

limestone cribs built into a surface stream containing an acid mine drainage soon lost their effectiveness and lime had to be used to achieve neutralization.

The results of the above-reported investigations seem to indicate that acid mine water neutralization by limestone is not practical. The most recent research efforts in this area are more promising.

2. Results of Recent Work:--Deul, et al, 1967 (43) demonstrated a laboratory-scale technique for limestone treatment of a wide range of mine waters. Limestone treatment was accomplished "using a small cement mixer as a simple reactor to provide abrasive agitation of limestone and mine water." Process variables "must be defined" before the development of the process is complete. This work is currently in progress.

Glover, 1967 (37) developed a continuous upflow expanded bed process using fine limestone grit. The process is believed to be acceptable providing that "a supplementary method of removing ferrous salts from the acid mine drainage" is found.

As of the writing of this report, only one full-scale application of limestone treatment is in operation, and this on an experimental basis.

The Rochester and Pittsburg Coal Company, Indiana, Pennsylvania, is currently using a rotating drum reactor followed by a settling basin for the treatment of 200,000 gpd of mine water containing 50 ppm of ferric iron. Evaluation of the process is in progress.

The problems associated with limestone neutralization involve the following:

1. Coating of the limestone particles with CaSO_4 (a reaction product).
2. Non-reactivity of limestone with ferrous iron.

Research is needed to find solutions to these problems.