase Order. Once installation is completed, necessary training within 02 weeks shall be imparted to Purchaser's Scientists/Technical Officers etc. for effective operation and maintenance of the equipment.</td></tr>
<tr><td>7</td><td>Installation Pre-requisites</td><td>Pre-installation requisites (electrical/floor/space/air-conditioning/ water etc.) need to be mentioned clearly.
Purchaser shall not be responsible for delays in release of payments on account of non-installation of the item for want of any essential installation prerequisite needed from Supplier's end.</td></tr>
<tr><td>8</td><td>Performance Security</td><td>To be submitted within 21 days of issue of this Purchase Order @5% of the order value i.e., Rs. 3,18,021.00 (Rupees Three lakh Eighteen thousand Twenty-one only)</td></tr>
<tr><td>9</td><td>Warranty</td><td>On site comprehensive warranty for a period of One year (to be effective from the date of successful installation, commissioning and training of the goods).
Two Preventive maintenance visits and breakdown visits as and when required.</td></tr>
<tr><td>10</td><td>Extended Warranty / CMC
(For 02 Years after completion of one-year warranty period)</td><td>On site Extended Warranty / CMC for a period of 02 years
(to be effective from the date of completion of standard warranty)
A separate Order will be issued, 05% PBG of total CMC value for period of 26 months will be submitted before expiry of Standard warranty, CMC will be continued just after expiry of Standard warranty.
Payment will be released on yearly- basis after certification of user scientist. Rates will be as per the amount mentioned below:
<table>
<tr><th>Years</th><th>Amount (₹)</th><th>GST (18%)</th><th>Total Amount(₹)</th></tr>
<tr><td>For 1st Year</td><td>1,74,804.00</td><td>31,464.72</td><td>2,06,269.00</td></tr>
</table>
</td></tr>
</table>

		For 2nd Year	**1,96,654.50**	**35,397.81**	**2,32,052.00**
		Two Preventive maintenance visits and breakdown visits as and when needed.			
11	AMC	On site AMC for a period of 05years (to be effective from the date of completion of Extended Warranty / CMC) **A separate Order will be issued, 05% PBG of total AMC value for a period of 62 months will be submitted before expiry of CMC period. AMC will be continued just after expiry of CMC/extended warranty.** **Payment will be released on yearly- basis after certification of user scientist. Rates will be as per the amount mentioned below:**			
		Years	**Amount (₹)**	**GST (18%) (₹)**	**Total Amount(₹)**
		For 1st Year	**48.450.00**	**8,721.00**	**57,171.00**
		For 2nd Year	**58,140.00**	**10,465.20**	**68,605.00**
		For 3rd Year	**67,825.00**	**12,208.50**	**80,034.00**
		For 4th Year	**77,515.00**	**13,952.70**	**91,468.00**
		For 5th Year	**87,205.00**	**15,696.90**	**1,02,902.00**
		Two Preventive maintenance visits and breakdown visits as and when needed.			
12	Payment Terms	100% payment within 30 days after receipt of certificate by user for successful installation, commissioning and training of the ordered goods. Part Supplies shall be avoided. If due to unavoidable reasons part supply is made, payment shall be processed after completion of full supply only.			
13	Taxes	Payable at the rate indicated in the Purchase Order/applicable as per the prevailing rate notified by the Government if item supplied within the delivery schedule only.			
14	Liquidated Damages	Except as provided under the Force Majeure clause, a delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to the imposition of liquidated damages unless an extension of time is agreed upon without the application of penalty clause. Liquidated damages a sum equivalent to 0.5% for each week of the price of the delayed Goods or unperformed Services or contract value up to a maximum deduction of 10%.			
15	Denial clause	Any increase in statutory taxes and/or upward rise in prices or any adverse fluctuation in foreign exchange are to be borne by the Supplier during the extended delivery period, while the purchaser reserves his right to get any benefit of a downward revisions in statutory taxes and foreign exchange rate.			
16	Force Majeure	A Force Majeure means extraordinary events or circumstance beyond human control such as an event described as an act of God (like a natural calamity) or events such as a war, strike, riots, crimes (but not including negligence or wrong-doing, predictable/seasonal rain and any other events specifically excluded in the clause). The Supplier has to give notice of FM as soon as it occurs and it cannot be claimed ex-post facto.			

17	Termination for Default	The Purchaser may, without prejudice to any other remedy for breach of contract terminate the Contract in whole or part. If the Supplier fails to perform any other obligation(s) under the Contract.
18	Settlement of disputes	Even after every effort both parties failed to resolve their dispute or difference by mutual consultation, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996 and Arbitration & Conciliation (Amendment) Act 2015. The dispute shall be referred to the Delhi International Arbitration Centre (DIAC), Delhi High Court, New Delhi.

Note: Contractual obligation as per the Purchase Order will be considered as completed only after Installation commissioning, training,one year standard warranty, 02 year CMC and 05 year AMC.

Sl. No.	Part No.	Description	Qty
1)	BRE731413	**Thermo Scientific Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) System Model: iCAP PRO XP Duo with Standard Aqueous Sample Introduction Kit, Thermo Scientific™ Qtegra™ Intelligent Scientific Data Solution™ (ISDS) Software and license** The iCAP PRO Series ICP-OES plasma system is designed to rapidly adapt to changing matrices and provide unparalleled robustness even for challenging samples such as brine samples. **Sample Introduction** • The bench height sample introduction system is positioned to facilitate user accessibility to all parts. **Spray-chamber** • Single-pass cyclonic spray chamber to efficiently filter out larger aerosol droplets for improved plasma stability • Compatible with all 6 mm OD nebulizer • Optional spray-chambers for total dissolved solids tolerance and resistance to organics or aggressive mineral acids **Nebulizer** • Glass concentric nebulizers for optimal sample consumption • Optional nebulizers in a range of flow rates, total dissolved solids tolerance and resistance to organics or aggressive mineral acids **Torch** • Demountable Enhanced Matrix Tolerance (EMT) • All connectivity (argon gas supplies and plasma ignition) designed into the torch holder, reducing complexity and improving usability • Proprietary, screw-in, self-aligning injector for simplicity and reproducibility **Peristaltic Pump** • High precision 12 roller, 4 channel pump • Pump tubing options are available for aqueous and samples containing organic solvents • Pump speed is optimized, fully adjustable between 0 and 125 rpm **RF Generator** • Argon ICP source with digital, solid state RF generator • Dynamic frequency impedance matching the plasma at 27 MHz • Highly stable and robust plasma • Adjustable RF power between 750 to 1400 W for the duo view instrument **Load Coil** • Water-cooled load coil with PTFE coating for improved lifetime and reliable plasma ignition	01

Sl. No.	Part No.	Description	Qty	Total Price in Rupees
		Plasma TV • Remote monitoring of plasma status via integrated camera **Plasma Viewing** • Dual view plasma ❖ The vertical dual view plasma may be viewed axially for applications requiring the lowest detection limits or radially to minimize matrix effects and extend the working range ❖ The dual purged optical path interface ensures excellent sensitivity in the UV region of the spectrum ❖ Adjustable radial viewing height of 6 to 18 mm above the load coil **Optical System** **Type** • High energy Echelle cross dispersion optical system with "side-by-side" optical arrangement of prism and grating • Unique, all spherical mirror design for very high image quality, improved optical resolution and very low stray light performance **Spectrometer Optical Path** • The entire spectrometer and foreoptics are purged with either argon or nitrogen to ensure maximum light transmission in the UV region **Spectral Bandpass** • <7 pm at 200 nm **Wavelength Coverage** • Capture the entire wavelength range in one measurement with the unique iFR analysis mode • Improve the sensitivity of the instrument in the UV region with the eUV analysis mode • Lower wavelength limit of 167.021nm allowing the determination of aluminium at the most sensitive wavelength of 167.120nm **Detector** **Type** • CID821 Charge Injection Device (CID). High performance solid state CID camera system. The Thermo Scientific™ CID is an enhanced charge transfer device delivering high contrast/low noise imaging and quantification of all wavelengths in the analytical range without blooming **Array Size** • Four mega pixel detector with individually addressable pixels of 12 μm^2 x 12 μm^2 in a 2048 x 2048 array for continuous coverage of the available wavelengths **Specifications:** • Peristaltic pump: 4 channel, adjustable between 0-125 rpm • Nebulizer: Glass concentric • Spray-chamber: Single pass glass cyclonic • Torch orientation: Vertical (both radial and dual view) • Injector: Quartz; 2 mm standard for duo • RF Generator: 27 MH, adjustable between 750-1400 W • Load coil: Water cooled with PTFE coating • Ar gas flow controllers ❖ Nebulizer: MFC tunable via software and adjustable between 0.0-1.5 L/min ❖ Auxiliary: MFC tunable via software and adjustable between 0.0-2.0 L/min ❖ Coolant: MFC tunable via software and adjustable between 0.0-20.0 L/min		

Sl. No.	Part No.	Description	Qty	Total Price in Rupees
		• Additional gas: Additional MFC adjustable via software between 0.0-0.25 L/min • Plasma viewing: Axial or radial, with radial adjustable 6 to 18mm and axial • Optical system: Echelle cross dispersion optical system with "side-by-side" optical arrangement • Optical path purge: Argon or nitrogen purged • Spectral band pass: <7 pm • Wavelength range: iFR: 167.021-852.145nm; eUV: 167.021-240.000nm • Detector type: Charge injection device CID821 • Array size: 2048 x 2048 pixel array • Full frame imaging: Yes • Startup time: Start up time from standby 5 min • Minimum integration time: 5 seconds • Detector cooling temperature: -45 °C with tolerance of 0.1 °C		
2)	101163010000 0A1	TF9 B A 230V/50HZ T1 35M IPR SPC	01	**Included**
3)	BRE0020564	Qtegra ISDS for iCAP PRO ICP-OES software and license card	01	**Included**
4)	BRE0020416	iCAP PRO CountKit IN/ZA _Type G	02	**Included**
5)	842313050711	Replacement Test Solutions-for iCAP Val.	01	**Included**
		ISC 65 Autosampler		
6)	BRE0030065	iSC-65 Autosampler	01	**Included**
7)	BRE0033171	Rack 60 Position	03	**Included**
8)	BRE0030827	Power Cord for India	01	**Included**
9)	BRE0030312	iSC-65 probe 0.5 mmID	01	**Included**
10)	BRE0034373	USB-Ethernet Adapter	01	**Included**
11)	942347004131	CETAC 14mL Poly Tubes, 16 x 100mm for Rack 60 (1000/kit)	01	**Included**
		Consumables Aqueous Kit		
12)	842312051411	Cyclonic Spray Chamber	01	**Included**
13)	842312051431	Concentric Nebuliser	01	**Included**
14)	BRE0012328	EMT Duo Torch iCAP PRO	05	**Included**
15)	842312051971	EMT Centre Tube 2.0	01	**Included**
16)	842312051511	Pump tubing aqueous sample (pack 6)	05	**Included**
17)	842312051521	Pump tubing aqueous drain (pack 6)	05	**Included**
		Enhanced Vapor Kit		
18)	842318050101	Enhanced Vapour System	01	**Included**
19)	842312051551	Internal Standards Kit/Basic hydride system	01	**Included**
20)	842312052611	Replacement tubing for Enhanced Hydride Gen	01	**Included**
		HF Kit		
21)	BRE0019685	iCAP PRO Duo HF Kit	01	**Included**
		Organic Kit		
22)	BRE0019683	iCAP PRO Duo Organics Kit	01	**Included**
23)	842312051621	Solvent Flex Pump Sample Tubing(Pk of 6)	01	**Included**
24)	842312051631	Solvent Flex Pump Drain Tubing(Pk of 6)	01	**Included**
25)	842312051531	Viton Pump tubing organic sample (pack 6)	01	**Included**
26)	842312051541	Viton Pump tubing organic drain (pack 6)	01	**Included**
27)	N/P	**Desktop Computer Configuration:** Compatible desktop PC Core I7 processor, 1 TB Hard disk, 16 GB RAM, and Full HD 21 -Inch LED Monitor. Make Lenovo/HP/Dell, Windows 11 preloaded and MS Office professional with license.	01	**Included**

Sl. No.	Part No.	Description	Qty	Total Price in Rupees
28)	N/P	Laser printer with 14 to 20 copies per minute speed, Make HP/Canon	01	Included
29)	N/P	Argon Gas Cylinder, Purity: 99.999% in 47ltrs Carbon Steel Cylinder with Valve and Valve guard. Gas Volume: 7.0 m3	07	Included
30)	N/P	Double Stage Pressure Regulator for Argon	04	Included
31)	N/P	Gas manifold, Argon Gas regulator, purification panel, etc., to be supplied by the vendor along with all tubing. Gas piping and fitting are from the gas bank which is 10 m away from ICP-OES	01	Included
32)	N/P	10 KVA online industrial-friendly low frequency UPS (Emerson/Vertiv) with isolation transformer. Battery: 30 min backup; battery make: Exide/Amaron/TATA; and battery rack. The cables required to connect the battery bank with UPS at about 10 m distance to be arranged by the firm. The battery has a three-year warranty	01	Included
33)	N/P	Multi-Element Standards (20 elements)	1Set	Included
34)	N/P	Coal/ fly ash/ rock/soil CRM for heavy metal/rate earth elements. ISO17034 certified standards	2set	Included
35)	N/P	SS Fume Hood for ICP instrument	01	Included
36)	N/P	Acid resistant fume chamber (table mount, 3 feet)	01	Included
37)	N/P	Muffle furnace of volume 5L or more (1200 °C, accuracy ± 5 °C)	01	Included

Annexure-III

<table>
<tr><th>Sl. No.</th><th>Technical Specifications for ICP-OES</th></tr>
<tr><td rowspan="8">1.</td><td>Equipment
• Fully automated computer-controlled Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) capable of analysing elements in aqueous and organic solutions of varied samples.</td></tr>
<tr><td>• True simultaneous and background correction, including simultaneous measurements of all analyte wavelengths, internal standard, and background.</td></tr>
<tr><td>• System should be able to determine major, minor, and trace elements in a dual view and in a single run measurement.</td></tr>
<tr><td>• The instrument must be a Polychromator based ICP using solid-state detector technology having Axial, Radial and Dual views.</td></tr>
<tr><td>• An online hydraulic generation system is to be provided to simultaneously determine hydride forming and non-hydride forming elements. The firm should submit the data sheet/ application note for the hydride generation system along with the technical bid.</td></tr>
<tr><td>• Performance reports/ application notes to be submitted along with the technical bid to support the capability of the quoted model to analyze rare earth elements (REEs) and the acceptable detection limits. The detection limit for REE to be provided, the acceptable detection limit of individual REE is 20 µg/L or better. The acceptable RSD for REE analysis is 10 % or lower.</td></tr>
<tr><td>• The system should have a higher linear dynamic range of detection and be capable of multi-element analysis without sample dilution. (Elemental detection chart to be provided). The required detection limits are given below.
<table>
<tr><th>Element</th><th>Method Detection Limit (µg/L) in Solution</th></tr>
<tr><td>Ag</td><td>2 or better</td></tr>
<tr><td>Al</td><td>25 or better</td></tr>
<tr><td>Ba</td><td>2 or better</td></tr>
<tr><td>Ca</td><td>20 or better</td></tr>
<tr><td>Cd</td><td>0.25 or better</td></tr>
<tr><td>Co</td><td>1 or better</td></tr>
<tr><td>Cr</td><td>1 or better</td></tr>
<tr><td>Cu</td><td>2 or better</td></tr>
<tr><td>Fe</td><td>5 or better</td></tr>
<tr><td>K</td><td>60 or better</td></tr>
<tr><td>Mg</td><td>5 or better</td></tr>
<tr><td>Mn</td><td>1 or better</td></tr>
<tr><td>Na</td><td>25 or better</td></tr>
<tr><td>Ni</td><td>1 or better</td></tr>
<tr><td>Pb</td><td>4 or better</td></tr>
<tr><td>Zn</td><td>1 or better</td></tr>
</table></td></tr>
<tr><td>2.</td><td>Spectrophotometer
Optics: Simultaneous echelle type grating
Spectral resolution: 7 Picometer or lower at 200 nm
Wavelength: 170 to 770 nm or better</td></tr>
<tr><td>3.</td><td>Detector
Latest detector CID/CMOS/SCD/CCD with anti-blooming features.</td></tr>
<tr><td>4.</td><td>RF Generator
❖ Frequency of 27 MHz or more.
❖ Optimal power output range of minimum 750 - 1500 watts or more in dual view</td></tr>
</table>

5.	**Gas Control** ❖ The instrument must have three mass flow controllers (MFC) for all plasma-related gas flows. ❖ The ICP-OES must have an additional gas for the introduction of gases like oxygen that allows for the direct introduction of organic solvents.
6.	**Sample Introduction System** ❖ Minimum four channels, variable speed, computer-controlled peristaltic pump, ❖ Dual view torch should be mounted vertically or horizontally ❖ The instrument must include a mechanism to eliminate the cool end of the plasma. ❖ Auto sampler to be provided, minimum 200 positions.
7.	**Software and Computer** • The instrument system software shall be based on the Windows operating system. Separate software CD/pen drive to be provided, with provision to load in multiple computers. • Software should feature automatic identification of possible spectral interferences. • Perform background correction; Inter Element Correction (IEC). • The capability to capture the complete spectra of the sample should be available. • Compatible desktop PC Core i7 processor, 1 TB Hard disk, 16 GB RAM, and Full HD 21-inch LED Monitor. Make Lenovo/HP/Dell, Windows 11 preloaded and MS Office professional with license. • Laser printer with 14 to 20 copies per minute speed, Make HP/Canon
8.	**Gas Cylinder and related accessories** • Argon/ nitrogen gas cylinders (7 nos.) as needed for the application. If nitrogen gas is needed, 5 Argon + 2 Nitrogen cylinders; if nitrogen is not required, all seven should be argon cylinders). • All gases are purity 99.999%, 47 L water capacity carbon steel cylinder, pressure 150 kg/cm^2 with test certificate. • Four SS double-stage gas regulators (Swagelok/Rotorex/Welch), tubings, and fittings, along with a certificate per applicable international guidelines and codes. A calibration certificate for the regulators is to be provided. • Gas manifold, Argon/ Nitrogen Gas regulator, purification panel, etc., to be supplied by the vendor along with all tubing. Gas piping and fitting are to be provided from the gas bank which is 10 m away from ICP-OES.
9.	**Accessories** • Water re-circulator/chiller from the original manufacturer as needed for the application. • Fume Hood Exhaust system • 10 KVA online industrial-friendly low frequency UPS (Emerson/Vertiv/Hitachi) with isolation transformer. Battery: 30 min backup; battery make: Exide/Amaron/TATA; and battery rack. The cables required to connect the battery bank with UPS at about 10 m distance to be arranged by the firm. The battery should have a three-year warranty. • Acid resistant fume chamber (table mount, 3 feet) • Muffle furnace of volume 5 L or more (1200 °C, accuracy ± 5 °C) • Full service manual, operational manual, and full service tool kit to be provided.
10.	**Standard supplies** • One set of torch, nebulizer, spray chamber, sample & drain tubing set, o rings, center tube/ inner tubes as needed for sample introduction. **Additional Consumables** • Multi-element Standards (min 20 elements, 1000 mg/l) for calibration, 100ml. ISO17034 certified standards to be provided. • Two bottles of coal/ fly ash/ rock/soil CRM for heavy metal/rare earth elements. ISO17034 certified standards to be provided. • Extra Torch -5 No, Centre Tube -1 No, Nebulizer – 1 No, EMT Injector Tube -1No. • Replacement tubing for hydride generation system-1 set. • Extra Spray Chamber- 1 No. • Pump tubing aqueous drain (pack 6)-5 Nos. • Pump tubing aqueous sample (pack 6) –5 Nos. • HF resistant sample introduction kit-1 full set. • Organic solvent-compatible sample introduction kit – 1 full set

11.	**Commissioning and Installation** Transportation, loading, and unloading at CSIR-CIMFR Digwadih Campus are in the scope of the supplier. Commissioning, installation, and calibration must be carried out by the supplier at CSIR-CIMFR Digwadih Campus, Dhanbad. The detection limits, suitability of the system for rare earth elements, and CRM recovery are to be demonstrated by the application specialist and documented for the system's acceptance. All the technical features should be demonstrated during commissioning.
12.	**Training at CSIR-CIMFR Digwadih Campus** Training to CSIR-CIMFR personnel for 5 days for operation, maintenance, calibration and troubleshooting of the instrument. The 5 days of training to be executed at CSIR-CIMFR Digwadih Campus after the completion of the installation and commissioning of the system.
13.	**Warranty, CMC, & AMC** 1. Onsite comprehensive warranty on the entire setup for 01 year from the date of commissioning. During warranty period there should be two preventive maintenance visit and break down visits as and when required without any extra charges. 2. After the completion of one-year comprehensive warranty, CMC for 2 years including UPS. Year-wise cost of the CMC to be quoted for 2 years. During CMC, for each year two preventive and breakdown visits as and when needed without any extra charges. CMC price year-wise will be freezed at the time of issue of purchase order. 3. After the completion of one-year comprehensive warranty and two years CMC, AMC for 5 years. Year-wise cost of the AMC to be quoted for 5 years. During AMC, for each year two preventive and breakdown visits as and when needed without any extra charges. AMC price year-wise will be freezed at the time of issue of purchase order. 4. AMC and CMC payments will be made on a yearly basis after the successful completion of the respective service period.