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APPENDICES

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CHAPTER 1
INTRODUCTION

Water constitutes one of the important physical environments of man and has a direct bearing on his health. There is no gainsaying that contamination of water leads to health hazards. Water is precious to man and therefore WHO refers to "control of Water Supplies to ensure that they are pure and wholesome as one of the primary objectives of environmental sanitation". Water may be polluted by physical, chemical and bacterial agents. Therefore, protected water supply is a sine qua non of public health of a community.

The population of India is likely to be around a thousand million by the end of the century. The urban population would be around four hundred million by that time. This means a very large demand on the civic amenities including water supply for domestic purposes and in addition more water would be needed for purposes such as irrigation, industry, etc., which have to keep pace with the increasing demands of rising population. Therefore, identification of sources of water supply, their conservation and optimal utilization is of utmost importance. Even the present scale of water supply to urban and rural population is grossly inadequate and not all communities are provided with safe water supply, let alone piped water system; hardly any metropolitan city has a continuous water supply; and very few cities could boast of providing adequate water supply to meet their growing demands at adequate pressure.

Many facets are involved in tackling the problem of providing protected water supply to all communities at the minimum cost and in the shortest possible time. Emphasis has to be laid on both the aspects of the system namely, planning and management technical and financial. At present a number of decisions, both at policy and technical levels, are being based on empirical considerations and divergent practices are in vogue in the country in so far as designing the system itself is concerned. The Manual would have to attempt at the unification of these practices and help to inculcate rationale to policy and managerial decisions apart from giving guidance to the public health engineers in achieving the target of providing safe water to all communities economically and expeditiously.

Obviously, it would be in the interest of public health engineers to have a standard manual in public health engineering and a code of practice which could serve as a guide in their day to day practice. This Manual would discuss the basic principles such as planning, identification of source of supply, development and transmission, water treatment, distribution system, testing and other related administrative aspects and also explain in detail the proper approach to each problem.

This Revised Manual has taken into account the recent technical advances and trends in the development of protected water supply systems, some of the major changes and additions as highlighted in the following areas:

- Ground water potential and its development in hard rock regions;
- Well development, failure of wells and remedial measures;
- Ground water abstraction through radial wells;
- Measurement of flow;
- Minimum requirements for domestic, non-domestic, institutional, fire fighting and industrial needs;
- Minimum residual pressure and quality standards including virological aspects,
- Concept of unit operations;
- Chemical handling and feeding;
- Recent concepts of coagulation and flocculation;
- Advances in filtration;
- Operation and maintenance problems in various unit operations involved in water supply, from source development to the actual supply;
- Pumping stations and equipment;
- Hydraulic network analysis, direct design of networks and computer programming;
- Preventive maintenance including detection and prevention of wastage;
- Protection against pollution and freezing;
- Corrosion and its prevention;
- Water hammer problems;
- House service connections;
- Optimal design of water treatment systems;
- Instrumentation & controls in water treatment plants;
- Financing and management;
- Legal aspects;
- Laboratory tests and procedures with special reference to the classification of the water works laboratories.

In keeping with the changeover to the metric system, the various units of measurements, operational parameters and design criteria have all been confined to the metric system only, with deliberate omission of equivalents in the British System generally furnished alongside. This has been felt necessary, since there is, still an apathy on the part of the field engineer to break away from the conventional, in which he feels at home, since tradition dies hard.