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Surface Mined Oil Sands: Advances in Bitumen Recovery and Water and Tailings Management

Tailings ponds are the single most obvious environmental issue affecting the debate around surface mined oil sands development. This short course outlines the evolution of the current bitumen extraction technologies and the history of the associated tailings and water management strategies in the development of this world class resource

Who should take the course and why:

The course is designed for scientists and engineers who would like to develop an appreciation for the water and tailings management issues associated with bitumen production from surface mined oil sands in Northern Alberta. Anyone with a curiosity about the environmental challenges facing the industry will also benefit from the largely non-technical nature of the material. This will be an informative and interesting high level introduction to an industry that is currently in the news. The course will provide an appreciation of the technical achievements and the technical implementation shortfalls of a variety of water and tailings technologies. In addition they will have a better understanding of the rhetoric on both sides of the economic and environmental debates about the increasing rate of development of Canada's oil sands resource.

The Instructor:

Randy Mikula is the former team leader of Natural Resources Canada's Oil Sands Extraction and Tailings team. In the past 8 years he has spoken widely on the water use and tailings management challenges facing the surface mined oil sands industry. With 25 years of research experience in oil sands, including extensive collaborations with academia and industry, Dr. Mikula offers a unique perspective on the environmental impact of oil sands development in Alberta. Randy has experience as the instructor for a variety of short courses for the Chemical Institute of Canada, Keyano College, and as speaker on oil sands issues at several university, industry, and non-governmental forums. Dr. Mikula has an informal style that is ideally suited to communicate this timely topic to an audience of both technical and non-technical participants.

The Course Outline (3 hours with a 20minute break):

An introduction to the Alberta Oil Sands:

The resource and reserve: Surface mining and in-situ (the short course focus is on surface mining)

Historical technology development: From tar and pitch to transportation fuels

Advances in bitumen extraction

Water and energy use in the last 50 years

Tailings Management, past, present, and future

Water requirements and water availability

Environmental Issues and the pace of development:

Oil sands vs Tar sands

Energy and water use improvements/reductions in the last 20 years: technology improvements

Energy and water use increases in the last 20 years: production increases

The link between tailings management/water use and environmental impact

Tailings Pond Science and Politics

Tailings and water management: where science and sociology cross

Water Leaching to the environment

New tailings treatment options that will reduce tailings ponds

New regulations mandating how tailings are managed (Directive 74)

Dirty Oil and other oil sands environmental issues

Oil Sands in the News and wrap up discussion