geoconvention
Calgary • Canada • May 15-19 2017

Acid Rock Drainage and Metal Leaching Assessment for Pipeline Projects -An Integrated Approach-

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Summary

Acid rock drainage and metal leaching (ARD/ML), commonly known as ARD, are inherent to hard rock mining projects and their assessments are required by regularity bodies as part of the environmental assessment application package. In the recent years, several regulatory agencies and government bodies consider the assessment of the potential for ARD risk related to pipelines projects and other infrastucture construction projects (e.g., roads, dams, Liquid Natural Gas terminals [LNG] terminal, ports, etc.) as part of the application and permit requirement. This move was a result of environmental incidents caused by ARD occurrences in road and airport construction projects in Canada (British Columbia and Nova Scotia) and the United States (Pennsylvania) and the heavy cost associated with clean up and restoration. ARD is increasingly being assessed in various pipelines, LNG and roads construction projects, but often as a secondary topic.

An approach was followed by the authors to consider ARD characterization work as an integrated part of the geohazard assessment process influencing project construction planning, execution, routing, cost estimates, and the implementation of future mitigation strategies. This approach relies on standard geochemical assessment and mitiggation methods commonly used in the mining industry (e.g., preliminary desktop screening, phased field investigation and sampling, laboratory test work, etc.) adapted for the context of a pipeline project actitivies (e.g., planning, permitting, construction and proposed operations), coupled with engineering estimation methods to identify areas with elevated potential for ARD/ML . This identification allows the estimation of quantities of ARD material that would require mitigation and the associated cost and potential impact on the project. This approach was applied to two major pipeline projects in Canada and the United States and resulted in the development of a phased assessment in line with pipeline project timeline. Adequate ARD field assessment and management plans during construction integrated into the overall site preparation, construction plans and schedule were created. The results of the ARD assessment was considered in the route selection process along with other geohazards. This presenation describes the methodology and potential benefits for pipeline in comparison to the environmental focused assessment.