

**CONSULTANCY SERVICES FOR  
TECHNO-ECONOMIC FEASIBILITY STUDY, INCLUDING  
PREPARATION OF PRELIMINARY DESIGN, ROUGH COST  
ESTIMATION,  
PREPARATION OF PC-I DOCUMENT, RFP DOCUMENT, ETC. FOR  
INTEGRATED MEDICAL HAZARDOUS WASTE SYSTEM IN KARACHI**

**BRIEF SCOPE / TERMS OF REFERENCE FOR THE  
ASSIGNMENT**

(Note: This is outline of ToR – Detailed ToRs, deliverables etc. shall be provided to shortlisted firms in RFP document)

The brief scope of work of the consultancy assignment is as follows:

**A. Background:**

Karachi is the biggest city of Pakistan having population of around 20 Million. Solid Waste Management is the biggest problem in the city at the moment. Total waste generation of the city is about 12,000 tons/day. Out of 12,000 tons the 9,000 tons of waste is generated within the administrative jurisdiction of Karachi Metropolitan Corporation (KMC) / District Municipal Corporation (DMC) and District Council Karachi (DCK). The remaining 3,000 tons of waste is generated in areas of other civic administrative bodies e.g. Cantonment boards, SITE, KPT, Pakistan Railways etc.

There are more than 500 Private Hospitals / Clinics, about 20 Major Laborites and 28 Government Hospitals in Karachi. It is estimated total of 200 to 250 ton hospital waste and clinical waste is generated daily in Karachi city. Term Medical Waste, Hospital Waste, Healthcare Waste, Medical Hazardous waste is interchangeably used to denote the waste generated in hospitals, health centres, clinics, blood banks and laboratories.

Medical Hazardous Waste is generated during diagnosis, treatment, or immunization of human beings or animals. It may include waste like sharps, non-sharp, disposables, syringes, bandages, blood parts, body parts chemical, pharmaceuticals, medical devices and radioactive materials. Poor management of Healthcare Waste exposes healthcare

workers, waste handlers and community to serious and sometimes life threatening infections, toxic effects and injuries.

Unfortunately, there are no systematic approaches to Medical Waste Disposal throughout Pakistan and Karachi is not an exception. Waste is simply mixed with the municipal waste in collecting bins at roadsides and then disposed of along with domestic waste. Disposable syringes, needles and other sharps are also not disposed of properly. In most cases waste pickers collect these items from area bins for recycling. In this process, not only they contract infectious diseases but act as a source of transmission of these infections to the community. It may be not be an exaggeration if they are labeled as living bombs. On the other hand re-use of these syringes and other disposal items has created a Public Health Emergency like situation, which is evident from prevalence rates of Hepatitis, AIDS and other communicable diseases.

In order to improve the current situation of the Medical hazardous waste in the City, Sindh Solid Waste Management Board (SSWMB) intends to hire the services of reputed and experienced National Consulting Firms for conducting Feasibility Study including Preparation of Preliminary Design, rough cost estimation, preparation of PC-I and bidding Documents etc., for establishment of Integrated Medical Hazardous Waste System in Karachi.

#### **B. Scope of Consultancy Works:**

- Analysis and Waste characterization based on Survey of hospital industry to determine type and magnitude of disposal problem;
- Conduct new and review existing studies relating to different types of medical hazardous waste;
- Survey hospitals, health centres, clinics and laboratories in Karachi to determine type and magnitude of medical waste disposal problem;
- Assess available hazardous waste treatment and disposal alternatives, and costs involved, to compare economic impact of alternative methods;
- Propose the best possible Medical Hazardous Waste collection, transport, disposal & treatment system;
- Conduct feasibility of the proposed Medical Hazardous Waste collection, transport, disposal & treatment system based on scientific methodologies/criteria while taking into account technical, environmental and community related aspects and to prepare layout and maps;
- Preliminary Engineering Design of Medical Hazardous Waste Collection, Transport, Disposal & Treatment System (Equipment specification and preliminary designs of civil works, utilities and electrical installations etc.);
- **Foreign Consultants Inputs (Minimum 100 hours):** Foreign consultants'/experts' inputs shall be taken for design criteria, specifications and engineering designs/ functionality requirements

by local consultants and same should be documented and integrated into the considering the ground realities;

- Co-ordination with Sindh Environmental Protection Agency (SEPA) for conducting Environmental Impact Assessment (EIA)/IEE if required;
- Rough Cost Estimates on the basis of Preliminary design;
- Preparation of Feasibility Report;
- Preparation of Project PC-I, incorporating all the Project Costs on the basis of Preliminary design;
- Preparation of Bidding Documents as per SSPRA rules 2010 (Amended 2013);
- Pre-qualification of Contractors as per SSPRA rules 2010 (Amended 2013), if required.
- The services shall also include any other extra work assignment relating to the project by competent authority of SSWMB not covered in contract. However, this shall be carried out on mutually agreed terms and conditions.

The consultants shall adequately address the following objectives within their engineering analysis and designs:

- Site selection for placement of 'Bins' for safe storage of different types of Medical Hazardous Waste;
- Safe and efficient flow of traffic for collection and transfer trucks from health facilities to disposal sites;
- Safe and efficient unloading of collection trucks and loading of transfer trucks;
- Site selection for 'Medical Hazardous Waste Disposal & Treatment facilities';
- Adequate enclosure and ventilation at 'Medical Hazardous Waste Disposal & Treatment facilities' for control of noise, odour and dust and to meet aesthetic needs;
- Office facilities for site supervisor and supporting staff at 'Medical Hazardous Waste Disposal & Treatment facilities';
- The fencing and gate control facilities, including weighbridges, to secure the site;
- Provision for parking space, workshop facilities and washing facilities;
- Drainage and sanitation facilities to fully meet the projected flow of twenty-year storm water;
- Ancillary services.
- The Consultant firm is also expected to take into account following factors while preparation of Feasibility Study:
  - Existing rules and regulations
    - Federal
    - Provincial
    - Emission Standards
  - No. of sources generating waste and their quantity of waste (Data Collection):
    - Govt. Hospitals, No. of beds

- Private Hospitals, No. of beds
  - Charity Hospitals, No. of beds
  - Private Clinics
  - Medical Labs
  - Blood banks and transfusion centers
  - Animal hospitals
  - Pharmacies (expired medicines)
  - Zoo, Safari parks
- Present system of Hospital Waste Management in waste generating sources:
- Hospitals having own incinerators?
    - Capacity
    - Type of Incinerator
    - Emission Control Devices
    - Ash Disposal, place and transportation system
    - Waste disposal - Landfill or any other place
    - Fee for disposal
    - Collection through Private Co
    - Collection through Govt. Agencies
  - Proposed new Hospital Waste management:
    - Organisation in generating sources
    - Segregation system
    - Sanitation of infected hazardous waste
    - Collection
    - Transportation to the plant for disposal
    - Storage at plant
    - Disposal, reuse and incineration
    - Accidents and spillages
    - In case of accidents and spillages, the action to be taken
    - Waste minimization and reuse proposals
  - Inspection and Implementation of rules and regulations in waste generating sources
  - Capacity building of staff in generating sources to handle waste
  - Fee charges from generating sources, if any
  - Government strategy to manage hospital waste
    - Government Owned Hospitals
    - Private Hospitals
    - Combination Govt./Private (Partnership)

Note: 6 Copies of each report shall be submitted by the Consultants.