

Desalination of Seawater

AWWA MANUAL M61

First Edition



**American Water Works
Association**

MANUAL OF WATER SUPPLY PRACTICES — M61, First Edition

Desalination of Seawater

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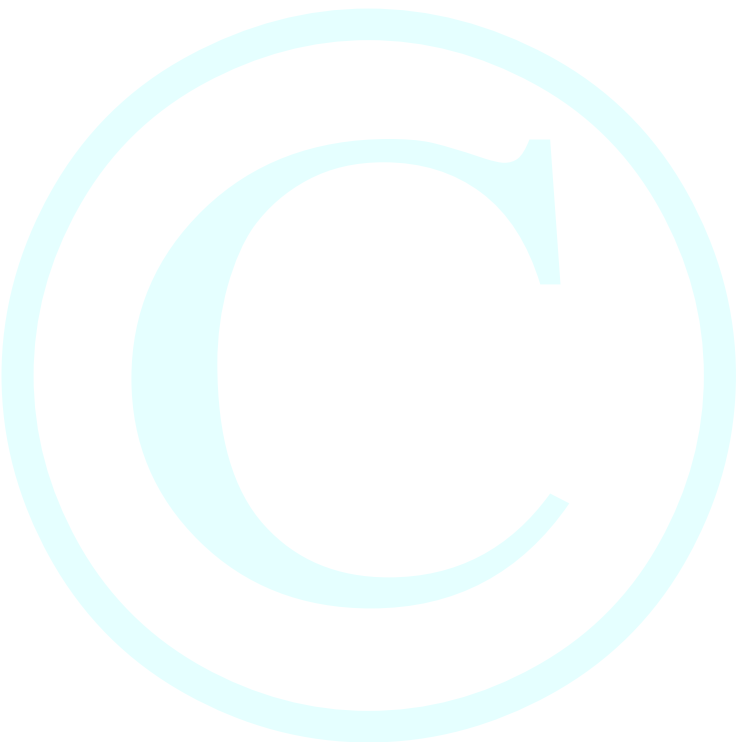
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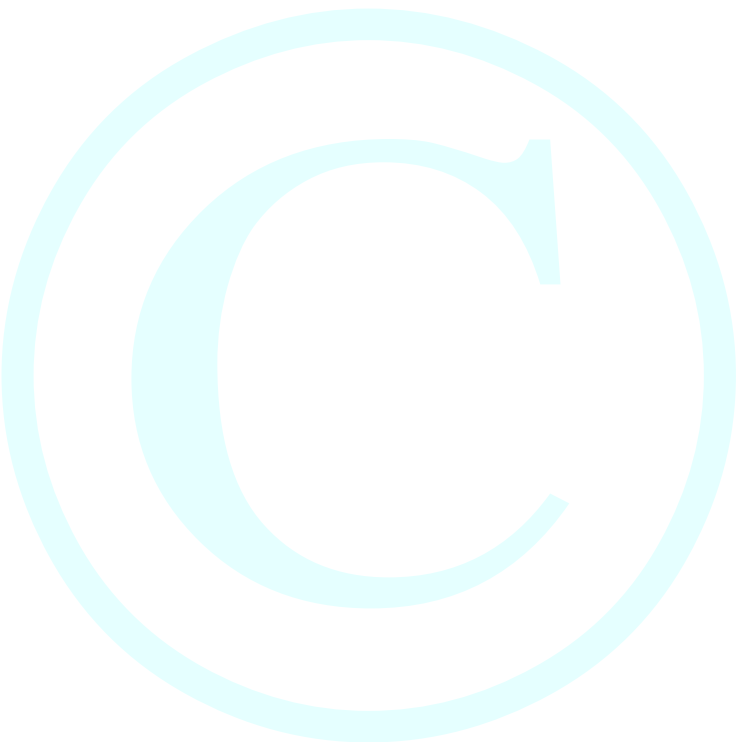
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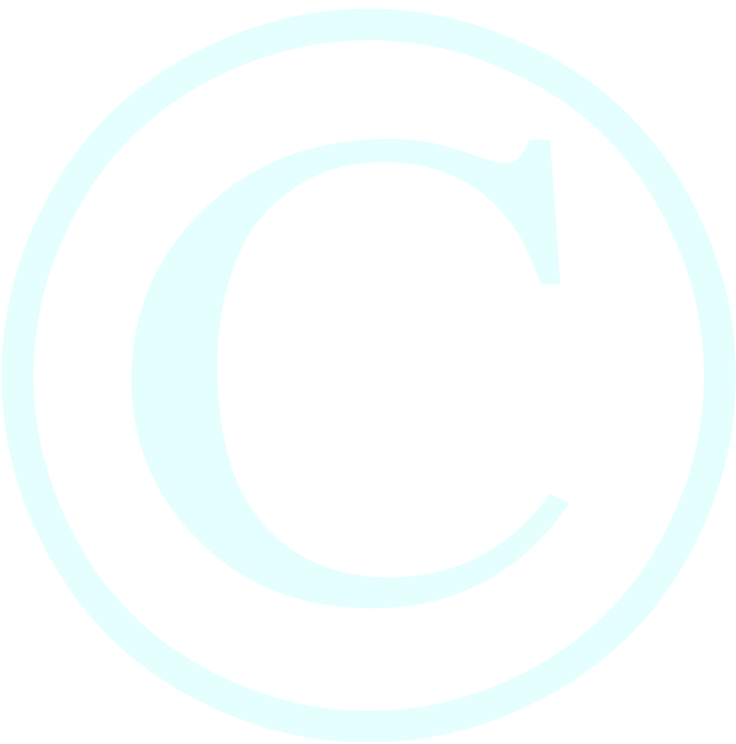
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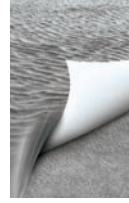
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Chapter 1

Seawater Desalination Overview

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INTRODUCTION

As worldwide fresh water supplies become increasingly stressed and world populations continue to grow, seawater desalination has become an increasingly sought-after alternative for new water supply in coastal areas. While three-quarters of the globe is covered with water, less than 0.3 percent is considered a renewable freshwater supply. More than half of the population in the United States lives within 50 miles (80 kilometers) of a coast, so the use of seawater as a source for potable water production is of great interest, especially in areas with stressed and overdrawn freshwater resources. Historically, the high cost of desalination has made it less attractive than freshwater supplies, even where those freshwater supplies were hundreds of miles away (i.e., Southern California).

As desalination becomes more economical, its use for municipal water supply has increased dramatically. Figure 1-1 shows that the worldwide desalination capacity more than doubled between 2002 and 2010. In the United States, most desalination facilities treat brackish water or are membrane softening plants; however, seawater desalination plants currently outnumber brackish water plants by 60 percent worldwide (GWI 2009).

Table 1 lists some of the more than two dozen seawater desalination plants built and operated in the United States. The majority of these facilities are industrial with a capacity of less than 1 million gallons per day (mgd) or 3.8 megaliters per day (MLD). In addition, a number of these plants are used intermittently because of the high cost of operation or problems experienced during operation. As coastal municipalities in the United States