

## Geoscience of Climate and Energy 9. History and Governance Models as a Blueprint for Future Federal–Provincial Co-operation on Environmental Monitoring in the Alberta Oil Sands Region,

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# SERIES



## Geoscience of Climate and Energy 9. History and Governance Models as a Blueprint for Future Federal–Provincial Co-operation on Environmental Monitoring in the Alberta Oil Sands Region<sup>1,2</sup>

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### OVERVIEW

The environmental impacts associated with existing and proposed developments in the Alberta oil sands region have received unprecedented national and international attention. The oil sands represent a strategic resource of

importance to Alberta, and Canada as a whole, and indeed to the international energy trading community.

The present and future potential magnitude of developments required to extract, upgrade and transport the oil have, for better or worse, vaulted the oil sands region into the realms of international economic, social, environmental, and political attention. Accordingly, both the federal and provincial governments have increasingly focused their attention to creating or expanding environmental monitoring and research programs in the oil sands region of Alberta.

At a time when new approaches to scientific monitoring programs are being reviewed, it may be useful to recall that there is an extensive, and successful, history of scientific and policy co-ordination between the governments of Alberta and Canada in regard to oil sands environmental assessment and management programs in the province. Past Federal–Provincial agreements have recognized the overlapping jurisdictional responsibilities, and governments have sought to achieve management and financial efficiencies to harmonize, if not resolve, these overlaps.

Here, past management models and agreements are reviewed, with particular attention paid to the Alberta Oil Sands Environmental Research Program (AOSERP) (1975 to 1980; Smith 1981) and the Northern River

Basins Study (NRBS) (1991 to 1996; NRBS 1996).

New and better integrated management systems need to be devised to bring about efficient, co-operative and sustained monitoring to be implemented by governments and industry. The Government of Alberta has increasingly acknowledged its inherently conflicting roles as resource manager and proponent, regulator and regulatory enforcer in the oil sands region. If the key recommendation of the Alberta Environmental Monitoring Panel (AEMP) to form “an *Alberta Environmental Monitoring Commission to operate at arm’s length from government, regulators and those being regulated*” is to be achieved successfully, it will first require heightened levels of intergovernmental co-ordination and co-operation (AEMP 2011).

Past models for environmental monitoring and research in the oil sands region, and perhaps equally as important, their respective histories, should be of material interest to senior federal, provincial, territorial and industry decision-makers as they approach future considerations of governance associated with oil sands development. The past governance models, (e.g. AOSERP and NRBS), should serve to guide potential new research program development and implementation.

<sup>1</sup> The initial paper upon which this article was based first appeared November 14, 2011 on the Alberta WaterPortal website ([www.albertawater.com](http://www.albertawater.com)) in the Guest Columnist Section. Permission has been granted to Geoscience Canada by the Alberta WaterPortal to publish an updated version of the paper.

<sup>2</sup> This article is a continuing series on Geoscience of Climate and Energy and is part of a set of papers published in Geoscience Canada Special Issue: Environmental Management of the Alberta Oil Sands, guest edited by Andrew D. Miall.

## RECENT ALBERTA OIL SANDS HISTORY: 2010–2011

As noted in the recent report of the Alberta Environmental Monitoring Panel (AEMP 2011), the Lower Athabasca and Cold Lake regions contain approximately 81% of Alberta's bitumen reserves. With current technology, it is estimated that about 175 billion barrels of bitumen, or 10% of the entire estimated Alberta oil sands resource, may be economically recoverable. Future advancements and market conditions could lead to development of the full 1.71 trillion barrels of bitumen (Government of Alberta 2011).

Investment in the oil sands has increased dramatically over the past two decades, from \$490 million in 1991 to a high of over \$20 billion in 2008 prior to the global recession (Government of Alberta 2011). The Canadian Energy Research Institute (CERI) project over the next 35 years that total capital investment in oil sands could range from \$213 billion to \$302 billion (Millington and Mei 2011). Another CERI report estimates a total GDP impact of \$2.1 trillion for Canada and more than \$500 billion for the United States. Employment in Canada (direct, indirect, and induced) as a result of new oil sands investment is predicted to grow from 75,000 jobs in 2010 to 905,000 jobs in 2035 (Honarvar et al. 2011).

Notwithstanding strategic and economic implications for North American continental energy supply, development of the oil sands region has been the subject focus of an escalating series of protests in Canada and the USA. These, and other internal United States political events, led US President Obama in November 2011 to refer for further review the Keystone XL pipeline application proposed to deliver higher volumes of oil from Canada's oil sands region to the USA. Prior to the highly political US decision, the oil sands development had been reviewed by agencies such as the Royal Society of Canada and special federal and provincial advisory panels composed of distinguished scientists from Canada and the USA (Royal Society of Canada Expert Panel 2010; Environment Canada 2010). These high-level scientific evaluations were commissioned in the face of

mounting public criticisms that encouraged governments to re-assess the nature and degree of environmental impacts associated with oil sands surface and sub-surface (*in-situ*) mining methodologies. The reviews assessed the adequacy of environmental monitoring systems used in the region (Royal Society of Canada Expert Panel 2010; Environment Canada 2010).

In the fall of 2010, the Federal Commissioner of the Environment and Sustainable Development reported that Environment Canada had recognized polycyclic aromatic hydrocarbons (PAHs) as a threat to water quality on the Athabasca River as early as 2001 (Commissioner of the Environment and Sustainable Development 2010). Moreover, it was noted that Environment Canada had insufficient data to “*monitor threats related to population growth and economic development in the region as well as insufficient data to monitor the oil sands.*” It was noted that as of June 2010, the federal government “*did not have the capability to monitor many of the toxic pollutants associated with oil sands production*” (Commissioner of the Environment and Sustainable Development 2010).

In 2010, the Government of Alberta formed another panel, the Water Monitoring Data Review Committee (WMDRC) to examine water quality data collected by several parties, including Regional Aquatics Monitoring Program (RAMP), Alberta Ministry of Environment and Water (now Ministry of Environment and Sustainable Research Development) and Dr. David Schindler's research group at the University of Alberta, with the overall aim of understanding the differences in the various results of four Athabasca River water quality studies (WMDRC 2011). The WMDRC report concluded that the sampling and analytical methods used by the RAMP program were inadequate and that RAMP suffered from low sampling frequency (WMDRC 2011). The WMDRC also highlighted failures of monitoring for trends in contaminants in the Athabasca River downstream of the oil sands, reporting that current monitoring “*was not intended to assess impacts of the oil sands on the river*” that “*it appears the laboratories Alberta Environment used do not have the capability of measuring the low concentrations*

*of PAC found in the water. The Committee believes that there were deficiencies in the sampling design and methodology for this study*” (WMDRC 2011). It was also noted that RAMP suffered from low sampling frequency.

The WMDRC also concurred with findings of Kelly et al. (2009, 2010) that indicated polycyclic aromatic hydrocarbons and trace metals were “*being introduced into the environment by oil sands operations.*” As with other reports, the WMDRC (2011) called for new monitoring programs that “*are conducted with scientific rigor and oversight.*” Another external review of RAMP, led by the Alberta Research Council (February 2011), confirmed that concerns voiced about RAMP by the Water Monitoring Data Review Committee (WMDRC 2011) and by a 2004 review of RAMP (Ayles et al. 2004) had indeed not been adequately addressed. Other reports (see Munk School of Global Affairs 2011) have drawn attention to the need for more inclusive and comprehensive examinations of the impacts resulting from oil sands developments.

In late 2010, the Royal Society of Canada comprehensively documented and confirmed insufficient monitoring in the oil sands region (Royal Society of Canada Expert Panel 2010). In particular, the report concluded that: “*The environmental regulatory capacity of the Alberta and Canadian Governments does not appear to have kept pace with the rapid growth of the oil sands industry over the past decade. The ELA [Environmental Impact Assessment] process relied upon by decision-makers to determine whether proposed oil sands projects are in the public interest has serious deficiencies in relation to international best practice. Environmental data access for cumulative impact assessment needs to improve.*”

The federally appointed Oil sands Advisory Panel (OAP) was also tasked with examining the state of monitoring in the oil sands (Environment Canada 2010). The OAP also found that the level of industrial activity dwarfed the scale of monitoring – as well as basic scientific research. In addition, baseline ecological data were considered to be poor and the panel determined that the *ad hoc* groups operating monitoring systems within the oil sands region lacked “*a coherent data management framework where informa-*

tion could be uploaded, shared or organized.” The OAP concluded that until such time as these shortcomings are addressed *“the debate on the environmental performance in the oil sands will continue to revolve around the adequacy of the data collected and not, as it should be, on data interpretation and implications”* (Environment Canada 2010).

In response to the Federal Oilsands Advisory Panel Report (Environment Canada 2010), Minister of the Environment Kent released Environment Canada’s plan for a new Lower Athabasca Water Quality Monitoring Program (Environment Canada 2011a). In the press release announcing the release of phase 1 of the monitoring plan, Minister Kent noted that: *“The development of the plan was led by Environment Canada in collaboration with Alberta Environment. We have both committed to improve efforts in our respective areas of jurisdiction and we will continue to work to deliver improved environmental outcomes in the oil sands”* (Environment Canada 2011b). In comments that received national and international attention Minister Kent noted that: *“...the new plan, which will cost C\$20 million a year to run, paid for by the oil industry, will include more frequent and widespread sampling, and form part of a broader system that will also monitor air quality and the impact of development on the region’s wildlife”* (Reuters 2011).

While the Environment Canada Phase 1 report focused on the issues of hydrology and water quality (Environment Canada 2011a), a subsequent report issued on July 21, 2011 recognized that there was a need to expand and integrate air and biodiversity monitoring, as well as broader water quality monitoring and effects assessment for the oil sands region (Environment Canada 2011c).

On June 30, 2011, the Alberta Environmental Monitoring Panel (AEMP) submitted its final report to Alberta Environment Minister Renner (AEMP 2011). The AEMP report made recommendations for the establishment of a world class environmental monitoring, evaluation and reporting system for Alberta. A key recommendation was for the creation of an independent Alberta Environmental Monitoring Commission to operate at arm’s length from government, regula-

tors and those being regulated (AEMP 2011). The Commission would be responsible for the strategic direction, scientific focus and on-going operation of the proposed environmental monitoring system.

On March 13, 2012, the Alberta Minister of Environment and Sustainable Resource Development announced a subsequent initiative, the Alberta Environmental Monitoring Working Group (AEMWG) that was tasked to: *“...provide expert advice, viable options and recommendations...in deciding the future governance and funding of a new provincial monitoring, evaluation and reporting system.”* The AEMWG reported on June 30, 2012 with recommendations that outlined and assessed governance options ranging from an arms-length public agency to a structure internal to the Government of Alberta (Government of Alberta 2012).

Clearly, if the recommendations from the several panels are to be implemented properly, a heightened level of scientific and policy co-ordination will have to be reached between the governments of Canada and Alberta. Here, it is suggested that governance models from past programs could guide Federal and Alberta decision-makers in their design and establishment of joint environmental monitoring programs, perhaps also to include certain university and private sector participants. It is further argued that, if successful, such co-operative efforts and programs would offer decision-makers enhanced levels of fiscal and scientific efficiencies at a time of growing international concern over government deficit expenditures. Properly structured co-operative efforts could result in less duplicative and enhanced scientific programs that would profit from the collaboration of widespread agencies and laboratories with unique, or highly specialized, analytical and assessment capabilities.

Not to achieve such co-operation between federal and provincial agencies could result in inefficient, ineffective, duplicative and perhaps discordant efforts to effectively regulate and monitor oil sands project developments that are in the national interest. Good governance, with appropriate adequately funded program designs, will be essential to achieving imple-

mentation of all the recommended scientific protocols required to achieve enhanced environmental assessments in the oil sands region.

## PAST PROVINCIAL-FEDERAL AND TERRITORIAL CO-OPERATION

The governments of Alberta and Canada co-operated actively with the Federal Oilsands Advisory Panel in the formulation of the federal water quality monitoring program released on March 22, 2011 (Environment Canada 2011a). This co-operative tone between the governments is consistent with past efforts between federal and provincial agencies in the oil sands region, giving rise to optimism that continued extended co-operation will occur in future monitoring programs in the oil sands region, especially following the work of the Alberta Environmental Monitoring Panel (AEMP 2011).

Although large-scale, or regional, watershed assessments have been done for the oil sands region (Paetz 1984; Wallace and McCart 1984) these studies did not represent formal co-operative inter-jurisdictional efforts. They were, at best, ‘snapshots’ of the state of the aquatic resources and, unfortunately, were not further supported with comprehensive regional field research. This need for substantive, integrated, ‘baseline’ assessments was made more certain by expanding and accelerating oil sands developments. Interestingly, in some cases, these ongoing gaps in research have tended to be filled increasingly by university researchers who have tended to expand the technological limits for monitoring to extend and include parameters of interest well beyond the methodologies employed by regulatory agencies or industry.

Notwithstanding the deficiencies noted by the various federal and provincial review panels, there has been a history of co-operative inter-jurisdictional environmental monitoring programs undertaken across western Canada and particularly in the Alberta oil sands region. These co-operative efforts may be categorized broadly as:

- a. Environmental assessments
- b. Monitoring (or ‘baseline’) studies

The former category (a. environmental



assessments in the oil sands region), has included major studies associated with oil sands development applications such as the Other Six Lease Operators (OSLO) heavy oil recovery Project, the Kearl Lake Project and others. These and other development assessment application reviews in northern Alberta, such as occurred with the Alberta Pacific Pulp Mill Project, required broader co-operative federal-provincial reviews. Notably, federal requirements for major project development assessments (consistent with federal legislation under the Canadian Environmental Assessment Act (CEAA)) grew to involve the Government of Alberta to also address requirements under parallel provincial environmental assessment legislation.

There are fewer examples of the latter (b.; formal federal-provincial joint studies for monitoring or 'baseline' studies). Clear exceptions to this general rule were the Northern River Basins Study Board (1996) and the earlier Alberta Oil Sands Environmental Research Program that was formally initiated between Canada and Alberta in 1975 (Smith 1981).

### **The Alberta Oil Sands Environmental Research Program**

The Alberta Oil Sands Environmental Research Program (AOSERP), covering the period from 1975 to 1980, grew out of national concerns, voiced even then, about the potential magnitude of rapidly expanding oil sands developments with their attendant and potential environmental and social impacts. The Agreement that brought the AOSERP into being was signed between the governments of Canada and Alberta in February 1975 (as was subsequently amended in September 1977; Smith 1981).

Signed at a time of heightened jurisdictional tensions between the governments of Alberta and Canada, the 1975 AOSERP program was, for its time, unique in scope and degree. Initially conceived as a \$20 million joint research program the 1975 Canada-Alberta Agreement for Alberta Oil Sands Environmental Research Program Agreement stated:

*"Whereas Canada and Alberta have agreed to identify, undertake or encourage and assist research into environmental*

*aspects of the renewable resources involved in the development of oil sands.....and wish by this agreement to provide a general framework for the co-ordinated planning, funding and implementation of such research...Whereas the results of an intensive study of the area will be useful in predicting the effects of any proposed development, as a basis for considering future development proposals, and whereas the results of the study program will be utilized by Alberta in the approval process for future developments and in the environmental design of any project which might be implemented; whereas Canada and Alberta are agreed on the objectives, general strategy and procedures which would govern the identification and selection of such research and the methods of encouragement and assistance..."*

After five years, \$17,324,000 had been spent to publish approximately 200 peer-reviewed research reports (Smith 1981). During AOSERP's active research phase, the program received material financial support and seconded personnel from the federal government (Fisheries and Oceans Canada and Environment Canada), and departmental representatives of several Alberta agencies and university researchers.

AOSERP was uniquely managed by a collective series of committees chaired by two federal and six Alberta representatives. They ultimately reported through an Alberta Program Manager and jointly to the respective Ministers of the Environment for Alberta and Canada. The program received international attention for its unique, co-operative and integrated approach to regional baseline monitoring and environmental research.

However, by 1977 the AOSERP program was substantially reorganized, enough so that a new negotiated Agreement was required. These events, and other administrative and fiscal tensions, may have led the federal government subsequently unilaterally, and somewhat acrimoniously, to withdraw from the program. The AOSERP Summary Report (Smith 1981) was submitted solely to the Alberta Ministry of the Environment and the AOSERP was disbanded.

Nonetheless, the 1975

AOSERP Agreement between Canada and Alberta may constitute a precedent and a formal basis that may deserve careful consideration for future joint 'baseline' or joint monitoring programs undertaken in the oil sands region between the federal and provincial governments.

Interestingly, even at the relatively early date in 1981, the AOSERP Summary Report noted that:

*"The systems approach used by AOSERP is only the first step toward any in-depth assessment of ecosystems and social impacts — an administrative convenience for organizing a complex series of investigations. In order to assess with any degree of exactitude what long-term impacts of oil sands development might be, extensive research will be required to develop a predictive capability which does not now exist"* (Smith 1981).

### **The Northern River Basins Study**

The subsequent Northern River Basins Study (NRBS), covering the period from 1991 to 1996, was an inter-jurisdictional study that took into consideration the Peace, Athabasca and Slave River basins (NRBS 1996). The study was launched co-operatively between the federal, provincial and territorial governments initially in response to widespread concerns voiced by northern residents about the present and future state of regional river systems following the approval of the Alberta Pacific Pulp Mill at Athabasca, Alberta. The NRBS Board was made up of representatives from the governments of Canada, Alberta and the Northwest Territories, including local communities and Aboriginal representatives.

An October 1989 Intergovernmental Steering Committee meeting between federal, provincial and territorial agencies with interests in the basins recognized that there was an urgent need to deal with recommendations from an earlier joint review panel report on the Alberta Pacific Pulp Mill Proposal (Alberta Environment 1990) with further technical studies. The Steering Committee and Task Force outlined the initial framework for the NRBS and developed a draft federal-provincial-territorial agreement. The study, initially proposed as approximately three years in duration, was to

be funded under the *Canada Water Act*, the *Alberta Water Resources Act*, and the Department of Indian Affairs' Northern Development Program. Following the guidance of the Intergovernmental Steering Committee that acknowledged widespread public concerns, the Task Force proposed a research program to address information and research gaps. Budgeted at \$12.3 million the research program was directed at topics in hydrology-hydraulics, water use, water quality, fisheries and wildlife.

The initial tripartite agreement between Canada, Alberta and the Northwest Territories was signed 27 September 1991 and brought into being the *'Peace-Athabasca-Slave River Basin Study.'* The Agreement was subsequently amended on 15 September 1995 to be an Agreement for a *'Northern River Basins Study'* (NRBS 1996). The program was directed by the NRBS Board that reported annually to the Ministers of Environment Canada, Indian and Northern Affairs Canada, Alberta Environmental Protection and Northwest Territories Renewable Resources. Importantly, under the scientific leadership of the internationally respected Dr. Peter Larkin, a scientific advisory panel was established to direct, and advise upon, the studies funded. This innovative program involved unprecedented participation and involvement of the public, Aboriginal and environmental communities. Co-chaired by senior representatives of Environment Canada and Alberta Environmental Protection, the Board completed 150 projects that required extensive community consultations (NRBS 1996). For instance, the Board met every second month in different communities within the basins allowing them to gain a personal sense of the culture, geography and interests of communities located throughout the basins.

The NRBS Board subsequently made comprehensive and numerous recommendations for possible future inter-jurisdictional successor organizations (NRBS 1996). The success of NRBS in building public trust and scientific credibility among key stakeholders throughout the river basins led the board to recommend that the exercise be continued in some form such that future programs be charged with a

*'mandate to monitor and power to research, monitor and regulate the environmental health of the aquatic ecosystems of the northern river basins'* (NRBS 1996).

Regrettably, the NRBS was subsequently disbanded and, while the subsequent Northern Rivers Ecosystems Initiative produced some excellent research, the importance of maintaining science-based and publicly interactive programs such as NRBS passed from the public and political consciousness.

### **A FURTHER BASIS FOR POTENTIAL CO-OPERATIVE FEDERAL-PROVINCIAL ASSOCIATION IN OIL SANDS MONITORING**

In January 1998, Canada and most provincial governments (excluding Quebec) signed a *'Canada-Wide Accord on Environmental Harmonization'*. The purpose of the Environmental Harmonization Accord was:

- *"To provide a framework and mechanisms to achieve the vision and to guide the development of sub-agreements pursuant to the Accord."*

The Accord stated that the objective of such 'harmonization' was to:

- *"enhance environmental protection;*
- *promote sustainable development; and*
- *achieve greater effectiveness, efficiency, accountability, predictability and clarity of environmental management for issues of Canada-wide interest, by:*
  1. *Using a cooperative approach, to develop and implement consistent environmental measures in all jurisdictions, including policies, standards, objectives, legislation and regulations;*
  2. *Delineating the respective roles and responsibilities of the Federal, Provincial and Territorial governments within an environmental management partnership by ensuring that specific roles and responsibilities will generally be undertaken by one order of government only;*
  3. *Reviewing and adjusting Canada's environmental management regimes to accommodate environmental needs, innovation, expertise and capacities, and addressing gaps and weaknesses in environmental management; and*
  4. *Preventing overlapping activities and inter-jurisdictional disputes"*

(Canadian Council of Ministers of the Environment 1998).

While the Canada-Wide

Accord on Environmental Harmonization may not provide a *specific basis* upon which to predicate future joint federal-provincial monitoring programs, it constitutes a 'point of departure' for the formulation of future co-operation, especially if other jurisdictions, such as the Northwest Territories and Saskatchewan, choose to consider joining any new programs.

The magnitude and challenge in monitoring and assessing the full extent of future oil sands mining and development projects may yet entail, or may even require, co-operative research that extends much more widely from the oil sands mining areas.

### **CONCLUSIONS**

Many would agree that, given the recent series of highly regarded expert reviews undertaken from 2010–2011, many of the concerns noted in the AOSERP and NRBS programs exist today in the oil sands region. Remarkably, these concerns remain in spite of material expenditures undertaken by government and industry to monitor and understand the environmental consequences of oil sands production ever since those early studies.

This evidence would suggest that a 'world-class' monitoring system for the oil sands region will require a significant, carefully crafted, long-term, co-operative, integrated effort by many levels of governments in Canada. At the very least, enhanced co-operation will be required to address and understand the consequences of the 'world-class' investments, and the resultant industrial production, extant in, or rapidly developing throughout, the oil sands region.

Unquestionably, these concerns attracted the attention of the AEMP and led them to recommend a new Commission to be managed by 'Albertans for Alberta' (AEMP 2011). The key AEMP recommendation that called for the creation of an Alberta Environmental Monitoring Commission was to allow it *"to operate at arm's length from government, regulators and those being regulated. The Commission would be responsible for the strategic direction, scientific focus and on-going operation of the proposed environmental monitoring system. It is concluded that not to achieve enlightened co-operation between federal and provincial agencies*

could result in inefficient, ineffective, duplicative - and perhaps discordant - efforts to more effectively regulate and monitor oil sands project development projects that are in the national interest" (AEMP 2011).

Given the high level of public distrust, and controversy surrounding oil sands environmental issues, it is essential that the creation of subsequent institutions achieve, and be seen to achieve, a science-based and 'arms-length' agenda. This is all the more so in light of the very material national and international public and scientific scrutiny currently focused upon the oil sands mining region. Notwithstanding this imperative, there exists the potential for an over-enthusiastic, over-reaction by a series of regulators, all of whom, while reflecting their valid mandates for the responsible regulation and monitoring within and outside of the region, may miss opportunities to implement *joint program management and financial efficiencies* that would enhance their mutual interests in the discharge of their respective mandates. Industry, particularly oil sands operators that experience long investment and development timelines, tend to thrive in an environment that provides regulatory and investment certainty.

Here, it is argued that much could be gained from co-operative approaches that involve all levels of governments, industry and the university research communities across Canada. Given the very public recent commitments and actions demonstrated by Canadian federal and provincial political leaders, one could conclude that shared, material political interests should be followed by co-ordinated strategic investments by governments, and presumably also industry, to enhance environmental monitoring and assessment systems in the oil sands region.

Accordingly, some past management models employed to accomplish these aims are presented in this paper. Those models, although they did not long survive jurisdictional rivalries, and changing fiscal priorities, nonetheless indicate that such major intergovernmental program agreements *can* be achieved, both in terms of legal design and co-operative scientific field operations - if there is a sustained political and social will to accomplish

these ends.

Canada should take careful notice of the recommendations of the Royal Society of Canada Expert Panel (2010) that noted the "*environmental regulatory capacity of the Alberta and Canadian Governments does not appear to have kept pace with the rapid expansion of the oil sands industry over the past decade.*" One could argue that if the governments of Alberta and Canada are indeed to achieve international best practices, we shall need to implement improved scientific and management practices that provide for better access to data and also for enhanced regional cumulative impact assessments. If Canada is to achieve these ends, new and better integrated management systems will surely need to be devised to bring about efficient, co-operative and sustained monitoring for governments and industry. If the key 2011 recommendation of the AEMP to form "*an Alberta Environmental Monitoring Commission to operate at arm's length from government, regulators and those being regulated*" is to be delivered and achieved successfully, it will require renewed levels of intergovernmental co-ordination and co-operation.

Past models for environmental monitoring and research in the oil sands region and, perhaps equally as important their respective histories, should be of high interest to senior federal, provincial, territorial and industry decision-makers as they approach future considerations of governance associated with oil sands development.

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