

# **National Mission for Clean Ganga**

राष्ट्रीय स्वच्छ गंगा मिशन

## **REQUEST FOR PROPOSAL (GeM)**

**For the Supply, Installation and Commissioning of Online Continuous Effluent Monitoring System (OCEMS) with 5 years of Operation and Maintenance of STP plants in Ganga River Basin and Development of Central Monitoring Station (Dashboard) with O&M of Portal for 5 years**

गंगा नदी बेसिन में एसटीपी संयंत्रों के संचालन और रखरखाव के लिए 5 साल की अवधि के साथ ऑनलाइन सतत प्रवाह निगरानी प्रणाली (ओसीईएमएस) की आपूर्ति, स्थापना और कमीशनिंग तथा 5 वर्षों के लिए पोर्टल के संचालन और रखरखाव के साथ केंद्रीय निगरानी स्टेशन (डैशबोर्ड) का विकास।

**RFP No.** : TE-15015/2/2020-TECH CONSTRUCTION NMCG  
**Issued on** : 19<sup>th</sup> August 2024

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## **National Mission for Clean Ganga**

Department of Water Resources, River Development & Ganga Rejuvenation  
Ministry of Jal Shakti  
1st Floor, Major Dhyan Chand National Stadium  
India Gate, New Delhi-110002

**RFP No.:** TE-15015/2/2020-TECH CONSTRUCTION NMCG

**Dated:** 19<sup>th</sup> August 2024

### **I. NOTICE INVITING TENDER (NIT)**

NMCG inviting proposals through Government e-Market Place (GeM) (<https://gem.gov.in/>) from interested firms who meet the eligibility criteria as per the Request for Proposal (RFP) document for Supply, Installation and Commissioning of Online Continuous Effluent Monitoring System (OCEMS) Instruments with 5 Years of Operation and Maintenance and Development of Central Monitoring Station (Dashboard).

The interested and eligible bidders shall submit their proposals along with necessary documents only on GeM portal as stipulated in in the RFP document.

Bid Security/Earnest Money Deposit (EMD) equal to **Rs.66,08,000/- (Rupees Sixty Six Lakh and Eight Thousand only)** in the form of Bank Guarantee issued by any scheduled bank in favour of 'National Mission for Clean Ganga' payable at New Delhi must be accompanied with the proposal.

For detailed eligibility criteria and terms of reference, please refer to the Request for Proposal (RFP) documents which can be downloaded from NMCG Website ([www.nmcg.nic.in](http://www.nmcg.nic.in)) and GeM portal (<https://gem.gov.in/>) as per the schedule mentioned above.

NMCG reserves the right to cancel the bid at any time or amend / withdraw any of the terms and conditions contained in the Bid Document without assigning any reason thereof.

## II. INSTRUCTIONS TO BIDDERS

1. The bidder shall be a **Sole Firm/Single entity or a consortium/joint venture of firms**. If the bidder is a consortium/joint venture, the combined Technical and Financial capacity of all members shall be considered for determining the eligibility of the bidder as stipulated in the RFP document. However, maximum numbers of members/partners are limited to two and other terms and conditions of the RFP document are applicable to each member of the consortium/joint venture. Also all members of the consortium are jointly and severally responsible for performance of the assignment. No bidder or its Member shall submit more than one proposal. A bidder applying individually or as JV shall not be entitled to submit another proposal either individually or as a member of any consortium/JV, as the case may be.
2. The bidder is expected to examine all instructions, forms, terms and conditions in the RFP document. Failure to furnish all information required by the RFP document or submission of a tender not substantially responsive to the RFP document in every respect will be at the bidder's risk and may result in rejection of the bid.
3. **Preparation of Bids**
  - 3.1 Language: Bids and all accompanying document shall be in English language. In case any accompanying documents are in other languages, it shall be accompanied by an English Translation. The English version shall prevail in matters of interpretation.
  - 3.2 Form of Bid: The form of bid shall be completed in all respects and duly signed and stamped by an authorized representative of the bidder. Relevant power of attorney for signing the bid should be attached.
  - 3.3 Cost of Bid: The bidders shall be responsible for all of the costs associated with the preparation of their proposals and their participation in the tender process including subsequent negotiation, visits to the NMCG, Project site etc. NMCG will not be responsible or in any way liable for such costs, regardless of the conduct or outcome of the Selection Process.
  - 3.4 Currencies of Bid and Payment: The bidder shall submit his financial bid in Indian Rupees and payment under this contract will be made in Indian Rupees.
4. **Clarifications by Bidders**
  - 4.1 Bidders requiring any clarification on the RFP may submit their queries to NMCG through GeM portal within four (4) days from the date and time of publication of RFP (as per GeM provision).
  - 4.2 NMCG shall endeavour to respond to the queries within the period specified therein but not later than the date specified in the clause 16. The NMCG will post the reply to all such queries on the GeM portal and without identifying the source of queries.

NMCG shall not be held responsible in any manner if prospective bidders miss any notifications placed on GeM Portal.

- 4.3 NMCG reserves the right not to respond to any questions or provide any clarifications, in its sole discretion, and nothing in this Clause shall be construed as obliging the NMCG to respond to any question or to provide any clarification.

## **5. Amendment of RFP**

- 5.1 At any time prior to the deadline for submission of Proposal, the NMCG may, for any reason, whether at its own initiative or in response to clarifications requested by an bidder, modify the RFP document by the issuance of Addendum/ Amendment and posting it on GeM portal.
- 5.2 In order to afford the bidders a reasonable time for taking an amendment into account, or for any other reason, the NMCG may, in its sole discretion, extend the bid submission date.

## **6. Pre-Proposal Meeting**

- 6.1 To clarify and discuss issues with respect to the Project and the RFP Document, a Pre-Proposal meeting (“Pre-Proposal Meeting”) will be conducted virtually on the date and time specified in Clause 16.
- 6.2 Attendance of the bidders at the Pre-Proposal Meeting is not mandatory. NMCG will endeavor to respond to all queries received by the scheduled date as per clause 16 from all bidders, irrespective of attendance of the bidder in the Pre-Proposal Meeting.

## **7. Format and Signing of Bid**

- 7.1 The documents comprising the bid shall be typed and all pages of the bid shall be signed by a person duly authorised to sign on behalf of the bidder.
- 7.2 The bid shall contain no alternations, omissions or additions except those to comply with instruction issued by NMCG, or are necessary to correct errors made by the bidder, in which case such corrections shall be initialled/signed by the person signing the bid.

## **8. Submission of Bids**

- 8.1 The Bidders shall upload the electronic copy of the Proposal (with all pages numbered serially and by giving an index of submissions) through GeM portal after digitally signing of all the documents.
- 8.2 The bidder shall upload the Technical Proposal and the Financial Proposal separately by using the appropriate sections on GeM portal.
- 8.3 NMCG, if required, will request the bidder to submit the hard copy of original Power of Attorney and Joint Bidding Agreement (if applicable) for scrutiny.

8.4 The Proposal shall be made in the forms specified in this RFP. Any attachment to such forms must be provided on separate sheets of paper and only information that is directly relevant should be provided. This may include photocopies of the relevant pages of printed documents. No separate documents like printed annual statements, company brochures, copy of contracts etc. will be entertained.

8.5 The rates quoted shall be firm throughout the period of performance of the assignment and discharge of all obligations of the agency under the Contract.

**9. Validity of Bid:** The bid must remain valid and open for acceptance for a period of 180 [*One Hundred and Eighty Days*] from the date of opening of Bid or any extension thereof prescribed by the NMCG for the receipt of Bids. A Bid valid for a shorter period shall be rejected by the NMCG as being non-responsive.

**10. Late and Delayed Bids:**

Bidders are encouraged to submit their proposals online well in advance before the prescribed due date and time to avoid any delay or problem during the bid submission process. NMCG will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to link failure/ internet problem etc.

**11. Opening and Evaluation of Technical Bid**

11.1 The electronic “Technical Proposals” shall be opened first, through GeM portal on the date and time specified in clause 16. The “Financial Proposals” shall remain unopened in the GeM portal, until the subsequent public opening following the evaluation of the Technical Proposals.

11.2 The Technical Bid of the bidder would be evaluated as per the eligibility criteria set out in the RFP document. Bids will be evaluated based on the information submitted by the bidders. However, NMCG reserves the right to seek clarification/documents from the bidders, if NMCG considers it necessary for proper assessment of the bid.

11.3 The Technical Bids will be evaluated based on eligibility criteria and only those bidders who meet the requirement shall qualify for further evaluation.

**12. Opening of Financial Bid and Final Evaluation**

12.1 The electronic “Financial Proposals” of the technically qualified bidders shall be opened, through GeM portal on the date and time specified.

12.2 **The selection of the bidder shall be based on Least Cost Selection method.**

12.3 Failure of the Successful Bidder to comply with the requirements shall constitute sufficient grounds for the annulment of the LOA. In such an event, NMCG reserves the right to,

- (a) invite the second lowest bidder and negotiate upon the following scenario, or
- (b) take any such measure as may be deemed fit in the sole discretion of NMCG, including annulment of the Bidding Process.

### **13. Right to accept any Bid and to reject any or all Bids**

- 13.1 NMCG is not bound to accept the lowest bid or any bid and may at any time by giving notice in writing terminate the tendering process.
- 13.2 NMCG may terminate the contract/cancel the LOA if it is found that the bidder is blacklisted on previous occasions by any of the central/state government ministry/ department/ institutions/local bodies/municipalities/PSUs, etc.
- 13.3 NMCG may also terminate the contract/cancel the LOA in the event the Successful Bidder fails to furnish the performance security or fails to execute the contract.

### **14. Award of Contract**

- 14.1 NMCG will award the contract to the Successful Bidder to perform the contract satisfactorily as per the terms and conditions incorporated in the RFP document.
- 14.2 NMCG will communicate the Successful Bidder by mail confirmed by letter transmitted by registered/speed post that his bid has been accepted. This letter (hereinafter and in the condition of contract called the "Letter of Award") shall prescribe the amount which NMCG will pay to the Successful Bidder in consideration of the execution of work/services by them as prescribed in the contract.
- 14.3 The Successful Bidder will be required to commence the assignment at the earliest as communicated by NMCG in this regard.
- 14.4 The Successful Bidder will be required to execute the contract for the services within a period of fifteen (15) days from the date of issue of Letter of Award.

### **15. Bid Security and Performance Security**

#### **15.1 Bid Security (EMD)**

- a. The Bidder shall furnish as part of its Proposal, a bid security of **Rs.66,08,000/- (Rupees Sixty-Six Lakh and Eight Thousand only)** in the form of Bank Guarantee/ e-Bank Guarantee issued by any of the Nationalised/ Scheduled Banks in India in favour of the National Mission for Clean Ganga payable at New Delhi (the "Bid Security"). The bid securities of unsuccessful bidders, during first stage i.e. technical evaluation, shall be returned within 30 days from the date of declaration of technical evaluation result. The bid securities of remaining bidders shall be returned upon the Selected Bidder signing the

contract, but in no case not later than 45 (Forty-Five) days from the expiry of validity of proposal.

Name of Account: National Mission for Clean Ganga- National Ganga Plan  
 Account No.: 344902010107168  
 IFSC Code: UBIN0534498  
 MICR Code: 110026014.

- b. Any bid not accompanied by the Bid Security shall be rejected by the NMCG as non-responsive.
- c. NMCG shall not be liable to pay any interest on the Bid Security and the same shall be interest free.
- d. The bidder, by submitting its Proposal pursuant to this RFP, shall be deemed to have acknowledged that without prejudice to the NMCG's any other right or remedy hereunder or in law or otherwise, the Bid Security shall be forfeited and appropriated by the NMCG as the mutually agreed pre-estimated compensation and damage payable to the NMCG for, inter alia, the time, cost and effort of the NMCG in regard to the RFP including the consideration and evaluation of the Proposal under the following conditions:
  - a) If a Bidder submits a non-responsive Proposal;
  - b) If a Bidder withdraws its Proposal during the period of its validity as specified in this RFP and as extended by the Bidder from time to time;
  - c) In the case of a Selected Bidder, if the Bidder refuses or neglects to execute the Contract or fails to furnish the required Performance Security within the time frame specified by NMCG.
- e. If the bidder is registered as Micro and small Enterprises (MSE) as defined in the MSE procurement policy issued by Ministry of Micro, Small and Medium Enterprises (MSME), such bidder is exempted from furnishing only the bid security as mentioned in this clause. In case of JV/Consortium, all partners must individually satisfy the eligibility criteria mentioned in this clause, to avail MSE exemption with regard to submission of bid security

## 15.2 Performance Security

The Successful Bidder shall be required to furnish a Performance Security prior to sign the contract (for an amount which is 5% of total project cost) in the form of Bank Guarantee from a scheduled Bank in acceptable form in favour of 'National Mission for Clean Ganga' payable at New Delhi. The Performance Security shall remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations. In case the contract period is extended further, the validity of Performance Security shall also be extended by the Successful Bidder accordingly. The format for BG for Performance Security is provided at Annexure-IX.

Failure of the Successful Bidder to comply with the requirements of above clauses shall constitute sufficient grounds or the annulment of the award and other actions as deemed necessary.



## 16. Schedule of Bidding Process

NMCG would endeavour to adhere to the following schedule:

<b>S.No.</b>	<b>Event Description</b>	<b>Date and Time</b>
1.	RFP Publish date	19 <sup>th</sup> August 2024
2.	Pre-Bid Conference by Virtual Meeting Platform	28 <sup>th</sup> August 2024 at 11:00 AM  Google Meet joining info Video call link: <a href="https://meet.google.com/qta-ndao-wnw">https://meet.google.com/qta-ndao-wnw</a>
3.	Last date & time for submission (upload) of online bidding document (Proposal Due Date or PDD)	18 <sup>th</sup> September 2024 up to 04.00 PM
4.	Opening of Technical Proposals through GeM portal	18 <sup>th</sup> September 2024 at to 04.30 PM
5.	Opening of Financial Proposal through GeM portal	To be informed later
6.	Signing of Contract	Within 15 days of acceptance of LoA
7.	Validity of Proposal	180 days from Proposal Due Date

### III. ELIGIBILITY AND EVALUATION CRITERIA

#### Technical

1. Having successfully completed the work for “Online Data Acquisition, Monitoring & Control System through Local & Remote Terminals, based on GPRS/GSM/WiFi or any other suitable System, including Supply of Field Instruments, for a minimum of **20 nos. STP/ETP/CETP of capacity not less than 1 MLD**” **under/for any Govt./Semi Govt./Govt. Undertaking body/Industrial association/trust** within last five years and having a satisfactory performance certificate not less than 12 months old from the user body. (Performance certificate submitted should be signed from the end user by an officer not below the rank of Executive Engineer or equivalent, is mandatory).
2. Authorization from O.E.M indicating the Tender Number, if the bidder is not a O.E.M.
3. The Bidder/ Bidders’ Manufacturer should have supplied, installed & Commissioned Real Time Sewage Water Quality Monitoring System for stations with minimum **4 water quality Parameters** out of BOD, COD, TSS, TOC, TN, TP, Flow and pH.
4. Bidder or OEM should be directly operational in India, for minimum last 3 years from the NIT date with office set up in India.
5. The tenderer shall meet the requirements as mentioned in technical specification (Submit the product literature, catalogues/brochures for all the sensors, Servers, Solar panel (If applicable), software and Hardware as requested in the tender documents).
6. The tenderer must comply each and every point of CPCB SOP [https://cpcb.nic.in/NGTMC/sop\\_ocems\\_stp.pdf](https://cpcb.nic.in/NGTMC/sop_ocems_stp.pdf) as per latest guidelines and it will be tenderer’s responsibility to comply all SOP points during commissioning and Operation & Maintenance of OCEMS system. (**Affidavit Annexure-\_\_\_\_\_** )
7. The printed literature and catalogue/brochure giving full technical details should be included with the technical bid to verify the specifications quoted in the tender. The bidders should submit copies of suitable documents in support of their reputation, credentials and past performance in .pdf format. The bidder shall also furnish details & compliance on the specifications specified in para 3 of sub-section 3 (Technical Specifications).
8. The bidder should submit an undertaking for the supply of complete list of spares and consumables required for 05 (five) years for trouble free operation and maintenance of the instrument and a certificate to be given by manufacturer that spare parts will be made available for five years.
9. The bidder shall have, over the past 5 years, completed minimum 3 assignments of “Development of Centralized Monitoring Systems (Dashboard) using cloud-based solutions for Online Continuous Data Acquisition, Monitoring & Control System covering minimum 30 no. of stations (in each assignment) through Local & Remote

Terminals, based on GPRSGSM/WiFi or any other suitable System including 1 year of O&M, under/for any Govt./Semi Govt./Govt. Undertaking body/Industrial association

The experience claimed by the Bidder shall be substantiated with suitable certificates such as work order/LoA/completion certificate from the client.

### **Financial**

1. The Minimum required average annual turnover of the Bidder/Bidders' Manufacturer in respect of Supply, Installation, and commissioning of goods during last three (3) **financial years** (FY 2020-21, FY 2021-22 and FY 2022-23) shall be minimum **INR 20 Crore (Twenty Crore)**.
2. Audited Balance Sheets of last five financial years with auditor's certificate regarding annual turnover from contracting business in each year.

#### **IV. SCOPE OF WORK AND TECHNICAL SPECIFICATIONS**

##### **Objective of project:**

As per the directive of CPCB, the work has been taken up towards the implementation of self-regulatory mechanism for online monitoring of the treated sewage for different parameters like Flow, pH, B.O.D, C.O.D, TSS, Total Nitrogen equivalent (TN eq) through installation of Online Continuous Effluent Monitoring System (OCEMS) for all the existing S.T.Ps which are under different stages of construction, operation & maintenance under Namami Gange Programme. This is in compliance with the order of Hon'ble NGT issued u/s (5) of Environmental Protection Act 1986. This (OCEMS) is suppose to monitor the desired data online with a continuous data transmission facility to the server of NMCG, SPMGs, EA & CPCB in a 24X7 manner in exact compliance with the latest Guidelines & S.O.P. published by CPCB.

The scope includes, Supply, Installation, Testing, Commissioning & Operation and Comprehensive Annual Maintenance for five (05) years from the date of successful completion of Trial Run of the effluent quality monitoring system for online (continuous) measurement of Flow, pH, Total Suspended Solids (TSS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Total Nitrogen equivalent (TN eq) by single / multiple analyzer with various sensors (TOC/ full spectrum spectral measurement in the UV-VIS range 200-750nm) performing reagent and chemical free analysis with automatic cleaning of sensor, signal cables and power cables, local data acquisition and display of data on continuous basis for up linking the data to NMCG, SPMGs, EA & CPCB approved complete in all respect as per Central Pollution Control Board (CPCB) guidelines for online continuous monitoring system for effluents with power back up system and as contained in Technical Specifications.

NMCG proposes to develop Integrated Dashboard for Real Time Data Monitoring and Analytics of Effluent Quality Monitoring system. The system will provide Data Analytics, Alerts, Dashboards and Customized Report Generation to monitor the pollution levels across Ganga Basin. It is estimated that the system once commissioned, will be capable of monitoring above 5000 devices (real time analyzers) from approximately 500+ Sewage treatment Plants. This will involve continuous data collection from various devices remotely stationed in the STPs and collection of the data at a central monitoring station at NMCG Office, New Delhi. The software should have dashboard, alerting and reporting capabilities to suit regulatory requirements and necessary alert systems based on the selected user configurable thresholds for various pre-defined parameters (range of 20 to 25 parameters depending on the samples monitored). The real time data should be sampled minimum on a 15-minute basis but should have a user defined flexibility to change the sampling time-frame and provision for input data of the measurement of Faecal Coliform.

The Dashboard should be capable to fetch, display and control the live feed of IP based CCTV. The integration of all IP cameras installed at various STP site by different Agencies via GSM/GPRS or internet.

## Scope of the contract:

### 1. OCEMS

The turn-key contract comprises Design, Engineering, supply, storage, Installation and commissioning of the Electro-Mechanical Equipment, trial Run for one month and comprehensive operation and maintenance for a period of 5 years upon completion of trial run except in so far as the contract otherwise provides, the provision of all labour, materials, constructional plant, temporary works and everything (whether temporary or permanent in nature) required for completion and operation & maintenance so far as the necessity for providing the same is specified in or reasonably to be inferred from the contract.

Supply, Installation and Commissioning of 2 sets of OCEMS for the real time monitoring the quality at inlet point (for influent) and outlet points (for treated water) of each STP for Total 39 STP Plants in Ganga river basin.

a) **Category-I:** Installation of OCEMS instruments at inlet and outlet of STP for measurement of Flow, pH, BOD, COD, TSS and TN(eq) of influent and effluent for **30 STP** Plants in Ganga river basin with 5 Years of Operation and Maintenance.

b) **Category-II:** Installation of OCEMS instruments at inlet and outlet of STP for measurement of Flow, pH, BOD, COD and TSS of influent and effluent for **9 STP** Plants in Ganga river basin with 5 Years of Operation and Maintenance.

#### 1.1 Supervisory Staff:

The Supplier shall engage an experienced and qualified Site Manager to be in day to day charge of the work and he should be authorized to receive instructions from the EIC. He shall receive orders given by the EIC from time to time and shall act on them promptly. The Contractor shall, during working hours, maintain engineer and supervisors of sufficient training and experience to supervise the various items and operations of the work. Orders and directions given to such engineers and supervisors or other staff of the Contractor shall be deemed to have been given to the Contractor. The Chief Engineer of the Contractor responsible for this work, by whatever designation he may be known, but who will be specified on award of the Contract shall at least once in a fortnight inspect the works and shall discuss with the EIC the conduct and progress of the work.

#### 1.2 List of STPs for supply and installation of OCEMS

S.No.	Description	Category
	<b>UTTRAKHAND</b>	
1	20 MLD STP at Mothorowala-I, Dehradun	<b>Cat-I</b>
2	68 MLD STP at Kargi Chowk, Dehradun	<b>Cat-I</b>
3	20 MLD STP at Mothorowala-II, Dehradun	<b>Cat-I</b>
4	5 MLD STP at Indira Nagar, Dehradun	<b>Cat-I</b>
5	3.12 MLD STP at Bhatfall Mussoorie, Dehradun	<b>Cat-I</b>

<b>S.No.</b>	<b>Description</b>	<b>Category</b>
6	1.2 MLD STP at Happy Vally Mussoorie, Dehradun	<b>Cat-I</b>
7	1.3 MLD STP, Landaur South, Mussoorie, Dehradun	<b>Cat-I</b>
8	1 MLD STP at Jakhan, Dehradun	<b>Cat-I</b>
9	18 MLD STP at Jagjeetpur, Haridwar	<b>Cat-I</b>
10	33 MLD STP at Saliyar, Roorkee	<b>Cat-I</b>
11	5 MLD STP at Bhagirathpuram, Tehri	<b>Cat-I</b>
12	1 MLD STP, Gangotri. Uttarkashi	<b>Cat-I</b>
13	1.4 MLD STP, Devprayag, Pauri Garhwal	<b>Cat-II</b>
14	28 MLD STP at Indra Nagar, Haldwani, Nainital	<b>Cat-I</b>
15	1.25 MLD STP at Bhimtal, Nainital	<b>Cat-I</b>
16	5 MLD STP at Pithoragarh, Pithoragarh	<b>Cat-I</b>
17	1.25 MLD STP, Narada, Pithoragarh	<b>Cat-I</b>
18	2 MLD STP Bakh, Almora	<b>Cat-I</b>
	<b>BIHAR</b>	
19	9 MLD STP at Naughachia , Bhagalpur	<b>Cat-I</b>
20	37 MLD STP at Karmalichak, Patna	<b>Cat-I</b>
21	10 MLD STP at Sultanganj, Patna	<b>Cat-I</b>
22	60 MLD STP at Pahari, Patna	<b>Cat-I</b>
23	43 MLD STP at Beur , Patna	<b>Cat-I</b>
24	11 MLD STP at Barh, Patna	<b>Cat-I</b>
25	60 MLD STP at Saidpur, Patna	<b>Cat-I</b>
26	3.5 MLD STP at Sonepur, Patna	<b>Cat-I</b>
	<b>Jharkhand</b>	
27	10.4 MLD STP at Bokaro	<b>Cat-I</b>
28	11.4 MLD STP at Bokaro	<b>Cat-I</b>
29	5.85 MLD STP at Bokaro	<b>Cat-I</b>
30	1.17 MLD STP at Bokaro	<b>Cat-II</b>
31	2.57 MLD STP at Bokaro	<b>Cat-II</b>
32	45 MLD STP AT BARA, East Singhbhum	<b>Cat-I</b>
33	16 MLD STP at Kharki, East Singhbhum	<b>Cat-I</b>
34	2.0 MLD STP at Chutia Ranchi	<b>Cat-II</b>
35	1.0 MLD STP at Harmu, Ranchi	<b>Cat-II</b>
36	1.5 MLD STP at Chutia Ranchi	<b>Cat-II</b>

S.No.	Description	Category
37	1 MLD STP at Shivling Temple, Ranchi_1	Cat-II
38	2 MLD STP at Kadru Ranchi	Cat-II
39	1.5 MLD STP at Harmu, Ranchi	Cat-II

### 1.3 Standards:

- 1.3.1 All Electro-mechanical supply of materials and or equipment under this specification shall be designed, manufactured, constructed and tested in accordance with latest revision of the relevant Indian Standards (IS), British Standards (BS ). Hydraulic Institute Standards (HIS), CPHEEO manual, ISO and International Electro Technical Commission ( IEC ) publication unless otherwise stated.
- 1.3.2 All electro mechanical installation shall meet the requirement of latest revision of relevant code of practice. In addition, all electrical installations shall also meet the requirement of Indian Electricity Rules, 1956 and Indian Electricity Act, 2003 as amended upto date.
- 1.3.3 In addition, any rules or regulation applicable to the work shall also be followed and obeyed. In case of any discrepancy, the decision of the EIC shall be final and binding upon the contractor.
- 1.3.4 Approval of Material and Equipment's : The specifications and drawings of each item to be supplied shall be individually scrutinized and its conformity with the technical specifications and conformity with the latest standards of CPCB shall be verified by the Engineer incharge.

### 1.4 Daily operation of the Built-up Eletro – Mechanical installation:

- 1.4.1 The installation generally mean all electro-mechanical equipments and accessories supplied, installed, tested, commissioned with allied civil works by the contractor.
- 1.4.2 Primary responsibility of the contractor is to operate and maintain the stated installation daily at the set time fixed by the department in good workmanship like manner. The set time is not firm and may vary.
- 1.4.3 The tenderers are advised to quote their rates for the specific item of comprehensive O&M considering all pros and cons of the situation which may eventually affect their rate. No claim what so ever shall be entertained by the department on such account.
- 1.4.4 The cost of all consumables, hardware and any goods which may be required during this period shall have to be provided by the contractor and the same shall also be taken into consideration while pricing the specific item of O & M.
- 1.4.5 Integration with plant's SCADA
- 1.4.6 During such operation and maintenance by the contractor, the conditions of the equipment's and accessories shall be monitored and if necessary, remedial measure shall be taken by the contractor at his own cost.

### **1.5 Day to day routine maintenance of the installation:**

- 1.5.1 The contractor has to ensure the operativeness of the entire installation in the best conditions by supplying and or fixing any items or any goods or any tools & plants required for the smooth and trouble free operation and maintenance.
- 1.5.2 All consumables, hardware and other spares for electrical luminaries (ballast, igniter, capacitors etc.) shall be supplied by the contractor during the O & M phase of work. The cost for such repair and or replacement shall be included in the specific item of operation and maintenance of the station.
- 1.5.3 The contractor has to contact and liaison with municipal engineers/Executing Agency and or any responsible person in case of any site need and or demand since the entire job is being done for the beneficiaries of the local area.

### **1.6 Damages due to faulty erection and or due to faulty operation & maintenance:**

Any damages caused to the equipments and or any installations due to the faulty and or defective erection and or operation and maintenance made by the contractor, shall be made good by the contractor at his cost and risk. Decision of the department in this regard shall be final and binding upon the contractor. In the event of failure to repair, mend good or set right the defects observed within a reasonable period of time from such intimation by the department, the same shall be repaired, mend good as the case may be, at the risk and cost of contractor.

### **1.7 Comprehensive maintenances:**

The contractor has to bear in mind that this operation and maintenance are exclusively comprehensive in nature. Any item / items / spares if any is / are required to be replaced / repaired / mend good for smooth and trouble free operation of the entire installations, the same shall be met by the contractor at his cost. Decision on the requirement / replacements / mending good damages shall be taken by the department and binding upon the contractor.

## **2. Central Monitoring Station (Dashboard for Real Time Data Monitoring and Analytics of Online Continuous Effluent Quality Monitoring system)**

### **2.1 General**

- 2.1.1 The system should be a highly scalable Internet of Things based system where the data acquisition software resides in Data logger devices installed at the site and the central software resides at the central location in the datacenter
- 2.1.2 Provide a highly scalable system that can connect more than 1000+ STPs simultaneously in real time, besides data from other sources with a non-proprietary highly scalable backend database suitable for storing Time Series Data.
- 2.1.3 The system should support multiple client software that are found suitable to the requirement and approved by NMCG, which can send data to the central server.



- 2.1.4 The central server software should expose authenticated Representational State Transfer (REST) based Application Programming Interface (API) for client software to transmit the data.
- 2.1.5 The client data acquisition software should NOT be restricted to the requirement of static IP and should be able to connect to the server based on the exposed API.
- 2.1.6 During collection and transmission, the platform should utilize digital encrypted communication (RSA/AES) to ensure authentic data is received and data origination location (GPS coordinates) and source signature are also verified by the software.
- 2.1.7 The software should provide two-way communication and have the ability to capture and display internal registers / protocols of the field instruments.
- 2.1.8 The software should be capable of providing remote calibration of field instruments as per CPCB Guidelines
- 2.1.9 The software application should have inbuilt ability to view the IP Camera without any kind of browser plug-in or Desktop software
- 2.1.10 The software should be able to control the IP camera and use the PAN, TILT and ZOOM functionality without any kind of plug-in for all cameras.
- 2.1.11 The software should provide the ability to annotate the validated data with the industry comments and data quality codes. The annotations should be visible while viewing the data in the charts.
- 2.1.12 The software also should provide ability to develop custom made on- demand reports with capabilities to export the data into PDF, CSV and Excel formats. The reports developed should be printable on any of the standard printers.
- 2.1.13 Entire Source code of the software should be provided to the NMCG and the NMCG should have the ability to review any specific module to validate the business logic and the data handling process. Strictly “NO” propriety software or code is allowed. The application source code including the real time data captured, processed and stored will remain the property of NMCG at all times.
- 2.1.14 The ability to generate the encryption keys for the Client Data Acquisition Software should be provided to the NMCG, so that the board can provide authorized keys to the individual sites for secured data transmission. There should not be any financial implication to NMCG for generation of such keys and it should be a software feature.
- 2.1.15 Publishing of data shall be at the NMCG end and should have necessary components inbuilt in the system to publish valid data only.
- 2.1.16 The Intellectual Property Rights (IPR) of the software will be solely of NMCG and all the technical know-how, information, source code, data and any other information generated during development and implementation of the software will be permanent property of NMCG.
- 2.1.17 Dashboard should be compatible with NIC (National Informatics Center) server/network.
- 2.1.18 Procurement and service charges of hosting cloud, backup cloud, security audit, migration to NIC server (if any) for development and O&M of 5 years shall be in the scope of bidder.

- 2.1.19 If any technical issue arises in hosting Server, i.e Cloud server or NIC cloud with respect to application/database, the issue need to resolve in coordination with Technical Team, NIC.
- 2.1.20 To enable the features for differently abled as per GIGW guidelines. (GIGW-Guidelines for Indian Government Website.)
- 2.1.21 The dashboard should be compatible and operational on mobile phone browser also.
- 2.1.22 Synergetic data use within the Ministry/Departments and Inter-Agency Data Collaboration: This means interlinking of various Ministerial / Departments Dashboard using API linkage in the existing Dashboard or development of new API for pushing of data to another Central dashboard.
- 2.1.23 Migration of the Dashboard (including source code and database) to GI Cloud Server or NIC cloud server will be the sole responsibility of the bidder.

## **2.2 Client Data Acquisition Software Requirements**

### Data Collection and Transmission Module

- 2.2.1 The data collection and transmission module should directly connect to the installed analyzer and fetch the data directly from the analyzer without any intermediary software or conversions and without any PC or server. The software should have no editing provision for altering / correcting the data at the industry side.
- 2.2.2 No data shall be accepted as an output from OPC of Server or DCS or any other intermediate software at Industry side.
- 2.2.3 Software should support reading analyzer configuration and report the configuration changes to the central server. Any configuration changes done at the site should have audit trail and reported to the regulator for approval in the form of workflow.
- 2.2.4 Data collection and transmission shall be minimum 15 minute or other mean average period selectable by user.
- 2.2.5 The data collection and transmission module should be able to transmit the data over Broadband /LAN /Wi-Fi /GPRS/ GSM/etc.
- 2.2.6 The data collection and transmission module should support any analyzer, make and model based on the configuration and protocol specific extensions.
- 2.2.7 The data collection and transmission module should be customizable to support any specific protocol required.
- 2.2.8 The Central Server should publish an open Application Programming Interface (API) to support different client side software. Any vendor supplying the data collection and transmission module should comply with the API. The client side software requirement shall be demonstrated at NMCG. Data transmitted only from such demonstrated and proven client software will be accepted by the Central Server Module.

## 2.3 Central Server Software Requirements

NMCG/NIC side software

- 2.3.1 The Central Server Module should provide backend processing services for transmitted data and a highly scalable backend database capable of storing time-series data acquired from the industry site.
- 2.3.2 The database should be able to support data storage and query for 10 years of data collected from all the industry sites with minimum of 15-minute interval.
- 2.3.3 The database should be scalable to support 1000 + concurrent connections and should be able to store and process more than 100 Terabyte of data.
- 2.3.4 The Central Server Module should support remote configuration of the industry site parameters from the NMCG.
- 2.3.5 The Central Server Module should generate automated alarms and alerts based on parameter exceedance, data connectivity failure, analyzer failures, etc.
- 2.3.6 The Central Server Module should be able to identify delayed data published from the industry site due to network connectivity failures and mark those data separately from the live connected data.
- 2.3.7 The Central Server Module should be able to send pre-configured template based SMS and Emails for alerts and alarms generated based on the configured rules. This feature should be a built- in capability of the Central Server Module and not external application software.
- 2.3.8 The Central Server Module should have facility to transfer data to other server at CPCB/SPCB end at periodic interval for data backup and recovery requirements.
- 2.3.9 The Central Server Module should be able to generate report on alarms/events and exceedance with industry wise consolidation and period wise say weekly, monthly, annually etc.
- 2.3.10 The Central Server Module should provide automatic notification to the industry site and NMCG inbox for all new notifications and action items like fixing communication issues, analyzer problems etc.
- 2.3.11 The central server module should be available 24/7 for 365 days for data collection. The system should provide automated redundancy so that industry site should be able to continuously send the data.
- 2.3.12 Database specification for Regulator side software:

S. No	Specifications	
1	Software	Highly scalable database capable of storing time-series data like Kiaros (Cassandra), Open TSDB (Hbase), Influxdb or similar.
2	Storage	Minimum 100 TB
3	Concurrent connections	Support minimum of 5,000 concurrent connections
4	Availability	High availability with 99.95% availability
5	Latency	< 5 seconds for standard site specific query

## **2.4 Dashboard Interface Requirement:**

### **2.4.1 General Requirements:**

- 2.4.1.1 To view, generate default report, analyze the collected data and collaborate with industry for various exceedance and failures.
- 2.4.1.2 The Dashboard Interface Module should provide a User Interface presented in the browser should be very user friendly and intuitive following the best practices in web based user interface design.
- 2.4.1.3 The User Interface should be supported on major browsers like Internet Explorer, FireFox, Chrome, Safari etc. The user interface should support rendering on a Tablet, smart phones which supports these browsers.

### **2.4.2 Configuration Management**

- 2.4.2.1 The Dashboard Interface module should provide the user interface to configure the site, monitoring station, analyzers, calibrator and measured parameters. The detail screens for site configuration, monitoring station configuration, analyzer configuration and parameter configuration should be available.
- 2.4.2.2 The Dashboard Interface module should have list of supported analyzers make and model for the major analyzers used in the Industry.
- 2.4.2.3 The Dashboard Interface module should support grouping of STP sites, STPs across geographic dimensions like District, City, etc. and other custom attributes (like industry type) selected by the regulator.
- 2.4.2.4 The Dashboard Interface module should allow configuration of analyzer parameters, channels etc. for a particular site.

### **2.4.3 Alerts and Alarms**

- 2.4.3.1 The Dashboard Interface module should provide an interface to view and list all alarms and alerts. There should be a filter to view only new alerts and alarms.
- 2.4.3.2 The Dashboard Interface module should provide an interface to acknowledge the alarms and alerts to STP and regulator. Once acknowledged, the alarms and alerts should disappear from the list.

### **2.4.4 Data Validation**

- 2.4.4.1 The Dashboard Interface module should provide user interface for data validation and approval. The regulator should be able to select a particular time range and approve/reject the data with proper comments.
- 2.4.4.2 The Dashboard Interface module should support manual and automated data validation and approval workflow to review the various industry site data and approve by providing appropriate comments based on the data quality.

2.4.4.3 The Dashboard Interface module should provide ability to annotate the data with the specific events/comments provided by the industry such as maintenance schedules, breakdown, analyzer fault etc.

2.4.4.4 Open API should support ISO 7168 Format.

#### **2.4.5 Live Status**

2.4.5.1 The Dashboard Interface module should support real time view of the data from all the industry sites for all the parameters configured for monitoring.

2.4.5.2 The Dashboard Interface module should support geo-location of the industry using specific latitude - longitude or as per cartographic coordinates overlay on a map and present information of industry, parameters connected and present value either graphically or numerically display.

2.4.5.3 The software should be able to show the status of each of the sites in a geographic map and should show alerts and alarms based on system failures and parameter exceedance.

2.4.5.4 The Bidder should develop Mobile application in Play store and iOS App Store to access the dashboard and manual data entry of STPs without OCEMS.

#### **2.4.6 CCTV**

2.4.6.1 Integration: Connect cameras to the central data management system using secure protocols (HTTPS).

2.4.6.2 Network Configuration: Configure IP addresses, subnet masks, and gateway settings for seamless connectivity.

2.4.6.3 Firewall Rules: Set up firewall rules to allow secure camera connections while blocking unauthorized access.

2.4.6.4 Cloud Storage: Store video feeds on “GI Cloud” servers with appropriate security measures.

2.4.6.5 Storage Configuration: Use “GI Cloud” for scalable storage with lifecycle policies for data retention.

2.4.6.6 Backup: Implement automated backup solutions to prevent data loss.

2.4.6.7 Real-time Monitoring: Enable real-time monitoring and recording capabilities through the central server.

2.4.6.8 Streaming Protocols: Use RTSP (Real-Time Streaming Protocol) for live video feeds.

2.4.6.9 Alerts: Configure motion detection and other event-based alerts for proactive monitoring.

2.4.6.10 Video Analytics: Integrate video analytics for advanced features like object detection and intrusion detection.

## 2.5 Operation and Maintenance

2.5.1 The Agency shall deploy the following three dedicated personnel for central server room operations and maintenance for 5 years and will be stationed at NMCG office at New Delhi.

S. No.	Category Name	Educational Qualification and Expertise	Nos. & Location
1.	Sr. Programmer	<ul style="list-style-type: none"> <li>B.Tech IT/Computer Science/ MCA with more than 5 years of relevant work experience.</li> <li>Experience in software development for major software development projects with proven programming skills (specifically related to programming languages/ technologies used for the development of this dashboard) and having exposure with version control systems.</li> <li>Knowledge of data protection norms/Govt. guidelines would be added advantage.</li> <li>Experience in Android app and IOS would be added advantage.</li> </ul>	1 (NMCG)
2.	Support Engineer	<ul style="list-style-type: none"> <li>BCA/ BSc (IT/CS) / B.Tech (IT/CS) with minimum 3 years of relevant work experience.</li> </ul>	2 (NMCG)

2.5.2 The NMCG will examine the CVs of all Personnel and those not found suitable shall be replaced by the Bidder to the satisfaction of the NMCG.

### 2.5.3 Service Level Agreement (SLA) (applicable for the Personnel Deployment:

S. No.	Parameter	Severity Level 1	Severity Level 2	Severity Level 3
1.	Non-Deployment of Personnel (Leave/unauthorised absence) - [for each personnel]	2 days	3 days	4 days

S. No.	Severity Levels	Definition	Penalty*
1.	<b>Level 1</b>	For single violation in a quarter	0.5% of the quarterly invoice raised
2.	<b>Level 2</b>	For single violation in a quarter	1% of the quarterly invoice raised
3.	<b>Level 3</b>	For single violation in a quarter	2% of the quarterly invoice raised

\*The % of penalty will apply for each personnel respectively.

**An increase in the number of violations of any level will attract higher Severity Levels viz.4-6, which are defined in the table below:**

<b>S. No.</b>	<b>Severity Levels</b>	<b>Definition</b>	<b>Penalty</b>
4.	<b>Level 4</b>	For two to four instances of any Level- violation	Penalty of respective level levied on each instance + 1% of the quarterly invoice raised
5.	<b>Level 5</b>	For five to six instances of any Level- violation	Penalty of respective level to be levied on each instance + 4% of the quarterly invoice raised
6.	<b>Level 6</b>	For more than six instances of any Level-violation	Penalty of respective level to be levied on each instance + 8% of the quarterly invoice raised

**Note:** Total Penalty that will be levied for violations of timelines as per SLA will be subject to a maximum of 15% of the quarterly invoice raised.

#### **Completion Period and payment schedule:**

##### **Component A: OCEMS**

<b>Construction, Operation &amp; maintenance</b>	<b>Job to be completed for declaration of completion of the work</b>	<b>Time Allowed</b>	<b>Cumulative Time Allowed</b>	<b>% of fee payable</b>	<b>Cumulative %</b>
1 <sup>st</sup> Milestone	Supply, delivery, storage of the Equipment / Materials.	60 days	60 days	50 %	50 %
2 <sup>nd</sup> Milestone	Installation, testing including pre-commissioning tests and commissioning of the system. (Including trial run for 30 days of entire installation as per requirement)	90 days	150 days	10 %	60%
3 <sup>rd</sup> Milestone	Comprehensive mandatory efficient & successful Operation &	1825 days	1975 days	1.8% for each quarter	96%

<b>Construction, Operation &amp; maintenance</b>	<b>Job to be completed for declaration of completion of the work</b>	<b>Time Allowed</b>	<b>Cumulative Time Allowed</b>	<b>% of fee payable</b>	<b>Cumulative %</b>
	Maintenance work of the entire installation for 5 <sup>th</sup> years.			(i.e. 20) = 36%	
4 <sup>th</sup> Milestone	Final completion certification of O&M period/completion report.		1975 days	4 %	100%

NOTE: Quarterly progress reports shall be submitted by the contractor to the concerned Executing Agency of State for approval and payments shall be released based on the approval of the reports.

#### **Component B: CMS**

<b>Construction, Operation &amp; maintenance</b>	<b>Job to be completed for declaration of completion of the work</b>	<b>Time Allowed</b>	<b>Cumulative Time Allowed</b>	<b>% of fee payable</b>	<b>Cumulative %</b>
1 <sup>st</sup> Milestone	<b>Month 1: Planning and Requirement Analysis</b> <ul style="list-style-type: none"> <li>• Conduct detailed requirement analysis with stakeholders.</li> <li>• Develop a comprehensive project plan.</li> <li>• Submission of Inception Report/concept in 15 days.</li> </ul>	30 days	30 days	25 %	25 %
	<b>Month 2: System Design</b> <ul style="list-style-type: none"> <li>• Design the system architecture and develop detailed technical specifications.</li> </ul>	30 days	60 days		



Construction, Operation & maintenance	Job to be completed for declaration of completion of the work	Time Allowed	Cumulative Time Allowed	% of fee payable	Cumulative %
	<ul style="list-style-type: none"> <li>Design user interfaces and dashboards</li> </ul>				
2 <sup>nd</sup> Milestone	<b>Month 3: Development</b> <ul style="list-style-type: none"> <li>Develop the database, processing, visualization, and validation software.</li> <li>Implement security features and conduct thorough testing.</li> </ul>	30 days	90 days	25%	50%
	<b>Month 4: Deployment</b> <ul style="list-style-type: none"> <li>Deploy the cloud-based servers on GI cloud.</li> <li>Install and configure the software for STPs.</li> </ul>	30 days	120 days		
3 <sup>rd</sup> Milestone	<b>Month 5: Testing and Validation</b> <ul style="list-style-type: none"> <li>Conduct extensive testing to ensure system functionality and reliability.</li> <li>Validate data accuracy and compliance with regulatory standards.</li> </ul>	30 days	150 days	40%	90%
	<b>Month 6: Training and Handover</b> <ul style="list-style-type: none"> <li>Provide training to operators and administrators.</li> </ul>	30 days	180 days		

<b>Construction, Operation &amp; maintenance</b>	<b>Job to be completed for declaration of completion of the work</b>	<b>Time Allowed</b>	<b>Cumulative Time Allowed</b>	<b>% of fee payable</b>	<b>Cumulative %</b>
	<ul style="list-style-type: none"> <li>Handover system documentation and source code to the owner.</li> </ul>				
4 <sup>th</sup> Milestone	Successful O&M of dashboard for Six months	180 days	365 days	10%	100%
<b>O&amp;M</b>					
	Comprehensive mandatory efficient & successful Operation & Maintenance work of the dashboard and manpower deployment for 5 years.	1825 days	1975 days	4.8% for each quarter (i.e. 20) = 96%	96%
	Final completion certification of O & M period/completion report.		1975 days	4 %	100%

NOTE: Quarterly progress reports shall be submitted by the contractor to NMCG for approval and payments shall be released based on the approval of the reports.

#### Reporting requirement along with payment terms for CMS

As soon as practicable & not later than fifteen (15) days after the end of each quarter during the period of services, the Agency shall submit to the NMCG, the invoices for the amounts payable. Prior to that the quarterly reports shall be submitted by the Agency. The payment shall be made within thirty (30) days of after the receipt by the NMCG of duly completed bills with necessary particulars subject to the approval of the quarterly report. The Agency shall also obtain the monthly attendance reports from NMCG for each of the Personnel deployed by them and submit it along with invoices for the quarterly payments.

#### Price variation Clause:

No price Escalation shall be payable during work.

### 3. Technical Specifications

**Monitoring Parameters: Flow, pH, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Nitrogen equivalent (TN eq).**

**The specification of the Controllers, Probes/Sensors, Server for centralized data connectivity for the OCEMS, Calibration of OCEMS, OCEMS Function check, Continuous Validation of OCEMS shall strictly be in compliance with the latest “Guidelines for Online Continuous Effluent Monitoring Systems (OCEMS)” & “S.O.P. Version 1.0”, issued by CPCB.**

**Some salient features of the equipment are as follows: - (The specifications given below are indicative and not exhaustive. The tenderer has to consider all technical aspect of the equipment to comply the latest Guidelines & S.O.P. issued by CPCB.)**

#### 1. Original Equipment Manufacture Qualification Criteria:

Sr. No	Item	Description of Requirement
1	Bidder or OEM Office	Bidder or OEM should be directly operational in India since last 2 years from the bid calling date.
2	OEM Company Certificates	TUV/MCERT/USEPA or equivalent (as applicable)

#### 2. Technical Specifications and Salient Features Regarding Online Water Quality Monitoring System.

- i. Should be capable of operating unattended over prolonged period of time.
- ii. System should be UV-Visible double beam spectrometry/ TOC measurement based on 680°C thermal catalytic combustion and NDIR detection.
- iii. System should have multipoint calibration facility.
- iv. System should be complied as per latest CPCB Direction.
- v. System should be complied new SOP published by CPCB.
- vi. Should produce analytically valid results with precision and repeatability.
- vii. The instrument/Sensor should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status.
- viii. The Sensor should have inbuilt features for automatic water matrix change adaption.
- ix. The instrument / Sensor should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices.
- x. Should have data validation facility with features to transmit raw and validated data to NMCG central server.

- xi. Should have Remote system access from NMCG central server provisioning log file access.
- xii. Should have provision for Multi-server data transmission from each station without intermediate PC or plant server.
- xiii. Should have provision to send system alarm to NMCG central server in case any changes made in configuration or calibration.
- xiv. Should have provision to record all operation information in log file.
- xv. For each parameter there should be provision for independent analysis, validation, calibration & data transmission.
- xvi. Must have provision of a system memory (non-volatile) to record data for at least one year of continuous operation.
- xvii. Should have provision of Plant level data viewing and retrieval with selection of Ethernet, wireless, Modbus & USB.
- xviii. The correlation/interpretation factor for estimating COD and BOD using UV-Visible Absorption Technique shall be regularly authenticated/ validated and details provided.
- xix. Record of calibration and validation should be available on real time basis on NMCG central server from each location/parameter.
- xx. Record of online diagnostic features including sensor status should be available in database for user friendly maintenance.
- xxi. Expandable program to calculate parameter load daily, weekly or monthly basis for future evaluation with flow rate signal input.
- xxii. Must have low operation and maintenance requirements with low chemical consumption and recurring cost of consumables and spares.
- xxiii. System must support visualization of parameters data onboard which is real time and records on real time basis. The parameter files recorded on data logger of 4GB are non-editable to safeguard authenticity of parameters.
- xxiv. Sensor should be operational in high Chloride applications.
- xxv. Sensor integrated cable should be with IP68 rating and specially designed for submerged installations.
- xxvi. MOC of Sensor should be SS316L with compressed air cleaning facility.
- xxvii. Sensor must measure full spectrum scanning for each parameter at specific bands of multiple wavelengths and provides sum parameter for COD, BOD, TSS, pH, TN(eq) parameters.
- xxviii. Extended life of xenon flash lamp in spectrophotometric sensor with minimum  $10^{14}$  flashes should be available.
- xxix. All the remote stations should be operational in a real time mode and NMCG central station should be able to access any remote station.
- xxx. The remote stations should be field operational and tolerant to extreme environmental conditions in India, in high or low temperatures, high humidity coastal conditions and high temperature.
- xxxi. The communication between Remote and NMCG Central Receiving station must be two-way communication system utilizing GPRS.

- xxxii. Remote station should have built in GPS receiver for automatic position determination.
- xxxiii. NMCG Central Receiving station must have the capability to remotely configure all remote stations.
- xxxiv. Multiple Component Analysis with Pattern Recognition & Library of Effluent Matrix Variant.
- xxxv. Multiple Component analysis with Multi- Point Calibration for Total COD, BOD, TSS etc.
- xxxvi. Individual parameter method analysis, Individual Calibration, Individual Validation without any coefficient calculation from one parameter to another.
- xxxvii. Automatic Sampling during calibration as per published CPCB SOP must be featured as integral part of OCEMS and every sample collection automatic real time monitoring must be part of data submission to NMCG and other agency with sample collection tag number and sample collection timeline. The sample must be collected as per USEPA compliance and document in this direction must be submitted by bidder.
- xxxviii. Online data acquisition, monitoring & control system through local & remote terminals, based on GPRS/GSM/WiFi or any other suitable System, including Supply of Field Instruments for the Sewage Treatment Plants.
- xxxix. TOC analyzer Should also be able to give COD and BOD measurements by establishing relationship factors from TOC values as suggested by CPCB guidelines.

### **2.1. Additional Technical Points:**

- i. System should work on wavelength of 200-750nm and all analyses should have independent values.
- ii. System should have UV Visible dual beam technology/ TOC measurement based on 680°C thermal catalytic combustion and NDIR detection.
- iii. System must have Automatic File Transfer features.
- iv. Automatic Sampling for laboratory measurement Feature Onboard.
- v. PLC Based basic features for process control to comply regulatory guidelines.
- vi. Probes and stations must be accessible remotely from any suitable device from any standard web browser e.g. via PC, Tablet, Notebook or Smart Phone.
- vii. System must have Impressive real-time zoom able, scrollable graphical visualization of all historical data including 3D-optical spectra.
- viii. System must have optimal display readability with Classic-, Day- and Night-Mode.
- ix. Quality controlled and documented status management of probes and stations must be available to eliminate the need for paper log books.
- x. Sensor must provide self-adaptive, self-controlled data validation in real time.
- xi. It must ensure both sensitive and reliable alarm limits respectively set points for process control.
- xii. System must analyze noise, outliers and other combinations in real time to reliably detect any malfunction at an early stage.

- xiii. System must help to dramatically reduce false alarm rates.
- xiv. System must have configurable auto-correction of data based on threshold, outlier and noise analysis.
- xv. System must have unmatched event detection tools based on proven algorithms for real-time event detection that use data streams from all connected probes separately and in combination.
- xvi. System must have capability of exploiting the enormous information contained in UV spectra which provide the most sensitive and stable data source for event detection.
- xvii. System must be optimized for use of multi-dimensional spectral data Analyzer System must have configurable auto-correction of data based on threshold, outlier and noise analysis.

**3. Sensors shall meet following specifications:**

**Spectrometry Based multi-parameter probe:**

- i. No parts to be replaced within 3 years, no consumables required.
- ii. System should have built-in spectral information for Sewage Water Quality data.
- iii. No sample preparation required.
- iv. Sensor shall be submersible in open channels or tanks. (for UV)
- v. No moving parts in contact with Sewage water.
- vi. Auto compensation of potential interference by turbidity/solids.
- vii. Connection to Data Logger via IP68 connector.
- viii. Auto diagnostic features.

**3.1. Minimum specification for pH Sensor**

Parameter	Specification	Compliance (with product details & Yes/No)
Basic Requirement	<p><b><u>pH Sensor Specifications:</u></b></p> <ul style="list-style-type: none"> <li>• Integrated temperature measurement and compensation should be provided in the pH sensor.</li> <li>• The pH sensor should have galvanically separated input.</li> <li>• Calibration history should be stored automatically in the sensor.</li> <li>• Field Sensor calibration</li> <li>• Signal Output – Digital</li> <li>• Sensor Check function/Diagnostics should be available in the pH sensor</li> <li>• protection type: IP 68 for both Sensor and Cable</li> </ul>	

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Measuring Range	<ul style="list-style-type: none"> <li>• Measuring Range: pH: 0 - 12 (Sensor should be designed for wastewater application)</li> <li>• Measuring: 0 to 60 Deg C</li> </ul>	
Measuring Principle	ISE - Potentiometric -combined, non-porous reference electrode	
Sensor Cable	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions	
Operating Temperature	Temp Compensation: 0 to +60 Deg C	
Material of construction of sensor	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.	
Calibration	Calibrate pH meter with Certified (having international traceability) Buffer solutions of pH 4, 7, 9.2 & 10. Perform at-least two point calibration within the expected range of the pH in the plant. For example, if pH is expected to be 7.8 then perform two points calibration with pH 7 and 9.2.	
Certifications	Product facility must have ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018/ Product conformity certificate by MCERTS/ TUV/Equivalent.	
Reagent Free	The pH combination electrodes should require very little maintenance and there should be no electrolyte replacement.	
Voltage Protection	Transient Voltage Protection should be integrated in the sensor	
Accuracy	$\leq 0.1$ units of pH certified reference standard	
Resolution	$\leq 0.01$ units of pH	
Response Time	$\leq 30$ seconds	
Method of Measurement	Potentiometric-Automatic compensation of Temperature	
Cleaning	Automatic cleaning	
Operating Humidity	5 to 95% non-condensing	

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Interface connection to display	sys plug (IP 67), RS485	
Power	12 VDC Nominal	
Protection Class	IP68 for sensor and IP 67 for Transmitter	
Operating Pressure	0... 400mbar	
Signal output	Compatible with Data Acquisition System	
Transmitter output	Default: 2 X 4-20 mA Additional optional: MODBUS RS485, HART, PROFIBUS.	
Transmitter Mounting	Pole/wall mounted (remote)	
Display	The TFT screen shall be of latest technology and readings shall be visible from a distance of 4 feet.	
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.	
	Parameter diagnostics: Calibration timeframe, calibration drift alert	
	High/low parameter permissible thresholds limit diagnostic	
	Maintenance and calibration schedule diagnostics	
Enclosure Material	Stainless Steel with epoxy coating for Analyser / Polycarbonate or equivalent. as per mfr. std. suitable for withstanding harsh Environment	
Calibration frequency	As per CPCB guidelines	
Tag plate	SS Tag plate	
Process Connection (Mounting)	Suitable for pipe or immersion (open tank / sump) type mounting with mounting as under for both the applications	

### **3.2. Specifications for Biochemical Oxygen Demand (BOD) sensor, Chemical Oxygen Demand (COD) Sensor and Total suspended solids (TSS) sensor.**

#### **3.2.1. Continuous Effluent Monitoring of BOD, COD, TSS with UV-Vis Full Spectrum dual beam technology**



<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Basic Requirement	<p>Continuous Effluent Monitoring of BOD, COD, TSS with UV-Vis Full Spectrum dual beam technology</p> <ul style="list-style-type: none"> <li>• System should work on wavelength of 200-750nm as per the CPCB guidelines and all analyses should have independent values.</li> <li>• System should have spectrophotometric probe made of SS316L/Titanium or equivalent.</li> <li>• Multi Parameter probe ideal for monitoring of BOD/COD/TSS in Municipal Wastewater.</li> <li>• The Sensor should have optimized function check referencing for excellent zero point and long-term stability.</li> <li>• The Sensor should provide compensation of interferences by evaluation of the whole measured spectrum.</li> <li>• System should be UV-Visible double beam spectrometry</li> <li>• System should have unlimited multipoint calibration facility as per CPCB SOP published on CPCB website in July 2020/latest version</li> <li>• System should be complied as per latest CPCB Direction, SOP &amp; Guidelines.</li> <li>• Should produce analytically valid results with precision and repeatability.</li> <li>• The instrument/Sensor should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status.</li> <li>• The Sensor should have inbuilt features for automatic water matrix change adaption.</li> <li>• The instrument / Sensor should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices.</li> <li>• For each parameter there should be provision for independent analysis, validation, Independent parameter calibration &amp; data transmission.</li> </ul>	

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
	<ul style="list-style-type: none"> <li>• Sensor integrated cable should be with IP68 rating and specially designed for submerged installations.</li> </ul>	
Measuring Range	BOD & TSS: 0 - 200 mg/L(with possibility to check higher ranges) COD: 0 - 300 mg/L(with possibility to check higher ranges)	
Accuracy	BOD: +/- 2.0 % in reference solution. COD: +/- 2.5% in reference solution. TSS: With Calibration: <1% of the measured value $\pm 0.01$ FNU/NTU  +/- 10% of Parameter value with reference to certified laboratory results or as per latest reference of published CPCB SOP/Guidelines, whichever is less.	
Reagent & Consumables Free	<ul style="list-style-type: none"> <li>• The Sensor should not use any reagents and should be easy to use and operate without any running costs.</li> <li>• The sensor should completely be reagent free for operation.</li> </ul>	
Measuring Principle	UV-Visible is double Beam Spectrophotometry with multipoint calibration from wavelength 200 – 750 nm, as per the CPCB Guideline, xenon flash lamp, 256 photo diodes, two beam measurement, complete spectrum	
Measurement	Must be direct In-Situ/Submersible measurement in Outlet or Inlet of wastewater treatment plant	
Operating Temperature	Operating temperature: -4°C to +50 °C; Storage temperature: -20 °C to +60 °C	
MOC	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.	
Light Source	Must emit UV and Vis wavelength of light.	
Sensor Cable	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions	
Inbuilt Cleaning	The sensor must have automatic mechanical cleaning facility with integrated system for cleaning at a	

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
	predefined interval. Chemical cleaning is not recommended.	
Calibration	Multipoint calibration for each spectrophotometric parameter	
Protection Rating	Protection type: IP 68 for both Sensor and Cable	
Certifications	Product facility must have ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018/  Product conformity certificate by MCERTS/TUV/Equivalent.	
Automatic compensation on cross sensitivities	Turbidity / solids and temperature	
Interface connection to display	MIL connector, IP 68, RS485, 12 VDC	
Operating Humidity	5 to 95% non-condensing	
Pressure	10 Bar	
Power	12V DC Nominal	
Signal output	Compatible with Data Acquisition System	
Resolution	$\leq 1$ mg/L or better	
Response Time	$\leq 60$ seconds	
Protection	Sensor IP-68 and Transmitter IP-67	
Enclosure	Stainless Steel with epoxy coating/ Polycarbonate or equiv. as per mfr. Std. suitable for withstanding harsh environment	
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.	
	Parameter diagnostics: Calibration timeframe, calibration drift alert	
	High/low parameter permissible thresholds limit diagnostic	
	Maintenance and calibration schedule diagnostics	

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Calibration frequency	Once in a month / As per CPCB guideline	
Transmitter output	Default: 2 X 4-20 mA Additional optional: MODBUS RS485, HART, PROFIBUS.	
Transmitter Mounting	Pole/ wall mounted (remote)	
Display	The TFT screen shall be of latest technology and readings shall be visible from a distance of 4 feet.	
Process Connection (Mounting)	Suitable for immersion (open tank / sump) or pipe type mounting with mounting as under for both the applications	
Surge Protection	Inbuilt	
Tag Plate	SS tag plate	

**3.2.2. Continuous Effluent Monitoring of BOD, COD, TSS based on 680°C thermal catalytic combustion and NDIR detection.**

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Measurement Principle for TOC.	TOC measurement based on 680°C thermal catalytic combustion and NDIR detection as per USEPA 415.1, EN 1484, APHA 5310B, CPCB Guidelines Manual Page 88, Item No.15. TOC analyzer Should also be able to give COD and BOD measurements by establishing relationship factors from TOC values as suggested by CPCB guidelines.	
Measurement Range	TOC Range: 0- 20,000 mg/L	
Repeatability	±2% full scale for TOC &	
Measurement Cycle	7 minutes for each channel/stream	
Calibration	Automatic calibration using standard solution	
Analogue Output/Load	Four 4–20mA; Load: 500 ohms.	

Digital interface	RS-485; Modbus	
Contact output	Contact output for alarms/events with contact rating of 2 amps/230 VAC;	
Contact Input	For Start calibration, stop measurement, start online calibration and reset alarm	
Power supply	230 V AC 50Hz	
Remote calibration	Remote Online calibration checking using known control sample. By CPCB and state PCB servers	
Location	Inside room/shelter	
Certification	MCERTS	
Carrier Gas	Compressor/Air generator to be provided as suitable for the analyzer	

### 3.3. Specification for Total Nitrogen equivalent (TN eq)

Parameter	Specification	Compliance (with product details & Yes/No)
Basic Requirement	<ul style="list-style-type: none"> <li>• Sensor Specifications:</li> <li>• Integrated measurement for parameters compensation should be provided in the Total Nitrogen (equivalent) Sensors.</li> <li>• Calibration history should be stored automatically in the sensor.</li> <li>• Field calibration facility</li> <li>• Signal Output –Digital</li> <li>• Sensor Check function/Diagnostics should be available in the Sensor.</li> </ul>	
Measurement Principal	Multiparameter Probe, Ion Selective Electrode/UV absorbance.	
Reagent Free	The Ammonical Nitrogen and Nitrate Nitrogen electrodes should require very little maintenance and they should not require any add on chemical for continuous measurement.	
MOC	The MOC must be SS316L / Titanium/ or equivalent to sustain the sensor in Sewage wastewater application.	
Sensor Cable	Integrated 15 meter cable with arrangement to increase length as per site conditions	

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Voltage Protection	Integrated in the sensor	
Measuring Range	Total Nitrogen: 0...500 mg/L (measurable up to 1000 mg/l considering the sewage waste water environment)	
Measurement Accuracy	$\pm 5\%$ of measured value $\pm 0.2$ mg/l in standard solutions	
Operating Temperature	Temp Compensation: 0 to +55 Deg C	
Certification	TUV/MCERT/USEPA or equivalent (as applicable)	
Response time	<2 min	
Power supply	10 - 30 VDC	
Operating pressure	0 - 1 bar	
Protection	Sensor IP-68 and Transmitter IP-65	
Enclosure	Stainless Steel with epoxy coating/polycarbonate for Analyser or any better non corrosive enclosure which provides better protection.	
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.	
	Parameter diagnostics: Calibration timeframe, calibration drift alert	
	High/low parameter permissible thresholds limit diagnostic	
	Maintenance and calibration schedule diagnostics	
Calibration	As per CPCB guideline.	
Transmitter output	Default: 2 X 4-20 mA	
Transmitter Mounting	Pole/ wall mounted	
Display	The TFT screen shall be of latest technology and readings shall be visible from a distance of 4 feet.	
Surge Protection	Inbuilt	

### 3.4. Specification for Smart Controller and Data logger

Parameter	Specification	Compliance (with product details & Yes/No)
Basic Requirement	<p>Controller should have the latest features of highly advanced Multi Parameter Controller having capability of handling at least 5 (five) Sensors in a single controller configuration for the parameters COD, BOD, TSS, pH, TN eq, Flow and must be expandable for more parameters &amp; sensors as and when required.</p> <ul style="list-style-type: none"> <li>• With Sensor ID recognition</li> <li>• High EMC interference immunity</li> <li>• Control unit should be latest touch screen display for the quick selection of software functions</li> <li>• Integrated lightning protection</li> <li>• With integrated back up controller function</li> <li>• The system should start automatically after the power is reset to the system (in case of power failure).</li> <li>• The system should have Service mode for cleaning /calibration/maintenance activities.</li> <li>• High-end IoT (Internet of Things) terminal preferably based on an industrial PC, minimum IP65 grade.</li> <li>• Large graphic display (minimum 9”) with backlight with adequate contrast for clear viewing in low ambient light and sunlit bright outdoor lighting conditions.</li> <li>• Sensor and station management of up to 20 parameters: automatic cleaning, data logging, sample &amp; calibration incl. history and multipoint calibration, sensor function check, user management, easy data transfer via USB-stick etc.</li> <li>• The Controller should preferably be able to power all the sensors and terminals or accessories attached to it without having to need any additional power sources in the system for increased protection against lightening and possible electromagnetic interference. The controller shall be low power</li> </ul>	

Parameter	Specification	Compliance (with product details & Yes/No)
	<p>operation and operable in 220VAC / DC (to be generated within the controller itself).</p> <ul style="list-style-type: none"> <li>• IoT (Internet of Things) and M2M (Machine to Machine) connectivity: Minimum 1 Gb/s Ethernet, 300 Mb/s Wi-Fi 802.11a/b/g/n and optional worldwide HSPA+ 3G interface, remote control (http), data transfer into cloud via FTP, SSH and TML</li> <li>• Process interface to SCADA via: Modbus RTU/TCP, SDI-12, Profibus DP, analog 0/4-20mA and relay outputs</li> <li>• Integration of third party sensors via: analog 0/4-20 mA and digital (solid state) inputs, Modbus RTU/TCP</li> <li>• Easily extendable: 8 slots to customize I/Os, additional software features like online data validation and event detection optional</li> </ul>	
Display	<ul style="list-style-type: none"> <li>• With large (size 9" preferably), both touch screen &amp; key pad type are acceptable. The system should preferably have the facility of Impressive real-time zoomable, scrollable graphical visualization of all historical data including 3D-optical spectra.</li> <li>• Display should be with improved reading precision through special backlit graphic touch screen display.</li> </ul>	
Power Supply	<ul style="list-style-type: none"> <li>• 10-36VDC or 100-240VAC Power Supply.</li> <li>• The controller should be low power consuming with consumption of less than 5W.</li> </ul>	
Number of sensors to be connected	<ul style="list-style-type: none"> <li>• Minimum 4 (Four) Sensors to be connected</li> </ul>	
Output Communication	<ul style="list-style-type: none"> <li>• Galvanically Separated current outputs (0/4-20 mA) that can be assigned arbitrarily</li> <li>• USB-interface for data transfer, upgrading firmware etc.</li> </ul>	



Parameter	Specification	Compliance (with product details & Yes/No)
	<ul style="list-style-type: none"> <li>It should be possible to download the data via the USB interface an extremely fast data exchange to USB memory stick.</li> </ul>	
Data Logger	<ul style="list-style-type: none"> <li>2 GB RA M minimum or higher as suitable for the system</li> <li>Internal integrated Data logger with minimum data memory for 5 years parameters recording &amp; logs data recoding (when 8 parameters, logged every 15 minutes)</li> <li>The controller should store the sensor configurations and calibrations and shall preferably depict the details when remotely accessed.</li> <li>The controller should have Log file to record the diagnostics.</li> <li>Data logger must have provision of a system memory (Non-volatile) to record data for at least one year of continuous operation.</li> <li>Lifetime Free firmware update.</li> </ul>	
Accessibility	<ul style="list-style-type: none"> <li>The system should be fully programmable with multiple levels of access control with help of Electronic-Key for data security and protection against non-authorized access to avoid any tampering or changes to the system configuration by unauthorized access</li> </ul>	
Status LED	<ul style="list-style-type: none"> <li>The system should have a status LED on Data logger terminal as well as on spectrophotometric probe that gives reliable and fast information regarding function and status of system. And the Controller/Probe must show a LED for diagnostic purposes on the front. These LED should show diagnostic alert about normal and malfunctions of the system at a glance.</li> </ul>	
Operating Temperature	<ul style="list-style-type: none"> <li>Ambient Conditions Operating temperature: -4°C to +50 °C</li> <li>Storage temperature: -20 °C to +60 °C</li> </ul>	
Housing Material	<ul style="list-style-type: none"> <li>Non corrosive e.g. Acrylonitrile-Styrene-Acryl ester polymer / Powder Coated Aluminium Alloy / Stainless Steel 316</li> </ul>	

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Protection Rating	<ul style="list-style-type: none"> <li>• IP 66 / equivalent NEMA standard for controller</li> <li>• Integrated Lightning Protection. According to EN 61326 enhanced overvoltage protection for the entire system, implemented in each component</li> <li>• IEC/EN/UL/CSA 61010-1 IEC/EN/UL/CSA 61010-2-201 IEC/EN 60529</li> </ul>	
Essential features for the System	<ul style="list-style-type: none"> <li>• System must have Automatic File Transfer features</li> <li>• Automatic Sampling for laboratory measurement Feature Onboard</li> <li>• PLC Based basic features for process control to comply regulatory guidelines</li> <li>• Camera Integration onboard in data logger for future regulatory compliance.</li> <li>• System must have display unit (size 9" preferably) both touch screen &amp; key pad type are acceptable. The system should preferably have the Impressive real-time zoomable, scrollable graphical visualization of all historical data including 3D-optical spectra.</li> <li>• Remote system must be protected by a user-configurable firewall</li> <li>• Analyzer must provide self-adaptive, self-controlled data validation in real time.</li> <li>• Analyzer System must have unmatched event detection tools based on proven algorithms for real-time event detection that use data streams from all connected probes separately and in combination</li> <li>• Analyzer System must have capability of exploiting the enormous information contained in UV spectra which provide the most sensitive and stable data source for event detection</li> <li>• Analyzer System must be optimized for use of multi-dimensional spectral data.</li> <li>• Analyzer System must have configurable auto-correction of data based on threshold, outlier and noise analysis.</li> </ul>	

### 3.5. Specification for Electromagnetic Flow meter FLOW SENSOR

### 3.5.1. Full Bore Electromagnetic Type Flow meter [ Applicable for closed conduit flow].

- i. There shall be one number of Full bore Electromagnetic flow meter on the outlet header/manifold of the S.T.P. The flow meters is to be installed and commissioned for measuring the instantaneous flow rates as well as the total flow for a period of time of the station passing throughout the common manifold. The flow rates shall be indicated in m<sup>3</sup>/hr & total flow in cubic meter. The flow sensor shall be suitable to measure sewage water. The flow meter shall be electromagnetic inline type to provide indication, totalization and signal transmission of the liquid. The display is required at the Control Room around 50 mtr away from the transmitter installation point on the pipe line and also should be compatible with the SCADA system (should have RS485 port, Modbus, Profibus, or any suitable communication port). Amplification of signals, if necessary, are to be incorporated. The flow meter must be capable of measuring velocity of water upto 3 m / sec with accuracy of  $\pm 0.5\%$ . Flow sensitivity must be  $\pm 0.3$  m/s at any flow rate. The linearity of the instrument shall be 0.1% of scale. The sensor must have enclosure of class IP-68. The tenderer shall clearly indicate the position of flow sensor. The flow meter shall be calibrated at the factory to its actual flow range in m<sup>3</sup>/hr as specified in the data sheets. Wet calibrate meters (at 5 points over the specified flow range) by gravimetric or volumetric methods.
- ii. A factory calibration certificate shall be provided with the meter. Flow meters shall have facility to detect the empty pipe condition either by additional sensor, flow sensors or other methods / technologies subject to project specific requirements. The unit shall also withstand an Isolation Test up to 1800V for 2 sec.
- iii. The transmitter unit shall be microprocessor based, of modular shall be easily configurable through integral keypads. The electronics shall be of modular construction for ease of maintenance and future expandability.
- iv. The transmitter shall be provided with Alpha-numerical illuminated display for rate of flow and totalized flow indication. The data storage shall be on EEPROM to preserve data on power failure without battery backup. The unit shall have high electromagnetic compatibility according to IEC 801/VDE 0843 and NAMUR recommendations. The unit shall be provided with extensive self-diagnostics for operational security with resulting error messages enunciated at the alarm output.
- v. By pass arrangement shall be considered for the bigger pipe size with bypass manual isolation valves (3 Numbers) for maintenance purpose. Flow sizing calculation for meter sizing selection shall be furnished for approval.

#### 3.5.1.1. The data sheet for flow sensor is as follows.

The flow meter will be full bore electromagnetic type should be capable to handle flow of sewage Water.

<b>Parameter</b>	<b>Specification</b>	<b>Compliance (with product details &amp; Yes/No)</b>
Type	Pulsed DC electromagnetic.	
Accuracy	± 0.25 % of measure value.	
Repeatability	± 0.2 %	
Size of flow meter	As per designed diameter of the common delivery manifold.	
Sensor type	In line full bore electromagnetic.	
Process connection	Flanged type.	
Weather protection class	IP68 NEMA 6 P or as per the specified by EIC.	
Liner Material	POLYURETHANE/ Hard Rubber/PTFE OR COMPLY TO THE IP REQUIREMENT OF CHEMICAL / BIOLOGICAL IMPACT	
Meter Size	As per flow sizing calculation	
Minimum conductivity	20 us/cm	
Full scale velocity	1 to 5 m/sec.	
Process temperature	-10 to +50°C max.	
Process pressure	10 Bar max.	
Electrodes	SS 316 L/ SS 316.	
Coil housing	As per Manufacturers standard,	
Flange MOC	Carbon steel.	
Flow sensor tube	SS304	
Cable between sensor and transmitter	Copper cable of Length minimum 50 meters with arrangement to increase length as per site conditions	
Flow transmitter	Microprocessor based, Pole/wall mounted.	
Type of display of transmitter	Display should be LCD or LED type and the size should be suitable for making it visible from at least 6m distance.	
Out put	4-20 mA DC	
Power supply	240 V AC 50 Hz and shall be supplied from the 415 V PDB at a maximum distance of 50 m.	

Parameter	Specification	Compliance (with product details & Yes/No)
Input	From flow tube	
Web server	The flow meter should be compatible for connection with web server for remote facility display facility.	
Protection class	IP 68.	
Calibration	Calibration shall be accredited according to ISO/IEC 17025.	
Grounding Type	Ring/Strap	
Empty pipe detection	Required	

### 3.5.1.2. Data Sheet of Flow Sensor

#### i. Flow Sensor

- a. Type :
- b. Make :
- c. Model No :
- d. Flange Rating :
- e. Electrodes :
- f. Flow Range :
- g. Metering Tube :
- h. Sensor Housing :
- i. Connection / Junction Box :

#### ii. Flow Transmitter/Converter

- a. Type :
- b. Display :
- c. Enclosure :
- d. Power Supply :
- e. Signal cable :
- f. Cable Gland :
- g. Terminals :

### 3.5.2. Ultrasonic Flow Meter [Applicable for open channel flow]

- i. The sensors should be suitable for the non-contact measurement of contaminated liquids, regardless of the pressure or electrical

- conductivity.
- ii. Suitable for open channel flow.
  - iii. Perfectly suitable for – retrofit measurement – flow monitoring – improving measuring points.
  - iv. Interface for easy integration into all common distributed control systems: – HART – PROFIBUS DP/PA/MODBUS etc
  - v. Easy, safe and menu-guided sensor mounting to ensure precise measuring results.
  - vi. Automatic frequency scan for optimized installation and maximum measuring performance.
  - vii. IP 68 grade protection for the probes for under water usage.
  - viii. The measuring system should operate on the principle of transit time difference.
  - ix. Open channel flow measuring system shall consist of level transducer, flow computer and flow transmitter as one unit that is compact electronics and one remote mounted flow indicator cum totalizer microprocessor based. The level of the fluid in the flume/weir shall be measured by the ultrasonic level transducer. The level measured shall be used along with the physical characteristics of the flume to compute the flow rate.
  - x. The level transducer shall be suitable for flange or bracket mounting as required and shall be environmentally protected as per IP65. It shall have ambient temperature compensation and adjustable datum setting facilities.
  - xi. The design and application of ultrasonic level meter shall take into account the channel construction, the material size, shape, environment, process fluid or material, the presence of foam granules, size etc.
  - xii. The installation shall avoid any degradation of performance from spurious reflections, absorption, sound velocity variations, sensor detection area, temperature fluctuation, specific gravity changes and condensation. For application where spurious reflections are unavoidable the control unit shall be provided with facilities for spurious reflection rejection.
  - xiii. The structure required for supporting the level sensor, platform, railings etc. shall be included in the scope.

### **3.5.3. Flow meter/ Flow sensor or Flow Tube fixing chamber [As applicable].**

For fixing of Flow Tube at the delivery pipe line, leak proof chamber is to be constructed with rung - ladder of dimension 2.5M x 1.5M x 2.5M (approx.) is to be constructed if required as per site condition and rung-ladder for 2.5 getting down. [for full bore electro-magnetic flow meter].

Construction of adequate dimension of flow stabilizing channel (V-Notch Weir or as applicable) as per the prerequisite for installation of ultrasonic type flow meter is included in the scope. [for open channel flow application].

### **3.6. Backup Power Supply: -**

The scope includes the supply, Installation & Commissioning of Online UPS back up with adequate no of maintenance free battery of minimum back up time of 2 hours. The output of the UPS shall be full wave rectification type.

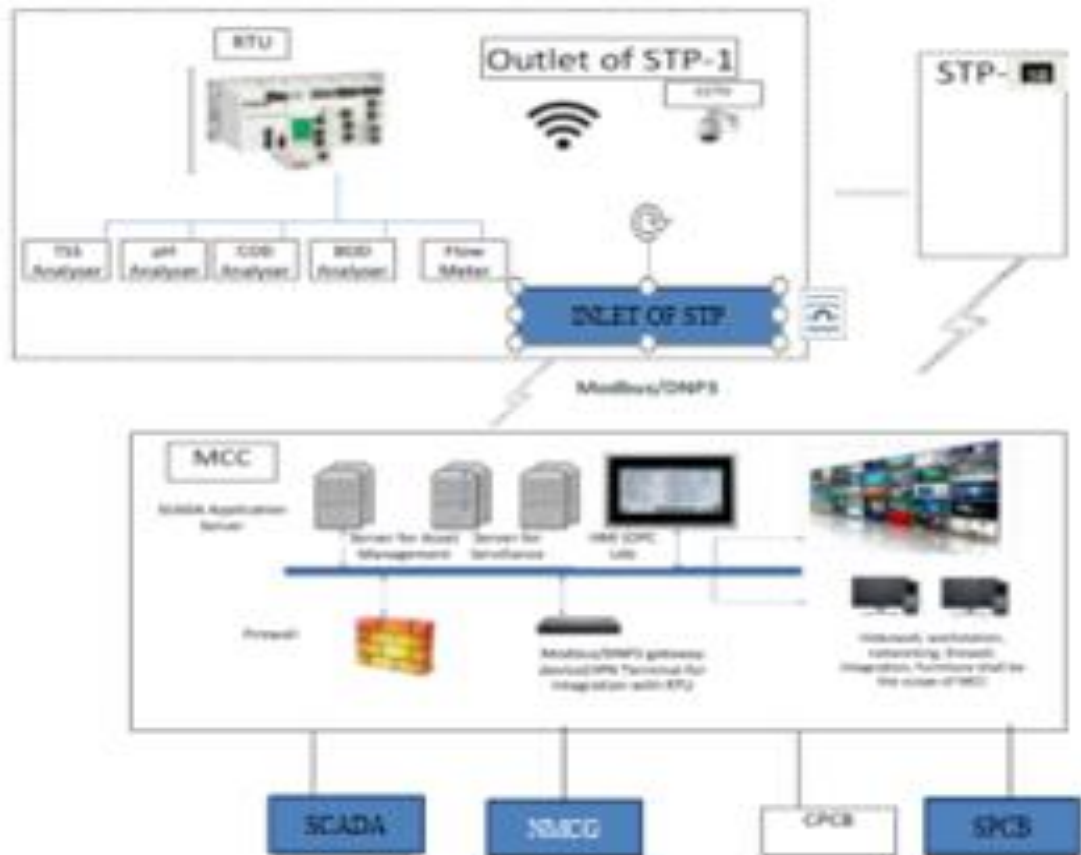
- i. The UPS shall be floor mounted, self-contained and metal clad and shall be suitable for operating on a nonlinear load.
- ii. It shall be front door accessible.
- iii. The UPS system shall be true On-Line.
- iv. The ON LINE UPS shall be incorporating a six-pulse rectifier and pulse width modulation inverter technology with 100% microprocessor control with built in static and manual bypass switch.
- v. The UPS shall incorporate a DC under voltage trip circuit to electrically trip the UPS in order to protect the battery.
- vi. The noise level of the unit shall not exceed 60dB (A) at 1m from the UPS cabinet.
- vii. The output of the inverter shall be a sine wave having less than 5% THD for linear loads and less than 4% to 50% nonlinear load. It shall be suitable for load power factor 0.8 lag.
- viii. The load crest factor shall not be less than 3:1.
- ix. The unit shall have dynamic response such that a 100% step load causes an output voltage transient of less than  $\pm 4\%$  with a recovery time of less than 4ms.  
For three phase output units the output voltage shall not vary by more than  $\pm 1\%$  for an unbalance for 10%.
- x. Indicators to indicate on SCADA/OCEMS
  - UPS status
  - UPS alarm conditions
- xi. The UPS shall provide a volt free contact output to indicate:
  - Warning. i.e. low battery capacity
  - Fault
  - Static bypass in use.
- xii. The UPS shall have an overload capacity of 150% for 30 seconds and shall be protected in the event of a short circuit of the output.
- xiii. The batteries shall be housed, either within the UPS enclosure or within a separate matching battery cubicle suitable for location adjacent to the UPS.
- xiv. The batteries shall be maintenance free lead acid type sealed for life.

S. No.	Parameter	Minimum Specifications	Compliance (with product details & Yes/No)
1.	Make		
2.	Model		

3.	Capacity	2 KVA	
4.	Output Wave Form	Pure Sine wave	
5.	Input Power Factor at Full Load	>0.90	
6.	Input Voltage Range	130-250 VAC at Full Load	
7.	Input Frequency	50Hz +/- 3 Hz	
8.	Output Frequency	50Hz +/- 0.5% (Free running); +/-3% (Sync. Mode)	
9.	Inverter efficiency	>90%	
10.	Overall AC-AC Efficiency	>85%	
11.	UPS shutdown	UPS should shutdown with an alarm and indication on following conditions 1) Output over voltage 2) Output under voltage 3) Battery low 4) Inverter overload 5) Over temperature 6) Output short	
12.	Battery Backup	3 hours in full load	



#### 4. Drawings



#### 5. Inspections and Tests

The tenderer must comply each and every point of CPCB SOP [https://cpcb.nic.in/NGTMC/sop\\_ocems\\_stp.pdf](https://cpcb.nic.in/NGTMC/sop_ocems_stp.pdf) as per latest guidelines and it will be tenderer's responsibility to comply all SOP points during commissioning and Operation & Maintenance of OCEMS system

## 6. Detailed Methodology for Creating a Central Monitoring Station for OCEMS Network

### 1. Introduction

The outline comprehensive methodology for creating a Central Monitoring Station (CMS) for the Online Continuous Effluent Monitoring System (OCEMS) network across various Sewage Treatment Plants (STPs) in different states of India. The central server will be a cloud-based solution hosted on GI Cloud, with servers located in India. The infrastructure includes a database server, processing server, visualization server, and data validation server, featuring robust security and upgraded methodologies. The database, processing, visualization, and validation software will be custom-built for the owner with access to the source code managed securely on GitHub. The solution will feature the following operational philosophies and features.

### 2. System Architecture

- **Cloud Hosting:** Utilize GI cloud platforms with data centers located in India to ensure compliance with local data residency regulations.
- **Modular Servers:** Design the system architecture with distinct modular servers for database management, data processing, data visualization, and data validation.
- **Security:** Implement comprehensive security measures including firewalls, encryption, and intrusion detection systems to protect data integrity and confidentiality.

### 3. GI Cloud Server Specifications

#### Database Server:

- **Instance Type:** R5 (Memory Optimized)
- **Database Engine:** PostgreSQL or MySQL
- **Backup:** Automated backup with different approved cloud server.

#### Processing Server:

- **Instance Type:** Compute Optimized
- **Processing Framework:** GI Cloud for server less compute or dedicated compute.
- **Scalability:** Auto-scaling groups to handle varying loads
- **Security:** IAM roles and policies for access control

#### Visualization Server:

- **Instance Type:** Accelerated Computing
- **Storage:** GI cloud for static content and dynamic content

- **Real-time Analytics:** Custom Algorithms for real-time data streaming and analytics,
- **Security:** SSL/TLS for secure data transmission

#### **Data Validation Server:**

- **Instance Type:** General Purpose
- **Validation Algorithms:** Custom algorithms running on GI cloud
- **Automated Alerts:** Automated alerts for monitoring and alerting

#### **4. Database Server Specifications**

- **Database Management System (DBMS):** Use a robust DBMS such as PostgreSQL or MySQL.
- **Data Storage:**
  - **Capacity:** Scalable storage to handle large volumes of effluent monitoring data.
  - **Performance:** High read/write speeds to ensure quick data access.
- **Backup and Recovery:**
  - **Frequency:** Automated daily backups with additional point-in-time recovery options.
  - **Storage:** Backup data stored in cloud with lifecycle policies for archiving.
  - **Retention:** Configurable retention periods based on regulatory requirements.
- **Security:**
  - **Encryption:** Data encryption at API and in transit.
  - **Access Control:** Fine-grained access control with IAM policies and database-level permissions.
  - **Monitoring:** Continuous monitoring for compliance tracking.

#### **5. Processing Server Specifications**

- **Data Ingestion:**
  - **Mechanism:** Core for ingesting data from multiple STPs.
  - **Protocol:** Support for various protocols (HTTP, MQTT, WebSockets).
  - **Batch Processing:** Batch for handling large data volumes.
- **Data Processing:**
  - **Framework:** Apache Spark on cloud for big data processing.

- **Algorithms:** Custom algorithms for data cleaning, transformation, and aggregation.
- **Latency:** Low-latency processing to support near real-time analytics.
- **Scalability:**
  - **Auto-Scaling:** Automatically adjusts capacity to maintain performance.
  - **Elasticity:** Elastic infrastructure to handle peak loads and scale down during off-peak hours.
- **Security:**
  - **IAM Roles:** Use of IAM roles for secure access to other GI cloud services.
  - **Data Encryption:** Encrypt data during processing.
  - **Network Security:** VPC with subnet isolation for different processing stages.

## 6. Visualization Server Specifications

- **User Interface (UI):**
  - **Design:** Responsive web-based UI with a focus on user experience.
  - **Technology:** Django Python Framework.
  - **Accessibility:** Ensure compliance with WCAG (Web Content Accessibility Guidelines).
- **Dashboards:**
  - **Customization:** Users can create and customize their dashboards.
  - **Widgets:** Variety of widgets (charts, graphs, tables) for data visualization.
  - **Interactivity:** Interactive elements (drill-downs, filters) for detailed analysis.
- **Real-time Analytics:**
  - **Streaming:** Real-time data streaming using latest technologies.
  - **Processing:** Strong backend algorithms for real-time data processing and anomaly detection.
  - **Alerts:** Configurable alerts for key metrics deviations.
- **Security:**
  - **SSL/TLS:** Secure data transmission with SSL/TLS encryption.
  - **Access Control:** Role-based access control (RBAC) for dashboard access.
  - **Data Masking:** Mask sensitive data in visualizations for privacy.

## 7. Data Validation Server Specifications

- **Validation Algorithms:**
  - **Custom Algorithms:** Developed specifically for effluent data validation.
  - **Machine Learning:** Use of ML models for advanced anomaly detection.
  - **Rules Engine:** Configurable rules engine for regulatory compliance checks.
- **Automated Alerts:**
  - **Types:** Threshold-based, pattern-based, and ML-based alerts.
  - **Channels:** Alerts via email, SMS, and push notifications.
  - **Integration:** Integration with GI SNS for alert distribution.
- **Reporting:**
  - **Formats:** Support for multiple formats (PDF, Excel, CSV).
  - **Customization:** Customizable report templates.
  - **Scheduling:** Automated report generation and distribution.
- **Security:**
  - **Data Integrity:** Ensure data integrity with checksums and validation logs.
  - **Audit Trails:** Detailed audit trails for all validation processes.
  - **Compliance:** Continuous compliance monitoring and reporting.

## 8. Software Development

- **Custom Software:** Develop custom software tailored to the owner's requirements with source code access.
- **Interoperability:** Ensure the software is interoperable with existing systems and devices used in STPs.
- **Upgradability:** Design the software to be easily upgradable to incorporate future enhancements and regulatory changes.
- **Source Code Management:** Use GitHub for source code management to ensure secure and efficient collaboration and version control.
  - **Repository Management:** Private repositories with access controls.
  - **Version Control:** Use Git for version control with branching and merging strategies.

## 9. Security Features

- **Encryption:**
  - **In Transit:** Use TLS/SSL for encrypting data in transit.

- **At Rest:** Use of encrypting data at rest.
- **Access Control:**
  - **Authentication:** Multi-factor authentication (MFA) for system access.
  - **Authorization:** Role-based access control (RBAC) for system resources.
  - **Identity Management:** managing user identities and permissions.
- **Audit Trails:**
  - **Logging:** Detailed logging of all user activities and system events.
  - **Monitoring:** Continuous monitoring using detailed logging mechanisms.
  - **Compliance:** Regular audits and compliance checks.

## 10. Operational Philosophy

- **Reliability:**
  - **Uptime:** Ensure high availability with 99.9% uptime.
  - **Redundancy:** Implement redundancy at all levels (servers, storage, network).
- **Accuracy:**
  - **Data Quality:** Implement data quality checks and validation.
  - **Calibration:** Regular calibration of sensors and instruments.
- **Compliance:**
  - **Regulations:** Adhere to all relevant environmental regulations and standards.
  - **Reporting:** Ensure accurate and timely regulatory reporting.
- **User-Friendliness:**
  - **Interface:** Intuitive and easy-to-use interface for all users.
  - **Support:** Provide comprehensive user support and training.
- **Scalability:**
  - **Infrastructure:** Scalable cloud infrastructure to accommodate growth.
  - **Software:** Modular software design for easy scaling and upgrading.

## 11. Data Receiving Methodology

- **sFTP:** Secure file transfer protocol for secure data transfer from remote sites to the central server.
- **API:** Application Programming Interface for real-time data integration from various sources.

- **HTTPS:** Secure HTTP protocol for data transmission over the internet.
- **Universal Approach:** Ensure compatibility with multiple data sources and formats to avoid data gaps and transmission difficulties.

## 12. Integration with Remote OCEMS

- **New Installations:** Integrate new OCEMS at various STP sites using sFTP, HTTPS, or API over GSM/GPRS.
- **Existing Installations:** Integrate previously installed OCEMS to the central server for visualization, validation, and reporting using sFTP, HTTPS or API over GSM/GPRS.
- **Data Transmission:** Ensure secure and reliable data transmission from remote sites from remote sites to the central server using the aforementioned methods.

## 13. Integration of data from Existing Cloud Software Database

- **Data Migration:** Migrate existing data from the cloud software **database to the new Central Data Management system on GI servers.**
  - **Data Extraction:** Extract data from the existing cloud software using standardized data export formats (CSV, JSON).
  - **Data Transformation:** Transform data into the required schema for the new system.
  - **Data Loading:** Load transformed data into the new database.
- **Data Consistency:** Ensure data consistency and integrity during the migration process.
  - **Validation:** Perform data validation checks before and after migration to ensure data integrity.
  - **Reconciliation:** Reconcile data between the old and new systems to confirm completeness and accuracy.
- **System Interoperability:** Ensure the new system is interoperable with the existing **cloud software to allow seamless data integration.**
  - **API Integration:** Develop APIs to facilitate data exchange between the old and new systems.
  - **Data Synchronization:** Implement data synchronization mechanisms to keep both systems updated during the transition period.

#### 14. Operation and Maintenance

- **Personnel: Employ three dedicated personnel for central server room operations and maintenance.**
  - **Roles and Responsibilities:**
    - **System Monitoring:** Regularly monitor system performance and security.
    - **Software Updates:** Update and upgrade all deployed software on the cloud server.
    - **Reporting:** Generate and distribute compliance and performance reports.
    - **Support:** Provide technical support for any issues arising in the operation of the system.
  
- **Maintenance Schedule:**
  - **Daily: System health checks, backup verification, and security scans.**
  - **Weekly:** Performance tuning, patch management, and log reviews.
  - **Monthly:** Comprehensive system audits, capacity planning, and incident response drills.
  
- **Documentation:**
  - **System Documentation:** Maintain detailed documentation of the system architecture, configurations, and operational procedures.
  - **Change Logs:** Keep a log of all changes made to the system for audit and compliance purposes.
  - **Training Materials:** Develop training materials and conduct regular training sessions for staff.

#### 15. Camera Surveillance and Connection of Remote IP Cameras:

##### Connection Methodology:

- **GSM/GPRS or Internet:** Use GSM/GPRS or internet connectivity for data transmission from remote cameras.
- **Integration:** Connect cameras to the central data management system using secure protocols (HTTPS).



- **Network Configuration:** Configure IP addresses, subnet masks, and gateway settings for seamless connectivity.
- **Firewall Rules:** Set up firewall rules to allow secure camera connections while blocking unauthorized access.
- **Cloud Storage: Store video feeds on GI cloud servers with appropriate security measures.**
  - **Storage Configuration:** Use for scalable storage with lifecycle policies for data retention.
  - **Backup:** Implement automated backup solutions to prevent data loss.
- **Real-time Monitoring: Enable real-time monitoring and recording capabilities through the central server.**
  - **Streaming Protocols:** Use RTSP (Real-Time Streaming Protocol) for live video feeds.
  - **Alerts:** Configure motion detection and other event-based alerts for proactive monitoring.
  - **Video Analytics:** Integrate video analytics for advanced features like object detection and intrusion detection.

## 16. Key Process Data and Efficiency Parameters

### Data Collection from STP SCADA Systems:

- **Existing Systems:**
  - **Data Interface:** Use OPC (OLE for Process Control) or Modbus protocols to interface with existing SCADA systems.
  - **Data Extraction:** Extract key process data using data polling or event-based data capture.
  - **Data Points:** Ensure all relevant data points (flow rates, chemical concentrations, etc.) are captured.
- **New Installations:**
  - **SCADA Configuration:** Configure new SCADA systems with required data points for real-time monitoring.
  - **Data Logging:** Implement data logging for historical analysis and reporting.
  - **Communication Protocols:** Ensure compatibility with industry-standard communication protocols (e.g., Ethernet/IP, Modbus/OPE).
- **Operational Parameters:**

- **Aeration Rates:** Monitor the rate of air supply to aeration tanks.
- **Sludge Levels:** Track the levels of sludge in clarifiers and digesters.
- **Temperature:** Monitor the temperature of wastewater at various stages of treatment.
- **Energy Consumption:** Measure the energy consumption of key equipment (pumps, blowers, etc.).

#### **Data Transmission and Storage:**

- **Transmission:**
  - **Protocols:** Use secure transmission protocols (sFTP, HTTPS, MQTT) for data transfer.
  - **Redundancy:** Implement redundant communication paths to ensure data availability.
- **Storage:**
  - **Database:** Store process data in a database for efficient querying and analysis.
  - **Retention:** Implement data retention policies to manage storage costs and compliance.
- **Analysis:**
  - **Real-time Analytics:** Use custom Algorithms and real-time data processing and alerts.
  - **Historical Analysis:** Use algorithms for historical data analysis and reporting.
  - **Machine Learning:** Apply ML algorithms for predictive maintenance and process optimization.

#### **System Integration:**

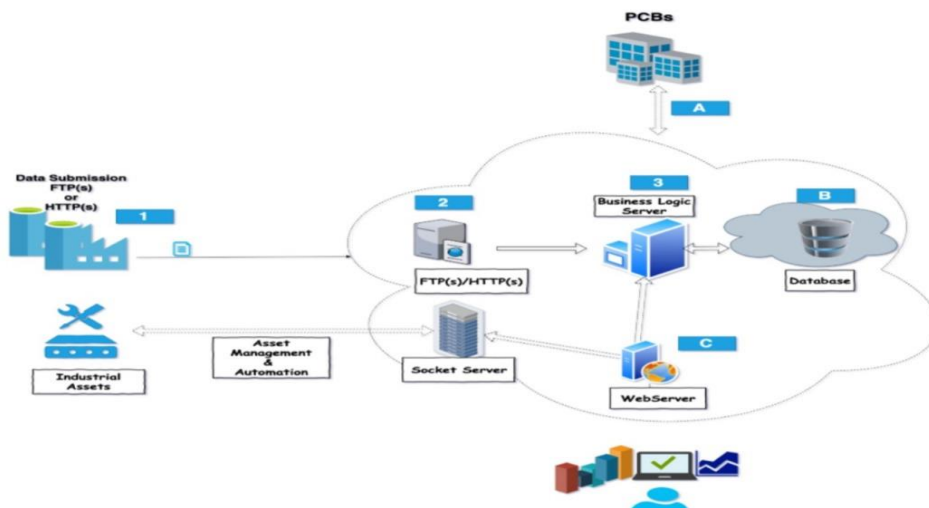
- **Integration Framework:**
  - **Middleware:** Use middleware for data integration between SCADA systems and the central monitoring station.
  - **APIs:** Develop RESTful APIs for seamless data exchange.
  - **Data Normalization:** Normalize data to ensure consistency across different sources.
- **Data Validation:**
  - **Validation Rules:** Define validation rules to ensure data accuracy and reliability.

- **Exception Handling:** Implement exception handling mechanisms for data discrepancies.
- **Reporting:** Generate reports on data quality and validation results.

## 17. Implementation Plan

- **Phase 1: Assessment and Design**
  - Conduct site assessments at selected STPs.
  - Design the system architecture and data flow diagrams.
  - Develop detailed technical specifications for all components.
- **Phase 2: Development and Integration**
  - Develop custom software for data collection, processing, visualization, and validation.
  - Integrate with existing SCADA systems and OCEMS devices.
  - Implement security measures and data transmission protocols.
- **Phase 3: Deployment and Testing**
  - Deploy cloud infrastructure.
  - Install and configure software and hardware at STPs.
  - Conduct comprehensive testing and validation.
- **Phase 4: Training and Handover**
  - Provide training for operators and administrators.
  - Handover system documentation, source code, and support manuals.
- **Phase 5: Monitoring and Optimization**
  - Monitor system performance and make necessary optimizations.
  - Conduct regular audits and compliance checks.
  - Implement feedback mechanisms for continuous improvement.

This comprehensive methodology ensures a robust, secure, and scalable solution for the central monitoring of OCEMS across various STPs, enhancing data accuracy, compliance, and operational efficiency.



**7 Important compliances:**

- i. No data should be shared with anyone without NMCG notice & written consent.
- ii. No sharing of source code to anyone without NMCG notice & written consent.
- iii. To secure the dashboard and mobile app, Security Audit to be performed by the vendors, Security Audit only be performed by the CertIn (Indian Computer Emergency Response Team, under Ministry of Electronic and Information Technology (Govt. of India)) emplaned agency. Cost of Security Audit to be bear by the vendor.
- iv. The Guidelines for Indian Government Website to be followed by the vendor.

**Tender Submission Letter**

To  
National Mission for Clean Ganga,  
1<sup>st</sup> Floor, Major Dhyan Chand National Stadium,  
India Gate, New Delhi-110002

Sub: RFP for *[insert project name]*

Ref: RFP No. ....

I/ We, the undersigned, offer to provide our services as per scope of work, as mentioned in RFP, to National Mission for Clean Ganga. We are hereby submitting our bid, in a sealed envelope.

I/We, hereby declare that:

- (a) We are submitting herewith our Bid, with the details as per the requirements of the tender, for your evaluation and consideration.
- (b) We submitted the Bid Security in accordance with the tender Document.
- (c) I/We have read carefully the terms and conditions of tender document attached hereto and hereby agree to abide by the said terms and conditions.
- (d) The bid is unconditional.
- (e) I/We undertake that documents submitted are genuine/authentic and nothing material has been concealed. I/We understand that the contract is liable to be cancelled, if it is found to be having obtained, through fraudulent means/concealment of information.
- (f) We shall make available to the NMCG any additional information it may find necessary or require to clarify, supplement or authenticate the Bid.
- (g) Until a formal agreement is prepared and executed, acceptance of this tender document shall constitute a binding contract between NMCG and us subject to the modifications, as may be mutually agreed to, between NMCG and us.
- (h) The Financial Proposal is being submitted separately by using the appropriate section on GeM portal. This Technical Proposal read with the Financial Proposal shall constitute the Proposal which shall be binding on us
- (i) We agree to keep this bid valid for acceptance for a period of *[insert number of days as per tender requirement]* from the date of opening the bid.

We understand that the NMCG is not bound to accept any tender that the NMCG receives.

Yours faithfully,

(Signature, name and designation of the authorised signatory)  
(Name and seal of the Bidder / Lead Member)

### Information on Bidder's Organisation

S.No.	Particulars	Details
1.	Name of the Bidder	
2.	Address of the Bidder	
3.	Incorporation status of the Bidder (Relevant Certificate to be submitted in Technical Bid)	
4.	Year of Establishment	
5.	Valid GST registration No. (Copy of certificate to be submitted)	
6.	Permanent Account No. (PAN) (Copy of PAN Card to be submitted)	
7.	Name and Designation of the contact person to whom all references shall be made regarding this Bid	
8.	Telephone No. (with STD Code)	
9.	E-mail id of the Contact Person	
10.	Fax No. (with STD Code)	
11.	Website (if any)	

.....

Name of the Bidder

.....

Signature of the Authorised Signatory

.....

Name of the Authorised Signatory

Place: \_\_\_\_\_

Date: \_\_\_\_\_

**POWER OF ATTORNEY**  
*(on non-judicial stamp paper of Rs. 100/-)*

Know all men by these presents, we, ..... (name of Firm and address of the registered office) do hereby constitute, nominate, appoint and authorise Mr / Ms..... son/daughter/wife and presently residing at ....., who is presently employed with us and holding the position of ..... as our true and lawful attorney (hereinafter referred to as the “Authorised Representative”) to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our Proposal for \_\_\_\_\_ including but not limited to signing and submission of all Proposals, proposals and other documents and writings, participating in pre-bid and other conferences and providing information/ responses to the NMCG, representing us in all matters before the NMCG, signing and execution of all contracts and undertakings consequent to acceptance of our proposal and generally dealing with the NMCG in all matters in connection with or relating to or arising out of our Proposal for the said Project and/or upon award thereof to us till the entering into of the Contract with the NMCG.

AND, we do hereby agree to ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Authorised Representative pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Authorised Representative in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE, ..... THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS ..... DAY OF ....., 20.....

For .....  
(Signature, name, designation and address)

**FORM OF POWER OF ATTORNEY FOR JOINT VENTURE**

*(on non-judicial stamp paper of Rs. 100/-)*

KNOW ALL MEN BY THESE PRESENTS THAT WE, the Partners whose details are given here under .....have formed a Joint Venture under the laws of ..... and having our Registered Office(s)/Head Office(s) at..... (hereinafter called the 'Joint Venture' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s ..... being the Partner in-charge do hereby constitute, nominate and appoint M/s. .... a Company incorporated under the laws of ..... and having its Registered/Head Office at ..... as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Authorized Representative" or "Partner In-charge") to exercise all or any of the powers for and on behalf of the Joint Venture in regard to work for the bids for which have been invited by National Mission for Clean Ganga (NMCG) to undertake the following acts:

- i. To sign and submit proposal and participate in the aforesaid tender on behalf of the "Joint Venture".
- ii. To negotiate with the NMCG the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with NMCG for and on behalf of the "Joint Venture".
- iii. To do any other act or submit any document related to the above.
- iv. To receive, accept and execute the Contract for and on behalf of the "Joint Venture".

For the above purpose, the person(s) authorized by the Partner In-charge shall be the person(s) authorized to act on behalf of the "Joint Venture" as per the Power of Attorney given to him/her/them by the Partner In-Charge.

It is clearly understood that all the partners of the joint venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and the Partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the assignment including the Operations and Maintenance period in terms of the Contract.

The Joint Venture hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney/Authorized Representatives/Partner in- charge quotes in the bid, negotiates and signs the Contract with the Owner and/or proposes to act on behalf of the Joint Venture by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.



IN WITNESS THEREOF the Partners Constituting the Joint Venture as aforesaid have executed these presents on this .....day of .....under the Common Seal(s) of their Companies.

For and on behalf of the Partners of Joint Venture

.....  
Name of the Bidder

.....  
Signature of the Authorised Signatory

.....  
Name of the Authorised Signatory

Place: \_\_\_\_\_

Date: \_\_\_\_\_

**Annexure-V**

**Performa for Affidavit**  
*(on non-judicial stamp paper of Rs. 100/-)*

*[If the bidder is Joint Venture, this affidavit shall be filled each partner of a Joint Venture]*

I \_\_\_\_\_ Proprietor/Director/Partner of the Agency M/s.\_\_\_\_\_ do hereby solemnly affirm that our Agency M/s.\_\_\_\_\_ has never been blacklisted/debarred by any Government department/Public Sector Undertaking/Private organisation and there has not been any work cancelled against them for poor performance in the last three years reckoned from the date of invitation of Bid.

.....  
Name of the Bidder

.....  
Signature of the Authorised Signatory

.....  
Name of the Authorised Signatory

Place: \_\_\_\_\_

Date: \_\_\_\_\_

**Annexure-VI****Relevant Experience undertaken during the last 5 years**

<b>S. No.</b>	<b>Description of Project / Scope of the work</b>	<b>Location of the work</b>	<b>Name of the Client</b>	<b>Actual value of the Project</b>	<b>Stipulated time for completion</b>	<b>Actual time taken for completion</b>
1.						
2.						
3.						

Supporting documents such as copies of documents as stipulated in the **Eligibility Criteria** to be attached.

.....  
Name of the Bidder

Signature of the authorised signatory: \_\_\_\_\_

Name of the Authorised Signatory: \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

### Financial Information of Bidder's Organisation

Year	Amount (in Rupees)
FY _____	
FY _____	
FY _____	
<b>Average</b>	

Note:

*Copy of audited balance sheet and profit and loss account for the aforesaid financial years must be submitted.*

.....

Name of the Bidder

.....

Signature of the Authorised Signatory

.....

Name of the Authorised Signatory

Place: \_\_\_\_\_

Date: \_\_\_\_\_

**FORM OF BID SECURITY (EMD)**

B.G.No:

Dated:

WHEREAS, .....(*name of Bidder including names of all Joint Venture Participants/Lead Member*) (hereinafter called “the Bidder”) has submitted its Bid (hereinafter called the “Bid”) dated (*date*) for the performance of (*name of Contract*).

KNOW ALL PEOPLE by these presents that We ..... (*name of Bank*) of ..... (*name of country*) having our registered office at ..... (hereinafter called “the Bank”) are bound unto ..... (hereinafter called “the Owner”) in the sum of .....for which payment well and truly to be made to the said Owner, the Bank binds itself, its successors, and assigns by these presents.

*[The Bidder should insert the amount of the guarantee in words and in figures. This figure should be the same amount as set out in RFP clause no.15.1. The details related to the Bid Security are set out in the same RFP Clause].*

The CONDITIONS of this obligation are:

- a. If the Bid has been termed as non-responsive in accordance with the clause 15.1 (d) of the RFP document.
- b. if the Bidder withdraws its Bid during the Bid Validity Period; or
- c. if the Bidder, having been notified of the acceptance of its Bid by the Owner during the period of Bid validity,
  1. fails to sign the Contract in accordance with and when required by RFP Clause 14.4.; or
  2. fails to provide the performance security to the Owner in accordance with and when required by RFP clause 15.2
- d. If the Bidder fails to commence the assignment as per Clause 14.3 of the RFP document.

We undertake to pay to the Owner up to the above amount upon receipt of its first written demand, without the Owner having to substantiate its demand, provided that in its demand the Owner will note that the amount claimed by it is due to it owing to the occurrence of one or more of the conditions set out above, specifying the occurred condition or conditions.

This Guarantee will remain in full force up to and including 45 days after the expiry of the Bid Validity Period and it may be extended by the Owner in accordance with the Bidding Documents, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date or the extended date.

This guarantee shall also be operatable at our..... Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs. \_\_\_\_\_ (Rs. \_\_\_\_\_) and the guarantee shall remain valid till\_\_\_\_\_. Unless a claim or a demand in writing is made upon us on or before \_\_\_\_\_ all our liability under this guarantee shall cease.

Notwithstanding anything contained hereinabove”

- A. Our liability under this guarantee shall not exceed Rs.\_\_\_\_\_ (Rupees\_\_\_\_\_).
- B. This bank guarantee shall be valid up to \_\_\_\_\_.
- C. We are liable to pay the guarantee amount or any part thereof under this bank guarantee only and only if you serve upon us, a written claim or demand on or before \_\_\_\_\_.

Signature and Seal of the Guarantor \_\_\_\_\_

In presence of

Name and Designation

1. \_\_\_\_\_  
(Name, Signature & Occupation)

Name of the Bank

Address

2. \_\_\_\_\_  
(Name & Occupation)

Date

### Form of Bank Guarantee for Performance Security

To  
 National Mission for Clean Ganga  
 1<sup>st</sup> Floor, Major Dhyan Chand National Stadium,  
 Near India Gate,  
 New Delhi-110002

WHEREAS \_\_\_\_\_ [Name and address of the Service Provider] (hereinafter called “the Agency”) has undertaken, in pursuance of NMCG’s Letter of Award No. \_\_\_\_\_ dated \_\_\_\_\_ to provide the services on terms and conditions set forth in this Contract \_\_\_\_\_ [Name of contract and brief description of works] (hereinafter called the “the Contract”).

AND WHEREAS it has been stipulated by you in the said Contract that the Agency shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Agency such a Bank Guarantee;

NOW THEREOF we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Agency up to a total of \_\_\_\_\_ [amount of Guarantee] \_\_\_\_\_[in words], such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of \_\_\_\_\_ [amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Agency before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the services to be performed there under or of any of the Contract documents which may be made between you and the Agency shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

The liability of the Bank under this Guarantee shall not be affected by any change in the constitution of the Agency or of the Bank.

This guarantee shall also be operatable at our..... Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs. \_\_\_\_\_ (Rs. \_\_\_\_\_) and the guarantee shall remain valid till \_\_\_\_\_. Unless a claim or a demand in writing is made upon us on or before \_\_\_\_\_ all our liability under this guarantee shall cease.

Notwithstanding anything contained hereinabove

- A. Our liability under this guarantee shall not exceed Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_).
- B. This bank guarantee shall be valid up to \_\_\_\_\_.
- C. We are liable to pay the guarantee amount or any part thereof under this bank guarantee only and only if you serve upon us, a written claim or demand on or before \_\_\_\_\_.

Signature and Seal of the Guarantor \_\_\_\_\_

In presence of

Name and Designation

1. \_\_\_\_\_  
(Name, Signature & Occupation)

Name of the Bank

Address

2. \_\_\_\_\_  
(Name & Occupation)

Date



## Annexure-X

### DRAFT CONTRACT

#### **Supply, Installation and Commissioning of Online Continuous Effluent Monitoring System (OCEMS) Instruments with 5 Years of Operation and Maintenance and Development of Central Monitoring Station (Dashboard)**

#### I. CONTRACT

**THIS CONTRACT** (hereinafter called the “Contract” is made on the \_\_\_\_\_ day of the month of \_\_\_\_\_, 2024 between

**National Mission for Clean Ganga (NMCG)**, a society registered under the Societies Registration Act 1860, having its office at 1<sup>st</sup> Floor, Major Dhyan Chand National Stadium, India Gate, New Delhi-110002 (hereinafter called “Employer” or “NMCG” which expression shall, unless excluded by or repugnant to be context be deemed to include its administrators, successors and assigns) of the one part

And

\_\_\_\_\_ {Name of the Firm} having its office at \_\_\_\_\_ (hereinafter called the “Agency” which expression shall, unless excluded by or repugnant to be context be deemed to include its successors, legal assigns, executors or administrators) of the second part.

#### WHEREAS

- a) the Employer had invited bids (vide its Tender no. .... dated \_\_\_\_\_ for Supply of the services as specified in Appendix-A (hereinafter called the “Services”);
- b) the Agency, having represented to the Employer that he has the required experience and resources, has offered to provide in response to the aforesaid tender;
- c) the Employer has accepted the proposal of the Agency to provide the services in conformity with the requirements specified in Appendix A of this Contract and in accordance with the terms and conditions of this Contract.

NOW, THEREFORE, IT IS HEREBY AGREED between the parties as follows:

1. The following documents attached hereto shall be deemed to form an integral part of this Contract:
  - a) The General Conditions of Contract;
  - b) The Special Conditions of Contract;
  - c) The following Appendices:
    - Appendix A: Scope of work
    - Appendix B: Letter of Award (LoA) issued by the Employer

Appendix C: Copy of BOQ

Appendix D: Working Hours and Holidays for Agency's Personnel

Appendix E: Performance Bank Guarantee

2. The mutual rights and obligations of the Employer and the Agency shall be as set forth in the Contract, in particular:
- a) the Agency shall carry out and complete the services in conformity with the requirements specified in Appendix A of this Contract and Central Monitoring Station in accordance with the provisions of the Contract; and
  - b) the Employer shall make payments to the Agency in accordance with the provisions of the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

All other terms and conditions of the tender document, clarifications, corrigendum and addendum if any shall form integral part of this Contract.

For and on behalf of  
**National Mission for Clean Ganga**

For and on behalf of  
*{Name of the Agency}*

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## II. General Terms and Conditions

### 1. GENERAL PROVISIONS

1.1. **Definitions** Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:

- (a) “Applicable Law” means the laws and any other instruments having the force of law in India for the time being.
- (b) “Agency” means the firm that shall carry out and complete the services in conformity with the requirements specified in Appendix A of this Contract.
- (c) “Contract” means the Contract signed by the Parties and all the attached documents listed in its Clause 1 i.e. the General Conditions (GC), the Special Conditions (SC), and the Appendices.
- (d) “Day” means calendar day.
- (e) “Effective Date” means the date on which this Contract comes into force and effect pursuant to Clause GC 4.1.
- (f) “GC” means these General Conditions of Contract.
- (g) “Government” means the Government of India.
- (h) “In writing” means communicated in written form with proof of receipt.
- (i) “Materials” means supply of items as specified in Appendix-A by the Agency to the Employer.
- (j) “Party” means the “Employer” or the “Agency”, as the case may be, and “Parties” means both of them.
- (k) “Personnel” means professionals and support staff provided by the Agency and assigned to perform the Services or any part thereof.
- (l) “SC” means the Special Conditions of Contract by which the GC may be amended or supplemented.
- (m) “Services” means the work to be performed by the Agency pursuant to this Contract, as described in Appendix A hereto.

### 1.2. Law governing the Contract

This Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the applicable laws of India, for time being in force as amended from time to time.

### 1.3. Subletting:

The Agency shall not sublet, transfer or assign this contract or any part thereof without the prior written consent/approval of the NMCG. In the event of the Agency contravening this condition, the contract is liable to be terminated and the Employer will be free to get the balance work or services under the contract executed at the risk and cost of the Agency. The Agency shall be liable for all the losses, damage which the NMCG may sustain in consequence or arising out the services being provided under the contract.

#### 1.4. Notices:

- 1.4.1. Any notice, request or consent required or permitted to be given or made pursuant to this Contract shall be in writing. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered post/e-mail to such Party at the address specified in the SC.
- 1.4.2. A Party may change its address for notice hereunder by giving the other Party notice in writing of such change to the address specified in the SC.

#### 2. Taxes and Duties

Unless otherwise specified in the Contract, the Agency shall pay all such taxes, duties, fees and other impositions as may be levied under the Applicable Laws and the NMCG shall perform such duties in regard to the deduction of such taxes as may be lawfully imposed on it.

#### 3. Fraud and Corruption

- 3.1. The Agency shall observe the highest standard of ethics during the execution of the Contract. In pursuance of this policy, the NMCG defines, for the purpose of this provision, the terms set forth below as follows:
  - (i) “corrupt practice” means the offering, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the selection process or in contract execution;
  - (ii) “fraudulent practice” means a misrepresentation or omission of facts in order to influence a selection process or the execution of a contract;
  - (iii) “collusive practices” means a scheme or arrangement between two or more agencies, with or without the knowledge of the NMCG, designed to establish prices at artificial, non-competitive levels;
  - (iv) “coercive practices” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in a procurement process, or affect the execution of a contract;
- 3.2. Measures to be taken by the NMCG
  - (a) NMCG may terminate the contract if it determines at any time that representatives of the Agency were engaged in corrupt, fraudulent, collusive or coercive practices during the selection process or the execution of that contract, without the Agency having taken timely and appropriate action satisfactory to the Employer to remedy the situation;
  - (b) NMCG may also sanction against the Agency, including declaring the Agency ineligible, either indefinitely or for a stated period, to be awarded a contract if it at any time determines that the Agency has, directly or through an agent, engaged in corrupt, fraudulent, collusive or coercive practices in competing for, or in executing, a NMCG- financed contract;

#### **4. COMMENCEMENT, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT**

##### **4.1. Effectiveness of Contract**

This Contract shall come into force and effect on the date (the “Effective Date”) of the NMCG’s notice to the Agency instructing the Agency to begin carrying out the Services.

##### **4.2. Commencement of Services**

The Agency shall begin carrying out the Services not later than the number of days after the Effective Date specified in the SC.

##### **4.3. Termination of Contract for failure to commence services**

If the Agency does not commence the Services within the period specified in Clause 4.2, NMCG may, by not less than 2 (two) weeks’ notice to the Agency, declare this Contract to be null and void, and in the event of such declaration, the Performance Security of the Agency shall stand forfeited.

##### **4.4. Expiration of Contract**

Unless terminated earlier pursuant to Clause GC 4.3 & 4.9 hereof, this Contract shall expire at the end of such time period after the Effective Date as specified in the SC.

##### **4.5. Entire Agreement**

This Contract contains all covenants, stipulations and provisions agreed by the Parties. No agent or representative of either Party has authority to make, and the Parties shall not be bound by or be liable for, any other statement, representation, promise or agreement not set forth herein.

##### **4.6. Contract Price**

The Contract Price for this Contract shall be the total cost of proposal submitted by Agency in the Financial Proposal. The Contract Price is including applicable taxes and duties if any payable and is as set forth in the SC.

##### **4.7. Modifications or Variations:**

Modification of the terms and conditions of this Contract, including any modification of the scope of the Services, may only be made by written agreement between the Parties.

##### **4.8. Force Majeure:**

###### **4.8.1. Definition**

(a) For the purposes of this Contract, “Force Majeure” means an event which is beyond the reasonable control of a Party, is not foreseeable, is unavoidable and not brought about by or at the instance of the Party claiming to be affected by such events and which has caused the non-performance or delay in performance, and which makes a Party’s performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible in the circumstances, and includes, but is not limited to, pandemic, epidemic, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other extreme adverse weather conditions, strikes, lockouts or other industrial action (except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure to prevent), confiscation or any other action by Government agencies.

(b) Force Majeure shall not include (i) any event which is caused by the negligence or intentional action of a Party or by or of such Party’s Sub-contractors or agents or employees, nor (ii) any event which a diligent Party could reasonably have been expected both to consider at the time of the conclusion of this Contract, and avoid or overcome in the carrying out of its obligations hereunder.

(c) Force Majeure shall not include insufficiency of funds or inability to make any payment required hereunder.

4.8.2. No Breach of Contract:

The failure of a Party to fulfill any of its obligations hereunder shall not be a breach of, or default under, this Contract in so far as such inability arises from an event of Force Majeure, provided that the Party affected by such an event has taken all reasonable precautions, due care and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.

4.8.3. Measures to be Taken:

(a) A Party affected by an event of Force Majeure shall continue to perform its obligations under the Contract as far as is reasonably practical and shall take all reasonable measures to minimize the consequences of any event of Force Majeure.

(b) A Party affected by an event of Force Majeure shall notify the other Party of such event as soon as possible, providing evidence of the nature and cause of such event, and shall similarly give written notice of the restoration of normal conditions as soon as possible.

(c) Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

(d) During the period of their inability to perform the Services as a result of an event of Force Majeure, the Agency, upon instructions by the “NMCG”, shall either:

i) demobilize; or

ii) continue with the Services to the extent possible, in which case the Agency shall continue to be paid proportionately and on prorata basis, under the terms of this Contract.

(e) In the case of disagreement between the Parties as to the existence or extent of Force Majeure, the matter shall be settled according to Clause GC 19.

#### 4.8.4. Extension of time

Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

#### 4.8.5. Payments

During the period of its inability to perform the Services as a result of an event of Force Majeure, the Agency shall be entitled to be reimbursed for additional costs reasonably and necessarily incurred by it during such period for the purposes of the Services and in reactivating the Services after the end of such period.

#### 4.8.6. Consultation

Not later than 30 (thirty) days after the Agency has, as the result of an event of Force Majeure, become unable to perform a material portion of the Services, the Parties shall consult with each other with a view to agreeing on appropriate measures to be taken in the circumstances.

#### 4.8.7. Suspension of Contract

NMCG may, by written notice of suspension to the Agency, suspend all payments to the Agency hereunder if the Agency shall be in breach of this Contract or shall fail to perform any of its obligations under this Contract, including the carrying out of the Services; provided that such notice of suspension (i) shall specify the nature of the breach or failure, and (ii) shall provide an opportunity to the Agency to remedy such breach or failure within a period not exceeding 30 (thirty) days after receipt by the Agency of such notice of suspension.

### 4.9. **Termination:**

#### 4.9.1. By NMCG

NMCG may, by not less than 30 (thirty) days' written notice, terminate this Contract in case of the occurrence of any of the events specified in paragraphs (a) through (g):

- a) If the Agency fails to remedy any breach hereof or any failure in the performance of its obligations hereunder,
- b) If the Agency becomes insolvent or go into liquidation or receivership whether compulsory or voluntary.

- c) If the Agency fails to comply with any final decision reached because of arbitration proceedings pursuant to Clause GC 19 hereof.
- d) If the Agency, in the judgment of the “NMCG”, has engaged in corrupt or fraudulent practices in competing for or in executing this Contract.
- e) If the Agency submits to the “NMCG” a false statement which has a material effect on the rights, obligations or interests of the “NMCG”.
- f) If the Agency fails to provide the quality services as envisaged under this Contract.
- g) If the “NMCG”, in its sole discretion and for any reason whatsoever, decides to terminate this Contract.

#### 4.9.2. By the Agency

The Agency may, by not less than 30 (thirty) days’ written notice to the NMCG, such notice to be given after the occurrence of any of the events specified in this Clause, terminate this Contract if:

- a) NMCG fails to pay any money due to the Agency pursuant to this Contract and not subject to dispute pursuant to Clause 19 hereof within 45 (forty-five) days after receiving written notice from the Agency that such payment is overdue;
- b) NMCG is in material breach of its obligations pursuant to this Contract and has not remedied the same within 45 (forty-five) days (or such longer period as the Agency may have subsequently granted in writing) following the receipt by the NMCG of the Agency’s notice specifying such breach;
- c) as the result of Force Majeure, the Agency is unable to perform a material portion of the Services for a period of not less than 60 (sixty) days; or
- d) NMCG fails to comply with any final decision reached as a result of arbitration pursuant to Clause 19 hereof.

4.9.3. In such an occurrence the NMCG shall give a not less than seven (7) days’ written notice of termination to the Agency.

4.9.4. Cessation of Rights and Obligations: Upon termination of this Contract pursuant to Clauses GC 4.3 or 4.9 hereof, or upon expiration of this Contract pursuant to Clause GC 4.4 hereof, all rights and obligations of the Parties hereunder shall cease, except (i) such rights and obligations as may have accrued on the date of termination or expiration, and (ii) any right which a Party may have under the Law.

4.9.5. Cessation of Services: Upon termination of this Contract by notice of either Party to the other pursuant to Clauses GC 4.9.1 or 4.9.2 hereof, the Agency shall, immediately upon dispatch or receipt of such notice, take all necessary steps to bring the Services to a close in a prompt and orderly manner and shall make every reasonable effort to keep expenditures for this purpose to a minimum.

4.9.6. Payment upon Termination: Upon termination of this Contract pursuant to Clauses GC 4.9.1 or 4.9.2 hereof, the NMCG shall make the following payments to the Agency:  
 (a) If the Contract is terminated, the Agency shall not be entitled to receive any agreed payments upon termination of the contract. However, the NMCG may consider making



payment for the part satisfactorily performed on the basis of Quantum Merit assessed by it, if such part is of economic utility to the NMCG. Applicable under such circumstances, upon termination, the NMCG may also impose liquidated damages as per the provisions of Clause 12 of this Contract. The Agency will be required to pay any such liquidated damages to NMCG within 30 days of termination date.

## **5. Obligations of the Agency**

### **5.1. General**

- 5.1.1. Standard of Performance:** The Agency shall perform the Services and carry out their obligations hereunder with all due diligence, efficiency and economy, in accordance with generally accepted professional standards and practices, and shall observe sound management practices, and employ appropriate technology and safe and effective equipment, machinery, materials and methods. The Agency shall always act, in respect of any matter relating to this Contract or to the Services, as faithful adviser to the NMCG, and shall at all times support and safeguard the NMCG's legitimate interests in any dealings with Sub-Agencies or Third Parties.
- 5.2. Confidentiality:** Except with the prior written consent of the NMCG, the Agency and the Personnel shall not at any time communicate to any person or entity any confidential information acquired during the Services, nor shall the Agency and its Personnel make public the recommendations formulated in the course of, or as a result of, the Services.
- 5.3. Insurance to be Taken out by the Agency:** The Agency (i) shall take out and maintain, and shall cause any Sub-contractors (if applicable) to take out and maintain insurance, at their (or the Sub-contractors, as the case may be) own cost, insurance against any risks.
- 5.4. Reporting Obligations:** The Agency shall submit to the NMCG the reports and documents specified in Appendix A, if applicable hereto, in the form, in the numbers and within the time periods set forth in the said Appendix.
- 5.5. Documents Prepared by the Agency to be the Property of the NMCG:** All plans, drawings, specifications, designs, reports, other documents and software prepared by the Agency for the NMCG under this Contract shall become the property of the NMCG, and the Agency shall, not later than upon termination or expiration of this Contract, deliver all such documents to the NMCG, together with a detailed inventory thereof. The Agency may retain a copy of such documents, but shall not use anywhere, without taking permission, in writing, from the NMCG and the NMCG reserves right to grant or deny any such request. If license agreements are necessary or appropriate between the Agency and third parties for purposes of development of any such computer programs, the Agency shall obtain the NMCG's prior written approval to such agreements.

## **6. Liability of the Agency**

- 6.1. The Agency's liability under this Contract shall be determined by the Applicable Laws and the provisions hereof.
- 6.2. The Agency shall, subject to the limitation specified in Clause 6.3, be liable to the NMCG for any direct loss or damage accrued or likely to accrue due to deficiency in Services rendered by it.
- 6.3. The Parties hereto agree that in case of negligence or wilful misconduct on the part of the Agency or on the part of any person or firm acting on behalf of the Agency in carrying out the Services, the Agency, with respect to damage caused to the NMCG's property, shall not be liable to the NMCG:
- (i) for any indirect or consequential loss or damage; and
  - (ii) for any direct loss or damage that exceeds (a) the Contract Value set forth in Clause 9.1 (C) of this Contract, or (b) the proceeds the Agency may be entitled to receive from any insurance maintained by the agency to cover such a liability in accordance with this Clause, whichever of (a) or (b) is higher.
- 6.4. This limitation of liability specified in Clause 6.3 shall not affect the Agency's liability, if any, for damage to Third Parties caused by the Agency or any person or firm acting on behalf of the Agency in carrying out the Services subject, however, to a limit equal to the Contract Value.

## **7. Agency's Personnel [*applicable for Component-B: Development of Central Monitoring Station (Dashboard)*]**

- 7.1. The Agency shall employ and provide such qualified and experienced Personnel as are required to carry out the Service. NMCG expects all the Personnel to be available during implementation of the Contract. NMCG will not consider substitution of Personnel except for reasons not attributable to the Agency such as any medical incapacity, resignation or due to health. Such substitution shall ordinarily be subject to equally or better qualified and experienced Personnel being provided to the satisfaction of the NMCG. For substitutions, the Agency shall give thirty (30) days' notice along with replacement CV to NMCG. For any substitution, a penalty of 1% (one percent) per Personnel of the quarterly payment shall be imposed and deducted from the bills submitted. However, NMCG reserves the right to waive off the deduction in fee on the basis of merits of the case.
- 7.2. Working hours, overtime, Holiday etc.

The Personnel shall not be entitled to be paid for overtime nor to take paid sick leave, vacation leave, maternity leave except as specified in the Contract, and the Agency's Financial Proposal shall be deemed to cover these items. Any taking of leave by any Personnel shall be subject to the prior approval of the NMCG, and the Agency shall ensure that any absence on leave will not delay the progress and quality of the Services.

## **8. Obligations of the Employer**

- 8.1. Assistance and Exemptions: Unless otherwise specified in the SC, the NMCG shall use its best efforts to ensure that the Government shall:
- a) Provide the Agency, and Personnel with work permits and such other documents as shall be necessary to enable the Agency or Personnel to perform the Services.
  - b) Issue letters/communications to officials, agents and representatives of the Government all such instructions as may be necessary or appropriate for the prompt and effective implementation of the Services.
  - c) Provide to the Agency and Personnel any such other assistance as may be specified in the SC.
- 8.2. **Change in the Applicable Law Related to Taxes and Duties:** If, after the date of this Contract, there is any change in the Applicable Laws of India with respect to taxes, which are directly payable by the Agency for providing the services i.e. GST tax, which increases or decreases the cost incurred by the Agency in performing the Services, then the amount payable to the Agency under this Contract shall be increased or decreased accordingly by agreement between the Parties hereto, and corresponding adjustments shall be made to the ceiling amounts specified in Clause GC 9.1 (C).
- 8.3. Payment: In consideration of the Services performed by the Agency under this Contract, the NMCG shall make to the Agency such payments and in such manner as is provided by Clause GC 9 of this Contract.

## **9. Payments to the Agency**

- 9.1. Total Cost of the Services
- a) The total cost of the Services payable is set forth in Appendix-C as per the Agency's proposal to the NMCG.
  - b) There is no separate/additional payments will be made for any visits undertaken or incidental expenses incurred in rendering the operational and maintenance services, including training and documentation.
  - c) Except as may be otherwise agreed under Clause GC 4.6 and subject to this Clause, payments under this Contract shall not exceed the amount specified in Appendix-C.
- 9.2. Prices will remain valid and firm during the Contract Period.
- 9.3. Currency of Payment: All payments shall be made in Indian Rupees.
- 9.4. Terms of Payment:

**Component-A: OCEMS**

<b>Construction, Operation &amp; maintenance</b>	<b>Job to be completed for declaration of completion of the work</b>	<b>Time Allowed</b>	<b>Cumulative Time Allowed</b>	<b>% of fee payable</b>	<b>Cumulative %</b>
1 <sup>st</sup> Milestone	Supply, delivery, storage of the Equipment / Materials.	60 days	60 days	50 %	50 %
2 <sup>nd</sup> Milestone	Installation, testing including pre-commissioning tests and commissioning of the system. (Including trial run for 30 days of entire installation as per requirement)	90 days	150 days	10 %	60%
3 <sup>rd</sup> Milestone	Comprehensive mandatory efficient & successful Operation & Maintenance work of the entire installation for 5 <sup>th</sup> years.	1825 days	1975 days	1.8% for each quarter (i.e. 20) = 36%	96%
4 <sup>th</sup> Milestone	Final completion certification of O & M period/completion report.		1975 days	4 %	100%

**Component-B: CMS**

<b>Construction, Operation &amp; maintenance</b>	<b>Job to be completed for declaration of completion of the work</b>	<b>Time Allowed</b>	<b>Cumulative Time Allowed</b>	<b>% of fee payable</b>	<b>Cumulative %</b>
1 <sup>st</sup> Milestone	<b>Month 1: Planning and Requirement Analysis</b> <ul style="list-style-type: none"> <li>• Conduct detailed requirement analysis with stakeholders.</li> <li>• Develop a comprehensive project plan.</li> </ul>	30 days	30 days	25 %	25 %

Construction, Operation & maintenance	Job to be completed for declaration of completion of the work	Time Allowed	Cumulative Time Allowed	% of fee payable	Cumulative %
	<b>Month 2: System Design</b> <ul style="list-style-type: none"> <li>• Design the system architecture and develop detailed technical specifications.</li> <li>• Design user interfaces and dashboards</li> </ul>	30 days	60 days		
2 <sup>nd</sup> Milestone	<b>Month 3: Development</b> <ul style="list-style-type: none"> <li>• Develop the database, processing, visualization, and validation software.</li> <li>• Implement security features and conduct thorough testing.</li> </ul>	30 days	90 days	25%	50%
	<b>Month 4: Deployment</b> <ul style="list-style-type: none"> <li>• Deploy the cloud-based servers on GI cloud.</li> <li>• Install and configure the software for STPs.</li> </ul>	30 days	120 days		
3 <sup>rd</sup> Milestone	<b>Month 5: Testing and Validation</b> <ul style="list-style-type: none"> <li>• Conduct extensive testing to ensure system functionality and reliability.</li> <li>• Validate data accuracy and compliance with regulatory standards.</li> </ul>	30 days	150 days	40%	90%
	<b>Month 6: Training and Handover</b>	30 days	180 days		

<b>Construction, Operation &amp; maintenance</b>	<b>Job to be completed for declaration of completion of the work</b>	<b>Time Allowed</b>	<b>Cumulative Time Allowed</b>	<b>% of fee payable</b>	<b>Cumulative %</b>
	<ul style="list-style-type: none"> <li>• Provide training to operators and administrators.</li> <li>• Handover system documentation and source code to the owner.</li> </ul>				
4 <sup>th</sup> Milestone	Successful O&M of dashboard for Six months	180 days	365 days	10%	100%
<b>O&amp;M</b>					
	Comprehensive mandatory efficient & successful Operation & Maintenance work of the dashboard and manpower deployment for 5 <sup>th</sup> years.	1825 days	1975 days	4.8% for each quarter (i.e. 20) = 96%	96%
	Final completion certification of O & M period/completion report.		1975 days	4 %	100%

- (a) Component-A: OCEMS- Quarterly progress reports shall be submitted by the contractor to the concerned Executing Agency of State for approval and payments shall be released based on the approval of the reports.
- (b) Component-B: CMS- Reporting requirement along with payment terms for CMS: As soon as practicable & not later than fifteen (15) days after the end of each quarter during the period of services, the Agency shall submit to the NMCG, the invoices for the amounts payable. Prior to that the quarterly reports shall be submitted by the Agency. The payment shall be made within thirty (30) days of after the receipt by the NMCG of duly completed bills with necessary particulars subject to the approval of the quarterly report. The Agency shall also obtain the monthly attendance reports from NMCG for each of the Personnel deployed by them and submit it along with invoices for the quarterly payments.
- (c) Payment will be made to the Agency within fifteen (15) days on completion of supply and acceptance by the Employer for each milestone. The Agency shall submit a pre-receipted bill/invoice along with satisfactory supply reports/ delivery challans duly signed by the Employer.
- (d) NMCG has right to inspect/ cross verify/ ask for delivery receipts pertaining to any/ all consignment at the time of processing of invoice.

- (e) Any penalties/ Liquidated Damages, as applicable, for delay and non-performance, as mentioned in this Contract, will be deducted from the payments for the respective supplies.
- (f) Taxes, if any and as applicable, will be deducted/ paid as per the prevalent rules and regulations.
- (g) Payment in case of those Materials which replacement or removal for defects or rejected shall be made only prescribed specification or alternate Materials have been delivered to the destination as required by the Employer.
- (h) All payments under this Contract shall be made to the accounts of the Agency as specified in SC.

## **10. Delivery**

- (a) The Agency, if faced with problems in timely delivery, which are beyond their control at any time during the contract, shall immediately inform the Employer in writing, about the causes of the delay and tentative duration of such delay etc. The Employer, on receipt of such notice, shall analyze the facts at the earliest and may at its sole discretion, extend the delivery/ Contract Period as deemed reasonable.
- (b) Any delay attributable to the Agency in the supply of Materials will make the Agency liable to any or all of the following:
  - i. Forfeiture of Performance Bank Guarantee
  - ii. Imposition of Liquidated Damage
  - iii. Termination of the Contract for default

## **11. Quantity Variation Clause**

The quantities mentioned in this contract are indicative only. The required quantities may vary to +/- 25%. However, the approved rate of each item as per Financial Bid and other terms and conditions shall remain unchanged during the period of the Contract. It will be entirely the discretion of the Employer to exercise this variation option or not. Additionally, the Employer reserves the right to not buy the quantities of some of the items that it does not require as stated in the Financial Bid.

## **12. Liquidated Damages/ Penalty for delayed services**

12.1. The liquidated damages shall be applicable under following circumstances:

### **12.1.1. Liquidated damages for delay**

If the deliverables are not submitted/supplied as per schedule as conveyed by the Employer, liquidated damages not exceeding an amount equal to 0.2% (zero point two per cent) of the contract value per day, subject to a maximum of 5% (five per cent) will be imposed and shall be recovered by appropriation from the Performance Security or otherwise. For the purpose of this clause, the contract value shall be calculated based on total cost of components A and B as per Table-Summary of costs (Annexure-C:

BOQ).

- 12.1.2. Liquidated Damages for error/variation: In case any error or variation is detected in the reports submitted by the Agency and such error or variation is the result of negligence or lack of due diligence on the part of the Agency, the consequential damages thereof shall be quantified by the NMCG in a reasonable manner and recovered from the Agency by way of deemed liquidated damages, subject to a maximum of 10% (ten per cent) of the contract Value.
- 12.1.3. Liquidated Damages for defect/variation: In case any defect or variation is detected in the supplied material by the Agency and such defect or variation is the result of negligence or lack of due diligence on the part of the Agency, the consequential damages thereof shall be quantified by the NMCG in a reasonable manner and recovered from the Agency by way of deemed liquidated damages, subject to a maximum of 10% (ten per cent) of the contract Value.
- 12.1.4. If supply of OCEMS from all 39 locations is not commenced by the Service Provider within 5 months from the date of contract, liquidated damages shall be levied as under: Liquidated damages will apply at the rate of 0.05% of the contract price per day of delay in case Service Provider delays commissioning in all 39 stations for commencing supply of aforesaid data. However, in case commissioning is delayed in lesser number of stations, amount of Liquidated damages referred to above shall be reduced on Pro-rata basis in proportion to the number of stations which are still to be commissioned. Maximum amount of liquidated damages shall be 10% of the contract price.
- 12.1.5. The Agency is supposed to ensure the desired numbers of spare inventory at hand however penalty clauses shall be prevailing in case of non-availability of sensors for reasons under the control of bidder like non availability of desired spares, non-calibration, etc.
- 12.1.6. The basis of penalty shall be as: Non Availability of Sensors - pH/TSS/COD/BOD /TN(eq) analyzer and Flow measured as total numbers of hours in which the devise was non-operational.
- |                            |        |
|----------------------------|--------|
| i. Upto 72 Hours           | - Nil  |
| ii. Between 72-120 Hours   | - 10%  |
| iii. Between 120-168 Hours | - 50%  |
| iv. Between 168-336 Hours  | - 75%  |
| v. More than 336 Hours     | - 100% |

These penalties shall be deducted on a monthly (720 hours) basis subject to availability of data on monthly O&M Cost.

Exclusions: Calibration, Force Majeure Clauses, Shutdown of Internet by Govt., Weather attributes etc.

- 12.1.7. The Agency shall mobilize the requisite team within time stipulated as per Letter of Award and Letter of handing over of site. In case of delayed mobilization, penalty upto 5% of the value of the quarterly payment will be imposed and shall be recovered from the bills submitted or otherwise.
- 12.1.8. During O&M phase penalties shall be applicable immediately with the start of the



### Operation & Maintenance Phase.

12.1.9. During O&M phase, It is expected that the System Integrator should comply with all the Policy/ Procedural / Regulatory Guidelines enforced by Government of India, and other statutory and related bodies, as amended from time to time. The System Integrator should also safeguard the Application Security and Application Integrity. Penalty would be applicable for non-compliance of relevant security certifications. There would be Zero Tolerance policy against such breaches.

12.1.10. During O&M phase, the analyzers for COD, BOD, TSS, PH, TN(eq) and Flow meter should be calibrated as per Guidelines for (OCEMS) & S.O.P. Version 1.0, issued by CPCB or as specified by manufacturer whichever is earlier. Noncompliance of same shall be considered under **clause 12.1.5 (above)** and penalty shall be imposed accordingly.

#### 12.1.11. **Workstation service levels - CMS**

The service level standards under this sub section pertain to all services which (i) do not impact the uptime of the equipment's (ii) are not related to security related services. Thus, if services are not available because of a virus attack, penalties under this sub section shall not be applicable. However, penalties may be attracted if any of the service mentioned in the sections are hampered because of shortage or unavailability of manpower. It is further clarified that in some cases breakdown of equipment may generate a service request for restoring services on another equipment and non-compliance of service level for the generated service request may lead to penalties:

Severity level	Service Description	Measurement Parameter	Target	Penalty
<b>1</b>	Fault/Alarm Clearance Resolution Time. Various service related to comprehensive onsite maintenance and Help Desk promptly	Resolution time measured as the time taken by the contractor to troubleshoot and fix the problem. Call will be treated as logged immediately after any incident/ problem occurs/ request made.	1 hour for incident of severity level 1;	1% of the Agreed Quarterly Payment for every 30 mins (or its part)delay.

2	Fault/Alarm Clearance Resolution Time. Various service related to comprehensive on site maintenance and Help Desk promptly	Resolution time measured as the time taken by the contractor to troubleshoot and fix the problem. Call will be treated as logged immediately after any incident/ problem occurs/ request made.	4 hours for incident of severity level 2;	0.5% of Agreed Quarterly Payment for every 60 mins delay.
3	Fault/Alarm Clearance Resolution Time. Various service related to comprehensive on site maintenance and Help Desk promptly	Resolution time measured as the time taken by the contractor to troubleshoot and fix the problem. Call will be treated as logged immediately after any incident/ problem occurs/ request made.	8 hours for incident of severity level 3;	0.25% of the Agreed quarterly Payment for every 120 mins (or its part) delay.

### 13. Performance Security

The Agency has furnished Performance Bank Guarantee No. \_\_\_\_\_ dated \_\_\_\_\_ amounting to Rs. \_\_\_\_\_/- (which is 5% of the total value of the contract) and valid for a period of sixty (60) days beyond the date of completion of all contractual obligations. In case the contract period is extended further, the validity of Performance Bank Guarantee shall also be extended by the Agency accordingly.

### 14. Rejection of Materials

- (a) Materials not approved during inspection shall be rejected and will have to be replaced by the Agency at his own cost within the time fixed by the Employer.
- (b) The rejected Materials shall be removed from Employer's premises by the Agency within Ten (10) days of intimation of rejection, after which Employer shall not be responsible for any loss, shortage or damage and shall have the right to dispose of such Materials at his discretion, at the Agency's risk and on his account.

### 15. Packing

- (a) The Agency shall provide such packing of the Materials as is required to prevent its damage or deterioration during transit to reach destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation and open storage.

- (b) The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as is required for such Materials.

## 16. **Transportation**

The Agency shall be responsible for transport by any means viz. sea, rail, road or air and delivery of the material in the good condition to the Employer at destination. In the event of any loss, damage or any shortage the Agency shall be liable to make good such loss and shortage found at the checking/ inspection of the Materials by the Employer. No extra cost on such account shall be admissible.

## 17. **Assignment or Transfer of Obligation:**

This Contract shall inure to the benefit of each of the parties and their respective successors and neither party shall otherwise assign the benefit or burden of this Contract to any others, without the previous written consent of the other party.

## 18. **Indemnity**

The Agency shall indemnify, protect and save the Employer/NMCG against all claims, losses, costs, damages, expenses, action suits and other proceeding, resulting from infringement of any law pertaining to patent, trademarks, copyrights etc. or such other statutory infringements in respect of all the Materials supplied by him.

Employer reserves the right to recover the cost towards any damage/loss caused due to the negligence on the part of the Agency engaged.

## 19. **Settlement of Disputes**

- 19.1. **Amicable Settlement:** Performance of the contract is governed by the terms & conditions of the contract, in case of dispute arises between the parties regarding any matter under the contract, either Party of the contract may send a written Notice of Dispute to the other party. The Party receiving the Notice of Dispute will consider the Notice and respond to it in writing within 30 days after receipt. If that party fails to respond within 30 days, or the dispute cannot be amicably settled within 60 days following the response of that party, Arbitration clause mentioned hereunder shall become applicable.
- 19.2. **Arbitration:** In the case of dispute arising upon or in relation to or about the contract between the Employer and the Agency, which has not been settled amicably, any party can refer the dispute for Arbitration under (Indian) Arbitration and Conciliation Act, 1996. Such disputes shall be referred to an Arbitral Tribunal consisting of 3 (three) arbitrators, one each to be appointed by the Employer and the Agency, the third arbitrator shall be chosen by the two arbitrators so appointed by the parties and shall act as Presiding Arbitrator. In case of failure of the two arbitrators, appointed by the parties to reach a consensus regarding the appointment of the third arbitrator within a period of 30 days from the date of appointment of the two arbitrators, the Presiding arbitrator shall be appointed by the Secretary of the Ministry / Department. The Arbitration and Conciliation Act, 1996 and any statutory modification or re-enactment thereof, shall apply to these arbitration proceedings.

- 19.3. Arbitration proceedings shall be held in New Delhi, India and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.
- 19.4. The decision of a majority of arbitrators shall be final and binding upon both parties. The expenses of the arbitrators as determined by the arbitrators shall be shared equally by the NMCG and the Agency. However, the expenses incurred by each party about the preparation, presentation shall be borne by the party itself. All arbitration awards shall be in writing and shall state the reasons for the award.

**20. Miscellaneous Provisions:**

- 20.1. Nothing contained in this Contract shall be construed as establishing or creating between the Parties, a relationship of master and servant or principal and agent.
- 20.2. Any failure or delay on the part of any Party to exercise right or power under this Contract shall not operate as waiver thereof.
- 20.3. The Agency shall notify the NMCG of any material change in their status, in particular, where such change would impact on performance of obligations under this Contract.
- 20.4. In case of a Consortium/JV, each member of the Agency shall be jointly and severally liable to and responsible for all obligations towards the NMCG for performance of works/services including under the Contract.
- 20.5. The Agency shall always indemnify and keep indemnified the NMCG against all claims/damages etc. for any infringement of any Intellectual Property Rights (IPR) while providing its services under the Contract.
- 20.6. The Agency shall always indemnify and keep indemnified the NMCG against any claims in respect of any damages or compensation payable in consequences of any accident or injury sustained or suffered by its (the Agency's) employees or agents or by any other third Party resulting from or by any action, omission or operation conducted by or on behalf of the Agency.
- 20.7. The Agency shall always indemnify and keep indemnified the NMCG against any and all claims by Employees, Workman, Contractors, sub-contractors, suppliers, agent(s), employed engaged or otherwise working for the Agency, in respect of wages, salaries, remuneration, compensation or the like.
- 20.8. All claims regarding indemnity shall survive for a period of 1 year post the termination or expiry of the Contract.
- 20.9. It is acknowledged and agreed by all Parties that there is no representation of any type, implied or otherwise, of any absorption, regularization, continued engagement or concession or preference for employment of persons engaged by the Agency for any engagement, service or employment in any capacity in any office or establishment of the Government of India or the NMCG.

**21. Jurisdiction of Courts**

Jurisdiction of courts for dispute resolution shall be New Delhi only.

### III. SPECIAL CONDITIONS OF CONTRACT

SCC Clause No.	Ref. of GC Clause No.	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
1.	1.4	<p><b>Addresses:</b>  <b>NMCG:</b>  National Mission for Clean Ganga  (Department of Water Resources, River Development &amp; Ganga Rejuvenation, Ministry of Jal Shakti),  1<sup>st</sup> Floor, Major Dhyan Chand National Stadium,  Near India Gate, New Delhi -110002  Tel: +91-11-23072900/901; Fax: +91-11-23049567</p> <p><b>Agency:</b>  <b>(Contact Persons name and contact details)</b>  .....  .....  .....</p>
2.	4.1	Effective date of contract.....
3.	4.2	Commencement of Services.....
4.	4.4	The time period shall be _____. The period could subsequently be extended for a further period of 2 years, on year by year basis based on satisfactory performance of the Consultant.
5.	4.6	The Contract Price is Rs. _____ (Rupees.....) inclusive of all applicable taxes.
6.	9 (h)	Account Details of the Agency: Name and Address of the Beneficiary: Bank: Branch: Address of the Bank: Account Number: Account Type: RTGS/NEFT/IFSC CODE: MICR NO:

**Appendix A: Scope of work**

**Appendix B: Letter of Award (LoA) issued by the Employer**

**Appendix C: Copy of BOQ**

**Appendix D: Working Hours and Holidays for Agency's Personnel**  
*(refer GC Clause 7)*

1. The Agency shall:

(a) ensure that the Personnel engaged by them to observe the official timings, practices, etiquettes, norms etc. as is required from the officials of the NMCG or as communicated to them by the Nodal Officer (s) of the NMCG so authorised.

(b) ensure that the Personnel engaged by them to observe holidays as are applicable to the officials, employees, consultants of the NMCG. The Agency shall ensure that all its Personnel deployed in NMCG enroll themselves in the biometric attendance system as applicable to the NMCG personnel. In case of Holidays, the norms applicable to the NMCG shall be applicable to the Personnel of the Agency. However, in case of exigencies, NMCG may require the Agency to depute such Personnel to work on holidays and late hours without any additional payments in this regard. If the personnel are out of station on tour or otherwise, the Nodal Officer of NMCG shall be kept informed by the Agency in this regard.

**Appendix E: Performance Bank Guarantee**

**Financial Proposal (BoQ)**

**(This form is provided at GeM portal [<https://gem.gov.in/>]. Bidders are advised to download and fill the required details in the permitted cells and upload the same)**