CHAPTER 2

SITE SELECTION

2-1. Site technical requirements. Site technical requirements are specific to each particular process. Generalized recommendations can be made regarding location, space, and access requirements. A typical desalination system flowsheet is shown in figure 2-1. A typical desalination system layout, using reverse osmosis as a sample process, is shown in figure 2-2.

a. Location. Desalination facilities will be located as close to the raw water source as possible in order to avoid excessive pipeline or pumping costs and to minimize operation and maintenance costs for pumping raw water (high saline content). The placement of desalination facilities within the perimeter of a military reservation will provide facility security. Topography should be considered in the siting of a desalination facility, and gravity flow should be used where possible.

b. Space requirements. The space required for desalination facilities is determined by the process. Membrane desalination equipment needs less space than distillation/condensation desalination equipment. In general, space requirements are less for the desalination equipment than for a conventional surface water treatment plant of the same capacity. An exception is solar desalination systems. These systems employ solar collectors that require an area several times greater than other types of desalination equipment in order to achieve equal capacity.

c. Access. Access to systems must be provided to permit routine maintenance, sludge and brine removal, and delivery of desalination equipment and supplies. The access requirements for desalination facilities are similar to those for conventional water treatment facilities.

2-2. Water storage and system modularization.

a. Equipment downtime. In all distillation/ condensation and many membrane desalination plants, storage will be determined by equipment downtime when equipment downtime is more than 1 day. To determine the necessary storage, establish the longest period of time that could be required for planned or unplanned maintenance. Calculate the storage by multiplying this time period by the water demand rate.

b. Peak daily demands. When maximum equipment downtime is less than 1 day, the peak daily demands may set a larger storage demand. When these peak demands set the storage requirements, refer to water storage in the TM 5-813 series.

c. Fire water storage. On a facility served by a desalination system, fire water may be saline water or potable water depending on economic analysis. Dual water distribution system will be required if saline water is used. Hence, part of the fire protection water can be either saline or potable water due to piping and pumping cost. Economic evaluation of various design alternatives is usually needed to assure the optimal design to be adopted.

d. System redundancy and modularization. One complete and functional desalination module in excess of that required to supply the design flow will be provided as redundant capacity, and all desalination systems will have a minimum of three independently functioning desalination modules where practicable.

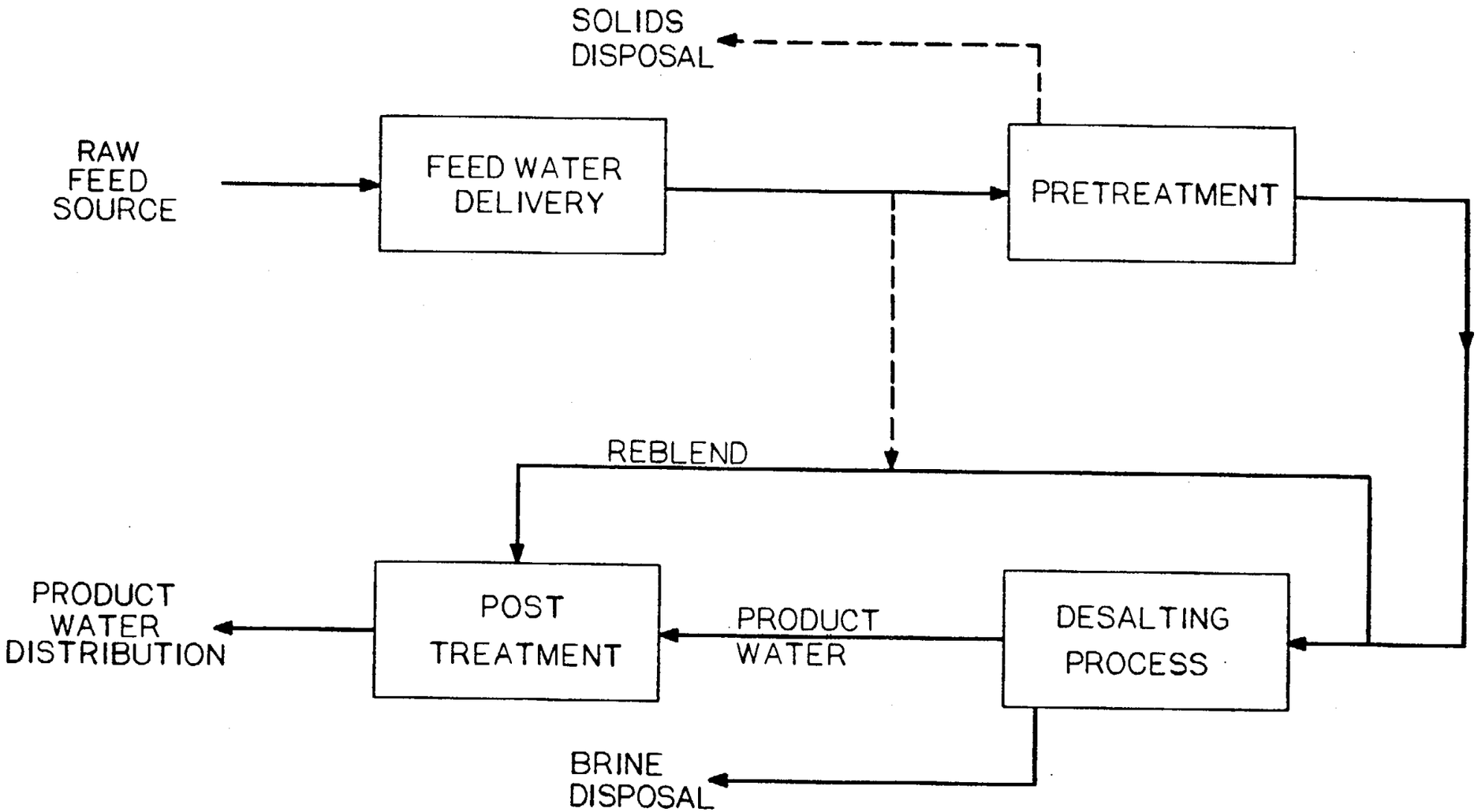

Figure 2-1. Typical desalination flowsheet.

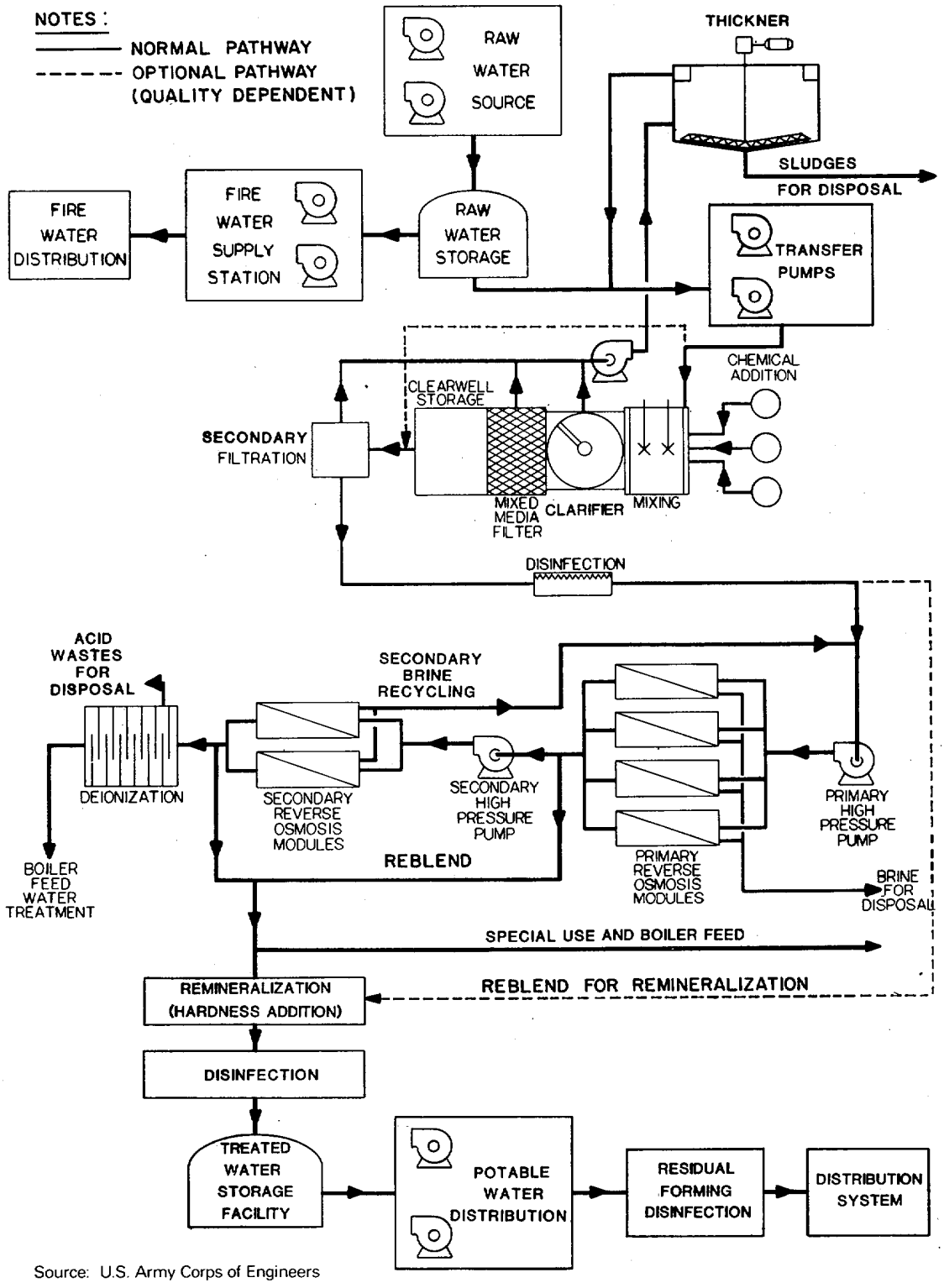

Figure 2-2. Typical reverse osmosis desalination system.