

Chapter 12

Disclosure of Consultants

12.1 General Information

Name of Institute	: National Environmental Engineering Research Institute (NEERI)
Address	: Nehru Marg, Nagpur - 440 020 (Maharashtra), INDIA
Telephone Nos.	: (+91) (0712) 2249896, 2249881, 2249878, 2247844, 2249900
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Email	: eirad@neeri.res.in
Constitution	: Constituent Laboratory of Council of Scientific and Industrial Research, India
Major Activities	: Research, Development and Consultancy Services in the field of Environmental Science, Engineering and Technology

12.2 Establishment

The National Environmental Engineering Research Institute (NEERI), Nagpur, was established in 1958 as Central Public Health Engineering Research

Institute (CPHERI), when environmental concerns were limited to human health with a focus on water supply / sewage disposal / communicable diseases and to some extent on industrial pollution and occupational diseases. The chemical and biological solutions to address these problems were simple, though challenging. However, slowly worldwide public awareness on the contamination of environment on regional to global scale started getting attention in 1970's. Shrimati Indira Gandhi, the then Prime Minister of India, rechristened the Institute as National Environmental Engineering Research Institute (NEERI) in the year 1974.

National Environmental Engineering Research Institute (NEERI), Nagpur is devoted to research and innovations in environmental science and engineering besides solving a range of problems posed by industry, government and public. It is a constituent of Council of Scientific and Industrial Research (CSIR), New Delhi and has a nation-wide presence with its five zonal laboratories at Chennai, Delhi, Hyderabad, Kolkata and Mumbai.

12.3 Mandate of NEERI

- ◆ To conduct research and developmental studies in environmental science and engineering
- ◆ To render assistance to the industries of the region, local bodies, etc. in solving the problems of environmental pollution by S and T intervention
- ◆ To interact and collaborate with academic and research institutions on environmental science and engineering for mutual benefit
- ◆ To participate in CSIR thrust area and mission project

Thus, the Institute is dedicated to the service of mankind by providing innovative and effective S and T solutions to environmental and natural resource problems by conducting effective R and D programmes in environmental science and engineering essentially comprising of:

- ◆ Characterization of environmental quality in terms of physical, chemical and biological parameters

- ◆ Technologies for prevention and control of air pollution, wastewater and solid waste in terms of their reduction, reuse, recycle, and finally safe disposal
- ◆ Innovative approaches to optimal utilization and conservation of environmental resources.

NEERI is served by competent and experienced team of about 125 scientists in various core disciplines of relevance to environmental science and engineering, viz. environmental engineering, chemical engineering, environmental chemistry, environmental biology and fourteen other science and engineering disciplines. Professionally competent and highly skilled and experienced technical officers and technicians support the scientific personnel.

The Director, NEERI has a mandate to realize the mission of the Laboratory by leading the high class R and D and S and T activities and seek the advices of Research Council (RC) and Management Council (MC) of the laboratory under the overall supervision of Director General, CSIR. The Research Council has a mandate to advise on the formulation of R and D programmes and future directions for research keeping in view the Five Year Plans, National priorities and opportunity areas besides review of R and D activities and research programmes. The Management Council has a mandate to recommend resource allocation for R and D activities / facilities of the Laboratory besides monitoring of R and D and other activities.

Over the years, the Institute has contributed to the reorientation of environmental policy towards:

- ◆ Prevention of pollution, developed technologies for substitution of non renewable resource base with renewable resources
- ◆ Recycle and reuse of industrial and domestic wastewater
- ◆ Environmental impact and risk assessment studies for developmental projects in industrial, mining, nuclear power, thermal power, river valley and urban infrastructure sectors
- ◆ Environmental audits of industrial and mining projects.

The Institute has necessary infrastructure and around 405 scientific and technical staff to monitor, analyze and characterize various elements and substances in the environmental samples on a national / regional scale with state of art equipments and methodologies.

Based on the directives from Hon'ble Supreme Court of India, besides Hon'ble High Courts of various States, NEERI has submitted several reports from time to time for resolving various critical environmental disputes / issues concerning industry, ecology and environment.

12.4 Thrust Areas

The Institute has considerable capabilities and experience in the domain of environmental management and at present, the major R and D thrust areas pursued by the Institute include:

- ◆ R and D Thrust Areas
 - Environmental Monitoring
 - Environmental Modelling
 - Environmental Biotechnology and Genomics
 - Environmental System Design and Optimization
 - Environmental Impact and Risk Assessment
 - Environmental Policy
- ◆ Advisory
 - Industries
 - Central Government Ministries / Boards
 - State Government Ministries / Boards
 - Judiciary

In the realm of uncertainty and changing regimes of environmental governance, NEERI envisions a futuristic perspective of a formal knowledge organization in terms of providing reliable data, coupled with modeling efforts to mimic the reality, adding its tacit knowledge with a collective perception of work ethic by effective interaction of its scientists and users.

12.5 NEERI'S Focus Areas

- ◆ Indoor Air Quality (IAQ) - VOCs, Monitoring, Health Impacts, Public Awareness and Training
- ◆ Ambient Air Quality (AAQ) – Urban AQ data bank, inventorization, source apportionment analysis, analytical techniques, cost effective control, conservation of monuments
- ◆ Drinking Water – WQ surveillance and assessment, water treatment, supply and distribution, training for rural sector
- ◆ Water Resources – EIA of river linking projects, artificial recharge of groundwater and aquifers, eco-restoration of lakes and reservoirs, ecological minimum flows, watershed planning, catchment areas treatment, salinity ingress in coastal areas
- ◆ Wastewater - Recycling for zero discharge, color and pathogen removal, treatability studies, and Design or revamping ETPs / STPs / CETPs through innovative solutions
- ◆ Industry - Waste minimization, Recovery and recycling of wastes, Environment and process audit, EIA, Carrying capacity, LCA, Global environmental policies
- ◆ Bio / Phyto Remediation – Reclamation and restoration of degraded lands (mine spoil dumps / tailings, saline soils, etc.), Carbon sequestration applications, Land application of treated sewage, nutrient dynamics
- ◆ Municipal Solid and Hazardous Wastes - Design of landfills and disposal systems, Composting and biomethanation, stabilization

- ◆ Energy security - Biogas systems, Enrichment of methane, Microbial production of hydrogen
- ◆ Health - Single Nucleotide Polymorphism (SNP) analysis for delineation of genetic disturbances due to exposures of air pollutants

With focus on above areas, NEERI endeavors to sustain itself as a pioneer CSIR Laboratory in the field of environmental science and engineering.

12.6 NEERI's Vision

Leadership in environmental sciences and engineering for sustainable developments.

12.7 NEERI's Mission

NEERI envisions a world in which:

- ◆ All have capacity to act in a manner that ensures achievement of sustainable environment and economic goals
- ◆ The natural balance is no longer threatened, and all share the benefit of a healthy environment

NEERI would continue to strive for:

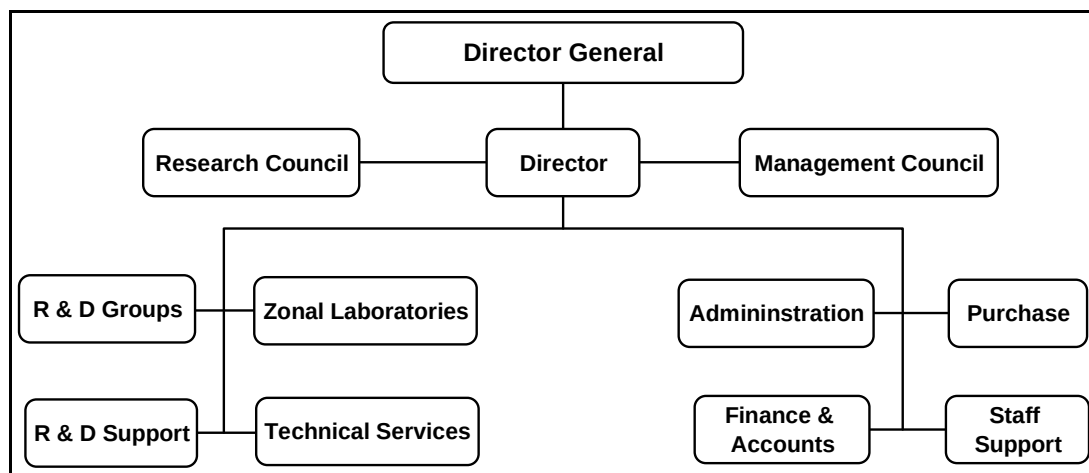
- ◆ Dedicating itself in the service of mankind by providing innovative and effective solutions to environmental and natural resource problems
- ◆ Leadership in environmental science, technology and management domestically and globally by working hand in hand with its partners
- ◆ Strong and effective working relationship with all its stakeholders in ensuring ecological health of all regions in India
- ◆ Strive to enable individuals and organizations to achieve productive and sustainable use of natural resources on which all life and human activity depend

12.8 Quality Objectives

NEERI is committed for excellence in R and D in environmental Sciences and engineering research and related services to government, industry and society.

- ◆ Enhanced R and D performance resulting in :
- ◆ Publications (Number in SCI Journals and CIF)
- ◆ Patents (Number)
- ◆ ECF generation (Growth in %)
- ◆ LR generation (Quantum)
- ◆ Projects (Growth in Number)
- ◆ Technology development and transfer (Number)
- ◆ Enhanced customer satisfaction (CS Index)
- ◆ Environmental information dissemination (Website, NEERI Journals, Publications, Reports, Newsletters, Best Practices, Manuals, Reviews, Databases, etc)
- ◆ Participation of scientists in societal missions and decision making in Government and industry

12.9 Organization Chart



12.10 Infrastructure

◆ Analytical

- AOx Analyser : IDC Multi X2000
- Atomic Absorption Spectrophotometers : GBC 904AA and Hitachi Z8000
- CHNS-O Analyzers: Carlo Erba EA 1108 & Thermoquest - Fissions EA 1110
- Fluorescence Spectrophotometer : Hitachi F-4000
- Fourier Transform IR Spectrometer : ATI Matson Infinity 60 AR
- Gas Chromatograph Mass Spectrometer: Varian Saturn III
- High Performance Liquid Chromatographs : Waters 204 and 501, Shimadzu LC-10
- Inductively Coupled Plasma Atomic Emission Spectrometer: Jobin Yvon JY-24
- Ion Chromatograph: Dionex 2000i
- IR Spectrophotometer : Perkin-Elmer 983 G
- Mercury Analyzers: Perkin-Elmer MAS-50 and MAS-50B
- Total Organic Carbon Analyzer: Beckman 915 A and Ionics 1555B
- UV-VIS-NIR Spectrophotometer: Perkin Elmer Lambda 900, Hitachi 330

◆ Computation

- 02 3D Console with 20"Colour Monitor for Internet / Intranet Servers
- Additional Softwares
- Compilers and Libraries

- Digital Image Processing
- Fire Well Software (TIS CAUNTELET 3.2 INTERNET FIRE WELL SOFTWARE ON IRIX OS WITH FOLLOWING FEATURES:)
- Geographics Information System
- Knowledge Based System
- Personal Workstation with Network Browsers and Graphics Capabilities
- Programming and Applications Development Environment
- Silicon Graphics 02 Workstation
- The POLLO 9000/730 Workstation
- The Silicon Graphics Internet / Intranet Server
- The Sun ultra workstation
- ◆ Others
 - Auditorium
 - Banks
 - Computing Facilities
 - Field Studies and Demonstration
 - Guest house and trainee hostel with mess
 - Laboratory Facilities
 - Post Office
 - Research Scholar hostel Mess
 - Seminar Halls
 - Sophisticated Instrumentation

- Staff Canteen
- Staff housing
- Staff recreation Club
- Vehicles
- Workshop

12.11 List of Technologies

Title	: Slow Sand Filtration
Classification	: Process improvements
Year of Development	: 1984
No. of Licenses	: -
Remarks	: Most efficient and reliable single step surface water treatment method for rural water supplies and even for municipal water supplies

Title	: Hand pump attachable Iron Removal Plant
Classification	: Process development
Year of Development	: 1988
No. of Licenses	: -
Remarks	: Based on contact bed aeration system Continuous operation (1 cu m / hour) Suitable for 250 population

Title	: Water filter for removal of organochlorine pesticides from water
Classification	: Process improvement; Device; Patents
Year of Development	: 1995
No. of Licenses	: -

Remarks : Refill type pesticide removal unit attachable to consumers tap Removes commonly encountered pesticides in drinking water at concentrations below 5 mg/l Not yet commercialized

Title : Flyash based zeolites

Classification : Process development, Patents

Year of Development : 1997

No. of Licenses : -

Remarks : Successfully proven at laboratory scale, maximum single batch produced of 200 - 300 g Possible applications in the area of soil remediation, CO₂ sequestration are being explored

Title : Arsenic Estimation Field Kit

Classification : Process development

Year of Development : 2000

No. of Licenses : 1

Remarks : Useful for rapid on-site screening of water sources for arsenic levels, free from occupational hazards, precise and accurate

Title : Electrolytic defluoridation process

Classification : Process development, patents

Year of Development : 2001

No. of Licenses : -

Remarks : Simple and most efficient process for defluoridation of water using the in-situ generation of poly hydroxy aluminium species by passing Direct Current (DC) through aluminium plates

Title	: “NEERI-Zar” Portable Instant Water Filter
Classification	: Process development, patents
Year of Development	: 2006
No. of Licenses	: -
Remarks	: Disaster management tool for drinking water supply under flood affected situations. Most reliable water purification system without use of electric power for water supply particularly under emergency situation with a wide range of flood water quality