

# Problem Cause/Effect/Remedy Guide

PROBABLE CAUSE	GENERAL EFFECT	PROBABLE REMEDY
Hardness (calcium & magnesium)	Scale in pipes and water heaters; causes "soap curd" on fixtures, tile, dishes and laundry, low sudsing characteristics.	Removal by ion exchange softener
Iron/Manganese	Causes discolored water; red,brown,orange or black stains on fixtures, appliances and laundry; dark scale in pipes and water heaters.	Low level (2 ppm) removal by ion exchange softener when hardness is also present; best removed by oxidizing iron filter; aeration and/or chlorination followed by filtration in some cases.
Iron/Manganese/Sulfur Bacteria	Same general effects as above plus slimy deposits that form in pumps, pipes, softeners and toilet tanks. Rotten egg odor possible.	Low level removal possible by oxidizing iron filter; best removed by chlorination followed by filtration
Hydrogen Sulfide Gas	Foul rotten-egg odor; corrosion to plumbing; tarnishes silver and stains fixtures and laundry; ruins the taste of foods and beverages.	Best removed by aeration, scrubbing and filtration; also removed by oxidizing filters or chlorination followed by filtration.
Turbidity	Suspended matter in water; examples include mud, clay, silt and sand; can ruin seats, seals and moving parts in appliances.	Removal by backwashing sediment filters; extra fine treatment utilizing sediment cartridge elements.
Acid Water (low pH)	Corrosive water attacks piping and other metals; red and/or green staining of fixtures and laundry	Best corrected by neutralizing filters or soda ash feeding.
Taste/Odor/Color (organic matter)	Makes water unpalatable; can cause staining	Depending on the nature of contaminant, aeration followed by filtration; carbon filtration; chlorination followed by filtration.
Tannins/Humic Acid	Can impart an "iced-tea" color to water; causes light staining; can affect the taste of foods and beverages.	Removal by special ion exchange or oxidizing agents and filtration.
Coliform Bacteria	Can cause serious disease and intestinal disorders.	Chlorination and filtration is most widely practiced; iodination, ozonation and ultra-violet treatment are used to a lesser degree.
Organic Halides (e.g. Herbicides & Pesticides)	Can cause serious disease and/or poisoning.	Most are readily removed by adsorption with carbon filters; some can also be removed by hydrolysis and oxidation.
Nitrates/Chlorides & Sulfates	Can cause health-related problems if quantities are high.	Removal by special ion exchange, deionization process or reverse osmosis.
Sodium Salts	Imparts an alkaline or soda taste to water.	Removal by deionization process or reverse osmosis; distillation can be used.