GSI W-6 Webinar

"Geosynthetic Applications Used in Heap Leach Mining"

Webinar Overview

The chemical extraction of precious metals from low grade ore and tailings has been ongoing since the 1950's. Gold, silver and copper are the general targets, wherein heaps of the ore are leached with cyanide or sulfuric acid which gravitationally flows to the base with its dissolved metals and is then collected by a drainage system. Of course, a geomembrane must be beneath or the pregnant leach solution will escape. (Incidentally, it is estimated that almost 40% of all geomembranes are being used for this application). The metal is then recovered from the leachate in an on-site processing plant. The barren liquid is then revitalized and sent to the top of the heap for recirculation until the process is no longer economic. In this webinar the various heap configurations and operations will be described.

The major design issues of geomembrane selection, leach drainage pads, slope and heap stability, liquefaction potential and pond liner decisions are described in as much detail as time permits. Reflections on the technology as well as summary, conclusions and recommendations are offered.

Learning Objectives

Webinar participants will learn the concept, technique and idiosyncrasies of heap leach mining as is currently practiced worldwide. Critical in the technique's success is the use of geosynthetics; including geomembranes, geonets, geotextiles, geosynthetic clay liners and geopipe. Five critical design issues will be emphasized. Among them are heap and slope stability (there are many stability failures) issues and procedures. Participants will learn about the economics of these massive operations vis-à-vis the environmental concerns which must be properly addressed.

Webinar Benefits

- Understanding the concept and select details of heap leach mining
- Appreciating to the enormous scale of operations and various heap configurations
- Learn about the application of the leaching chemicals
- Learn about geomembrane selection
- Learn about various leachate collection schemes
- Learn about stability issues and some failures that have occurred
- Learn of the importance of high liquid heads and the possibility of liquefaction
- Learn about pond liner design

Intended Audiences

Heap leach operations owners and operators; general civil and mining consulting engineers; geosynthetic manufacturers and distributors; testing organizations servicing these organizations; heavy construction contractors; federal and state regulatory agencies, academic and research groups; and others desiring technical information on this important aspect of precious metals recovery.

Specific Topics Covered

1. Background and Concept
2. Categories and Operations
3. Materials and Cross Sections
4. Major Design Categories
5. Final Comments and Issues

Webinar Instructor

Dr. George R. Koerner is the director of the Geosynthetic Institute, a position that he has held since 2014. George's interest in geosynthetics spans his entire professional life from undergraduate work in the 1980's to the present. He holds his PH.D. in Civil, Architectural and Environmental Engineering from Drexel University in Philadelphia. George's master thesis was on direct shear testing of geosynthetic interfaces and his doctoral dissertation was on landfill leachate clogging of soil and geosynthetic filters. Both are regularly cited to this day.

Dr. George Koerner is a Professional Engineer in both Pennsylvania and New Jersey, and is an ASQC Quality Auditor. During his 30-years of geosynthetic activities, Dr. Koerner's output has been tremendous and he has to his credit the following publications:

- Books Edited or Co-Edited – 15
- Journal Papers – 18
- Symposium and Conference Publications – 40
- Book Chapters and Published Reports – 4
- Miscellaneous Articles – 30

The Geosynthetic Institute is a nonprofit research and development organization dedicated to the proper use of geosynthetics in its myriad applications. As director of the Geosynthetic Institute, Dr. George Koerner is also in charge of the laboratory accreditation and inspection certification programs.