**Causes Of Corrosion**

**Electrical conductivity**

Water that has few dissolved

minerals is a poor conductor, but water

containing high mineral concentrations is a relatively

good conductor. Water containing sodium salts is

more corrosive than water containing calcium salts.

Hard water usually coats the inside of pipes and

reduces corrosion.

Two different metals in contact with each other

and a solution that conducts electricity create a galvanic

cell. This cell generates electricity and one

metal dissolves or corrodes in proportion to the electricity

generated. This galvanic corrosion occurs very

close to the joint between the metals. It is common

where copper and galvanized iron pipes are joined

together.

**Acidity.** The acidic or or basic condition of water is

measured on a scale known as the pH. The pH can

vary from 0 to 14 with a pH of 7 being neutral. If the

pH is below 7, the water is acidic; above 7, it is basic.

Alkalinity is often confused with basic pH of

water, but they are not the same. Total alkalinity of

water is a measure of capacity of all its combined

chemical components to neutralize acid. It is measured

as the calcium carbonate equivalent for neutralizing

acid, but includes bicarbonate, carbonate, and

even some phosphates and silicates. For ideal corrosion

control, water should have moderate alkalinity

(30 to 70 mg/L) and a pH from 7.9 to 8.2. Values of

pH below 6.5 indicate corrosive water, especially

with low alkalinity. Surface water in Alabama is naturally

corrosive because pH is usually slightly acidic to

neutral and alkalinity is low. Values of pH above 7.5

are also corrosive when alkalinity is low.

**Oxygen concentration.** Oxygen dissolved in water

will also enhance the process of corrosion. Deep well

water is usually free of dissolved oxygen, but oxygen

is present in surface water.

**Water temperature.** Corrosion is faster at higher

temperatures. Above 140°F the rate of steel corrosion

doubles with every 20° increase in temperature.