

## Geochemistry in the Mine Life Cycle

ROB BOWELL<sup>1</sup> JULIEN DECLERCQ<sup>2</sup> MICHAEL HERRELL<sup>4</sup>  
CARL WILLIAMS<sup>2</sup>

<sup>1</sup> SRK Consulting, Churchill House, Churchill Way, Cardiff  
CF10 2HH, Wales, UK, [rbowell@srk.co.uk](mailto:rbowell@srk.co.uk)

<sup>2</sup> SRK Consulting, Churchill House, Churchill Way, Cardiff  
CF10 2HH, Wales, UK,

<sup>3</sup> SRK Consulting, SRK Consulting (Canada) Inc., 1066 West  
Hastings Street, Vancouver, BC V6E 3X2, Canada

Geochemistry seeks to understand the world and its mechanisms. It involves the study of the chemical make-up of the Earth, the processes and reactions that govern the composition of rocks, water, and soils, and the large-scale cycles of matter and energy between the different components of the Earth system.

In the context of mining projects, the skills of a geochemist can be utilized at almost every step in a mining project from initial discovery and exploration, through development and design, construction, production and finally closure and post closure. These steps represent the Mine Life Cycle and from discovery to post closure an operation can span more than thirty years. This means that mines operate for decades and have an impact for generations. We, as geochemists, are here to ensure that before a mine even exists positive impacts are promoted, and negative impacts mitigated or minimised.

This study provides an overview of the role of applied geochemistry in the Mine Life Cycle and explores its contribution to mine design, engineering studies and environmental assessment.

The concepts of the sub-discipline Geochemical Engineering will be explored in the context of mining and illustrated with case studies from operational and developing mines globally.