

DESIGN AND CONSTRUCTION CHALLENGES FOR LIMESTONE-BASED PASSIVE TREATMENT SYSTEMS IN THE RURAL ANDES, POTOSÍ, BOLIVIA¹

W.H. Strosnider², J. Alvarez, F.S. Llanos López, C. Breazile, S. Crook, P. Monje, T. Cooper, and R.W. Nairn

Abstract: Two open limestone channels (OLCs) and one anoxic limestone drain (ALD) were constructed in the rural Andean Rio Juckucha valley, near the historical mining city of Potosí, Bolivia. The OLCs and ALD were part of a broader project that includes the active treatment of an operating mine, the goal of which is to restore Rio Juckucha as a safe irrigation water source. Due to the site's inaccessibility, the systems had to be designed with a relatively small field data set and limited laboratory trials. A myriad of construction challenges, from purely technical (e.g., lack of suitable equipment, road failures, work on extreme slopes, rainy season earth instability) to purely non-technical (e.g., general strikes, road blockades, inter-partner communication issues, volunteer workforce management), were surmounted. Over 10 months, 2060 metric tonnes of limestone was transported from three quarries approximately 80 km from the project site and placed in the ALD (165 tonnes) and OLCs (1895 tonnes). The speed of construction was quite slow when compared to standards in the developed world, but was understandable given constraints in the developing world (e.g., hand-placement of limestone, unavailability of suitable equipment, poor infrastructure). Preliminary data suggests that the systems are improving water quality. Despite the myriad difficulties overcome, the lasting partnerships developed and resultant progress, have made the project a worthwhile endeavor.

Additional Key Words: Aqueous geochemistry, anoxic limestone drain, open limestone channel, passive treatment

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² William H.J. Strosnider, Assistant Professor, Environmental Engineering Program, Saint Francis University, 117 Evergreen Drive, Loretto, PA 15940; Jose Alvarez, Field Engineer, Engineers In Action, Tulsa, OK; Freddy S. Llanos López, Mining Engineering Department, Universidad Autónoma Tomás Frías, Potosí, Bolivia; Christopher Breazile, Undergraduate Student, University of Oklahoma School of Civil Engineering and Environmental Science, 334 Carson Engineering Center, 202 W. Boyd St., Norman, OK 73019; Scott Crook, Undergraduate Student, Oregon State University School of Civil & Construction Engineering, Corvallis, OR; Patricia Monje, Chief Executive Officer, Empresa Minera Agricola Kumurana, Potosí, Bolivia; Tom Cooper, Past President, Norman Rotary Club, Norman, OK; Robert W. Nairn, Associate Professor, University of Oklahoma School of Civil Engineering and Environmental Science, 334 Carson Engineering Center, 202 W. Boyd St., Norman, OK 73019.