Overview

Many Appalachian communities have been severely impacted by the release of acid mine drainage (AMD) from local coal mines. AMD is created when water and oxygen come into contact with sulfides, primarily pyrite. The resulting oxidation reaction produces sulfuric acid, which lowers the pH, and high levels of dissolved iron. Much of this drainage remains untreated because of a lack of funds, and consequently enters streams and watersheds, tainting the water supply and devastating local aquatic species. The polluting AMD is very similar in chemical composition to the raw materials used in the production of iron-based synthetic paint pigment, which dominates the red, yellow, and brown markets. In 2007, total US iron oxide production was estimated at 50,000 tons, valued at $50 million. Preliminary estimates indicate that one large, local seep could produce 1,004 tons/yr. of pigment and could potentially generate total sales of $1,004,000/yr., yielding a potential profit of $287,000, while cleaning up a volatile source of pollution.

Commercial Application

- Effective collection and cleanup of harmful AMD’s in local water supplies
- Production of pure paint pigments from AMD’s through precipitation process
Benefits

- Removes harmful pollutants from watersheds and surrounding ecosystems
- Uncompromised pure paint pigments generated from AMD’s
- Highly demanded paint pigments provide revenues to reimburse cleanup effort and yield impressive profits

Inventor

Guy Riefler, Ph.D. is an associate professor of civil engineering in the Russ College of Engineering and Technology at Ohio University. Dr. Riefler first conceived this technology in April 2011 and has been working meticulously to bring it into practice.

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