ALTERNATIVE TAILINGS TECHNOLOGIES: REDUCING THE RISK

Presented By

G. Ward Wilson, University of Alberta
Bjorn Weeks, Golder Associates, Canada
Kristen Salzsauler, Golder Associates, Canada
Ben Wickland, Golder Associates, Canada
Sue Longo, Golder Associates, Canada

The course presents a state of practice summary with practical considerations for alternate tailings disposal technologies to tailings dams with a water pond. The course will include:

- an overview of tailings disposal methodologies,
- geotechnical and geochemical risks and mitigations associated with tailings facilities,
- a technology primer and implementation considerations for tailings dewatering and co-disposal of tailings with waste rock, and
- closure considerations.

The course focus includes a broad overview and advanced technical content regarding tailings facility operation, principles of unsaturated soil mechanics, seepage flow, soil mechanics, and acid rock drainage/ metal leaching. The course is suitable for industry practitioners, regulators, stakeholders, students, and mine owners with at high school to Ph.D. level of education.

Agenda:

1. Introduction (0.25 hours) Bjorn Weeks
2. Overview of state of practice for mine waste disposal (1 hour) Ward Wilson
3. Risks and Geotechnical Hazards of tailings facility (1 hour) Ben Wickland and Ward Wilson
4. Coffee Break (0.25 hours)
5. Geochemistry of tailings (1 hour) Kirsten Salzsauler
6. Lunch (1 Hour)
7. Dewatering tailings for disposal (1 hour) Sue Longo
8. Co-disposal of tailings (1 hour) Ben Wickland
9. Coffee Break (0.25 hours)
10. Closure of Tailings Facilities (1 hour) Bjorn Weeks
11. Questions (1 hour) each technical session will include an allowance for questions, with time reserved in the course for questions that may occur during the day.

Presenters and Bios:

Ward Wilson, P.Eng., P.Geo. , Professor, NSERC/COSIA Senior Industry Research Chair in Oil Sands Tailings Geotechnique, University of Alberta

Professor G. Ward Wilson brings over 30 years of experience to the practice of geoenvironmental and geotechnical engineering. Dr. Wilson is involved in mine waste management systems for numerous sites worldwide and serves as a specialist review consultant for many large international mining projects. He recently served as the lead author responsible for the chapter on Prevention and Mitigation in the Global Acid Rock Drainage Guide prepared for International Network for Acid Prevention and is currently working with a team of writers commissioned by CSIRO to prepare a new manual for Large Open Pit Projects - Geotechnical Guidelines for Mine Waste and Stockpile Designs. Dr Wilson has also been engaged in the large scale-up experiments for waste rock at the Grasberg mine in Indonesia and the Antamina Mine in Peru.

Bjorn Weeks, P.Eng., Ph.D. , Principal, Senior Geo-Environmental Engineer Golder Associates Ltd.

Dr. Weeks is a Principal with Golder Associates, and a senior technical director for mine closure projects in Canada and South America. His areas of expertise include closure and reclamation planning and cost development, cover system design, waste containment, and earth/atmosphere interactions. Dr. Weeks has worked as an engineer since 1994, following the completion of a Masters' Degree in Environmental Engineering. Dr. Weeks has also completed a Ph.D. in Mining Engineering, with a focus on the containment of mining waste and the design of soil covers. He has worked on mine closures and closure-related projects in various countries, including Canada, Chile, Argentina, Peru, Uruguay, Brazil, Colombia, Spain, Australia, and the USA. This has encompassed closure work in a wide variety of climates, including permafrost and cold regions, as well as in temperate arid and high-rainfall zones. He has worked on closure projects for diverse clients including AngloGold Ashanti, Anglo American, Glencore-Xstrata, BHP Billiton, Barrick Gold, Codelco, AMSA, Minsur, Teck, and others, as well as for regulatory authorities. He has managed the development of closure plans for all stages of project life, including detailed design and execution of closure plans, as well conceptual designs, and plan updates and evaluations. He has worked on various projects where climate change impacts on mine closure have been addressed, including in the context of both applications in northern climates, and in the development of guidance for regulators. He was the lead author of the recently published APEC document "Mine Closure Checklist for Governments", and the chapter on closure in the book "Guidelines for Mine Waste Dump and Stockpile Design" (CSIRO).

Kristen Salzsauler, M.Sc., P.Geo , Associate - Senior Geochemist, Golder Associates Ltd.

Kristin Salzsauler is an Associate and Senior Geochemist in Vancouver, with over 10 years of experience in geochemical evaluation of mining environment issues. Kristin has extensive experience in geochemical characterization and hydrogeochemical modelling for all stages of the mine life, which form the link between engineering studies and environmental impact assessment. In addition, Ms. Salzsauler is involved in the development of mine waste management plans, which connect the results of geochemical testing to decision making framework for operations and closure. Ms. Salzsauler has experience with collaboration with multi-disciplinary teams to develop mine waste engineering alternatives to assist with the mitigation of acid rock drainage and metal leaching. Kristin's project experience spans several countries, including Canada, the USA, Peru, Turkey, Romania, Brazil and Mongolia.

Ben Wickland, P.Eng., Ph.D. , Associate, Senior Geotechnical Engineer, Golder Associates Ltd.

Dr. Wickland holds degrees in Biology, Civil Engineering, and a Ph.D. in mine waste management in co-disposal. He has worked since 1998 in consulting and research in the mining industry. Project work has included design of mine waste storage facilities, including site selection, technology selection, dam design, and deposition planning. He has presented several short courses in mine waste management, and co-authored Chapter 6 of the GARD Guide, the global manual for best available practice for prevention of acid rock drainage. He has recently worked on the feasibility level design of an ultra-high tailings dam.

Sue Longo, P.Eng., MBA, Principal / Region Manager, Golder Associates Ltd.

Ms Longo, is a senior Project manager and Principal with Golder Associates. Since joining Golder Associates Ltd. in 2004, she has worked on conceptual, through to detailed design projects related to tailings dewatering and paste backfill. Recently she has been developing new applications for paste technology including its application in the power industry for fly ash disposal. Sue has spent time running large on-site and laboratory testing programs for both surface disposal and backfill projects around the world for mining, oil & gas and power clients.