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GUIDELINES FOR RECOGNITION OF ENVIRONMENTAL LABORATORIES UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

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Addendum II Copy of Gazette Notification No S.O.2340 (E), dated 16th June, 2021 for Delegation of powers for recognition of Environmental Laboratories under the Environment (Protection) Act, 1986 to Central Pollution Control Board by MoEF&CC

Addendum III Amendment Notification S.O. 2409 (E), dated 19th June 2024
Addendum IV Glossary of Terms - Laboratory Quality Assurance (QA) and Quality Control (QC) system

Sampling and analysis charges applicable at CPCB laboratories for Environmental Samples (Please refer Gazette Notification No. 163, dated 23rd Feb 2022).

CHAPTER 1.0

INTRODUCTION

1.1 Environmental Laboratory

Environmental laboratory plays predominant role in assessing the status of environment comprising both abiotic (soil, water and air) and biotic (flora, fauna and human being) components. Environmental laboratory is a building where processing and testing of samples collected from the environmental media (air, emissions, water, waste water, soil, sludge, sediments biota etc.) is taking place. The environmental laboratory is also responsible for monitoring of industrial solid waste, municipal solid waste, hazardous waste, biomedical waste etc. that affect the environment, humans and wildlife.

The environmental laboratories are the essential cornerstones of any effective pollution control programme, that provide qualitative as well as quantitative data for appropriate decision making. For generating this valuable data with a desired accuracy and to quantify concentration of the constituents present in the samples, the laboratory should have the standard facilities, trained manpower and capabilities to achieve the above goals. The qualifications and experience of laboratory technicians / personnel, play a significant role in generating standardized protocols, proper techno- scientific sampling of environmental matrices and their accurate and quality analysis to produce scientifically reliable and legally defensible data.

"For successful implementation of environmental protection programme, it is essential to identify and quantify the pollution sources, pollutants, conduct baseline survey, lay down standards and build-up monitoring systems". A competent laboratory is required to meet out these requirements with all necessary instruments, equipment, expertise, capabilities etc.

Present Guideline intends to provide a comprehensive manual describing about the complete requirements that has to be fulfilled by the environmental laboratories seeking for Recognition under The Environment (Protection) Act, 1986. This guideline also explains the complete procedure of recognition right from the registration to the publication of gazette notification.

1.2 Legal Provisions of Recognition of Environmental Laboratory

The need for laboratories in implementation of the various Pollution Control Acts laid down for the protection of the environment is essential under the following sections of Act.

1.2.1 The Environment (Protection) Act, 1986

Under Section 12 (1)
The Central Government may, by notification in the Official Gazette-

a) establish one or more laboratories,

b) Recognize one or more laboratories or institutes as environmental laboratories to carry out the functions entrusted to an environmental laboratory under this Act.

Under section 12 (2)
The Central Government may, by notification in the Official Gazette, make rules specifying-

a) the functions of the environmental laboratory

b) the procedure for the submission to the said laboratory of samples of water, air, soil or other substance for analysis or tests, the form of the laboratory report there on and the fees payable for such report;

c) such other matters as may be necessary or expedient to enable that laboratory to carry out its functions.

Under Section (13)

The Central Government may by notification in the official Gazette, appoint or recognize such persons as it thinks fit and having the prescribed qualification to be Government Analysts for the purpose of analysis of samples of water, air, soil or other substances sent for analysis to any environmental laboratory established or recognized under sub-section (1) of section 12 of The Environment (Protection) Act, 1986.

1.2.2 Functions of Environmental Labs as specified under Rule 9 of The Environment (Protection) Rules, 1986

i. To evolve standardized methods for sampling and analysis of various types of environmental pollutants.
ii. To analyze samples sent by the Central Government or the officers empowered under sub-section (1) of section 11 of E(P)A, 1986
iii. To carry out such investigations as may be directed by the Central Government to lay down standards for the quality of environment and discharge of environmental pollutants, to monitor and to enforce the standards laid down.
iv. To send periodical reports regarding its activities to the Central Government.
v. To carry out such other functions as may be entrusted to it by the Central Government from time to time.

1.3 Objectives for Recognition of the Laboratory under the Environment (Protection) Act, 1986

The main objective of recognition of Environmental laboratory under the Environmental Protection Act, 1986, is to develop a laboratory equipped with all the facilities and infrastructure capable to analyze the environmental quality parameters of major concern (prescribed parameters). Since the recognition has been granted in line of the guidelines and the laboratories are notified under the Government of India Gazette following the approved procedure along with periodical surveillance, stands the credibility of these laboratories.

The up-to-date list of Environmental laboratories recognized under The Environment (Protection) Act, 1986 are posted and updated periodically on the CPCB Website along with its scope, so that the organizations working for various projects in the fields of environment may utilize the services of these recognized laboratories.

1.4 Delegation of powers for Recognition of Environmental Laboratories under the Environment (Protection) Act, 1986 to Central Pollution Control Board (CPCB) by MoEF&CC

In exercise of the powers conferred under section 23 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government delegated the powers to CPCB by issuing the Gazette Notifications with respect to grant of recognition to environmental laboratories as follows: -

Gazette Notification No. S.O.145 (E), Dated 21st February, 1991 (Addendum-1), the powers delegated for recognition of the laboratories are reproduced as below:

1. The Central Government hereby delegates the powers with respect to grant of recognition to laboratories or institutes as environmental laboratories and to appoint or recognize Analysts as Government Analysts, as conferred by clause (b) of sub-section (1) of Section 12 and section 13 respectively of the Environment (Protection) Act, 1986 to the Central Pollution Control Board.
2. Recognition of private laboratories under clause (b) of sub-section (1) of section 12 of the Environment (Protection) Act, 1986 as well as recognition of their Analysts as Government Analysts under section 13 of the Environment (Protection) Act, 1986, will continue to be done by the Central Government.
3. The laboratories recognized under clause (b) of sub-section (1) of section 12 of the Environment (Protection) Act, 1986 shall be specified as Government/ Autonomous/Public Sector Undertaking/Educational Institution/ State or Central Pollution Control Board Laboratories.

Gazette Notification No. S.O. 2340 (E) dated 16th June 2021 (Addendum-2) and amended Notification S.O. 2409 (E)dated 19th June 2024, The powers delegated for recognition of the laboratories are as below:

Recognition of environmental laboratories (Govt. & Private) under clause (b) of sub-section (1) of section 12 of the said act as well as recognition of their Analysts as Government Analysts under section 13 of the Environment (Protection) Act, 1986, shall be done by the Central Pollution Control Board.

1.5 Benefits of Recognition and Accreditation to the Laboratory

The Recognition granted to an eligible environmental laboratory signifies that the laboratory has all the major requisites for assessing the quality of environment by analyzing all the concerned parameters under its scope. The recognition also provides many other benefits as below:

- EPA recognition is a mandatory requirement by some of the SPCBs / PCCs for empanelment of laboratories under The Water Act, 1974 and Air Act, 1981.
- Recognition/Accreditation is not about who the best is, but identifies the laboratory which has a system of standard procedures with aim to improve the analytical quality and safety.
- The Accreditation/Recognition of labs improves facilitation of accurate analysis, efficiency of treatment and reduction of errors in the laboratory process.
- The Recognition and Accreditation increases operational efficiency and productivity.
- Increase of confidence in testing/calibration data and personnel performing work.
- Savings in terms of time and money due to reduction or elimination of the need for re-testing of analysts/products.

- Better control of laboratory operations and feedback to system that the concerned laboratory is technically competent. Thus it boosts reputation of the laboratory among analytical services seekers.
- Potential increase in business due to enhanced customer confidence

Following paragraphs of this guideline describe the prerequisite, mandatory and other requirements and detailed procedure for seeking recognition under environmental Protection Act, 1986 by any Environmental Laboratory

CHAPTER 2.0

REQUISITE GUIDELINES FOR APPLICATION FOR RECOGNITIONOF ENVIRONMENTAL LABORATORIES UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

2.1 Recognition under the Environment (Protection) Act, 1986

The environmental laboratories shall be granted recognition (Fresh/Renewal) under Section 12 and 13 of the Environment (Protection) Act, 1986 for the period of three years with valid accreditation of National Accreditation Board for Testing and Calibration Laboratories Accreditation (ISO/IEC 17025:2017) and certification for Occupational Health and Safety Management System (IS/ISO 45001:2018), under the provisions of the said Act, throughout the recognition period for-

a. Fresh or renewal of recognition of laboratory;
b. Changes in the name of Government Analysts;
c. Shifting and Name change of laboratory premises.

One month before expiry of validity period, the laboratory has to apply for renewal.

2.2 Who can apply for Recognition - Category of the Laboratory

The Environment laboratories of any of the following organizations shall be eligible to apply for recognition**:**

- Autonomous & Govt. Dept./Institutions including Pollution Control Boards/Committees
- Public Sector Undertaking
- Educational Institutes (Govt./Govt. Aided/Private)
- Private Laboratories
- Non Govt. Organization (NGO)
- Co-operative Sector Laboratories
- Public Private Partnership (PPP) Laboratories
- Others

2.3 Application Fees for Recognition

The Following fee for processing of applications with respect to grant of recognition to Environmental laboratories under the Environmental (Protection) Act, 1986, has to be paid along with the application by applicant laboratory.

Application	Application Fee
Fresh Application ➢ **Applying for the first time** ➢ **Applying after the expiry of current recognition**	**Rs. 50,000/- + GST as applicable** *(In case application is rejected on account of not fulfilling mandatory requirement only 50% of fee will be refunded)*

➢ **Name or Address change of Laboratory**	
Renewal of Recognition/ Changes in the name of Govt. Analysts	**Rs. 25,000/- + GST as applicable**

The Laboratories applying for EPA recognition are required to submit fee through payment gateway at the time of filing the application via Web-portal in the designated Account.

2.4 How to Apply for Recognition

The environmental Laboratory (Private or Government), seeking recognition (Fresh/Renewal) *for the first time*, may apply through dedicated Web-Portal specific for Laboratory Recognition under the Environment (Protection) Act, 1986 namely "http://cpcbepalab.in/epalab" available at CPCB Website by filling up all the desired information and submitting the prescribed fee as per the following steps.

Step-1 Registration:
This is the initial step which covers the basic information of laboratory like name, address and contact details of the laboratory. The login ID and the password will be generated in this step by sending SMS or creating one-time password (OTP) for verification at the end of CPCB. After the login through registered ID, the portal system will take the laboratory to the next section.

Step-2 Type of recognition:
In this step laboratory has to select the type of recognition for which it is applying for whether new/ renew/ other.

Step-3 Pre-Requisite:
In this step laboratory has to fill/upload all the information as a pre-requisite requirement as mentioned at para 2.9. If the laboratory fails to comply with any of the pre-requisites, the application will not be accepted by the system. This information has to be filled at the time of fresh recognition or first time registration in the portal.

In case laboratory changes its Name, it has to apply afresh as new registration with new name.

Step-4
After completing the first three steps the web-portal will take the laboratory to the new window, where the laboratory has to fill the complete details of laboratory, scope of recognition, quality control activities, video coverage of the lab and photos of laboratory sections with GPS location.

Step-5
The applicant laboratory has to complete the required information at various sections of the application and also upload relevant supporting document as required by the system.

Step-6

The laboratory has to self-check, whether all the documentation required as in the documentation checklist at para ahead have been uploaded at relevant para of online application. until the entire application is filled up, completed and ready for online submission

In case of Renewal, where there is any change in application, laboratory has to follow the steps 4 - 6.

2.5 Duration of Recognition

Environment laboratory will be recognized for three years with valid accreditation (ISO/IEC 17025: 2017) and cerification (IS/ISO 45001:2018) during the recognition period.

2.6 Expiry of Recognition

The laboratory's recognition shall not be valid after expiry of recognition period, if application is not submitted for renewal before the expiry of recognition.

2.7 Renewal of Recognition

If there is no change with respect to the following, (An undertaking in this regard has to be submitted)

- Name and premises of the laboratory
- Scope of the recognition
- Government Analyst
- Instrument/Equipment

The laboratory can apply for renewal with the prescribed fee, by submitting the **valid renewal certificates of ISO/IEC 17025:2017 (NABL) and IS/ISO 45001:2018, the updated details of CRM, existing manpower and calibration details of instruments/ equipment.**

Note: In case there is any change on the above, the laboratory has to submit fresh complete application with prescribed fee.

2.8 Submission of application for Renewal of Recognition

Laboratories presently with valid recognition, are advised to apply for renewal of recognition atleast one month before the expiry of their existing recognition with valid ISO/IEC 17025:2017 or IS/ISO 45001:2018 to avoid discontinuation of recognition. The applications submitted after the expiry of recognition shall be treated as a fresh recognition.

2.9 Pre-requisite Requirements for application

Laboratories has to fulfil the following pre-requisites applying for the New/ Renewal of Recognition, failing which the laboratory can not move to next step of application:

- Laboratory Legal Entity/ Certificate of incorporation/ Registration/ Authorization
- Whether laboratory situated in authorized area
- Valid Certificate of Laboratory Accreditation as per ISO/IEC 17025:2017
- Valid Certificate of Occupational Health and Safety Management System as per ISO 45001:2018

- Number of Man-Power: Laboratory has to fulfill minimum requirement of total number of 9 manpower
- Area of the Laboratory: The laboratory has to fulfill the criteria of minimum working area requirement of 150 Sq. mt. excluding administration and accounts.

2.10 Complete details of Mandatory Requirements of EPA Recognition

2.10.1 Laboratory Legal Entity/Certificate of Incorporation/ Registration/ Authorization

The laboratory (Private/NGOs) under consideration for Recognition under the Environment Protection Act 1986 must be legally identifiable and duly registered with an appropriate statutory body i.e. Local Bodies, State Govt. or Central Govt. For certification of Legal Identity of the laboratory – any one or more of the following documents/Registration Certificate needs to be submitted along with the application for New/Renewal of recognition. The copy of registration certificate must be uploaded while applying through Web-portal. In case laboratory changes its premises or Name, it has to apply afresh with new registration of the new premises/ New Name whatever is the case.

i) Certificate of Registration by Company Registrar and Memorandum of Articles in case the laboratory belongs to a Limited Company
ii) Document issued as per Societies Registration Act or Indian Trust Registration Act
iii) Partnership Deed and copy of registration under the Limited Liability Partnership Act 2008
iv) In case of Government Body; Gazette or Government Notification or self-Declaration on Letter head by Head of the organization

Note: In case the document(s) of address proof and legal identity is (are) in the local language, then their authenticated English Translation may preferably be provided

2.10.2 Laboratory Site / Location in designated authorized area

Laboratory must be situated in designated authorized area as certified by the registering authority. Authenticating the premises of laboratory - any one or more of the following document needs to be submitted

i) Certificate from Registrar of Firms or Directorate of Industries or Industries Centre
ii) Municipal Corporation / Local Body / MSME/Pollution Control Board or any such Govt. document indicating premises of the applicant laboratory.

2.10.3 Mandatory Accreditation & Certification

The laboratory has to submit details of mandatory accreditation as per ISO/IEC 17025:2017 along with its validity as well as for IS/ISO 45001:2018. The copies of these certificates should be uploaded with the application, wherever required. The application received without having mandatory ISO 17025 Accreditation and ISO 45001 Certification will be summarily rejected.

2.10.4 Submission of Detailed Scope of ISO/IEC 17025 Accreditation

The laboratory has to provide information regarding each parameter whether it is under scope of ISO/IEC 17025:2017 and also a copy of Scope of ISO/IEC 17025:2017 Accreditation depicting various parameters and discipline for which the accreditation has been granted needs to be submitted with the application.

All the critical parameters identified by CPCB for recognition should cover under the scope of ISO/IEC: 17025 Accreditation.

2.10.5 Laboratory Total Work Area

The laboratory should have sufficient working area to accommodate all its analytical and supporting activities. There should be total minimum floor space of 150 Sq meter excluding the area allotted to Administration and Accounts as detailed ahead in Table 7.1

Table 2.1 Laboratory Minimum area/Floor space section wise requirement

S.No.	Laboratory Sections	Minimum Space in Sq.mt.
1.	Water Analysis Section (Potable water, Ground Water, Natural water (Lakes, Rivers, Wetlands, Estuaries)	60 sq m
2.	Waste Water Analysis Section (Sewage, Industrial Effluents, other waste waters)	
3.	Soil, Sediments, Sludge/Slurry and HW Analysis Section	
4.	Microbiological & Biological Analysis Section	15 sq. m
5.	Ambient Air & Source Emission Monitoring & Analysis Section	25 sq m
6.	Instrumentation Section (Common instruments/ equipment and supporting for other analytical sections)	30sq m
7.	Instrumentation Section (Sophisticated Instruments)	
8.	Sampling Equipment, Storage area including compressed gas storage area, Common library, Committee Room & Staff area	20 sq m
Total Area		**150 sq m**

Note The dimensions of individual section may vary but Minimum covered area of the Environmental laboratory should not be less than 150 sq. mt.

The applicant environmental Laboratory shall upload its detailed layout plan with dimensions at the time of submitting application for the recognition.

2.10.6 Man-Power-Details

The Laboratory must have sufficient skilled manpower according to the Work load of the laboratory. The Manpower employed must be capable of doing specific works allotted to them. The laboratory shall submit the details of all the existing manpower including with the top and senior management as per hierarchy with their Name, Age, Qualifications, Experience details, working at the laboratory since, job responsibilities, emoluments drawn per annum etc. in the format given in **Annexure II**.

The laboratory should have atleast 09 number with following skilled manpower;

Table 2.2: Indicative list of the Typical Manpower for an Environmental Laboratory

S. No.	Position	Qualifications	Experience	Nature of Work
1.	Head of Laboratory/Equivalent	Ph.D./M.Sc./M.Tech.	>10 years	Laboratory Management, & Supervisory
2.	Environmental Scientist/Equivalent	Ph.D./M.Sc.//B.Tech.	>5 years	Supervision & Analysis
3.	Junior Scientist (Chemical)/Equivalent	M.Sc. (Chemistry/ Environmental Science	> 3 years	Instrumental Analysis
4.	Junior Scientist /Equivalent (Microbiology)	M.Sc. (Microbiology/ Environmental Science)	>3 years	Microbiological Analysis
5.	Technical Officer/Assistant /Equivalent	M. Sc./B.E./ B.Tech./Dip. Engg	>3 years	Sampling and Analysis
6.	Laboratory Analysts	M. Sc./B.Sc.	.>2 years	Laboratory Analysis
7.	Laboratory/Field Assistants /Equivalent	B.Sc. Chemistry, Zoology, Botany	>2 years	Sampling and Analysis
8.	Laboratory Attendant/ Multitasking Staff (MTS) /Equivalent	12^{th}/Matriculate	-	Assistance in Sampling & analysis
9.	Administration / Accounts	B.Com/BA/BSc	>2 years	Accounts& Administrative matters

The desired qualification of the personnel involved in the laboratory activities should possesses the below mentioned qualification**.**

Table 2.3: Recommended qualifications of laboratory and field monitoring personnel:

S. No	Activity	Minimum Educational Qualification
1.	Analysis of Air/ Water	Graduates/Post Graduates in Chemistry/Environmental Sciences
2.	Analysis of Soil/hazardous wastes	Graduates/Post Graduate in Chemistry/Environmental Sciences/ Agricultural Sciences
3.	Analysis of Microbiological parameters & Biomonitoring	Graduates/Post Graduates in Biochemistry/Microbiology/ Environmental Sciences/ Agricultural Sciences
4.	Water & Soil sampling	Graduates in Chemistry/Environmental Sciences/Agricultural Sciences/ Graduate/Diploma in Engineering 10+2 with science
5.	Air sampling	Graduates in Chemistry/Environmental Sciences/ Engineering/ Physical sciences/ Diploma in Engineering
6.	Assistance in Laboratory	10+2 with Science/Diploma
7.	Field Assistant	Diploma in engineering/ITI

2.10.7 Laboratory Organization Structure

The applicant laboratory while submitting the application for new/renewal of recognition has to attach the respective Laboratory's Organization Chart clearly depicting all positions, the hierarchy, the names of present incumbents, analysts and their brief responsibilities with the application.

2.10.8 Work Allotment Details

The Laboratory has to provide work allotment details of the personnel involved in the various activities of the laboratory in prescribed column of application.

2.10.9 Training Details of Man power

The officials involved in various laboratory activities must be well trained and aware with the work assigned to them therefore the laboratory is required to provide the training details of all the laboratory personnel

2.10.10 Code of Ethics & Integrity of Analytical Reports

The undertaking for maintaining Code of Ethics & to maintain Integrity of Analytical reports at the laboratory shall be furnished, in the specified format (**Annexure I**) on the laboratory's official letterhead duly signed and sealed by the Head of the Organizarion/laboratory, the undertaking may be furnished by the Head of the Laboratory.

2.10.11 GST/PAN Registration

The laboratory should have registered under Goods & Services Tax Act and secured GST number, which needs to be mentioned in the application. Similarly, the Income Tax PAN number, also to be indicated in the application.

2.10.12 Geo tagging Details

Laboratories are required to provide their location in terms of Latitude and Longitude. For that laboratories are to pin their location in the map provided in the Web-portal to create latitude and longitude for showing exact location of the lab in the map.

2.10.13 Laboratory Photographs

Laboratory has to upload the digital photographs of various sections of the laboratory to depict clear picture of the working status of laboratory. All the major analytical and other areas should be covered while taking the photographs. Photographs of following area but not limited to, are to be uploaded on web-portal at the time of submission of application for recognition.

1. Outer View of the laboratory, Building Front Elevation structure
2. Water Analysis Section (Potable water, Ground Water, Natural water (Lakes, Rivers, Wetlands, Estuaries)
3. Waste Water Analysis Section (Sewage, Industrial Effluents, other waste waters)
4. Microbiological & Biological Analysis Section
5. Ambient Air & Source Emission Monitoring & Analysis Section
6. Soil, Sediments, Sludge & Slurry Analysis
7. Wastes (Industrial Solid Waste, Municipal Solid waste) Analysis Section
8. Hazardous Waste Analysis Section
9. Miscellaneous Analysis Section
10. Instrumentation Section
11. Library & Conference/Committee room
12. Laboratory Staff Sitting area
13. Laboratory Waste Collection, Segregation and disposal
14. Gas storage and distribution area

2.10.14 Laboratory Video Clipping

The Laboratory has to prepare one short video with geotags covering all its activities relevant to the EPA Recognition (infrastructure, facilities, manpower etc.) and to provide its Google drive link, while submitting the application. Lab video shold not be more than 2 minutes.

2.10.15 Environmental Parameters Analyzed and details of their Analytical Method, Range of analysis, MDL etc.

The laboratory has to provide complete information about various parameters analysed matrix wise, details of their Analytical methods, Range of Analysis, Minimum Detection limit in the relevant column of the application. The complete list of parameters is given at **Annexure –IV.** The laboratory may apply for all or any of these parameters. However, there are minimum number of analytical parameters are required for Recognition under the Environment (Protection) Act, 1986 under each matrix as per **Annexure –III. These parameters have been summarized in the table as** given below.

Table: 2.4 ANALYTICAL PARAMETERS FOR RECOGNITION

Discipline/ Group: WATER AND WASTEWATER		
S.No.	**Category**	**Mandatory parameters**
W(A)	Physical Tests	08
W(B) Inorganic	(i) General& Non-metallic	15
	(ii) Trace Metals	20
W(C)	Organics (General) and Trace Organics	06 (21)
W(D)	Microbiological Tests	04
W(E)	Toxicological Tests	01
Discipline/ Group: SOIL/SEDIMENT:WASTE (Liquid/Slurry/Sludge/Solid/Semi-solid), Plastic waste, Municipal Solid waste		
S(A)	Soil/Sludge/Sediment and Solid Waste	07
S(B)	Hazardous Waste Characterization/Analysis	08
Discipline/ Group:AIR		
A(A)	Ambient Air	12
A(B)	Stack gases/source emission	09
A(C)	Noise level	02
A(D)	Meteorological Monitoring	05

Laboratory seeking recognition should compulsorily have comprehensive analytical facilities for all the parameters for which the recognition is applied in a particular group. Mandatory parameters and applied secondary parameters should be covered under the scope of accreditation as per ISO/IEC 17025: 2017 and recognition shall be granted only for those parameters, which are covered under the scope of accreditation as per ISO/IEC 17025: 2017.

2.10.16 Use of Validated Analytical Methods

The analytical testing at the environmental laboratory should be performed by using only validated methods prescribed internationally/nationally are envisaged. While submitting application for Fresh/Renewal of recognition under the Environment (Protection) Act, 1986, the laboratory has to submit details about the methodology used for analysis of respective analytes. The list of parameters with suggestive methods are given at **Annexure V**.

2.10.17 List of Reference Material/Certified Reference Material

The laboratory has to fill-up the complete information about availability of various Reference Material (RM) as well as Certified Reference Material (CRM) in the relevant column of the application. The expiry date of each should also be mentioned.

2.10.18 Technical Infrastructure and Equipment

The laboratory should have quality infrastructure in conformity with the analytical services requirement expected from a reputed environmental laboratory. The laboratory shall maintain sufficient sampling and sample processing equipment, analytical and support instruments/equipment to conduct required analytical operations. The laboratory shall maintain up-to-date inventory of all instruments/equipment. The laboratories submitting their application of New/Renewal of Recognition under the Environment (Protection) Act 1986 must fill up the information about the availability of various sampling, sample processing and Analytical instruments/equipment (as per **Annexure VI&VII**) at their laboratory in the prescribed column in the application while submitting the application.

2.10.19 Calibration status of important instruments / equipment with accepted validity

While completing information in the application, the laboratory has to provide all the details of instruments and equipment including with range accuracy and calibration details in the relevant column of web-portal with indication of validity of calibration of respective instrument/equipment.

2.10.20 Maintenance of Laboratory Instruments/Equipment

The applicant laboratory has to submit details of Instrument/Equipment under warranty, after sales service/ Maintenance contract (AMC, breakdown contract or other type) in the relevant column in the application.

2.10.21 Participation in Inter-Laboratory Analytical Quality Control (IQC) / Proficiency Testing (PT)

The laboratories desirous to seek recognition under the Environment (Protection) Act, 1986 shall participate in all inter-laboratory comparison exercise conducted by the Central Pollution Control Board and a proficiency testing programme conducted by the proficiency testing provider certified under ISO/IEC: 17043, covering all the parameters under recognition, within two years from the date of recognition. The Laboratory should achieve Z-Score below 2.0 for all the parameters and the parameters for which the desired score could not be achieved have to be re-participated in the PT through an authorized PT provider and submit the satisfactory report. The performance Report of the past two or three years of PT / ILC Exercise has to be uploaded during filing of the online application for Fresh/Renewal recognition.

2.10.22 Compulsorily Participation in Inter-Laboratory Analytical Quality Control (AQC) conducted by CPCB

The environmental laboratories recognized under The Environment (Protection) Act, 1986 have to compulsorily participate in Analytical Quality Control exercises organized by Central Pollution Control Board as per the plan posted on CPCB official website. CPCB may also send environmental samples to the recognized laboratory to keep constant check over the analytical results generated by the recognized laboratory and results will be provided to the CPCB.The performance of recognized environmental laboratory in

Analytical Quality Control Exercise should be satisfactory (should not be less than 70%) during the recognition period. In case, the performance of the laboratory has been found below the desired standard, the laboratory has to take immediate necessary action to maintain the analytical quality at the laboratory.

Past three Results of compulsory participation in Analytical Quality Control conducted by CPCB have to be submitted by the laboratory in the application. If the performance of the laboratory is not found satisfactory in any two Analytical Quality Control (AQC) out of the last three AQC in past, in that case, laboratory has to submit Root Cause analysis of parameters (unsatisfactory performance) and also submit satisfactory performance of those parameters by participating in another PT/ILC exercise as per requirement of NABL-163.

2.10.23 CPCB AQC Participation Fees

For participation in the CPCB AQC programme, Environmental Laboratories have to submit participation fees in the respective Inter-laboratory AQC Exercise. The fee submission details have to be provided timely to the concerned Laboratory Head at Central Pollution Control Board, Delhi for ensuring the participation in the AQC. **(Annexure IX)**

2.10.24 Government Analyst

A person shall not be qualified for appointment or recognized as a Government analyst unless he or she is possessing following age, qualification and experience.

Age: The Government Analyst under nomination should not have attained the age of the age of 65 yrs or retirement age, whichever is less.

Qualification & Experience: graduation in science from a recognized university with five year experience in environmental investigation, testing and analysis; or

Post-graduation in science/ environmental science or a graduate in engineering or a graduate in medicine or equivalent with two years' experience in laboratory engaged in environmental investigation, testing and analysis.

The applicant laboratory should recommend the names of senior officials involved in analytical operation in the laboratory and fulfilling the criteria for Govt. Analyst in the application proforma in the Web-portal.

The notification of the Government analyst shall deemed be cancelled either he/she leaves the job or the recognition of laboratory gets expired. Laboratory shall immediately inform to CPCB regarding the same and apply for his/ her replacement atleast one month before his/ her leaving the job.

2.10.25 Nomination for proposed Govt. Analysts

The laboratory (Pvt. Lab) has to nominate maximum three senior level analysts for consideration as Govt. Analyst at the laboratory as per Section 13 of the Environment (Protection) Act 1986, in case the laboratory is recognized under the said Act.

2.10.26 Submission of Bio Data by respective nominated Govt. Analyst

The nominated personnel from the laboratory for consideration of Govt. Analyst have to upload their detailed bio-data/Resume including with training details in the specified format at **Annexure XII** for consideration of Recognition under The Environment (protection) Act 1986. The documentary evidences of qualification, experience, training obtained in the field of sampling and analysis of environmeal samples has to be submitted along with the biodata.

2.10.27 Terms & Conditions for Recognition of Government Analyst

The analysts recommended by the laboratory in the application will be considered and selected by CPCB as Government Analyst. These selected analysts will have to submit Acceptance of Terms &Conditions by Govt. Analyst unconditionally, as specified in the application as per **Annexure XI**.

2.10.28 Substitution of Govt. Analyst during the period of recognition

The Laboratory should appoint their analyst atleast for the period of validity of Recognition. Even though, if any of the recognized Govt. analysts by CPCB, vacates his position due to superannuation / death / resignation from the services of the concerned laboratory, the recognized laboratory may nominate substitute and if found qualified as per laid guidelines will be accepted and notified as Govt. Analyst.

2.10.29 Authorized Signatory of Analysis Reports issued by recognized lab

The analysis report depicting analytical results of environmental samples will be issued by the recognized environmental laboratory under signature of concerned analyst, supervisor analyst and have to be countersigned by any one of government analysts designated by the Central Govt or authorized signatory of NABL. The Government analyst recognized with the environmental laboratory will be the authorized signatory of analysis reports generated by the concerned laboratory.

2.10.30 Acceptance of Terms & Conditions for Recognition of Laboratory under the Environment (Protection) Act 1986 by Head of Laboratory

While submitting application for Fresh/Renewal of recognition under the Environment (Protection) Act, 1986, the laboratory has to upload acceptance of Terms & Conditions for Recognition of Laboratory under the Environment (Protection) Act 1986 in the specified format as given at **Annexure X**.

2.10.31 Bio-Metric Attendance System

Laboratories are required to install Bio-Metric Attendance system at the entrance of Laboratory to ensure the daily attendance of all the employees as well as the Govt. Analysts to provide the Biometric attendance information of all the laboratory officials for past two months.

2.10.32 Laboratory Waste generation (Liquid waste, Solid waste, Spent Solvents, Bio-hazardous waste) collection and disposal practices

The laboratory has to submit the write up about approximate quantity of various types of Laboratory waste generated, their segregation, adequate collection and disposal practices.

2.10.33 Other Requirements for Best Laboratory Practices

Laboratories have to furnish details of following requirements, whenever asked or at the time of Surveillance visit/ audit or surprise inspection.

- **Electricity Supply Load and Power Back up (DG set & UPS system)**

  Information of Electric supply load for the laboratory operation, Power back up arrangement such as Diesel Generator set with its capacity and details of UPS system their capacities and nos.

- **Laboratory Environmental Condition, Air Handling Unit & HVAC system**

  Details of AHU & HVAC system their capacity/tonnage

- **Water Supply & Distilled / Deionized Water source**

  The laboratory should have provision for continuous raw water supply either from a direct supply source or through storage tanks. Details of water supply whether bore well water, piped water or water supplied through tankers. Similarly, the details of Distilled/deionized water availability through in house water purification system or glass distillation system or water softening system or quantity of deionized water purchased from the supplier to be mentioned.

- **Quality of Glassware/Labwares and Chemicals used**

  Information about the makes/quality of Glassware/Labwares and Chemicals.

- **Record of Evidence for Intra Laboratory Analytical Quality Control**

  The applicant Laboratory will have to adopt all the steps and procedures of Intra laboratory Analytical Quality Control required for checking the precision and accuracy of analytical results within laboratory but not limited to as per the clause 7.7.1 of the ISO 17025 and systematically maintain its record.

- **Use of Laboratory Signage & Symbols**

  The laboratory should adopt and provide the globally harmonized Laboratory signage and symbols, wherever these are required, within the laboratory operation area.

- **Laboratory Safety/Protection Equipment**

  The laboratory should provide information in the relevant para in the application about the list of available numbers of various Laboratory safety and protection equipment. List of few such equipment is given at **Annexure-VIII**

- **Maintenance of Customer Service Feedback, Complaints and their Resolution**

  The laboratory should have adequate mechanism for Customer Service feedback, to register their appreciation as well as complaints and procedure for the resolution of complaints and should be shown to the inspection/ surveillance team at the time of visit.

2.11 Documentation Checklist for fulfilment of requirement of Recognition-Documents Checklist for completeness of Application (New/Renewal) for Recognition of the Laboratory under The Environment (Protection) Act, 1986

S. No.	Requirements as per the Guidelines for Recognition of Laboratory under the E (P) Act 1986
1.	Legal identity of Laboratory Certificate of Incorporation / Registration / Authorization
2.	GST/PAN Registrations
3.	Location details of the laboratory in Authorized Area (indicate in Google Map)
4.	Video clip of laboratory (link) to be provided by the laboratory
5.	Laboratory Covered Area, dimensions of various sections
	Laboratory Layout Map showing different sections
6.	Laboratory Photograph including with External Photograph with front elevation of building
7.	Undertaking by Laboratory Head to follow Code of Ethics in the specified format
8.	Laboratory Organization Structure/Chart
9.	Details of Senior Management of Laboratory
	List of total Manpower with Qualifications, Designation, Experience, Work responsibilities and Present Emoluments
10.	Biometric Attendance of all laboratory officials (past three months)
11.	Work allotment Details of Laboratory Personnel
12.	Training Details/Record of Laboratory Personnel
13.	Write up/SOP of Laboratory Waste Management Practices
14.	List of Sampling Instruments/Equipment
15.	List of sample processing Instruments / Equipment
16.	List of Analytical Instruments, details of their date of purchase, Authorization for operation
17.	Calibration status of important instruments / equipment with accepted validity.
18.	Details of Maintenance of Instrument/Equipment
	List of Instrument/Equipment Calibration, and Maintenance Service Contracts
19.	Water Supply & Distilled/deionized water
20.	Quality of Glassware/Labware and Chemicals used including with their brands and grading
21.	Environmental Parameters Analyzed and details of their Analytical Method, Range of analysis, MDL etc
22.	List of Reference Material/Certified Reference Material
23.	Record of Evidence for Intra Laboratory Analytical Quality Control
24.	Record of Evidence for External AQC/PT participation during preceding three years
25.	Past three Results of compulsory participation in Inter-laboratory Analytical Quality Control conducted by CPCB
26.	Copy of Certificate for NABL Accreditation (17025:2017) along with detailed Scope with accepted validity at least 1½ years prior from the expiry date
27.	Copy of ISO 45001 Certification Certificate with validity & Expiry
28.	Copy of Scope of ISO 17025 Accreditation highlighting the mandatory parameters required for The E(P)Act 1986 recognition included in the scope
29.	Acceptance of Terms & Conditions for Recognition of Laboratory under the Environment (Protection) Act 1986
30.	Nomination of Proposed Govt Analysts (Maximum three)
31.	Bio data of proposed Government Analysts in prescribed proforma with photograph, records of qualification, Training, Experience, Salary, etc.
32.	Acceptance of Terms & Conditions by the nominated personnel for consideration of Govt. Analysts
33.	Latest Schedule of Analytical charges, levied by the laboratory for various analysis, which should not exceed as notified by CPCB
34.	Any other relevant documents in support of application

2.12 Submission of Duly Completed Application

As per the clause 2.4, how to apply for recognition after the acceptance of pre-requisite from the system the Application format for Recognition has to be completed online. After filling up all the required information online as per requirement of EPA Guidelines, preparing all the enclosures as per the information sought beforehand the duly completed application have to be uploaded through the Web portal. The successful payment of Application Fees as applicable has also to be submitted online,

2.13 Amendments/changes with application proforma and evaluation criteria

If felt necessary CPCB may amend / change application proforma and criteria.

2.14 Scrutiny /processing of Application

The applications received from applicant laboratories for consideration of recognition through Web-portal will be scrutinized at first instance by concerned section of CPCB as per the criteria laid down in the guidelines. If the application is found with major shortcoming related with infrastructural requirement or not fulfilling the application will liable to be rejected and laboratory has to apply afresh after fulfilling the desired requirement.

2.15 Communication of shortcomings in the infrastructure facilities of the laboratory

If minor deficiencies have been found in the proposal with respect to laid down criteria for recognition, the same will be communicated to concerned laboratory by CPCB with detailed statement of deficiencies for clarification/rectification through web-portal within the defined time limit, failing which the laboratory has to apply for Fresh recognition.

2.16 Rejection of Application (if found incomplete or non - fulfilment of pre-requisite criteria).

If the laboratory fails to fulfill the pre-requisite or mandatory requirements as per this requirement the application will be rejected and only 50 percent of application fee will only be refunded. The laboratory has options to apply fresh, once it fulfills all the requirements

2.17 Meeting all the requirements as per the Checklist on Web-portal

When the Laboratory finds complying with all the requirement of this document before or after taking all the action taken within the stipulated time limit against the shortcomings as communicated to the laboratory the compliance status of the application is forwarded to Competant Authority for approval .

2.18 Grant of Recognition and Gazette Notification

The Environmental Laboratory and Govt. Analyst found qualified, recommended by the Expert Committee, approved by the competent authority, and finally on unconditional acceptance of Terms & condition by the laboratory may be Gazette notified in Govt. of India Gazette

2.19 Expert Committee

Expert Committee has been constituted at CPCB to review the procedure of recognirion of laboratory as and when required. The Expert Committee will comprise of members from (i) MoEF&CC (ii)State Pollution Control Board (iii) NABL (iv) NEERI (v) CPCB Expert, (vi) CPCB Member Convener

2.20 Procedure for Processing and Evaluation of Environmental Laboratory for Consideration of Recognition under the Environment (Protection) Act 1986

As per the revised Guidelines to grant recognition to Private laboratories as well as Government laboratories under the Environment (Protection) Act 1986, the procedural steps for evaluation of the application are summarized below:

Procedural Steps followed for Processing of Application

Step-I	Scrutiny / Processing of the application based on the criteria for Evaluation & Assessment of Application submitted for recognition by CPCB Team,
Step-II	Verification of the information, documents and all the requirement as submitted in the application form by CPCB Team as detailed in various paras at Chapter 2.0.
Step-III	Status of the application (Accepted / Rejected) with the observations/comments of CPCB Team will be reflected on web-portal.
Step-IV	In case of the incomplete information in the application, the application will be send back to the laboratory for completing the information**.**
Step-VI	Verification of the information/corrective actions resubmitted by the applicant and complete application with comments shall be forwarded to for final recommendation.
Step-V	Based on the recommendation of CPCB Team, approval from the Competent Authority of CPCB for consideration of Environmental Laboratory for Recognition under the Environment (Protection) Act 1986.
Step-VI	Generate and issue the Recognition Certificate after approval.
Step-VII	Gazette Notification of approved environmental laboratory and Govt. Analysts.
Step VIII	The list of approved recognized Environmental laboratories under the Environment (Protection) Act 1986 will be posted on CPCB Website (www.cpcb.nic.in).

2.21 Time limit for Disposal of application

After receiving of complete application with all the desired documents /information on the web-portal, maximum one month shall be required to get it approved by the Competent Authority.

2.22 Use of Phrase "Recognized under the Environment (Protection) Act, 1986"

The recognized environmental laboratory under The Environment (Protection) Act, 1986 may use the phrase "Recognized under The Environment (Protection) Act, 1986" on the analysis report, official stationary, signboards etc. However, the validity period of recognition has also to be mentioned alongwith the phrase.

2.23 Obligation of the Laboratory during the period of Recognition

The laboratories recognized under The Environment (Protection) Act, 1986 will have jurisdiction to function as Environmental laboratory in any state of the country. However, sample collection, preservation and transport protocol will have to be adopted and maintained by the laboratory as per standard references.

2.24 Desktop Audit, Surveillance, and Surprise Inspection of recognized laboratories

Laboratory should willingly ready and affirm any surprise surveillance/inspection either physically or virtually, by the joint inspection team of MoEF&CC, CPCB and SPCB, any time during the period of recognition. In case, joint inspection team find/observe any major shortcomings, hiding of facts by laboratory, inadequate supporting documents for respective analytical work undertaken, or laboratory reportedly indulged in gross manipulation of analytical data may lead to revoking/withdrawal of recognition granted.

2.25 Inspection Team

The joint inspection team of MoEF&CC, CPCB and SPCB will comprise of atleast two/three officers having experience in the field.

2.26 Actions to be taken against non-compliance

Following actions may be taken against the non-compliance/ Shortcomings found by the inspection team during the visit**.**

S. No.	Shortcomings	Action to be taken	Reversal of action after taking corrective action by the laboratory
01.	Pre-requisite requirements	Revoking of recognition	To apply a fresh after fulfilling the requirement
Mandatory Requirements			
02.	Use of standard/ Validated Analytical Methods:	Recognition for concerned parameter(s) shall be cancelled	To submit the documentary evidence after the standard/ validated method adopted.
03.	Availability of Reference Material/Certified Reference Material with accepted validity	Until the valid CRM is purchased the analysis of concerned parameters shall be stopped	To submit certificate of valid CRM.
04.	Technical Infrastructure and Equipment:	Revoking of recognition if any Instrument / equipment not available for mandatory parameter(s)	To apply a fresh after fulfilling the requirement
		Recognition for concerned parameter(s) shall be cancelled if shortcoming is for secondary parameter	To submit supporting document after fulfilling the requirement
05.	Calibration status of important instruments / equipment with accepted validity:	Until the valid Calibration certificate is submitted, analysis of concerned parameters shall be stopped	To submit valid calibration certificate.

06.	Participation in Inter-Laboratory Analytical Quality Control (AQC) / Proficiency Testing (PT):	Suspension of Recognition if not participated in the PT exercises for mandatory parameters	To participate in the PT/ AQC for the said parameter and submit satisfactory report
		Recognition for concerned parameter(s) shall be cancelled if shortcoming is for secondary parameter	
07.	Compulsorily Participation in Inter-Laboratory AQC conducted by CPCB	Suspension of Recognition if not participated in at least 2 out of last 3 AQCs conducted by CPCB	To participate in the same parameter/s from any authorized PT Provider with satisfactory performance and send the report
		Recognition shall be withdrawn for those unsatisfactory parameters in the last 3 AQC for which corrective action was not taken	
08.	Qualification and competency of Government Analyst	The laboratory shall be derecognized till the laboratory appoints another competent Govt. Analyst with accepted qualification	To submit record of newly appoint Govt. Analyst and the revival of recognition will be based on verification of records
09.	Training Details/Record of Analysts for performing Environmental Analysis:	The analyst may be stopped for analysis till he/she gets the proper training	To submit training record for the concerned analyst
10.	Photographs provided with the application not matching with the original location	The recognition shall be suspended at least for 3 months on false reporting	To apply afresh application after 3 months
11.	Complaints	On verification of the complaint, if it is found to be correct and/or any violation or non-compliance committed by the laboratory, the recognition shall be cancelled for 3 months	After taking corrective action the laboratory will intimate to CPCB and apply a fresh after verification from CPCB.

2.27 Penalty for contravention of the provisions of the Act and rules, orders and directions

Any Such activity which fails to comply with the or contravenes any of the provisions of the Act or Rules made or orders or directions issued there under penalties may be imposed on the laboratories as per the Environment (Protection) Act, 1986;

2.28 Show Cause Notice & Revoking of Recognition

The CPCB reserves its right to de-recognize/revoke its recognition or issue show cause notice at any time in public interest without assigning any reason, if it is deemed necessary by the Central Govt./CPCB. The recognition will also be revoked during following events:

- In case, the laboratory indulges in malpractices and issuing fraudulent reports.

- There are complaints against the laboratory regarding analytical malpractices.
- The laboratory violates the accepted terms & conditions for recognition of environmental laboratory under the Act.
- The laboratory not complying the rules and regulations notified under The Act.

Annexure I

UNDERTAKING TO FOLLOW CODE OF ETHICS

I……the Laboratory Head / authorized signatory of Environmental Laboratory of M/s_____

Address_____

_____

Submitting application for recognition under The Environment (Protection) Act, 1986 as we understood to have fulfilled the Laboratory Recognition mandatory and optional Criteria as stipulated by Central Pollution Control Board / Ministry of Environment, Forest & Climate Change do hereby undertake that:

1. Integrity: We shall have a professional behaviour, be straightforward and honest in all professional and business practices and maintain absolute integrity of analytical data/information.
2. Objectivity: We shall not allow bias, conflict of interest or undue influence of others including clients in our professional testing and reporting activity.
3. Professional competence and due care: It is our continuing duty to maintain professional knowledge, skill and testing facilities at the level required to ensure that the customer receives competent professional services based on current technological advancements, revision/amendment in the analytical procedures, standards etc.
4. Our laboratory will not indulge in deliberate falsification of analytical results, where failed method requirements are made to appear acceptable during reporting. An intentional gross deviation from specified analytical method and practices, combined with the intent to conceal the true analytical value
5. The following practices shall be strictly discouraged:
    - Sharing of test results with the customer/client before completion of testing as well as before final issue of report.
    - Reporting the test results without proper/actual testing on the environmental sample
    - The intentional recording or reporting of incorrect analytical information
    - Giving any undue favor to the customer/client in terms of testing and reporting of results
6. Confidentiality: We shall maintain adequate confidentiality with respect to the sample under test and the test results.
7. Professional behaviour: We shall comply with relevant laws and regulations and should avoid any action that discredits the profession

: Date

: Laboratory Head / Authorized Signatory

Place

Name & Designations

Seal of Laboratory:

_____

Note: The undertaking shall be furnished, signed and sealed by the Proprietor or Director or Partner of the applicant laboratory on laboratory's official stationery (letter-head). For Government sector labs, the undertaking may be furnished by the senior most head of the Lab.

Annexure II

Details of Laboratory Personnel at the Laboratory as per Organization chart

S. No	Name	Designation	Qualifications	Total experience (years & months)	Working at the laboratory Since	Emoluments drawn per annum
Top Management Officials						
Laboratory Personnel						

<u>Training attended in the field of environmental sampling and analysis and quality control systems may be included</u>

Annexure III

LIST OF MANDATORY ANALYTICAL PARAMETERS FOR RECOGNITION

Discipline/ Group:

WATER AND WASTEWATER

(A) Physical Tests:

S. No.	Parameter
1.	Temperature
2.	Colour
3.	pH
4.	Turbidity
5.	Conductivity
6.	Total solids
7.	Total dissolved solids (TDS)
8.	Total suspended solids (TSS)

(B) Inorganic (i) General& Non-metallic

S. No.	Parameters
1.	Alkalinity
2.	Chloride
3.	Cyanide
4.	Dissolved oxygen
5.	Nitrite nitrogen
6.	Nitrate nitrogen
7.	Ammonical nitrogen
8.	Fluoride
9.	Hardness (Total)
10.	Calcium
11.	Magnesium
12.	Phosphate
13.	Sulphate
14.	Sulphide
15.	Total Residual chlorine (TRC)

(ii) Trace Metals

S. No.	Parameter
1.	Aluminium (Al)
2.	Arsenic (As) Total
3.	Barium
4.	Boron
5.	Chromium (Cr) Hexavalent
6.	Chromium (Cr) Total
7.	Cadmium (Cd)
8.	Cobalt (Co)
9.	Copper (Cu)
10.	Iron (Fe)

11.	Lead (Pb)
12.	Manganese (Mn)
13.	Mercury (Hg)
14.	Nickel (Ni)
15.	Potassium (K)
16.	Sodium (Na)
17.	Vanadium (V)
18.	Zinc (Zn)
19.	Selenium (Se)
20.	Sodium Adsoption Ratio (SAR)

(C) Organics (General) and Trace Organics

S. No.	Parameters
1.	Biological Oxygen Demand (BOD)
2.	Chemical oxygen demand (COD)
3.	Oil & Grease
4.	Phenolic Compounds as C_6H_5OH
5.	Benzopyrene
6.	Pesticides
6.a.	Organochlorine Pesticides (OCPs)
i.	Aldrin
ii.	Alpha Endosulphan
iii.	p,p'-DDT
iv.	Alpha-HCH
v.	Beta HCH
vi.	Beta Endosulphan
vii.	Gama-HCH
viii.	o,p'-DDT
ix.	p,p'-DDE
6.b.	Organophosphorus Pesticides (OPPs)
i.	Malathion
ii.	Methyl parathion
iii.	Chloropyriphos
iv.	Dimethoate
v.	Dieldrin
vi.	Ethion

(D) Microbiological Tests

S. No.	Parameters
1.	Total Coliform
2.	Faecal Coliform
3.	*E. coli*
4.	*Faecal Streptococci*

(E) Toxicological Tests

S. No.	Parameter
1.	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)

Discipline/ Group: SOLID/SOLIDWASTE

(A) Soil/ Sediment /compost

S. No.	Parameter
1.	Cation Exchange Capacity (CEC)
2.	Electrical Conductivity (EC)
3.	Organic carbon (chemical method)
4.	pH
5.	Soil moisture
6.	Total nitrogen
7.	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)

(B) Hazardous Waste (Liquid/Slurry/Sludge/Solid//Semi-Solid)

S. No.	Parameter
1.	Corrosivity
2.	Ignitability (Flash point)
3.	Loss on Drying at 105^0C (% Moisture content)
4.	Loss on Drying at 550^0C (% Organic content)
5.	pH
6.	Organic carbon/matter (chemical method)
7.	Calorific Value
8.	Toxicity Characteritics leaching procedure (TCLP) Laechate and Metals in Laechate ((As, Cd, Cr, Pb, Ni)

Discipline/ Group: AIR

(A) Ambient Air

S. No.	Parameters
1.	Nitrogen dioxide as NO_2
2.	Sulphur dioxide (SO_2)
3.	Particulate matter (PM_{10})
4.	Particulate matter ($PM_{2.5}$)
5.	Carbon Monoxide
6.	Ozone
7.	Benzene
8.	Ammonia
9.	Metals in Particulate Matter, Pb
10.	Metals in Particulate Matter, As
11.	Metals in Particulate Matter, Ni
12.	Particulate Benzo-a-Pyrene (BaP)

(B) Stack Gases/Source Emission

S. No.	Parameter
(i)	**Mandatory Parameters**
1.	Particulate Matter
2.	Sulphur Dioxide
3.	Carbon Dioxide
4.	Carbon Monoxide (NDIR based Method)
5.	Temperature
6.	Moisture
7.	Oxygen
8.	Oxides of Nitrogen
9.	Halides (HCL/HF)

(C) Noise Level

S. No.	Parameters
1.	Ambient Noise level measurement (20 to 140 dB(A)
2.	Source Noise Level Measurement (Industrial Process, DG Set etc) (20 to 140 dB(A)

(D) Meteorological Monitoring

S. No.	Parameters
1.	Ambient Temperature
2.	Wind direction
3.	Wind speed
4.	Relative Humidity
5.	Mixing Height

Annexure IV

List of all the other parameters may be applied for Recognition

S. No.	Physical Tests
01.	Salinity
02.	Odour
03.	Flocculation test (Jar test)
04.	Fixed Volatile solids
05.	Settleable solids
06.	Sludge volume index (SVI)
07.	Velocity & discharge Measurement of industrial effluent stream
	Inorganic (i) General& Non-metallic
01.	Acidity
02.	Bromide
03.	Chlorine demand
04.	Free chlorine
05.	Dissolved Carbon dioxide
06.	Iodide
07.	Silica
08.	Sulphite
09.	Total Kjeldhal Nitrogen (TKN)
10.	Total Phosphorus
	Trace Metals
01.	Beryllium (Be)
02.	Antimony (Sb)
03.	Lithium (Li)
04.	Selenium (Se)
05.	Silver (Ag)
06.	Strontium (Sr)
07.	Tin (Sn)
08.	Thalium (Tl)
	Organics (General) and Trace Organics
01.	Total Organic Carbon (TOC)
02.	Adsorbable Organic Halide (AOX)
03.	Surfactants
04.	Tannin & lignin
05.	Polynuclear aromatic hydrocarbon (PAH)
a.	Naphthalene
b.	Acenaphthalene
c.	Acenaphthylene
d.	Phenanthrene
e.	Anthracene
f.	Fluoranthene
g.	Pyrene/ Benzo(a) pyrene
06.	Carbon/Nitrogen ratio
07.	Poly-chlorinated biphenyl (PCB's) as enviro indicator
a.	2,4,4'-trichlorobiphenyl (PCB-28)
b.	2,2',5,5'-tetrachlorobipheny (PCB-52)
c.	2,2',4,5,5'-pentachlorobiphenyl(PCB-101)
d.	2,3',4,4',5-pentachlorobiphenyl(PCB-118)
e.	2,2',3,4,4',5'-hexachlorobiphenyl(PCB-138)
f.	2,2',4,4',5,5'-hexachlorobiphenyl(PCB-153)
g.	2,2',3,4,4',5,5'-heptachlorobipheny (PCB-180)
8.	**Phenolic Compounds**

a.	Phenol
b.	4-nitrophenol
c.	2,4-dinitrophenol
d.	2-nitrophenol
d.	2-chlorophenol
e.	2,4-dimethylphenol
f.	2-methyl,4,6-dinitrophenol
g.	4-chloro,3-methylphenol
h.	2,4-dichlorophenol
i.	2,4,6-trichlorophenol
j.	Pentachlorophenol
	Microbiological Tests
01.	Total plate count
02.	*Coliphage*
	Toxicological Tests
01.	Measurement of toxicity factor using zebra fish (dimensionless toxicity test
02.	Bio-accumulation, bio magnification and bio-transformation studies
03.	Estimation of the effect at tissue level
04.	Measurement of toxicity using Daphnia or other organism
	Biological Tests
01.	Diversity Score **(**Benthic macro**-**invertebrates**)**
02.	Benthic organism identification and count
03.	Macrophytic identification
04.	Planktonic identification count
05.	Measurement of various diversity index
06.	Saprobity Index
07.	Chlorophyll
08.	Primary productivity
09.	P/R Ratio
	Soil/Sludge/Sediment and Solid Waste
01.	Available N, P, K
02.	Micronutrients-Available Fe, Cu, Mn, Zn Mo By DTPA
03.	Available Boron
04.	Available Sulphur
05.	Exchangeable Ca, Mg, Na
06.	Sodium Absorption Ration (SAR)
07.	Exchangeable sodium percentage (ESP)
08.	Gypsum requirement
09.	Lime Requirement
10.	Metals in Soil by digestion
11.	Persistent Organic pollutants, Pesticides and Insecticides
12.	Soil Texture
13.	Soil Structure
14.	Total Soluble Sulphates as SO_4
15.	Total Soluble Solid
16.	Water holding capacity (WHC)
	Hazardous Waste Characterization/Analysis
01.	Cyanide, total and amenable to chlorination
02.	Nitrate
03.	Reactivity
04.	Metals in waste (Sb, Be, Se, Te, Th, Co Cu, Mo, Sn, W, V, Ag, Ba, Zn, Hg, Hexavalent chromium)
05.	Persistent Organic pollutants, Pesticides and Insecticides
06.	Phenols

07.	Sulphide
08.	Toxicity
09.	TOC
10.	Toxicity characteristic leaching procedure (TCLP) and Metals in Laechate
11.	Toxicity characteristic leaching procedure (TCLP) and Persistant Organic Pollutant, Pesticides and Insecticides in Laechates
12.	Hydrogen cyanide released from wastes
13.	Hydrogen sulphide released from wastes
14.	Paint filter Liquid Test
15.	Liquid Release Test
	Municipal Solid Waste/Plastic Waste
01.	Composition and characterization (% by weight)
02.	Density
03.	Moisture
04.	N-P-K (Total Nitrogen) (Phosphorus as P_2O_5) (Potassium as K_2O)
05.	C/N ratio
06.	Biochemical Characteristics: carbohydrates, proteins, natural fiber and biodegradation factor
07.	Degradation of Plastics
08.	Toxicity profile of MEW included heavy metals, oersistant organic pollutants, presticides, and insecticides
09.	Thichness of Plastic
	Ambient Air
01.	Hydro sulphide
02.	Anions in Particulate Matter, Bromide
03.	Anions in Particulate matter, Chloride
04.	Anions in Particulate matter, Fluoride
05.	Anions in Particulate matter, Nitrate
06.	Anions in Particulate matter, Nitrite
07.	Anions in Particulate matter, Phosphate
08.	Anions in Particulate matter, Sulphate
09.	Cations in Particulate matter, Ammonium
10.	Cations in Particulate matter, Barium
11.	Cations in Particulate matter, Calcium
12.	Cations in Particulate matter, Lithium
13.	Cations in Particulate matter, Magnesium
14.	Cations in Particulate matter, Potassium
15.	Cations in Particulate matter, Sodium
16.	Cations in Particulate matter, Strontium
17.	Metals in Particulate Matter, Cd
18.	Metals in Particulate Matter, Cr
19.	Metals in Particulate Matter, Cu
20.	Methane
21.	Non Methane Hydrocarbon
22.	Polycyclic Aromatic Hydrocarbon (PAH)
23.	Volatile Organic Carbon
24.	Carbonyls (Formaldehyde & Acetone)
25.	Polychlorinated Dibenzo-Dioxins (PCDDs)
26.	Polychlorinated Dibenzofurans (PCDFs)
	Stack Gases/Source Emission
01.	Sulphuric Acid mist (As SO_3)
02.	Chlorine
03.	Total Organic Carbon
04.	Hydrogen Sulphide
05.	Carbon Disulphide
06.	Mercaptan

07.	Polychlorinated Dibenzo-Dioxins (PCDDs)
08.	Polychlorinated Dibenzofurans (PCDFs)
	Fugitive Emissions
01.	SPM
02.	BTEX and other VOCs
03.	Methane
04.	H_2S
05.	Metals (Pb, Ni, As, Cu, Cd, Cr, Sb)
06.	Hydrocarbons
07.	Total Organic Compounds
	Noise level
01.	DG Set Noise Leq
	Meteorological Monitoring
01.	Solar radiation
02.	Rain fall
03.	Atmospheric Pressure

Note:Any other sample , not listed in the above list may be considered under the Secondary parameters.

ANNEXURE V

Analytical Methods

As stipulated in ISO/IEC 17025, clause 7.2 the analytical testing at the environmental laboratory should be performed by using only validated methods prescribed internationally/nationally are envisaged. Following are the prescribed methods to be adopted by the laboratories for designated parameters;

A. Methods for Analysis of Water, Wastewater and Groundwater

For waters, wastewaters and ground waters, methods selected from the standard references listed below should be used.

International:

1. American Public Health Association (APHA), Standard Methods for the Examination of Water and Wastewater. Latest Edition.
2. US Environmental Protection Agency SW846 Online, Methods for Chemical Analysis of Water and Wastes, www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm#table
3. American Society for Testing and Materials (ASTM), Water and Environmental Technology.
4. US Environment Protection Agency 1978, Microbiological Methods for Monitoring the Environment, Water and Wastes.

National

1. Bureau of Indian Standard (BIS), Drinking Water Standard IS 10500:2018
2. IS 3025: Part 1: 2021. Methods of sampling and test (Physical And Chemical) for water and wastewater: Part 1 sampling (First Revision) ·
3. IS: 3025. (Various Parts i.e. from Part 2 to Part 80) Method of Sampling and Test (Physical and Chemical) for Water and Wastewater

B. Trace Metals Analysis in Water, Waste water, Soil, Sediments, Solid and Hazardous waste.

The summary of various instrumental techniques used for trace metals analysis in environmental matrices are presented in Table 5.2 :

Table 5.1 Methods (International) for Trace Metal Analysis in Environmental matrices

S. No.	Element	Environmental matrices	Range of analysis	Methods	Instrument
1	Calcium	In all matrix	Parts per Million (ppm)	APHA 3500-Ca B IS 3025	
2	Magnesium	In all matrix	Parts per Million (ppm)	APHA- 3500-Mg B IS 3025	--
3	Sodium Absorption Ratio (SAR)	Water and Waste water	Ratio	USEPA-SW 846 1S11624	--
		Soil/ Sediment		USEPA-6020A, 7000B	

S. No.	Element	Environmental matrices	Range of analysis	Methods	Instrument
4	Boron	In all Matrix	Parts per Million (ppm)	APHA 4500 B, 4500 B-C IS 3025	Spectrophotometer
5	Chromium Hexavalent	Drinking water, Surface Water and Ground Water	Parts per Million (ppm)	APHA 3500-Cr B, 3500- Cr C 1S 3025	Spectrophotometer/ Ion Chromatograph
		Wastewater and Industrial discharge etc.	Parts per Million (ppm)		
6	Sodium, Potassium	In all Matrix	Parts per Million (ppm)	APHA 3500 NaB, 3500- K B IS 3025	Flame Photometer
7	Cadmium, Chromium (T), Copper Iron, Lead, Nickel, Zinc	Drinking water, Surface Water and Ground Water	Parts per Billion (ppb) to Parts per Million (ppm).	APHA, 3111, 3113,3120 and 3125.	Selection of instruments (AAS, ICP-OES and ICP-MS etc.) as per parameter-wise applicable methods.
		Wastewater and Industrial discharge etc.	Parts per Billion (ppb) to Parts per Million (ppm).	APHA, 3111, 3120 and 3125.	
		Soil, Sediment, Solid waste and Hazardous Waste etc.	Parts per Billion (ppb), Parts per Million (ppm) and % level.	USEPA 3050-B, 6010, 6020 and APHA, 3125.	
8.	Arsenic	Water and wastewater	Parts per Billion (ppb) to Parts per Million (ppm).	APHA, 3113, 3114,3120 and 3125.	
		Soil, Sediment, Solid waste and Hazardous Waste etc.	Parts per Billion (ppb) to Parts per Million (ppm).	USEPA 3050-B, 6010, 6020 and APHA, 3125.	
9	Mercury	Water, Wastewater and Industrial discharge etc.	Parts per Billion (ppb) to Parts per Million (ppm).	APHA, 3112 and 3125.	AAS and ICP-MS or equivalent dedicated instruments.
		Soil, Sediment, Solid waste and Hazardous Waste etc.	Parts per Billion (ppb) to Parts per Million (ppm).	EPA 7471, 7473 and 6020.	
10	Aluminium, Beryllium, Barium, Lithium, Manganese, Selenium, Strontium, Tin, Antimony, Cobalt, Vanadium	Drinking water, Surface Water and Ground Water	Parts per Billion (ppb) to Parts per Million (ppm).	APHA, 3111, 3113,3120 and 3125.	AAS, ICP-OES and ICP-MS.
		Wastewater and Industrial discharge etc.			
		Soil, Sediment, Solid waste and Hazardous Waste etc.	Parts per Billion (ppb), Parts per Million (ppm) and % level.	USEPA 3050-B, 6010, 6020 and APHA, 3125.	

Indian Standard Methods

1. Bureau of Indian Standards, IS 10500 (2018): Drinking Water with latest amendments.
2. IS 3025 (Part 2):2004 Method of Sampling and Test (Physical and Chemical) for Water and Wastewater, Determination of 33 Elements by Inductively Coupled Plasma Atomic Emission Spectroscopy

Remarks: The BIS methods documented for Spectrophotometric analysis of heavy metals/trace metals are mostly not suitable for environmental matrices analysis as they are only for analysis in PPM and percentage range, while in environment the presence of trace metals are expected in PPB and Sub PPB levels,

C. Trace Organics in Water, Waste Water, Soil, Sediments, Solid waste and Hazardous waste

The suggestive analytical methods to be followed for analysis of these compound groups in environmental matrices are presented in the Table 5.2 below:

Table 5.2: Trace Organics Analytical Methods in various Environmental Matrices (Water, Waste water, Soil and Sediments).

S. No.	Trace Organic Compounds	Instrument	Analytical Method
Mandatory Trace Organics Analysis			
1	Organochlorine pesticides (HCH, DDT, Aldrin, Endosulphan)	Gas Chromatograph with capillary column and Electron Capture Detector (ECD)	USEPA Methods – 508 & 8081 using GC-ECD USEPA Method 608
2	Organophosphorus/Organonitrogen pesticides (Malathion, methyl parathion, chlorpyriphos)	Gas Chromatograph with capillary column and Nitrogen Phosphorus Detector (NPD) / Flame photometric Detector (FPD)	USEPA Methods – 507 & 8141B using GC-NPD / GC-FPD
3	Polychlorinated Biphenyls (PCBs)	Gas Chromatograph with capillary column and Electron Capture Detector (ECD) / Mass Spectrometer Detector (MSD)	USEPA Methods – 3540, 3610, 3630, 3660, 8082 & 8280 using GC-ECD / GC-LRMSUSEPA Method 608
4	Polyaromatic hydrocarbons (PAHs)	High Pressure Liquid Chromatograph (HPLC) with UV-VIS / UV-DAD Detector or Gas Chromatograph with capillary column and Flame Ionisation Detector (FID) / Mass Spectrometer Detector (MSD)	USEPA Method 610
5	Volatile Organic Compounds (VOCs)	Purge & Trap System (Aqueous Samples) or Head Space System (Solid Samples), Gas Chromatograph with capillary column and Mass Spectrometer Detector (MSD)	USEPA Method – 524.2 using Purge & Trap with GC-LRMS USEPA Method 1624
6	Trihalomethanes (THMs)	Gas Chromatograph with capillary column and Electron Capture Detector (ECD) / Mass Spectrometer Detector (MSD)	USEPA Method –501.1 (Archive method) US EPA Method – 551.1
7	Carbamates	High Pressure Liquid Chromatograph (HPLC) with UV-VIS / UV-DAD Detector	USEPA Method – 531.1 USEPA Method – 632 USEPA Method – 632.1
8	Herbicides	Gas Chromatograph with capillary column and Electron Capture Detector (ECD) or High Pressure Liquid Chromatograph (HPLC) with UV-VIS / UV-DAD Detector	USEPA Method – 515.1 USEPA Method – 8151A USEPA Method – 8321B

D. Microbiological Analysis

Microbiological analysis in environmental samples is performed through a range of test methods designed for that purpose.The suggestive analytical methods to be followed for analysis of microbiological parameters in environmental matrices are presented in the Table 5.3 below:

Table 5.3: Microbiological Analysis in environmental samples of Drinking water, Natural waters and waste waters

S.	Parameter	Method	Method Reference

No.			
1.	Total coliform and	a. Multiple tube technique	American Public Health Association (APHA), Standard Methods for the Examination of Water and Wastewater. Latest Edition. Bureau of Indian Standards; (BIS) Methods for Microbiological examination of water
		b. Membrane filter technique	
2.	Faecal Coliform	a. Multiple tube technique	
		b. Membrane filter technique	
3.	*Faecal streptococci*	a. Multiple tube technique	
		b. Membrane filter technique	
4.	*Enterococcus*	a. Multiple tube technique	
		b. Membrane filter technique	
5.	Total plate count	a. Pore plate method	
		b. Spread plate method	
		c. Membrane filter method	
6	*E. Coli*	a. Multiple tube technique	
		b. Membrane filter technique	

Indian Reference Methods (BIS):

1. IS 1622: 1981 Methods of sampling and Microbiological Examination of water
2. IS 15188:2012 Water quality — General guide to the Enumeration of micro-organisms by culture
3. IS 5401 (Part 1): 2012 Microbiology – General guidance for enumeration of coliforms; Part 1 Colony count technique (first revision)
4. IS 15185: 2016 Water Quality — Detection and Enumeration of *Escherichia coli* and Coliform bacteria — Membrane FiltrationMethod
5. IS 15188:2012 Water quality — Horizontal method for the detection of Enumeration of coliforms; Part 1 Colony count technique (first revision)

E. Toxicological and Biological Analyses

Prescribed methods for toxicological analysis in environmental samples are mentioned in table 5.4 below:

Table 5.4 Methods for Toxicological Analysis in Environment

S. No	Toxicological Test	Reference method
1.	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	American Public Health Association (APHA), Standard Methods for the Examination of Water and Wastewater. Latest Edition. IS 6582 (Part 1) 1971 Bio-Assay Methods for Evaluating Acute Toxicity of Industrial Effluents and Waste Waters
2	Measurement of toxicity factor using zebra fish (dimensionless toxicity) test	IS 6582 : (Part 2) : 2001 (Reaffirmed Year : 2019)Bio-assay methods for evaluating acute toxicity of industrial effluents and wastewaters : Part 2 Using Toxicity Factor to Zebra Fish
3	Measurement of toxicity using Daphnia or other organism	

4	Bio-accumulation, bio-magnification and bio-transformation studies	American Public Health Association (APHA), Standard Methods for the Examination of Water and Wastewater. Latest Edition.

Bio-monitoring of biological parameters has significant advantages over traditional analysis of abiotic matrices (water, sediments). Besides providing information on the bio availability of contaminantsFor Biological Monitoring or Bio-monitoring following are the important studies undertaken apart from toxicological studies.

Table 5.5 Methods for Bio-Monitoring/ Biological Analysis parameters in the Environment

S.No	Biological Monitoring	Reference Method
1.	Benthic macro-invertebrates sample collection	American Public Health Association (APHA), 2017 Standard Methods for the Examination of Water and Wastewater. 23rd Edition; Benthic macro-invertebrates part 10500; PP 10-67 to 10-81
2.	Benthic macro-invertebrates identification and count	D. de Zwart and R.C. Trivedi, 1995Manual on Integrated Water Quality Evaluation, CPCB Report
3	Measurement of Diversityindex	
4	Measurement of Saprobity Index	
5	Macrophytic identification	American Public Health Association (APHA), 2017 Standard Methods for the Examination of Water and Wastewater. 23rd Edition; A) Aggregate Organic Constituents, Part 5000; P5-1; Inorganic non-metallic constituents Part 4500, P4-114 B) Archieve.epa.gov/wattarchieve/web/html/ch03main.html
6	Planktonic identification count	
7	Chlorophyll	
8	Primary Productivity	
9	P/R Ratio	

Other References

1. USEPA, 2002Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms Fifth Edition.
2. USEPA, 2002 Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms Fourth Edition.
3. USEPA, 2021 Elements of Bio Monitoring/Bio Assessment, Chapter 3.

F. Hazardous Waste Analysis

Analytical methods are required to be standardized for characterization of wastes specialized training for the concerned personnel is also required.

Table 5.6 Hazardous waste Characterization Analysis at Hazardous Waste at Environmental laboratories

S. No.	Hazardous waste Test	Characteristics	Reference method
1.	Ignitability	Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have	USEPA 1010-1986 USEPA 1020-1986

		a flash point less than 60 °C (140 °F). Examples include waste oils and used solvents	
2	Corrosivity	Corrosive wastes are acids or bases (pH less than or equal to 2, or greater than or equal to 12.5) that are capable of corroding metal containers, such as storage tanks, drums, and barrels. Battery acid is an example	USEPA SW-846 Test Method 1110A: Corrosivity toward Steel
3	Reactivity	Reactive wastes are unstable under "normal" conditions. They can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water. Examples include lithium-sulphur batteries and explosives	USEPA40 CFR Section 261.23 includes 8 different properties of a waste identifying characteristics of reactivity.
4	Toxicity	Toxic wastes are harmful or fatal when ingested or absorbed When toxic wastes are disposed, the toxic constituents may leach from the waste and pollute ground water. Example include wastes containing mercury, lead, DDT, PCBs, etc.	USEPA 1311-1992 & APHA 2017 -3120B

Toxicity Characteristics Leaching Procedure (TCLP)

1-USEPA SW-846 Method 1311 Toxicity Characteristic Leaching Procedure

2-Testing Procedure for Analysis of Hazardous Waste Samples, SCHEDULE II [See rule 3 (1) (17) (ii)] of HOWM Rules, 2016.

Table 5.7 Hazardous Waste Constituents, Concentration limits and Analytical Methods

Class A: Based on leachable concentration limits [Toxicity Characteristic Leaching Procedure (TCLP) or Soluble Threshold Limit Concentration (STLC)]

Class	Constituents	Concentration (mg/L)	Analytical Method
A1	Arsenic	5.0	ICP Method (APHA 3120 B)
			AAS Method (APHA 3114B)
A2	Barium	100.0	AAS Method APHA 3111B)
			AAS Method APHA 3120 B)
A3	Cadmium	1.0	ICP Method (APHA 3120 B)
			AAS Method (APHA 3111B)
A4	Chromium and/ or Chromium (III)	5.0	ICP Method (APHA 3120 B)
			AAS Method (APHA 3111B)
A5	Lead	5.0	AAS Method (APHA 3111B)
			ICP Method (APHA 3120B)
A6	Manganese	10.0	ICP Method (APHA 3120 B)
			AAS Method (APHA 3111B)
A7	Mercury	0.2	ICP Method (APHA 3120 B)
			AAS Method (APHA 3112B)
A8	Selenium	1.0	ICP Method (APHA 3120 B)
			AAS Method (APHA 3114B)
A9	Silver	5.0	ICP Method (APHA 3120B)
A10	Ammonia	50*	Distillation followed by Titrimetric Method (APHA 4500- NH_3 B/C)
A11	Cyanide	20*	Distillation followed by Titrimetric Method (APHA 4500-CN^- C/D:)
A12	Nitrate (as nitrate-nitrogen)	1000.0	UV-Vis Screening Method (APHA 4500-NO3-B
A13	Sulphide (as H2S)	5.0	Iodometric Method (APHA 4500-S^{2-} F)
A14	1,1-Dichloroethylene	0.7	

A15	1,2-Dichloroethane	0.5	USEPA Method 8260 B Volatile Organic Compounds byGas Chromatography Mass Spectrometry (GC-MS)
A16	1,4-Dichlorobenzene	7.5	
A17	2,4,5-Trichlorophenol	400.0	
A18	2,4,6-Trichlorophenol	2.0	
A19	2,4-Dinitrotoluene	0.13	
A20	Benzene	0.5	
A21	Benzo (a) Pyrene	0.001	USEPA Method 8310: Poly nuclear Aromatic Hydrocarbons
A22	Bromodicholromethane	6.0	USEPA Method 524.2 Measurement of Purgeable organic compounds in water by Capillary Column Gas chromatography/Mass Spectrometry (GC-MS)
A23	Bromoform	10.0	
A24	Carbon tetrachloride	0.5	
A25	Chlorobenzene	100.0	USEPA Method 8260 B Volatile Organic Compounds byGas Chromatography Mass Spectrometry (GC-MS)
A26	Chloroform	6.0	USEPA Method 524.2 Measurement of Purgeable organic compounds in water by Capillary Column Gas chromatography/Mass Spectrometry (GC-MS)
A27	Cresol (ortho+ meta+para)	200.0	USEPA Method 8260 B Volatile Organic Compounds byGas Chromatography Mass Spectrometry (GC-MS)
A28	Dibromochloromethane	10.0	USEPA Method 524.2 Measurement of Purgeable organic compounds in water by Capillary Column Gas chromatography/Mass Spectrometry (GC-MS)
A29	Hexachlorobenzene	0.13	USEPA Method 8081B Organochlorine Pesticides by GasChromatography
A30	Hexachlorobutadiene	0.5	
A31	Hexachloroethane	3.0	
A32	Methyl ethyl ketone	200.0	NIOSH Method 2500 by Gas Chromatography
A33	Naphthalene	5.0	USEPA Method 8310: Polynuclear Aromatic Hydrocarbons
A34	Nitrobenzene	2.0	Gas Chromatography Mass Spectrometry Method (APHA6410B : 2012)
A35	Pentachlorophenol	100.0	USEPA Method 8260 B Volatile Organic Compounds byGas Chromatography Mass Spectrometry (GC-MS)
A36	Pyridine	5.0	
A37	Tetrachloroethylene	0.7	
A38	Trichloroethylene	0.5	
A39	Vinyl chloride	0.2	
A40	2,4,5-TP (Silvex)	1.0	USEPA Method 8321B Herbicides by High Pressure LiquidChromatography (HPLC)
A41	2,4-Dichlorophenoxyacetic acid	10.0	
A42	Alachlor	2.0	USEPA Method 8081B Organochlorine Pesticides by GasChromatography
A43	Alpha HCH	0.001	
A44	Atrazine	0.2	Method 8141B: Organophosphorus Compounds by GasChromatography
A45	Beta HCH	0.004	USEPA Method 8081B Organochlorine Pesticides by GasChromatography
A46	Butachlor	12.5	
A47	Chlordane	0.03	
A48	Chlorpyriphos	9.0	USEPA Method 8141B: Organophosphorus Compounds byGas Chromatography
A49	Delta HCH	0.004	USEPA Method 8081B Organochlorine Pesticides by GasChromatography
A50	Endosulfan (alpha+ beta+sulphate)	0.04	
A51	Endrin	0.02	USEPA Method 8141B: Organophosphorus Compounds byGas Chromatography
A52	Ethion	0.3	
A53	Heptachlor (& its Epoxide)	0.008	USEPA Method 8081B Organochlorine Pesticides by GasChromatography

A54	Isoproturon	0.9	USEPA Method 532 by Gas Chromatography
A55	Lindane	0.4	USEPA Method 8081B Organochlorine Pesticides by Gas Chromatography
A56	Malathion	19	USEPA Method 8141B: Organophosphorus Compounds byGas Chromatography
A57	Methoxychlor	10	USEPA Method 8081B Organochlorine Pesticides by Gas Chromatography
A58	Methyl parathion	0.7	USEPA Method 8141B: Organophosphorus Compounds byGas Chromatography
A59	Monocrotophos	0.1	
A60	Phorate	0.2	
A61	Toxaphene	0.5	USEPA Method 8081B Organochlorine Pesticides by Gas Chromatography
A62	Antimony	15	ICP Method (APHA 3120 B)
			AAS Method (APHA 3112B)
A63	Beryllium	0.75	ICP Method (APHA 3120 B)
			AAS Method (APHA 3114B)
A64	Chromium (VI)	5.0	Colorimetric Method (APHA 3500-Cr^- B)
			IC method (APHA 3500-Cr^- C)
A65	Cobalt	80.0	AAS Method (APHA 3111B)
			ICP Method (APHA 3120B)
A66	Copper	25.0	ICP Method (APHA 3120 B)
			AAS Method (APHA 3111B)
A67	Molybdenum	350	AAS Method (APHA 3111D)
A68	Nickel	20.0	AAS Method (APHA 3111B)
			ICP Method (APHA 3120B)
A69	Thallium	7.0	ICP Method (APHA 3120 B)
			AAS Method (APHA 3111B)
A70	Vanadium	24.0	AAS Method (APHA 3111B)
			ICP Method (APHA 3120B)
A71	Zinc	250	ICP Method (APHA 3120 B)
			AAS Method (APHA 3111B)
A72	Fluoride	180.0	SPANDS method (APHA 4500-F^- D)
A73	Aldrin	0.14	USEPA Method 8081B Organochlorine Pesticides by Gas Chromatography
A74	Dichlorodiphenyltrichloroethane (DDT), Dichlorodiphenyldichloroethylene (DDE), Dichlorodiphenyldichloroethane (DDD)	0.1	
A75	Dieldrin	0.8	
A76	Kepone	2.1	USEPA Method 8260 B Volatile Organic Compounds by Gas Chromatography Mass Spectrometry (GC-MS)
A77	Mirex	2.1	USEPA Method 8081B Organochlorine Pesticides by Gas Chromatography
A78	Polychlorinated biphenyls	5.0	USEPA Method 8082A Polychlorinated Biphenyls by Gas Chromatography
A79	Dioxin (2,3,7,8-TCDD)	0.001	USEPA Method 1613B Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution by HRGC-HRMS
			USEPA Method 8081B Organochlorine Pesticides byGas Chromatography

Class B: Based on Total Threshold Limit Concentration (TTLC)

Class	Constituent	Concentration (mg/Kg)	Test method

B1	Asbestos	10,000	**USEPA method 100.1** Analytical Method for Determinationof AsbestosFibers inwater
B2	Total PetroleumHydrocarbons **(**TPH**)(**C5 **-** C36**)**	5,000	**USEPA Method 8015C**Non-halogenated Organics by GasChromatography **(**C6 – C28**)**

Note:

The testing method for list of constituents at A1 to A61 in Class-A, shall be based on Toxicity Characteristic Leaching Procedure (TCLP) and for extraction of leachable constituents, USEPA Test Method 1311 shall be used.

The testing method for list of constituents at A62 to A79 in Class- A, shall be based on Soluble Threshold Limit Concentration (STLC) and Waste Extraction Test (WET) Procedure given in Appendix II of section 66261 of Title 22 of California Code regulation (CCR) shall be used.

In case of ammonia (A10), cyanide (A11) and chromium VI (A64), extractions shall be conducted using distilled water in place of the leaching media specified in the TCLP/STLC procedures*.

A summary of above specified leaching/extraction procedures is included in manual for characterization and analysis of hazardous waste published by Central Pollution Control Board and in case the method is not covered in the said manual, suitable reference method may be adopted for the measurement.

In case of asbestos, the specified concentration limits apply only if the substances are in a friable, powdered or finely divided state.

The hazardous constituents to be analysed in the waste shall be relevant to the nature of the industry and the materials used in the process.

Wastes which contain any of the constituents listed below shall be considered as hazardous, provided they exhibit the characteristics listed in Class-C of this Schedule:

Class-C

S. No.	Constituent	Test Methods
1.	Acid Amides	**USEPA METHOD 8316** Acrylamide, Acrylonitrile and Acrolein by High Performance Liquid Chromatography (HPLC)
2.	Acid anhydrides	**USEPA METHOD 8270D** Semi-volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
3.	Amines	
4.	Anthracene	
5.	Aromatic compounds other than those listed in Class-A	
6.	Bromates, (hypo-bromites)	**USEPA METHOD 300** Determination of Inorganic anions in Drinking Water by Ion Chromatography
7.	Chlorates (hypo-chlorites)	
8.	Carbonyls	**USEPA METHOD 8315A** Determination of Carbonyl Compounds by HPLC
9.	Ferro-silicate and alloys	
10.	Halogen- containing compounds which produce acidicvapours on contact with humid air or water e.g. silicontetrachloride, aluminum chloride, titanium tetrachloride	**USEPA METHOD 9023** Extractable Organic Halides (EOX) in Solids
11.	Halogen- silanes	
12.	Halogenated Aliphatic Compounds	**USEPA METHOD 8121** Chlorinated Hydrocarbons by Gas Chromatography: Capillary Column Technique
13.	Hydrazine (s)	
14.	Hydrides	
15.	Inorganic Acids	**USEPA METHOD 9056A** Determination of Inorganic Anions by Ion

S. No.	Constituent	Test Methods
		Chromatography
16.	Inorganic Peroxides	
17.	Inorganic Tin Compounds	
18.	Iodates	
19.	(Iso- and thio-) Cyanates	
20.	Manganese-silicate	
21.	Mercaptans	
22.	Metal Carbonyls	**USEPA METHOD 207-2** Analysis for Isocyanates By HPLC:
23.	Metal hydrogen sulphates	
24.	Nitrides	
25.	Nitriles	**USEPA METHOD 8316** Acrylamide, Acrylonitrile and Acrolein by HPLC
26.	Organic azo and azooxy Compounds	**USEPA METHOD 8321B** Solvent-Extractable Non-volatile Compounds by High-Performance Liquid Chromatography/ Thermospray/Mass Spectrometry (HPLC/TS/MS) Or Ultraviolet (UV) Detection
27.	Organic Peroxides	**ASTM E298** Standard Method for Organic Peroxides
28.	Organic Oxygen Compounds	
29.	Organic Sulphur Compounds	
30.	Organo- Tin Compounds	**USEPA METHOD 8323** Determination of Organotins by Micro-Liquid Chromatography- Electrospray Ion Trap Mass Spectrometry
31.	Organo nitro- and nitroso compounds	**USEPA METHOD 8270D** Semi-volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
32.	Oxides and hydroxides except those of hydrogen carbon, silicon, iron,aluminum, titanium,manganese,magnesium, calcium	
33.	Phenanthrene	**USEPA METHOD 8270D** Semi-volatile Organic Compounds by GC/MS
34.	Phenolic Compounds	**USEPA METHOD 8041A** Phenols by Gas Chromatography
35. 36.	Phosphate compoundsexcept phosphates ofaluminum, calcium andiron Salts of pre-acids	**USEPA METHOD 365.3** Phosphorous, all forms
37.	Total Sulphur	
39.	Tellurium and tellurium compounds	
40.	White and Red Phosphorus	**USEPA Method 7580** White Phosphorus (P4) by Solvent Extraction and **USEPA METHOD 8270D** Semi-volatile Organic Compounds by GC/MS
41.	2-Acetylaminofluorene	
42.	4-Aminodiphenyl	
43.	Benzidine and its salts	
44.	Bis (Chloromethyl) ether	

S. No.	Constituent	Test Methods
45.	Methyl chloromethyl ether	
46.	1,2-Dibromo-3-chloropropane	
47.	3,3'-Dichlorobenzidine andits salts	
48.	4- Dimethylaminoazobenzene	
49.	4-Nitrobiphenyl	
50.	Beta-Propiolactone	**USEPA METHOD 8260C** Volatile organic compounds by GC/MS

G. Soil, Sludge, Sediment and Solid Waste Analysis

Soil analysis is a set of various chemical processes that determine the chemical, physical, and biological soil properties important for plant nutrition, or "Soil health" Soil contamination, soil pollution, or land pollution as a part of land degradation is caused by the presence of xenobiotic chemicals or other alteration in the natural soil environment. It is typically caused by industrial activity, agricultural chemicals or improper disposal of waste.

There are several standards methods issued by various organizations world over, which may be standardized and adopted at the environmental laboratory for analysis of soil, sediments and solid waste. Following are some of standard references for analytical methods for analysis of Soil, Sludge, Sediment and Solid Waste.

International:

1. American Society for Testing and Materials (1992): Standard test method for determination of the composition of unprocessed municipal solid waste. ASTM Method D 5231 – 92 (September)
2. ASTM D8064 Standard Test Method for Soil and Solid Waste
3. USEPA 1999 Characterization of Municipal Solid Waste in the United States Internet: www.epa.gov
4. Environmental Protection Agency EPA Ireland (1996): Municipal Waste Characterization, ISBN 1 899965 32 7, Ireland
5. EPA Method 3050B: Acid Digestion of Sediments, Sludges, and Soils

Indian:

1. Bureau of Indian Standard (BIS), IS: 2720 (Part 1) - 1983. Indian Standard. Methods Of Test For Soils. Part 1 Preparation. Of Dry Soil. Samples for various Tests. (Second Revision)
2. Bureau of Indian Standard (BIS), IS: 2720 (various parts such as Part 2 to 9) - 1983. Indian Standard Methods of Test for Soils. (2^{nd}Revision)

Table 5.8 Ambient Air (Manual & Continuous Analysers), Indoor Air & Fugitive Emission Analysis

S.No.	Analytes	Methods of Analysis	
		Chemical Method	Continuous Analyzers
1.	Sulphur Dioxide (SO2), µg/m^3	• Improved West and Gaeke	• Ultraviolet fluorescence
2.	Nitrogen Dioxide (NO2), µg/m^3	• Modified Jacob &Hochheiser (Sodium-Arsenite)	• Chemiluminescence
3	Particulate Matter (size less than 10 µm) or PM10 µg/m^3	• Gravimetric	• TOEM • Beta attenuation

4	Particulate Matter (size less than 2.5 microns) or $PM_{2.5}$ $\mu g/m^3$	• Gravimetric	• TOEM • Beta attenuation
5	Ozone (O^3) $\mu g/m^3$	• Chemical method	• UV photometric • Chemiluminescence
6	Lead (Pb) $\mu g/m^3$	• AAS / ICP method after sampling on EPM 2000 or equivalent filter paper • ED – XRF using Teflon filter	_
7.	Carbon Monoxide (CO) mg/m^3	• Non Dispersive Infra Red (NDIR) Spectroscopy	
8.	Ammonia (NH_3) $\mu g/m^3$	• Indophenol blue method	• Chemiluminescence
9.	Benzene (C6H6) $\mu g/m^3$	• Adsorption and desorption followed by GC analysis	• Gas chromatographybased Continuous analyser
10.	Benzo (a) Pyrene (BaP) – particulate phase only ng/m^3	• Solvent extraction followed by HPLC / GC analysis	_
11.	Arsenic (As) ng/m^3	• AAS / ICP method after sampling on EPM 2000 or equivalent filter paper AAS / ICP method after sampling on EPM 2000 or equivalent filter paper	_
12.	Nickel (Ni) ng/m^3	• AAS / ICP method after sampling on EPM 2000 or equivalent filter paper AAS / ICP method after sampling on EPM 2000 or equivalent filter paper	_

International Methods

1. Methods of Air Sampling and Analysis, 2020 , By James P. Lodge Jr, 3rd Edition June 30, 2020 by CRC Press, 784 Pages
2. USEPA Procedures for Collecting Ambient Air Samples, Ambient Air Sampling (3/28/2016, SESDPROC-303-R5)
3. Handbook of Air Toxics - Sampling, Analysis, and Properties, Lawrence H. Keith, Mary Walker, CRC Press, 640 Pages

Indian Methods

1. CPCB Guidelines "Methods for Measurement of Air Pollution- Guidelines for Manual Sampling and Analysis, National Ambient Air Quality Series: NAAQMS/36/2012-13
2. CPCB Methods and Standard Operating Procedures of Emission Testing in Hazardous Waste Incinerator, LATS series
3. IS 5182IS 5182: Part 1: 2006Methods for measurement of air pollution may 2006: Part 1 dust fall (First Revision)
4. IS 5182: Part 2: 2001 (1 Revision) Methods for measurement of air pollution: Part 2 sulphur dioxide (First Revision)
5. IS 5182: Part 2: Sec 2: 2018Methods for measurement of air pollution: Part 2 sulphur dioxide: Sec 2 ultraviolet fluorescence method

6. IS 5182: Part 4: 1999 (1 Revision) Methods for measurement of air pollution: Part 4 suspended - Particulate matter (First Revision)
7. IS 5182: Part 5: 2020 (1 Revision) Methods for Measurement of Air Pollution Part 5 Sampling of Gaseous Pollutants (First Revision)
8. IS 5182: Part 6: 2006 (1 Revision) Method for measurement of air pollution: Part 6 oxides of nitrogen (First Revision)
9. IS 5182: Part 6: Sec 2: 2018Methods for measurement of air pollution: Part 6 oxides of nitrogen: Sec 2 chemiluminescence method
10. IS 5182: Part 7: 2021 (1 Revision) Methods For Measurement of Air Pollution Part 7 Hydrogen Sulphide FIRST REVISION
11. IS 5182: Part 10: 1999 (1 Revision) Methods for measurement of air pollution: Part 10 carbon monoxide (First Revision)
12. IS 5182: Part 11: 2006 (2 Revision) Methods for measurement of air pollution: Part 11 benzene, toluene and xylene (BTX) (Second Revision)
13. IS 5182: Part 12: 2004 (1 Revision) Method for measurement of air pollution: Part 12 Polynuclear Aromatic Hydrocarbons (PAHs) in air particulate matter (First Revision)
14. IS 5182: Part 13: 1991Methods of measurement of air pollution: Part 13 total fluorides in ambient air
15. IS 5182: Part 15: 1974Methods for measurement of air pollution: Part 15 mass concentration of particulate matter in the atmosphere
16. IS 5182: Part 15: Sec 2: 2018/ISO 10473: 2000Methods for Measurement of Air Pollution Part 15 Mass Concentration of Particulate Matter Section 2 Beta-ray absorption method
17. IS 5182: Part 19: 2022(1 Revision) Methods For Measurement Of Air Pollution Part 19 Chlorine First Revision
18. IS 5182: Part 20: 1982Methods for measurement of air pollution: Part carbon disulphide
19. IS 5182: Part 21: 2001Methods for measurement of air pollution: Part 21 non methane hydrocarbons in air by gas chromatography
20. IS 5182: Part 22: 2004Methods for measurement of air pollution: Part 22 lead
21. IS 5182: Part 23: 2006Methods for measurement of air pollution: Part 23 respirable suspended particulate maiter (PM 10), cyclonic flow technique
22. IS 5182: Part 24: 2019Methods for Measurement of Air Pollution Part 24 Fine Particulate Matter ($PM_{2.5}$)
23. IS 5182: Part 25: 2018Methods for measurement of air pollution: Part 25 ammonia
24. IS 5182: Part 26: 2020 Method For Measurement of Air Pollution Part 26 Nickel

H. Source Emissions Sampling & Measurement

The source emission monitoring requirements can necessitate periodic manual monitoring/measurements or through Continuous Emission Monitoring Systems (CEMS) related to consent terms or conditions (e.g., emission limits, work practice requirements, equipment design and operating requirements) that result from regulations. For Manual Source Emission Monitoring following international or Indian Emission measurement methods have to be adopted for systematic monitoring.

Table 5.9 Source Emission Sampling & Measurement

S.No.	Source Emission Sampling & measurement	Test Method
1.	Composition of Flue Gas & Molecular Weight Determination	

2.	Stack Gas Static pressure determination	
3	Stack gas velocity& temperature determination	USEPA Test Methods
4	Stack gas volumetric fl ow/Discharge	
5	Flue Gas Moisture determination	
6	Stack Sampling Port and Traverse point	CPCB Emission Regulations
7	Sulfur Dioxide in Emissions	
8	Sulphuric Acid Mist	
9	Nitrogen Oxides in Emissions	
10	Particulate Matter (PM) emissions	Bureau of Indian Standard (BIS) Methods of Measurement of Stationary Sources
11	Hydrogen Halides and Halogens	
12	Metals and Non Metals in Emissions	

International Methods

1. USEPATest Method 1— Sample and Velocity Traverses for Stationary Sources(40 CFR Part 60, Appendix A) 4-28-2020
2. USEPA Test Method 2 –Determination of Stack Gas Velocity and Volumetric Flow Rate-S-type Pitot, 8-2-2017
3. USEPA Test Method 3 – Gas Analysis for Determination of Dry Molecular weight
4. USEPA Test Method 4—Determination of Moisture Content in Stack Gases 10-7-2020.
5. USEPA Test Method 5 Determination of particulate matter emissions from stationary sources 12-7-2020
6. USEPA Test Method 6 Determination of Sulfur dioxide emissions from stationary sources 8-3-2017
7. USEPA Test Method 7 Determination of Nitrogen oxide emissions from stationary sources 1-14-2019
8. USEPA Test Method 8 Determination of SO2 and sulphuric acid mist
9. USEPA Test Method 10 Determination of Carbon Monoxide- NDIR
10. USEPA Test Method 29 Determination of metals emissions from stationary sources 8-2-2017
11. USEPA Test Method 201A Determination of PM10 and PM2.5 Emissions From Stationary Sources (Constant Sampling Rate Procedure) 10-7-2020

Indian Methods

1. Guidelines on Methodologies for Source Emission Monitoring" Central Pollution Control Board, LATS / 80 / 2013-14
2. CPCB Emission Regulation (Part III) Comprehensive Industry Document Series COINDS/20/1984-85
3. CPCBGuidelines for Continuous EmissionMonitoring Systems (CEMS), July 2017
4. IS 11255 : Part 1 : 1985Methods for measurement of emissions from stationary sources: Part 1 particulate matter
5. IS 11255 : Part 2 : 1985Methods for measurement of emissions from stationary sources: Part 2 sulphur dioxide
6. IS 11255 : Part 3 : 2008(1 Revision)Methods for measurement of emissions from stationary sources: Part 3 flow rate (First Revision)
7. IS 11255 : Part 4 : 2006(1 Revision)Method for measurement of emission from stationary sources: Part 4 hydrogen sulphide and carbon disulphide (First Revision)
8. IS 11255 : Part 5 : 1990Methods of measurement of emissions from stationary sources: Part 5 total fluoride

9. IS 11255 : Part 6 : 1999Methods of measurement of emissions from stationary sources: Part 6 ammonia
10. IS 11255 : Part 7 : 2005Methods for measurement of emission from stationary sources: Part 7 oxides of nitrogen
11. IS 17133 : 2019/ISO 10396 : 2007Sampling from Stationary Sources for Automated Determination of Gas Emission Concentration Using Permanently Installed Monitoring Systems

I. Noise/Sound level Monitoring

Noise pollution is unwanted and unpleasant sound which can deteriorate human health and other living organisms present in the Environment. Noise or sound level monitoring or measurement is a process to measure the magnitude of Noise in residential, commercial and industrial areas. Data collected from Noise level helps us to understand trends and action required to be taken to reduce noise pollution.

Ambient Noise Level

Ambient Noise measurement includes Residential area noise measurements, Noise measurement in vicinity of Road traffic, Industrial Noise or Noise generated within Industry.

Source Generated Noise level

Source generated Noise is the loud sound generate continuously from a defined source, running machinery noise, hammering, drilling, heavy duty motors, lathe machine work, grinding, fabrication, forging, compressing, breaking, pumping, packing, transporting etc. The intensity of noise generated is quite high and may cause serious and large scale Noise related problems for workers and those people who are in vicinity

Table 5.10 Noise Measurement

S.No.	Noise measurement parameters	Method
1.	Noise Level, dBA	Measurement by Sound Level Meter
2.	Equivalent Continuous Sound Pressure Level (L_{EQ})	Department of Environment and Resource Management (2000) "Noise Measurement Manual", 3rd Edition,Queensland, Australia.
3	Sound Exposure Level (LAE or SEL)	
4	Percentile sound pressure level exceeded for 90% of the measurement period, (L90)	
5	Percentile sound pressure level exceeded for 50% of the measurement period, (L50)	IS-9989:1981·Assessment of Noise with respect to Community Response

J. Plastic waste Management Rules – Plastic carry Bag Thickness measurement

The Union Ministry of Environment, Forest & Climate Change (MoEFCC) has notified the Plastic Waste Management Amendment Rules, 2021, ondated 12th August 2021 that makes it mandatory for the thickness of plastic carry bags to be increased to 120 microns by December, 2022, and prohibit the manufacture, import, stocking, distribution, sale and use of several products with low utility but high littering potential.The permitted thickness of the plastic bags, 50 microns, has been increased to 75 microns from September 30, 2021, and will be increased to 120 microns from the December 31, 2022, according to the gazette notification. The basic behind the polybags measurements is that the larger the micron/gauge/millimeter of polybag, the thickness of the polybag increases.

Table 5.11 Plastic carry Bag Thickness measurement

S.No.	Plastic Poly bags	Method
1.	Plastic Poly Bag Thickness	Digital Micro Meter Method Non-Contact Capacitance Thickness Gauge IS:2508-1984 Specifications for Low Density Polythene Films ASTM D6988 – Guide for Determination of Thickness of Plastic Film Test Specimens ASTM D8136 – Standard Test Method for Determining Plastic Film Thickness and Thickness Variability Using a Non-Contact Capacitance Thickness Gauge
2.	Bio-degradability	ISO-14855-2, 2018-07; Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting condition – Method by analysis of evolved carbon di-oxide

ANNEXURE VI

List of Sampling Instruments/Equipment at Environmental Laboratory

S. No.	Name of Instruments/ Equipment	Nos. Available	S. No.	Name of Instruments/ Equipment	Nos. Available
Sampling Equipment/items- Water (Ground water, River water & Lake water); Waste water (sewage, industrial effluents)					
1.	Antiseptic Hand wash / soap		23	Ice packs	
2.	BOD/DO Bottles		24	Measuring Tape 25 mtrs	
3.	Borosilicate Glass Sample bottles (Transparent & Amber coloured		25	Nylon Rope 20 mtrs	
4.	Bottom Sampler		26	Oil & Grease sampler	
5.	Buckets (Stainless steel) 10 litres separate for water and waste water sampling		27	Packing tape	
6.	Chloroscope for residual chlorine		28	Permanent Marker Pen Black/Blue	
7.	Depth sampler		29	pH strips/pH meter pen type	
8.	Disposable Gloves & Rubber gloves		30	Plastic Beaker/plastic Mug / Volumetric Cylinder	
9.	Dissolved Oxygen meter hand held type		31	Plastic bucket	
10.	Dissolved Oxygen Sampler		32	Plastic Storage bags	
11.	Distilled Water Bottle		33	Polypropylene Bottles	
12.	Drinking water storage insulated Jug		34	Polypropylene/Polyethylene Carboys (various capacities)	
13.	Electrical Conductivity meter pen type		35	Sampling Rod / Bamboo stick maximum 2.5 mtrs length	
14.	Field Aprons		36	Self-stick Cotton Tape for Labelling of carboys/bottles	
15.	Field Multiparameter Water Testing Kit		37	Stainless steel Mug	
16.	Field Notebook		38	Stainless steel scale	
17.	First Aid Kit		39	Stop Watch	
18.	Float Balls (For Flow measurement		40	Thermometer	
19.	Flow meter		41	Turbidity Meter pen type	
20.	GPS		42	Wash Bottles	
21.	Gum Boots & Waders		43	Water sampler, Vandorn or equivalent (Automatic sampler when composite sampling to be done)	
22.	Ice boxes with ice block				
Sampling Equipment/items - Microbiological and Biological					
1	Bottom Sampler		13	Match box	
2	Cotton Roll for swab		14	Narrow mouth Polypropylene sample bottle	
3	Cotton tape for labelling		15	Permanent Marker	
4	Dark & light Bottles		16	Plankton Net	
5	Ekman Dredge		17	Rectified Spirit	
6	Field Note book		18	Rope	
7	Fine sieves large size for collecting benthos		19	Safety Glasses/Lab goggles	
8	Gum boot		20	Soft Brushes 1 inch & ½ inch	

9	Hand gloves		21	Sterilized microbiological glass bottle with ground glass cap	
10	Hand shovel		22	Tweezers broad/fine	
11	Ice box with ice block		23	Wide mouth glass sampling bottles	
12	Large Container for Bulk sample for Toxicity testing sample		24	Wide mouth polypropylene sampling bottles	
Sampling Equipment/items - Soil, Sediment, Sludge					
1.	Antiseptic hand wash		9	Plastic tray for compositing the sample	
2.	Bucket		10	Polyethylene Bags	
3.	Coring devices/core catchers		11	Rubber Gloves	
4.	Disposable gloves		12	Sampling Auger & shovel	
5.	Distilled water		13	Stainless steel Hand Shovel	
6.	Measuring tape		14	Stainless steel large spatula/spoon	
7.	Permanent marker pen		15	Wash Bottle	
8.	pH strips/pH meter for field measurement of pH		16	Wide mouth Sampling Jars (Plastic/glass)	
Sampling Equipment/items- Industrial solid waste, Hazardous waste & Municipal Solid waste, Plastic waste					
1	Antiseptic Hand wash		16	Rubber Gloves	
2	Bucket		17	Sampling Auger & shovel	
3	Coliwasa (Composite Liquid waste sampler) Glass & Plastic		18	Sampling Auger	
4	Coring devices/core catchers		19	Sampling Bags (Polythene)	
5	Disposable gloves		20	Sampling Trier	
6	Distilled water		21	Sieves set	
7	Double Protection Filter Chemical Gas Respirator		22	Stainless steel Hand Shovel	
8	Field Note Book		23	Stainless steel large spatula/spoon	
9	Grain sampler		24	Stainless steel Scoop/Trovel	
10	Measuring tape		25	Tray for compositing the sample	
11	Permanent Marker pen		26	Veihmeyer sampler	
12	Polythene bags thickness Gauge (Digital)		27	Wash Bottle	
13	Pond Sampler		28	Waste pile sampler	
14	PP/PE Plastic bottles		29	Weighted Bottle Sampler	
15	PPE Kit including safety goggles/face mask		30	Wide mouth Glass Bottles /Jars	
Sampling Equipment/items- Ambient Air/Fugitive Emissions (Manual)					
1	Absorbing solutions separate for separate gases to be monitored		18	Laboratory safety goggles	
2	Air Flow meter		19	Low Volume Sampler (LVS)	
3	Air pollution mask		20	Maximum Minimum Thermometer	
4	Air Sampling Data sheet		21	Permanent Marker	
5	Anemometer				
6	Breathing apparatus		22	Personal Air Samplers	
7	Dichotomous Sampler (PM2.5 and PM10)		23	Polyuretahane Foam (PUF) Sampler	
8	Disposable gloves		24	PP/PE Sampling bottles narrow mouth leak proof	
9	Double Protection Filter Chemical Gas Respirator		25	Pre weighed & coded EPM 2000 Filter paper (Air Monitoring)	

10	Drager's Pump and Dragers Detection tubes for specific air pollutants		26	Pre weighed & coded Glass Fibre (GFA) Filter paper (Air monitoring)	
11	Dust Fall Sampler		27	Rain Gauge	
12	Envelops for filter paper storage		28	Respirable Dust Sampler (RDS) (*4 Nos)	
13	Glass adsorption tubes		29	Spare carbon brushes	
14	Glass Impingers 35 ml		30	Tedler bags	
15	Handy Sampler with set of glass impingers (*2 Nos)		31	Top loading orifice kit (For calibration of HVS)	
16	High Volume Sampler (HVS)		32	Weather Monitoring system	
17	Laboratory Coat		33	Wind speed/wind direction monitor	
Sampling & Analytical Instrument/Equipment/items- Continuous Ambient Air Monitoring					
1	Continuous Ambient Air Monitoring System (Fixed)		13	Continuous Ambient Air Monitoring System (Mobile)	
2	Continuous PM_{10} Analyser		14	Continuous $PM_{2.5}$ Analyser	
3	Continuous PM_{10}& $PM_{2.5}$ Monitoring Analyser (TEOM system)		15	Ambient Sulphur Dioxide Analyser	
4	Ambient Nitrogen Oxides (NO-NO_2-NO_x) Analyser		16	Ambient Carbon Monoxide & Carbon dioxide Analyser	
5	Ambient Ozone Analyser		17	Total Hydrocarbon Analyser	
6	Ambient BTEX Analyser		18	Ambient Ammonia Analyser	
7	Multipoint Gas Calibration system		19	Zero Gas Generator	
8	19 inch Rack mounting system for air analysers		20	Air Sampling Probe Mast	
9	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.		21	Calibration Gas Cylinders (SO_2, NO, CO, NH_3. Benzene and Toluene (One each) with stainless steel Regulators	
10	Synthetic Air Cylinder		22	Nitrogen Cylinder	
11	Permeation tubes (SO_2, NO-NO_2-NOx,NH_3, BTX		23	Air Conditioners (Split type) 1.5 ton & 2.0 ton	
12	Computer Station with Modem		24	UPS system 5 KVA & UPS system 15 KVA	
Sampling Equipment/items- Source Emissions					
1	Activated Charcoal tubes		13	Isokinetic Stack Monitoring Kit (complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	
2	Asbestos gloves		14	Metal braided Flexible umbilical cord	
3	Barometer (digital)		15	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	
4	Continuous emission monitoring equipment		16	Monoblock type, rotary design vacuum pump	
5	Dry Gas Meter		17	Orsat Apparatus	
6	Electricity Generator		18	Pre weighed and coded cellulose and fibre glass thimbles	
7	Face Shield & helmet		19	Protective apron	
8	Fire Extinguisher		20	Soap Bubble meter	

9	First Aid box		21	Source emission monitoring Impingers train set with spare impingers (100 ml & 225 ml capacity)	
10	Flue Gas Analyser		22	Stainless steel heated Sampling Probes with thimble holders (short and long)	
11	Gas Mask		23	Stop watch	
12	Isokinetic Nozzles (Different sizes nozzles set)		24	Thermocouple probe	
Sampling & Analytical Equipment - Vehicular Emission					
1	Carbon Dioxide Analyser		4	Multigas Analyser (petrol, CNG, LPG)	
2	Diesel Exhaust Analyser		5	Opacity meter (Diesel)	
3	Exhaust CO/HC Analyser with Sampling Probe		6	Smoke Density meter	
Sampling & Analytical Equipment- Ambient Noise/Source Noise					
1	Automated Noise Monitoring System		3	Digital Sound level (Noise) Meters	
2	Calibrator for Noise Meters		4	Integrating Sound level meter	

List of Environmental sample processing instruments / Equipment (alphabetically arranged) at Environmental Laboratory

S.No.	Name of Instruments/ Equipment	Nos. Available	S.No.	Name of Instruments/ Equipment	Nos. Available
Environmental Sample Processing Equipment					
1	Accelerated Solvent Extraction (ASE) System		31	Laboratory Pestle mortar	
2	Aerosol Generator		32	Laboratory Ball Mill	
3	Ammonia distillation assembly			Laboratory Grinder	
4	Analytical Balance (Digital)		33	Laminar Flow bench for Microbiological analysis	
5	Aquarium for Toxicity bioassay test (*4 Nos)		34	Magnetic Stirrer with or without heating system (*2 Nos)	
6	Arsenic Estimation assembly		35.	Mechanical Shaker	
7	Autoclave (*2 Nos)		36	Membrane Filtration assembly with vacuum pump	
8	Bacteriological bottles 300 ml		37	Microbial culture refrigerator	
9	Bacteriological Incubators-(Stainless steel) (*2 Nos)		38	Microwave Digester	
10	Bio safety cabinets		39	MPN Bacteriological tubes with stand	
11	BOD Incubators		40.	Muffle Furnace ((*1 Nos))	
12	Centrifuge		41	Multi-parameter Kit for pH, Temperature, DO and Conductivity	
13	COD Digestion heated Blocks		42	Petri Dishes	
14	Cyanide Distillation Assembly		43	Phenol distillation assembly	
15	Deep Freezer (Horizontal)		44	Plate counter (Manual/Automatic)	
16	Deep Freezer (Vertical)		45	Precision Digital Balance (minimum detection 0.001mg/0.01 mg)	
17	Digestion Chambers		46	Refrigerators Big Size 300 ltrs or more	

18	Digital Thermometer		47	Rotary Evaporator (Buchi type) with water recirculating chiller	
19	Dispensers (Various capacities)		48	Separating funnel shaker	
20	Filtration Assembly with vacuum pump		49	Separating Funnels for Liquid Liquid extraction	
21	Fluoride Distillation Assembly		50	Soxhlet Apparatus	
22	Glass Distillation assemblies (Arsenic/ Fluoride/)		51	SPE/SPME Extraction system	
23	Glass Double Distillation Assembly		52	Spirit lamp/burner	
24	Heating mantles		53	Thermometer	
25	Hot Air Ovens (*2 Nos)		54	Thermometer (Dry & wet bulb)	
26	Hot plates (small, Medium and Large) (*2 Nos)		55	Toxicity characteristic leaching procedure (TCLP) extractor	
27	Hygrometer		56	Ultra sonic water bath	
28	Imhoff Cone		57	Vacuum Pump with filtration assembly	
29	Inoculation loop		58	Water Bath with temperature control (*2 Nos)	
30	Kjeldhal Apparatus				

ANNEXURE VII

Analytical Instruments at Environmental laboratories

S. No.	Name of Instrument
1.	Atomic Absorption spectrometer (AAS)
2.	Automatic Titration Assembly
3.	Binocular Microscope
4.	Binocular Stereo Zoom Microscope
5.	Bomb Calorimeter
6.	BTX Analyzer with BTX calibrator
7.	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer
8.	Colony counter
9.	Conductivity meter (*2 Nos)
10.	Digestion chamber(*01 Nos)
11.	Digital Burettes
12.	Digital Mercury Analyser
13.	Dissolved Oxygen Meter (Bench model)
14.	EDXRF Analyser
15.	Flame Photometer (*1 Nos)
16.	Flash Point Apparatus
17.	Flocculator (Jar testing apparatus)
18.	Fourier-transform infrared Spectrometer (FTIR)
19.	Gas Chromatograph Mass Spectrometer with Head Space analyser
20.	Gas Chromatograph Mass Spectrometer with Purge & Trap
21.	Gas Chromatograph TOF-MS
22.	Gas Chromatograph with Electron capture detector and Flame photometric Detector GC-ECD/FPD
23.	Gas Chromatograph with Flame ionization detector GC-FID
24.	Gas Chromatograph with Mass Spectrometer (GC-MS)
25.	Gas Chromatograph with Mass Spectrometer (GC-MS-MS)
26.	Graphite Furnace Atomic Absorption Spectrometer (GFAAS) with Vapour Generation Assembly
27.	High Performance Liquid Chromatograph (HPLC)
28.	High Resolution Mass Spectrometer (HRGC-HRMS)
29.	Inductively Coupled Plasma (ICP) Spectrometer-OES
30.	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer
31.	Ion Chromatograph Anion & Cations
32.	Liquid Chromatograph with Mass Spectrometer (LC-MS-MS)
33.	Methane and Non Methane (NMHC) Analyser
34.	Microscope
35.	Microscope Inverted
36.	Microscope Binocular Research
38	Moisture Content Meter
37.	CO (NDIR based) analyser(*1 Nos)
38.	Nephelometer (Turbidity Meter)

S. No.	Name of Instrument
39.	Noise level Meter (*2 Nos)
40.	Organic halogen (AOX/TOX) Analyser
41.	pH-Meter with combined electrode
42.	Specific ion Analyser with ion selective electrodes
43.	Spectrophotometer (Visible)
44.	Stereoscopic Microscope
45.	TKN Analyser semi-automatic with aluminium block digester
46.	TOC Analyser
47.	Toxic Gas Analyser
48.	UV-Vis Spectrophotometer
49.	Wavelength Dispersive X-ray Fluorescence (WDXRF)
50.	X Ray Fluorescence (XRF) Spectrometer (Portable)
51.	Zero Head Space Extractor (ZHE)

ANNEXURE VIII

Laboratory Safety / Protection Equipment

S. No	Safety/Protection Equipment	S. No	Safety/Protection Equipment
1.	Lab Coats with name plate	**20.**	Fire blanket
2.	Full body Aprons	**21.**	Safety storage cabinet
3.	Gloves heat protecting non absorbent gloves (Insulated)	**22.**	Chemical splash apparel
4.	Acid and Alkali proof gloves	**23.**	Safely belts
5.	Gloves (Latex examination gloves , Non sterile)	**24.**	Rope (thick)
6.	Gloves (Nitrile examination gloves , Non sterile)	**25.**	Knee caps
7.	Gloves (Nitrile examination gloves , sterile)	**26.**	Helmets
8.	Hard toed shoes (for transportation of cylinders)	**27.**	Fire proof jackets
9.	Gum Boots	**28.**	Shoe cover
10.	Safety Goggles	**29.**	Slippers
11.	Tongs (big size)	**30.**	Shoe rack
12.	Tongs (small size)	**31.**	Safety Harness
13.	Hand Truck for transporting cylinders	**32.**	Wadding suit
14.	Sample trollies	**33.**	Hand Protector grip
15.	First Aid Boxes	**34.**	Fire extinguisher
16.	Gas Masks (Plastic) N-95	**35.**	Solvent cabinets
17.	Masks (particulate respire)	**36.**	Chemical spill kits
18.	Safety hand shower	**37.**	Segregated Waste disposal containers for broken glass, chemical waste, plastic ware, paper. Electronic waste / batteries etc.
19.	Stretcher		

ANNEXURE IX

CPCB Inter-laboratory AQC Participation Fees

Environmental Laboratories have to participate mandatorily in the Inter Laboratory Proficiency Testing program conducted by CPCB Annually as per the plan posted on CPCB official website. Environmental Laboratories have to submit participation fees for participation in respective Inter-laboratory AQC Exercise. The fee shall be submitted only through online transfer (no other means of deposit shall be accepted).

The Inter Laboratory AQC Fee Structure for Environmental laboratories is given below:

Laboratories	Inter laboratory AQC Participation Fee
Private Laboratories	Rs.30,000/= per year as per revised Gazette Notification
Laboratories of Govt./ Semi Govt./ Public Sector undertaking/ Autonomous	Rs.20,000/= per year as per revised Gazette Notification

ANNEXURE X

TERMS & CONDITIONS FOR RECOGNITION OF LABORATORIES UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

The following terms and conditions shall be observed for recognition of laboratories under Section 12 (1) (b) of the Environment (Protection) Act, 1986.

1. The laboratory (Private/NGOs) shall be legally identifiable and registered with an appropriate statutory body i.e. local govt., State govt. or Central Govt.

2. The laboratory shall perform all the functions as mentioned in Rule 9 of the Environment (Protection) Rules, 1986.

3. It shall carry out the tests by using only validated/verified methods prescribed internationally/nationally are envisaged.

4. The test report shall be recorded in the standard format in triplicate. It shall be signed by the Government Analyst and be sent to the officer from whom the sample is received by the laboratory.

5. It shall carry out those tests, which are specified in the application and it shall not carry out any other test on the samples given.

6. The laboratory shall charge rates not exceeding those fixed by Central Pollution Control Board under Schedule of Analysis Charges as per the gazette Notification no. S.O./42(3)/87 dated 23rd February 2022.

7. The laboratory shall not charge rates higher than the rates they charge to any other Government or Public Sector organization.

8. The laboratory shall ensure that a Legal sample submitted to it for testing will only be tested by the authorised person and supervised by the `Government Analyst' by Central Government under provisions of the Environment (Protection) Act and as notified in the official gazette from time to time.

9. When a Government Analyst ceases to be in the services of the Laboratory, the Head of the Laboratory shall report this fact to the CPCB within fifteen days and simultaneously take steps for filling up this vacancy.

10. Any report signed by the Government Analyst may be used as evidence of facts in a court of law as per Section 14 of the Environment (Protection) Act, 1986. The laboratory shall provide all facilities to the `Government Analyst' for giving evidence in a court of law, if it becomes necessary.

11. It shall maintain complete secrecy in respect of the test results. These shall not be divulged to any person or authority other than the Officer empowered under Section 11 of the Act of the court having jurisdiction.

12. Laboratory shall remain open for all working days except weekly off, Central & State Govt. holidays. Environmental laboratory of an educational institute/college will make arrangement of acceptance of samples and their analysis during any vacation exceeding more than 5 days i.e. summer/winter vacation etc.

13. It shall maintain proper records and registers and the calculations and test results in respect of tests conducted by them.

14. The laboratory and the Government Analysts employed by the laboratory shall participate in (Inter Laboratory- Analytical Quality Control Exercises) organized by the Central Government/ CPCB or an organization designated by it to test the capabilities of the recognized laboratories and analysts from time to time. The fee for participation in Inter Laboratory Analytical Quality Control exercise has to be paid by the participating laboratory to the designated organization.

15. If feel necessary, Central Government will send dummy environmental samples to the laboratory to keep constant check over the laboratories of the results of the sample, which are to be analysed, free of cost by the laboratory and results will be provided to the Central Government.

16. If the laboratory is sent samples from an establishment with which it has got connections through ownership or other means which make it improper for the laboratory to carry out the tests with respect to that sample, it shall disclose the fact to the empowered officers or authority sending the sample and shall refuse the samples.

17. It shall be the responsibility of the laboratory to maintain properly the necessary infrastructure for conducting tests successfully.

18. In case the laboratory desires to make a mention of its recognition as environmental laboratory in its letter heads, printed material, signboards, etc., it shall specify the period of recognition and such mention of the recognition shall cease immediately after the expiry of recognition.

19. The laboratory shall comply with all the rules and regulations notified under the Environment (Protection) Act, 1986.

20. The recognition shall become effective from and to the date stated in provisional certificate issued by Central Government.

21. CPCB shall have the right to revoke the recognition or de-recognize the laboratory at any time in public interest without assigning any reason, if it is deemed necessary by the Central CPCB.

22. The laboratory shall maintain complaint register (bounded and numbered)

23. The recognition accorded to Government Analysts in an environmental laboratory ceases along with the de-recognition of that environmental laboratory.

24. In case there is any change in Location or name of the laboratory for which it has been granted recognition earlier the laboratory will inform Central Govt./CPCB regarding the change as well as apply afresh for recognition.

25. In case of takeover of a recognized private laboratory, its ownership changes; occurrence of such changes must be communicated to the recognition body Central Government/CPCB within one month. Through, an appropriate mechanism that the laboratory continues to comply with the criteria against which recognition was originally granted will be verified.

26. After recognition, laboratory can be re-inspected at any time for its periodic surveillance/assessment/performance.

The aforesaid terms and conditions are acceptable to us.

Dated:

Signature _____

(Head of Laboratory)

Full Name _____

(in capital letters)

Address _____

ANNEXURE XI

TERMS AND CONDITIONS ACCEPTANCE BY PROPOSED GOVERNMENT ANALYSTS UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

1. A person working as analyst in a laboratory recognized as Environmental Laboratory under the Environment (Protection) Act, 1986 may be recognized as a Government Analyst if he has the qualifications and experience as prescribed in the Rule 10 of the Environment (Protection) Rules, 1986.

2. The recognition of a Government Analyst is with respect to the laboratory where he is employed at the time of recognition and which is recognized as an environmental laboratory under Section 12 of the Environment (Protection) Act, 1986. If he ceases to be in the services of the said laboratory, his recognition ceases forthwith from the date of termination of his service with the laboratory.

3. The recognition accorded to the Government Analyst in an Environmental Laboratory ceases along with the expiry of recognition/ revoking of recognition/de-recognition of that environmental laboratory.

4. The Government Analyst shall participate in any `Round Robin Test' organized by the Central Government or an organization designated by it for testing his capabilities for conducting various environmental tests.

5. It shall be the responsibility of the Government Analyst to see that the instruments necessary for conducting various environmental tests are properly maintained and calibrated.

6. The test report by the Government Analyst submitted to the appropriate authority shall bear the logo/ seal of the laboratory/ Organization.

7. The Government Analyst shall appear in a court of law for giving evidence, If required by the appropriate court / Central Govt.

8. The Government Analyst shall maintain complete secrecy in respect of test results.

9. The Government Analyst shall comply with the rules and regulations notified under the Environment (Protection) Act, 1986.

11. The Central Government/ CPCB shall have the right to derecognize the Government Analyst any time in public interest without assigning any reason.

The undersigned accept the above terms and conditions for consideration of recognition as Government Analyst as per Section 13 of Environment (Protection) Rules, 1986

S. No	Name of proposed Govt Analyst	Designation	Qualifications	Signature
1.				
2.				
3.				

Countersignature Head of Laboratory

SEAL of LABORATORY

ANNEXURE XII

BIO-DATA PROFORMA FOR CONSIDERATION OF RECOGNITION AS GOVT. ANALYST UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

1. Name in full (In block letters) : _____

2. Father's name : _____

3. Date of birth : _____

4. Nationality : _____

5. Permanent Address : _____

_____

6. Tel No. _____ Fax _____ E-Mail _____

7. Educational qualification (Give detail in chronological order from graduation & onward):

S. No.	Exam passed	Name of Board/ University/ Institution	Year of passing	Subjects taken	Division
1.					
2.					

8. Professional Training taken during last 3 years:

S. No.	Organization	Period of training		Subject of the training
		From	To	

9. Previous and current employment records:

S. No.	Name & address of employer	Type of organization Govt./Semi-Govt./ Public Sector/ Private/NGO	Period of service		Post held	Salary drawn	Job nature	Reason for leaving
			From	To				

Note: Please attach separate sheet, if space is inadequate.

10. Experience in Analysis of Environmental Samples _____ years.

11. Please provide details if earlier appointed / recognized as Govt. Analyst under The Environment (Protection) Act, 1986:

12. Declaration:
I declare that the foregoing information is correct and complete to the best of my knowledge and belief and nothing has been concealed / distorted. Documents in support of my educational qualification and experience will be provided, if required so.

Place: (Signature of candidate)
Date:

Signature of the Head of the Laboratory

SEAL OF THE LABORATORY

ANNEXURE XIII

Draft Gazette Notification

TO BE PUBLISHED IN THE GAZETTE OF INDIA EXTRAORDINARY
PART ……. SECTION ……SUB-SECTION……..
CENTRAL POLLUTION CONTROL BOARD
MINISTRY OF ENVIRONMENT & FORESTS

NOTIFICATION

New Delhi, Dated ……..

No. _____In exercise of the powers conferred by clause (b) of Sub-section 1 of Section 12 and Section 13 read with clause 1 of the Notification No. 145(E), dated 21st February, 1991, issued under Section 23 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Pollution Control Board, PariveshBhawan, East Arjun Nagar, Delhi - 110032 hereby recognizes, (a) the laboratories specified in column (2) of the Table below as 'Environmental Laboratories' to carry out the functions entrusted to the environmental laboratories under the said Act, and the rules made thereunder, and (b) specified persons in column (3) of the Table as the Government Analysts for the purposes of analysis of samples of air, water, soil or other substances sent for analysis, specified for respective groups of parameters mentioned in Column (4).

After Sr. No._____ of the Notification No. _____, dated _____, and the entries relating thereto, the following Serial Nos. and entries shall be added namely:-

S. No.	Name of Laboratory	Name of the Govt. analysts	Recognized for parameter groups	Validity
1.	2.	3.	4.	5.

The Environmental Laboratories so mentioned shall remain valid as per column (5) from the date of Gazette notification. However, Government Analysts so mentioned at column (3) shall be appointed for a validity period mentioned at column (5) or up to the superannuation from the service of the Organization, whichever is earlier.

Authorized Signatory
CPCB / MoEF

Foot Note:

The principal notification was published in the Gazette of India vide SO NO. 728(E), dated 21.7.1987 and subsequently amended vide:-

(I)SO 838(E), dated 23.9.87 (2) SO 989(E) dated 17.11.87 (3) SO 489(E) dated 17.5.88 (4) SO 156 (E) dated 24.2.89 (5) SO 846(E) dated 24.10.89 (6) SO 375(E) dated 26.4.1990 (7) SO 803(E) dated 23.9.92 (8) SO 97(E) dated 5.12.1994 (9) SO 418(E) dated 31.3.1996 (10) SO 889 (E) dated 31.8.1996 (11) SO 452 (E) dated 31.5.97 (12) SO 631 (E) dated 31.5.1998 (13) SO (E) 336 dated 1.1.1999(14) SO.44(E), dated 15.1.2001, (15) S.O.No.490(E), dated 1.6.2001, (16) S.O. No. 532(E), dated 1.1.2002, (17) S.O. No.1168(E), dated 1.6.2002, (18) S.O.No.888(E), 1.6.2003, (19) No.Legal/42(3)/87/, dated 1.6.2004, (20) Legal/42(3)/87, dated 1.3.2005, (21) Legal42(3)/87, dated 1.9.2005, (22) Legal 42(3)/87, dated 15.12.2005 and (23) Legal 42(3)/87, dated 1.5.2006.

रजिस्ट्री सं. डी. (डी.एन.)-127 REGISTERED NO. D. (D.N.) 127

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-Section (ii)

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 128] नई दिल्ली, बुधवार, फरवरी 27, 1991/फाल्गुन 8, 1912
No. 128] NEW DELHI, WEDNESDAY, FEBRUARY 27, 1991/PHALGUNA 8, 1912

इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके
Separate Paging is given to this Part in order that it may be filed as a separate compilation

पर्यावरण और वन मंत्रालय

(पर्यावरण, वन तथा वन्यजीव विभाग)

अधिसूचना

नई दिल्ली, 21 फरवरी, 1991

का. आ. 145(अ):—केन्द्रीय सरकार, पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 23 के द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, निम्नलिखित आदेश जारी करती है, अर्थात्:—

1. केन्द्रीय सरकार, प्रयोगशालाओं या संस्थानों को पर्यावरण प्रयोगशालाओं के रूप में मान्यता देने तथा विश्लेषकों को सरकारी विश्लेषकों के रूप में नियुक्त करने अथवा

मान्यता देने की बाबत पर्यावरण (संरक्षण) अधिनियम, 1986 की क्रमशः धारा 12 की उपधारा (i) के खण्ड (ख) और धारा (13) द्वारा प्रदत्त शक्तियों को केन्द्रीय प्रदूषण नियंत्रण बोर्ड को प्रत्यायोजित करती है।

2. पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 12 की उपधारा (i) के खंड (ख) के अधीन प्राईवेट प्रयोगशालाओं की मान्यता और पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 13 के अधीन उनके विश्लेषकों को, सरकारी विश्लेषकों के रूप में मान्यता, केन्द्रीय सरकार द्वारा दी जाती रहेगी।

3. पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 12 की उपधारा (i) के खण्ड (ख) के अधीन मान्यताप्राप्त प्रयोगशालाओं को सरकारी/स्वायत्त/पब्लिक सेक्टर उपक्रम/शैक्षिक संस्था/राज्य या केन्द्रीय प्रदूषण नियंत्रण बोर्ड की प्रयोगशालाओं के रूप में विनिर्दिष्ट किया जाएगा।

4. पर्यावरण (संरक्षण) अधिनियम, 1986 के अधीन मान्यताप्राप्त प्रत्येक प्रयोगशाला द्वारा किया गया कार्य केन्द्रीय प्रदूषण नियंत्रण बोर्ड की वार्षिक रिपोर्ट में सम्मिलित किया जाएगा।

5. यह अधिसूचना राजपत्र में प्रकाशन की तारीख से लागू होगी।

[सं. क्यू-15013/1/89-सीपी डब्ल्यू]

मुकुल सनवाल, संयुक्त सचिव

MINISTRY OF ENVIRONMENT AND FORESTS

(Department of Environment, Forests and Wildlife)

NOTIFICATION

New Delhi, the 21st February, 1991

S.O. 115 (E).—In exercise of the powers conferred under Section 23 of the Environment (Protection) Act, 1986, (29 of 1986), the Central Governmen hereby issue the following orders, namely :—

1. The Central Government hereby delegates the powers with respect to grant of recognition to laboratories or institutes as environmental laboratories and to appoint or recognize Analysts a Government Analysts, as conferred by clause (b) of sub-section (i of section 12 and section 13 respectively of the Environmen (Protection) Act, 1986 to the Central Pollution Control Board.

2. Recognition of private laboratories under clause (b) of sub-section (i) of section 12 of the Environment (Protection) Act, 1986 as well as recognition of their Analysts as Government Analysts under section 13 of the Environment (Protection) Act, 1986, will continue to be done by the Central Government.

3. The laboratories recognized under clause (b) of sub-section (i) of section 12 of the Environment (Protection) Act, 1986 shall be specified as Government|Autonomous|Public Sector Undertaking| Educational Institution|State or Central Pollution Control Board Laboratories.

4. The work done by each Laboratory recognised under the Environment (Protection) Act, 1986, shall be included in the Annual Report of the Central Pollution Control Board.

5. This notification shall come into force on the date of its publication in the Official Gazette.

[No. Q-15013|1|89-CPW]

MUKUL SANWAL, Jt. Secy.

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The Gazette of India

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 2176] नई दिल्ली, बुधवार, जून 16, 2021/ज्येष्ठ 26, 1943
No. 2176] NEW DELHI, WEDNESDAY, JUNE 16, 2021/JYAISHTHA 26, 1943

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 16 जून, 2021

का.आ. 2340(अ).—केन्द्रीय सरकार, पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) (जिसे इसके पश्चात अधिनियम कहा गया है) की धारा 23 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और भारत सरकार के तत्कालीन पर्यावरण, वन और वन्यजीव मंत्रालय संख्या का.आ. 145(अ), तारीख 21 फरवरी, 1991, की अधिसूचना के अधिक्रमण में उन बातों के सिवाय जिन्हें ऐसे अधिक्रमण से पहले किया गया है या करने का लोप किया गया है,निम्नलिखित आदेश करती है, अर्थात् :-

1. उक्त अधिनियम की धारा 12 की उप-धारा (1) के खंड (ख) के अधीन निजी प्रयोगशालाओं की मान्यता, के साथ-साथ पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 13 के अधीन सरकारी विश्लेषकों के रूप में उनके विश्लेषकों की मान्यता केंद्रीय प्रदूषण नियंत्रण बोर्ड द्वारा की जाएगी।

2. सभी पर्यावरण प्रयोगशालाओं को

(i) प्रयोगशाला की मान्यता का ताजा या नवीनीकरण;

(ii) सरकारी विश्लेषकों के नाम में परिवर्तन; और

(iii) प्रयोगशाला परिसर का स्थानांतरण

के लिए उक्त अधिनियम के उपबंधों के अधीन उक्त आवेदन पर विचार करने के लिए केंद्रीय प्रदूषण नियंत्रण बोर्ड को आवेदन जमा करने से पहले व्यावसायिक स्वास्थ्य और सुरक्षा प्रबंधन प्रणाली (आईएसओ 45001:2018) के प्रमाणीकरण के साथ केंद्रीय प्रदूषण नियंत्रण बोर्ड द्वारा यथापरिभाषित सभी मानदंड के परीक्षण मानकों के लिए राष्ट्रीय परीक्षण और अंशांकन प्रयोगशालाओं के प्रत्यायन बोर्ड (आईएसओआई 7025: 2017) से प्रत्यायन प्राप्त करना होगा।

3. प्रयोगशाला की मान्यता आईएसओ 17025:2017 के अधीन प्रत्यायन की वैधता अवधि और उसमें प्रत्यायन प्राप्त परीक्षण मानकों के लिए दी जाएगी।

4. प्रयोगशाला की मान्यता किसी मान्यताप्राप्त एजेंसी से आईएसओ 45001:2018 प्रमाणीकरण की वैधता अवधि के लिए दी जाएगी और इसके संचालन के उसी परिसर के लिए वैध होगी जिसके लिए आवेदन किया गया है।

5. केंद्रीय प्रदूषण नियंत्रण बोर्ड यह सुनिश्चित करेगा कि पर्यावरण प्रयोगशालाओं या सरकारी विश्लेषकों की मान्यता के लिए आवेदनों की प्रास्थिति के बारे में जानकारी के प्रसार सहित आवेदन के प्रसंस्करण के लिए एक वेब आधारित पोर्टल, इस अधिसूचना के प्रकाशन की तारीख से तीन महीने के भीतर प्रचालित हो गया है और मान्यताप्राप्त प्रयोगशाला द्वारा प्रस्तुत अनुपालन रिपोर्ट को ऑनलाइन जमा करने का उपबंध भी इस पोर्टल के माध्यम से किया जाएगा।

6. प्रयोगशाला या सरकारी विश्लेषक की मान्यता अपेक्षाओं के अनुपालन की स्वघोषणा और केंद्रीय प्रदूषण नियंत्रण बोर्ड द्वारा मान्यता प्रदान करने के लिए केंद्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित सभी अपेक्षित जानकारी के लिए सहायक दस्तावेज प्रस्तुत करने पर आधारित होगी और केंद्रीय प्रदूषण नियंत्रण बोर्ड द्वारा यथापरिभाषित के रूप में अनुपालन रिपोर्ट मान्यताप्राप्त प्रयोगशाला द्वारा नामित वेब-पोर्टल पर द्वि-वार्षिक प्रस्तुत किया जाएगा।

7. केंद्रीय प्रदूषण नियंत्रण बोर्ड या तो स्वयं या राष्ट्रीय पर्यावरण इंजीनियरिंग अनुसंधान संस्थान या ऐसे अनुसंधान संस्थानों के सहयोग से सभी मान्यताप्राप्त प्रयोगशाला के लिए वार्षिक रूप से सभी मानकों को कवर करने के लिए, इस तरह के प्रयोग करने के लिए सिद्ध क्षमता वाले दक्षता परीक्षण और अंतर-प्रयोगशाला तुलना प्रयोग आयोजित करेगा और इस तरह के प्रयोग के संचालन से जुड़ी लागत भाग लेने वाली प्रयोगशालाओं द्वारा वहन की जाएगी, और इस तरह के प्रयोग के रिकॉर्ड और रिपोर्ट सार्वजनिक क्षेत्र में उपलब्ध कराई जाएगी।

8. केंद्रीय प्रदूषण नियंत्रण बोर्ड, पर्यावरण (संरक्षण) अधिनियम, 1986 के अधीन मान्यताप्राप्त पर्यावरण प्रयोगशालाओं पर लगाई गई शर्तों के सत्यापन के लिए पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी), केंद्रीय प्रदूषण नियंत्रण बोर्ड और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समितियों के सदस्यों की एक संयुक्त समिति का गठन करके आकस्मिक निरीक्षण का उपबंध करेगा और निरीक्षण रिपोर्ट सार्वजनिक क्षेत्र में उपलब्ध कराई जाएंगी।

9. केंद्रीय प्रदूषण नियंत्रण बोर्ड प्रयोगशाला मान्यता के लिए विद्यमान दिशानिर्देशों की समीक्षा और संशोधन करने के लिए एक विशेषज्ञ समिति का गठन करेगा जिसमें पर्यावरण वन और जलवायु परिवर्तन मंत्रालय, राज्य प्रदूषण नियंत्रण बोर्ड, राष्ट्रीय परीक्षण और अंशांकन प्रयोगशालाओं के लिए प्रत्यायन बोर्ड और राष्ट्रीय पर्यावरण इंजीनियरिंग अनुसंधान संस्थान के सदस्य और विशेषज्ञों को उपयुक्त समझा जाएगा जिसके अंतर्गत परिभाषित मानदंड परीक्षण पैरामीटर, प्रवीणता परीक्षण और अंतर-प्रयोगशाला तुलना प्रयोग के लिए प्रक्रिया, प्रक्रिया और लागत अनुमान, मान्यता के लिए अनुपालन शर्त और प्रयोगशालाओं, आदि द्वारा अनुपालन रिपोर्ट ऑनलाइन जमा करने के लिए अपेक्षित संबंधित जानकारी सम्मिलित है। इस अधिसूचना के प्रकाशन के तीन महीने के भीतर और विशेषज्ञ समिति की सिफारिश के आधार पर, केंद्रीय प्रदूषण नियंत्रण बोर्ड उक्त अधिनियम के अधीन प्रयोगशाला और सरकारी विश्लेषकों को मान्यता देगा ।

10. विशेषज्ञ समिति वार्षिक रूप से प्रक्रियाओं, दिशानिर्देशों और अन्य प्रक्रिया की समीक्षा और पुनर्मूल्यांकन करेगी और केंद्रीय प्रदूषण नियंत्रण बोर्ड के विचार के लिए आवश्यक सिफारिश करेगी।

11. यह अधिसूचना राजपत्र में इसके प्रकाशन की तारीख से प्रवृत्त होगी।

[फा. सं. क्यू.-15018/13/2020-सीपीडब्ल्यू]

नरेश पाल गंगवार, संयुक्त सचिव

MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 16th June, 2021

S.O. 2340(E).—In exercise of the powers conferred by section 23 of the Environment (Protection) Act, 1986 (29 of 1986) (thereinafter referred to as the Act.) and in supersession of the notification of the Government of India, in the erstwhile Ministry of Environment, Forests and Wildlife number S.O 145 (E), dated 21st February, 1991, except as respects things done or omitted to be done before such supersession, the Central Government hereby makes the following orders, namely: -

1. Recognition of private laboratories under clause (b) of sub-section (1) of section 12 of the said Act, as well as recognition of their Analysts as Government Analysts under section 13 of the Environment (Protection) Act, 1986, shall be done by the Central Pollution Control Board.

2. All environmental laboratories shall obtain accreditation from the National Accreditation Board for Testing and Calibration Laboratories Accreditation (ISO17025:2017) for all criteria testing parameters as defined by Central Pollution Control Board along with certification for Occupational Health and Safety Management System (ISO 45001:2018) before submission of application to the Central Pollution Control Board for consideration of the said application under the provisions of the said Act, for-

(i) fresh or renewal of recognition of laboratory;

(ii) changes in the name of Government Analysts; and

(iii) shifting of laboratory premises.

3. The recognition of laboratory shall be granted for the validity period of accreditation under ISO17025:2017 and for the testing parameters accredited therein.

4. The recognition of laboratory shall be granted for the validity period of ISO45001:2018 certification from a recognised agency and shall be valid for the same premises of its operation for which the application is made.

5. The Central Pollution Control Board shall ensure that a web based portal, for processing of application including disseminating the information on status of applications for recognition of environmental laboratories or Government Analysts, is made operational within three months from the date of publication of this notification, and the provision for online submission of compliance report submitted by the recognised laboratory shall be also made through this portal.

6. The recognition of laboratory or Government Analyst shall be based on self-declaration of compliance of the requirements and submission of supporting documents for all requisite information as stipulated by the Central Pollution Control Board for grant of recognition by the Central Pollution Control Board, and Compliance report as defined by Central Pollution Control Board shall be submitted by the recognised laboratory bi-annually on designated web-portal.

7. The Central Pollution Control Board shall conduct proficiency test and inter-laboratory comparison exercise either of its own or in collaboration with National Environmental Engineering Research Institute or such research institutes having proven capabilities for undertaking such exercise, for all recognised laboratory bi-annually, covering all parameters annually, and the cost associated in conducting such exercise shall be borne by the participating laboratories, and records and reports of such exercise shall made available in public domain.

8. The Central Pollution Control Board shall make provision for surprise inspection for verification of conditions imposed on the environmental laboratories recognised under the Environment (Protection) Act, 1986 by constituting a joint committee comprising members of the Ministry of Environment, Forest and Climate Change (MoEFCC), the Central Pollution Control Board and concerned State Pollution Control Boards or Pollution Control Committees, and the inspection reports shall be made available in public domain.

9. The Central Pollution Control Board shall constitute an expert committee comprising of members from the Ministry of Environment Forests and Climate change ,State Pollution Control Boards, National Accreditation Board for Testing and Calibration Laboratories and National Environmental Engineering Research Institute and experts as deemed appropriate, to review and revise the existing guidelines for laboratory recognition including defined criteria testing parameters, procedure, process and cost estimate for proficiency test and inter-laboratory comparison exercise, compliance condition for recognition and corresponding information required for online submission of compliance report by laboratories, etc., within three months of publication of this notification, and based on the recommendation of expert committee, the Central Pollution Control Board shall recognise the laboratory and the Government Analysts under the said Act.

10. The expert committee shall review and reassess the procedures, guidelines and other process annually and make necessary recommendation for consideration of the Central Pollution Control Board.

11. This notification shall come into force from the date of its publication in the Official Gazette.

[F. No. Q-15018/13/2020-CPW]

NARESH PAL GANGWAR, Jt. Secy.

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Addendum III

रजिस्ट्री सं. डी.एल.- 33004/99 REGD. No. D. L.-33004/99

भारत का राजपत्र
The Gazette of India

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 19 जून, 2024

का.आ. 2409(अ).—केन्द्रीय सरकार, पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 23 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय की अधिसूचना, जो भारत के राजपत्र, असाधारण, भाग 2, खंड 3, उपखंड (ii) में का.आ. सं. 2340(अ), तारीख 16 जून, 2021 को प्रकाशित हुई थी, में निम्नलिखित और संशोधन करती है, अर्थात्:-

उक्त अधिसूचना में,-

(i) पैरा 1 में "प्राईवेट प्रयोगशालाएं" शब्दों के स्थान पर "प्रयोगशालाओं या पर्यावरणीय प्रयोगशाला के रूप में संस्थान" शब्द रखे जाएंगे ;

(ii) पैरा 3 के स्थान पर निम्नलिखित पैरा रखा जाएगा, अर्थात् :-

"3. प्रयोगशाला को मान्यता तीन वर्ष की कालावधि के लिए अनुदत्त की जाएगी" ;

(iii) पैरा 4 का लोप किया जाएगा ;

(iv) पैरा 7 के स्थान पर निम्नलिखित पैरा रखा जाएगा, अर्थात् :-

"7(1). मान्यताप्राप्त प्रयोगशाला केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा संचालित सभी अंतर-प्रयोगशाला तुलना अभ्यास और मान्यताप्राप्त होने की तारीख से दो वर्ष के भीतर मान्यता के अधीन सभी मानकों को

कवर करते हुए आईएसओ/आईईसी : 17043 के अधीन प्रमाणित दक्षता परीक्षण प्रदाता द्वारा संचालित दक्षता परीक्षण कार्यक्रम में भाग लेगी ।

(2) केन्द्रीय प्रदूषण नियंत्रण बोर्ड अभ्यास के अभिलेखों और रिपोर्टों को पब्लिक डोमेन में उपलब्ध कराएगा ।

(3) मान्यताप्राप्त प्रयोगशाला अभ्यास और कार्यक्रम के संचालन के लिए लागू फीस का संदाय करेगी ।"।

[फा. सं. क्यू-15018/13/2020-सीपीडब्ल्यू]

नरेश पाल गंगवार, अपर सचिव

टिप्पण : मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग 2, खंड 3, उपखंड (ii) में का.आ. सं. 2340(अ), तारीख 16 जून, 2021 द्वारा प्रकाशित की गई थी ।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 19th June, 2024

S.O. 2409(E).—In exercise of the powers conferred by section 23 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following amendment in the notification of the Government of India in the Ministry of Environment, Forest and Climate Change number S.O. 2340(E), dated the 16th June, 2021, published in the Gazette of India, Extraordinary, Part-II, Section 3, Sub-section (ii), namely:-

In the said notification,–

(i) in paragraph 1, for the words "private laboratories", the words "laboratories or institutes as environmental laboratories" shall be substituted;

(ii) for paragraph 3, the following paragraph shall be substituted; namely:–

"3. The recognition of laboratory shall be granted for a period of three years";

(iii) paragraph 4 shall be omitted;

(iv) for paragraph 7, the following paragraph shall be substituted, namely:–

"7. (1) The recognised laboratory shall participate in an all inter-laboratory comparison exercise conducted by the Central Pollution Control Board and a proficiency testing programme conducted by the proficiency testing provider certified under ISO/IEC: 17043, covering all the parameters under recognition, within two years from the date of recognition.

(2) The Central Pollution Control Board shall make available the records and reports of the exercise in the public domain.

(3) The recognised laboratory shall pay the applicable fee for the conduct of the exercise and the programme.".

[F. No. Q-15018/13/2020-CPW]

NARESH PAL GANGWAR, Addl. Secy.

Note.– The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) vide number S.O. 2340(E), dated the 16th June, 2021.

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Addendum IV

GLOSSARY OF TERMS - LABORATORY QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC) SYSTEM

1.	**Accreditation**	Formal recognition of the competence of a body or an organization for a well-defined purpose. It is the procedure by which a laboratory is assessed to perform a specific range of test or measurements
2.	**Accuracy**	The closeness of agreement between the "true" value and the measured value. The smaller the systematic error of the analysis is, the more accurate is the analytical procedure. It is assessed by means of reference samples and percent recoveries
3.	**Audit Sample**	Prepared reference sample inserted into the sample processing procedure as close to the beginning as possible.
4.	**Background Sample**	A sample taken from a location on or proximate to the site of interest and used to document baseline or historical information
5.	**Bias**	Systematic error, consistent deviation of measured values from the true value.
6.	**Calibration**	In chemical measurement, Calibration refers to the process by which the response of a measurement system is related to the concentration or the amount analyte of interest
7.	**Calibration Laboratory**	Laboratory that performs calibration.
8.	**Calibration Method**	Defined technical procedure for performing a calibration.
9.	**Calibration Standards**	A series of known standard solutions used by the analyst for calibration of instrument (i.e. preparation of the analytical curve).
10.	**Certified Reference Material (CRM)**	A certified reference material is a material or substance whose property or properties can be defined so exactly that it may be used for the calibration of measuring instruments, the check of results obtained from measuring, testing and analytical processes, and for the characterization of substance properties.
11.	**Chain of Custody (COC)**	Documentation of the history of the sample. The components of chain of custody are sample seals; log book, record and sample analysis request sheet and the procedures used for estimation.
12.	**Confidence Interval**	Set of possible values within which the true value will lie with a specified level of probability.
13.	**Confidence Limit**	One of the boundary values defining the confidence interval
14.	**Contamination**	Something inadvertently added to the sample during the sampling or analytical process.
15.	**Control**	Type of sample against which the results of a procedure are judged.
16.	**Conventional true value**	Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose
17.	**Data Quality Objectives (DQOs)**	Statements on the level of uncertainty that a decision-maker is willing to accept in the results derived from environmental data.
18.	**Environmental sample**	An environmental sample or field sample is a representative sample of any material (aqueous, no aqueous or multimedia) collected from any source for which determination of composition of contamination is requested or required.
19.	**Error**	Difference between a measured value and the true value.
20.	**Good Laboratory Practice(GLP)**	Good laboratory Practice(GLP) is concerned with the organizational process and the conditions under which laboratory studies are planned, monitored, recorded and reported
21.	**Gross error**	Which makes it necessary to begin a new analysis (Ex. using a wrong reagent, taking a wrong pipette, measuring at a wrong wavelength. instrument breakdown, heavily contaminated glassware etc.). These errors should easily be recognized.
22.	**Instrumentation Detection Limit**	The concentration equivalent to a signal due to the analyte which is equal to three times the standard deviation of a series of 7 replicate measurements of a reagent blank's signal at the same wave length
23.	**Inter Laboratory Precision**	(Reproducibility) Variation associated with two or more laboratories or organizations using the same measurement method

24.	**Inter Laboratory Test**	A series of measurements of one or more quantities performed independently by a number of laboratories on samples of a given material (other terms: Round robin test, Collaborative trial, Collaborative reference program, Collaborative analytical study, ring test).
25.	**Interferences**	Compounds whose presence obscures the measurement of the analyte of interest by the introduction of an unrelated analytical signal where the analyte is measured.
26.	**Internal Quality Control**	Internal quality control encompasses all measures, which are planned, ordered and executed by a laboratory itself
27.	**Intra-laboratory Precision**	(Repeatability) Variation associated with a single laboratory or organization.
28.	**Limit of detection (LOD)**	The LOD of an individual analytical procedure is the lowest analytical amount of an analyte in a sample, which can be detected but not necessarily quantified as an exact value. For many purposes, the LOD is arbitrarily taken to be $3s_b$ or 3 x the standard deviation of the blank value or of background
29.	**Limit of Determination**	The lower level where measurements become arbitrarily meaningful and is defined arbitrarily as LOQ-$10s_b$ (10 x the standard deviation of the blank value or of background) At this concentration, the relative confidence in the measured value is ± 30% at the 95% confidence level.
30.	**Limit of Quantitation (LOQ)**	The constituent concentration that produces a signal sufficiently greater than it can be detected within specified limits by good laboratories during routine operating conditions. Typically, it is the concentration that produces a signal time 10s above the reagent water blank signal.
31.	**Matrix**	The matrix of a material is the totality of all parts of a material and their chemical and physical properties including mutual influences
32.	**Matrix /Spike Duplicate Analysis**	In matrix/spike duplicate analysis, predetermined quantities of stock solutions of certain analytes are added to a sample matrix prior to sample extraction/digestion and analysis. Samples are split into duplicates, spiked and analyzed. Percent recoveries are calculated for each of the analytes detected. The relative percent difference between the samples is calculated and used to assess analytical precision. The concentration of the spike should be at the regulatory standard level or the estimated or actual method quantification limit. When the concentration of the analyte in the sample is greater than 0.1% no spike of the analyte is necessary.
33.	**Method Detection Limit (MDL)**	The minimum concentration of a substance that can be measured and reported with 99 % confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample in given matrix containing analyte which has processed through the pre-operative procedure
34.	**Method Quantification Limit (MQL)**	The Method Quantification Limit is the minimum concentration of a substance that can be measured and reported.
35.	**Optimum Concentration Range**	A range defined by limits expressed in concentration, below which scale must be used and above which curve correction should be considered. This range varies with the sensitivity of the instrument and the operating conditions employed.
36.	**Outlier data**	The data, which are suspected to be extremely low or high from the expected value or mean.
37.	**Precision**	The closeness of agreement between the results obtained by applying the experimental procedure several times under prescribed conditions. (The smaller the random part of the experimental errors, which affect the results, the more precise is the procedure). Within run and between day precisions have to be considered. (See repeatability and reproducibility)
38.	**Proficiency Testing**	Determination of the laboratory calibration or testing performance by means of inter-laboratory comparisons.
39.	**Protocol**	Thorough written description of the detailed steps and procedures involved in the collection of samples.
40.	**Quality Assessment**	Procedure for determining the quality of laboratory measurements by use of data from internal and external quality control measures.

41.	**Quality assurance**	All those planned and systematic actions necessary to provide adequate confidence that a product or a service will satisfy given requirements for quality
42.	**Quality Assurance Programme Plan (QAPP)**	An orderly assemblage of management policies, objectives, principles and general procedures by which an organization involved in environmental data generation activities outlines how to produce data of known quality.
43.	**Quality Assurance Project Plan (QAPP)**	An orderly assemblage of detailed procedures designed to produce data of sufficient quality to meet the DQOs for a specific data collection activity.
44.	**Quality Characteristic**	The characteristics and characteristic values (or expressions) of something (e.g. a method, a piece of equipment, a measurement result etc.) in relation to their suitability to fulfill set requirements.
45.	**Quality Control**	Set of measures within a sample analysis methodology to assure that the process is in control.
46.	**Quality Control Charts**	A Quality control chart is a sequential plot of some quality characteristic. It may be a day-by –day measurement of any interest of analyte (e.g. COD or BOD or Nitrate). The Chart consists of central line and two pairs of limit lines, the Upper and Lower Warning Limits (UWL, LWL) and Upper and Lower Control Limits (UCL., LCL) Example : Shewart's Quality Control Chart
47.	**Quality Manual**	A document stating the quality policy, quality system and quality practices of an organization.
48.	**Quality System**	The organizational structure, responsibilities, procedures, processes and resources for implementing quality management.
49.	**Random Errors**	Random errors are indicated by the scatter of the results of repeated measurements on the aliquot of same sample about the mean value. The sign and magnitude of the error of any particular result varies at random and cannot be known exactly. Random errors arise from uncontrolled variations in the conditions of the analytical system (factors like analyst, equipment, instrument, method, quality of glassware and chemicals, reagents etc.,) during different analysis.
50.	**Range**	Spread of values calculated by subtracting the lowest value from the highest value
51.	**Reagent Blank**	A reagent blank is an aliquot of analyte –free water or solvent analysed with the analytical batch.
52.	**Reference material**	A material or substance one or more of whose property value are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning value to materials
53.	**Reference Standard**	A standard, generally of the highest meteorological quality available at a given location, from which measurements made at that location, is derived**.**
54.	**Relative Standard Deviation (RSD)**	Estimate of the average error in the measurement due to unassignable causes and usually expressed as a percentage of the average sample concentration.
55.	**Repeatability**	The closeness of agreement between successive results obtained with the same method on identical test material under the same condition. (Same operator, same apparatus, same laboratory and short intervals of time) can also be interpretable as within – run precision.
56.	**Replicate Sample**	A replicate sample is a sample prepared by dividing a sample into two or more separate aliquots. Duplicate sample is considered to be two replicates.
57.	**Replicate Sample**	A replicate sample is a sample prepared by dividing a sample into two or more separate aliquots. Duplicate sample is considered to be two replicates.
58.	**Reproducibility**	The closeness of agreement between individual results obtained with the same method and on identical material but under different test conditions (different operator, different time's etc.) Can also be interpreted as "Between-run precision".
59.	**Sampling**	Attempt to choose and extract a representative portion of a physical system from its surroundings.

60.	**Sensitivity**	Sensitivity describes the ability of an experimental method to differentiate between related values (e.g. concentrations). It indicates to which degree value changes depending upon the signal of the measuring system and can be quantified using the slope of the calibration curve.
61.	**Standard Curve**	A standard curve is a curve, which plots concentrations of known analyte standard versus the instrument response to the analyte.
62.	**Standard Deviation**	Square root of the variance (statistical analysis).
63.	**Standard Methods**	A standard method is an acknowledged analytical method according to an international or national standard or guidelines or to a given legal statue.
64.	**Standard Operating Procedure (SOP)**	Standard Operating procedure (SOP) means written procedure, which describes how those routine laboratory operations, are to be performed.
65.	**Stratified Random Sampling**	Sampling technique in which estimates of strata means are combined to yield estimates of the population mean.
66.	**System Blank**	(Instrument Blank): Measure of the instrument background or baseline response in the absence of a sample.
67.	**Systematic Error**	Systematic errors are indicated by a unidirectional tendency of results, which could be greater or smaller than the true value. When systematic error is present, the result are said to be biased (bias systematic error) Systematic errors in analytical results may occur when method used is not specific for the analyte; due to presence of some interfering substances; improper performing of the analysis, instability of samples between sample collection and analysis.
68.	**Test**	A technical operation that consists of the determination of one or more characteristics or performance of a given product, material equipment organism, physical phenomenon, process or service according to a specified procedure.
69.	**Test Method**	Defined technical procedure for performing a test
70.	**Traceability**	The property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons.
71.	**True value**	Real amount or concentration of an analyte in a certain sample. It is an ideal value, which could be arrived at only if all causes of measurement error was eliminated. The amount or concentration given for an analyte in a certified reference material is a good substitute for the true value.
72.	**Trueness**	The closeness of agreement between the average value obtained from a large series of test results and an accepted reference value
73.	**Uncertainty of measurement**	Parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measured
74.	**Validation**	Validation is the total testing procedure if an analytical method is free of random and systematic error, not only within calibration but also and especially frees of interference when analyzing real samples.
75.	**Variance**	Measure of the variability in a population / set of analytical data. It is the square root of the standard deviation