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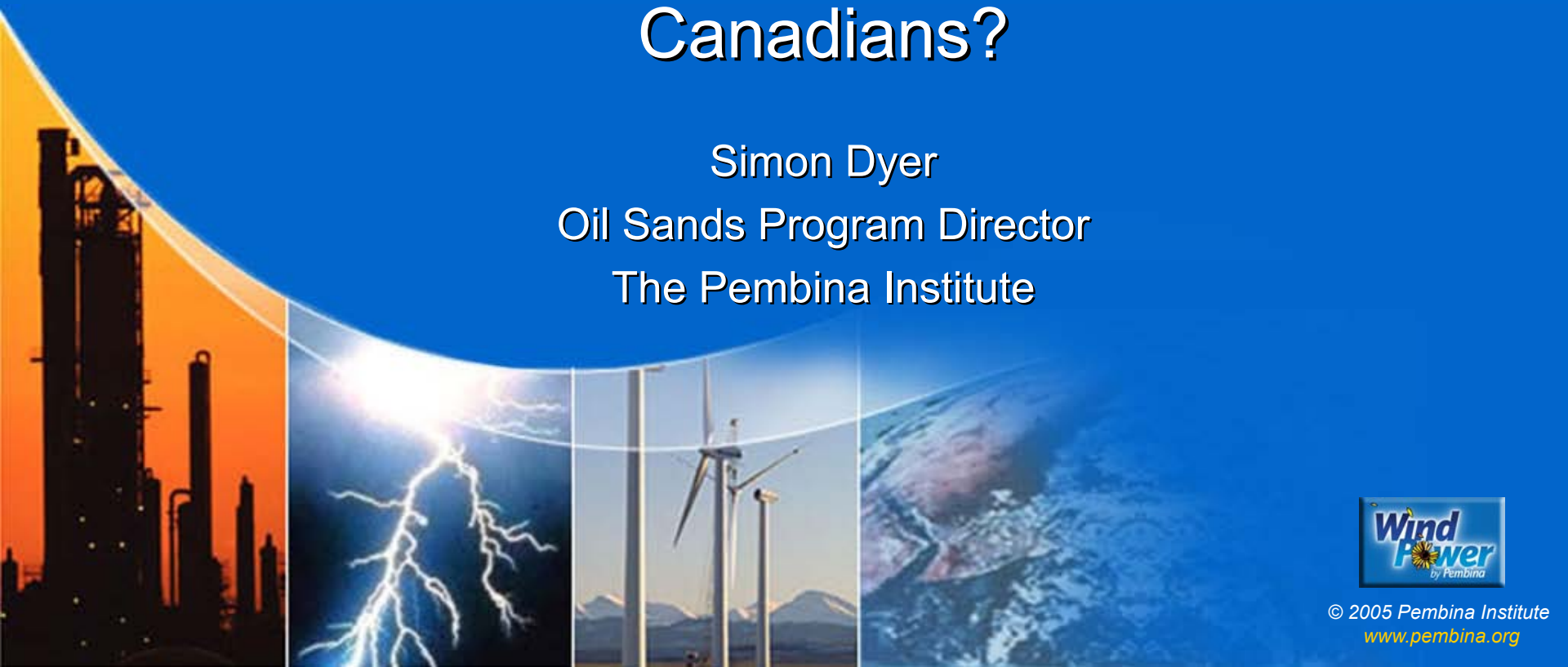
Sustainable Energy Solutions

Oil Sands and Water

A growing toxic legacy for Canadians?

Simon Dyer
Oil Sands Program Director
The Pembina Institute



Wind Power by Pembina

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"To advance sustainable energy through research, education, consulting and advocacy."

- Founded in Drayton Valley, AB in 1985
- Focus on energy and environment issues & environmental economics
  - policy research and analysis
  - public interest advocacy
  - corporate environmental analysis and consulting
  - public / school education

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Oil Sands and Water

- Lack of protection of flows of the Athabasca River
- Unresolved toxic liability – tailings and End Pit Lakes
- Lack of transparency, and availability of environmental impact data

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Giving priority to oil over water

- Federal-provincial management framework for the Athabasca River does not protect the river during low flow periods
- Green-Yellow-Red Zones
- Red does not mean “stop”
- Will Phase 2 of the Framework require withdrawals are halted?

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A Tailings Legacy

Photo: Technology Review, Katherine Bourzac

- Mining by-product stored in “lakes” for 40+ years
- 720 billion litres
- Cover > 130 km^2
- Tailings production = 1.5 barrels of liquid tailings for every barrel of bitumen
- Reclamation of liquid tailings has never been demonstrated
- Contain hydrocarbons and naphthenic acids, PAHs
- Source of methane, VOCs and H_2S emissions

Tailings Lakes – a growing problem

- Size
- Toxicity
- Risk of failure
- Seepage
- Undemonstrated reclamation

End pit lakes as waste dumps

- Tailings waste will be capped with 65-100m of Athabasca River water
- Meromixis - upper water layers do not mix with the lower portions
- “Wet landscape approach”
- Unproven, risky concept, yet already endorsed for > 25 EPLs.

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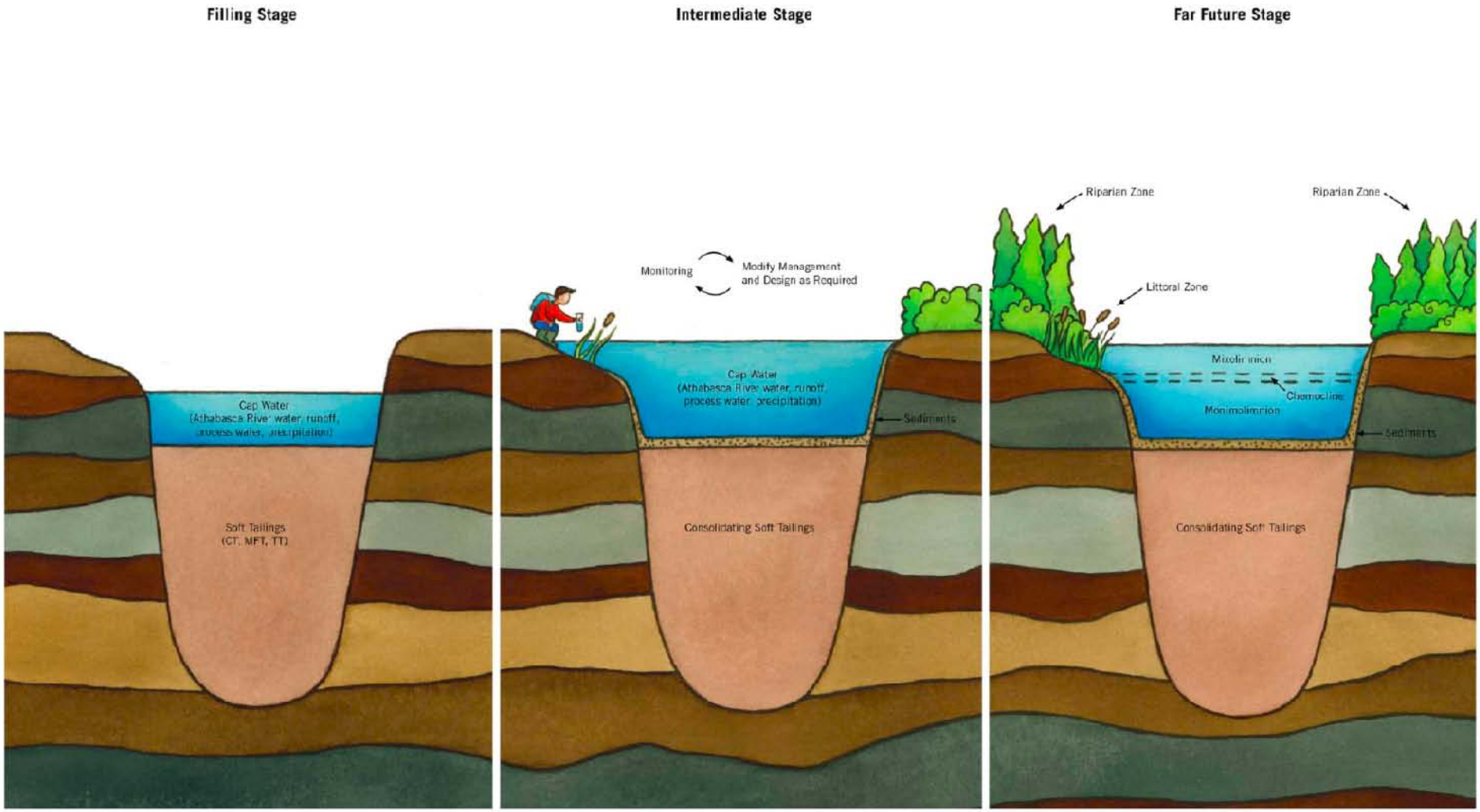

Filling Stage: Following excavation, the mined-out oil sands pit will be filled with process-related materials (including soft tailings, process-affected water, lean oil sands and/or overburden). It will be filled to the top with cap water.

Intermediate Stage: During reclamation, the EPL will begin to develop, mature and stabilize. Physical, chemical and biological features will be monitored to verify that the EPL is functioning as planned. The design and/or management of the EPL will be modified as required.

Far-Future Stage: The reclaimed, certified landscape will include an EPL with a healthy, self-sustaining aquatic ecosystem. The EPL will be connected to upstream and downstream environments.

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End pit lakes as tool for disposing waste

- "…historical data are insufficient to determine a realistic outcome of the final features of EPLs. Modelling and relevant background studies have been the basis of research, but a fully realized EPL has yet to be constructed."
  - Cumulative Environmental Management Association - EPL subgroup

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Tailings Seepage

- Tailings lakes are leaking
- Industry projections predict leakage will increase
- Public has limited access to Government and industry data

- Unknowns… (?)
  - What
  - How much
  - Long term impacts on ground/surface water
  - Long term management plans

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Where is the data?

- Lack of publicly accessible, transparent and cumulative data
- Weak public reporting by industry, Government of Alberta, Government of Canada
- Ongoing criticism of the Regional Aquatic Monitoring Program

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Recommendations

- **No new approvals or water licenses for oil sands mines should be granted until the establishment of a scientifically-based Ecosystem Base Flow for the Athabasca River, beyond which withdrawals by all oil sands operations during the red zone or low flow periods would be prohibited.**

- **No more oil sands mine approvals should be granted that include extraction technologies that result in mature fine tailings or that propose unproven end pit lakes as a reclamation strategy.**

- **Independent, transparent, publicly available monitoring that has a strong peer-reviewed scientific basis is needed. Publicly available data should include comprehensive water quality, tailings reclamation and tailings seepage information.**

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