

CHAPTER 2

Public Water Supply Systems*

INTRODUCTION

The public water supply utility industry is one of the Nation's oldest industries. Its history can be traced back to colonial times to the system built in Boston in 1652 consisting of wooden pipe and conduits used to convey water from wells and springs to a wooden tank from which people could fill their water buckets. Almost a century later, in 1746, a farmer named Schaeffer piped water from his Pennsylvania farm to the community now called Schaefferstown. This was the first water supply in the United States built to serve an entire town.

Despite these early examples, public water service did not enjoy immediate acceptance. People preferred to take water from their own wells and springs. There were, for example, only 16 public water systems in 1800, and 83 in 1850. The situation changed rapidly, however, during the second half of the 19th century, so that by 1890 there were 1,878 public water supply systems serving 22,500,000 people. Today water utilities constitute one of the Nation's largest and most essential industries, serving almost 160 million people. The industry has established a record for safety, reliability, and service unmatched elsewhere in the world.

A. NATURE AND COMPOSITION OF THE WATER UTILITY INDUSTRY

1. DESCRIPTION OF FACILITIES

(a) *General Physical Characteristics*

The main components of a public water system are:

1. *Source of water supply.* Surface water sources are lakes, ponds, and streams. Water may be taken directly from a stream on a continuous basis, or a dam may be built, creating a reservoir to hold flood waters. Ground water sources are wells, springs, and infiltration galleries, wells being most commonly used for public supply.

2. *Collection works and transmission mains.* Collection and transmission works comprise intakes, pumping stations, and pipelines as necessary to collect and transport the water to the treatment plant or distribution system.

3. *Treatment plants.* Minimum treatment for sources of excellent natural quality usually consists of disinfection as a safeguard. Treatment may be much more extensive in order to produce a safe and palatable water and may include application of various chemicals together with mixing, flocculation, settling, and filtration. Other processes are employed as needed to soften the water and remove objectionable amounts of iron and manganese.

*Prepared by the American Waterworks Association, with minor editing by committee staff.