

# **Sustainability in Mining**

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## **Abstract**

This paper examines how mining can be sustainable through case studies of sustainable practices in hard rock mining from exploration through reclamation and closure. These case studies include exploration for gold in a tropical rainforest environment in French Guiana, South America; innovative techniques for reclamation of copper tailings in the arid southwestern United States of America (USA); and a novel approach for a post-mining land use for the closure of a gold mine in California, USA.

The first case study discusses sustainable practices and mitigation measures, employed at the Camp Caiman gold project explored by ASARCO LLC, to minimize environmental impacts in a sensitive environment. These measures included the use of a rubber-tired, self-propelled combination diamond, reverse circulation and auger drill that could drive on forest litter. An Environmental Advisory Committee provided the company advice on the environmental impacts of mineral exploration in a tropical rainforest.

The second case study examines the utilization of biosolids and cattle by Asarco and other copper companies in the southwestern USA in promoting reclamation of copper tailings. Biosolids can be a cost effective source of organics and nutrients necessary for successful reclamation while tailings sites offer cost effective and economically sound solution for the management of biosolids. In addition, copper tailings slopes have been stabilized and reclamation enhanced using livestock in Southern Arizona.

The third case study discusses the closure and reclamation of Homes take Mining Company's McLaughlin gold mine in California, as an illustration of how one company addressed post closure environmental and social concerns and shows how good reclamation and closure planning can result in a positive legacy. The reclamation plan involved a unique post mining land use - the conversion of the mine site to an environmental studies field research station. The reclamation goals of minimizing erosion, stabilizing disturbed areas with permanent diverse vegetative cover, maximizing productive land use and protecting water quality were met through preconstruction engineering and planning to facilitate implementation of the reclamation plan. Annual monitoring was used to evaluate and modify reclamation methods for future years.