The Role of Environmental Assessment in Understanding and Managing Oil Sands Development in Northern Alberta

Laury North, P.Eng.
Environmental Assessment Team Leader
Alberta Environment

The Challenge of Oil Sands Development

- **Oil reserves in the Athabasca oil sands deposits are world-scale in size and may account for 50% of Canada's production in the next decade.**
- **Capital investment in oil sands projects is expected to reach approximately $60 billion.**
- **Recovery requires significant water and energy inputs and results in land disturbance and air emissions.**
- **Information is needed by industry and government to manage development effectively.**
- **The public wants assurance that the environment can and will be protected.**
- ***Is environmental assessment a useful tool in understanding and managing the project-specific and cumulative/regional effects of oil sands development?***

Alberta's Environmental Assessment Process

- **Every application under the *Environmental Protection and Enhancement Act* or the *Water Act* undergoes an environmental review.**
- **The scope and scale of the environmental review is determined by the nature of the activity, its environmental setting, and potential for significant adverse effects.**
- **An Environmental Impact Assessment (EIA) Report is the most complex type of environmental review in Alberta Environment's regulatory framework.**
- **Alberta Environment continues to review activities even after an approval is issued to ensure compliance with approval requirements.**

Alberta's Environmental Assessment Process

- **Alberta Environment works closely with other agencies to examine environmental effects.**
- **When an environmental assessment is required by both the federal and provincial governments, both levels of government cooperate in assessing a project.**
- **Alberta uses a team-based process to review EIA reports.**
- **Review teams are usually media-based and composed of professional and technical specialists from various provincial and federal agencies.**
- **The information in the EIA report is used by regulatory and resource management decision-makers at both levels of government to make their own decisions.**

Alberta Environment's Regulatory Process

- **The EIA Report**
  - Provides information about the project and effects
  - Outlines the proponent's view of the significance of effects
  - Proposes mitigation for adverse effects and management plans for residual effects
- **The EUB Decision Process**
  - Provides opportunity to "test" proponent's view of the project
  - Identifies issues that require follow-up
  - Provides advice and direction to regulators
- **EPEA Approval**
  - Provides direction on emission management requirements
  - Identifies information proponent must provide before start-up
  - Specifies on-going monitoring and reporting requirements
- **Water Act Licence**
  - Sets rate of water withdrawal or diversion
  - Recognizes need to address IFN

Oil Sands Development 1993 to 2004

- **Only two oil sands mines operating in the Fort McMurray area between 1978 and 1995**
  - **Syncrude Canada Ltd.**
  - **Suncor Energy Ltd.**
- **13 major projects reviewed in the Fort McMurray area since 1995:**
  - **Syncrude (2) - Aurora Oil Sands Mine, Mildred Lake Upgrader expansion**
  - **Suncor (3) - Steepbank Oil Sands Mine, Millennium expansion, Firebag SAGD project**
  - **TrueNorth - Fort Hills Oil Sands Mine**
  - **Shell Canada (2) - Albian Oil Sands Mine, Jackpine Oil Sands Mine**
  - **Canadian Natural Resources Limited - Horizon Oil Sands Project**
  - **OPTI/Nexen - Long Lake SAGD project**
  - **Petro Canada (2) - MacKay SAGD project, Meadow Creek SAGD project**
  - **Conoco Philips - Surmont SAGD project**
- **2 new oil sands mines and 1 SAGD project at the "Terms of Reference" stage with more on the horizon.**

Issues Identified for Oil Sands Development

- **Air Quality**
  - **Major emissions are SO_2 and NO_x - concern about acid deposition.**
  - **Concern about effects of SO_2 emissions has led to significant reductions in emissions from Syncrude's and Suncor's existing bitumen upgrading plants and from new approved projects.**
    - **Actual combined SO_2 emissions in 1995 - 440 tonnes per day (2 operating projects);**
    - **Estimated combined SO_2 emissions in 2004 - 303 tonnes per day (3 operating and 3 approved projects).**
  - **NO_x emissions are increasing due to truck & shovel mining methods - low NO_x technology mandatory.**
  - **Increasing interest in GHG emissions and potential effects of climate change on development.**
  - **Proponents required to describe GHG emissions as well as project-specific and corporate management plans.**
  - **Concern about secondary pollutants - ground-level ozone, $PM_{2.5}$.**

Issues Identified for Oil Sands Development

- **Water Quality & Quantity**
  - **No direct release of process-affected water to the watershed.**
  - **Seepage from tailings ponds needs to monitored and managed to prevent impacts on surface water and groundwater resources as well as wetlands and aquatic biota.**
  - **Extraction and upgrading processes use large volumes of water from surface and ground sources. The potential for recycling is limited by corrosion concerns.**
  - **Protection of fresh groundwater resources is a concern during mine development and in-situ bitumen recovery.**
  - **Research focusing on seepage from tailings ponds and future reclaimed tailings areas, in-stream flow needs, reach-specific water quality objectives for the lower Athabasca River, and integrity of the Muskeg River watershed.**

Issues Identified for Oil Sands Development

- **Traditional Land Use**
  - **Information on traditional uses and activities is a key component in the socio-economic and historical resources assessments.**
  - **Need to understand how oil sands development may affect cultural and historical resources and the ability of Aboriginal people to hunt, fish and trap.**
  - **Recognition that traditional knowledge from First Nation people can contribute to understanding the effects of development.**
  - **Consultation with recognized First Nation and Metis people who may be affected a development is gaining an increasing level of scrutiny in Alberta.**
  - **Alberta is responding by developing comprehensive policy on Aboriginal consultation.**

Issues Identified for Oil Sands Development

- **Wildlife**
  - **Effects on wildlife a cornerstone of oil sands mine EIA reports.**
  - **Key issues considered include:**
    - **Habitat fragmentation and loss,**
    - **Wildlife corridors,**
    - **Development setbacks from rivers,**
    - **Effects of noise and disturbance,**
    - **Identification of key indicator species and "listed" species,**
    - **Habitat suitability modeling.**
  - **Caribou, moose, fur-bearing animals and listed species are of significance in EIA reports in terms of their value to traditional activities and the need to protect species at risk.**

Issues Identified for Oil Sands Development

- **Human Health**
  - **Human health assessment is a highly complex issue for oil sands EIA reports.**
  - **Assessment uses a multi-pathway approach that includes effects of water and air quality, as well as food.**
  - **Issues of public perception are the most difficult to assess.**
  - **Efforts to address regional human health questions identified in EIA reports resulted in the Athabasca Oil Sands Community Health Effects Assessment Program (AOSCHEAP).**
  - **The AOSCHEAP study was completed in May 2000.**
  - **It was the first of several studies by Alberta Health & Wellness across Alberta to address uncertainty related to exposure and human health outcomes in the oil sands region.**
  - **It provides a baseline of information on health and exposure referenced in subsequent and current EIA reports in the region.**

Issues Identified for Oil Sands Development

- **Reclamation**
  - **Reclamation is a key component of EIA reports and an active research area.**
  - **Successful reclamation of disturbed areas will be key to ecosystem sustainability.**
  - **Focus is on:**
    - **Reclaiming disturbances to a dry landscape through consolidated tailings technology,**
    - **Reclaiming the landscape and drainage to support ecologically functioning end-pit lakes, wetlands and forested ecosystems,**
    - **Integration of water management plans and reclamation plans during project development, operation and reclamation.**
  - **The scale of oil sands mines means large volumes of overburden and water must be managed during the life of a project.**
  - **Integration of multiple projects in close proximity is also a key issue.**

Issues Identified for Oil Sands Development

- **Cumulative Effects**
  - **Alberta's approach to cumulative effects assessment has changed over time. It is now a major component of every EIA report.**
  - **Managing cumulative effects requires a partnership of all stakeholders in the region.**
  - ***Regional Sustainable Development Strategy for the Athabasca Oil Sands Area* (RSDS)**
    - **Released by Alberta Environment in 1999 after a comprehensive consultation process,**
    - **Organized 72 issues into 14 theme areas,**
    - **Developed a rational, systematic approach to address issues,**
    - **Emphasizes the application of adaptive management principles,**
    - **Strong support for partnerships and cooperation,**
    - **Provides a balance between development and environmental protection.**

Issues Identified for Oil Sands Development

- **Cumulative Effects - *continued***
  - **Cumulative Effects Management Association (CEMA)**
    - **CEMA founded in 2000 to bring stakeholders together to address key cumulative effects issues,**
    - **Currently has over 40 member organizations representing industry, all levels of government, Aboriginal groups and interest groups,**
    - **Five working groups developing regional environmental management systems to address the issues identified in the RSDS,**
    - **CEMA's recommendations will be provided to Alberta Environment and Alberta Sustainable Resource Development for consideration and possible implementation,**
    - **In August 2002 CEMA provided Alberta with recommendations for managing trace metal emissions,**
    - **In July 2003 CEMA industry members voluntarily agreed to adopt three management tools to minimize land disturbance,**
    - **CEMA has completed over 25 technical reports with over 20 other reports in progress on a broad range of issues,**
    - **Many recent EIA reports reference CEMA's work as a means to address cumulative effects issues.**

Conclusions

- **The understanding and management of effects from oil sands development is greatly enhanced by the environmental assessment process.**
- **Regulators use the process to focus efforts on key environmental issues and develop proactive mitigation proposals.**
- **Environmental assessment information assists Alberta in presenting its position to the EUB and assists the EUB in determining if a project is in the public interest.**
- **Information is used in setting terms and conditions in approvals and licences.**
- **The process provides a transparent means to identify key research and monitoring gaps.**
- **It can help to differentiate between issues of perception and scientific uncertainty.**
- **Environmental assessment provides a basis for long-term monitoring and management plans.**