

RESEARCH ARTICLE

## Rock Formation Acid Mine Drainage in Epithermal Gold Mineralization, Pandeglang, Banten Province

Dudi Nasrudin Usman<sup>1,\*</sup>, Sri Widayati<sup>1</sup>, Sriyanti<sup>1</sup>, Era Setiawan<sup>2</sup>

<sup>1</sup>Bandung Islamic University, Mining Engineering Department, Mining, Bandung City, Indonesia

<sup>2</sup>Cibaliung Sumberdaya Corporation, General Manager, Mining, Pandeglang – Banten, Indonesia

\* Corresponding author: dudi.n.usman@gmail.com

Tel.: +62-81-3175-66144; fax: +62-22-426-3895

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### Abstract

Mine acid water is acidic water and contains iron and sulfate, which is formed under natural conditions when geological strata containing pyrites are exposed to an oxidizing atmosphere or environment. One of the impacts of the mineralization zone where there is a mining process is the potential for the formation of acid mine drainage, especially in the Cibaliung gold mineralization area and its surroundings, Pandeglang Regency, Banten Province. Acid-forming sulfide minerals include pyrite (FeS<sub>2</sub>), headquarters (FeS<sub>2</sub>), picolites (FexSx), calcocytos (CuS), covellite (CuS), chalcocopyrite (CuFeS<sub>2</sub>), molybdenite (MoS), mulenite (NiS), chalcocytos (CuS), covellite (CuS), chalcocopyrite (CuFeS<sub>2</sub>), molybdenite (MoS), mulenite (NiS), chalcocytos (CuS), covellite (CuS), chalcocopyrite (CuFeS<sub>2</sub>), molybdenite (MoS), mulenite (NiS), galena (PbS) ) and sphalerite (ZnS). Of all these minerals, pyrite is the most dominant sulfide in acid formation.

Alkaline mine water (alkaline mine drainage) is mine water that has an acidity level (pH) of 6 or more, containing alkalinity but still containing dissolved metals that can produce acids. The quality of mine water, acid or alkali, depends on the presence or absence of acid mineral content (sulfides) and alkaline materials in the geological strata.

Acid water formation tends to be more intensive in mining areas. This can be prevented by avoiding exposure to sulfide-containing materials in the free air. Acid-forming sulfide minerals include pyrite (FeS<sub>2</sub>), headquarters (FeS<sub>2</sub>), picolites (FexSx), calcocytos (CuS), covellite (CuS), chalcocopyrite (CuFeS<sub>2</sub>), molybdenite (MoS), mulenite (NiS), chalcocytos (CuS), covellite (CuS), chalcocopyrite (CuFeS<sub>2</sub>), molybdenite (MoS), mulenite (NiS), chalcocytos (CuS), covellite (CuS), chalcocopyrite (CuFeS<sub>2</sub>), molybdenite (MoS), mulenite (NiS), galena (PbS) ) and sphalerite (ZnS). Of all these minerals, pyrite is the most dominant sulfide in acid formation. Formation of potential acidic water also occurs in tailings which are residues/processing residues containing sulfide minerals. The formation of acid mine drainage does not always develop in every sulfide-ore mining. In certain types of ore deposits, there are neutralizing agents which prevent the formation of acid mine drainage.

**Keywords:** Acid Mine Drainage, Epithermal gold, Sulphide Minerals, Source Rock, Cibaliung.

### 1. Introduction

AAT is formed as a result of oxidation of certain sulfide minerals contained in rocks, which react with oxygen in the air in an aqueous environment (Sayoga, 2007). In the initial stages of acid mine drainage is the presence of water in a green mining pit. As a result of these mining activities, can potentially produce acid mine drainage it is necessary to consider how the impact on the surrounding community.

Control of acid mine drainage is something that needs to be done during mining activities and after mining activities end, because Acid Mine Water (AAT) can cause a decrease in the quality of water, surface water, and groundwater, in addition, if flowed into the river will have an impact on the community stay along the river and will disturb the biota that lives on land as well as the biota in the waters. Acid Mine Water (AAT) can reduce water pH from public waters so that it will kill aquatic biota.

Alkaline mine water (alkaline mine drainage) is mine water that has an acidity level (pH) of 6 or more, containing alkalinity but still containing dissolved metals that can produce acids. The quality of mine water, acid or alkali, depends on the presence or absence of acid mineral content (sulfides) and alkaline materials in the geological strata. It generally contains a lot of sulfides and contains little alkaline material that tends to form acid mine water. Conversely, materials that contain a lot of alkalies, even though they contain sulfide material with a lot of concentration, often produce alkaline water (net machine water).

### 2. System and Characteristics of Epithermal Deposits

Epithermal ore deposits are deposits formed in near-surface hydrothermal environments that have relatively low temperatures and pressures and are associated with sub-aerial calc-alkali magmatism.