

BIOMINERAL ALTERATION TO CREATE PATHWAYS IN ORES TO RELEASE TARGETED ELEMENTS

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ABSTRACT

The oil patch defines permeability as the measure of the rock's ability (commonly measured in darcys) to transmit fluid through pores. By comparison, permeabilities in hard rock mining environments may be measured in fractions of a nano darcy. The challenge is to create artificial pathways through gangue material, often resistant to most lixivants, to allow contact with the target mineral.

Until the latter part of the 20th century, the transformation and degradation of minerals (Global Mineral Cycle) were thought to be driven by physical and chemical processes. Recognition of the role that biological or geomicrobial processes play in the global mineral cycle has led to development and application of biological processes for mineral resource recovery.

With the development of more than 30 proprietary bio-technologies, Auric BioRecovery Systems have successfully applied bio-alteration processes to both resource recovery and bioremediation for environmental restoration. Moreover, these bio-alteration processes have delivered, in several projects, both remediation and a return to commerciality.

This paper looks at the mechanisms of enhancing permeability, created by naturally occurring non-pathogenic bacteria generating lixivants capable of interrupting the global mineral cycle and with it increased ore mineral contact. The bacteria creation of permeability will be considered in both hard and soft rock environments.

Keywords: Auric, permeability, bio-alteration, lixiviant, non-pathogenic