

## Guidelines on Construction, Operation and Application of RootZone Treatment Systems for the Treatment of Municipal Industrial Wastewater

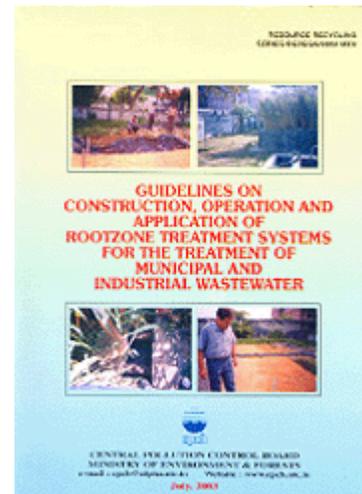
### Foreword

Rootzone Treatment Systems (RZTS) use natural processes to effectively treat domestic & industrial effluents. This technology was developed during the seventies in Germany and since then spread out all over the world. The process incorporates the self-regulating dynamics of a specially designed soil eco-system. RZTS are by now well known in temperate climates and are easy to operate on-site treatment facilities, which involve less installation, maintenance and operational costs than the conventional treatment methods. Also RZTS offer cost effective options for decentralization of wastewater treatment.

The term Rootzone encompasses the interactions of various species of bacteria, fungi and other microorganisms, the roots of wetland plants (helophytes), filter bed media, sun and, of course, water. The helophytes conduct oxygen through their stems into their root systems and create favourable conditions for the growth of aerobic microorganisms. Since the process occurs in a deep filter bed, aerobic and anaerobic zones exist side by side.

The wastewater enters the root zone horizontally or vertically and it passes through the system where the organic pollutants are decomposed biochemically by the microorganisms present in the rhizosphere of the helophytes. The filter bed media are selected or mixed carefully to provide favourable conditions for both plants and bacterial growth and to ensure optimum hydraulic load.

To investigate the efficiency of Rootzone Treatment Systems in warm climates, a pilot project in collaboration with the German Technical Co-operation (GTZ) has been set up at Mother Dairy, Delhi to treat the dairy wastewater. On the basis of data collected from the Mother Dairy project as well as from other plants in India and abroad, Guidelines for Construction, Use, Operation & Maintenance were elaborated by a Committee set up for this purpose under the Chairmanship of Dr. K.R. Ranganathan. The contributions of the members and experts of this Committee and the support by the management and the staff of Mother Dairy are gratefully acknowledged. We hope, this document will be useful for municipalities, panchayats, individual house owners and industries. However, this document presents the present state of knowledge of application of RZTS in tropical climate and it will be updated periodically with growing experience and availability of a larger database in India.



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