



**CENTRAL POLLUTION CONTROL BOARD**  
**'Parivesh Bhawan', East Arjun Nagar**  
**Shahdara, Delhi - 110032**

**REQUEST FOR EXPRESSION OF INTEREST (EoI)**  
**NCEF Project on Remediation of Hazardous Waste Contaminated Dump Sites**  
**Consulting Services**

1. The Central Pollution Control Board (CPCB), Ministry of Environment & Forests (MoEF), Government of India has received a grant under the National Clean Energy Fund (NCEF) from the Ministry of Finance, Department of Expenditure and intends to apply part of the proceeds of this fund for payment under the contract for the following work:
  - i. Preparation of detailed project report (DPR) for remediation of 10 priority contaminated areas (containing multiple sites) spread across 6 states in India based on detailed site investigation studies and assessment.
2. The study is a single assignment for a period of one year. Consultancy firms are required to submit Expression of Interest (EoI) for the above assignment, which will be thoroughly evaluated and shortlisted.
3. The CPCB now invites competent national/international consultants to indicate their interest in providing quality consultancy services (preferably certified) in remediation of contaminated sites. Interested consultants must provide information indicating that they are qualified to perform the services (brochures, description of similar assignments, experience in similar conditions and availability of appropriate skills among staff etc.). Consultants may associate to enhance their qualification. The association may take the form of a joint venture (with joint and several liability) or at a sub-consultancy.
4. Consultant will be selected in accordance with the procedures laid down by the Project Steering Committee of CPCB.
5. Interested consultants may obtain further information from CPCB website [www.cpcb.nic.in](http://www.cpcb.nic.in).
6. Expression of Interest must reach this office not later than 40 days from the date of publication (in case it falls on holiday, then the next working day shall be applicable as the last date of submission). The document must be clearly superscripted as 'Expression of Interest' for the above mentioned consultancy in sealed covers and addressed to The Incharge, Hazardous Waste Management Division, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Shahdara, Delhi – 110032

Sd/-  
Member Secretary  
Central Pollution Control Board  
Email: [jskamyotra.cpcb@nic.in](mailto:jskamyotra.cpcb@nic.in) / [bvbabu.cpcb@nic.in](mailto:bvbabu.cpcb@nic.in)

**NCEF PROJECT ON  
REMEDICATION OF HAZARDOUS WASTE CONTAMINATED  
DUMP SITES IN INDIA**

***(Phase - I: Preparation of Detailed Project Report)***

**1. Project Description**

The Central Pollution Control Board (CPCB) an autonomous agency under Ministry of Environment & Forests (MoEF), Government of India is the implementing agency for the project for remediation of 10 priority hazardous waste contaminated areas (some are having multiple sites in the vicinity) spread across 6 States in the country which pose severe risks to human health and the environment. This project is designed to provide a detailed site investigation, design of appropriate engineering solutions for remediation and also to implement actual remediation of those contaminated sites. This project is envisaged in two phases i.e. preparation of detailed project report (DPR) for remediation of each contaminated area in the first phase and subsequently undertaking environmentally sound remediation of these sites in the second phase of the project.

**2. Background**

There are several hazardous waste contaminated dump sites in various parts of India where hazardous wastes was dumped by several industrial units during their industrial operations, resulted in contamination of soil and ground/surface water thereby posing severe health and environmental risks. These contaminated dump sites need to be remediated on priority and restored in an environmentally sound manner through appropriate remediation technologies and safeguard human health and environment. Most of these sites were polluted when there was no regulation in the country for safe disposal of hazardous wastes. In some instances, industries responsible for contamination have been either closed down or the cost of remediation is beyond the capacity of the polluter, thus the sites remain polluting. These sites were also created due to illegal and clandestine ways of dumping and disposal of industrial waste.

Though there may be numerous contaminated sites in the country, the priority areas have been selected only from the sites identified by State Pollution Control Boards. The sites selected for remediation are prioritized for remediation based on hazardous constituents identified in preliminary site investigation studies on each sites carried out by respective State Pollution Control Boards.

Remediation of the sites will minimize the environment and health risks by containing the migration of the chemicals and pollutants from contaminated soil and groundwater to acceptable and safe levels. This project shall derive best practicable remediation solutions by adopting a cost effective sustainable remediation option.

### **3. Objective**

Site specific implementable remediation plans shall be prepared for the following 10 contaminated areas (containing multiple sites) identified by CPCB as priority sites, the details of the sites are given at Annexure –I.

- i. Eloor-Edyar area, Cochin, Kerala
- ii. RanipetChromium Contaminated area, TN
- iii. RatlamIndustrial area, Ratlam, MP
- iv. Chromium Contaminated area, Sundergarh, Orissa
- v. Talcher Chromium contaminated area, Talcher, Orissa
- vi. Gunjam Mercury contaminated area, Gunjam Orissa
- vii. JuhirakhiMandi, Kanpur, UP
- viii. Rania, Kanpur Dehat, UP
- ix. Nibra Village, WB
- x. POPs contaminated area, Lucknow, UP

The result of detailed project report for remediation results in a direct economic benefit in re-discovering contaminated land in terms of real estate price stabilization (Increase supply of saleable/leasable land).Although the proposed project may not necessarily bring direct economic benefits; it will generate long term environmental and social benefits. These benefits will be mainly associated with a reduction in air, water and soil pollution and hence an improvement in human health and quality of life of the Indian citizens.

### **4. Scope of Work**

The scope of work for preparation of detailed project report (DPR) for remediation of hazardous waste contaminated dump sites shall be as below;

- i. To prepare a detailed project report for the 10 priority hazardous waste contaminated areas as per the methodology envisaged in Annexure – II.
- ii. The project outcome will focus on the systematic contaminated site investigation and assessment and remediation methodology to be followed for remediation of selected hazardous waste contaminated sites.
- iii. The project envisages identification &assessment of contaminants, outlining the contaminated areas, detailed site investigation and characterization, risk assessment studies, selection of remediation criteria, outlining remediation options, preparation of detailed technical specifications for the selected remediation options, preparation of bid document and engineering drawings for each contaminated areas over a period of 12 months.

- iv. The detailed site investigation report should provide all relevant information of the contaminants prevalent at the site, initial site characteristics, drilling test wells, hydro-geological surveys, contaminated soil / groundwater profile studies, ecological and social impact and detailed site characterization results etc.. as per Annexure-II.
- v. The consultant may choose to prepare DPRs for one or more sites as per their technical skills or competence.
- vi. The agency may require submitting 2-3 alternate remediation options for each site with techno-economic feasibility and also in conformity to remediation criteria approved by Technical Expert Committee (TEC) constituted by CPCB. Detailed engineering design shall be prepared only for the remediation option approved by Project Steering Committee (PSC).
- vii. The final remediation plan should provide detailed remediation options with complete engineering solution that can be implementable in the country.
- viii. The report can then be subject to more detailed review as and when appropriate, to allow decisions to be made on the interventions and possible remediation goals.
- ix. The executing agency shall work in association with project team of Central Pollution Control Board and report its progress of work regularly to Project Steering Committee.

## **5. Consultant Qualifications and Team**

The Consultant should be able to demonstrate experience and qualifications in the following areas:

- Identification, assessment, site analysis and characterization of a range of hazardous pollutants at contaminated sites.
- Knowledge on use of latest tools for site assessment both for preliminary and detailed investigation studies so as to reduce monitoring costs.
- Experience in site sampling and testing design for large contaminated sites.
- Risk assessment and priority setting methodologies for hazardous or polluted areas.
- Development of programmes for remediation of contaminated areas and/or redevelopment of Brownfield's areas. Social, political and economic aspects of pollution control and waste management schemes.

The consultants will be evaluated based on the following criteria

<b>S.No.</b>	<b>Component</b>	<b>Weightage</b>
1.	Technical skills/expertise of consultant	60%
2.	Turnover of the company	10%
3.	Number of projects executed especially in the remediation of sites contaminated with POPs/Heavy metals (experience in the investigation characterization and remediation of contaminated sites including risk assessment).	20%
4.	Consultants having local establishments/joint ventures in India.	10%

**ANNEXURE – I****LIST OF HAZARDOUS WASTE CONTAMINATED DUMP SITES**

<b>S. No</b>	<b>Location of the area</b>	<b>Name of the Polluter</b>	<b>Number of Sites</b>	<b>Product manufactured</b>	<b>Type of Waste Generated</b>	<b>Quantity/Area of the Waste/Contamination</b>	<b>Primary Contaminant</b>
<b><u>KERALA</u></b>							
1.	Eloor – Edayar, Cochin	Large Scale Chemical and Pesticide industries and a Zinc smelter	1	DDT, Endosulfan, Dicofol, thiozoles, sulphamides, Zinc ingots	Jarosite, POPs	200000 (Kuzhikandomthodu), 206200 (Ammenthuruth-Karipadam), 30000 (Edayattuchal) & 15500 (Chakkarchal) m <sup>2</sup> area of contamination.	POPs, heavy metals
<b><u>MADHYA PRADESH</u></b>							
2.	Ratlam	H-Acid and Pharmaceutical industries.	4	Vitamin C & Sorbitol and H-Acid & G-Acid	ETP sludge; Iron Sludge/ Gypsum sludge/Sodium Sulphate/ Incinerated	30 MT of waste and 20906 MT/1166 MT/1410 MT of waste at 3 locations	Heavy metals, Iron salts and organic compounds
<b><u>ORISSA</u></b>							
3.	Ganjam	Caustic Soda Plant.	3	Alkali, HCl, Chlorine	Brine Sludge, Mercury waste	5000 MT/33000 MT/18000 MT at three locations	Mercury
4.	Talcher	Closed Chrome Salt manufacturing unit	1	Sodium Dichromate	Leached Residue	60000 tonnes of waste	Chromium
5.	Sundargarh	Closed /operational Chrome Salt manufacturing units.	4	Sodium Dichromate	Leached Residue dumped in premises and isolated land.	11250 MT/16500 MT/1500 MT/15000 MT	Chromium
<b><u>TAMILNADU</u></b>							
6.	Ranipet	Closed Chrome Salt manufacturing unit	1	Sodium Dichromate, BCS.	Chromium leach residue	7.41 acres of contaminated site, 2-4 m height. Chrome bearing waste. Apprx. 2.2 lakh tones of waste.	Chromium

S. No	Location of the Site	Name of the Polluter	Number of Sites	Product manufactured	Type of Waste Generated	Quantity/Area of the Waste/Contamination	Primary Contaminant
<b>UTTAR PRADESH</b>							
7.	Lucknow	India Pesticides Ltd.	1	Lindane	HCH (Hexachlorocyclohexane) muck wasteg pesticides.	Apprx. 36432 tonnes of waste.	HCH
8.	Kanpur, Juhi Baburaiya, (RakhiMandi)	Kanpur Chemicals (Factory dismantled long back).	1	Chrome salts	Waste containing chromium.	Area of 5-6 acres apprx. Owners not known. Area is densely populated with slum settlement. Apprx. 10000 tonnes of waste. dumped	GW / Soil contaminated with Hexavalent Chromium
9.	KhanpurVillage, Kanpur Dehat	Cluster of BCS manufacturing units	1	Chrome salts	Waste containing chromium.	Area 2 sq. km. Private land. Apprx. 45000 tonnes of waste.	GW / Soil contaminated with Hexavalent Chromium
<b>WEST BENGAL</b>							
10.	Village Nibra, Dist. Howrah	Not Known	1	-	Waste containing chromium	4440 tonnes of waste	Chromium

**METHODOLOGY**

The sequence of steps, for undertaking contaminated site investigation, assessment, characterization, proposing remediation options for contaminated sites (soil and surface/groundwater) and preparation of detailed project reports for the selected remediation option to be carried out in a phased manner based on the methodology as proposed below

***Initial Phase***

**1) Outlining the contaminated site**

- Identification and delineation of the contaminated site - Physical inspection
- Formation of site assessment team/experts
- Collection of history/background information of the contaminated site
- Basic features of the site i.e. collection of information on the site like site maps (topographical, geological), information from local authorities, information on the type of industries (storage and disposal of raw materials, by-products and wastes)
- Nature, location, type and characteristics of the site
- Site photographs
- Identification of previous and current land use pattern of the site (past 10 years)
- Identification of parameters causing immediate threat to the ecology and environment

**2) Survey of the contaminated site**

- Selection of the observation wells(BW/DW) in the watershed covering the site, for monitoring water level and quality monitoring at appropriate locations, & Inventory details like total depth of the well, Water column; Frequency of sampling (Pre monsoon/ Post monsoon or Bimonthly)
- Preparation of groundwater level contour maps w.r.t. msl; ascertaining groundwater flow direction
- Analysis for soil, surface water, ground water for major ions and heavy metals, organic constituents, pesticides and other relevant parameters related to the contaminated site.
- Identification of Benchmark /Background samples
- Use of rapid assessment tools / methods (for Field & Laboratory analysis)
- Outlining the extent of contaminant plume through surfer maps during pre & post monsoon periods



### **3) Reporting on the status of soil and surface water/groundwater quality in a preliminary assessment report**

- Submission of report based on preliminary findings on the need for actual remediation

### ***Secondary Phase***

#### **4) Detailed site investigation and characterization**

- Delineating the aquifer geometry through geophysical methods and ascertaining lithology of formations
- Drilling of bore-holes in grid manner in and around contaminated sites
- Water quality Assessment, geochemical analysis - analysis of heavy metals, specification of heavy metals, isotopic signatures etc.
- Geological, hydrogeological and hydrological features of the contaminated site - Hydraulic conductivity, permeability, porosity, groundwater flow, lineaments, tracer tests if required & pump tests.
- Development of conceptual – groundwater flow processes & contaminant transport processes to visualize the contaminant plume in groundwater
- Development of groundwater flow and mass transport models

#### **5) Risk assessment of contaminated site**

- Socio - economic and environmental assessment of the contaminated area
- Environmental, ecological and health related effects of the identified contaminants
- Pathways of contaminant transport and exposure
- Assessment of toxicity, bioavailability, biodegradability and mobility of contaminants
- Identification of significant receptors and establishing trigger values
- Interaction with local groups. Reporting of meetings/opinions

#### **6) Identification of remediation goals/objectives**

- Summarizing various remediation technologies for each site for soil and groundwater remediation
- Apprising on possible remediation options (atleast 3 alternate options for each site) to the Technical Expert Committee
- Estimation of economic feasibility of the each proposed remediation technology

#### **7) Preparation of Detailed Project Report**

- Preparation of detailed project reports & cost estimates and draft bid documents
- Time targeted application of the remediation plan
- Submission of detailed project report (DPR)

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