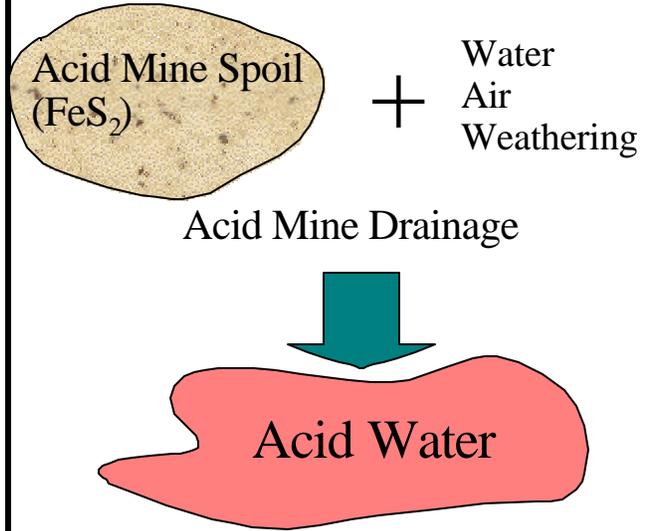


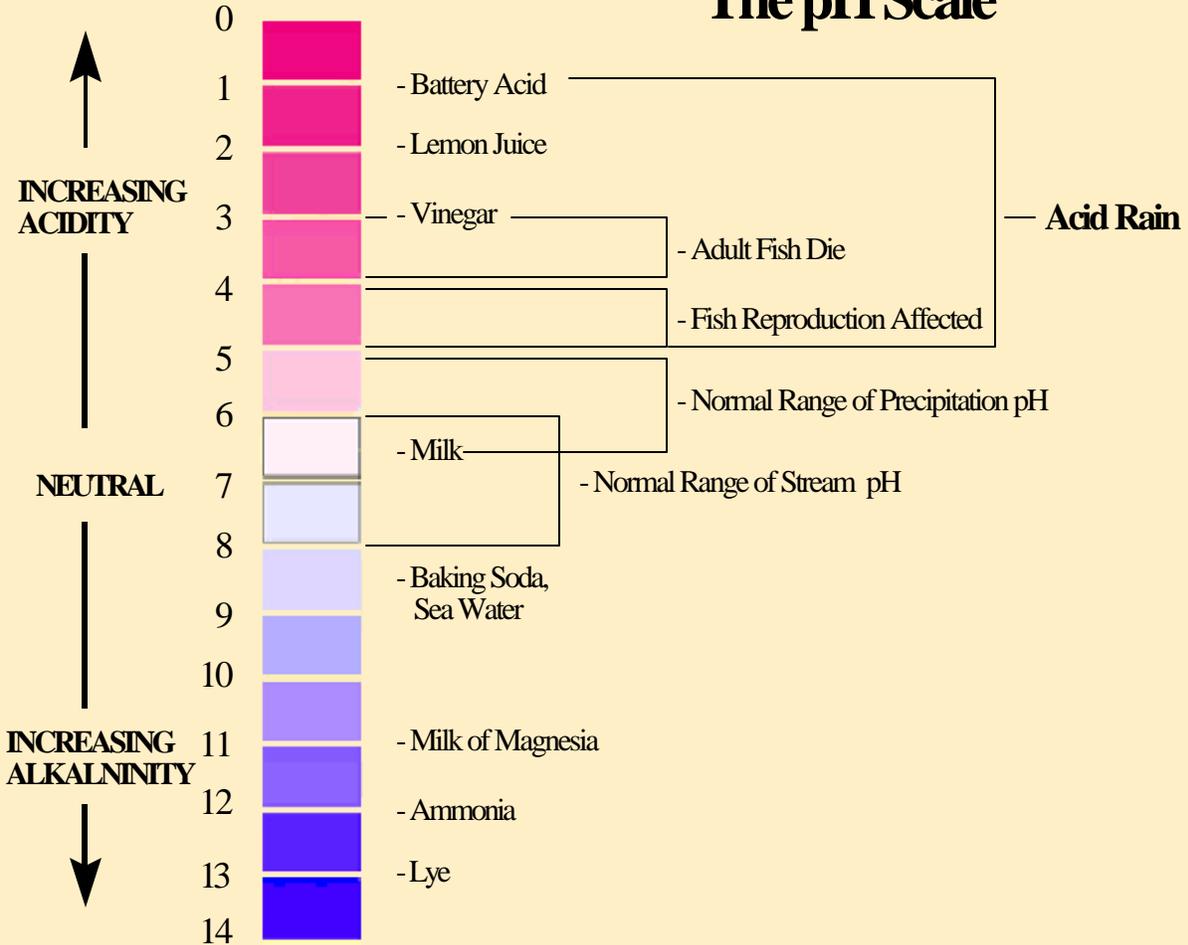
ACID WATER & AQUATIC SPECIES

ACID WATER

Acid Mine Spoil contains iron sulfide (FeS_2) that generates acid water (acid mine drainage) if exposed to water, air, or weathering processes. The term “acid water” is used to describe water that has a pH lower than what is natural for a given area. The pH scale is used to measure how acid or alkaline a substance is. It ranges from 0 (pure acid) to 14 (pure alkaline). Pure water has a pH value of 7.0, meaning that it is neutral, neither acid or alkaline. The figure below shows commonly known substances and their pH values.



The pH Scale



ACID WATER & AQUATIC SPECIES

EFFECTS OF ACID WATER ON AQUATIC LIFE

The effects of acid mine drainage (AMD) are most clearly seen in aquatic environments, such as streams, lakes, and ponds. Most lakes and streams have a pH between 6 and 8. A pH between 6.5 and 9.0 is harmless to most aquatic species. However, near an acid mine spoil site, AMD water flows to streams, lakes, and ponds and may greatly acidify the water. Lakes and streams become acidic when the water itself and its surrounding soil cannot buffer the acid water enough to neutralize it. The pH of many AMD waters fall below 5.0.

Generally, the young of most species are more sensitive to changes in acidity than adults. When the acidity of a lake or stream drops the pH to less than 6.0, there are decreases in the reproductive success in many aquatic species. As lakes and streams increase in acidity to a pH below 5.0, the number of aquatic species that live in these water decreases. Some species like frogs are able to tolerate acidic waters but eventually disappear due to low prey (mayfly) populations. At a pH of less than 4.5, most fish species can not survive.

The chart below shows that not all adult fish, shellfish, or their food insects can tolerate the same amount of acid (color bars). It also shows the levels of acidity that are harmful to reproduction for each species listed in the chart (gray hatched bars below the colored bars).

