

How does mine drainage occur?

Mine drainage is formed when pyrite (an iron sulfide) is exposed and reacts with air and water to form sulfuric acid and dissolved iron. Some or all of this iron can precipitate to form the red, orange, or yellow sediments in the bottom of streams containing mine drainage. The acid runoff further dissolves heavy metals such as copper, lead, and mercury into groundwater or surface water. The rate and degree by which acid-mine drainage proceeds can be increased by the action of certain bacteria.

Problems associated with mine drainage include contaminated drinking water, disrupted growth and reproduction of aquatic plants and animals, and the corroding effects of the acid on parts of infrastructures such as bridges.

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Why are some lakes full of algae and thick plants?

Plants naturally grow in and around lakes, but sometimes lakes and ponds can get an overgrowth of plants, algae, or bacteria. In many cases, humans are responsible. Chemicals that are used on lawns and in agriculture (like nitrogen and potassium) wash into our water systems. Once there, plants and algae have a feast on this "food". Sometimes overgrowths of cyanobacteria (called "blooms") can make...



How does acid precipitation affect marble and limestone buildings?

When sulfurous, sulfuric, and nitric acids in polluted air and rain react with the calcite in marble and limestone, the calcite dissolves. In exposed areas of buildings and statues, we see roughened surfaces, removal of material, and loss of carved details. Stone surface material may be lost all over or only in spots that are more reactive. You might expect that sheltered areas of stone buildings...



Can lakes near volcanoes become acidic enough to be dangerous to people and animals?

Yes. Crater lakes atop volcanoes are typically the most acid, with pH values as low as 0.1 (very strong acid). Normal lake waters, in contrast, have relatively neutral pH values near 7.0. The crater lake at El Chichon volcano in Mexico had a pH of 0.5 in 1983 and Mount Pinatubo's crater lake had a pH of 1.9 in 1992. The acid waters of these lakes are capable of causing burns to human skin but are...



What is methane and why is it a safety concern?

Methane (a gas composed of carbon and hydrogen) is produced two ways: Through biologic decomposition of organic matter at shallow depths. Swamps, landfills, and even shallow bedrock are some settings where this occurs. Methane can also be derived over millions of years by high pressure and high temperature processes that produce fossil fuels deep underground. Examples include coal deposits and oil...



How do we extract minerals?

The primary methods used to extract minerals from the ground are: Underground mining Surface (open pit) mining Placer mining The location and shape of the deposit, strength of the rock, ore grade, mining costs, and current market price of the commodity are some of the determining factors for selecting which mining method to use. Higher-grade metallic ores found in veins deep under the Earth's surface...

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