



WATER AND SANITATION AGENCY (LDA)

TERMS OF REFERENCE (TORs) FOR SHORT (INDIVIDUAL) CONSULTANCY FOR STUDY OF CONSTRUCTION OF A PILOT SCALE WASTEWATER TREATMENT PLANT FOR WASA LAHORE

1. BACKGROUND

Water and Sanitation Agency (WASA) Lahore, is the subsidiary agency of Lahore Development Authority (LDA), Government of the Punjab, Pakistan to perform all functions and exercise all powers with regard to water supply, sewerage and drainage. WASA Lahore is the second largest water utility of Pakistan as a regulated monopoly for water supply & sewerage services in the city, operating in the area of more than 350-Sq.Km, through approximately 596 tubewells, about 5,826-Km length of water supply lines and about 5140-Km length of sewerage network.

Currently, all of the wastewater generated in Lahore City (domestic and industrial) is being discharged into River Ravi through different discharge points (via Disposal pumping stations and gravity drains) without any treatment as no Wastewater Treatment Plant (WWTP) has been constructed in Lahore City to first treat the wastewater and then dispose off it into water body like River Ravi. An estimated 540 MGD (1000 Cusec) of untreated domestic sewage is being disposed of into river Ravi. Therefore, WASA Lahore has planned the project of construction of wastewater treatment plants in the city and intends to construct the Wastewater Treatment Plants on priority basis.

To identify the need of wastewater treatment for the city of Lahore, a study was carried out by M/s Balfour Maunsell in 1987 through a grant provided by the British Government. M/s Balfour Maunsell identified total six (6) locations for construction of Waste Water Treatment Plants (WWTPs) to treat wastewater from Northern and Southern part of the city. The detail of WWTPs is provided hereunder:

- i. North East-I Mehmood Booti WWTP
- ii. North East-II Shadbagh road WWTP
- iii. North West Shahdara WWTP
- iv. South West Babu Sabu WWTP
- v. South Mohlanwal & Kattar Bund WWTP
- vi. South East Ferozpur Road near Hudiana Drain WWTP

A feasibility study to construct the wastewater treatment plants for Mehmood Booti, Shadbagh, Shahdara & Babu Sabu (South West) was prepared by Meinhardt in 2014, which was later updated by the consultant M/s ILF (Pvt.) Ltd. In spite of various studies & recommendations no treatment plant could be installed up till now due to lack of investment and other reasons.

2. JUSTIFICATION

Despite so many recommendations of the studies and hideous efforts for construction of a large scale WWTP to treat wastewater of Lahore, no wastewater treatment plant could be constructed so far, which has created a general impression that wastewater treatment is very difficult job requiring lot of money with limited utilization of treated effluent. Therefore, WASA Lahore wants to construct a small Wastewater Treatment Plant as a pilot project, which could help to familiarize the wastewater treatment and capacity building of the utility regarding operation of treatment plant. It will also reduce the myth of complexity of the process.

3. OBJECTIVES:

- 3.1 Carry out the Feasibility Study for construction of a Wastewater Treatment Plant at pilot scale in Lahore considering the factors which includes but not limited to the selection of appropriate site, suitability of site, social factors and land availability & cost for WWTP.
- 3.2 Recommend the most commonly used technology in the world capable to treat municipal wastewater for unrestricted irrigation of parks and green belts along the roads of the city as per NEQs and international standards for reuse of wastewater.
- 3.3 Carry out concept design based on best relevant International Codes, Standards, and Specifications complete in all respect.

4. SCOPE OF WORK / DUTIES AND RESPONSIBILITIES OF THE CONSULTANT.

A. FEASIBILITY STUDY:

1. Collection and Review of all primary and secondary data including selection of Design Parameters.
2. To prepare concept note for proposed pilot scale wastewater treatment plant.
3. Conduct Feasibility Study to construct pilot scale wastewater treatment plant having appropriate treatment capacity less than or equal to 01 cusec. The FSR shall include the analysis for selection of site, Conveyance of wastewater to the treatment plant site, wastewater characteristics, effluent characteristics, mechanism of the project, process train, concept design, site plan, space requirement, sustainability, man power requirement, Wastewater Quality Monitoring, Selection of wastewater parameters for design of treatment plant, selection of most suitable technology by comparing all suitable treatment technologies for wastewater reuse and a plan for sludge management.
4. The Consultant shall be responsible for: preparation of layout plans of source, selected site, site area and plant to final discharge/ connection points.
5. The Consultant shall be responsible to conduct the sampling of wastewater to be treated at WWTP to establish influent characteristics.
6. Identify different potential sites (at least 03 potential sites) and select the most suitable site(s) based on considerations such as availability of land, technical, financial, environmental, social and others.
7. Prepare the concept design of conveyance system to WWTP.
8. The analysis should enable to reach at a conclusion for selection of treatment technology or a combination of technologies/Hybrid technology (preferably mechanized), which is technically and economically viable and sustainable under local

conditions. The criteria for comparison of the wastewater treatment technologies will include but not limited to the following:

- Desired treatment objectives for wastewater reuse for plants & green belts.
 - Efficiency of removal of organic pollution by the technology
 - Design Flows
 - Wastewater Characteristics
 - Space / Area Requirements
 - Required effluent Quality, to meet National Environmental Quality Standards (NEQS) as a minimum requirement. However, based upon the recommended reuse of treated water e.g. category of irrigation for direct watering of plants, etc., the quality of treated effluent may be improved accordingly.
 - Capital Cost
 - Operational Cost
 - Energy / Power Requirement
 - Ease in operation
9. Prepare energy requirement & uninterrupted power supply plan for the WWTP and identify the possible sources of the electricity to run the plant.
 10. Assess the options/potential for reuse of the treated water keeping in view the expected effluent quality, identification of potential users, assessment of additional treatment requirements and associated O&M activities etc.
 11. The Quality of Treated effluent must conform to National Environmental Quality Standards (NEQS) as a minimum requirement. However, Based upon the recommended reuse of treated water e.g. category of irrigation requirement etc. quality of treated effluent may be improved accordingly.
 12. Conduct analysis of different sludge stabilization methods and disposal mechanisms. The consultant shall also recommend the mechanism for sludge storage & disposal.
 13. Submit Draft and Final Feasibility Study Report for the pilot project including the recommendations covering all above parameters for consideration and approval of the client.

B. CONCEPT DESIGN:

The consultant will prepare and submit concept design of WWTP along with all its components including the collection mechanism to tap wastewater from existing system (disposal station or drain) to the proposed WWTP. Consultant will prepare the layout plans of the components of the WWTP. Concept engineering design will also include Pumping Stations (if required), Collection Mechanism and disposal of treated Wastewater complete in all respects.

5. TIME DURATION FOR THE PROPOSED CONSULTANCIES

The time duration for this consultancy work is 3 months.

6. CONSULTANT'S QUALIFICATION & EXPERIENCE

BSc. Civil/Mechanical/Environmental/Sanitary Engineering or equivalent having 10 years experience or M.Sc. Civil/Mechanical/Environmental/Sanitary Engineering or equivalent having 05 years experience in the public or private sector related to provision of sanitation services. The consultant must have experience of carrying out feasibility study of at least (01) One municipal wastewater treatment plant.

7. SCHEDULE OF SUBMISSIONS AND RELEASE OF PAYMENT

Sr. No.	Report / Document	Cumulative Timeline	Payment
1.	Concept Note	1 Month	25%
2.	Draft Feasibility Report	1.5 Months	25%
3.	Final Feasibility Report	2 Months	25%
4.	Concept Engineering Design	3 Months	25%