

Terms of Reference

Impact of Municipal Solid Waste on Environment at the sites Vijayawada, Ananthapur, Karimnagar and Warangal

Under Capacity Building for Industrial Pollution Management Project, World Bank

I. Background

The Government of India, through the Ministry of Environment and Forests (MoEF) is implementing a project on Capacity Building and Industrial Pollution Management (CBIPMP) with financial assistance from the World Bank. The objective of the project is aligned with the endeavor of the GOI to establish a National Program for Rehabilitation of Polluted Sites (NPRPS) as a framework for scaling up the clean up and rehabilitation of polluted sites and facilitate the reduction of environmental and health risks associated with legacy polluted sites. It also aims to build capacity at the State and Central level and develop a framework to address these issues in a comprehensive and systemic manner.

Project activities will include demonstrative investments for area-based management of pollution resulting from legacy contamination and ongoing industrial activities through (i) remediation/containment of polluted sites / hazardous waste hotspots, (ii) implementation of enforcement and self-regulatory measures to improve compliance and competitiveness of industries in selected industrial clusters, and (iii) upgrading of common environmental infrastructure.

II. Project Components

The main components implemented by APPCB are

1. **Strengthening of Environmental Institutions** - This component is aimed at building capacity for addressing pollution remediation, through pilot site remediation, developing risk-based technical solutions to implement measures for intercepting, containing or treating, as well as monitoring the environment and health impacts in the project areas
2. **Investments in Priority Remediation and Environmental Improvements** - Technical and administrative support for remediation of Noor Mohammad Kunta Lake near

Hyderabad and closure and containment of Kadapa Municipal Solid Waste Site in Kadapa District are taken as priority areas in Andhra Pradesh under this component.

3. **Project Management** - for effective and transparent implementation of the project.

III. Objective of Consultancy

The main objective of this consultancy is (i) to assess the level and nature of contamination (groundwater, surface water, soil) Municipal Solid waste dump site (ii) conduct detailed investigations, (iii) prepare technical and engineering designs and bid document for containment and closure of Municipal Solid waste dump site (iv) Preparation of Social and Environment Management Plan.

IV. Scope of Work

Towards achieving the objectives of the consultancy the following broad steps shall be undertaken by the consultancy firm.

Step: 1 Reconnaissance and Preliminary Assessment of the site through site visits, review of existing documents, maps and literature and carry out the following activities.

- Site description (location, size, proximity to human settlements, water bodies etc)
- Study of topographical, geological, soil and flood plain maps, land use, rainfall rates, groundwater and soil cover characteristics, flora and fauna, known other sources of pollution in the surroundings.
- Current status of waste disposal at the site
- Study previous site investigation reports and conduct a desk review of type, volume and location of waste disposal at the site, recommendations from previous investigations, if any.
- Discussion with local people and other informed people, district administration, municipal and regulatory authorities, NGOS, etc.
- Description of hotspot affected waterbodies, land and air and estimated lands of contamination
- The consultant shall consolidate site data after collection of additional information through site visits and interact with local experts

The Andhra Pradesh pollution Control Board (APPCB) will share the relevant documents available. The Board will help in acquiring relevant information specific to the project from other Govt. departments on the request of the consultant.

After the preliminary assessment is completed, a report, detailing the physical site and pollution characteristics and the area of containment shall be submitted

Step 2: Development of Sampling Protocol and Sample Analysis

A detailed sampling protocol aimed at assessing the pollution level of the site and to establish the present environmental status of the project area, shall be developed. The protocol shall include identification and layout plan of sampling and drilling prints parameters for analysis, sampling frequency (number of seasons), number of samples, method of sampling for air, water and drilling methods, QA / QC programme and shall be submitted for approval by APPCB.

The samples shall be analyzed for physico-chemical parameters, heavy metals, volatile, semi-volatile and non-volatile organics as per the MSW rules and based on pollutant parameters present at the site and as per national / international testing procedures. All samples may be analyzed at the APPCB Central Lab or any labs recognized by Ministry of Environment & Forests, Govt. of India.

This step based on the above sample analysis shall establish the extent of pollution, characteristics, ranking of pollutants at the project site.

Step 3: Field Investigations of the identified polluted site

Field investigations shall be conducted to identify the level and extent of pollution. The work will consist the following:-

- Conduct sampling to identify areas of pollution – the hotspot at the MSW dumpsite and surrounding to MSW dumpsite
- Determine soil characteristics, depth of aquifer and quality of ambient groundwater

- Determine pollutant concentration in both soil and groundwater through test pits, bore holes, monitoring wells, nearby water bodies, etc. through soil, groundwater and surface water sampling
- Quality Assurance/Quality Control (QA/QC) Program
- Determine extent of pollution
- Presence of landfill gas.

The consultancy firm will take up detailed field investigations consisting of, but not be limited to, the following.

- Delineating the area of pollution in both soil and groundwater, through topographic and other engineering surveys, and supplemented by modeling
- Estimating the waste quantum (weight & volume), waste characteristics (pollutants and their concentrations), and level of ongoing leachate contamination
- Estimation of landfill gas
- On-site or affected population report, based on detailed socio-economic surveys and impacts on flora, fauna.
- Detailed risk and Impact Assessment resulting from continual exposure to environmental contaminants and health contaminations (Pathogenic and bacteriology)

Step 4 : Preparation of Social and Environment Management Plan.

The consultant shall prepare social and environmental management plan based on the baseline data collected during the previous steps of the work and after conducting the public stake holder meetings.

Step 5: Development of closure and containment Plans

The consultant shall

- List and evaluate best options for (i) containment and closure of the dump site (ii) addressing the issues of water and soil pollution in the affected areas, based on cost, complexity, technology, effectiveness, execution aspects, previous performance,

safety, locally available skills, etc.

- Assess the environmental and social impacts of the proposed option, based on detailed field surveys and investigations
- Recommend appropriate implementation strategies, considering the future land use and based on (i) compliance with the standards as applied in India or standards adopted for similar situations in other countries and (ii) performance based approach that is based on verifiable success in similar situations.
- The implementation strategy should consider options such as technology neutral performance or conventional turnkey or Engineer-Procure-Construct (EPC) contracts. For each of the identified strategy, the consultant will analyze engineering, environmental and contractual requirements.
- Prepare detailed designs for the approved option, comprising engineering drawings, cost estimates and implementation schedule and preparation of bid documents.
- To impart hands on training in situ/on site to the PIU & LIU staff of APPCB.

V. Data, Services & Facilities to be provided by APPCB to

1. Relevant data and reports available with APPCB and MOEF.
2. Facilitate correspondence with relevant agencies; however, it will be the sole responsibility of the consultancy firm to get the necessary data and reports.

VI. Consultancy firm Qualifications

The consultancy firm must have experience in the area of Municipal Solid Waste Management.

- The consultancy firm shall have experience in executing similar type of works carried out earlier and should have demonstrated good technical skills in the earlier assignment of similar nature and scale.
- The team shall be headed by an experienced Environmental /Civil engineer/scientist with more than 15 years' experience and who is well versed in surveying with GPS system and GIS.

- The team shall have atleast one Environmental Engineer who is having experience in the area of Municipal Solid Waste Management and shall be well versed with Indian regulation on MSW Management.