**11.51** List three possible methods for controlling crown corrosion in a large concrete sanitary sewer.

11.51 Crown corrosion in large concrete sewer pipe can be retarded by ventilation and chlorination to control hydrogen sulfide generation and synthetic coatings and linings. (Section 11.35)

**11.57** Outlined below is the sequence of unit operations and chemical additions used in the treatment of a well-water supply. Briefly state the function or purpose of each unit process and the reason for each chemical addition.

1. Mixing and flocculation with the addition of lime.
2. Sedimentation.
3. Recarbonation.
4. Granular-media filtration.
5. Postchlorination.

11.57
1. Lime softening for precipitating carbonate hardness.
2. Sedimentation removes settleable solids.
3. Recarbonation stabilizes the water by lowering the pH.
4. Filtration to remove nonsettleable solids.
5. Postchlorination establishes a disinfecting residual.

**11.58** Outlined below is the sequence of unit operations and chemical additions used in the treatment of a well-water supply. Briefly state the function or purpose of each unit process and the reason for each chemical addition.

1. Prechlorination at the wells.
2. Aeration over a tray aerator.
3. Rechlorination.
4. Detention in a settling basin.
5. Granular-media filtration.
6. Addition of anhydrous ammonia.

11.58
1. Prechlorination starts oxidation of reduced iron and manganese, surpresses growth of iron bacteria in pipelines, and controls algal growth on open aerators.
2. Aeration adds dissolved oxygen, removes carbon dioxide, and oxidizes iron and a portion of the manganese.
3. Rechlorination oxidizes the remainder of iron and manganese.
4. Detention allows chemical reaction time.
5. Filtration removes metal oxides.
6. Ammonia converts a portion of the free chlorine to combined chlorine residual.