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Section I
Introduction

I.1 Overview of Cost-Based Water Utility Rate Making
Establishing cost-based rates, fees, and charges is an important component in a well-managed and operated water utility. Cost-based rates provide sufficient funding to allow communities to build, operate, maintain, and reinvest in their water system that provides the community with safe and reliable drinking water and fire protection. Properly and adequately funded water systems also allow for the economic development and sustainability of the local community. The purpose of this manual is to discuss standard practices in financial planning and rate making that a utility can use to establish cost-based rates, fees, and charges to recover the full costs associated with their water system.

The methods and analyses used to establish cost-based rates, fees, and charges have a long history within the water utility industry. Operators of some of the earliest water systems recognized the need for sufficient funding and rates to properly operate, maintain, and expand their water systems. The American Water Works Association (AWWA) appointed the Committee on Water Rates in 1949. As time passed, the utility industry recognized the need for a manual of standard practice. Through the work of this committee, the first AWWA M1 manual, *Water Rates Manual*, was published in 1954. Many of the same concepts, methodologies, and analyses used in 1954 remain relevant today. As time has passed, the AWWA M1 manual has been updated and expanded to reflect the changing industry and its current financial and rate issues. The development of AWWA’s Sixth Edition of the M1 manual continues the efforts of many dedicated rate professionals to provide a manual of standard practice for the development and establishment of cost-based water rates, fees, and charges.

As a manual of standard practice, AWWA advocates the use of the generally accepted cost-based principles and methodologies for establishing rates, charges, and fees contained and discussed within this manual. Establishing cost-based and
equitable rates is technically challenging and requires, at some level, knowledge and understanding of finance, accounting, budgeting, engineering, system design and operations, customer service, public outreach and communication, and the legal environment as it may relate to setting rates, fees, and charges.

**OBJECTIVES OF COST-BASED RATE MAKING**

Water rates developed using the methodologies discussed in this manual, when appropriately applied, are generally considered to be fair and equitable because these rate-setting methodologies result in cost-based rates that generate revenue from each class of customer in proportion to the cost to serve each class of customer. Water rates are considered fair and equitable when each customer class pays the costs allocated to the class and thus cross-class subsidies are avoided.

While recovery of the full revenue requirement in a fair and equitable manner is a key objective of a utility using a cost-of-service rate-making process, it is often not the only objective. The following list contains the typical objectives in establishing cost-based rates:

- Effectiveness in yielding total revenue requirements (full cost recovery)
- Revenue stability and predictability
- Stability and predictability of the rates themselves from unexpected or adverse changes
- Promotion of efficient resource use (conservation and efficient use)
- Fairness in the apportionment of total costs of service among the different ratepayers
- Avoidance of undue discrimination (subsidies) within the rates
- Dynamic efficiency in responding to changing supply and demand patterns
- Freedom from controversies as to proper interpretation of the rates
- Simple and easy to understand
- Simple to administer
- Legal and defendable

**OVERVIEW OF THE GENERALY ACCEPTED RATE-SETTING METHODOLOGY**

This manual outlines the methodologies and analyses that are used to establish cost-based rates. As displayed in Figure I.1-1, the generally accepted rate-setting methodology includes three categories of technical analysis. The first is the revenue requirement analysis. This analysis examines the utility’s operating and capital costs to determine the total revenue requirement and the adequacy of the utility’s existing rates. Next, a cost-of-service analysis is used to functionalize, allocate, and equitably distribute the revenue requirements to the various customer classes of service (e.g., residential, commercial) served by the utility. The final technical analysis is the rate-design analysis. The rate-design analysis uses the results from the revenue

requirement and cost-of-service analysis to establish cost-based water rates that meet the overall rate-design goals and objectives of the utility.

A section of the manual has been dedicated to providing a detailed discussion of each type of analysis previously referenced. Section II of this manual discusses the various technical components of establishing a utility's revenue requirements. Section III discusses the various methodologies that may be used to conduct a cost-of-service analysis. Finally, Section IV reviews the various issues and technical considerations in designing water rates.

OVERVIEW OF THE KEY TECHNICAL ANALYSES ASSOCIATED WITH COST-BASED RATE MAKING

In establishing cost-based water rates, it is important to understand that a cost-of-service methodology does not prescribe a single approach. Rather, as the First Edition of the M1 manual noted, “the (M1 manual) is aimed at outlining the basic elements involved in water rates and suggesting alternative rules of procedure for formulating rates, thus permitting the exercise of judgment and preference to meet local conditions and requirements.”* This manual, like those before it, provides the reader with an understanding of the options that make up the generally accepted methodologies and principles used to establish cost-based rates. From the application of these options within the principles and methodologies, a utility may create cost-based rates that reflect the distinct and unique characteristics of that utility and the values of the community.

Revenue Requirement Analysis

The purpose of the revenue requirements analysis is to determine the adequate and appropriate funding of the utility. Revenue requirements are the summation of the operation, maintenance, and capital costs that a utility must recover during the time period for which the rates will be in place. There are two generally accepted approaches discussed in this manual for establishing a utility’s revenue requirements: the cash-needs approach and the utility-basis approach. Section II of the manual provides a detailed discussion and numerical examples about how to establish a utility’s revenue requirement using these two approaches, and this section provides a framework for determining how to select between the two approaches.

Cost-of-Service Analysis

The purpose of the cost-of-service analysis is to equitably distribute the revenue requirements between the various customer classes of service served by the utility. The cost-of-service analysis determines what cost differences, if any, exist between serving the various customer classes of service. There are two generally accepted methodologies for conducting the cost-of-service analysis. They are called the base-extra capacity methodology and the commodity-demand methodology. The functionalization, allocation, and distribution process of the base-extra capacity and commodity-demand methodologies are generally considered fair and equitable because both approaches result in the revenue requirements being distributed to each class in proportion to each class’s contribution to the system cost components. A discussion of both cost-of-service methodologies, along with numerical examples to illustrate their differences, are provided in Section III of this manual.

Rate-Design Analysis

The final technical analysis is the rate-design analysis. This analysis determines how to recover the appropriate level of costs from each customer class of service. There are different rate structures that may be used to collect the appropriate level of revenues from each customer class of service. Section IV of this manual covers the selection and development of rate designs in detail.

OTHER WATER RATE ISSUES AND CONSIDERATIONS

In addition to the topics previously discussed, this manual also contains guidance on a variety of other water rate and cost recovery issues, capacity and development charges, and water rate implementation issues. These topics are discussed in Sections V through VII.

Section V provides an overview of many distinct situations and pricing considerations that utilities may need to address. It is not unusual for a utility to face situations where a customer or group of customers has unique characteristics and circumstances. These situations include establishing inside- versus outside-city rates, standby rates, drought and surcharge rates, low-income and affordability rates, negotiated contract and economic development rates, indexed rates, price elasticity of rates, and marginal cost pricing. Regardless of the distinctive situation and pricing considerations, the cost-based principles and methodologies as discussed within this manual should be adapted for the cost analysis to provide proper support for the rates.

In recent years, the cost of system expansion and customer growth has had a significant financial impact on utilities. The development of cost-based connection fees, system development charges, or dedicated capacity charges are the topics reviewed in Section VI.

Finally, while cost-of-service principles for rate making and related fees and charges relies on significant amounts of financial analysis, engineering analysis, and policy decisions, it is necessary to engage the public and to understand the legal environment in which fair and equitable rates are set. These topics, along with the data needs for developing cost-based rates, are discussed in Section VII of the manual.