Establishing a World Class Public Information and Reporting System for Ecosystems in the Oil Sands Region – Report and Appendices

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Oil Sands Research and Information Network

OSRIN is a university-based, independent organization that compiles, interprets and analyses available knowledge about returning landscapes and water impacted by oil sands mining to a natural state and gets that knowledge into the hands of those who can use it to drive breakthrough improvements in reclamation regulations and practices. OSRIN is a project of the University of Alberta's School of Energy and the Environment (SEE). OSRIN was launched with a start-up grant of $4.5 million from Alberta Environment and a $250,000 grant from the Canada School of Energy and Environment Ltd.

OSRIN provides:

- **Governments** with the independent, objective, credible information and analysis required to put appropriate regulatory and policy frameworks in place
- **Media, opinion leaders and the general public** with the facts about oil sands development, its environmental and social impacts, and landscape/water reclamation activities – so that public dialogue and policy is informed by solid evidence
- **Industry** with ready access to an integrated view of research that will help them make and execute reclamation plans – a view that crosses disciplines and organizational boundaries

OSRIN recognizes that much research has been done in these areas by a variety of players over 40 years of oil sands development. OSRIN synthesizes this collective knowledge and presents it in a form that allows others to use it to solve pressing problems. Where we identify knowledge gaps, we seek research partners to help fill them.

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REPORT SUMMARY

This report presents a vision for a comprehensive and effective Public Information and Reporting System for Ecosystem Effects in the Oil Sands Region that is relevant, credible, durable, transparent, and robust. The report describes the key Principles and Elements of an information and reporting system that would provide Albertan's and the World with assurance that ecosystem effects due to development in the Wood Buffalo region are reported and evaluated and, along with socio-economic information, support decision-making and responsible management of the land, air and water. The report describes two Scenarios to improve the current system.

This report was developed through an intensive six month (January to June, 2010) structured process called the Challenge Dialogue System where we addressed the question of "What Constitutes an Adequate and Effective Public Information and Reporting System for Ecosystems in the Oil Sands Region?" This process involved 70 people drawn from industry, government (all levels), NGOs, First Nations, academia and the public. A one-day workshop in June 2010, attended by 25 people from government, industry, NGOs and staff from the four major monitoring programs in the Wood Buffalo Region, further refined the concepts arising from the written feedback.

The Principles for an effective information and reporting system are:

- Relevant (responsive, addresses key objectives, supports decisions)
- Credible (science-based, consistent methodology, standardized reporting, verifiable, independent and objective, collaborative)
- Understandable (increases public awareness, causal relations understood)
- Transparent (publicly available data, methodology and reports, timely reporting)
- Robust (durable, continuously-improving)

Two scenarios were developed to provide advice to improving the current information and report system for ecosystem effects in the oil sands region. These scenarios are:

- An Enhanced Information and Reporting System developed from the current assemblage of monitoring and reporting programs; and
- A World Class Information and Reporting System that incorporates or replaces the current system.

The Key Criteria for a World Class Information and Reporting System are:

- Independence
- Responsiveness
- Administrative and operational integration
- Transparent and collaborative governance structure
- Stable funding

- Integration across media
- Ease of access to data and information
- Excellence in reporting and communication
- Understanding of causal relationships
- Complex science-based information is understandable by all audiences
- Operational excellence
- Continuous improvement

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The Dialogue was assisted by the Advisory Members of the Organizing Team comprised of Satya Das, Cambridge Strategies Inc.; Calvin Duane, Canadian Natural Resources Ltd.; Simon Dyer, Pembina Institute; Fred Kuzmic, Shell Albian Sands; Albert Poulette, Alberta Environment; and Lisa Schaldemose, Fort McKay Industrial Relations Corporation.

The Dialogue was facilitated by Douglas James, Congruent Strategies and Terje Vold, Terje Vold & Associates Consulting Ltd.

OSRIN, the Organizing Team and the consultants are grateful for all of the constructive input received from people who participated in one or more parts of the Challenge Dialogue process.

1 INTRODUCTION

This report summarizes the results of an intensive six month (January to June, 2010) structured process called the Challenge Dialogue System[1] where we addressed the question of "What Constitutes an Adequate and Effective Public Information and Reporting System for Ecosystems in the Oil Sands Region?" This process involved 70 people drawn from industry, government (all levels), NGOs, First Nations, academia and the public.

OSRIN was seeking to establish through the Challenge Dialogue, and through a separate independent survey of Albertans by Chapman and Das (2010), the key principles and elements of an information and reporting system that can provide the public with assurance that potential ecosystem effects of oil sands development are known and, with such knowledge can be used to inform future management action.

For further information on the four major environmental effects monitoring programs in the Wood Buffalo Region (Alberta Biodiversity Monitoring Institute (ABMI), Regional Aquatic Monitoring Program (RAMP), Wood Buffalo Environmental Association (WBEA) and Cumulative Environmental Management Association (CEMA)) see the OSRIN report by Lott and Jones (2010).

1.1 The Challenge

Public scrutiny of the effects oil sands development on the environment has steadily increased over the past several years, including several recent high-profile media events and publications.

Many people are concerned that oil sands development is having significant negative impacts on the ecosystem. They are interested in knowing what impacts are occurring, what impacts were expected and what actions have been taken or are planned to avoid, mitigate or minimize both expected and unexpected impacts over time. There are various opinions held by the public. Some individuals or organizations believe that the environmental impacts from oil sands development are unacceptable, either in absolute terms or relative to derived economic and social benefits. Others believe that development of the oil sands resource is acceptable providing the impacts of oil sands development are minimized while the resource is being extracted and the end state of the land following reclamation is ecologically viable.

The public debate on the question of potential ecosystem effects related to oil sands development has been neither balanced nor informed. While effects from oil sands mining and other operations are inevitable, the relevant question is "How significant are the impacts and can the land can be returned to a productive state?" There is a wide variation in opinion on the significance and duration of the impacts including both what constitutes a significant impact and what constitutes an appropriate management responses to those impacts. Moreover, because

[1] This report follows in part an approach, structure and tools developed by the *Innovation Expedition Inc*. and its *Challenge Dialogue System*^{TM} — a disciplined process that engages diverse groups on discovering collaborative and innovative solutions to complex challenges. www.innovation.expedition.com

many of the hydrocarbons and other chemicals released from oil sands development are potentially harmful to ecosystems and human health, it is vitally important to understand the degree to which these constituents are entering the ecosystem beyond naturally occurring levels.

Environmental concerns have led to significant and increasing public pressure to reduce or restrict the development of the Alberta oil sands. Effectively addressing these concerns is required to sustain the social license for Alberta's oil sands industry to operate, access markets, and access capital to invest in oil sands.

Ultimately, these concerns can be addressed only by having a trusted source transparently and effectively providing credible information to all interested parties.

The oil sands industry and the Alberta government, along with other participants, currently maintain or support many monitoring programs intended to address questions about ecosystem effects that, potentially, should be able resolve confusion regarding the effects of oil sands development (Lott and Jones 2010).

In spite of these monitoring programs, there is no consensus on whether or not significant ecological effects are occurring due to oil sands development. This may be because the information from existing monitoring programs is not being effectively evaluated and reported, or because the monitoring systems in place do not provide sufficient information on ecosystems to support a credible assessment of impacts. There are a variety of reasons for this. Some people believe that the scientific studies and performance measures to date are adequate but that access to and transparency of that information has not been adequate. Others believe that the scientific studies available have not been adequately used or understood to inform the debate. Some people simply do not believe the current sources of information. Others also say that our current understanding is incomplete because most historical "scientific studies" were not designed to assess ecosystem effects. In addition, ecosystem monitoring is not simple – the potential for effects on ecosystems is related to the location, magnitude, duration, frequency, timing and contaminant concentration in releases. Some values monitored change depending on the scale of observation and, consequently, issues of comparability arise when moving from local effects to lease-specific impact assessments and finally to regional scale and cumulative impact assessments. In general, historical studies are not regional in scale and select local impacts need to be reported to capture locally significant impacts such as odors.

It is Alberta's responsibility to manage the oil sands resource and its development by industry in a responsible manner that strikes a balance between social, economic and environmental considerations so that negative ecosystem effects are avoided and/or mitigated where possible and practical to do so. Environmental evaluations need to be in context with social and economic impact and consequently a frame of reference is needed against which it is possible to compare the results of monitoring.

In light of the controversy, it is clear that improvements in the current monitoring and reporting system are urgently required. It all comes down to ensuring that the public has confidence in the ecosystem effects monitoring system.

It is against this backdrop that a group of 70 individuals from across industry, academia, government (provincial, federal and municipal), First Nations, and NGOs worked together over a period of six months to:

> *Describe the key principles and elements of an information and reporting system that would provide Albertan's and the World with assurance that ecosystem effects due to development in the Wood Buffalo region are reported and evaluated and, along with socio-economic information, support decision-making and responsible management of the land, air and water.*

1.2 Structure of the Report

The report is organized as follows:

- The body of the report describes the key Principles and Elements of an information and reporting system that would provide Albertan's and the World with assurance that ecosystem effects due to development in the Wood Buffalo region are reported and evaluated and, along with socio-economic information, support decision-making and responsible management of the land, air and water. The report also provides two Scenarios to improve the current system.
- Appendices 1 to 5 provide supporting information related to the body of the report:
  - Appendix 1 – Guiding Principles
  - Appendix 2 – Partial List of Monitoring Programs
  - Appendix 3 – Current Status of Monitoring and Reporting Programs
  - Appendix 4 – Draft Logic Model
  - Appendix 5 – Mapping of Key Findings
- Appendices 6 to 10 provide the various documents that were part of the Challenge Dialogue process. The Challenge Dialogue process is disciplined process that engages diverse groups on discovering collaborative and innovative solutions to complex challenges. A Challenge Dialogue typically operates over several months, with the bulk of the work being done electronically with the participants via the issuance of an initial Challenge Paper which is then commented on. The synthesized comments are used to create one or more Progress Reports, the process being repeated iteratively as the Challenge evolves. Finally, a face-to-face Workshop is held to work in a focused way on the remaining outstanding issues.

  Note that these Appendices contain edited and reformatted materials and therefore will look different than the original materials provided to Dialogue participants. There is considerable duplication in the documents but it is provided to show the evolution of the concepts as additional feedback was received.

The output documents from this Challenge Dialogue are:

- Appendix 6 – the original Challenge Paper that was sent out to interested parties to to introduce the key problem, provide context and the current understanding, and to seek feedback.
- Appendix 7 – the synthesis of the feedback received on the Challenge paper.
- Appendix 8 – the Progress Report which incorporated the feedback into an updated Challenge paper for further comment.
- Appendix 9 – the Workshop Workbook, based on the Progress Report and feedback received, that was given to Workshop participants as background material.
- Appendix 10 – the Workshop Summary Report that brought together all the input gathered at the Workshop.

2 KEY PRINCIPLES

Effective environmental information and reporting systems are developed in context of the circumstances of the region to be monitored, the purpose of the outputs of system and the stakeholders to the process. Typically, environmental monitoring and reporting is undertaken to:

- Provide information to the public to assure them that any unanticipated effects on health or the environment from industrial development are known and understood;
- Provide information to regulators to assist in managing individual industrial developments and regional environmental protection;
- Provide information to government and industry to allow them to continuously improve their human health and environmental protection programs.

These contextual preconditions were explored in detail for Alberta (Appendix 1) and provide the background for developing an effective information and reporting system specifically for the oil sands region.

With this context in mind, five key principles were developed to ensure that ANY public information and reporting system will be credible and believable by a wide audience. Key elements of the desired information and monitoring system are described under each principle.

It is through the lens of these principles and elements that we developed scenarios for an effective Information and Reporting System for ecosystem effects in the oil sands region.

2.1 Principle #1: Relevant

The information and reporting system needs to address key objectives (e.g., as expressed from a variety of sources including provincial strategies, regulations and reporting requirements for industry; regional land use plans; local communities and First Nations).

The information and reporting system must support a business management decision process and be responsive to the needs of decision-makers so that the information and reporting is used to make timely and well informed decisions.

Reporting should capture both transient events and trends to address both the long- and short-term needs of the various stakeholders.

The information and reporting system needs to support local, regional and national assessment and reporting of ecosystem effects.

2.2 Principle #2: Credible

Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices, with appropriate quality assurance measures applied, and be subject to periodic peer review.

Information, including monitoring, needs to be reviewed and verified. Information gathering, analysis and reporting should be standardized with consideration that a certified framework such as ISO or CSA be used or adapted where appropriate.

A collaborative structure providing oversight involving government, industry, First Nations, academia and non-government organizations will enhance credibility of an information and reporting system.

2.3 Principle #3: Understandable

Complex science-based information needs to be interpretable, and interpreted, so that the public and decision-makers understand its meaning (e.g., using "plain language" rather than scientific terms; using a risk-based approach where the likelihood and consequences of adverse environmental impacts are considered). This results in the need for multiple information formats including raw data, science-based analyses and plain language analyses.

The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g., not all impacts in the oil sands region are due to oil sands development – other sources of effects may be causing the impacts). This will involve developing linkages between the information and reporting system and existing and ongoing research into causal relationships.

2.4 Principle #4: Transparent

The public information and reporting system must be transparent with respect to data collection methods, data collected, and models used for evaluation. Data should be released early as "best available" information with provisos in context with its intended application, and as "final" when appropriate.

All information and reporting needs to be made readily accessible at little or no cost to the public.

A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report should be published periodically (e.g., complete cycle for all sectors every 3 to 5 years, with specific sectors reporting each year on a rotation). A collaborative structure led by the Government of Alberta (such as described above) that oversees the development of the report as well as peer review to ensure the report is based on sound science will enhance its credibility. The report should document ecosystem changes and management efforts to avoid, mitigate or lessen impacts. It will be necessary to establish the region boundary, or otherwise make it clear the intended scope of the report.

2.5 Principle #5: Robust

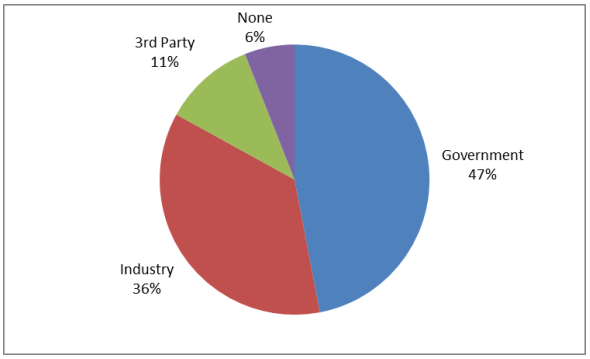
The information and reporting system should be independent with stable, long-term funding.

A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent. It is important that any improvements made do not unduly compromise the ability to compare current data to baselines (or even year to year) as this would affect the ability to document change over time. The system itself must also be flexible to be able to address the key objectives that can change over time.

3 CURRENT STATUS

The current reporting and information system is comprised of several monitoring and reporting programs that, for historical reasons, are neither comprehensive nor integrated. An outline of the current system is given in Appendix 2 and Appendix 3. The current slate of programs were developed over time, are not uniform in application or extent of monitoring, are variable in the degree of access to data, are not integrated or collaborative with each other, and have different funding and governance structures.

These deficiencies are understood by most participants in the existing monitoring and reporting system and some efforts have begun to bridge the problems. Two government initiatives are being developed, one by Alberta Environment (IMERF) and another by the Oil Sands Secretariat, which intend to address many of the issues regarding access, reporting and decision-making based on monitoring data. Some of the programs (RAMP, CEMA) are also looking to improve both transparency and the availability of data.



These efforts are both timely and necessary. According to the June 2010 OSRIN/Cambridge Strategies survey of Albertans' values regarding oil sands development, monitoring of ecological impacts was among the three most important factors in continued public acceptance of development (Chapman and Das 2010). In the 2010 survey 47% of participants believed the government was doing the monitoring, 36% believed industry was responsible and 11% were of the view that independent third parties were doing the ecological monitoring. Only

6% felt there was no ecological monitoring.

4 FUNDAMENTAL REQUIREMENTS FOR AN EFFECTIVE INFORMATION AND REPORTING SYSTEM

To be relevant and credible, any information and reporting system for the oil sands region will address the Key Principles and, *at a minimum*, will:

- Support local, regional and national assessment and reporting of ecosystem effects in the entire oil sands region.
- Address key objectives as expressed from a variety of sources including provincial strategies, regulations and reporting requirements for industry, regional land use plans, local communities and First Nations in the oil sands region.
- Support a business management decision process and be responsive to the needs of decision-makers so that the information and reporting is used to make timely and well informed decisions. It can do this by supporting both regulatory requirements and non-regulatory best practices, and being timely and responsive to the users of the information.
- Capture both transient events and trends to address both the long and short term needs of the various stakeholders. To do this, the system must:
    - be designed to support the need for both 'corporate' memory and public confidence in a reliable system;
    - accommodate changes implemented over time, to provide confidence in and continuity for the stakeholders to the system; and
    - ensure that slowly emerging events are reported accurately - there is benefit in cumulative effects monitoring as you learn things not expected that evolve over time.
- Be science-based and employ recognized best practices with appropriate quality assurance measures and be subject to periodic peer review. To address public perceptions of credibility, it is important that both the monitoring and reporting functions are at arm's length from and, ideally, independent of both program funders and users of the data including companies, regulators, government departments and other stakeholders. In this way, the claims of stakeholders, government and industry regarding environmental performance can be evaluated against credible data.

5 IMPROVING THE CURRENT SYSTEM

Two scenarios were developed to describe what it will take to transition the current Information and Reporting System into either an enhanced system or a world class system for the oil sands region.

5.1 Scenario I: Enhanced Information and Reporting System

Scenario I describes an Enhanced Information and Reporting System that addresses much of the information and reporting needs of the various audiences without substantially increasing the scope or expenditures of the existing monitoring system. Scenario I is viewed as an interim solution to improving the current system.

Based on the principles developed during the Dialogue, an Enhanced Information and Reporting System would build upon the existing system to achieve the objectives outlined below.

5.1.1 *Greater Integration*

The Enhanced Information and Reporting System is more integrated than the current system. Integration addresses the functions of data collection, evaluation, synthesis, and communication. It would also be useful to integrate reporting, funding, continuous improvement, administration and governance.

Integration could be achieved by instituting a common reporting structure. This could be done by merging the existing programs or establishing a single overarching entity that manages individual media-based monitoring programs but, in either case, operating them under a common collaborative governance mechanism. Oversight and a clear mandate will be needed to integrate and amalgamate when it makes sense to do so: the current programs are a disparate assemblage with wide variation of monitoring, data analysis, location, operational form, reporting, management, governance and mandate - it will be necessary to address these disparities to provide a comprehensive and coherent reporting system.

A collaborative governance mechanism will be established that includes government, industry, First Nations, academia and non-government organizations. The governance mechanism should not be involved in detail or design of the system to ensure objective science. Ideally, to ensure wide-spread credibility, the governance mechanism will be independent of, but responsive to, the stakeholders and funders.

It is essential to ensure critical separations are made between data providers (monitoring) and the users of data (reporting) in the integrated system to ensure independence.

5.1.2 *Reliable, Stable Funding*

Stable, long term committed funding will raise the credibility of the Enhanced Information and Reporting System, allow for forward planning and support better decision making. Funding needs to be at the level necessary to achieve the objectives of the program (and accommodate the changes that are necessary over time). There is no intent to increase the amount of monitoring in this scenario other than as required by regulation.

Potential options to achieve stable funding include a mandatory levy on industrial activity or direct provincial funding. The allocation of funding would likely be for core monitoring paid for by all and site-specific monitoring paid for by the entities responsible for specific sites (however the site-specific monitoring information is also provided to the Enhanced Information and Reporting System to ensure regional reporting is comprehensive).

It is important to recognize that industry monitoring costs are eligible expenses for royalty calculation purposes (i.e., they reduce royalties payable), which means that the public is ultimately paying for a portion of the costs when industry pays for monitoring. One implication is that the amount of monitoring and reporting can be established at the level commensurate with the public's need for assurance and willingness to pay based on the perceived need.

Routine program reviews should be conducted to ensure that the funding is efficiently and effectively deployed.

5.1.3 *Improved Access to and Understanding of Data*

The Enhanced Information and Reporting System improves both access to the data and understanding of the implications of the data.

The Enhanced Information and Reporting System will be more transparent with respect to data collection methods, data collected, and the models used for evaluation. This will require disclosure of information and interpretation methods that is both understandable and provides context to stakeholders. Moreover, the information will be readily accessible at little or no cost to the public (for some existing programs there are additional steps required to gain access to data; it is also not easy to get access to data submitted to government as part of regulatory requirements).

Improving access will most likely be best achieved by self-service access to data, which will also help address concerns regarding the costs of meeting data requests. In addition, an ombudsman for data requests could be considered to facilitate access prior to the establishment of a more effective mechanism.

5.1.4 *Improved Reporting and Communication*

Currently, it is often difficult to access the information being collected due to issues of confidentiality or proprietary ownership.

An effective way to significantly improve reporting and communication would be to regularly publish a fully integrated *State of the Environment Report for the Oil Sands Region* synthesis document for all monitoring systems (no such document is currently available). This report can be the main integrating tool for the various monitoring programs across all media (air, water and groundwater). The report should document ecosystem changes and management efforts to avoid, mitigate or lessen impacts. A current index of environmental integrity similar to Alberta's Air Quality Index[2] (e.g., good, fair and poor) should be reported along with explanatory text for context. The report should include environmental forecasting where trends show some indicators are improving, some with no significant change, and some deteriorating.

[2] See WBEA http://wbea.org/content/view/29/198/

The report's credibility will be enhanced by a collaborative governance structure that oversees the development of the report and a peer review process that ensures the report is based on sound science.

Due to the magnitude of the task, it may be necessary to cycle through all the media every three to five years, with specific media reporting each year on a rotation.

5.1.5 *Causal Relationships*

The causal relationships of ecosystem effects need to be better understood to avoid misinforming the public (not all impacts in the oil sands region are necessarily due to oil sands development and other sources of effects may be causing the impacts) and so that important information is directed to appropriate decision-makers. This will require establishing a scientific investigative function. As with the monitoring and reporting functions, the investigative/interpretive science function responsible for determining cause-effect evaluations should operate independently.

Overall, it is critical to recognize that providing context is as important as enhanced interpretation – the data, information and reports need to be interpretable by a wide audience.

5.2 Scenario II: World Class Information and Reporting System

Scenario II addresses what it will take to create a World Class Information and Reporting System in the oil sands region. In addition to implementing all attributes of the Enhanced Information and Reporting System (above), this will be achieved by meeting the criteria outlined below.

5.2.1 *Comprehensive System*

The World Class Information and Reporting System consists of:

- Monitoring infrastructure that allows for collection and analysis of environmental samples at the right locations and at the right frequency (this will include stationary and mobile infrastructure);
- Technical support infrastructure that allows for the analysis and interpretation of the sampling data;
- Reporting infrastructure that takes the data and makes them available in real time and in useable formats for stakeholders (the form of data will likely vary depending on the user); and
- Governance structure that is transparent and provides assurance to the stakeholders that the results can be trusted.

5.2.2 *Independent and Responsive*

Independence is achieved by establishing an independent organization such as a not-for-profit company or society that is at arm's-length from both industry and government and with both federal and provincial regulatory support requiring participation by industry. While being

independent, the World Class Information and Reporting System will be responsive through the governance structure.

5.2.3 *Administratively and Operationally Integrated*

The World Class Information and Reporting System is administratively and operationally integrated. Integration is achieved by mandating and empowering this single organization to collect, interpret and report environmental data for the oil sands region. The physical extent of the "oil sands region" is clearly defined and considers the effects of all industrial and urban development, not just oil sands development.

The World Class Information and Reporting System has the mandate to:

- gather environmental data;
- disseminate environmental data and interpretations of the data;
- release information and discuss results with stakeholders and media pursuant to internal governance guidelines;
- inform regulators, industry and other stakeholders when human health or environmental thresholds are reached;
- investigate and test new monitoring and reporting methods for potential incorporation into the System;
- evaluate and respond to claims of human health or environmental effects by stakeholders; and
- educate stakeholders on environmental monitoring and the results of the program.

A less effective (interim) solution to integration could be an independent organization charged with integrating the information collected by existing monitoring programs (e.g., from ABMI, WBEA, RAMP, CEMA).

5.2.4 *Transparent and Collaborative Governance Structure*

The governance structure is transparent and provides assurance to the stakeholders that the results can be trusted. The governance structure will be a collaborative mechanism that ensures all relevant parties have a voice in program design (including government, industry, First Nations, academia and non-government organizations). The governance structure will include:

- arms-length peer-review of methods and results that is made public and that requires the monitoring program provide public responses to the review;
- carefully evaluates the impacts of changes to, additions to or deletions from the System goals and functions to identify the impacts of the change on the mandate and scientific credibility of the organization;

- clearly separates the monitoring and reporting function from the decision-making and rule-setting functions, but at the same time is responsive to the needs of the decision-makers;
- includes mandatory ongoing training of personnel; and
- includes mandatory ongoing maintenance and updating of infrastructure.

5.2.5 *Reliable, Stable Funding*

Funding is provided either from multiple levels of government (federal, provincial) and industry (through a mandatory levy) or a combination of both. The sale of information products can augment revenues, but must not be relied upon for core funding and must not unduly restrict access to data by the public. The funding system will be transparent as to the source of the funds.

5.2.6 *Fully Integrated Across Media*

The World Class Information and Reporting System will include:

- gathering basic environmental information that is used in the assessment and interpretation of other monitoring data (e.g., climate, river flow, lake levels, etc.);
- gathering specific environmental information that is intended to determine potential effects of industrial development (e.g., air quality, surface water quality, groundwater quality, groundwater quantity, fish and wildlife, vegetation, soils, human health, etc.); and
- regional environmental monitoring programs undertaken by arms-length bodies and the site-specific monitoring required by government (AENV, ASRD, ERCB) that is carried out by individual companies.

5.2.7 *Ease of Access to and Clear Understanding of Data*

The World Class Information and Reporting System provides both ease of access to the data and clear understanding of implications arising from the data. This is done via a fully integrated *State of the Environment Report for the Oil Sands Region* synthesis document (see section 5.1.4 above for details). This report will discuss not only status and retrospective events, but will also forecast impacts and implications with possible mitigating strategies. This report will also compare predictions from environmental impact assessment reports and approval applications with actual impacts to allow improvement in the predictive tools.

5.2.8 *Reporting and Communication*

Excellent reporting and communication is a cornerstone of the World Class Information and Reporting System. Access is delivered through a single, integrated, web-based reporting system that provides both raw and analyzed data (elements of this approach are being developed by both Alberta Environment and the Oil Sands Secretariat). For example, this integrated portal could

provide access to all oil sands environmental information by making all project documentation available on-line.

The reporting system will provide data, as close to real time as possible, in a variety of forms and formats that meet the needs of various stakeholders. The data will:

- be available on-line;
- have clearly articulated descriptions of how they were collected and what they mean and what should and should not be done with them; and
- will include all of the monitoring information collected in the region.

5.2.9 *Causal Relationships*

Causal relationship understanding is accomplished by establishing a significant independent scientific and investigative capacity that will examine both ecosystem effects and human health linkages. This capacity may be achieved by integrating various research activities across the province in addition to internal staff.

The data base will include historical data wherever possible and build on existing information rather than starting fresh.

5.2.10 *Understandable Information*

Information and data are provided in context so that both the public and decision-makers understand the implications without 'spin'. This requires:

- establishing capability to impartially interpret data;
- establishing benchmark indicators, thresholds and performance standards to measured against (including filling gaps as necessary);
- using a risk-based approach where the likelihood and consequences of adverse environmental impacts are considered; and
- making data available in multiple formats including raw data, science-based analyses and plain language analyses to serve the needs of a wide range of users.

5.2.11 *Operational Performance*

Operational performance of the World Class Information and Reporting System is of the highest standard. All processes and practices are reviewed and verified by independent review. Information gathering, analysis and reporting will be standardized with consideration that a certified framework such as ISO or CSA be used or adapted where appropriate.

5.2.12 *Continuous Improvement*

The World Class Information and Reporting System employs the principles of continuous improvement to ensure that the World Class System remains relevant, credible and understandable. It is important that any improvements do not unduly compromise the ability to

compare current data to baselines (or even year to year) as this would affect the ability to document change over time. The system itself must also be flexible to address the key objectives that can change over time. An appropriate training system is in place ensuring quality and continued upgrading of skills.

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7 GLOSSARY OF ACRONYMS IN THIS REPORT

ABMI	Alberta Biodiversity Monitoring Institute
AENV	Alberta Environment
AOSR	Athabasca Oil Sands Region
ASRD	Alberta Sustainable Resource Development
C&R	Conservation and Reclamation
CCME	Canadian Council of Ministers of the Environment
CEMA	Cumulative Environmental Management Association
CONRAD	Canadian Oilsands Network for Research and Development
CSA	Canadian Standards Association
EC	Environmental Canada
EIA	Environmental Impact Assessment
ENGO	Environmental Non-Government Organizations
ERCB	Energy Resources Conservation Board
FMA	Forest Management Agreement
FTIR	Fourier Transform Infrared spectroscopy

GHG	Greenhouse Gas
GoA (GOA)	Government of Alberta
GOC	Government of Canada
GTA	Greater Toronto Area
IFN	In-stream Flow Needs
IMERF	Integrated Monitoring, Evaluation and Reporting Framework
IRC	Industry Relations Corporation
ISO	International Standards Organization
NGO (see ENGO)	Non-Government Organizations
OSIP	Oil Sands Information Portal
OSLI	Oil Sands Leadership Initiative
OSRIN	Oil Sands Research and Information Network
PADEMP	Peace Athabasca Delta Environmental Monitoring Program
RAMP	Regional Aquatic Monitoring Program
SARA	*Species at Risk Act*
SoE	State of the Environment
SRD (see ASRD)	Sustainable Resource Development
TEEM	Terrestrial Environmental Effects Monitoring
TMJWG	Terrestrial Monitoring Joint Working Group
WBEA	Wood Buffalo Environmental Association

APPENDIX 1: Guiding Assumptions for Developing an Effective Public Information and Reporting System for Ecosystems in the Oil Sands Region

The following list of guiding assumptions is intended to more accurately describe the thinking leading up to this report.

1. The federal government also has an important role and obligation with respect to monitoring and reporting (for example, to address trans-boundary impacts, fish habitat, species at risk, migratory birds, Aboriginal health, etc.). It is important that the federal government and government of Alberta work together to compliment each other's roles and avoid duplication.
2. Public confidence that an adequate and effective system of information and reporting is in place to detect and report on ecosystem effects is a critical element of ensuring the social license to develop the oil sands and to inform responsible decision-making. Public confidence will be gained if the information and reporting system is based on sound science and is used to support decisions regarding oil sands development.
3. Various monitoring programs exist (see Appendix 2) but the programs do not appear to be coordinated, and their results are not always easily accessible to the public and/or are considered proprietary. Historic monitoring data were collected for different purposes and it may not be possible to simply bring this together to evaluate ecosystem health in a science-based manner.
4. The variety of ecosystem effects are not known or are poorly known in the region subject to oil sands development.
5. Although monitoring is occurring, it is not generally known what the current information and reporting 'system' is, and whether it is effective. At a minimum, the current system needs to be better communicated with improved access to data and information. Ideally, there should be a single point of contact where the public can easily obtain information.
6. The current monitoring and reporting of cumulative ecosystem effects is regarded with skepticism by some stakeholders. This may be because they:
   - regard both government and industry as lacking credibility; and/or
   - feel the information and reporting is not open and transparent; and/or
   - feel the current system is not tailored to measuring ecosystem effects in a credible manner.
7. Credibility would be enhanced if stakeholders felt that an adaptive management framework is in place to evaluate measured impacts relative to the predicted impacts to confirm that they are accurately measured and reported, and then where necessary adjust the predictive models and implement remedial actions.
8. There is a view that industry should bear the costs of monitoring (either directly or indirectly via revenues paid to government), but that the goals and methods need to

be set by government in consultation with others (industry, stakeholders, First Nations, academia, etc.) so that quality data are produced. Another perspective is that government should play a more active role in broad regional monitoring and to ensure an effective overall monitoring system is in place.

9. The cost of an adequate and effective public information and reporting system needs to be established in the context of what is appropriate given the scale of oil sands development and associated ecosystem effects, providing that an acceptable base level is achieved and maintained.

10. Integration of various monitoring programs into a coherent and streamlined information and reporting system that is regularly and openly validated by peer review would substantially increase public confidence in environmental performance and reports of cumulative impacts. The reporting needs to be simple but underpinned with sound science. In some cases, existing monitoring programs will need to be augmented.

11. Raw scientific and operational data alone are often not useful to the public and decision-makers due to a variety of issues:
    - Inadequate context (how does this piece of information fit into the picture?),
    - Communication difficulties (use of scientific jargon, interpretation of statistical data, etc.)
    - Lack of ease of access (where only reported to government and not readily available to the public, in conference proceedings, etc.).

    These issues need to be addressed for scientific data to become a useful information source to the public and decision-makers.

12. Transparency will be critical to a successful public information portal: both the data and the interpreted results should be made more readily available. This should also be supported by communication to enhance public awareness regarding key findings.

13. Thresholds, goals and objectives are needed to inform the information and reporting system and these would stem from the documents such as the Oil Sands Strategic Plan and the Lower Athabasca Regional Plan.

14. Information and reporting needs to be provided in the context of risk management. The reporting should be in context of the risk of the contaminants to ecosystem and human health.

15. It is possible to develop a solution, a set of solutions or a set of scenarios regarding an adequate and effective public information and reporting system that will satisfy the vast majority of stakeholders.

16. The information and reporting system will be based on sound science as a core principle. Community-based and traditional knowledge should constitute part of a

comprehensive information and reporting system: this would enhance confidence within aboriginal communities that the system addresses their interests.

APPENDIX 2: Partial List of Ecosystems Effects Monitoring Programs Active in the Oil Sands Region

Currently a series of independent monitoring programs are in place in the oil sands region (see Lott and Jones 2010 for more details on many of these programs). These programs are operated by different organizations and funded by a variety of sources in industry and government.

- Water quantity and quality are monitored regionally by the Regional Aquatic Monitoring Program (RAMP), which is funded largely by the oil sands industry. www.ramp-alberta.org/RAMP.aspx
- Air quality and pollutant deposition is monitored by a series of stations operated by the Wood Buffalo Environmental Association (WBEA). WBEA also monitors acid deposition. WBEA's largest program is in Terrestrial Environmental Effects Monitoring (TEEM). www.wbea.org
- Impacts of development on plants and animals are tracked by the government and industry funded Alberta Biodiversity Monitoring Institute (ABMI). This program is currently of limited scope. www.abmi.ca/abmi/home/home.jsp
- Alberta Environment maintains its own aquatic monitoring system which encompasses part of the oil sands region, and through its Integrated Monitoring, Evaluation, and Reporting Framework (IMERF) intends to facilitate better integration. Work underway with IMERF and the development of an Oil Sands Information Portal are intended to improve access to information.
- Other potential monitoring information sources include the federal government (e.g., National Pollutant Release Inventory, National Forest Inventory, State of Environment reporting, and State of Forests reporting), Alberta State of Environment reporting and its approach to Regional Strategic Environmental Assessment. The extent of these programs needs to be determined.
- CONRAD through the Wildlife Habitat Effectiveness and Connectivity Program. www.conrad.ab
- PADEMP – Peace Athabasca Delta Environmental Monitoring Program (considering regional impacts in the Delta).
- AENV Oil Sands branch monitoring initiatives that fall under various management frameworks. These are related to IMERF but are being developed independently: groundwater, surface water, air, reclamation and disturbance.
- Sustainable Resource Development in partnership with several oil sands developers have initiated a Terrestrial Monitoring Joint Working Group (TMJWG). The purpose of the group is to design a regional monitoring system that will contribute to standardized and systematic approach with ABMI as the foundation for the integrated monitoring program.

- Considerable monitoring is undertaken by oil sands companies that are reported to government.
- The Cumulative Environmental Management Association (CEMA) has mandate to study the cumulative effects of industrial development in the Wood Buffalo region, and currently is being expanded to review impacts of the IFN Phase 2 Framework. www.cemaonline.ca/
- The Fort McKay Industry Relations Corporation (IRC) is very interested in monitoring and taking a collaborative approach and is undertaking activities aimed to be credible locally and to a broader audience.

APPENDIX 3: Current Status of Some Existing Environmental Effects Monitoring Programs (as of June 2010)

The following updates were provided at the June 2010 Integrated Monitoring and Reporting Workshop.

Integrated Monitoring, Evaluation and Reporting Framework (IMERF)

Susan Johnstone with Alberta Environment provided a brief update on the IMERF project. The project started about a year ago in response to issues similar to those that prompted this Dialogue. IMERF is intended to be a principle-based framework where both spatial and temporal integration is envisioned. A key driver is to help ensure key information is available to support decisions made by Alberta Environment. Part of the data management will be a quality classification. Alberta Environment prepared a draft Framework in October 2009. The intent is that in general the data would be publicly available although some information may be withheld should it be necessary to address the protection of privacy. Overall, IMERF's goals and background are very similar to those noted by OSRIN in support of this Dialogue.

Regional Aquatics Monitoring Program (RAMP)

Fred Kuzmic provided an update on RAMP. RAMP was initiated in 1997 with a multi-stakeholder oversight including industry and government, and initially also First Nations. RAMP is primarily funded by industry with focus on lakes and rivers. Baseline conditions are monitored to ascertain the natural range of variability. Baseline conditions are monitored to ascertain the natural range of variability, and then monitored during the subsequent development to ascertain trends and to compare them with EIA predictions. A community component of RAMP assesses fish. Consultants are hired to run RAMP and technical committees are formed to help ensure proper scientific design. In 2004, a peer review was completed and RAMP is addressing issues raised. The design and rationale for the program is provided in a comprehensive 600 page document. Another peer review is currently underway.

One of the recommendations from the current review might be that RAMP data be made more publicly available (the concern in the past was that companies who are not contributing financially to RAMP would get free access to use the data which could undermine the financial support needed for the program).

About $4 million is spent each year on fish, benthic/invertebrate, sediment, water quantity and quality, and acid-sensitive lake work. Companies can choose to be a part of RAMP, and pay for the data collected to support their operations, or can opt to do their own data collection. RAMP is currently not a legal entity but going that route is under consideration.

Responsible Actions: A Plan for Alberta's Oil Sands

Jennifer McGill, Oil Sands Secretariat, summarized some of the follow-up activities stemming from the 2009 report *Responsible Actions: A Plan for Alberta's Oil Sands* (Government of Alberta 2009). One of the challenges was how to measure 'being responsible': what data should be collected and how should stakeholders be involved? Twenty-two national and international programs were reviewed that addressed social, economic and environmental indicators. Via

review with stakeholders, 31 indicators were initially identified. About 80% of the indicators have existing data. The Secretariat is currently in the process of validating the indicators and gathering information regarding them. In Fall 2010 they expect to have baseline data collected publicly available. A challenge being addressed is how "to connect the dots regarding the indictors and supporting data in order to tell a story". The intent is to provide a regional perspective and to have access to the information via GeoDiscover Alberta.

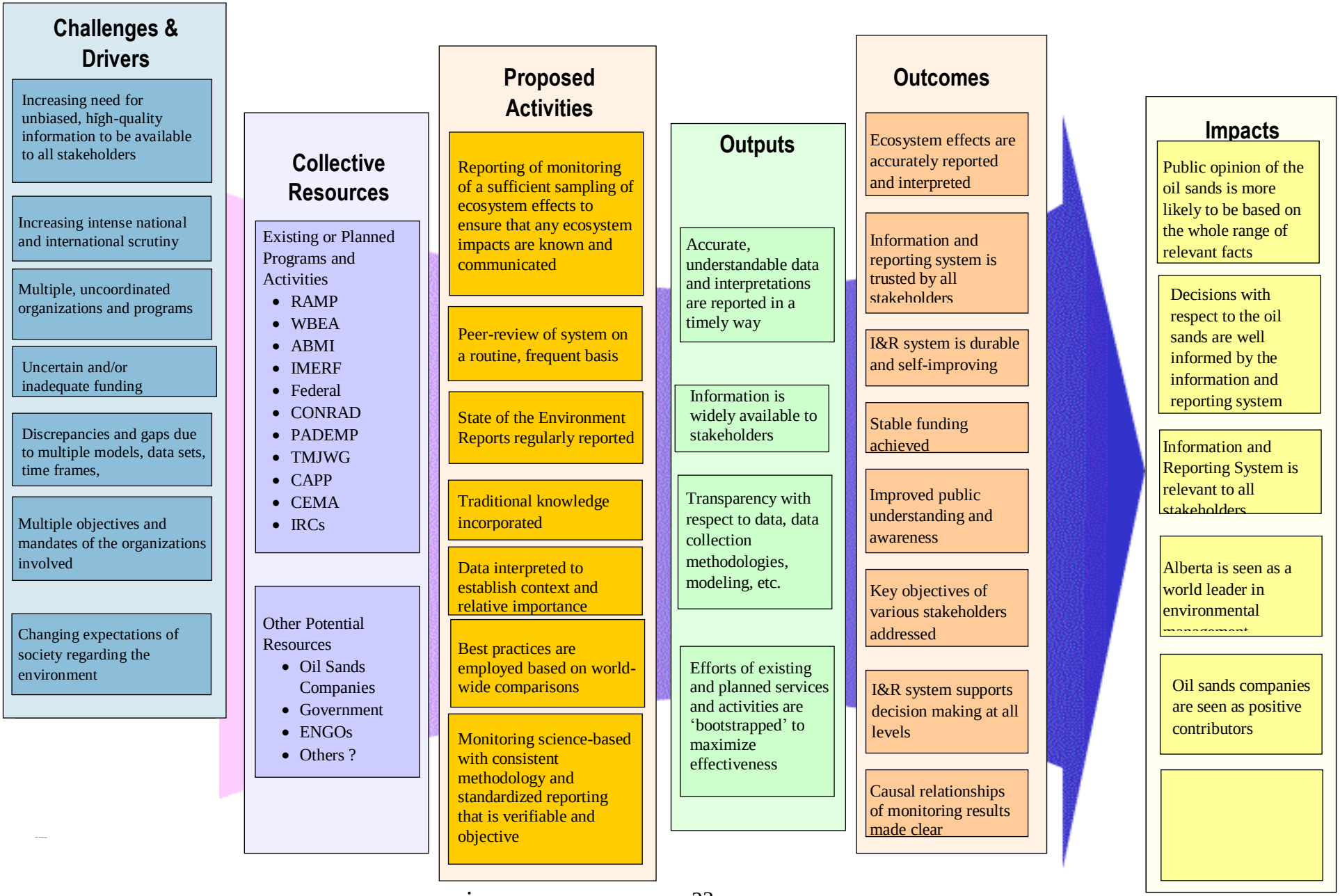
Alberta Biodiversity Monitoring Institute (ABMI)

Jim Herbers, ABMI, provided a brief update on ABMI as it relates to the oil sands area. Monitoring efforts in northeast Alberta have been undertaken to support approvals under the Environmental Protection and Enhancement Act (EPEA). The information collected helps support a company's environmental impact assessments (EIAs). Regarding this effort, developing a vision on how the data could be more broadly used might improve the transparency considerations with approvals.

Cumulative Environmental Management Association (CEMA)

Fred Kuzmic provided an update on CEMA. CEMA is involved in data collection but not monitoring. CEMA includes a Traditional Environmental Knowledge (TEK) component, and a strong communications aspect. The Board overseeing CEMA is representational with four from industry, four from government, four from First Nations and four from NGOs. Currently, there is not really a cumulative impact program in place. Industry invests about $19 million per year collectively to CEMA, RAMP, WBEA and related programs. It was noted that it is hard to get data from CEMA but that CEMA recognizes this and is trying to deal with it.

APPENDIX 4: Draft Logic Model for the Information and Reporting System



APPENDIX 5: Mapping of Key Findings to Principles and Elements

This table maps the recommendations collected from Workshop participants to the relevant Key Principles required to build an effective Information and Reporting System. The recommendations are grouped into two categories: the upper (white) group is for the Enhanced System and the lower (blue) group is for the World Class System.

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System
Principle #1: Relevant	1. The information and reporting system needs to address key objectives (e.g., as expressed from a variety of sources including provincial strategies, regulations and reporting requirements for industry; regional land use plans; local communities and First Nations).	• Monitoring programs can support both regulatory requirements and non-regulatory best practices • Issue: Important to document why the program is designed the way it is (and why modified over time) for corporate memory and public confidence
		• Need assessment and gap analysis beyond province to address questions being raised by people outside of province • The entity can set monitoring standards for other activities such as environmental impact assessments (potentially including assessment of GHGs) • System needs to be designed to address different 'scales' of question: at provincial and national level, and a regional level
	2. The information and reporting system must support a business management decision process and be responsive to the needs of decision-makers so that the information and reporting is used to make timely and well informed decisions.	• Need to be responsive to who needs information and when it is needed • The program should be substantiated (defended) from two perspectives: national/global and regional/site scales • System is only as strong as its weakest link with respect to credibility
		• The entity should be responsible for all kinds of monitoring except the regulatory monitoring that industry does • Differentiate between monitoring and decision-making – keep them separate • The entity would inform regulatory agencies, companies and public when issues arise (e.g., raise 'red flags' where agreed to thresholds have been breached), and report on actions • The entity should in fact be 'all things to everyone' in that it can respond to various questions raised at different scales of interest/concern • Delegated authority for monitoring under legislation/regulation is a potential vehicle to make this happen

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System
		• Need to carefully design a world class system; getting it right will likely take more than a year • The benefits of providing proactive information need to be made clear (e.g., the value with improved science-based knowledge)
	3. Reporting should capture both transient events and trends to address both the long and short term needs of the various stakeholders.	• There are probably more gaps in information than inefficiencies with current system • Legacy programs – need for continuity and public confidence which suggests program should carry on; only stop if confident the information will not be needed • System needs to be flexible with acknowledgment that requirements may change to address use of data in the future
	4. The information and reporting system needs to support local, regional and national assessment and reporting of ecosystem effects.	• Need an extension arm as exists for Agriculture • Monitoring design should be with the province in mind that can be more detailed to fit the operational needs of northeast Alberta where oil sands development is occurring
Principle #2: Credible	5. Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices with appropriate quality assurance measures applied and subject to periodic peer review.	• The claims of government and industry regarding environmental performance need to be backed up with data • To address public perceptions, it is important that data providers are at arm's length, that the client (data user) does not affect the kind of information being collected and reported, and that monitoring that is separate from government regulatory bodies
	6. Information, including monitoring, needs to be reviewed and verified. Information gathering, analysis and reporting should be standardized with consideration that a certified framework such as ISO or CSA be used or adapted where appropriate.	• Need to invest time in design up front to address statistical validity, scale, etc. • Monitoring and reporting should be at media level including assembly of information and communication • May be an external integrator might see things in the weeds that information providers don't see • Potential problems with misuse of metadata underscores need for quality control so that data are not taken or used out of context • Also issue with proprietary data and ability to use and access this information • Current quality of information is variable
		• Does ISO world class monitoring structure exists that we can consider or use? • A technical (peer review) committed can assist

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System
	7. A collaborative structure providing oversight involving government, industry, First Nations, academia and non-government organizations will enhance credibility of an information and reporting system	• Potential to integrate monitoring program operations • Administrative integration of monitoring programs another consideration • Integration considerations include reporting, funding, continuous improvement, and governance (e.g., a corporation involved in information and reporting) • Oversight is needed to integrate and amalgamate when it makes sense but don't unnecessarily integrate where it does not make sense • Regarding organization and governance, do you combine information and reporting programs or do you preserve the existing entities; what would be role and mandate of an overarching body; separate by media (air, land, water, biodiversity). • The functions of data collection, evaluation, synthesis, communication and application need to be made clear with critical separations made between data providers and use of data to support decision making • Integration of monitoring and reporting should involve communities • External integration at high level with First Nations/stakeholder involvement providing oversight but not involved in detail or design; science by committee is bad
		World Class Integration necessary • Provides logistical and operational efficiency • Allows reporting of media interactions (correlative aspect) • Media not independent – need to be looking for holistic relationships Options To Consider: *Model 1*: An integrating body reports on information collected by existing monitoring programs (e.g., ABMI, WBEA, RAMP) *Model 2*: One single organization runs entire information and reporting system for all media • An independent entity is needed to deliver a world class system • Strategic partnerships with existing monitoring programs (such as ABMI), industry (such as via CAPP), and NGOs (e.g., Alberta Conservation Association, Pembina Institute) are needed

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System
		• Although independent from decision-makers, the monitoring program needs to respond to client needs such as decision-makers regarding the types of information needed (arms-length data providers with clear linkages to decision-making so that the interface between information and decision-making is actively managed; similar to researchers who need to be responsive to their customers/clients) • Multi-stakeholder oversight should be provided (with board structure) • Oversight review committee (e.g., industry/government) needed to help steer system Entity needs to be arm's length and provide credible data; be independent with external recognition or certification • An institute could be formed that provides oversight, research capability, and that does the monitoring; test monitoring techniques (research arm) before making operational • The institute or university should be self-contained where system design, synthesis, quality assurance/quality control, interpretation, evaluation and release of information using newest technology available can be effectively delivered • Concern will be fear of losing current programs • Need significant political leadership to make this happen • A commitment and structure is needed at a high level to make this happen (e.g., federal and provincial government buy-in at the deputy minister level)
Principle #3: Understandable	8. Complex science-based information needs to be interpretable, and interpreted, so that the public and decision-makers understand its meaning (e.g., using "plain language" rather than scientific terms; using a risk-based approach where the likelihood and consequences of adverse environmental impacts are considered). This results in the need for multiple information formats including raw data, science-based analyses and plain language analyses.	• Important to separate benchmark indicators and thresholds ▪ There is issue of integration across various users of information as well as integration across various media (land, water, air) ▪ Monitoring design may be different for valid reasons ▪ Purpose/objectives of monitoring are different which can be barrier to integration • Need to be careful regarding how data are packaged without 'spin' • Performance standards and indicators needed to report against • Need for data standards to encourage appropriate use • Do some core (basic) interpretations but allow others to interpret based on availability of raw data • Need in-house capability to do interpreting • Need mechanism to ensure impartial interpretation e.g., give an impartial third party group the funding to interpret who do not have a conflict of interest

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System
		• A potential barrier is developing a comprehensive system that can deal with the complexity of ecosystems • *Issues* ▪ We are not using the data we are currently capturing ▪ Lack of benchmarks ▪ Collection of key indicators
		• Active interpretation of data needed • Ability to answer questions proactively (earlier) rather than reactively (after it is raised) is clear benefit • There needs to be appropriate training system in place • If we collect more or different data, we need to know why (rationale)
	9. The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g. not all impacts in the oil sands region are due to oil sands development, rather other sources of effects may be causing the impacts). This will involve developing linkages between the information and reporting system and existing and ongoing research into causal relationships.	• The investigative science part that leads to cause-effect evaluations should be a separate arm (of government) from those undertaking core and customized monitoring • Providing context is more important than enhanced interpretation • There is benefit in cumulative effects monitoring as you learn things not expected
		• Causal relationships needed to be evaluated (identify, confirm) • A problem solving investigative branch of the entity is needed • There should be a research arm • Health linkages should be part of system
Principle #4: Transparent	10. The public information and reporting system must be transparent with respect to data collection methods, data collected, and models used for evaluation. Data should be	• Who is going to do this? (government, industry, third party?) • Who is it for? What questions need answering? • There tends to be a bias against reporting with data collection specialist • More data likely being collected than being used (are data sometimes collected for the sake of data collection? Are significant amounts of data unused?)

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System
	released early as "best available" information with provisos in context with its intended application, and as "final" when appropriate.	• Information technology infrastructure has not kept pace with the amounts of data being collected • There is sometimes a 'run around' with respect to getting information from companies and government which makes it difficult for the public to access data • Ombudsman for data requests should be considered • Self-service access to data should be goal so current concerns from government about costs of meeting data requests are addressed (e.g., a common portal to all oil sands environmental information where all project documentation is available on-line). This requires changing expectations of public access to data • CEMA dataset library should be considered
		• Real time automated data should be provided with less people involved in data handling • There should be a university affiliation and extensive network built so that best global practices are applied in a world-class information and reporting system • A '24 hour a day/7 days' a week approach to responding to emerging issues • The entity should provide 'one-stop shopping' with respect to information and reporting for ecosystems for entire province (not just area subject to oil sands development) – with initial focus on the 'oil sands area' • The raw data should be available on-line • The entity should be considered a 'centre of excellence'
	11. A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report should be published periodically (e.g., complete cycle for all sectors every 3 to 5 years, with specific sectors reporting each year on a rotation). A collaborative structure led by the Government of Alberta (such as described in element #7 above) that oversees the development of the report as well as peer review to ensure	• High priority should be given to an Alberta State of the Environment report that includes areas covered by oil sands operations with annual reporting • One report such as this can help coordinate reporting on results of various monitoring programs • Questions cross environmental media • There is need to monitor groundwater • An index of environmental integrity should be considered where its state can be assessed (e.g., good, fair and poor) • There should be ability to undertake environmental forecasting where trends show some indicators are improving, some with no significant change, and some deteriorating • Should those providing information do the forecasting or should the data be made available to enable stakeholders to do it? • Are there gaps? Assessment of regulation reports? Right information being provided?

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System

	the report is based on sound science will enhance its credibility. The report should document ecosystem changes and management efforts to avoid, mitigate or lessen impacts. It will be necessary to establish the region boundary, or otherwise make it clear the intended scope of the report.	Further work required to evaluate this
		• Barriers:
		  o Complexity of ecosystems
		  o Funding/resources/capability issues
		• Issue: How do we integrate data from different sources?

		• Gap is lack of historic benchmarks; need to find proxies • Reporting frequency should be current for some components such as air quality and water flow, but less important for other components such as soil and vegetation • Access experts outside but transfer knowledge to Alberta

Principle #5: Robust	12. The information and reporting system should be independent with stable, long-term funding.	• Adequate funding needed for existing monitoring programs
		• Consider a mandatory levy to provide a fair funding system as 'price of doing business'
		• Need stable funding – either guaranteed funds to invest in information and reporting (e.g., legislatively requires this), or assured product to sell that produces stable income
		• Funding source is critical and must be available in a timely manner; stable funding raises credibility; stability also allows forward planning and better supports effective decision-making
		• Industry pays for monitoring which currently is applied as a royalty offset so in effect the public does pay
		• Concern about long-term funding; need value review to ensure good value for investment
		• Should be core monitoring where everyone pays, and additional monitoring that individuals fund
		• Barriers to stable funding include:
		  ▪ Fear that dollars spent not efficient or effective
		  ▪ Concern that may not encourage program review of merit/use/value of information collected
		  ▪ May be different monitoring needs. Needs for different purposes; should pay for universal regulations but not specialized (operator or site) requirements
		  ▪ Funding/resources/capability issues

		• Agree to business (scope of) funding • Endowment based funding can finance system • To help offset costs, a fee for service work can be charged • Challenge will be securing needed dollars to deliver a world-class system

Principles	Key Elements	Suggestions to Achieve an Effective Information and Reporting System
	13. A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent. It is important that any improvements made do not unduly compromise the ability to compare current data to baselines (or even year to year) as this would affect the ability to document change over time. The system itself must also be flexible to be able to address the key objectives that can change over time	• System needs to be flexible with acknowledgment that requirements may change to address use of data in the future

APPENDIX 6: Original Challenge Paper

The Challenge Paper *What Constitutes an Adequate Public Information and Reporting System for Ecosystems in the Oil Sands Region?* was distributed on April 6, 2010 to 70 people to solicit feedback.

NOTE: References in the Challenge Paper to *submitting comments* is now out of date as the Dialogue process has been completed; similarly, the proposed Workshop dates mentioned are incorrect as the Workshop was held in June 2010.

PURPOSE OF THIS CHALLENGE PAPER

The purpose of this Challenge Paper is to stimulate a conversation or Dialogue with a diversity of individuals and organizations interested in the responsible development of Alberta's oil sands about *What Constitutes an Adequate Public Information and Reporting System for Ecosystems in the Oil Sands Region?* The diversity of Albertans contacted to participate in the Dialogue includes individuals affiliated with aboriginal interests, academia, industry, media, and a variety of government (federal, provincial and local) and non-government organizations. The Dialogue Organizing Team in part reflects that diversity and has an interest in fostering a successful and open Dialogue.

By sponsoring this 'Information and Reporting' Dialogue, the Oil Sands Research and Information Network (OSRIN) – along with the Organizing Team – wish to initiate an exchange of ideas first electronically via this Challenge Paper and then with a Workshop which will be designed to reflect and be informed by the preceding Dialogue.

The Challenge Paper is structured as follows:

- Scope and Context: the intended scope of, and context for the Dialogue is described;
- Key Challenge: a statement of the key challenge for the Dialogue is provided;
- Background: statements of fact that provide context and represent key drivers for the challenge are offered;
- Expectations: the expected outcomes of the Dialogue are proposed;
- Assumptions: general assumptions, and assumptions regarding the scope and purpose of the Dialogue are listed;
- Principles and Elements: of an adequate public information and reporting system are examined; and
- Next Steps: in the Dialogue process are outlined.

At various points in this Challenge Paper you will be asked for your reaction and further input. Please write your responses in a separate Feedback Document (MS Word format). You are not being asked to represent the official position of your organization, but to provide your personal perspective as an individual Albertan.

Please consider what has been presented in this Challenge Paper carefully and contribute your reactions. A participant typically spends about ½ to 1 hour but please feel free to contribute as much or as little as you have time for – even 5 minutes on an issue of personal importance is valuable. **Your input is very important and will strongly influence the success of the Dialogue and Workshop.**

SCOPE AND CONTEXT

The intended scope of the Dialogue and supporting rationale are briefly described below (see 'Section 4: Assumptions – Scope and Purpose' for further discussion):

1. The Dialogue's focus is on environmental effects given OSRIN's mandate.
2. At this point in the Dialogue, the discussions should be at a relatively high level regarding information and reporting adequacy such as key principles and elements.
3. This Dialogue's audience is intended to be Albertans representing a diversity of interests to find common ground regarding what constitutes an adequate public system of information and reporting.
4. The Dialogue should focus at this stage on 'function' not 'form' i.e., what does an adequate public information and reporting system look like and not the delivery mechanism or the role of various organizations.

KEY CHALLENGE

A potentially useful perspective for addressing this Challenge Paper might be that, as a resident of Alberta, you are an owner of the oil sands resource and therefore, however indirectly, have a personal obligation and interest in ensuring the responsible development of the oil sands regarding ecosystem effects. Consequently, you need to receive and consider sufficient and credible information that gives you assurance that you are well informed to make decisions.

With that scope and context, the proposed Key Challenge for this Dialogue is:

> To describe key principles and elements of an adequate public information and reporting system that would meet your needs for assurance that potential ecosystem effects of oil sands development are known to you.

> **INPUT REQUEST #1: Please review the KEY CHALLENGE and provide your response in writing in the accompanying Feedback Form.**
>
> Consider – *Is the perspective statement meaningful to you? Do you agree with the Key Challenge? Is anything missing? Is 'adequate' the best word to describe the system required? Is anything not relevant in your view? What additional clarification would be helpful? What other ideas does the statement spark in your mind?*

BACKGROUND

A number of events have led us to our current Key Challenge. The following background statements provide a few key points to remind us of these events and to set context. The Appendix briefly describes some of the existing ecosystems effects monitoring programs in the oil sands region.

1. OSRIN has identified the concern over possible ecosystem effects as one of the key elements in sustaining the social license for Alberta's oil sands industry.

2. It is well known that many of the hydrocarbons and associated chemicals released from bitumen extraction and upgrading processes are potentially harmful to ecosystem and human health. The degree to which these constituents are entering the ecosystem through the air, groundwater, and surface water is not entirely understood. The potential for effects on ecosystems is related to the magnitude, duration and contaminant concentration in such releases.

3. Many people are concerned that mining and upgrading of oil sands may be having negative impacts on the ecosystem in the mining area.

4. Some individuals or organizations are absolutely convinced that oil sands development is producing environmental degradation. In many instances, scientifically valid investigation and evidence is either not publicly available or does not support the conclusion of impacts nor does it allow the conclusion to be discounted. There is also a wide variation in opinion of the significance of the impacts.

5. To date the public debate on the question of potential ecosystem effects related to oil sands development has been neither balanced nor informed. One perspective is that the scientific studies are in fact adequate but access and transparency to that information has not been adequate. Another perspective is that the scientific studies that are available have not been adequately used to inform the debate.

6. To address questions about potential ecosystem effects, both the Alberta Government and the oil sands industry maintain or support systems of ecosystem effects monitoring. The section at the end of this Appendix provides a brief overview of some of these monitoring programs.

7. It is not clear whether significant ecological effects are occurring in the region and whether this is because any such effect is minor or of limited scope, or because the monitoring systems are inadequate to identify the risk of such effects or evidence of actual effects.

Given the above background, OSRIN is seeking to establish, through this Dialogue and through a survey of Albertans, the key principles and elements of an information and reporting system that provide the public with assurance that potential ecosystem effects of oil sands development are

known, and can be used to inform future management action. OSRIN intends to address the degree to which existing information and reporting programs satisfy the expectations of Albertans in subsequent studies.

> **INPUT REQUEST #2: Please review the BACKGROUND STATEMENTS and provide your response in writing in the accompanying Feedback Form.**
>
> Consider – *Do you agree with the statements? Which ones do you disagree with and why? What other important information or perspectives are missing that would help inform the challenge we are addressing? What other ideas did the statements spark in your mind? Please refer to the background statement number in your response so we know which one you are referring to.*
>
> *Please feel free to inform us of monitoring and reporting programs that are not listed in the section at the end of this Appendix, as this will contribute to our understanding of the extent of programs currently in place.*

EXPECTED OUTCOMES

Expected outcomes anticipated from the Dialogue (which includes the Workshop) are that participants:

1. Gain an improved understanding and appreciation of the diverse perspectives from various individuals and organizations regarding an adequate public information and reporting system for environmental impacts;
2. Improve awareness of existing information and reporting systems currently in place in the oil sands region[3]; and
3. Develop a clear understanding and alignment about the key principles and elements required for an adequate public information and reporting system for the oil sands region.

Stretch goals are that Dialogue participants:

4. Co-create a draft model of a credible environmental and ecosystem information and reporting system; and
5. Identify information and reporting gaps that need to be addressed and warrant additional focus.

Key Expected Outcome for OSRIN: OSRIN will be capturing the key themes from the dialogue in a paper that identifies knowledge and information gaps, and new research directions. This paper will be posted on the OSRIN website. OSRIN's hope is that our record of this conversation will get more Albertans engaged in thinking and talking in an informed way about

[3] 'Oil sands region' refers to the areas where oil sands development is occurring.

solutions. We hope that all participants will get excited about the ideas generated and feed them into work underway within their own organizations.

> **INPUT REQUEST #3: Please review the EXPECTED OUTCOMES and provide your response in writing in the accompanying Feedback Form.**
>
> Consider — *Are you in alignment with these three expected outcomes? Are there any others you would like see accomplished? Do you think some of the outcomes are unrealistic? What expectations do you have for the face-to-face Workshop — as in "I would consider the Workshop a great success if..."*

ASSUMPTIONS

Please review the following list of assumptions that bear on the key challenge of the dialogue. At the end of this section, we provide the opportunity to react to these assumptions and to accept, reject, modify, or add to the list.

General

1. It is Alberta's responsibility to develop the oil sands resource and to manage that development in a "responsible manner" avoiding or mitigating negative ecosystem effects.

2. The federal government also has role, for example, to address trans-boundary impacts.

3. Public confidence that an adequate public system of information and reporting – an "assurance system" (e.g., see below regarding a continuous improvement system) – is in place to detect and report on potential ecosystem effects is a critical element of ensuring the social license to develop the oil sands and to inform responsible decision-making. Public confidence will be gained if the information and reporting system is based on biological evidence.

4. Substantial monitoring is already occurring (NOTE: see the section at the end of this Appendix) but it is not always in a format that is available to the public and/or is considered proprietary.

5. Although considerable monitoring is occurring, it is not generally known what the current information and reporting 'system' is, and whether it is adequate (i.e., at a minimum, the current system needs to be better communicated with improved access to data and information).

6. The current monitoring and reporting of cumulative ecosystem effects is regarded with skepticism by some stakeholders. This may because they regard both government and industry as lacking credibility, or feel the information and reporting is not open and transparent, or for other reasons.

7. There is general agreement that industry should bear the costs of monitoring but that the goals and methods need to be set by government, and that government should ensure quality data are produced.

8. The costs of an adequate public information and reporting system needs to be in the context of what is affordable given the potential scale of oil sands development.

9. Integration of reporting from the various monitoring programs into a single, coherent, streamlined information and reporting system that is regularly and openly validated to the standard of peer review would substantially increase the confidence of the public in environmental performance and reports of cumulative impacts. International peer review is already part of the development and as part of the periodic verification of monitoring programs in the oil sands region.

10. Raw scientific data alone are often not useful to the public due to a variety of issues:
    - Inadequate context (how does this piece of information fit into the picture?),
    - Communication difficulties (use of scientific jargon, interpretation of statistical data, etc.)
    - Lack of ease of access (e.g., where only reported to government and not readily available to the public).

    These issues need to be addressed for scientific data to become a useful information source to the public.

11. Transparency will be critical to a successful public information portal: both the raw data and the interpreted results should be made more readily available.

12. The perception of risk is a key confounding factor. For example, as the ability to monitor increases, the presence of lower and lower levels of contaminants is more easily determined. The reporting of only the raw data is thus insufficient as the risk of these contaminants causing significant effects must be placed into context of the thresholds for impact and the carrying capacity of the environment to the contaminants.

13. It is possible to develop a solution, a set of solutions or a set of scenarios regarding an adequate public information and reporting system that will satisfy greater than 80% to 90% of the stakeholders.

14. Community-based and traditional knowledge would constitute part of an effective monitoring system.

Scope and Purpose:

15. Although responsible development and sustainability typically considers economic, social and environmental factors, given OSRIN's mandate and need to provide the

Dialogue with focus, the scope of this Dialogue should be on environmental and human health concerns (related to air, water and land) with particular focus on environmental information and reporting of ecosystem effects.

16. Greenhouse gas (GHG) emissions and carbon accounting related to oil sands development is an important issue but outside of OSRIN's mandate and therefore outside the scope of this Dialogue. That said it is important that this topic be addressed by other venues such as Alberta's GHG Reporting Program.

17. At this point in the Dialogue, the discussions should be at a relatively high-level. For example:
    - What are the key drivers, objectives, principles, strategic outputs for an adequate public information and reporting system?
    - How can those strategic outputs contribute to desired outcomes and broader societal goals?

18. At this point in the Dialogue, we should avoid detailed discussions of specific indicators (e.g., what species to monitor, what water parameters need to be measured) that might need to be monitored. Those discussions can happen once there is alignment regarding an overall integrated public information and reporting system.

19. The Dialogue's focus at this juncture should be for Albertans representing a diversity of interests to find common ground (alignment) regarding what constitutes an adequate public information and reporting system for ecosystem effects in the oil sands region. Once this is attained, we can share these views with a broader audience outside the Province and if necessary expand the Dialogue.

20. The Dialogue should focus at this stage on 'function' not 'form'. That is, we will strive to achieve alignment on what an adequate public information and reporting system might look like, as opposed to detailed delivery model options (i.e., this Dialogue is neither about the specific roles of any particular organization nor about the technologies employed). These latter topics will be informed by the former (i.e., form follows function, not the other way around).

21. It is expected that the Dialogue would address:

    - The requirements for an information and reporting system that produces sufficient, highly credible scientific data to ensure that the environmental impacts of oil sands operations are known; and
    - Determining that the local, regional and international publics are satisfied that the information and reporting system is sufficient such that potential ecosystem effects of oil sands development are known.

INPUT REQUEST #4: Please review the ASSUMPTION STATEMENTS and provide your response in writing in the accompanying Feedback Form.

Consider – *Are you in alignment with these Assumptions? If not, which ones do you disagree with and why? Do any confuse you and require clarification? What other key Assumptions need to be added that are missing? Are there any that you would modify, expand, contract, etc.? Please refer to the assumption number in your response so we know to which one you are referring.*

KEY PRINCIPLES AND ELEMENTS OF AN ADEQUATE PUBLIC INFORMATION AND REPORTING SYSTEM FOR ECOSYSTEMS IN THE OIL SANDS REGION

The purpose of this section is to explore the key principles and elements that are required for an adequate public information and reporting system for ecosystems in the oil sands region.

'Straw-Dog' Public Information and Reporting System

Key Principles

The identification of key principles and elements can help ensure that public information and reporting system is adequate and therefore publicly acceptable. Key principles would, at the least, include:

1. Relevant (e.g., addresses key objectives, supports decisions)
2. Credible (e.g., science-based, verifiable, collaborative)
3. Transparent (e.g., publicly available, timely reporting)
4. Understandable (e.g., increases public awareness, causal relations understood)
5. Robust (e.g., durable, continuously-improving)

Exploration and Identification of Key Principles and Elements

The following are some statements about proposed elements that support each of these potential key principles. It should be noted that some of these elements may describe current practice (i.e., what is proposed is already being done) whereas in other situations they describe a proposed desired future outcome (i.e., a gap in the information and reporting system that may need to be filled).

Principle #1: Relevant

Elements:

1. Information and reporting needs to address key objectives (e.g., as expressed from a variety of sources including provincial regulations and strategies; regional land use plans; local communities and First Nations).

2. The information and reporting system needs to address the needs of decision-makers and be readily available so that decisions can be made in a timely and well informed manner.

3. The reporting should be timely, and capture both transient events and trends in order to address both the long and short term needs of the various stakeholders.

4. Both local and regional needs will be addressed.

Principle #2: Credible

Elements:

5. Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices with appropriate quality assurance measures applied and subject to periodic international peer review.

6. Information, including monitoring, needs to reviewed and verified and should be standardized and certified through an appropriate framework such as ISO or CSA.

7. A collaborative structure providing oversight and integration – involving government, industry, First Nations, academia and non-government organizations – will enhance credibility of an information and reporting system.

Principle #3: Understandable

Elements:

8. Complex science-based information needs to be interpretable so that the public and decision-makers understand its meaning (e.g., using "plain language" rather than scientific terms; using a risk-based approach where the likelihood and consequences of adverse environmental impacts are considered). This may result in the need for multiple information formats – including raw data, science-based analyses and plain language analyses.

9. The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g., not all impacts in the oil sands region are due to oil sands development, rather other sources of effects may be causing the impacts).

Principle #4: Transparent

Elements:

10. The public information and reporting system must be operated with complete openness and transparency with data collection methods, data, models, information and reporting readily accessible to the public.

11. A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report should be published annually for the oil sands region. A collaborative structure (such as described in element #7 above) that oversees the development of the report will enhance its credibility.

Principle #5: Robust

Elements:

12. A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent.

Some Thoughts on Continuous Improvement

Responsible development of the oil sands resource requires an overall management framework that fosters continuous improvement (learning by doing). The Deming Cycle of Plan-Do-Check-Act is frequently used to describe a continuous improvement management framework and can help provide guidance for developing an adequate public information and reporting system in the context of the responsible development of the oil sands.

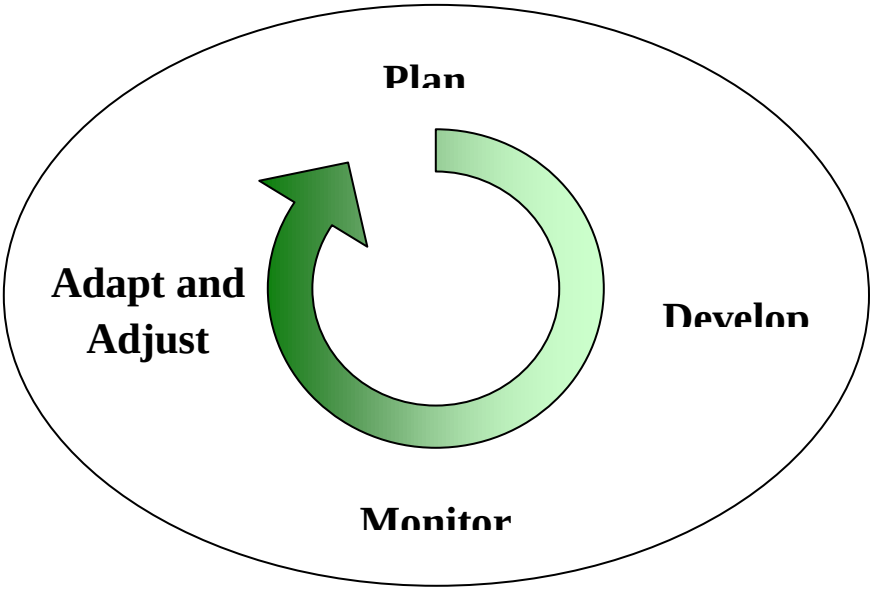
The four steps in the Deming Cycle (with examples of how they can be employed in the oil sands region) include:

1. *Plan*: front-end desired conditions (objectives) are provided. In the oil sands region, this can come from provincial strategies, regulations and operating approvals; regional land use plans; First Nations and community objectives.
2. *Do*: develop the oil sands consistent with the objectives using management tools such as modeling and best management practices.
3. *Check (monitor and report)*: back-end information collected and reported to determine if the objectives were achieved (i.e., via an adequate monitoring and reporting system).
4. *Act (adapt and adjust)*: assess if the desired objectives were attained and, if not, take corrective action to improve attainment of those objectives (i.e., continuous improvement). In some cases, the objectives themselves may need to be modified.

The focus of this Dialogue is on the public information and reporting system, which is part of the Check (monitor including information and reporting) 'step' in the continuous improvement framework. Although information and reporting alone is not sufficient to determine if the assess oil sands development is responsible, they are an important component of an overall management framework.

The Deming Cycle can also be used to describe how a public ecosystem information and reporting system itself is to remain responsive and continuously improve (e.g., Alberta Environment uses this approach to support their Knowledge and Performance management). For example, you need to: (1) plan the system so that desired outcomes (e.g., principles and elements

described above) are attained; (2) develop the system; (3) monitor and report on the systems effectiveness; and (4) adapt and adjust the information and reporting system so that it can better match desired outcomes. This can be visualized as follows:



INPUT REQUEST #5: Please review and respond to the Key Principles and Elements that most interest you and provide your response in writing in the accompanying Feedback Form.

Consider:

1. *Do you agree/disagree with any principle and/or element? Does the statement require modification, qualification, or clarification?*
2. *What other principles or elements need to be added?*
3. *What is most important to you?*
4. *Do you find the Deming approach useful? What other approaches would you suggest?*
5. *Please add any comments or suggestions that you feel would add to our understanding of an adequate public system of information and reporting.*

Please refer to the statement number in your response so we know which statement you are referring to.

NEXT STEPS

The above material establishes a starting point for our Dialogue. Please consider this document as "a work in progress." Following are the next steps in the Dialogue.

- As noted earlier, please consider what has been presented in this Challenge Paper carefully and contribute your reactions electronically using the separate **Feedback Form** sent along with this Challenge Paper. A participant typically spends about ½ to 1 hour but please feel free to contribute as much or as little as you have time for – even 5 minutes on an issue of personal importance is valuable. **Your input is very important and will strongly influence the success of the Dialogue and Workshop.**
- Feedback will be compiled and made available to you in electronic form as-is and un-attributed in late April 2010 (see Next Appendix for this material).
- Feedback will be compiled into a Progress Report by early May, 2010.
- We will use the Challenge Paper feedback to help design a Workshop, tentatively scheduled for May 28, and inform the development of a *Workshop Workbook*. The Workbook, which includes an agenda, will be distributed to you in electronic form a few days ahead of the workshop.
- The Challenge Paper feedback and the Workshop results (*Workshop Synopsis* document) will inform the development of a Final Report from OSRIN about an information and reporting system for the oil sands region.

As noted previously, OSRIN's hope is that our record of the Dialogue in the Final Report will get more Albertans engaged in thinking and talking in an informed way about solutions. We hope that all participants will get excited about the ideas generated and feed them into work underway within their own organizations.

> **INPUT REQUEST #6: Do you have any questions regarding the NEXT STEPS. Do you have any other questions or comments you would like to share?**

PARTIAL LIST OF EXISTING ECOSYSTEMS EFFECTS MONITORING PROGRAMS IN THE OIL SANDS REGION

Currently a series of independent monitoring programs are in place in the oil sands region. These programs are operated by different organizations and funded by a variety of sources in industry and government:

- Water quantity and quality are monitored regionally by the Regional Aquatic Monitoring Program (RAMP), which is funded largely by the oil sands industry. www.ramp-alberta.org/RAMP.aspx

- Air quality is monitored by a series of stations operated by the Wood Buffalo Environmental Association (WBEA). WBEA also monitors acid deposition. www.wbea.org/
- Impacts of development on plants and animals are tracked by the government and industry funded Alberta Biodiversity Monitoring Institute (ABMI). www.abmi.ca/abmi/home/home.jsp
- Alberta Environment maintains its own monitoring network and through its Integrated Monitoring, Evaluation, and Reporting Framework (IMERF) intends to facilitate better integration. Work underway with IMERF and the development of an Oil Sands Information Portal are intended to improve access to information.
- Other potential monitoring information sources include the federal government (e.g., National Pollutant Release Inventory, National Forest Inventory, State of Environment reporting, and State of Forests reporting), Alberta State of Environment reporting and its approach to Regional Strategic Environmental Assessment.
- Considerable monitoring is undertaken by oil sands companies that are reported to government.

Many organizations have a direct interest in monitoring; two examples include:

- The Cumulative Environmental Management Association (CEMA) has mandate to study the cumulative effects of industrial development in the Wood Buffalo region. www.cemaonline.ca/
- The Fort McKay Industrial Relations Corporation (IRC) is very interested in monitoring and taking a collaborative approach and is undertaking activities aimed to be credible locally and to a broader audience.

Please feel free to inform us any other ecosystem monitoring and reporting systems or projects of which you are aware. In a separate project, OSRIN in preparing an inventory of these projects and your contribution will be communicated to those responsible for that project.

APPENDIX 7: Synthesis of Comments on Challenge Paper

This part of the Appendix describes and assesses the feedback received from the *Challenge Paper: What Constitutes an Adequate Public Information and Reporting System for Ecosystems in the Oil Sands Region?*

Participants were asked to provide comments if they so desired.

NOTES:

- References to "Appendix 2" mean the list of monitoring programs described at the end of Appendix 6 of this report.

PURPOSE

This Synthesis is intended to provide:

- an overview synthesis of the range of feedback on the Challenge Paper (with sample quotes)
- a sense of where participants expressed significant alignment with ideas in the Challenge Paper and areas where there is confusion or disagreement or a desire for more information
- additional issues, ideas and suggestions that participants feel need addressing
- some initial reactions to the feedback received
- an initial effort to refine the key components of the Challenge Paper — Key Challenge, Expected Outcomes, Assumptions, Key Principles and Elements — based on participant feedback.

SUMMARY COMMENTS ON THE FEEDBACK RECEIVED TO DATE

Thirty-three people kindly responded to the request to provide feedback on the Challenge Paper of which two indicated they were unable to provide input at this time. The amount and quality of the feedback from 31 individuals who were able to review and comment on the Challenge Paper has been most encouraging. Nearly all of the 31 individuals providing feedback kindly took the time to respond to every input request and the depth of comments provided demonstrated a real interest and commitment to this Dialogue. The table below summarizes the number of individuals providing feedback the amount of feedback in pages within the *Challenge Paper Consolidated Feedback* document

Input Request	# individuals providing comment	# pages of comment received
Key Challenge	31	7
Background	30	9

Input Request	# individuals providing comment	# pages of comment received
Expected Outcomes	29	5
Assumptions	29	19
Principles and Elements	28	9
Next Steps	16	2
Appendix 2 – Monitoring Programs	15	3
Total	31 individuals	54 pages

The 31 individuals providing comment are affiliated with a diversity of organizations: 9 are with industry, 7 with the Alberta government, 5 with monitoring programs, 3 with First Nations (including consulting support), 3 with academia, 2 with consulting firms, and 2 with other non-government organizations.

At a high level, the considerable feedback received suggests the need to improve the wording on the Key Challenge, Background Statements, Expected Outcomes, Assumptions and Principles and Elements. Very few comments indicated disagreement, but provided valuable ideas so that the intent is better conveyed. In some cases, we have taken the liberty to move comments to augment the discussion of other segments of the Challenge Paper.

The following provides a summary of key points made by respondents (the full set of comments will follow).

THE KEY CHALLENGE

Original Challenge Statement:

> To describe key principles and elements of an adequate public information and reporting system that would meet your needs for assurance that potential ecosystem effects of oil sands development are known to you.

General Feedback

All 31 individuals who provided comments on the Challenge Paper responded to this input request with 14 comments indicating or implying general support with the proposed Key Challenge – several with suggestions for improvement or questions, and many other comments provided to clarify or improve the key challenge statement. At high level, the feedback included:

- The Dialogue should include in-situ oil sands development as well as mining
- The term ‘adequate’ should be replaced by something stronger such as ‘effective’, ‘appropriate’, or ‘world-class’

- Concerns that merely describing the key principles via the Dialogue will delay building and implementing an effective ecosystem-focused information and reporting system
- Several comments mentioned the need that the information and reporting system include clear links to decision-making and actions taken to mitigate impacts, whereas some comments felt that information and reporting should focus on facts and be kept separate from management responses
- Concern about 'potential' effects; that we need to acknowledge there are ecosystem effects with oil sands development, the issue is how detrimental are they to the environment
- Further to that the 'scale' of considerations needs to be made clear – i.e., ecosystem-level effects vs. local 'footprint' effects (e.g., impacts at mine site itself)
- That the perspective of making decisions considering social, economic and environmental aspects needs to be provided, and that there is a regulatory process in place to support decision-making

The responses to each question asked in the input request are provided below.

Is the perspective statement meaningful to you?

There were five comments on the perspective statement including three that agreed with it and two that felt refinements were needed. Feedback included:

- *The perspective statement is meaningful to me and is an interesting way of viewing the issue.*
- *The perspective statement seems odd to me as the responsible development of the oil sands has social, economic and environmental dimensions.*
- *Perspective statement – would be helpful to describe scale of resource to make the statement more meaningful.*

Suggestion for revised statement: it would be useful to make clear in the perspective statement that responsible development includes consideration of social, economic and environmental dimensions – with the focus of this Dialogue on the environmental aspects. The statement should also include a description of scale-related considerations to provide context.

Do you agree with the Key Challenge?

There were several comments responding to this question with 14 implying support for the proposed Key Challenge while several provided specific ideas to reword the Key Challenge or other comments. Several other comments were on other aspects of the Key Challenge and are addressed in the other questions within this input request that follow. Feedback included:

- *The key challenge is appropriate.*
- *I do agree with the Challenge statement in the context of what OSRIN is trying to achieve.*

- *Where is the challenge? Designing an 'adequate' system that would assure that potential effects of oil sands development are 'known to me' could be done in an afternoon. Further, approaching this challenge from the perspective of an Albertan uninformed on the issues mandates a lowest common denominator approach. Oil sands development is one of the biggest, if not the biggest, environmental issues in Canada at the moment and is attracting global attention. The challenge is to develop a state-of-the-art research, monitoring and reporting program that measures against clear, comprehensive and accepted performance indicators, provides causal and directional information and has a clear link to decision-making in government and industry as well as to the evolution of policy and regulation on the oil sands. THEN you can present the information in a format that resonates with the average Albertan. That is a communication issue not a design issue. Nothing less will suffice.*
- *Key Challenge – 'To describe key principles and elements of a public information and reporting system for ecological elements that would meet the needs of the general public in understanding potential ecosystem effects of industrial development in the oil sands region so that they may make informed decisions about future developments in the area.'*
- *Suggest: 'To describe the key principles and elements of a world-class public information and reporting system that credibly measures the effects of oil sands development on the ecosystem.'*
- *I think describing it as an 'adequate and meaningful' public information and reporting system would round out this key challenge.*
- *I think that the 'key challenge" frames a useful question. I would say that the information "requirements" or desires of this community are different, and higher, than that of the average Albertan, due to the proximity of this community to oil sands development and the magnitude of the impacts of this development, both positive and negative, on this community. But other than that, I think that this is a meaningful and relevant area for dialogue.*
- *I would rewrite the Key Challenge: "To describe key principles and elements of an informative, publicly available information and reporting system that provides assurance that ecosystem effects of oil sands development are monitored and reported on a regular basis. Furthermore, to outline the methodology and analysis necessary for periodic review.*
- *To describe key principles and elements of an adequate public information and reporting system that would meet your needs for assurance that current and potential ecosystem effects of oil sands development are known to you to the extent that allows you to make meaningful and informed decisions.*

- *I would argue that this statement is crucial to effective decision making and evaluation of trade-offs. However, the lack of clarity on scale and context are missing. From a principal perspective this is fine but putting elements of oil-sands etc. in context is crucial for an effective dialogue.*
- *This statement should be further refined to better reflect ecosystem management in the context of integrated resource management. A public information and reporting system should convey the overall state of the environment with consideration of potential ecosystem effects in the context of the region and the province. The public wants assurance that the potential ecosystem effects are known and to be confident that there is sufficient and effective management oversight of effects to ensure that local communities or Albertans more broadly do not bear an undue burden associated with land or resource use or development. Socio-economic issues also need to be considered and all put into the appropriate context.*
  Alternate proposal: To describe key principles and elements of a public information and reporting system that would meet your needs to understand the state of the ecosystem, and provide assurance that significant potential effects to the ecosystem are understood in a meaningful way to be confident that there is sufficient oversight of potential ecosystem effects in the context of regional and provincial priorities defined under regional plans and broader provincial policy.
- *To be meaningful to me, the Key Challenge needs to also include an aspect related to decision-makers. Albertans need to be assured that ecosystem values are known to everyone and that decision-makers are aware and understand which aspects of ecosystem effects are least palatable to individuals. In essence, decision-makers should know and be able to articulate which environmental aspects Albertans are not willing to tradeoff in exchange for other values.*

Is anything missing?

Some of the comments regarding 'what is missing' are included in the proposed rewording of the Key Challenge as noted above. Additional feedback on what is missing included:

- *Why merely 'describe' key principles. This implies another step, plus the very real potential for delay on implementation.*
- *I have to express my disappointment that in-situ issues have been excluded. I consider this short-sighted. Probably more than 80% of the oil sands resource will be extracted using in-situ, involving a far larger area than just mining. If we are to get ahead of the social license issue, we ought to be wrestling with in-situ issues now.*
- *When we state the key challenge in a way that only talks about problems we are short selling the process. Are people just interested in knowing and having assurance that the potential ecosystems effects of oil sands development are known*

or are they really interested in knowing what is being done to mitigate them? … Perhaps it can be fixed by adding something about knowing what is being done about the situation.

- *Knowing impacts is important, but being confident that they are used to improve/inform management is equally important.*

Given the feedback regarding the Key Challenge and what is missing, it would be useful to:

- Add importance that the information and reporting system provide decision-support
- Explicitly include in-situ oil sands development as in scope
- Note the focus on principles and elements is an important step in developing a system but it may be asking too much of this initial Dialogue to go much further – however it can be captured as a stretch goal under Expectations.

Is 'adequate' the best word to describe the system required?

Of the 15 comments on this question, 14 thought or implied another term should be used. Feedback included:

- *Why 'adequate'. I suggest that you will never attain an adequate outcome. There will be at least one influential sector that may never be satisfied. Why not 'appropriate' that at least leaves some room for consensus building?*
- *I do question the word adequate and how do you measure this?*
- *Adequate leaves the impression of the scope as 'minimum required'. Not what I would look for in a Key Challenge.*
- *The term 'adequate' is ambiguous and should be deleted.*
- *Adequate is OK, but why aim so low? Why not world-class?*
- *I would use the term 'appropriate' as opposed to 'adequate'. Using the term 'appropriate' may also give you some of the 'value' quality your initial Challenge statement suggested. I just don't like the term 'adequate'. It always suggests to me more could be done, we just haven't bothered to do that extra bit; we settled for 'adequate'.*
- *The term 'adequate' connotes mediocrity. I would prefer to see a robust, clear, accurate, unbiased and fully transparent information and reporting system.*
- *I believe 'adequate' is an appropriate term to use. Defining adequacy would be the difficult part.*
- *I would prefer the term 'effective' over 'adequate'.*
- *Use of the word 'adequate' – bad choice doesn't drive innovation and betterment.*

- *"Adequate" should be 'world-class'. Alberta's Oil Sands Deposits are a world-class resource that deserves a world-class information system to support responsible stewardship,*
- *The word adequate implies a substandard level of information sharing where we should be striving for excellence in reporting.*
- *Adequate indicates only just sufficient. I think another adjective would be more appropriate.*
- *There is much meaning associated with the word "adequate" and that meaning will vary with each organization. Another word that could be used is "appropriate" because again the information and the way it is presented need to be appropriate to the organization.*
- *I find the word "adequate" to be vague and non-committal. "Meaningful" would support the intent of providing opportunities for dialogue based on well-informed and thoughtful understanding of the issues.*

The main concern with the term 'adequate' seems to be that it implies the information and reporting system would be to a low standard; alternative terms suggested included "appropriate", "effective", "world-class", and "meaningful".

Is anything not relevant in your view?

Three comments related to this question felt that the word 'potential' should be removed from the Key Challenge statement.

- *I would also like to see the word 'potential' deleted. Can't there be some reporting that actually presents ecosystem effects. I don't want speculation; I want factual reporting that gives me the ecosystem effects.*
- *"Potential" should be removed because it is distracting and inaccurate. All human development has an effect on ecosystems – even if immeasurably small. Accepting that ecosystems are affected will enable the question – 'How big is the impact of development on the ecosystem'. The answer to this will lead to a discussion with and between citizens of Albert around if that effect is excessive or appropriate…*
- *The challenge statement appears to be leading. By using the term 'potential' to describe ecosystem effects appears to be inferring that may not be an effect. There needs to be acknowledgement that effects are occurring but they key question is if that effects is biologically detrimental. It would be better to remove the word 'potential'.*

Considering this feedback, the word 'potential' should be removed from the Key Challenge.

What additional clarification would be helpful?

Seven comments related to need for additional clarification particularly as it relates to 'ecosystem effects'. The feedback included:

- *The term 'effects' is often misunderstood. Effects come from measurement of change; change may or may not lead effect; effect may or may not lead to impact. Change may be positive (pollution mitigation response as in southern California, excess N deposition in Europe stimulates forest growth) or negative. Change is easier to monitor and to document than effect, which occurs over a much longer term. I would suggest change rather than effects.*
- *'System' these days implies computer based rather than a way of doing things. Clarify. 'Albertan's needs' rather than 'your needs'.*
- *I am assuming that this challenge refers to both surface and in-site oil sands development. If it refers only to surface mining than I would like to see that clarified in the challenge statement.*
- *What are potential effects? Are these predicted in EIA's and this system confirms those predictions? Should we be looking to identify and report on any effects of oil sands development and their (the effects) significance to the environment or ecosystem? Should be noted that the effects from development were predicted in the EIA's and subsequently approved by regulators.*
- *I don't think I need assurance as an Albertan from a reporting system. I would need assurance from the government who is responsible on my behalf for oil sands appropriate development.*
- *…in my mind there is a big difference between an ecosystem effect and an environmental effect. Please define an 'ecosystem effect'. With respect to effects, what scale are you interested in? Local? Regional? Both? This needs to be clear in the key challenge.*
- *Not clear what kind of data you want to capture i.e. inputs to the environment, ecological effects data or both…*

Clarification should be provided on what 'ecosystem effects' and 'system' are intended to mean, and as noted earlier that the Dialogue is intended to capture in-situ oil sands development.

What other ideas does the statement spark in your mind?

Ten comments related to this question including the following:

- *Assuming in-situ remains out of scope, I would however challenge you to consider in your deliberations how any solutions or system design improvements that may be identified in your process could also address what are likely to be very similar*

architectural/system issues on the in-situ side. Any system fixes ought to move in the direction of addressing both mining and in-situ.

- *…I am worried that you are taking aim at the wrong target. From the 'taxpayer' mentality: the information presented to me comes from ENGO's and radical environmentalists. The challenge to get the balanced, 'adequate' information out to the Albertan masses is a PR problem. The public are not scientists. There is a bunch of good (from an ecological scientific point of view) work occurring that should give the public confidence that we are measuring the ecosystem effects of oil sands development. We don't need more work, we need an easily digestible message – maybe that's the job of a PR company.*
- *Well first off you have to know what the average Albertan wants. You have non-educated and educated people out there…who is your target market? Everyone? The perhaps you need two levels of information – high level and more detailed. I don't think you can determine adequacy until you determine what your target audience is. Also, you asked about needs for assurance. Who am I as Joe Public to determine assurance? I should be comfortable that through the government's regulatory system they are ensuring companies are doing what they are supposed to be doing and that it's sufficient to protect the environment and my future world.*
- *The only other comment is associated with the term "...potential ecosystem effects" The problem with the word "potential" is that it implies that no effects have happened yet. I think that some people would have trouble with that. In any case I think that the team did a good job to articulate the Key Challenge.*

Some of the feedback dealt with key principles and elements – and has helped shape suggested improvements to that material (see #5 below). Other feedback noted the need to shape information and reporting to the intended target audience which may vary from those wanting general information to those wanting access to detailed data. Two comments noted that the public needs assurance from government that oil sands are being responsibly developed.

Revised Key Challenge Statement

Given the feedback on the proposed Key Challenge in the Challenge Paper, the following revised Key Challenge is suggested for this Dialogue:

> To describe key principles and elements of an effective information and reporting system that would provide Albertan's (and the World) with assurance that ecosystem effects due to development in the oil sands region are known and reported and, along with socio-economic information, support meaningful decision-making and responsible management of the resource during its entire life cycle.

The following clarifications are also suggested:

- 'oil sands region' includes all areas encompassing resources and/or affected by oil sands development

- 'system' is meant to refer to 'the collective activities of funding, planning, data gathering, data synthesis, data interpretation and data reporting that are carried out by all parties in the oil sands region'
- 'oil sands development' refers to both in-situ and mining operations
- 'ecosystem effects' is intended to be used similar to term 'environmental effects' where a local or regional change to the environment can be measured and can be related to oil sands development.

BACKGROUND STATEMENTS

Several comments indicated general alignment with one or more of the Background Statements in the Challenge Paper while most feedback provided reactions to particular Statements as noted below.

Background Statement #1

Original Background Statement:

> OSRIN has identified the concern over possible ecosystem effects as one of the key elements in sustaining the social license for Alberta's oil sands industry.

There were 14 responses with 8 agreeing with this statement (including 1 providing comment), none in disagreement, and 6 other comments provided.

- *I think the concern was identified before OSRIN was formed. The term social license is very important.*
- *I believe the concern is over ecosystem effects, not possible ecosystem effects. It's not what might happen, it what's happening. Oil sands industry will be allowed to continue until reporting presents actual ecosystem effects.*
- *Should be reworded (concern over effects sustain the social license?)*
- *Good but should be expanded – 1. Social license to operate, 2. Access to markets to sell goods, 3. Access to capital to invest in oil sands.*
- *I would think that the key element in sustaining the social license of the oil sands industry is our global appetite for petroleum. But, I agree that ecosystems effects may be an important aspect of this equation.*
- *Industry doesn't have a social license. This sounds like they are running entertainment businesses.*
- *'Concern over possible effects' needs to be defined by OSRIN. This is not substantiated by ABMI data where 94% intactness is reported, but rather is based on media perspective which is driven by agendas not associated with scientific validity. If OSRIN is to be the unbiased opinion, statements must not be leading.*

Considering this input, a suggested rewording of Background Statement #2 is:

> OSRIN and other organizations have identified ecosystem effects as a key concern that needs to be addressed to sustain the social license for Alberta's oil sands industry to operate, access markets, and access capital to invest in oil sands.

Background Statement #2

Original Background Statement:

> It is well known that many of the hydrocarbons and associated chemicals released from bitumen extraction and upgrading processes are potentially harmful to ecosystem and human health. The degree to which these constituents are entering the ecosystem through the air, groundwater, and surface water is not entirely understood. The potential for effects on ecosystems is related to the **magnitude, duration and contaminant concentration in such releases.**

There were 18 responses with 6 agreeing with this statement, none expressing disagreement, and 12 other comments provided.

- *Not all primary/secondary air pollutants in the AOSR are HC related; most are not.*
- *The last sentence needs to include the timing of events (e.g. spring runoff) and their location, and the importance of magnitude, duration and contaminant concentrations depends on the contaminant.*
- *I disagree with the phrase 'is not entirely understood'. I would be much more comfortable with the phrase 'is poorly understood'. It is a given that because we are dealing with extremely complex ecological systems, our current level of understanding about ecosystem effects from oil sands development is very poor. A major challenge will be providing reliable and objective measures of how good or poor our information and understanding is regarding various ecosystem effects from development, including the temporal and spatial context of those effects.*
- *Again in most cases this is managed through EPEA approvals. Talk to someone in AENV who regulates these issues and can explain the management and monitoring systems in place regarding air, land and water. We should be clearer in defining what is known and what is not known so we don't make larger umbrella statements that can have significant implications.*
- *Yes, but the majority are naturally occurring. The ecosystem here has adapted to the naturally higher concentrations of these components. Will we ever fully understand constituent entry into the ecosystem?*
- *In no particular order – 1. Amount of hydrocarbons released, 2. Harmfulness of they hydrocarbon, 3. Persistence in the environment, 4. Concentration*

- *We know that releases from air for example are entering ecosystems but the question is if these effects are biologically meaningful. You should consider magnitude, duration and frequency.*
- *Some are known, prefer not to use language like 'it is well known'*
- *It is well known that many of the hydrocarbons and associated chemicals released from oil sands development (such as extraction, upgrading and tailings storage) are potentially harmful to ecosystem and human health. The degree to which these constituents are entering the ecosystem through the air, groundwater, and surface water and its subsequent effects on animal and human health is not entirely understood.*
- *Hydrocarbons have occurred naturally at the surface in some areas of the oil sands region for thousands of years.*

Considering this input, a suggested rewording of Background Statement #2 is:

> Many of the hydrocarbons and other chemicals released from oil sands development are potentially harmful to ecosystems and human health. It is important to understand the degree to which these constituents are entering the ecosystem beyond naturally occurring levels. The potential for effects on ecosystems is related to the location, magnitude, duration, frequency, timing and contaminant concentration in such releases.

Background Statement #3

Original Background Statement:

> Many people are concerned that mining and upgrading of oil sands may be having negative impacts on the ecosystem in the mining area.

There were 18 responses with 8 agreeing with the statement (including 2 providing comment), one in disagreement, and 9 other comments provided.

- *Does not one intuitively anticipate negative impacts in a mining area? I would delete this one. Industrialization always comes with a price.*
- *Again, it's part of the public interest decision that impacts are temporary and are mitigated over time.*
- *True there is concern as there should be but industry and government has not done a good job at showing success and addressing this concern.*
- *Not just the mineable oil sands, but in-situ as well.*
- *The oil sands are having negative environmental impacts. What is under dispute is whether these impacts are significant/growing or are bigger than they need to be.*
- *With respect to statements 3 and 7, it is difficult to envision how anybody capable of sight and thought could maintain that mining and upgrading "may be" having negative impacts or be "not clear" about whether significant ecological effects are*

occurring in the region. There is no doubt that mining and upgrading are producing significant negative ecological impacts and it should be stated so.

- *Should this statement also include the mineable area (i.e. in-situ projects)?*
- *It is! That's common sense. Development and maintenance of a house in Edmonton is having a negative impact on the ecosystem. Society has deemed this acceptable. The real question about the oil sands is: 'how much of an impact is it having?' Society can decide if this impact is acceptable but they require access to credible and relevant information in order to make any informed determination.*
- *I would not restrict this to mining…suggest that revised to oil sands' industrial activities.*
- *There appears to be a misunderstanding of impacts. The mine footprint is big and ugly and is not open for debate, but outside of that, both land disturbance and impacts to air and water are not documented to a conclusive point.*
- *Many people are concerned that oil sands development is or may be having significant negative impacts on the ecosystem in the oil sands and surrounding area. Perceptions of the degree of these impacts are and can result in stress and ultimately a negative impact to one's quality of life.*
- *Many people believe that the economic benefits derived from oil sands development, and the security of energy supply is very important. Many people believe that the environmental issues related to oil sands development arise from end user energy consumption and that global energy issues need to be addressed.*

Considering this input, a suggested rewording of Background Statement #3 is:

> Many people are concerned that oil sands development is having significant negative impacts on the ecosystem. They are interested in knowing what impacts are occurring, what impacts were expected and what actions have been taken or are planned to avoid, mitigate or minimize both expected and unexpected impacts over time.

Background Statement #4

Original Background Statement:

> Some individuals or organizations are absolutely convinced that oil sands development is producing environmental degradation. In many instances, scientifically valid investigation and evidence is either not publicly available or does not support the conclusion of impacts nor does it allow the conclusion to be discounted. There is also a wide variation in opinion of the significance of the impacts.

There were 18 responses with 10 agreeing with the assumption (including 3 providing comment), none in disagreement, and 8 other comments provided.

- *This statement is very true and accurate.*

- *The assessment of a new project uses the previous project as the base case rather than pre-development conditions. Accordingly, cumulative effects projections for the new project are highly dependent on the previous project's projections. There are not checks to confirm that the impact predictions from modeling are correct. One would expect data to be assembled as the project unfolds that would be used to validate predictions and direct adaptive management actions to address gaps.*
- *Belief is not an issue here – surface mining of about 4500 sq. km is environmental degradation and should be accepted as such. In most cases, scientific information does not exist – especially credible baseline data. And differences of opinion on the impacts are entirely due to the lack of clear objectives and the inadequacy of the current monitoring and reporting system.*
- *Agreed; ecosystems are dynamic by their nature and hard to measure given the resiliency of Mother Nature. I'm not sure that the wide variation in opinion will ever be solved without sound science.*
- *I feel the debate on oil sands fails to recognize the choice/decision that is made with resource development. This decision is a conscious one whereby there will be some environmental effect to extract the resource and in turn there are economic and social benefits. This balance is weighed and a decision is made. There is environmental degradation from development when it is active. The commitment is to return land to an equivalent state.*
- *What does 'producing environmental degradation' mean? All open pit mining temporarily disturbs the land…*
- *I think that the critical issue here is not the identification of impacts, but in a societal conversation (and reflection in regulation and practice) on what constitute "unacceptable impacts". I work in the field of effects of deposition of atmospheric pollutants on terrestrial ecosystems, including direct involvement with the WBEA's Terrestrial Environmental Effects Monitoring work, and there is no doubt that we can detect "impacts" of air pollution in surrounding ecosystems (primarily in increased soil and vegetation tissue concentrations of deposited elements, primarily sulphur and nitrogen). Whether these effects are enough to cause changes is not known in the region with any scientific certainty, and what changes would be acceptable versus unacceptable has not been defined in any way that I am aware of, at least for this issue.*
- *Although this statement is true, it should be framed as opinion. That information is available but people do not seek it out over the much more broadly distributed media hype that is an issue.*
- *There is also a wide variation in opinion of the significance of the impacts and the extent that they are mitigated (e.g., using BATEA; applying appropriate regulatory incentives and control).*

- *Oil and gas activity occurs in a managed fashion under the terms and conditions of permits that include provisions for post-approval monitoring, the management of effects, remediation and reclamation.*
- *Statement #4 requires some broadening. Individuals do not perceive the environment in a narrow perspective similar to scientific research. Human perception of environmental issues tends to be more holistic and broad ranging and science is not well equipped to address issues on this same scale.*

Considering this input, a suggested rewording of Background Statement #4 is:

> While effects from oil sands mining and other operations are inevitable, the impacts of oil sands development need to be considered in terms of both while the resource is being extracted and the expected condition of the land following development. Then the relevant question is "How significant are those impacts and whether or not the land can be returned to a natural state?"

Perspectives include:

- There is a wide variation in opinion on the significance and duration of the impacts including what constitutes a 'significant' impact and appropriate management responses to those impacts.
- Some individuals or organizations believe that the environmental impacts from oil sands development are unacceptable relative to derived economic and social benefits.

Background Statement #5

Original Background Statement:

> To date the public debate on the question of potential ecosystem effects related to oil sands development has been neither balanced nor informed. One perspective is that the scientific studies are in fact adequate but access and transparency to that information has not been adequate. Another perspective is that the scientific studies that are available have not been adequately used to inform the debate.

There were 18 responses with 7 agreeing with the assumption (including 2 providing comment), none in disagreement, and 11 other comments provided.

- *One perspective is missing; perhaps studies/monitoring done to date have not been informed by adequate science, and, therefore, measured insensitive/unresponsive indicators?*
- *The first statement understates the factors influencing public debates. A major issue is whether the right questions are or have been asked and another is the differing contexts in which information is presented.*
- *I don't think we are making sufficient use of scientific information (and knowledge) that is already available. Part of the problem is that a lot of information is in*

fragmentary forms within peer-reviewed journals and there has not been sufficient effort to synthesize it into more useful and accessible forms suited for decision-makers.

- *No one other than a few NGO's (negatively) had done a really good job at informing the debate. The info collected has to be done in a scientifically credible manner and then be open, transparent, and available for other interpretations.*
- *Not all public debate has been balanced or informed, but lots of the criticism is reasonable. The oil sands have more than a PR problem! Another perspective is that monitoring is not adequate.*
- *Yet another perspective might be that studies which do not support the conclusions desired are suppressed or withheld. Another might be that funding is available only for studies that will provide the desired conclusions. That access to information is inadequate and opaque is an understatement.*
- *I feel there is a level of adequacy in the scientific studies to date and still progress to make. I believe that the pure amount of information is difficult to comprehend and therefore cannot be fully appreciated in a public debate context.*
- *You will not be able to separate out the effects of oil sands development from other industries.*
- *The following statement is likely inaccurate: 'One perspective is that the scientific studies are in fact adequate but access and transparency to that information has not been adequate'. Most historical 'scientific studies' are designed to address a highly specific question or focused on a highly specific site location. The historical legacy of monitoring information in North-Eastern Alberta (and most of Alberta) is one that is designed to support site-and-place regulatory compliance requirements. This information cannot be 'knitted together' in a scientifically credible manner. And if it could be, it will not be the most efficient way to answer ecosystem scale performance monitoring questions. If you desire an information system at an ecosystem scale – then you need to build and invest in one.*
  'Another perspective is that the scientific studies that are available have not been adequately used to inform the debate.' This is an extension of the previous perspective. You can try – but it would be surprising if you could weave together a credible information system out of site-and-place compliance monitoring data. If you are referring to other data sources – this statement may be more accurate.
- *I am not certain that there is much "public debate", or effective public debate, around oil sands development, let alone balanced and informed debate. In the field of air-pollution impacts on terrestrial ecosystems, we have a certain amount of evidence to describe major trends to date, but I would not say that that means that the studies are "adequate" – there is a large amount of information we simply do*

not have. So, I would say that the issue is limited primarily by scientific understanding, rather than by lack of access or transparency.

- *This is true; the transparency is the fundamental issue and getting this into the media rather than sector opinions.*
- *Another perspective is that scientific studies that are available have not been adequately used or understood to inform the debate.*

Considering this input, suggested rewording of this Background Statement:

> To date the public debate on the question of potential ecosystem effects related to oil sands development has been neither balanced nor informed.

Perspectives include:

- Scientific studies are in fact adequate but access and transparency to that information has not been adequate,
- Scientific studies that are available have not been adequately used or understood to inform the debate, and
- Most historical 'scientific studies' were not designed to assess ecosystem effects: If an ecosystem-scale information system is desired then it will need to be built.

Background Statement #6

Original Background Statement:

> To address questions about potential ecosystem effects, both the Alberta Government and the oil sands industry maintain or support systems of ecosystem effects monitoring. Appendix 2 provides a brief overview of some of these monitoring programs.

There were 15 responses with 8 agreeing with the assumption (including 2 providing comment), none in disagreement, and 7 other comments provided.

- *I do not think this is a balanced view. The burden has been assumed by industry who have stepped up to the plate and are funding scientifically-defensible monitoring (air/terrestrial) conducted by high quality teams of international scientists. The inference is that the Government of Alberta provides significant funding.*
- *Many monitoring programs are ad hoc rather than systematic making it difficult to arrive at any conclusions from the data.*
- *Absolutely – very credible organizations monitoring a lot of things but remember, these organizations are not all things to all people. They were designed for a specific purpose.*

- *I would not describe many of the monitoring systems as ecosystem effects monitoring. Although there are monitoring systems, many do not have thresholds in place to relate to, or have adequate baseline information to compare to and therefore cannot present ecosystem effects.*
- *Industry and government may fund those agencies listed in Appendix 2 but the transparency and effectiveness of the programs are questionable. Independence from influence (by funders or governments with vested interests) along with full transparency and public access to all data produced are mandatory if effective monitoring and honest reporting are to be outcome.*
- *True but as I said above it is not clear how these relate to one another.*
- *Many of the monitoring programs listed (WBEA, RAMP, etc.) are comprised of multi-stakeholder groups so this should not be limited to Industry and Government.*
- *Appendix 2 does not adequately provide an overview of the monitoring programs to inform participants in this dialogue.*
- *To address questions about potential ecosystem effects, the Government of Alberta, individual oil sands industries as well as multi-stakeholder organizations develop, maintain and support systems of ecosystem effects monitoring.*

Considering this input, suggested rewording of Background Statement #6:

> The oil sands industry and the Alberta government, along with other participants, maintain or support monitoring programs that can help address questions about ecosystem effects. (Appendix 2 provides a brief but growing list via feedback to this Challenge Paper of some of these monitoring programs.)

Background Statement #7

Original Background Statement:

> It is not clear whether significant ecological effects are occurring in the region and whether this is because any such effect is minor or of limited scope, or because the monitoring systems are inadequate to identify the risk of such effects or evidence of actual effects.

There were 17 responses with 4 agreeing with the assumption (including 2 providing comment), one in disagreement, and 12 other comments provided.

- *This is a roundabout way of saying that no one knows what is happening up there because there is no credible means of accessing and reporting information; hence the dialogue.*
- *Concerning statement #7, a major problem, for both short term and new monitoring systems, is their ability to predict the potential degree of risk for serious ecosystem effects, particularly when there has been limited research on, and understanding of,*

how these complex regional ecosystems function and respond to disturbances (natural & anthropogenic). In many instances we can anticipate that ecological effects will have lag times and thresholds of various magnitudes that can be highly variable for different ecosystem components.

- *I suspect some monitoring systems are not adequate to detect some contaminants. Emerging research on naphthenic acids shows the current industry standard method to measure these chemicals (FTIR) is inadequate for toxicity monitoring.*
- *This issue is key and needs to be addressed. The programs may or may not be adequate or the effects may actually be small. It is important to remember that these effects (if any) were predicted and approved.*
- *I would suggest that many effects are biologically significant. They may not be statistically significant, but I'm not sure how important that is. The use of the term 'significant' is a problem.*
- *I do not believe that the monitoring systems currently in place have the ability to determine the general level of affect.*
- *I disagree with this statement, I don't believe oil sands related regional effects are occurring and I do believe we have enough monitoring information for water/aquatic ecosystems to demonstrate this. Also, it seems odd to refer to a regional effect as limited in scope…*
- *'Significant' as it is being used here implies a value judgment (rather than statistical). This should raise concern – information and reporting systems should be designed to tell the facts. Judgments can then be drawn from these facts (e.g,. it is a fact that it is 15 degrees C outside. Further context can be provided to this fact – average wind speed of 30 km/hr and raining. It is then up to the observer of the fact and context to make a judgment. Is the weather good or bad? Warm or cold?) The information system should focus on providing facts with appropriate context. Leave it to the observer (management system and Albertan's) to judge. The last part of #7 is confusing. It suggests that an information system must reveal negative effects in order to be 'adequate'.*
- *Truly there are significant present-day and potential ecological efforts occurring in the region. I think part of the problem is not that the monitoring is limited but that there is a lack of coordination of efforts. The second problem that has long plagued oil sands research and monitoring is the lack of peer reviewed results – that has begun to change but is still a problem. Often monitoring has a grab bag consisting of a grocery list of measuring everything one can think of, it would be better to develop key criteria each with clear indicators and then monitor these – this I think follows on from the EIA type of date that seems to include a bevy of measurements, many not relevant at all.*
- *I think it would be better to say there is "No consensus whether significant…etc.*

- *We have measured the effects on the terrestrial side with ABMI. Change on regional basis is small but measurable.*
- *This is an odd statement given the substantive long term assessments that have been undertaken that have not been able to detect significant impacts except in very localized sites. Referencing monitoring as inadequate is to suggest that the international experts designing the program were unable to establish a program capable of detecting change, or that the program is required to prove the negative, not finding something is not proof that an impact doesn't exist. Both are flawed logic.*
- *There is not consensus on whether significant…*

Considering this input, a suggested rewording of Background Statement #7:

> There is not consensus on whether or not significant ecological effects are occurring due to oil sands development. This may be because the information from existing monitoring programs is not being effectively evaluated and reported, or because the monitoring systems in place do not provide sufficient information on ecosystems to support an assessment of impacts.

What other important information or perspectives are missing that would help the challenge we are addressing? What other ideas did the statements spark in your mind?

- *You don't mention a research organization – specifically CONRAD; which is surprising because I know you know about it. The 'hard to understand' and 'inconclusive' science contained within speaks directly to many of the background statements you have (#s 2, 3, 4, 5, and 7). I think you just need scientifically-minded PR people to get them out in the open.*
- *Overall the background provides a good basis for discussion. The real issue is finding the balance between social, economic and environmental issues. Reality is you cannot have development without some impacts. Knowing the potential impacts and mitigating or limiting the impacts is reality. Having an adequate data, information and reporting system to monitor and report is a key to showing the public that we are striking the right balance between social, economic and environmental elements.*
- *I think we actually know a fair bit. The ABMI has scientifically stated the status of biodiversity in the oil sands region. The ecosystem is 95% intact. The footprint is 5%. These are the facts.*

  The challenge is to related programs on air and water to the biotic programs. A single comprehensive system should be established. We should be able to draw a relationship with (for example) depositions and the health of plants. A consistent foundation of protocols should be used.

- *Numerous ecological monitoring programs are conducted in the oil sands region, however, because they are done on an individual basis and there is no basic set of standards for various programs, it is sometimes difficult to compare results from the various studies.*
- *Comment on the last paragraph on p. 3* (in Challenge Paper) – *I think the expectations of Albertans is an important thing to gauge, but I also think national and international audiences expectations are equally important to the future of the oil sands.*
- *I would argue that the main problem is a discussion about the level of change that is "acceptable". Many people, myself included can document how oil and gas changes things. What we cannot do is tell you that this much change is OK and this much is bad. It is in this respect that existing data have been underutilized. We need to make predictions based on hypotheses about how development alters things for animals / etc. Then based on these hypotheses we need to test whether or not our predictions are met or not. There is many ways in time and space to do this and the lack of experimental rigor of most monitoring programs in oil sands is a key problem.*

  Similarly, it is a no brainer to say that the pits have X value to wildlife. We can do this now for lots of species. The magnitude of importance is the key question NOT whether there is an effect. Make your context all of Canada and the oil sands is a minor, itty bitty issue. Make the area NE Alberta and the importance of the effects to that are large. CONTEXT MATTERS.
- *I agree that all the statements listed in the background represent commonly held views. Having participated on most of the monitoring programs I would agree that more needs to be done. The statements did get me to think about what I felt about the various topics. Basically I believe that more monitoring work can be done and that more needs to be done to incorporate Traditional Environmental (or Ecological) Knowledge. Basically we need to create a link between western science and Indian culture and beliefs."*
- *An additional item is that some of the research, monitoring and evaluation work that is done is not perceived as valid because of the credibility of the source undertaking the work.*

EXPECTED OUTCOMES

Several comments indicated general alignment with one or more of the Expected Outcomes in the Challenge Paper while feedback was also provided in response to a particular Expected Outcome as noted below.

General comments

Some of the general comments included:

- *Three outcomes can be achieved if suggestions from* (the Key Challenge section) *are considered. However, I question whether you can achieve complete alignment amongst a group of 50-60; and 'understanding' is possible?*
- *There needs to be a caution that in the discussion we do not gravitate to technical monitoring system design elements, like number of stations, placement of stations, types of monitoring instruments, etc. Options on what might be needed might be okay but monitoring networks needed to have a strong science background.*
- *I am in alignment with the expected outcomes.*
- *Sounds good.*
- *Need to ensure discussion is focused on the monitoring, reporting and information system and not get side tracked on whether effects are occurring or not.*
- *They are fine….however. Will this process be used by the regulatory* (agencies) *in the development of a new system? Or is this nice research and exploratory in nature. The system needs a major overhaul.*
- *Given the context of what OSRIN is looking to achieve, I am aligned with the objectives. I think the order of the second and the third objectives should be switched. An appreciation should be gained for people's perspectives, then look for understanding /alignment on the principles. Then from this foundation, provide the awareness of what is being done. You may find that putting aside what is already done and just focus on the elements of an ideal system you may get more 'purity' in the discussion. Then evaluate what is currently done against this 'pure' vision. The two may not be too far apart.*
- *Yes – I'm in alignment with the outcomes. If we achieve all three, then it's a very successful workshop.*
- *I think the outcomes are ambitious but do-able. I think the difficulty will be in collecting the data and ensuring it is in the same format – Southern Athabasca Oil Producers attempting to integrate their biodiversity data ran up against the issue of date formatting.*
- *I am in complete agreement with these 5 outcomes/goals. I think goals 4 and 5 are especially key.*
- *I think that the first two objectives largely cover pretty well-worn ground, and spending a disproportionate amount of time on these would not lead to meaningful outcomes. I support objectives 3-5.*

- *These are lofty goals. Goals 1-3 are possibly realistic. I don't believe it will be possible to achieve 4-5 in 1 day given my experience.*
- *Yes. There are no other expectations.*
- *These are the expectations of OSRIN, not mine so I have no comment. I think they are reasonable for OSRIN, starting at a point of limited knowledge and not appropriate for industry who have been engaged in designing and operating these programs with direction from scientific experts over several decades. Aside from a better communication program and better transparency, and the incorporation of new science as it becomes available, the programs meet the outcomes already.*
- *I am in alignment with these outcomes. There is a lot of work to be done to archive the outcomes stated. The stretch targets are also very important.*
- *Seems to me the first three have been beaten to death through the CEMA process with little success. How to get past this legacy of trying to coordinate etc. will be the key challenge.*
- *Agree with outcomes 1, 2, 3, and 5. Outcome 2 should be achieved first in order to develop a common basis for dialogue based on informed perspectives of all stakeholders.*
- *Outcomes seem challenging, reasonable and achievable.*

Expected Outcome #1

Original Outcome Statement

> Gain an improved understanding and appreciation of the diverse perspectives from various individuals and organizations regarding an adequate public information and reporting system for environmental impacts;

There were 20 responses with 16 agreeing with this expected outcome, one in disagreement, and 3 other comments provided.

- *Disagree with #1 – if your key challenge is to inform the public, why are you asking people already within the oil sands about their perspectives? Ask the public – I'll bet one of the main things you will find is that general public doesn't know the life cycle of an oil sands mine or how oil sands mining compares to other industrial activities on the landscape. I know I didn't before working at an oil sands company. You don't need a workshop (dialogue) you a need a focus group of Albertans. OR a telephone poll.*
- *#1-3 Is this really the scope of a Challenge Dialogue??? Frankly, this would be adequate if none of the participants had any understanding of information and reporting or of oil sands development issues. I suspect that the invited participants are a much more informed lot.*

- *My opinion of the first two outcomes is that they are intended to maintain the status quo. I am aware of the information that is accessible under existing monitoring programs, as well as that which is lacking, and would not wish to participate in a process designed only to communicate the perspectives of participants. Those perspectives have been widely communicated and I am clear as to what they are. I would, however, be interested in hearing what others think might produce a robust, clear, accurate, unbiased and fully transparent information and reporting system for the oil sands region.*
- *Consider taking this further. People are more likely to accept and respect the findings of an information and reporting system if they had input into creating it. So – understanding perspectives is helpful. But as important is ensuring that stakeholders actually have had input and feel that their input is valued.*

Expected Outcome #2

Original Outcome Statement:

> Improve awareness of existing information and reporting systems currently in place in the oil sands region[4];

There were 20 responses with 16 agreeing with this expected outcome, none in disagreement, and 4 other comments provided.

- *I would like to see the envelope pushed beyond 'improved awareness' to include some initial efforts to evaluate the relevance/adequacy of existing information and reporting systems to report on potential ecosystem effects of oil sands development.*
- *Outcome #2 seems different in scope than the key challenge (i.e., existing information and reporting systems is a lot broader than ecosystem monitoring). Is this intentional?*
- *Good, if the programs meet the critical principles identified by OSRIN.*
- *Improve awareness and transparency*

Expected Outcome #3

Original Outcome Statement:

> Develop a clear understanding and alignment about the key principles and elements required for an adequate public information and reporting system for the oil sands region.

There were 17 responses with 16 agreeing with this expected outcome, none in disagreement, and 1 other comment provided.

[4] 'Oil sands region' refers to the areas where oil sands development is occurring

Expected Outcome #4

Original Outcome Statement:

> Co-create a draft model of a credible environmental and ecosystem information and reporting system.

Perspectives included:

- *Stretch goals are ambitious but would be very useful.*
- *I would also be willing to help in accomplishing the "stretch goals" however I suspect they may be too ambitious for a one-day workshop."*

Expected Outcome #5

Original Outcome Statement:

> Identify information and reporting gaps that need to be addressed and warrant additional focus.

There were 17 responses with 14 agreeing with this expected outcome, none in disagreement, and 3 other comments provided.

- *This is much more interesting. The bottom line is that there are numerous models out there - everything from programs to monitor emissions like NPRI to broad initiatives such as reporting against the criteria and indicators of sustainable forest management. And that's just in Canada. Surely, the Challenge Dialogue can be supported by some leading edge examples from around the world. I have zero interest in traveling to Edmonton to appreciate the perspectives of other stakeholders on this issue. Why not try and hit the ground running and take some things as given? Far too much work has been done in this area to start with a room full of people and a blank sheet of paper.*
- *I am still uncertain about the co-creation goal. What would be the benefit or purpose of the model that gets created? Putting the model in a report seems to scream so what? If the purpose of the model was for OSRIN to actually create the system, is this really possible or even the mandate of OSRIN?*
- *Co-create a draft model of a credible and "transparent" environmental and ecosystem information and reporting system.*
- *I am concerned that this exercise may not lead to meaningful change – for example – if we attain #4 how is it going to be adopted and will it be by all stakeholders? Should we be providing recommendations for at a minimum the stretch goals so that they are meaningful and adoptable to all the stakeholders? Who is going to champion any change that may be recommended – government? For example, sometimes there are reporting gaps because industry reports directly to government as part of their approvals but is not willing to share that information with the*

broader public or at a minimum the stakeholders in the region that are directly affects (e.g. wildlife mortality on lease sites).

- *The ability to achieve outcome 4 (i.e., credible (…) system) is contingent upon stakeholders accepting that the system must be rationalized to collect information and reporting on things that matter and not every aspect of the environment nor ecosystems. There should be an eye to risks in view of regulatory requirements and safeguards and not in the absence of them. This is challenging if there is a philosophical belief that oil sands development is not compatible with ecosystem management (i.e. any and every impact is significant).*

Expected Outcome #5

Original Outcome Statement:

> Identify information and reporting gaps that need to be addressed and warrant additional focus.

There were 16 responses with 14 agreeing with this expected outcome, none in disagreement, and 2 other comments provided.

- *This would be fun, too; however, it would require participants to have some technical capacity and to be roughly familiar with the existing monitoring programs and policy/regulation relating to oil sands development. That's not out of the question with a good background paper.*

Are there any others (expected outcomes) you would like to see accomplished?

- *I think an additional outcome or maybe it is a dialogue question but how can you better integrate the information from monitoring.*
- *I would like to see an expected outcome around resourcing such a monitoring system. World-class environmental monitoring is not cheap, but if we are serious about developing this resource responsibly we need to acknowledge this.*
- *If I were to add, I recommend that cumulative effects should be included, at least the understanding of cumulative effects if not a monitoring program to measure and assess them. There should also be a recognition that development and operation of industry, municipalities, transportation, etc. is done so through planning and trade-offs recognizing the social, economic and environmental benefits and costs.*

Revised Expected Outcomes

Considering all of the feedback above on the draft Expected Outcomes in the Challenge Paper, the following revisions are suggested:

1. Gain an improved understanding and appreciation of the diverse perspectives regarding an effective public information and reporting system for environmental impacts (Note: this in part can be achieved by reviewing the Progress Report);

2. Gain an improved understanding of existing information and reporting systems currently in place in the oil sands region (Note: this may be achieved via background material provided before the Workshop);

3. Develop a clear understanding and alignment about the key principles and elements required for an adequate public information and reporting system for the oil sands region (Note: this would be the main focus of the Workshop).

Stretch goals:

4. Develop a draft model of an effective and credible environmental and ecosystem information and reporting system consistent with the principles and elements accepted at the workshop

5. Identify information and reporting gaps that need to be addressed and warrant additional focus.

The above 'notes' are intended in part to address concerns raised by some of the Dialogue feedback that people are already aware of the diverse perspectives and would not like to see an undue amount of time spent on that at the Workshop. In that sense Outcome #1 can be considered a by-product of the Dialogue, and also the concern some expressed that we need to be focused at the Workshop on the Key Challenge (i.e., outcome #3).

WHAT EXPECTATIONS DO YOU HAVE FOR THE FACE-TO-FACE WORKSHOP – AS IN I WOULD CONSIDER THE WORKSHOP A GREAT SUCCESS IF…"

Comments:

- *Finally, I would consider the workshop a great success if it was populated by individuals who were decision-makers in government or industry, key influencers or those directly affected by oil sands development who could have an informed and productive discussion of how to develop a world class research, monitoring and reporting system for the oil sands region of northern Alberta.*
- *If we achieve all three (expected outcomes), then it's a very successful workshop*
- *I think the workshop would be a great success if… the outcomes of the discussion are truly used to progress the issues. Far too often initiatives do not maintain traction to drive change.*
- *I would consider the Workshop a great success if we could see reporting presented on actual emissions, actual acidification values of soils, actual values of water usage, actual air contaminants plumes and recorded distances, as compared to what companies have presented in their EIAs.*
- *I think the workshop will be a great success if the stretch goals are achieved.*
- *The workshop would be a great success if there was shared understanding and agreement on the essential characteristics and elements of al monitoring system that*

could support public reporting on potential ecosystem effects directly tied to oil sands development. Additionally, it would be a great success if there was agreement on essential characteristics and elements of the public reporting system, including issues related to accessibility of data and synthesized information, transparency of analysis for reporting purposes, and ease/cost of access by the public.

- *I would specifically like to learn more about the joint ASRD-industry monitoring initiative, and about how the needs of regional stakeholders not represented in this work to date will be incorporated.*
- *In fact for me the Workshop will be a great success if the main three outcomes are achieved and an extraordinary success if the last two outcomes could also be achieved.*
- *The workshop would be considered a success if we could achieve:*
  - *a common understanding of available information and reporting systems, their purpose, scope and strengths or limitations for offering an adequate public information and reporting system; and*
  - *explore necessary prerequisites for acceptance of an adequate public information and reporting system (i.e., what would need to be addressed with existing monitoring and reporting systems to gain acceptance of its outputs from a broad range of stakeholders).*
- *I would consider the workshop a great success if:*
  - *There is broad representation from all stakeholder groups (government, mining, in-situ, environmental groups, aboriginal groups) at the workshop – they are all well-informed and willing to 'leave their hats at the door' if necessary to tackle the issues that are important*
  - *There is identified a mechanism to move the outcomes forward and acknowledgement/willingness that the outcomes will be adopted by all, even if that means change in current reporting protocols, increased human and financial resources to make the information meaningful, transparent and reportable*

ASSUMPTION STATEMENTS

Of the 31 individuals who provided feedback to the Challenge Paper, 27 responses were received on this input request with many comments provided on specific Assumption Statements as noted below. The quotes provided below are where comment was provided beyond just 'agree'.

Assumption Statement #1

Original Assumption Statement:

> It is Alberta's responsibility to develop the oil sands resource and to manage that development in a "responsible manner" avoiding or mitigating negative ecosystem effects.

There were 15 responses with 4 agreeing with the assumption (including 2 providing comment), 3 in disagreement, and 6 other comments provided.

- *I generally agree but feel there is a conscious decision to make for developing resources, one that may result in an acceptable level of impact. Certainly negative impacts should be mitigated to a reasonable level but full avoidance I don't think can be achieved nor is desirable when weighed against the social and economic benefits of the development (e.g., health care, schools, jobs, etc.).*
- *Agreed, but also it is our responsibility to acknowledge that there are significant and negative ecosystem effects, and although we will do our best to mitigate these effectively, a realistic assessment of affects should form part of the debate around oil sands development.*
- *Disagree with #1 – there will be negative ecosystem effects; there is an assumption that should be included.*
- *Reject: Alberta does not have to develop the oil sands. If we choose to do so, we do need to manage the development in a responsible manner. Why was responsible manner in quotes? We do need to manage the development in a responsible manner. No quotation marks are necessary.*
- *This is a management statement that needs to be outside of the scope an information and reporting system for the oil sands. Having said that, of course it is Alberta's responsibility to be a good steward of these resources. I think it is misleading, and likely to damage Alberta's credibility, to try and maintain that this development will not have negative ecosystem effects. It will. You may be able to mitigate some of these effects but it will take political leadership. Again, assumption #1 should be out-of-scope for this project as it is very much a management goal.*
- *Alberta has the authority to develop the oil sands but it is not its responsibility to do so.*
- *There seems to be something missing, it is not just about avoiding or mitigating, it is about managing in a sustainable manner that strikes the right balance between social, economic and environmental considerations.*
- *Alberta has reviewed effects during the EIA and approved the activities. Alberta has the ultimate responsibility but operators bear responsibility as well. It is important to establish what 'negative ecosystem effects' are.*
- *Suggested alternative wording: The oil sands industry has sole responsibility for developing the oil sands resource and is obliged to manage that development in a responsible manner avoiding or mitigating negative ecosystem effects. It is the Canadian and Alberta Governments' responsibility to ensure that industry fulfills its obligations.*

- *…negative ecosystem effects, even if this means slowing or stopping oil sands development all together.*
- *Assumption 1 needs a temporal aspect that recognizes short term effects towards longer term goals.*

Considering this input, a suggested rewording of Assumption #1 is:

> It is Alberta's responsibility to manage the oil sands resource and its development by industry in a responsible manner that strikes a balance between social, economic and environmental considerations so that negative ecosystem effects are avoided and/or mitigated where possible and practical to do so.

Assumption Statement #2

Original Assumption Statement:

> The federal government also has role, for example, to address trans-boundary impacts.

There were 17 responses with 8 agreeing with the assumption (including 5 providing comment), none expressing disagreement, and 9 other comments provided.

- *Agree, both provincially (across provinces, i.e., Saskatchewan is likely not that pleased with the impacts from oil sands development) and on an international/global scale.*
- *Agree that the federal government is a stakeholder in this but they need to be mindful of duplication.*
- *Yes it does. It also has some jurisdiction in the realms of fish, protected areas, migratory birds, to name a few. These are all "ecosystem" scale responsibilities.*
- *I agree that the federal government has a role and it is to monitor the health of the First Nation communities. The Federal government needs to do more work to prove the safety of the water in Lake Athabasca. After all it is the Federal Government that is responsible for F.N., Uranium mining and fisheries. As well, the impact of the BC Hydro dams of the Peace River also have an impact on water quality and ecosystems in the Delta and other communities downstream.*
- *Perhaps, but scope needs to be defined to minimize the risk of duplication*
- *WBEA has moved to involve some GOC scientists with EC support. Two focused measurement campaigns are being planned around two emerging issues. The GOC has considerably more capacity, despite severe downsizing in Federal labs, than is listed. The statement implies a purely regulatory, negative function.*
- *The federal government has other roles than just trans-boundary impacts. These include fiduciary responsibility for First Nation rights and interests and management responsibility under the Fisheries Act (Canada manages/regulates fish habitat; Alberta manages/regulates the fish).*

- *This completely understates the federal role on everything from the Migratory Birds Convention, to the Navigable Waters Act, to First Nations issues, greenhouse gas emissions, etc. It also ignores the fact that the Department of Foreign Affairs and International Trade and other agencies will be involved in trade- and market-related issues relating to products from the oil sands as well as the role of federal agencies in addressing the international campaign against oil sands development. Any information system needs to take account of federal needs in this area.*
- *All levels of government have a role play*
- *I would also reference impacts to fish habitat (re: federal Fisheries Act) and species at risk listed under the federal Species at Risk Act (SARA).*
- *Suggested alternative wording: The federal government has an obligation to the people of Canada to monitor and report on environmental impacts and to enforce federal laws as they relate to resource extraction in the Alberta oil sands.*
- *…trans-boundary impacts and impacts to federal and Treaty Land Entitlement lands.*

Considering this input, a suggested rewording of Assumption #2 is:

> The federal government also has an important role and obligation with respect to monitoring and reporting (for example, to address trans-boundary impacts, fish habitat, species at risk, migratory birds, Aboriginal health, etc.). It is important that the federal government and government of Alberta work together to complement each other's roles and avoid duplication.

Assumption Statement #3

Original Assumption Statement:

> Public confidence that an adequate public system of information and reporting – an "assurance system" (e.g., see section 7 regarding a continuous improvement system) – is in place to detect and report on potential ecosystem effects is a critical element of ensuring the social license to develop the oil sands and to inform responsible decision-making. Public confidence will be gained if the information and reporting system is based on biological evidence.

There were 20 responses with 6 agreeing with the assumption (including 3 providing comment), 1 expressing disagreement, and 13 other comments provided.

- *Agreed, but not the only critical element. Also need to understand the risk associated with the activities, the limits of acceptable effect, and recognition of the spatial and temporal aspects of those potential effects.*

- *I agree with this assumption as a person that understands the value and concept of biological evidence. I am not sure the general public fully understands this and more base the decisions on the source of the reporting.*
- *In the main, I agree. However a public "information and reporting system" is not an "assurance system". The former is a component of the latter. But the former may also reveal facts that are not perceived as "assuring news". The way that "assurance system" is being used implies that you are advocating an information system that will tell a story that is friendly to the continued development of the oil sands. The information system may tell that story or it may not – depending on the facts. The point is that one should advocate building an information system that will tell the facts. Let the government, industry, environmental community, first nations, and other stakeholders decide if they are "assured" by the facts.*
- *Do not agree; no amount of "biological evidence" will suffice, if that evidence is not science based' the evidence must be "science-based"*
- *Unsure what #3 is – long way of saying that you want traffic lights on a website somewhere?*
- *As indicated earlier, this assumption sets the bar far too low.*
- *It is really true that the info and reporting system will be or should be based on "biological evidence"? This seems somewhat limiting.*
- *I am starting to choke on the consistent use of 'potential' as a modifier of 'ecosystem effects'. I would hope that we could also report on 'actual/demonstrable' ecosystem effects. It should also be noted that public confidence will be gained if the information and reporting system is seen to be used and having direct influence on oil sands development decisions and processes in ways that avoid or reduce ecosystem effects (i.e., the monitoring and reporting system is effectively integrated in to a larger adaptive management system for oil sands development and other resource development processes in the region.*
- *Don't mix assurance with monitoring. Monitoring should be science based, generating factual results that can then be addressed by managers. There should be no value judgments in monitoring other than determining what you can afford to do.*
- *The first part – yes. As for the last sentence, I'm not convinced that public confidence will be gained if the information and reporting system is based on biological evidence alone. I think you will need champions (the Dr. Schindler's and Suzuki's of the world will need to support it, otherwise, there will still be doubt.*
- *Suggested alternative wording: The people of Canada will permit industry to exploit the Alberta Oil Sands only if it is done in a manner that does not degrade local or universal ecosystems and does not pass environmental liabilities on to future generations. Canadians will accept no less than complete honesty and full*

transparency in monitoring and reporting and expect their governments to enact and enforce laws necessary to prevent harm to vital life support systems from resource exploitation.

- *Biological should be replaced with scientific.*
- *I believe that gaining public confidence requires an information and reporting system based on biological evidence (and evidence from other scientific disciplines), but also requires having a more mature debate about overall regional cumulative effects of oil sands development. I believe that we rely too heavily on the idea that mitigation will address all effects, when we are really not sure the extent to which this is true (related to the OSRIN Challenge Dialogue on reclamation).*
- *I am not certain what is meant by the last sentence, what other evidence is collected and reported other than biological evidence? Monitoring is that, by definition.*
- *…biological evidence and where biological information is lacking or where uncertainty exists the use of the Precautionary Principle is used.*
- *Assumption 3 and 4 needs the biological evidence to be presented in an understandable format for the public.*
- *Public confidence will also be gained by demonstrating in the information provided that many and diverse ecosystem values are clearly understood and reflected in the "responsible" development of the resources.*

Considering this input, a suggested rewording of Assumption #3 is:

> Public confidence that an effective system of information and reporting is in place to detect and report on ecosystem effects is a critical element of ensuring the social license to develop the oil sands and to inform responsible decision-making. Public confidence will be gained if the information and reporting system is based on sound science and is used to support decisions regarding oil sands development.

Assumption Statement #4

Original Assumption Statement:

> Substantial monitoring is already occurring (see Appendix 2) but it is not always in a format that is available to the public and/or is considered proprietary.

There were 18 responses with 6 agreeing with the assumption (including 3 providing comment), 2 expressing disagreement, and 10 other comments provided.

- *True, and sometimes for good reason. It is important that this information is transparent and available for other interpretation.*
- *Agreed but the information is often too vast to comprehend.*
- *Very important to include.*

- *This is really not true; certainly, transparency can be improved. However, air quality data at least is publically available within one hour of collection, 24/7.*
- *By-and-large, this is a fallacy. It is very common to hear "if only we could get access to all of the environmental data in the oil sands we could report on the health of the ecosystem". Similarly, people seem to commonly believe that the data must exist given all the money that has historically been spent collecting environmental data in the oil sands. Again, the vast majority of the data was collected for a different purpose and cannot simply be brought together to evaluate ecosystem health. You need to specifically build the information and reporting tool for the oil sands region. If you don't, scientifically credible reporting will be nearly impossible to achieve. The information and reporting system should strive for the same degree of scientific credibility as the Alberta Biodiversity Monitoring Institute.*
- *Is there consistency in the monitoring of the air, land, water, etc. in the province? Is it based on "good science" or what is it based on? Is the monitoring forward thinking and considerate of new scientific findings, new technology, other regions, etc? Is Alberta current?*
- *Mostly, it lacks comprehensiveness, consistency and credibility and the format is only part of the reason.*
- *The substantial monitoring is not integrated; it works in its own little silo which equates to gaps, redundancies, different reporting mechanisms, etc. There is no real "monitoring system", just independent parts.*
- *The term 'substantive' as a modifier for existing monitoring efforts may be a bit presumptive with respect to what is actually needed as a go forward strategy to monitor and report on 'ecosystem effects' for the oil sands development region. I am assuming that the oil sands region includes all areas having both surface mining and in situ extraction potential.*
- *Suggested alternative wording: Some monitoring and reporting is occurring but it is often ineffective, obtuse and inaccessible to the public.*
- *Substantial monitoring is occurring, but may not be as well designed and implemented as necessary to answer questions.*
- *There is limited information that is not available, even RAMP data that is inappropriately closed to non-members (this is being corrected and will be made publicly available) all data other than company specific data is public. Of the non-public data, this is information about proprietary results and not directly related to public accountability on performance measures as specified in approvals or under legislation. This statement, therefore is a bit of an outlier, based on the one case of RAMP data that, has never really been true (case in point, Kevin Timoney requested the data through Mikisew Cree and received all raw data and most companies will release all raw data on request).*

- *I do not believe that enough monitoring is being done right now to know if oil sand development is having an impact on the environment and determine if that impact is significant. I do agree that there is lots a data generated but it is not easily accessible to the public.*
- *Assumption 3 and 4 needs the biological evidence to be presented in an understandable format for the public.*
- *Monitoring is occurring but it may not be in a scientifically defensible manner that can provide assurance of regional impact mitigation.*

Considering this input, a suggested rewording of Assumption #4 is:

> Various monitoring programs exist (see Appendix 1) but the programs do not appear to be coordinated, and their results are not always easily accessible to the public and/or are considered proprietary. Historic monitoring data were collected for different purposes and it may not be possible to simply bring this together to evaluate ecosystem health in a science-based manner.

Assumption Statement #5

Original Assumption Statement:

> Although considerable monitoring is occurring, it is not generally known what the current information and reporting 'system' is, and whether it is adequate (i.e., at a minimum, the current system needs to be better communicated with improved access to data and information).

There were 14 responses with 8 agreeing with the assumption (including 2 providing comment), none expressing disagreement, and 6 other comments provided.

- *Again, yes room for improvement here and WBEA is moving forcefully with a scientific literacy effort.*
- *This is probably true.*
- *Another perspective is that existing scientific studies and monitoring systems are not adequate because they have not been designed to fully assess cumulative ecosystem effects over the larger development region.*
- *Reporting should present actual vs. predicted values (This is what the proponent said the values would be (and they received approvals based on these values) and this is what the values are).*
- *Suggested alternative wording: Although some monitoring is occurring, there is no single point of contact where the public can go to easily obtain information, nor is there ready access to the people directly involved in monitoring for clarification of monitoring results or to independent experts for interpretation of results. Some information is not reported within reasonable time frames. There is a perception*

that the current monitoring system is inadequate and should be expanded. Industry withholds proprietary information necessary for the public to be assured the resource is being exploited responsibly. The Alberta government does not disclose the basis for the reclamation security that it holds. These are all areas where industry and government could improve access to data and information.

- *Reporting system –assume non-existent for ecological effects.*
- *Parts of the system could use a higher profile. However, the current system is not tailored to measuring ecosystem effects in a credible, unbiased manner.*
- *In this statement, who is responsible to ensure that the public is informed of all public information? Even in this challenge dialogue, limited effort was given to informing the respondents on the full nature of existing monitoring, despite it being readily available. Instead direction to web sites were provided. So, is this a negative to monitoring programs or more about how people conduct themselves in one, not bothering to make the effort to reveal the information and two, not bothering to look up the information even when it is available?*

Considering this input, a suggested rewording of Assumption #5 is:

> Although monitoring is occurring, it is not generally known what the current information and reporting 'system' is, and whether it is effective. At a minimum, the current system needs to be better communicated with improved access to data and information. Ideally, there should be a single point of contact where the public can easily obtain information.

Assumption Statement #6

Original Assumption Statement:

> The current monitoring and reporting of cumulative ecosystem effects is regarded with skepticism by some stakeholders. This may because they regard both government and industry as lacking credibility, or feel the information and reporting is not open and transparent, or for other reasons.

There were 18 responses with 9 agreeing with the assumption (including 1 providing comment), none expressing disagreement, and 9 other comments provided.

- *Agreed; there is a view that since industry is paying for the work; they are 'buying the result they want'.*
- *There are three ways to define cumulative effects; I am not sure that the GOA is clear on which they have adopted for policy discussion. At least two cumulative management frameworks are lacking in scientific underpinning.*
- *The other reason is that measured cumulative effects are not compared to predictions made at the regulatory stage to confirm that they are accurate. The whole foundation for adaptive management is missing. Moreover there are no firm*

thresholds for many parameters that clearly identify the degree of the effect – i.e., not detectable, detectable but reversible, detectable but not reversible; or the maximum limit that the ecosystem should have to sustain.

- *The first sentence is true but it is not for the reasons cited. David Schindler, has criticized RAMP. The reality is that there is a patchwork of programs that are often limited in scope, poorly designed, inconsistently applied and operating to different standards. A sound research, information and monitoring program would harness these existing efforts and force improvements in them to fill gaps where possible and recommend new programs where required.*
- *Because there is no real system to point to, some stakeholders have a skeptical view of the parts and pieces.*
- *Do we have a lot of "cumulative" ecosystems effects monitoring? How do we turn individual operator monitoring into a format that shows cumulative or regional effects?*
- *The skepticism exists for the following reasons:*
  - *because there is limited understanding of what "cumulative effects" are, let alone how they are managed.*
  - *Yes, government and industry lack credibility with some stakeholders. And some ENGO's lack credibility with government and industry. An open and transparent and credible monitoring and reporting systems needs to be arms-length from the management and the advocacy system.*
- *I don't know why or if "some stakeholders" feel this way. However, I think that it would be useful to differentiate between monitoring programs designed to detect specific cumulative effects (e.g., those from deposition of air pollutants), and our overall assessment of whether or not cumulative effects are occurring, which relies far more heavily on the Environmental Impact Assessment process than on any monitoring programs. Because the EIA process is paid for and largely directed by proponents, and is a tidy industry unto itself, it is not clear that it results in objective assessment of cumulative effects. I think that this process is a cause for skepticism, as is the repeated findings in EIAs of "no significant impacts", when it is clear to many stakeholders that significant impacts are in fact occurring.*
- *Cumulative effects needs to be defined: is this cumulative across media, across projects, etc?*
- *Assumption 6 should consider who is a credible source for ecosystem effects.*

Considering this input, a suggested rewording of Assumption #6 is:

> The current monitoring and reporting of cumulative ecosystem effects is regarded with skepticism by some stakeholders. This may be because they:
>
> - regard both government and industry as lacking credibility; and/or

- feel the information and reporting is not open and transparent; and/or
- feel the current system is not tailored to measuring ecosystem effects in a credible manner.

Credibility would be enhanced if stakeholders felt that an adaptive management framework is in place to evaluate measured impacts relative to the predicted impacts to confirm that they are accurately measured and reported, and then where necessary adjust the predictive models and implement remedial actions.

Assumption Statement #7

Original Assumption Statement:

> There is general agreement that industry should bear the costs of monitoring but that the goals and methods need to be set by government, and that government should ensure quality data are produced.

There were 20 responses with 4 agreeing with the assumption (including 2 providing comment), 1 expressing disagreement, and 15 other comments provided.

- *Agree. In addition to ensuring quality data are produced, government and industry should have mechanisms in place that will ensure this data is effectively considered and used in support of decisions guiding oils sands development.*
- *OK – a bit surprising. Usually a cost-shared model between the developers and the land owner is advocated.*
- *I disagree with this. I have spoken with friends who do not have any association with the oil sands and would represent a typical, well educated Albertan. They are generally surprised industry funds the monitoring conducted on regional scales. They felt this should have been the role of government. For myself, I feel industry has a place in funding monitoring but government bears the largest responsibility for broad regional monitoring.*
- *Quality data must be produced and validated by those who collect them, not by a third party. The "polluter pay" paradigms is justifiable and at least in the AOSR to be working. Improving data quality will not come from government edict, but rather from involving high quality personnel in monitoring design and operation. Government should not demand if it unprepared to fund!*
- *Generally, industry bears the costs of monitoring the impacts of its own operations and the Crown bears the cost of monitoring broader ecological impacts - for example, should each oil sands operation do its own moose count on its license area or should the government do one or two regional ones perhaps with some cost-sharing?*

- *I question whether there is "general agreement" that industry should bear the costs. AENV uses the phrase 'polluter pay", the trick is determining the polluter and determining their share.*
- *I agree that industry should bear the cost of monitoring, but I do not agree that government should be the only party setting goals and methods and ensuring data quality. Given lack of trust in the government (as stated in assumption 6), these parts of the process must include other stakeholder groups. Input and review from academia and other stakeholders will be very important for broader credibility.*
- *Costs shouldn't be borne wholly by industry. This needs to be joint effort both to pay for the monitoring and develop the goals as methods as expertise in some areas is better within companies. Industry should have to pay the majority.*
- *Not necessarily. Government could pay for monitoring out of revenues from oil sands rather than downloading responsibility to industry.*
- *Suggested alternative wording: There is general agreement that industry must bear the costs of monitoring but that the goals and methods must be set by government, and that government should ensure quality data are produced and a system is in place to ensure monitoring is effective, reliable and uninfluenced by its funders.*
- *I don't think there is not sufficient scientific credibility in the government to assure quality data.*
- *Funding – I don't think that it is particularly clear who should or does bear the cost of funding monitoring, as industry funding and government collection of royalties are related. So, depending on the royalty mix, I am not sure that it matters whether gov't. or industry pays.*
  Direction – I think that government should play a role in setting goals and methods and reviewing data, and should likely be ultimately responsible for outcomes, but I do not believe that government. always has sufficient expertise to unilaterally direct. I believe that it takes input and expertise from all stakeholders – government., industry, and other – to develop and implement effective monitoring programs.
- *Objectives/goals and methods should be set by stakeholders including govt. Not sure government is more trusted than industry. Potentially 3rd party QAQC/database maintenance is needed?*
- *In point 1 under this section it is noted that Alberta has a responsibility to develop and manage the oil sands. This is the public, yet in this point, it is noted that industry bears the responsibility to monitor. What role does the public have if not in all aspects? The two points contradict each other. The public also believes that the industry monitoring is tainted because it is paid for by companies with an interest in having development continue. This is incorrect since all monitoring programs are peer reviewed, however, the public has an opinion, informed or not.*

- *I do not think that there is general agreement that Industry fund the costs of monitoring. There are those that feel that this is the responsibility of the Provincial and Federal government and that if they had been doing this for the last few decades in a continuous manner we would be far better off. Certainly it might counter the argument that industry has no credibility.*
- *In some cases it is better if a multi-stakeholder forum is used to set the goals and methods – this allows for buy-in by all the parties and avoids industry players for lobbying the government on particular approval conditions. The government is responsible to Albertans to ensure that the goal is reached and methods employed.*
- *Assumption 7 needs to reflect the premise of cost sharing based on recognition that there may be multiple land and resource users may contribute positively or negatively to the status or condition of ecosystem elements (i.e., forestry, recreational). There is provincial precedent reflected in the funding formula for airshed monitoring (i.e., CRAZ) and the notional acceptance of this in the conceptual foundation for IMERF.*
  The assumption that industry should pay should be justified. As landlord, the owner of the oil sands resource and also responsible party under the EPA the GOA has the responsibility. If future monitoring requirements have significant increases in cost, then the terms of the oil sands leases, including the royalties payable might need to be re-examined.

Considering this input, a suggested rewording of Assumption #7 is:

> There is a view that industry should bear the costs of monitoring (either directly or indirectly via revenues paid to government), but that the goals and methods need to be set by government in consultation with others (industry, stakeholders, First Nations, academia, etc.) so that quality data are produced. Another perspective is that government should play a more active role in broad regional monitoring and to ensure an effective overall monitoring system is in place.

Assumption Statement #8

Original Assumption Statement:

> The costs of an adequate public information and reporting system needs to be in the context of what is affordable given the potential scale of oil sands development.

There were 19 responses with 7 agreeing with the assumption (including 4 providing comment), 4 expressing disagreement, and 8 other comments provided.

- *Agree, but I would substitute the term 'appropriate' for 'affordable' and add to the end of the statement "and associated ecosystem effects".*
- *Partially agree. They also need to be effective regardless of the scale of development although the two are often closely linked.*

- *I agree with this assumption but it is important to understand how much of the monitoring costs are being written off through write-offs bitumen royalties.*
- *Of course. However, evaluation of what is "affordable" requires an increase in transparency, as it is difficult to reconcile statements that certain programs are too expensive with public financial statements by large, multinational oil corporations.*
- *No, information should not be oil price dependent*
- *I do not agree the costs need to in the context of what is affordable given the potential scale of development. The system needs to provide adequate data, info and knowledge and it has to be adequately resourced.*
- *Given the billions involved in oil sands development, this statement is absolutely ridiculous. There is no reason the oil sands couldn't have the best research, monitoring and information program in the world.*
- *Disagree. The cost is justified by the information needed to determine if the development of the oil sands is taking place in a responsible manner. If it becomes unaffordable to industry, then stop developing the resource. If it isn't in the public interest, it shouldn't happen, and we won't know if it's in the public interest without doing sufficient monitoring.*
- *"What is affordable" is often used as the crutch to justify no action. Monitoring and reporting must meet adaptive management and ecosystem safety needs. For example, saying one should not monitor air quality to ensure it meets public health standards because it is not affordable would be unacceptable because of its profile. But often the same monitoring to ensure it meets ecosystem health needs falls short – because of affordability.*
- *More importantly it should not duplicate the work already being done by AENV (annual C&R reporting, OSIP, etc.)*
- *Suggested alternative wording: Given the scale of oil sands development and the revenues available from exploiting the resource, there is no reason for not providing adequate funding for a robust, clear, accurate, unbiased and fully transparent public information and reporting system.*
- *Too vague – who should pay and how much.*
- *The oil sands represent one of the largest capital investments in the world. This investment is expected to result in economic return for several generations at least. The investment in an information and reporting system for this region needs to reflect and anticipate the magnitude of development and associated management/policy challenges to come. The assumption "the costs of an adequate public information and reporting system needs to be in the context of what is affordable given the potential scale of oil sands development" appears to imply that the oil sands is too small a development to afford a world-class information system.*

Consider turning this assumption around to reflect the realities of the oil sands – The oil sands need a world-class, cost-effective, information and reporting system.

- *The costs of development are not directly related to cost of monitoring as this point might suggest. This infers if the oil sands are very expensive to develop then monitoring should be very expensive. The opposite is true, the oil sands are, on a global scale, marginal projects and only have advantage in that they are very long-term and the resource is very well known and predictable. There are many other projects that have a better economic return. So, in a marginal project, the money available to monitoring needs to be focused on the impacts and to address them. However, even with this, the oil sands have the most extensive monitoring systems in Canada. The air network, for example, is more robust and extensive than the GTA even though the air quality is very much better in the oil sands than it is in Toronto, and the potential effects to humans are substantially higher in Toronto. Odd. So, monitoring should be based on the potential impacts and the sensitivity of receptors, not on a belief of who can spend more money.*
- *…oil sands development and the potential costs of 'business as usual' reporting vs the benefit of a reporting system that will allow all Albertans to make well informed decisions about the impacts of oils sands development.*

Considering this input, a suggested rewording of Assumption #8 is:

> The cost of an adequate and effective public information and reporting system needs to be established in the context of what is appropriate given the scale of oil sands development and associated ecosystem effects, providing that an acceptable base level is achieved and maintained.

Assumption Statement #9

Original Assumption Statement:

> Integration of reporting from the various monitoring programs into a single, coherent, streamlined information and reporting system that is regularly and openly validated to the standard of peer review would substantially increase the confidence of the public in environmental performance and reports of cumulative impacts. International peer review is already part of the development and as part of the periodic verification of monitoring programs in the oil sands region.

There were 18 responses with 8 agreeing with the assumption (including 4 providing comment), none expressing disagreement, and 10 other comments provided.

- *This is highest priority.*
- *Would be nice, but quite difficult to do.*
- *Good idea but scope must be carefully defined*

- *Generally agree except, is international peer review really employed to validate monitoring programs? If so, I would be interested in learning the specifics around such peer review.*
- *Who is in charge and leading the work??*
- *A single information reporting system is a black hole for funding. Would rather spend the funds on better monitoring and reporting without worrying about centralization.*
- *I don't understand the last sentence. If it means that some monitoring and verification involves international peer review then my point would be: What's the point? Peer review means getting independent expert input and where those experts are located is irrelevant.*
- *To truly create a "system", integration needs to happen long before reporting.*
- *This is potentially a huge boondoggle because the data that are associated with these various monitoring systems have been collected for a wide range of different purposes and at various spatial scales and levels of scientific rigor. The result is that the diverse datasets have to be dumbed down to the lowest common denominator and even then we are likely to be mixing apples with oranges when it comes to reporting on ecosystem effects.*
- *It may make it more transparent and provide confidence given a peer review but I feel thousand page reports by academics have little effect on the average voting Albertan. As someone with a science background, the technical details are often lost on me, regardless of a high school educated individual. The reporting needs to be simple but underpinned with sound science to be effective for communication to the general public and able to withstand scrutiny in the scientific community. I feel ABMI is the most effective at doing this.*
- *Will be very difficult to resolve.*
- *This pre-supposes that there will be "various" monitoring programs that need to be somehow integrated (form before function – see assumption #20 in this section). Design the information system to meet the needs of the emerging ecosystem management paradigm (function before form). Do not retrofit existing programs that were not specifically designed to monitor ecosystems.*
- *I would support this idea as a component of improving programs in the region, but not as a solution to all limitations.*
- *Also, WHO does the reporting will have big impact on credibility*

Considering this input, a suggested rewording of Assumption #9 is:

> Integration of various monitoring programs into a coherent and streamlined information and reporting system that is regularly and openly validated by peer review would

substantially increase public confidence in environmental performance and reports of cumulative impacts. The reporting needs to be simple but underpinned with sound science. In some cases, existing monitoring programs would need to be augmented.

Assumption Statement #10

Original Assumption Statement:

> Raw scientific data alone are often not useful to the public due to a variety of issues:
> - Inadequate context (how does this piece of information fit into the picture?),
> - Communication difficulties (use of scientific jargon, interpretation of statistical data, etc.)
> - Lack of ease of access (e.g., where only reported to government and not readily available to the public).
>
> These issues need to be addressed for scientific data to become a useful information source to the public.

There were 16 responses with 11 agreeing with the assumption (including 3 providing comment), none expressing disagreement, and 5 other comments provided.

- *For sure, again remember your audience.*
- *True; this could be resolved through a 'report card' or similar process/tool*
- *Generally agree, however, along with interpretation of scientific data, the raw data must also be accessible for independent verification where deemed necessary.*
- *Raw scientific data is not useful to anyone other than fellow scientists in that field. And it is far more important for data to be interpreted correctly for decision-makers.*
- *We need to be careful in using the term "raw scientific data", there needs to be some guidance or common practices in data validation otherwise different people uses different processes to get "true data" and therefore they get different answers.*
- *While the raw scientific data may not be useful to many members of the public, it should still be included for the benefit of those members of the public who are able to understand the jargon and statistics.*
- *Again, I think the issues in the oil sands as they relate to scientific enquiry are really more substantive (i.e., limitations of current knowledge) than they are related to communications challenges. I also think that this relates to the discussion of the role of EIAs that I included in the response to #6, above.*
- *Assumptions 10, 11 and 12 are unclear. What exactly is meant by information? Information typically is raw data that has been analyzed and interpreted in context to better understand condition or trends. Furthermore, raw data indicating elevated levels of contaminants is not helpful in the absence of interpretation to indicate the level relative to background (for those that may also occur in the area naturally),*

contaminant mobility and pathways and the carrying capacity. In Assumption 10, there again is the assumption that science is accepted.

Considering this input, a suggested rewording of Assumption #10 is:

> Raw scientific data alone are often not useful to the public and decision-makers due to a variety of issues:
> - Inadequate context (how does this piece of information fit into the picture?),
>   - Communication difficulties (use of scientific jargon, interpretation of statistical data, etc.)
>   - Lack of ease of access (where only reported to government and not readily available to the public).
>
> These issues need to be addressed for scientific data to become a useful information source to the public and decision-makers.

Assumption Statement #11

Original Assumption Statement:

> Transparency will be critical to a successful public information portal: both the raw data and the interpreted results should be made more readily available.

There were 15 responses with 8 agreeing with the assumption (none providing comment), none expressing disagreement, and 7 other comments provided.

- *Really no point in making raw data available; meta data is appropriate for public.*
- *Again careful about the term "raw", if this is really raw with no validation, I disagree.*
- *10 bothered me until I read 11. I suggest merging these two assumptions.*
- *But again, provide context – What does it mean? How is it being managed? Why is it important? Will it be an issue at closure?*
- *It would sure help although we need to recognize the potential risk of alternate interpretation of the result or inappropriate (not scientifically valid) use of the data*
- *When public resources are used there should be no proprietary interest held by the proponent with respect to data. The fact that FMA holders own the forest industry and the government cannot make that publicly available is a travesty.*
- *And potentially even fed to the general public, for example through press releases when a peer review is done or effects are shown to have occurred (or not) - a good communications specialist would help the group on this.*

Considering this input, a suggested rewording of Assumption #11 is:

> Transparency will be critical to a successful public information portal: both the data and the interpreted results should be made more readily available. This should also be supported by communication to enhance public awareness regarding key findings.

Assumption Statement #12

Original Assumption Statement:

> The perception of risk is a key confounding factor. For example, as the ability to monitor increases, the presence of lower and lower levels of contaminants is more easily determined. The reporting of only the raw data is thus insufficient as the risk of these contaminants causing significant effects must be placed into context of the thresholds for impact and the carrying capacity of the environment to the contaminants.

There were 17 responses with 5 agreeing with the assumption (including 1 providing comment), 1 expressing disagreement, and 11 other comments provided.

- *Agree, it would be beneficial to the public to also include CCME and other contaminant guidelines (if they exist) when reporting raw data.*
- *Disagree. I do not believe the perception of risk is a confounding factor. I do agree the reporting of raw data alone is insufficient. Also, how can an assumption include the concept of thresholds, when these do not exist?*
- *Very confused with this one; whose responsibility is it to define critical loads/levels? Unfortunately, there is no mechanism in Canada for legally enforceable limits as via the Clean Air Act in the US; the US experience with air quality and NO in particular has been highly successful and Canada could learn from it.*
- *This is obviated if there are clear goals and objectives for the performance of oil sands operations. Better detection methods could always link to operational improvements if the risk (likely cumulative) warrants.*
- *Including thresholds would be nice, but we currently don't have thresholds for impacts from some of the contaminants.*
- *I think one of the risks is that the more info you make publicly available the more questions are going to be asked of both the operators and the government. Is the government ready to support this increase in workload? We already don't have enough resources. Which is why the context is so super important.*
- *Context is absolutely essential.*
- *Is #12 needed? I believe it is captured through #10.*
- *Give examples of other data that may be needed.*

- *Context is critical. The way the assumption is currently written implies that the information system is something to be feared. It is not – it is just telling the facts – and yes it has to be meticulous about providing appropriate context.*
- *I think this is a valid point, but not a key issue. One thing to consider is that, at least in the fields of wildlife biology and terrestrial impacts, we often use the term "carrying capacity", but really do not have sufficient knowledge about what those capacities are.*
- *…carrying capacity of the environment and risk to human health.*
- *The perception of risk is an interesting factor. Particularly, the perception of risk associated to circumstances or activities for which individuals feel they have no control. For example, a negative perception of oil sands development may be heightened by a sense of lack of control over the pace of activities – and a perception of growing control by developers with less at stake, from an environmental perspective, than local residents.*

Considering this input, a suggested rewording of Assumption #12 is:

> Information and reporting needs to be provided in the context of risk management. The reporting should be in context of the risk of the contaminants to ecosystem and human health.

Assumption Statement #13

Original Assumption Statement

> It is possible to develop a solution, a set of solutions or a set of scenarios regarding an adequate public information and reporting system that will satisfy greater than 80% to 90% of the stakeholders.

There were 14 responses with 7 agreeing with the assumption (including 2 providing comment), 1 expressing disagreement, and 6 other comments provided.

- *Generally agree. I feel there are several groups of stakeholders that find more benefit in not being satisfied as it allows them to push their agenda which supports their business model. While 80% of stakeholders (if you take this to be all Albertans and those outside Alberta who feel they have a stake in this) may be satisfied, it is the remaining 20% that are the issue.*
- *Yes, a system can be developed that is perceived as credible and relevant by the majority of stakeholders.*
- *I don't believe that is possible. If we can satisfy 2/3 of the stakeholders we will have been successful. It is not possible to change some views.*

- *Try 60% of the stakeholders and 80 to 90% of the public. I believe that some stakeholders are scared for their health and will never be satisfied until the oil sands are gone.*
- *I just do not know how we can say this statement, this might be a goal but I do not believe it is an assumption. On what basis was the assumption derived?*
- *The estimated range of 20 to 10% of stakeholders unsatisfied seems disappointing to me. Which 10 to 20% may not have their needs met by the information and reporting system? The way this assumption is worded to me makes it seem like OSRIN may already have a group in mind.*
- *You are setting the bar rather low here. Why would any solution not be satisfactory to 100% of the stakeholders, who are after all the people of Canada?*
- *Ambitious statement – I would say satisfy those stakeholders who make an effort to become informed.*
- *Assumption 13 appears to be more of a desired outcome rather than an assumption. The achievability of this is affected by whether or not there is a common understanding of how oil sands development is regulated. Past experience in other multi-stakeholder processes have illustrated that there is not a detailed understanding of oil and gas regulation in Alberta.*

Considering this input, a suggested rewording of Assumption #13 is:

> It is possible to develop a solution, a set of solutions or a set of scenarios regarding an effective public information and reporting system that will satisfy the vast majority of stakeholders.

Assumption Statement #14

Original Assumption Statement:

> Community-based and traditional knowledge would constitute part of an effective monitoring system.

There were 15 responses with 5 agreeing with the assumption (including 2 providing comment), none expressing disagreement, and 10 other comments provided.

- *I agree with this statement but feel the perceived need of community-based programs stems from the distrust of industry and government monitoring. If the trust was gained in those conducting the monitoring this need may go away. Alternatively, this may be the only way trust can be earned.*
- *Add to the end "if it is repeatable and objective".*
- *Like biodiversity, very hard to define as it means so many things to so many people. Ultimately, if big management action is taken it must be based on sound science.*

- *Careful consideration needs to be given to the type of community-based and traditional knowledge that would be acceptable and the weight it is to be given.*
- *Maybe to satisfy some stakeholders but it's difficult to rationalize traditional observations (veiled as science) vs. western science. Does community based mean in the community, by the community, or developed by the community.*
- *Consider changing effective to comprehensive. Also will be very difficult to resolve.*
- *If it satisfies the core values/principles – yes.*
- *I think that participation by interested stakeholders in monitoring is critical to gaining public acceptance of results. Community-based monitoring and traditional knowledge are specific examples of this.*
- *I would be concerned about simply using key words here without any substance. Perhaps expand or roll up into different assumptions with similar themes. Why single out TEK and CBM?*
- *While I agree that Community based monitoring (CBM) will have a role. Getting people to even agree to what CBM means can take a long time.*
  What needs to be added is the assumption that everyone involved with the oil sands is interested in protecting the environment and understanding ecosystems. There are people who do not believe that the company they work for is making any effort and there are ENGOs and others that use the controversy to further political and economic gains. Their involvement has nothing to do with ecosystem protection or mitigation.
- *…system and would go a long way to ensuring that aboriginal communities are confident of monitoring results. Inclusion of these elements would also empower aboriginal community members to inform and become informed about the current and potential impacts to their traditionally used lands. Continued minimization of such elements will further exacerbate the frustration and mistrust of aboriginal communities and may result in the opposition of oil sands development by this key stakeholder group.*
- *The expectation associated with Assumption 14 is unclear. A credible Public Information and Reporting System should convey a consistent message on the state of the environment. Community-based and traditional Knowledge and scientific knowledge do not always agree. How will this be reconciled to everyone's satisfaction?*

Considering this input, a suggested rewording of Assumption #14 is:

> The information and reporting system will be based on sound science as it core principle. Community-based and traditional knowledge should constitute part of a comprehensive information and reporting system: this would enhance confidence within aboriginal communities that the system addresses their interests.

Assumption Statement #15

Original Assumption Statement:

> Although responsible development and sustainability typically considers economic, social and environmental factors, given OSRIN's mandate and need to provide the Dialogue with focus, the scope of this Dialogue should be on environmental and human health concerns (related to air, water and land) with particular focus on environmental information and reporting of ecosystem effects.

There were 15 responses with 9 agreeing with the assumption (including 4 providing comment), none expressing disagreement, and 6 other comments provided.

- *Agree, but I would also reference biodiversity, along with air, water and land.*
- *Agree, although economic and social factors too are critical to responsible and sustainable development. Perhaps they can be addressed in subsequent workshops.*
- *Agreed. Economic interests are generally strongly represented in our society, and trying to deal with social issues would require a whole different suite of expertise. Consideration of "environmental" issues is a wide-ranging topic already.*
- *Assumption 15 has a reasonable approach to managing the scope of discussion. There needs to be recognition however that this discussion must occur within a provincial policy context within which economic, social and environmental factors are considered for the benefit of Albertans. Socio-economic factors inherent to policy should be acknowledged in scoping the monitoring and reporting.*
- *Modify to: "cumulative ecosystem effects as they relate to predictions". Projects are approved based on predictions. Simply presenting cumulative effects gives no context. It must be assessed relative to the predictions used as the basis of the regulatory approval. If cumulative effects are worse or different than predicted then adaptive management must be initiated.*
- *As soon as you bring in human health, you enter the social and subsequently the economic realm.*
- *I don't think OSRIN should focus on human health.*
- *Is the context I was looking for on input request #1.*
- *First time human health effects are mentioned – would be beneficial to separate out human and environmental effects – focus on one or the other – both is too ambitious and would get confusing.*
- *This point seems to contradict point 8 above. This would seem to corroborate my perspective in response to point 8. Obviously some inconsistency in understanding or belief about monitoring.*

Considering this input, a suggested rewording of Assumption #15 is:

> Although responsible development and sustainability typically considers economic, social and environmental factors, given OSRIN's mandate and need to provide the Dialogue with focus, the scope of this Dialogue should be on environmental and human health concerns (related to biodiversity, air, water and land) with particular focus on environmental information and reporting of ecosystem effects.

Assumption Statement #16

Original Assumption Statement:

> Greenhouse gas (GHG) emissions and carbon accounting related to oil sands development is an important issue but outside of OSRIN's mandate and therefore outside the scope of this Dialogue. That said it is important that this topic be addressed by other venues such as Alberta's GHG Reporting Program.

There were 12 responses with 7 agreeing with the assumption (including 2 providing comment), 3 expressing disagreement, and 2 other comments provided.

- *OK – but if these emissions impact the ecosystem – the information system will need to account for this and report accordingly.*
- *Disagree. The people of Canada are unlikely to provide a social license to operate without a robust system that ensures timely access to accurate GHG emission reporting of oil sands emissions. Unfortunately Alberta's GHG Reporting Program fails on both counts. Perhaps OSRIN's mandate should be expanded.*
- *Disagree – this is a hot topic of debate – Albertans want to know the contribution of the oil sands to GHG emissions and when questioned this is the typical answer. Global warming can have significant ecological effects and if not addressed this whole process may be questioned.*
- *Strongly disagree. Air issues extend beyond GHG and climate change issues (e.g., acidification, eutrophication). Whether air is within OSRIN's mandate or not, it must be part of the monitoring information and reporting system or that system will lack credibility. Air information (concentrations and loadings) is a very important supporting variable in which to evaluate ecosystem effects! Similarly, water quality and quantity and soil quality information is critical to evaluating biological data.*
- *GHG emissions are different than the disturbances to the ecosystem that affect carbon storage and sequestering. So I do not think the DHD reporting system would be appropriate for the local carbon changes due to mining.*
- *This seems like a random statement and does not fit with the others or under the category of "scope and purpose".*

Considering this input, no suggested changes to assumption #16 proposed; however it is acknowledged that not all agree that GHG emissions should be outside scope of this initial Dialogue.

> Greenhouse gas (GHG) emissions and carbon accounting related to oil sands development is an important issue but outside of OSRIN's mandate and therefore outside the scope of this Dialogue. That said it is important that this topic be addressed by other venues such as Alberta's GHG Reporting Program and, if possible, the results of such a reporting program be made available to the ecosystem monitoring and reporting system contemplated in this Dialogue.

Assumption Statement #17

Original Assumption Statement:

> At this point in the Dialogue, the discussions should be at a relatively high-level. For example:
>
> - What are the key drivers, objectives, principles, strategic outputs for an adequate public information and reporting system?
> - How can those strategic outputs contribute to desired outcomes and broader societal goals?

There were 11 responses with 9 agreeing with the assumption (including 2 providing comment), none expressing disagreement, and 2 other comments provided.

- *Sure, but as a participant I want some assurance that the fine details will also be worked somewhere sometime, hopefully soon.*
- *Agree with first bullet, not with the second bullet. Societal goals will change with time and economic status, and age structure of population, and many other factors.*
- *It is likely important to establish agreement on high-level objectives and approaches, but we probably do not need another document (if the outcome of this workshop is to be represented in a document) full of vision statements. I would like to move fairly quickly through high-level objectives to generating actions to address these in tangible ways.*
- *This dialogue has to move quickly. The "level" of discussion and the ability to focus on quality outcomes depends to a huge extent on who is in the room.*

Considering this input, a suggested rewording of Assumption #17 is:

> At this point in the Dialogue, the discussions should be at a relatively high level. For example: What are the key drivers, objectives, principles, strategic outputs for an effective public information and reporting system?

Assumption Statement #18

Original Assumption Statement:

> At this point in the Dialogue, we should avoid detailed discussions of specific indicators (e.g., what species to monitor, what water parameters need to be measured) that might need to be monitored. Those discussions can happen once there is alignment regarding an overall integrated public information and reporting system.

There were 12 responses with 10 agreeing with the assumption (including 4 providing comment), 2 expressing disagreement, and no other comments provided.

- *Agree but feel this will be difficult to stay away from. The dialogue will need to be well facilitated to stay on task of just looking at the fundamentals of a monitoring and reporting system.*
- *Good. Key will be process framework, governance, funding challenges.*
- *I agree that discussion of specific indicators is likely best done in venues with concentrated expertise.*
- *For sure – don't get into that here. A lot of this information is already defined in the approvals so need to ensure we're not reinventing the wheel. Start with what's already being done then go from there.*
- *Nonsense. There are some very obvious components of the system - largely many of the ones already being monitored. These don't need to be validated at this stage but they do provide a framework around which a discussion of a more comprehensive system can be structured.*
- *Disagree – with this group in the room, it might be good to touch on some of this (not specific monitoring protocols and schedules), to get an idea of general elements to consider.*

Considering this input, no suggested changes to Assumption #18 proposed; however it is acknowledged that some of the feedback indicates disagreement.

> At this point in the Dialogue, we should avoid detailed discussions of specific indicators (e.g., what species to monitor, what water parameters need to be measured) that might need to be monitored. Those discussions can happen once there is alignment regarding an overall integrated public information and reporting system.

Assumption Statement #19

Original Assumption Statement:

> The Dialogue's focus at this juncture should be for Albertans representing a diversity of interests to find common ground (alignment) regarding what constitutes an adequate public information and reporting system for ecosystem effects in the oil sands region.

Once this is attained, we can share these views with a broader audience outside the Province and if necessary expand the Dialogue.

There were 11 responses with 8 agreeing with the assumption (including 2 providing comment), 2 expressing disagreement, and 1 other comments provided.

- *Agree, but substitute 'adequate' with 'effective'.*
- *Agree with this statement. Has an everyday Albertan (e.g., a school teacher in Whitecourt) been contacted to fill out this form? It may provide an interesting contrast to what "insiders" may say.*
- *Again, I disagree with this unambitious expectation. Rather, I would prefer to see diverse interests with respect to oil sands development come together. They can then share their views with the vast majority of Albertans who have no knowledge of oil sands development.*
- *Disagree. This issue has long ago progressed beyond Alberta. Canadians are concerned and indeed, the international community is concerned. And both are becoming increasingly influential in determining whether oil sands exploitation will continue. You risk failure should you institute a system that fails to respond to the information needs of national and international communities.*
- *If you mean talk to Albertan's first – sure. The management and scientific community should not, however, download their responsibility to build a credible system.*

Considering this input, a suggested rewording of Assumption # 19:

> The Dialogue's focus at this juncture should be for Albertans representing a diversity of interests to find common ground (alignment) regarding what constitutes an adequate public information and reporting system for ecosystem effects in the oil sands region. Once this is attained, we can share these views with a broader audience outside the Province and if necessary expand the Dialogue. The Dialogue however will consider the needs for an adequate information and reporting system needs from national, international, and trans-boundary impact perspectives.

Assumption Statement #20

Original Assumption Statement

> The Dialogue should focus at this stage on 'function' not 'form'. That is, we will strive to achieve alignment on what an adequate public information and reporting system might look like, as opposed to detailed delivery model options (i.e., this Dialogue is neither about the specific roles of any particular organization nor about the technologies employed). These latter topics will be informed by the former (i.e., form follows function, not the other way around).

There were 11 responses with 9 agreeing with the assumption (including 3 providing comment), none expressing disagreement, and 2 other comments provided.

- *I agree the focus should be on function but the reality of certain organizations responsibilities may affect this function. It is a relevant topic to the discussion.*
- *Interesting that this assumption is made here – it is great. However many of the other comments/assumptions throughout this OSRIN Challenge seems to be putting form before function, e.g., comments that the data currently exist, if only they could be accessed (see # 9 in this section).*
- *I think that this is a reasonable approach, but would reiterate the comments provided in #17, above (i.e., need to establish agreement on high level objectives).*
- *What will be the bases of common ground (key components) in the search for alignment?*
- *There is enough money in the system if we deploy it in a responsible way. This means that we need to address function and rationalize the system relative to the things that we really care about. A bottom up analysis will not drive the required change.*

Considering this input, no suggested changes to assumption#20 are proposed.

> The Dialogue should focus at this stage on 'function' not 'form'. That is, we will strive to achieve alignment on what an adequate public information and reporting system might look like, as opposed to detailed delivery model options (i.e., this Dialogue is neither about the specific roles of any particular organization nor about the technologies employed). These latter topics will be informed by the former (i.e., form follows function, not the other way around).

Assumption Statement #21

Original Assumption Statement

> It is expected that the Dialogue would address:
>
> - The requirements for an information and reporting system that produces sufficient, highly credible scientific data to ensure that the environmental impacts of oil sands operations are known; and
> - Determining that the local, regional and international publics are satisfied that the information and reporting system is sufficient such that potential ecosystem effects of oil sands development are known.

There were 13 responses with 9 agreeing with the assumption (none providing comment), none expressing disagreement, and 4 other comments provided.

- *You need to 'de-sensationalize' the oil sands for the public. It needs to be put into context for a balanced view of what is actually happening. A good example is this – at a recent seminar I was at an oil-sands stakeholder talked about oil sands withdrawing 8 m^3/s of water from the Athabasca. This person went into detail about how many bathtubs, etc. but it was never mentioned that the average flow is around 630 m^3/s, that further restriction can be enacted, and the river can flow as high as 3000 m^3/s. 8 m^3/s is a lot of water to drink, but not a lot out of the Athabasca.*
- *An information system that "produces" sufficient data to ensure that the impacts of oil sands development are "known" is useless. It is a recipe for monitoring the ecological decline of the oil sands region. Data needs to be interpreted and related back to decision-making and policy to ensure that the impacts of oil sands development are avoided or mitigated in compliance with stated objectives.*
- *Public needs assurance that if there are impacts they are known and addressed. A new assumption is that international, third party review of Alberta's monitoring systems would improve confidence and credibility.*
- *…system is sufficient and meaningful such that current and potential ecosystem…*

Considering this input, a suggested change to Assumption #21 is:

It is expected that the Dialogue would address:

- The requirements for an information and reporting system that produces sufficient, highly credible scientific data to ensure that the environmental impacts of oil sands operations are known; and
- Determining that the local, regional and international publics are satisfied that the information and reporting system is sufficient and meaningful such that potential ecosystem effects of oil sands development are known.

What other key Assumptions need to be added that are missing?

Four suggestions were provided:

- *Where is there any reference to the impacts of oil sands development on adjacent jurisdictions? The Northwest Territories will be affected downstream and Saskatchewan will be affected downwind. Saskatchewan will also be developing its own oil sands resources. Whatever the system for research, monitoring and reporting put in place by Alberta, it will need to be compatible with what is happening in neighboring jurisdictions and the input of those jurisdictions into system design is warranted.*

- *Monitoring results also have to be put into a spatial context. If the area is too small, then the results will show substantial impacts. If the area is too big, then the results will show minimal impacts.*
- *I think the majority are valid statements. I will add that there needs to be better integration in reporting from all the various monitoring activities. Currently, it looks as if all monitoring is undertaken in silos with little "inter- communication among monitoring organization. It is also somewhat unclear how all this monitoring fits together and "who" sets the priorities for monitoring.*
- *The information system should also consider feedback from individuals and be able to demonstrate how public concerns and issues are being heard and addressed.*

Considering this input, suggested changes were made to previous assumptions that were intended to capture these important ideas (e.g., for first bullet, see assumption #19).

KEY PRINCIPLES AND ELEMENTS

General Comments Regarding Key Principles

18 general comments were provided on key principles with 10 indicating agreement with the five proposed principles, 5 suggesting need for additional principles, and 3 other comments provided as noted below.

- *I agree with all of the key principles and associated elements. Credibility and transparency are most important to me.*
- *I generally agree with these principles and elements. I do have a few concerns… (noted in comments for two elements below).*
- *Most important are credible and transparent.*
- *I agree with the key principle of success.*
- *This was an excellent list.*
- *This is really pretty good!! I especially like number 11, a key document - probably not done by industry or government.*
- *I agree with the principles as provided and don't feel there are others that are required for the system to be adequate. The elements as described are suitable to the principles. All of the principles are important but the most would likely be "credible". This is the foundation (i.e., science-based) where I see the other principles as functions whose success is based on how well they are executed.*
- *The principles seem appropriate. Further discussion may be required to clarify the need for raw data in light of the challenges in understanding the implications of raw data (see earlier comments). We look forward to further understanding the need for or expectation of raw data at the workshop.*

- *I agree with all key principles, perhaps with the addition of a few more: Effective; Comprehensive; Truthful.*
- *In terms of the Key Principles, if you achieve all of them you would still fall short if it did not lead to a management response by regulators. If you do not have a link to that action then the system is limited to being a Watch Dog. I think it would be more effective for this to be one step in a Deming Cycle of Adaptive Management.*
- *The principles are generally OK if a little muddled. I would have Verifiable as a completely independent principle. I would also add two principles. One is that the information provided should be directional - clearly indicating whether performance is moving toward or away from an objective. The second would be a clear link to decision-making, either at the operational level or to policy and regulation.*
- *I stated the principles on the first page. They are generally aligned with the five you have stated but there are more. (Note: The system should have the following attributes: Arms length; Scientifically credible and comprehensive; Single repository; Consistent methodology; Relevant reporting; Publicly available data and information products; One organization responsible). I'm still a believer in having a consolidated system under a single management structure. Monitoring should be organized functionally not by the current government departmental mandates. Form follows function. Function should not follow form.*
- *I would add the principle that the information system should be "responsive", in that development of objectives should not be done solely by scientific and/or bureaucratic experts, but should be developed to be capable of reacting to concerns/issues raised by non-experts, and further should have a mechanism to understand what these issues/concerns might be (e.g., polling). This idea is to some extent captured under the "Relevant" principle, but I thought I would elaborate on it.*
- *The system needs to have a way to balance or arbitrate between varying needs and wants. So in the area of relevance, how would the system addresses key objectives of various parties when the objectives are at odds with each other? System needs to be Win-win not win –lose.*
- *I think principle #1 Relevant is very important, especially when identifying what information gaps need to be filled.*
- *(Principle) #4 is most important – further to my stress on explaining the process – how will the public understand the causal relationships if they don't have a full understanding of what is actually occurring at an oil sands mine? This is a daunting task for a PR campaign – but I believe it is do-able.*
- *… a 'public' information and reporting system should be: a) transparent (whereby one can readily decipher how information was collected, interpreted and reported),*

b) understandable (presented in layman's terminology) and c) relevant (useful for planning and decision-making).

- *The system should have the following attributes: (1) arms length; (2) scientifically credible and comprehensive; (3) single repository; (4) consistent methodology; (5) relevant reporting; (6) publicly available data and information products; and (7) one organization responsible. I would also contend that factual unbiased reporting should be kept separate from the management responses of governments and industry. To do otherwise puts system integrity into question.*
- *I see the government as acting on my behalf. Although I am a partial owner of the resource as an Albertan, I feel the government (elected and employed) has the responsibility to manager our resources on my behalf. I look to them for assurance… In terms of a reporting system, I would expect the government to decide what assurances they need and as an Albertan, I would expect transparency in any such system.*
- *One item that strikes me is there are a number of organizations that deal with monitoring, however the exact mandates for these groups and how exactly various monitoring efforts are parceled out is unclear to many. At the very least, these monitoring efforts need to have their mandates clearly transparent. Also, there is not one clearing house for such information or as far as I can tell or any one group that has mandate to make results known to the general public.*
- *Transparency and publicly available; Reporting and evaluation steps are accountability are in place; Long term monitoring and uncertainties addressed; Indicators selected should be meaningful, responsive to management activities/responses.*
- *Independent transparent, scientific credibility, accessible.*
- *Monitoring and reporting must be a purpose driven exercise. Given the complexity of the environment, it is not feasible, practical nor useful to monitor and report on all aspects so we need to clearly define what Albertans want to understand and why (see response to input request #1). Some of this work has already been completed. We need to understand these priorities through the lens of the Lower Athabasca Regional Plan, and build on existing monitoring protocols and reporting mechanisms.*

  A public information system should not be scoped on the basis of optics, politics and platforms of lobbyists. It should be designed to focus on conveying relevant facts and scientific evidence of the condition of the environment. There needs to be a simple and effective communications strategy addressing what Albertans want to know.

  The range of opinions for several statements need to be further explored in the context of an understanding of current regulatory requirements in order to identify

critical elements of the public information and reporting system. For instance, themes could be grouped with reference to:

- *deficiencies in state of public debate on oil sands effects due to lack of access to, transparency of and use of available information to inform discussion – 4 and 5;*
- *degree of certainty that mining and upgrading oil sands are having negative impacts on the environment – 3 and 4;*
- *confidence in ability to draw conclusions on the significance of effects in a regional context relative to existing research or monitoring – i.e., to distinguish truly minor effect of limited extent vs. systemic flaws to monitoring systems to identify risk or actual effects – 4 and 7.*

Considering this input, we suggest keeping the 5 principles as they are but elaborating on their description to capture some of the suggestions for additional principles. For example, responsive and relevant reporting can be captured under Principle #1 – Relevant; truthful, consistent methods, scientifically credible and verifiable can be captured under Principle #2 – Credible; publicly available data and information products can be captured under Principle #4 – Transparent.

Comments Regarding Elements

Principle #1 – Relevant

Element 1

Original Element 1:

> Information and reporting needs to address key objectives (e.g., as expressed from a variety of sources including provincial regulations and strategies; regional land use plans; local communities and First Nations).

Comments:

- *How do we know that existing objectives are comprehensive and appropriate?*
- *Also needs to address the regulatory reporting requirements for industry or it will be more difficult for them to buy in*

Considering this input, a suggested rewording of Relevance Element #1 is:

> The information and reporting system needs to address key objectives (e.g., as expressed from a variety of sources including provincial strategies, regulations and reporting requirements for industry; regional land use plans; local communities and First Nations).

Element 2

Original Element 2:

> The information and reporting system needs to address the needs of decision-makers and be readily available so that decisions can be made in a timely and well informed manner.

Comments:

- *Please note that Principle 1-2 (multi stakeholder dialogue) is already working well and that is what drives funding.*
- *Must support a business management decision process.*
- *It also needs to be used by the key decision makers – there needs to be a commitment that this will in fact be done.*

Considering this input, a suggested rewording of Relevance Element #2 is:

> The information and reporting system must support a business management decision process and be responsive to the needs of decision-makers so that the information and reporting is used to make timely and well informed decisions.

Element 3

Original Element 3:

> The reporting should be timely, and capture both transient events and trends in order to address both the long and short term needs of the various stakeholders.

Comments:

- *The most important element surely is credibility not timeliness; otherwise you merely drive another process to meet deadlines*
- *This has more to do with the credibility of the reporting*

Considering this input, a suggested rewording of Relevance Element #3 is:

> Reporting should capture both transient events and trends to address both the long and short term needs of the various stakeholders.

Element 4

Original Element 4:

> Both local and regional needs will be addressed.

Comments:

- *There are so many seemingly overlapping processes at the moment on top of approvals and objectives that it is hard to see how they can, or are being coordinated*
- *As indicated, there is a national component to oil sands development and the monitoring and reporting system needs to support this.*
- *Needs clarification. Are the local and regional needs human or ecosystem needs or both?*

Considering this input, a suggested rewording of Relevance Element #4 is:

> The information and reporting system needs to support local, regional and national assessment and reporting of ecosystem effects.

Principle #2 – Credible

Element 5

Original Element 5:

> Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices with appropriate quality assurance measures applied and subject to periodic international peer review.

Comments:

- *See earlier comment about the irrelevance of the word "international" in the context of peer review.*
- *Element 5 is most important to me.*
- *Just a question, why does monitoring/reporting need to be subject to international peer review?*
- *Credible – yes and needs to be comparable with what was submitted in order to get approval.*
- *The information should be science-based, but not exclusively so, or should not use scientific expertise as a barrier to contribution. The system should at the very least be capable of consideration of non-science-based observations in setting hypotheses.*
- *This is critical and data needs to be available in a transparent way.*
- *There needs to be acknowledgement of the Precautionary Principle – too often the excuse that there is not enough information leads to inaction – this is not seen as credible to stakeholders.*

Considering this input, a suggested rewording of Element #5 is:

> Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices with appropriate quality assurance measures applied and subject to periodic peer review.

Element 6

Original Element 6:

> Information, including monitoring, needs to reviewed and verified and should be standardized and certified through an appropriate framework such as ISO or CSA.

Comments:

- *This is a bad idea.*
- *Precisely - there are already numerous models out there for designing a credible and comprehensive research, monitoring and information program. Why would we start with a blank sheet of paper? Why not put relevant ISO/CSA information on the table? There is a lot of good material in the CSA's Z808/9 Sustainable Forest Management standard that is applicable to the forested landscape of the oil sands region, for example.*
- *Represents an ideal. At the moment, not all oil sands contaminants are included under ISO and CSA frameworks (e.g., naphthenic acids). I suggest modifying the statement to "…where possible should be standardized and certified…"*
- *Depends what it is. Some things are easier to manage like that than other things are. Also, consider the timeliness of information access if it needs to go through a review and verification process. Can we have our cake and eat it too?*
- *This is a 'would be nice' be nice as opposed to a must. It is enough to accomplish element #5.*
- *I know little about ISO or CSA, but would want to be sensible about this, and not create an onerous structure that detracts from fundamental objectives.*
- *Element 6 suggests that the review and verification is not being done, when it is being done on a regular basis. Case in point, RAMP, undergoes a peer review every 5 years and is adapted based on that review. A review by Kevin Timoney resulted in a modification to the program and a recent paper of multiple authors (including Dr. David Schindler) is resulting in further program changes. A second peer review is ongoing. Yet, despite all these facts, the only point made is that the first review found problems. That is the point of a review, to find problems; the only real problem is that environmental groups don't report that change was made in response to that review because it does not support their views and opinions. RAMP*

failed in making the changes public, primarily because it is hardly media worthy to report things are being done in a positive manner.

Considering this input, a suggested rewording of Element #6 is:

> Information, including monitoring, needs to be reviewed and verified. Information gathering, analysis and reporting should be standardized with consideration that an appropriate certified framework such as ISO or CSA be used or adapted where appropriate.

Element 7

Original Element 7:

> A collaborative structure providing oversight and integration – involving government, industry, First Nations, academia and non-government organizations – will enhance credibility of an information and reporting system.

Comments:

- *This is already operating to some level of success in the AOSR; unfortunately new processes being layered over the multi stakeholder approach may undo good that has been done.*
- *Disagree. Some form of multi-stakeholder oversight committee makes sense, perhaps working in concert with a scientific advisory committee. However, asking such a committee to handle integration introduces politics into the interpretation and prioritization of issues and data.*
- *Perhaps a group like this can help when determining upfront monitoring requirements and structure for reporting but how will a group like this make the information reported more credible? Put it in up front but minimize the bureaucracy at the end.*
- *Will certainly need a multi-layer structure to meets the needs of different stakeholders.*
- *Under Credibility, I do not think that having collaborative approaches necessarily increase credibility. Monitoring fully housed in Government and Universities with no participation in data collection or analysis by industry would be considered more credible. The dominance of industry participation at organizations like WBEA and RAMP is problematic. Where multi-stakeholder monitoring does exist, compare ABMI, with one oil sands industry rep on the board to RAMP which has about 15?*
- *Full collaboration will undoubtedly be difficult.*
- *I strongly agree.*

- *Element 7 has existed since the monitoring programs began and is ongoing today. That these groups already participate is an obvious oversight in this review. The system exists, is being done, but, the organizations suggested to participate do not do so or make it public that they do because this would likely undermine their agenda and potentially their sources of funding, donations from groups opposed to oil sands.*
- *How do the principles link to the public or Albertans (possible gap in element 7)? We also look forward to exploring the nature of element 7. There needs to be some thought as to how to ensure the accountability of all stakeholders for the achievement of an Adequate Public Information and Reporting System for Ecosystems in the Oil Sands Region.*

Considering this input, a suggested rewording of Element #7 is:

> The information and reporting system should be independent with stable, long-term funding. A collaborative structure providing oversight involving government, industry, First Nations, academia and non-government organizations will enhance credibility of an information and reporting system.

Principle #3 – Understandable

Element 8

Original Element 8:

> Complex science-based information needs to be interpretable, and interpreted, so that the public and decision-makers understand its meaning (e.g., using "plain language" rather than scientific terms; using a risk-based approach where the likelihood and consequences of adverse environmental impacts are considered). This may result in the need for multiple information formats – including raw data, science-based analyses and plain language analyses.

Comments:

- *This issue does result in the need for multiple, layered information formats (not "may").*
- *Agreed*
- *Raw data will require contextual information so that any capable scientist can use it effectively.*

Considering this input, a suggested rewording of Element #8 is:

> Complex science-based information needs to be interpretable so that the public and decision-makers understand its meaning (e.g., using "plain language" rather than scientific terms; using a risk-based approach where the likelihood and consequences of

adverse environmental impacts are considered). This results in the need for multiple information formats including raw data, science-based analyses and plain language analyses.

Element 9

Original Element 9:

> The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g., not all impacts in the oil sands region are due to oil sands development, rather other sources of effects may be causing the impacts).

Comments:

- *Surprised this comes up so late in the paper as it is a huge issue. What is the quality of baseline data on the key components of the information system? This is particularly important given the proximity of bitumen to the surface and surface waters in some areas and the potential for "contamination" to have existed historically. For how long has monitoring been undertaken on each component in the region? To what extent can forestry and agriculture (and in some cases increased public access) be shown to have had an impact? If we don't know the starting point, it is very difficult to establish performance objectives or to assign causal relationships (as opposed to correlation).*
- *I'm confused by this element. It's my understanding that monitoring programs are not designed to determine causal relationships. That is the realm of experimental research. Is the intention of the information and reporting system to also include results of experiments?*
- *Decision makers should get this information directly from the companies – not from OSRIN.*
- *Needs to be done in a manner that is non-accusatory or points fingers. Recognize that these effects may have been 'approved'. The basis should be corrective and mitigative, not punitive and placing blame. Need to be careful on the product that is envisioned here.*
- *Agreed.*
- *Agree, but again refer to the use of the Precautionary Principle.*

Considering this input, a suggested rewording of Element #9 is:

> The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g., not all impacts in the oil sands region are due to oil sands development,

rather other sources of effects may be causing the impacts). This will involve developing linkages between the information and reporting system and existing and ongoing research into causal relationships.

Principle #4 – Transparent

Element 10

Original Element 10:

> The public information and reporting system must be operated with complete openness and transparency with data collection methods, data, models, information and reporting readily accessible to the public.

Comments:

- *This will not likely be possible. There may be some situations in which proprietary information or intellectual property may be involved and mechanisms need to be established to respect that.*
- *'Accessible to the public' should mean at little or no cost to the public.*
- *Once the decision is made exactly what information will be made available in this forum.*
- *Agreed.*
- *Element 10 is, for the most part, true today. The one exception, RAMP, is being corrected.*
- *Where possible, methods and models should be standardized. A good example is air emissions modeling – different companies use different consultants to develop EIAs and there can be huge discrepancies in the results reported (in one case there was a 400% difference between 2 EIAs describing the same scenario).*

Considering this input, a suggested rewording of Element #10 is:

> The public information and reporting system must be transparent with respect to data collection methods, data collected, and models used for evaluation, and make all this information and reporting readily accessible at little or no cost to the public.

Element 11

Original Element 11:

> A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report should be published annually for the oil sands region. A collaborative structure

(such as described in element #7 above) that oversees the development of the report will enhance its credibility.

Comments:

- *Fine, but a description of what is happening is inadequate. The report needs to assess the significance in changes to any indicator and link the changes to improvements in management practices to demonstrate that the impacts are not only being observed but that they are being addressed.*
- *Second sentence, I would also suggest that the 'development of the report be by a credible arms-length entity'. By this I mean that the report is based upon objective scientific data and analysis, prepared and reviewed by appropriate experts and is not some sort of negotiated outcome based on potentially competing interests represented within the proposed oversight collaborative structure.*
- *It's supposed to be done through the GOA but its super old … working with them on that would be helpful … or doing your own. But, avoid (a) duplication and (b) saying two completely different things.*
- *Technical Reports there may be too much information for readers to process. The synthesis report needs to be that – short sweet, and to the point - set up for easy public digestion.*
- *Creating a state of the environment report from a collaborative group may not be achievable. The monitoring itself could be done collaboratively but I feel government plays the role for advising Albertans on the state of the environment.*
- *I especially like number 11, a key document - probably not done by industry or government.*
- *I think that a SoE report is a good idea, but I think that preparing such a document of necessary rigor and quality is a substantial undertaking, and I doubt that the capacity exists to do this on an annual basis. Further, I would suggest that many of the issues that we seek to investigate would not necessarily be expected to manifest as changes over such a short time frame, and many existing monitoring systems have longer cycles (e.g., a 6+ year cycle for WBEA's TEEM program, and idealized 5-year cycle for the ABMI). So, I think that a 3-5-year routine for SoE reporting would be more useful.*

Considering this input, a suggested rewording of Element #11 is:

> A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report should be published periodically (e.g., every 3 to 5 years). A collaborative structure led by the Government of Alberta (such as described in element #7 above) that oversees the development of the report as well as peer review to ensure the report is based on sound science will enhance its credibility. The report should document ecosystem changes and management efforts to avoid, mitigate or lessen impacts.

Principle #5 – Robust

New Element 12:

> The information and reporting system should be independent with stable, long-term funding.

Element 13

Was Original Element 12:

> A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent.

Comments:

- *Need understand the relationship between sound accepted monitoring practice and method testing, research, and trials. The latter can somewhat muddy the waters if relevant interpretation and context are not provided.*
- *Robust – improvement, yes, but don't keep changing the system so there is no ability to compare current data to baseline or even from year to year – this would affect the credibility.*
- *Based the explanation in section 7.2, I strongly recommend that the term continuous improvement be replaced with more appropriate term adaptive management. Continuous improvement is about improving your environmental performance, not about your environmental information remaining relevant. Please see the definitions below extracted from Alberta Environment's 2007 Glossary of Terms Related to Shared Environmental Management(Alberta Environment 2007) for further explanation:*

  Continuous Improvement

  The on-going improvement in the performance in achieving environmental and resource outcomes, as well as improvements in the management systems used to achieve the outcomes (i.e., policies, delivery, performance assessment and information systems). Continuous improvement is based on the need to continuously monitor performance and success and to strive for improvement at all levels, across all activities and sectors, and with all participants.

  Adaptive Management

  A dynamic management system or modeling process that recognizes the future cannot be predicted perfectly. In response to these imperfect predictions, planning and management strategies are modified frequently as better information becomes available. Adaptive management applies scientific principles and methods to

improve management activities incrementally, as decision makers learn from experience and new scientific findings, and adapt to changing social expectations and demands.

Adaptive management can refer to a continuous improvement management model that allows new information to be considered and new management approaches to be incorporated in support of better resource and environmental outcomes. It starts out with clear goals followed by "plan, do, check" and then making adjustments for on-going improvement.

Considering this input, a suggested rewording of Element #13 is:

A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent. It is important that any improvements made do not unduly compromise the ability to compare current data to baselines (or even year to year) as this would affect the ability to document change over time.

Note: There is a strong and logical overlap between continuous improvement and adaptive management, but the Deming cycle is commonly referred to as a continuous improvement cycle; so would not make the suggested change above in the wording of the element.

Continuous Improvement

Original Statement:

Responsible development of the oil sands resource requires an overall management framework that fosters continuous improvement (learning by doing). The Deming Cycle of Plan-Do-Check-Act is frequently used to describe a continuous improvement management framework and can help provide guidance for developing an adequate public information and reporting system in the context of the responsible development of the oil sands.

The four steps in the Deming Cycle (with examples of how they can be employed in the oil sands region) include:

1. *Plan*: front-end desired conditions (objectives) are provided. In the oil sands region, this can come from provincial strategies, regulations and operating approvals; regional land use plans; First Nations and community objectives.
2. *Do*: develop the oil sands consistent with the objectives using management tools such as modeling and best management practices.
3. *Check (monitor and report)*: back-end information collected and reported to determine if the objectives were achieved (i.e., via an adequate monitoring and reporting system).

4. *Act (adapt and adjust)*: assess if the desired objectives were attained and, if not, take corrective action to improve attainment of those objectives (i.e., continuous improvement). In some cases, the objectives themselves may need to be modified.

The focus of this Dialogue is on the public information and reporting system, which is part of the Check (monitor including information and reporting) 'step' in the continuous improvement framework. Although information and reporting alone is not sufficient to determine if the assess oil sands development is responsible, they are an important component of an overall management framework.

General Comments:

- *Yes, I think the Deming approach is useful.*
- *Yes, the Deming approach is useful. This is essentially an adaptive management process that has been actively promoted for sustainable forest management within Alberta.*
- *I am not really sure how the Deming cycle fits into this overall project. At AENV we are speaking in terms of Knowledge & Performance management cycle which is a modification of the Deming cycle. The paper suggests we concentrate on the monitor portion, I agree but still am confused why we even raise the Deming cycle at all?*
- *Deming approach – yes in principle, but does the Government of Alberta want to make the tough decisions that might constrain development if we get monitoring results we don't like, as in the case of declining woodland caribou herds. The evidence suggests no.*
- *Whatever the plan is or was, the do is happening, so can we please get the check in place soon so we can proceed to act.*
- *I see the Deming approach useful but not without the discipline to actually use the system and ensure it drives the improvement required.*
- *I think the conceptualization of how continuous improvement principles are relevant to this discussion is appropriate.*
- *The Deming approach is applicable and useful in this context.*
- *I also agree with the Deming Approach. The Deming approach is part of continual improvement and is what I thought was the connection between CEMA (Plan and Act) and the two monitoring organizations RAMP and WBEA (do and check).*
- *The Deming approach would seem useful.*
- *7.2 #1 plan should include federal and international policies; #2 Do should include management frameworks.*

Specific comments provided:

- *7.2.1Where is the collection of baseline data?*
- *Some of the "do" needs to consider the cumulative impacts of multiple companies on the objectives – are they company-specific or regional in nature. A link to OSLI would also be appropriate.*
- *Objectives are not likely to be achieved on an annual basis. The information needs to be directional and should be presented in a way that progress, or lack thereof, toward an objective can be assessed.*
- *7.4 Adapt and adjust could be applied to the information and monitoring system. And, once again, there should be a means to not only influence operating practices, both individually and cumulatively, but also policy and regulation.*

Considering this input, we will employ Section 7.2 and the comments as guidance for the workshop and design of a monitoring and reporting system.

OTHER COMMENTS OR SUGGESTIONS

Comments

- *Whatever system is moved forward, it needs to have longevity. Constant changes to the system (outside of normal improvement) will not benefit anyone. It will take time to get brand recognition so patients will be required by all stakeholders. There will always be critics – even on the whether or not it is science-based (science is not always aligned or objective). It needs to be a model we are truly proud of.*
- *Public reporting is going to have to be a coordinated effort. Governments have a large role to play here. I think that not only to we need to teach adults about the work and results but we also need to teach the children in schools and their teachers. The only way one can enact change is to do something different. Educating teachers who in turn educate children is a much more focused and long term strategy.*
  I also believe that oil sand companies can only talk about sustainability if they are actually doing it. I think that more work can be done in this area by the various operators.

The following feedback was provided which we report in its entirety:

> *The Mission:*
>
> To support natural resource decision-making by providing relevant, timely, and credible scientific knowledge on the state of the environment in the oil sands

Values:

a) *Independent and Objective – the information system needs to operate at arm's length from all oil-sands stakeholders and produce factually based results in a value-neutral way;*

b) *Scientifically Credible – the information system need to be built on a foundation of scientifically credibility. This credibility needs to be actively maintained and must include independent peer-review that is conducted in an open and transparent manner;*

c) *Standardized Repository for Data – high quality data and information management is* housed and managed in standardized place to ensure timely and accurate delivery;

d) *Transparent Operations – the information system must be transparent, to be in keeping with its role as an arm's length system entrusted with addressing critical public interest needs;*

e) *Public Access to Data – data and information products must be publicly accessible;*

f) *Value from Products/Services – The information system needs to be committed to delivering as much value as possible from its data set – and be accountable if it does not.*

g) *Relevant – the systems must be specifically and deliberately designed to address the needs of resource managers, policy analysts, and Albertans at the ecosystem scale in the oil sands. It must be committed to providing relevant products as part of its core business.*

h) *Cost-effective – the system should integrate multiple ecosystem-scale monitoring and reporting needs where appropriate. This will result in a more cost-effective delivery of knowledge.*

Other considerations (recommendations primarily come from the United States' National Research Council:

a) *The organization running the monitoring program should be non-regulatory. A monitoring system housed within a regulatory agency will face problems of internal conflict of interest (particularly around communication), changing priorities, and data confidentiality. This may lead to a higher rate of denial of access to land base types for the purpose of conducting surveys. In addition, the need for short-term information for regulation might compromise the ability of the agency to commit resources to long-term monitoring programs.*

b) *The organization running the information system needs to make it the highest priority internally and in its presentations to stakeholders.*

c) *The organization needs to have predictable, stable, long-term funding devoted to the business of environmental monitoring and reporting in the oil sands. The funding model must be robust to changing political priorities and economic down-turns. Large fluctuations in funding will seriously damage the program.*

d) *The oil sands information and reporting system should have a strong administrative and scientific team capable of providing the initiative with high-quality leadership that is required for such a large and highly visible program.*
e) *The organization running the information system should have strong familiarity with each of the resource types being monitored. This can occur through internal capacity or through having timely and open access to such expertise.*
f) *The information system should have the capability to carry out (or interact with) strong research programs affiliated with the monitoring system to answer detailed questions raised by the programs ecosystem performance monitoring. Environmental performance monitoring, compliance monitoring and research are not the same thing. Though they should all interact.*
g) *The organization running the information system should have a strong scientific and management reputation, making it easier to attract and retain top professional staff.*
h) *The organization running the program should be in close communication with agencies that will administer management and policy (e.g., the management system).*
i) *The organization running the program cannot be an advocacy organization. It must remain entirely value neutral – this may be challenging if the organization(s) are housed in a regulatory government ministry, industry, or the environmental community.*

The Alberta Biodiversity Monitoring Institute (ABMI) has been developed using all of these core principles as fundamental pieces of the business model. As a result of the ABMI's commitment to these principles, the program is viewed by government, industry, the environmental community, and the financial investment community as credible and relevant.

The input above is very useful, however some of it relates to a potential single agency approach in delivering the information and reporting system. The assumption (#20) that the Dialogue should focus at this stage on 'function' not 'form' – was generally supported via feedback received – and therefore suggests discussions on delivery model options should occur later. Again, we will use this feedback as guidance for the workshop and design of a monitoring and reporting system.

NEXT STEPS

Do you have any questions regarding the Next Steps?

Comments

- *I see one important pitfall that you may not be realizing – for this to be successful you need to report to the public, not to the portion of the public that makes the most noise. CAPP already exists.*

Considering the input above, suggest noting that OSRIN's Final Report would provide opportunities for the public to review and comment, and that those comments unattributed would be made available.

Do you have any other questions or comments you would like to share?

Comments:

- *Is OSRIN intended to provide a purely reporting/collating function? How will OSRIN influence monitoring if scoping, funding, execution of monitoring is outside its purview?*
- *I am a cautious optimist so I will be very interested in the upcoming dialogue and workshop. I will always keep asking the questions, So what? And to what end? What will be done with all the info gained?*
- *The whole system needs to be thought out and developed in a measured way for it to be successful. It cannot be a knee jerk reaction to an issue.*
- *I would like to see more emphasis placed on cost and lack of resources. There are many examples in Alberta of gaps in monitoring due to budgetary constraints, and a general lack of recognition as to the importance of monitoring.*
- *I am a concerned citizen. I think we need to get our act together and get some monitoring and reporting in place sooner rather than later, so we can act and make some informed decisions regarding the public interest.*
- *In terms of comments, I would suggest that for OSRIN to be credible with the stakeholders it engages, it needs to be aware of all the aspects currently underway for the topics they are covering. In this instance (information and reporting), OSRIN needs to be up to date on the all the environmental reporting that has happened and is happening in the region. I feel there are a lot of initiatives underway that are aimed at the oil sands but are often not up to speed on the topics they are aimed at. This starts to diminish their credibility from the start.*
  There is a need to be very precise and accurate in what is portrayed – for example, it is a bit unclear if this task relates to the oil sands mining or all oil sands developments. This lack of precision in the language can be confusing and often inadvertently misrepresent oil sands. For instance media will often show a picture of a large mining truck beside a story regarding an in situ development. This lack of precision can be confusing to the general public.
- *Overall, really good work, but I remain confused about whether this is about designing the ideal information and reporting system for oil sands environmental information, or is about designing an information and reporting system that fits OSRIN's reclamation-oriented mandate. Either is fine, but this needs to be clarified before going any further.*
- *This dialogue seems very out of place in the OSRIN challenge. This continuous improvement model is the business of the management and policy systems. This is not the business of the information systems. Certainly, this is out-of-scope for an information and reporting system for ecosystems in the oil sands region of Alberta.*

The information system needs to interact with a management system. However, if the information system crosses the line into making management recommendations or taking a position in the management system – then the monitoring system will fail to achieve/maintain credibility.
In-scope is understanding where the oil sands information system can best support the management system. Understanding and supporting the management system is a fundamental business activity of the oil sands information and reporting system.

- *I cannot meet the request that I participate as an individual, I do represent the oil sands industry and my employer. I was asked to participate because of those reasons and my response reflect that. I think it is impossibility for any respondent to reply in a completely unbiased manner so the assumption is flawed and should not be considered as valid in analysis of the information received. I suggest that the responses should be considered as biased and therefore it is the balance that is important rather than consider all opinions equal and representative of individuals.*
- *Who is asking what information Albertans need in order to have confidence in development and ecosystem health from a provincial perspective (i.e., beyond oil sands region)? How is this information gathered (i.e., regional planning, other process)? What is the relationship of this initiative to existing monitoring work? What critical elements are needed from a system design perspective in order for all other organizations overseeing monitoring to feel comfortable integrating their work under one umbrella?*

APPENDIX 2

Please feel free to inform us of monitoring and reporting programs that are not listed in Appendix 2.

The following comments were received:

- *How about including agencies that should be conducting their own monitoring, reporting and enforcement programs but are not on the list? (like Environment Canada, DFO and Health Canada)*
- *You don't mention a research organization – specifically CONRAD…."*
- *"CONRAD – Wildlife Corridor and Connectivity Research Program (not sure exactly what it's called);*
- *"CONRAD also has some monitoring programs, such as the Wildlife Habitat Effectiveness and Connectivity Program"*
- *Both Alberta Environment and Environment Canada have initiated monitoring/research work in the area.*
- *Other stakeholders including First Nations and Academics are undertaken monitoring.*

- *Should regional human health monitoring programs also be included in the list (if they exist)? Also, Alberta Caribou Committee annual statistics for herds co-existing with in-situ developments?*
- *The statement that AENV "maintains its own monitoring network" is imprecise and a little misleading. For example, AENV has a provincial long-term river monitoring network for surface water quality and a few of these sites fall in the oil sands area, but we do not have a surface water quality monitoring network specifically for the oil sands.*
  I think a brief summary of the number and location of air, surface and groundwater water quality and quantity monitoring stations within the oil sands be provided so that gaps and adequacy can be assessed.
  I don't believe AENV has any long-term land monitoring sites, but I trust that SRD does (they may also have fish monitoring sites).
  Does the ERCB have any monitoring programs
- *It is not clear, from the information provided, what type of data is collected by Alberta Environment's own monitoring system.*
  Many, if not most, federal government monitoring and reporting systems that I am familiar with rely heavily on provincial government data sources and probably are of limited value for assessment of local and regional ecosystem effects.
  I am assuming that most monitoring undertaken by individual oil sands companies is specific to their land holdings and is not part of a larger systematic data collection for the region/sub-region. Ecosystem effects, by and large, need to be monitoring and evaluated over relatively large areas and longer time frames.
  There needs to be a determination of whether there are relevant monitoring systems already in place for fisheries and ground-water resources within the oil sands region.
- *WBEA operates 15 continuous air monitoring stations in the AOSR. These stations located from Fort Chip in the north to Anzac south of McMurray monitor criteria and some non-criteria air pollutants. Raw data are streamed to our web site, and corrected data are streamed to CASA. WBEA also collects semi-continuous data on 23 species of PAH's, a long list of VOC's, fine PM, reactive nitrogen forms, and precipitation chemistry. WBEA also operates highly specialized equipment to monitor ambient air including the first ever deployment in Canada of: an ambient ion monitor, a refrigerated/automated precipitation sampler, and a patented gas chromatograph for co-measurement of inorganic/organic sulphurs, hydrocarbons and VOC's. WBEA also operates trace level analyzers with detection limits below those required in industry approvals.*
  WBEA's largest program is in Terrestrial Environmental Effects Monitoring (TEEM). This program has had a four-fold increase since 2007. It is an integrated, source to sink monitoring effort that is science based. Key projects include emission source (mobile, fixed, fugitive, urban, area) characterization, linking elemental

concentrations in lichens from over 320 sites arrayed geospatially with source type through source apportionment, new indicators for early warning of change (stable isotopes, needle surface chemistry, soluble ion movement etc.), ecologically analogous monitoring site network, instrumented 30 m towers for separation of climate/pollution influence, bog monitoring and many more. The source characterization project being done by leading world authorities includes the first on board, measurement of GHG/pollutant emissions from heavy haulers. Much of TEEM's program has been funded to supply needed information to regional dispersion modeling and enhance informed decision making within the air shed. WBEA is also undergoing a significant data base enhancement, including the first ability to deliver Level 3 ambient air data and maximize instrument performance below manufacturer stated detection limits.

I am only familiar with the field of air-pollution impacts on terrestrial ecosystems, but suggest that Appendix 2 inadequately describes the scope of WBEA's programs. WBEA is described as monitoring air quality and acid deposition, but in fact WBEA funds the most effective programs in the region for assessing effects of deposition of industrial atmospheric emissions on terrestrial vegetation communities and soils. Although Appendix 2 states: "Impacts of development on plants and animals are tracked by the government and industry funded Alberta Biodiversity Monitoring Institute", I would argue that ABMI's design is only capable of detecting larger, land-use-related impacts (due to sampling intensity and design), and would be ineffective at monitoring for effects of something like pollutant deposition, or of identifying causes of detected changes. I also think that the ABMI statement is somewhat disingenuous, in that, to my knowledge, ABMI is not fully funded, and thus not fully capable of delivering on the statement in Appendix 2.

Also, it is my understanding that there is joint ASRD-industry initiative under development for a regional monitoring group. This is not included in your appendix, and that fact seems consistent with the lack of transparency around this initiative to date, from the perspective on non-GoA and -industry stakeholders.

Under the CEMA bullet, note that the Surface water working group's monitoring technical task group is developing a recommendation for monitoring to understand the impacts of the IFN Phase 2 Framework. This should be completed in the fall and will build on existing monitoring initiatives in the region.

Additionally, there are several other monitoring initiatives in the region

PADEMP – Peace Athabasca Delta Environmental Monitoring Program (considering regional impacts in the Delta)

AENV Oil Sands branch monitoring initiatives that fall under various management frameworks. These are related to IMERF but are being developed independently: groundwater, surface water, air, reclamation and disturbance.

- *Lower Athabasca Terrestrial monitoring. Not named yet. OSDG and SRD.*
- *Unfortunately the WBEA reference failed to note the extensive terrestrial monitoring undertaken through the Terrestrial Environmental Effects Monitoring (TEEM)*

program. This detracts from a respondents understanding of monitoring to be able to properly respond to this dialogue.

- *Gaps in Appendix 2 initiative include:*
  Voluntary reporting under CAPP stewardship
  Wildlife monitoring by SRD
  As a general comment, for consistency this list should identify each monitoring program, its mandate, model for governance/oversight with reference to participants and funding model.
- *Sustainable Resource Development in partnership with several oil sands developers have initiated a Terrestrial Monitoring Joint Working Group. The purpose of the group is to design a regional monitoring system that will contribute to standardized and systematic approach with ABMI as the foundation for the integrated monitoring program.*

Considering this input, Appendix 2 will be expanded to address some of the other programs mentioned.

APPENDIX 8: Progress Report

PURPOSE OF THIS REPORT

This Progress Report is intended to provide:

- an overview synthesis of the range of feedback on the Challenge Paper (with sample quotes)
- a sense of where participants expressed significant alignment with ideas in the Challenge Paper and areas where there is confusion or disagreement or a desire for more information
- additional issues, ideas and suggestions that participants feel need addressing
- some initial reactions to the feedback received
- an initial effort to refine the key components of the Challenge Paper — Key Challenge, Expected Outcomes, Assumptions, Key Principles and Elements — based on participant feedback.

The Progress Report is a summary document with commentary from the Champion. It was derived from the Synthesis in Appendix 7 of this report.

SUMMARY COMMENTS ON THE FEEDBACK RECEIVED

Thirty-three people responded to the request to provide feedback on the Challenge Paper of which two indicated they were unable to provide input at this time. The amount and quality of the feedback from 31 individuals who were able to review and comment on the Challenge Paper has been most encouraging. Nearly all of the 31 individuals providing feedback kindly took the time to respond to every input request and the depth of comments provided demonstrated a real interest and commitment to this Dialogue. The table below summarizes the number of individuals providing feedback the amount of feedback in pages within the *Challenge Paper Consolidated Feedback* document:

Input Request	**# individuals providing comment**	**# pages of comment received**
Key Challenge	31	7
Background	30	9
Expected Outcomes	29	5
Assumptions	29	19
Principles and Elements	28	9

Input Request	# individuals providing comment	# pages of comment received
Next Steps	16	2
Appendix 1 – Monitoring Programs	15	3
Total	31 individuals	54 pages

The 31 individuals providing comment are affiliated with a diversity of organizations: 9 are with industry, 7 with the Alberta government, 5 with monitoring programs, 3 with First Nations (including consulting support), 3 with academia, 2 with consulting firms, and 2 with other non-government organizations.

At a high level, the considerable feedback received suggests the need to improve the wording on the Key Challenge, Background Statements, Expected Outcomes, Assumptions and Principles and Elements. Very few comments indicated disagreement, but provided valuable ideas so that the intent is better conveyed. In some cases, we have taken the liberty to move comments to augment the discussion of other segments of the Challenge Paper.

We assume that among those who have not yet provided feedback, most if not all, of you will still follow the Dialogue and are interested in seeing how this journey evolves and where it might take us. Your comments on this Progress Report are appreciated.

We commit to honour and respect your contribution by:

- using your feedback to shape the next steps of the Dialogue including the Workshop
- working creatively to expand and sustain an open, frank Dialogue
- assisting participants to gain alignment around some priority ideas concerning an information and reporting system for ecosystems in the oil sands region

We invite you to hold us to this commitment.

KEY CHALLENGE

The revised Key Challenge for this Dialogue is:

> To describe key principles and elements of an adequate and effective information and reporting system that would provide Albertan's (and the World) with assurance that ecosystem effects due to development in the oil sands region are known and reported and, along with socio-economic information, support meaningful decision-making and responsible management of the resource during its entire life cycle.

Champion's Comment:

We have expanded the original Key Challenge statement to incorporate the key issues raised in the feedback. One issue key that elicited much comment is the word 'adequate'. This word seemed to mean 'second-rate' or 'barely adequate' to many. Suggestions for substitution included 'world-class', 'excellent', and so on. We believe that 'adequate' means 'does the job to the level required and expected and thus achieves the intended purpose'. Consequently, we have chosen to leave 'adequate' in the Key Challenge statement, but have added effective for further clarity. We have also expanded the Key Challenge statement to include a 'directedness of purpose' such that an adequate system would support meaningful decision making and responsible management. In this context, other factors will impinge, and this is noted.

Requested clarifications are:

- *'oil sands region' includes all areas encompassing resources and/or affected by oil sands development*
- *'system' is meant to refer to 'the collective activities of funding, planning, data gathering, data synthesis, data interpretation and data reporting that are carried out by all parties in the oil sands region'*
- *'oil sands development' refers to both in-situ and mining operations.*
- *'ecosystem effects' is intended to be used similar to term 'environmental effects' where a local or regional change to the environment can be measured and can be related to oil sands development. Throughout this dialogue, the terms changes, effects and impacts have been used somewhat interchangeably. We received an excellent comment that said:*

  The term 'effects' is often misunderstood. Effects come from measurement of change; change may or may not lead effect; effect may or may not lead to impact. Change may be positive (pollution mitigation response as in southern California, excess nitrogen deposition in Europe stimulates forest growth) or negative. Change is easier to monitor and to document than effect, which occurs over a much longer term. I would suggest change rather than effects.

We acknowledge that we should use a single term unless otherwise intended. We will use 'effects' generally, and reserve 'impacts' for significant changes (of varying magnitudes). We welcome comment on this usage.

INPUT REQUEST #1: Please review the revised KEY CHALLENGE and provide your response in writing in the accompanying Feedback Form.

BACKGROUND

The following revised list of background statements is provided in response to the comments received, and are intended to more accurately describe the Background leading up to this Challenge Dialogue:

1. OSRIN and other organizations have identified ecosystem effects as a key concern that needs to be addressed to sustain the social license for Alberta's oil sands industry to operate, access markets, and access capital to invest in oil sands.
2. Many of the hydrocarbons and other chemicals released from oil sands development are potentially harmful to ecosystems and human health. It is important to understand the degree to which these constituents are entering the ecosystem beyond naturally occurring levels. The potential for effects on ecosystems is related to the location, magnitude, duration, frequency, timing and contaminant concentration in such releases.
3. Many people are concerned that oil sands development is having significant negative impacts on the ecosystem. They are interested in knowing what impacts are occurring, what impacts were expected and what actions have been taken or are planned to avoid, mitigate or minimize both expected and unexpected impacts over time
4. While effects from oil sands mining and other operations are inevitable, the impacts of oil sands development need to be considered in terms of both while the resource is being extracted and the expected condition of the land following development. Then the relevant question is "How significant are those impacts and whether or not the land can be returned to a natural state?" Perspectives include:
    - There is a wide variation in opinion on the significance and duration of the impacts including what constitutes a 'significant' impact and appropriate management responses to those impacts.
    - Some individuals or organizations believe that the environmental impacts from oil sands development are unacceptable relative to derived economic and social benefits.
5. To date the public debate on the question of potential ecosystem effects related to oil sands development has been neither balanced nor informed. Perspectives include:
    - Scientific studies are in fact adequate but access and transparency to that information has not been adequate,
    - Scientific studies that are available have not been adequately used or understood to inform the debate, and
    - Most historical 'scientific studies' were not designed to assess ecosystem effects: if an ecosystem-scale information system is desired then it will need to be built.

6. The oil sands industry and the Alberta government, along with other participants, maintain or support monitoring programs that can help address questions about ecosystem effects. (Appendix 1 provides a brief but growing list of some of these monitoring programs.)
7. There is not consensus on whether or not significant ecological effects are occurring due to oil sands development. This may be because the information from existing monitoring programs is not being effectively evaluated and reported, or because the monitoring systems in place do not provide sufficient information on ecosystems to support an assessment of impacts.

Appendix 1 has been amended to include additional programs and activities identified through comments from Dialogue participants.

Champion's Note:

OSRIN believes that it has three potential roles:

- *provide advice to government,*
- *be a source of information to the public and, possibly,*
- *be a systems integrator.*

Given these, OSRIN is seeking to establish through this dialogue (and through an independent survey of Albertans) the key principles and elements of an information and reporting system that can provide the public with assurance that potential ecosystem effects of oil sands development are known and, with such knowledge can be used to inform future management action.

OSRIN will be capturing the key themes and outputs from the Dialogue in a report that identifies options for an monitoring and information system, knowledge and information gaps to be overcome to implement such a system, and new research directions that would improve our understanding of issues addressed by such a system. This report will be posted on the OSRIN website. OSRIN's hope is more Albertans will engage in thinking and talking in an informed way about potential solutions. We hope that \ participants seriously consider the ideas generated and adopt them into work underway within their own organizations. And we trust that our reports, and the others that arise from subsequent work, will provide advice to government that will lead to improvements in the monitoring and information system.

INPUT REQUEST #2: Please review the revised BACKGROUND STATEMENTS and provide your response in writing in the accompanying Feedback Form.

Consider — *Do you agree/disagree with the revised Background statements and why? Is there anything else that should be added to help inform the challenge we are addressing? Please refer to the background statement number in your response so we know which one you are referring to.*

Please feel free to inform us of additional monitoring and reporting programs that are not listed in Appendix 1.

EXPECTED OUTCOMES

Expected outcomes anticipated from the Dialogue (which includes the Workshop) are that participants:

Primary Goals:

1. Gain an improved understanding and appreciation of the diverse perspectives regarding an effective public information and reporting system for environmental impacts *(Note: this can be achieved in part by reviewing this Progress Report)*.
2. Gain an improved understanding of existing information and reporting systems currently in place in the oil sands region *(Note: this may be achieved via background material provided before the Worksho*p *via Appendix 1*).
3. Develop a clear understanding and alignment about the key principles and elements required for an adequate public information and reporting system for the oil sands region *(Note: this will be a focus of the Workshop).*

Stretch goals:

4. Develop a draft model of an adequate, effective and credible environmental and ecosystem information and reporting system consistent with the principles and elements accepted at the workshop.
5. Identify information and reporting gaps that need to be addressed and warrant additional focus.

Champion's Note:

We believe that the Expected Outcomes are now clear and provide direction to guide us through the remainder of the Dialogue.

Please see the Champion's Note in the previous section regarding OSRIN's expected outcome.

INPUT REQUEST #3: Please review the EXPECTED OUTCOMES and provide your response in writing in the accompanying Feedback Form.

Consider — *Are there any additions or changes to the Expected Outcomes that you would like to add?*

ASSUMPTIONS

We provide a list of revised assumptions that bear on the key challenge of the dialogue. Please review these and, at the end of this section, we provide the opportunity to react to these assumptions and to modify or add to the list.

General:

1. It is Alberta's responsibility to manage the oil sands resource and its development by industry in a responsible manner that strikes a balance between social, economic and environmental considerations so that negative ecosystem effects are avoided and/or mitigated where possible and practical to do so.
2. The federal government also has an important role and obligation with respect to monitoring and reporting (for example, to address trans-boundary impacts, fish habitat, species at risk, migratory birds, Aboriginal health, etc.). It is important that the federal government and government of Alberta work together to compliment each other's roles and avoid duplication.
3. Public confidence that an adequate and effective system of information and reporting is in place to detect and report on ecosystem effects is a critical element of ensuring the social license to develop the oil sands and to inform responsible decision-making. Public confidence will be gained if the information and reporting system is based on sound science and is used to support decisions regarding oil sands development.
4. Various monitoring programs exist (see Appendix 1) but the programs do not appear to be coordinated, and their results are not always easily accessible to the public and/or are considered proprietary. Historic monitoring data were collected for different purposes and it may not be possible to simply bring this together to evaluate ecosystem health in a science-based manner.
5. Although monitoring is occurring, it is not generally known what the current information and reporting 'system' is, and whether it is effective. At a minimum, the current system needs to be better communicated with improved access to data and information. Ideally, there should be a single point of contact where the public can easily obtain information.
6. The current monitoring and reporting of cumulative ecosystem effects is regarded with skepticism by some stakeholders. This may be because they:

   - regard both government and industry as lacking credibility; and/or
   - feel the information and reporting is not open and transparent; and/or
   - feel the current system is not tailored to measuring ecosystem effects in a credible manner.

   Credibility would be enhanced if stakeholders felt that an adaptive management framework is in place to evaluate measured impacts relative to the predicted impacts to confirm that they are accurately measured and reported, and then where necessary adjust the predictive models and implement remedial actions.
7. There is a view that industry should bear the costs of monitoring (either directly or indirectly via revenues paid to government), but that the goals and methods need to

be set by government in consultation with others (industry, stakeholders, First Nations, academia, etc.) so that quality data are produced. Another perspective is that government should play a more active role in broad regional monitoring and to ensure an effective overall monitoring system is in place.

8. The cost of an adequate and effective public information and reporting system needs to be established in the context of what is appropriate given the scale of oil sands development and associated ecosystem effects, providing that an acceptable base level is achieved and maintained.

9. Integration of various monitoring programs into a coherent and streamlined information and reporting system that is regularly and openly validated by peer review would substantially increase public confidence in environmental performance and reports of cumulative impacts. The reporting needs to be simple but underpinned with sound science. In some cases, existing monitoring programs will need to be augmented.

10. Raw scientific data alone are often not useful to the public and decision-makers due to a variety of issues:

    - Inadequate context (how does this piece of information fit into the picture?),
    - Communication difficulties (use of scientific jargon, interpretation of statistical data, etc.)
    - Lack of ease of access (where only reported to government and not readily available to the public).

    These issues need to be addressed for scientific data to become a useful information source to the public and decision-makers.

11. Transparency will be critical to a successful public information portal: both the data and the interpreted results should be made more readily available. This should also be supported by communication to enhance public awareness regarding key findings.

12. Information and reporting needs to be provided in the context of risk management. The reporting should be in context of the risk of the contaminants to ecosystem and human health.

13. It is possible to develop a solution, a set of solutions or a set of scenarios regarding an adequate and effective public information and reporting system that will satisfy the vast majority of stakeholders.

14. The information and reporting system will be based on sound science as a core principle. Community-based and traditional knowledge should constitute part of a comprehensive information and reporting system: this would enhance confidence within aboriginal communities that the system addresses their interests.

Scope and Purpose:

15. Although responsible development and sustainability typically considers economic, social and environmental factors, given OSRIN's mandate and need to provide the Dialogue with focus, the scope of this Dialogue should be on environmental and human health concerns (related to biodiversity, air, water and land) with particular focus on environmental information and reporting of ecosystem effects.
16. Greenhouse gas (GHG) emissions and carbon accounting related to oil sands development is an important issue but outside of OSRIN's mandate and therefore outside the scope of this Dialogue. That said it is important that this topic be addressed by other venues such as Alberta's GHG Reporting Program and, if possible, the results of such a reporting program be made available to the ecosystem monitoring and reporting system contemplated in this Dialogue.
17. At this point in the Dialogue, the discussions should be at a relatively high level. For example: What are the key drivers, objectives, principles, strategic outputs for an adequate and effective public information and reporting system?
18. At this point in the Dialogue, we should avoid detailed discussions of specific indicators (e.g., what species to monitor, what water parameters need to be measured) that might need to be monitored. Those discussions can happen once there is alignment regarding an overall integrated public information and reporting system.
19. The Dialogue's focus at this juncture should be for Albertans representing a diversity of interests to find common ground (alignment) regarding what constitutes an adequate and effective public information and reporting system for ecosystem effects in the oil sands region. Once this is attained, we can share these views with a broader audience outside the Province and, if necessary, expand the Dialogue. The Dialogue however will consider the needs for an adequate information and reporting system from national, international, and trans-boundary impact perspectives.
20. The Dialogue should focus at this stage on 'function' not 'form'. That is, we will strive to achieve alignment on what an adequate public information and reporting system might look like, as opposed to detailed delivery model options (i.e., this Dialogue is neither about the specific roles of any particular organization nor about the technologies employed). These latter topics will be informed by the former (i.e., form follows function, not the other way around).
21. It is expected that the Dialogue would address:

    - The requirements for an information and reporting system that produces sufficient, highly credible scientific data to ensure that the environmental impacts of oil sands operations are known; and

- Determining that the local, regional and international publics are satisfied that the information and reporting system is sufficient and meaningful such that potential ecosystem effects of oil sands development are known.

Champion's Comments:

We thank the Participants for their rich and detailed feedback regarding the Assumptions. On the whole, the comments supported the thrust of the original Assumptions, but we have modified the Assumption Statements to better reflect the thoughts of the Participants.

INPUT REQUEST #4: Please review the revised ASSUMPTION STATEMENTS and provide your response in writing in the accompanying Feedback Form.

Consider – *Are there any that you would modify, change, etc.? Please refer to the assumption number in your response so we know to which one you are referring*.

KEY PRINCIPLES AND ELEMENTS OF AN ADEQUATE PUBLIC INFORMATION AND REPORTING SYSTEM FOR ECOSYSTEMS IN THE OIL SANDS REGION

The purpose of this section is to explore the key principles and elements that are required for an adequate public information and reporting system for ecosystems in the oil sands region.

Key Principles

The identification of key principles and elements can help ensure that public information and reporting system is adequate and therefore publicly acceptable. Key principles would, at the least, include this revised list:

1. Relevant (e.g., responsive, addresses key objectives, supports decisions)
2. Credible (e.g., science-based, consistent methodology, standardized reporting, verifiable, independent and objective, collaborative)
3. Understandable (e.g., increases public awareness, causal relations understood)
4. Transparent (e.g., publicly available data, methodology and reports, timely reporting)
5. Robust (e.g., durable, continuously-improving)

Key Elements of the Principles

The following are updated and revised elements that support each of these key principles.

Principle #1: Relevant

Elements:

1. The information and reporting system needs to address key objectives (e.g., as expressed from a variety of sources including provincial strategies, regulations and

reporting requirements for industry; regional land use plans; local communities and First Nations).

2. The information and reporting system must support a business management decision process and be responsive to the needs of decision-makers so that the information and reporting is used to make timely and well informed decisions.
3. Reporting should capture both transient events and trends to address both the long and short term needs of the various stakeholders.
4. The information and reporting system needs to support local, regional and national assessment and reporting of ecosystem effects.

Principle #2: Credible

Elements:

5. Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices with appropriate quality assurance measures applied and subject to periodic peer review.
6. Information, including monitoring, needs to be reviewed and verified. Information gathering, analysis and reporting should be standardized with consideration that a certified framework such as ISO or CSA be used or adapted where appropriate.
7. A collaborative structure providing oversight involving government, industry, First Nations, academia and non-government organizations will enhance credibility of an information and reporting system.

Principle #3: Understandable

Elements:

8. Complex science-based information needs to be interpretable, and interpreted, so that the public and decision-makers understand its meaning (e.g., using "plain language" rather than scientific terms; using a risk-based approach where the likelihood and consequences of adverse environmental impacts are considered). This results in the need for multiple information formats including raw data, science-based analyses and plain language analyses.
9. The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g. not all impacts in the oil sands region are due to oil sands development, rather other sources of effects may be causing the impacts). This will involve developing linkages between the information and reporting system and existing and ongoing research into causal relationships.

Principle #4: Transparent

Elements:

10. The public information and reporting system must be transparent with respect to data collection methods, data collected, and models used for evaluation, and make all this information and reporting readily accessible at little or no cost to the public.
11. A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report should be published periodically (e.g., complete cycle for all sectors every 3 to 5 years, with specific sectors reporting each year on a rotation). A collaborative structure led by the Government of Alberta (such as described in element #7 above) that oversees the development of the report as well as peer review to ensure the report is based on sound science will enhance its credibility. The report should document ecosystem changes and management efforts to avoid, mitigate or lessen impacts.

Principle #5: Robust

Elements:

12. The information and reporting system should be independent with stable, long-term funding.
13. A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent. It is important that any improvements made do not unduly compromise the ability to compare current data to baselines (or even year to year) as this would affect the ability to document change over time.

Champion's Comments:

Again, we have modified the Elements to reflect the feedback received. We believe this list now provides an excellent starting point for exploration of specific information and reporting structures.

INPUT REQUEST #5: Please review and respond to the Key Principles and Elements that most interest you and provide your response in writing in the accompanying Feedback Form.

Please add any comment or suggestions or changes that you feel would add to our understanding of an adequate public system of information and reporting. Please refer to the statement number in your response so we know to which statement you are referring.

'STRAW-DOG' PUBLIC INFORMATION AND REPORTING SYSTEM

We present below a set of questions that will help guide us into considering specific models for delivering an adequate and effective information and reporting system. **Based on the Principles and Elements**, please consider some or all of the following questions:

1. What should the key operational objectives of an adequate monitoring and reporting system be?
2. What are the key strategic outputs (deliverables) from monitoring? What other outputs (or performance measures of success) are important to you?
3. What key information (types) would you need to receive to have the confidence that the resource is being responsibly managed?
4. Is there something special that needs to be done with respect to monitoring in the oil sands that is different than what should normally be monitored elsewhere in Alberta?
5. How should the information and reporting system be paid for to ensure durability and independence?
6. How should the information and reporting system be governed?
7. If you were to start from scratch, what key operational elements would you build into a single, integrated information and reporting system?
8. Can we adapt the slate of existing programs (in part or in whole) to become components of a single, integrated system? If so, how?
9. What do you feel are key implementation steps over the next 5 years to help ensure that an adequate monitoring system is in place for the oil sands region?
10. Are there any other questions, concerns or suggestions regarding an operational system?

INPUT REQUEST #6: Please consider the questions about 'What constitutes an adequate and effective information and monitoring system in the oil sands region'? Please provide your response in the accompanying Feedback Form.

NEXT STEPS

The above material establishes a review and step forward for our Dialogue. Please consider this document as "a work in progress." Following are the next steps in the Dialogue. Please note the deadline for receiving your feedback.

- As noted earlier, please consider what has been presented in this Progress Report carefully and contribute your reactions electronically using the separate **Feedback Form** sent along with this Progress Report. A participant typically spends about ½ hour but please feel free to contribute as much or as little as you have time for – even 5 minutes on an issue of personal importance is valuable. **Your input is very**

important and will strongly influence the success of the Dialogue and Workshop.

- We will use the Progress Report feedback to help design a Workshop scheduled for June 18, and inform the development of a Workshop Workbook. The Workbook, which includes an agenda, will be distributed to you in electronic form a few days ahead of the workshop.
    - The Challenge Paper, Progress Report feedback and the Workshop results will inform the development of a Final Report from OSRIN about an adequate and effective information and reporting system for the oil sands region.

APPENDIX 1: AMENDED PARTIAL LIST OF EXISTING ECOSYSTEMS EFFECTS MONITORING PROGRAMS IN THE OIL SANDS REGION

Currently a series of independent monitoring programs are in place in the oil sands region. These programs are operated by different organizations and funded by a variety of sources in industry and government:

- Water quantity and quality are monitored regionally by the Regional Aquatic Monitoring Program (RAMP), which is funded largely by the oil sands industry. www.ramp-alberta.org/RAMP.aspx
- Air quality and pollutant deposition is monitored by a series of stations operated by the Wood Buffalo Environmental Association (WBEA). WBEA also monitors acid deposition. WBEA's largest program is in Terrestrial Environmental Effects Monitoring (TEEM). www.wbea.org
- Impacts of development on plants and animals are tracked by the government and industry funded Alberta Biodiversity Monitoring Institute (ABMI). This program is currently of limited scope. www.abmi.ca/abmi/home/home.jsp
- Alberta Environment maintains its own aquatic monitoring system which encompasses part of the oil sands region, and through its Integrated Monitoring, Evaluation, and Reporting Framework (IMERF) intends to facilitate better integration. Work underway with IMERF and the development of an Oil Sands Information Portal are intended to improve access to information.
- Other potential monitoring information sources include the federal government (e.g., National Pollutant Release Inventory, National Forest Inventory, State of Environment reporting, and State of Forests reporting), Alberta State of Environment reporting and its approach to Regional Strategic Environmental Assessment. The extent of these programs needs to be determined.
- CONRAD through the Wildlife Habitat Effectiveness and Connectivity Program. www.conrad.ab

- PADEMP – Peace Athabasca Delta Environmental Monitoring Program (considering regional impacts in the Delta)
- AENV Oil Sands branch monitoring initiatives that fall under various management frameworks. These are related to IMERF but are being developed independently: groundwater, surface water, air, reclamation and disturbance.
- Sustainable Resource Development in partnership with several oil sands developers have initiated a Terrestrial Monitoring Joint Working Group. The purpose of the group is to design a regional monitoring system that will contribute to standardized and systematic approach with ABMI as the foundation for the integrated monitoring program.
- Considerable monitoring is undertaken by oil sands companies that are reported to government (such as CAPP).
- The Cumulative Environmental Management Association (CEMA) has mandate to study the cumulative effects of industrial development in the Wood Buffalo region, and currently is being expanded to review impacts of the IFN Phase 2 Framework. www.cemaonline.ca/
- The Fort McKay Industrial Relations Corporation (IRC) is very interested in monitoring and taking a collaborative approach and is undertaking activities aimed to be credible locally and to a broader audience.

Champion's Comment:

Thank you for your additions to the list. OSRIN is preparing a separate report detailing monitoring programs in the oil sands region. Your comments will aid in preparing this report. The report will be made available to the Workshop in June.

Any additional suggestions are appreciated.

APPENDIX 9: Workshop Workbook

This document was handed out to Workshop participants prior to the Workshop.

This version has been edited to focus on the key Workshop materials.

PURPOSE OF THIS WORKBOOK

The purpose of this Workbook is:

- To provide a guiding framework for the workshop participants to discuss an adequate and effective information and reporting system for the oil sands region.
- To set the scene for a workshop that is intended to be interactive, informative, innovative, practical and fun.
- To provide take away reference material for participants to use in follow-up discussions with their colleagues, including those that were unable to attend this workshop. Please feel free to share it.

This Workbook and the Workshop design was supported and preceded by:

- An Information and Reporting ***Challenge Paper*** was prepared and distributed to over 70 individuals with a wide range of affiliations from government, industry, First Nations and non-government organizations;
- Feedback was received from 31 individuals representing a significant percentage of those contacted. This feedback was assembled in a ***Consolidated Feedback*** document that was sent to all Dialogue participants;
- A ***Progress Report*** that assessed the feedback and suggested revisions to the content of Challenge Paper was prepared and distributed to all Dialogue participants for further review and comment;
- All of the above material and feedback helped shaped the design and preparation of this ***Workshop Workbook***. The Workbook includes selected unattributed quotes from the Challenge Paper Feedback intended to reflect the range of comments received in various topic areas.

WELCOME AND INTRODUCTIONS

Purpose:

The purpose of this section is to:

- To provide the workshop host, the Oils Sands Research and Information Network (OSRIN), with an opportunity to welcome the participants to the workshop and to make a few introductory remarks to help set the scene (see Champion's Note below).

- To thank the participants for coming and their anticipated contributions at the workshop, and for their input to the Dialogue thus far.
- To extend appreciation to the Organizing Team for their review, support and advice during the Dialogue.
- To allow workshop participants to introduce themselves and their affiliation.
- To briefly outline the focus of the workshop: in the morning, to confirm alignment with materials discussed to date (e.g. key principles and elements of an information and reporting system); and in afternoon, to develop various scenarios of an adequate and effective public information and reporting system.
- OSRIN will be capturing the key themes and outputs from the Dialogue in a report that will be posted on the OSRIN website.

Champion's Note:

OSRIN believes that it has three potential roles:

- *provide advice to government,*
- *be a source of information to the public and, possibly,*
- *be a systems integrator.*

Given these, OSRIN is seeking to establish through this dialogue (and through an independent survey of Albertans) the key principles and elements of an information and reporting system that can provide the public with assurance that potential ecosystem effects of oil sands development are known and, with such knowledge can be used to inform future management action.

OSRIN will be capturing the key themes and outputs from the Dialogue in a report that identifies options for a monitoring and information system, knowledge and information gaps to be overcome to implement such a system, and new research directions that would improve our understanding of issues addressed by such a system. This report will be posted on the OSRIN website. OSRIN's hope is more Albertans will engage in thinking and talking in an informed way about potential solutions. We hope that participants seriously consider the ideas generated and adopt them into work underway within their own organizations. And we trust that our reports, and the others that arise from subsequent work, will provide advice to government that will lead to improvements in the monitoring and information system.

SESSION 1: SETTING THE STAGE FOR A PRODUCTIVE, COLLABORATIVE WORKSHOP

Purpose

The purpose of this session is to affirm why we are here today and how we will make the most of our time by:

- Reviewing Rules of the Road, Fostering Dialogue and Seeking Alignment

- Ensuring alignment with the Key Challenge and Expected Outcomes of the workshop
- Reviewing the agenda, timeframes and other logistics

Key Challenge

Considering the feedback received from the Challenge Paper as proposed in the Progress Report, the suggested revised Key Challenge for this Dialogue is:

> To describe key principles and elements of an adequate and effective information and reporting system that would provide Albertan's (and the World) with assurance that ecosystem effects due to development in the oil sands region are known and reported and, along with socio-economic information, support meaningful decision-making and responsible management of the resource during its entire life cycle.

Task for Participants

- Are you in alignment with the Key Challenge?
- If not, what changes do you feel are critical for you to support the Key Challenge?

Expected Outcomes for the Dialogue and the Workshop

Considering the feedback received from the Challenge Paper, as reflected in the Progress Report the following expected outcomes for the Dialogue and the workshop are proposed for your consideration.

Primary Goals:

1. Gain an improved understanding and appreciation of the diverse perspectives regarding an effective public information and reporting system for environmental impacts.

   (Note: this has been achieved in part by reviewing the Progress Report);

2. Gain an improved understanding of existing information and reporting systems currently in place in the oil sands region.

   (Note: this has been achieved in part by Appendix 1 and will be addressed in Session 4 presentation at Workshop);

3. Develop a clear understanding and alignment about the key principles and elements required for an adequate public information and reporting system for the oil sands region.

   (Note: this will be a focus of the Workshop in the morning).

Stretch goals:

4. Develop a draft model of an adequate, effective and credible environmental and ecosystem information and reporting system consistent with the principles and elements accepted at the workshop.

   (*Note: this will be focus of the Workshop in the afternoon when assessing three scenarios).*

5. Identify information and reporting gaps that need to be addressed and warrant additional focus.

   (Note: this should be captured in Session 8 when assessing one of the scenarios).

Task for Participants

- Are you in alignment with the Expected Outcomes?
- If not, what changes do you feel are critical?

SESSION 2: FEEDBACK FROM CHALLENGE PAPER AND PROGRESS REPORT

Purpose

The purpose of this section is to:

- To provide participants with opportunity to reflect on the proposed Background Statements and Assumptions in the Progress Report which were revised considering the feedback received on the Challenge Paper.
- To make any necessary revisions in order to seek alignment on this material.

Background Statements

The following revised list of background statements was provided in the Progress Report in response to the comments received on the Challenge Paper, and are intended to more accurately describe the Background leading up to this Challenge Dialogue. We will not read or assess these in detail; rather take about 10 minutes to scan them to see if on balance you can accept them and move forward with the Dialogue.

1. OSRIN and other organizations have identified ecosystem effects as a key concern that needs to be addressed to sustain the social license for Alberta's oil sands industry to operate, access markets, and access capital to invest in oil sands.
2. Many of the hydrocarbons and other chemicals released from oil sands development are potentially harmful to ecosystems and human health. It is important to understand the degree to which these constituents are entering the ecosystem beyond naturally occurring levels. The potential for effects on ecosystems is related to the

location, magnitude, duration, frequency, timing and contaminant concentration in such releases.

3. Many people are concerned that oil sands development is having significant negative impacts on the ecosystem. They are interested in knowing what impacts are occurring, what impacts were expected and what actions have been taken or are planned to avoid, mitigate or minimize both expected and unexpected impacts over time.

4. While effects from oil sands mining and other operations are inevitable, the impacts of oil sands development need to be considered in terms of both while the resource is being extracted and the expected condition of the land following development. Then the relevant question is "How significant are those impacts and whether or not the land can be returned to a natural state?" Perspectives include:

    - There is a wide variation in opinion on the significance and duration of the impacts including what constitutes a 'significant' impact and appropriate management responses to those impacts.
    - Some individuals or organizations believe that the environmental impacts from oil sands development are unacceptable relative to derived economic and social benefits.

5. To date the public debate on the question of potential ecosystem effects related to oil sands development has been neither balanced nor informed. Perspectives include:

    - Scientific studies are in fact adequate but access and transparency to that information has not been adequate,
    - Scientific studies that are available have not been adequately used or understood to inform the debate, and
    - Most historical 'scientific studies' were not designed to assess ecosystem effects: if an ecosystem-scale information system is desired then it will need to be built.

6. The oil sands industry and the Alberta government, along with other participants, maintain or support monitoring programs that can help address questions about ecosystem effects. (Appendix 1 provides a brief but growing list of some of these monitoring programs.)

7. There is not consensus on whether or not significant ecological effects are occurring due to oil sands development. This may be because the information from existing monitoring programs is not being effectively evaluated and reported, or because the monitoring systems in place do not provide sufficient information on ecosystems to support an assessment of impacts.

Task for Participants

- Take 10 minutes to scan the Background Statements.
- Are you in alignment with the revised Background Statements?
- If not, what Statements do you feel need to be revised?

Assumptions

The following revised list of assumptions was provided in the Progress Report in response to the comments received on the Challenge Paper, and are intended to more accurately describe the Assumptions leading up to this Challenge Dialogue. We will not read or assess these in detail; rather take about 10 minutes to scan them to see if on balance you can accept them and move forward with the Dialogue.

General:

1 It is Alberta's responsibility to manage the oil sands resource and its development by industry in a responsible manner that strikes a balance between social, economic and environmental considerations so that negative ecosystem effects are avoided and/or mitigated where possible and practical to do so.

2 The federal government also has an important role and obligation with respect to monitoring and reporting (for example, to address trans-boundary impacts, fish habitat, species at risk, migratory birds, Aboriginal health, etc.). It is important that the federal government and government of Alberta work together to complement each other's roles and avoid duplication.

3 Public confidence that an adequate and effective system of information and reporting is in place to detect and report on ecosystem effects is a critical element of ensuring the social license to develop the oil sands and to inform responsible decision-making. Public confidence will be gained if the information and reporting system is based on sound science and is used to support decisions regarding oil sands development.

4 Various monitoring programs exist (see Appendix 1) but the programs do not appear to be coordinated, and their results are not always easily accessible to the public and/or are considered proprietary. Historic monitoring data were collected for different purposes and it may not be possible to simply bring this together to evaluate ecosystem health in a science-based manner.

5 Although monitoring is occurring, it is not generally known what the current information and reporting 'system' is, and whether it is effective. At a minimum, the current system needs to be better communicated with improved access to data and information. Ideally, there should be a single point of contact where the public can easily obtain information.

6 The current monitoring and reporting of cumulative ecosystem effects is regarded with skepticism by some stakeholders. This may be because they:

- regard both government and industry as lacking credibility; and/or
- feel the information and reporting is not open and transparent; and/or
- feel the current system is not tailored to measuring ecosystem effects in a credible manner.

Credibility would be enhanced if stakeholders felt that an adaptive management framework is in place to evaluate measured impacts relative to the predicted impacts to confirm that they are accurately measured and reported, and then where necessary adjust the predictive models and implement remedial actions.

7 There is a view that industry should bear the costs of monitoring (either directly or indirectly via revenues paid to government), but that the goals and methods need to be set by government in consultation with others (industry, stakeholders, First Nations, academia, etc.) so that quality data are produced. Another perspective is that government should play a more active role in broad regional monitoring and to ensure an effective overall monitoring system is in place.

8 The cost of an adequate and effective public information and reporting system needs to be established in the context of what is appropriate given the scale of oil sands development and associated ecosystem effects, providing that an acceptable base level is achieved and maintained.

9 Integration of various monitoring programs into a coherent and streamlined information and reporting system that is regularly and openly validated by peer review would substantially increase public confidence in environmental performance and reports of cumulative impacts. The reporting needs to be simple but underpinned with sound science. In some cases, existing monitoring programs will need to be augmented.

10 Raw scientific data alone are often not useful to the public and decision-makers due to a variety of issues:

- Inadequate context (how does this piece of information fit into the picture?),
- Communication difficulties (use of scientific jargon, interpretation of statistical data, etc.)
- Lack of ease of access (where only reported to government and not readily available to the public).

These issues need to be addressed for scientific data to become a useful information source to the public and decision-makers.

11 Transparency will be critical to a successful public information portal: both the data and the interpreted results should be made more readily available. This should also

be supported by communication to enhance public awareness regarding key findings.

12 Information and reporting needs to be provided in the context of risk management. The reporting should be in context of the risk of the contaminants to ecosystem and human health.

13 It is possible to develop a solution, a set of solutions or a set of scenarios regarding an adequate and effective public information and reporting system that will satisfy the vast majority of stakeholders.

14 The information and reporting system will be based on sound science as a core principle. Community-based and traditional knowledge should constitute part of a comprehensive information and reporting system: this would enhance confidence within aboriginal communities that the system addresses their interests.

Scope and Purpose:

15 Although responsible development and sustainability typically considers economic, social and environmental factors, given OSRIN's mandate and need to provide the Dialogue with focus, the scope of this Dialogue should be on environmental and human health concerns (related to biodiversity, air, water and land) with particular focus on environmental information and reporting of ecosystem effects.

16 Greenhouse gas (GHG) emissions and carbon accounting related to oil sands development is an important issue but outside of OSRIN's mandate and therefore outside the scope of this Dialogue. That said it is important that this topic be addressed by other venues such as Alberta's GHG Reporting Program and, if possible, the results of such a reporting program be made available to the ecosystem monitoring and reporting system contemplated in this Dialogue.

17 At this point in the Dialogue, the discussions should be at a relatively high level. For example: What are the key drivers, objectives, principles, strategic outputs for an adequate and effective public information and reporting system?

18 At this point in the Dialogue, we should avoid detailed discussions of specific indicators (e.g., what species to monitor, what water parameters need to be measured) that might need to be monitored. Those discussions can happen once there is alignment regarding an overall integrated public information and reporting system.

19 The Dialogue's focus at this juncture should be for Albertans representing a diversity of interests to find common ground (alignment) regarding what constitutes an adequate and effective public information and reporting system for ecosystem effects in the oil sands region. Once this is attained, we can share these views with a broader audience outside the Province and, if necessary, expand the Dialogue. The Dialogue however will consider the needs for an adequate information and

reporting system from national, international, and trans-boundary impact perspectives.

20 The Dialogue should focus at this stage on 'function' not 'form'. That is, we will strive to achieve alignment on what an adequate public information and reporting system might look like, as opposed to detailed delivery model options (i.e., this Dialogue is neither about the specific roles of any particular organization nor about the technologies employed). These latter topics will be informed by the former (i.e., form follows function, not the other way around).

21 It is expected that the Dialogue would address:

- The requirements for an information and reporting system that produces sufficient, highly credible scientific data to ensure that the environmental impacts of oil sands operations are known; and
- Determining that the local, regional and international publics are satisfied that the information and reporting system is sufficient and meaningful such that potential ecosystem effects of oil sands development are known.

Task for Participants

- Take 10 minutes to scan the Assumptions.
- Are you in alignment with the revised Assumptions?
- If not, what Assumptions do you feel need to be revised?

SESSION 3: SEEKING ALIGNMENT ON KEY PRINCIPLES AND CRITICAL QUESTIONS

Purpose

The purpose of this session is:

- To provide participants with opportunity to reflect on the proposed Principles and Elements in the Progress Report which were revised considering the feedback received on the Challenge Paper.
- To provide participants with opportunity to reflect on the Critical Questions which were provided in the Progress Report as these can guide discussions in the afternoon break-out sessions.
- To make any necessary revisions in order to seek alignment on this material.

Principles and Elements

The following revised list of Principles and Elements was provided in the Progress Report in response to the comments received on the Challenge Paper. We will not read or assess these in detail; rather take about 10 minutes to review them to see if on balance you can accept them and move forward with the Dialogue. The Principles and Elements will help guide your evaluation of various scenarios in the afternoon so it is important that there is general alignment.

Key Principles

The identification of key principles and elements can help ensure that public information and reporting system is adequate and therefore publicly acceptable. Key principles would, at the least, include this revised list:

1. Relevant (e.g., responsive, addresses key objectives, supports decisions)
2. Credible (e.g., science-based, consistent methodology, standardized reporting, verifiable, independent and objective, collaborative)
3. Understandable (e.g., increases public awareness, causal relations understood)
4. Transparent (e.g., publicly available data, methodology and reports, timely reporting)
5. Robust (e.g., durable, continuously-improving)

Key Elements of the Principles

The following are updated and revised elements that support each of these key principles.

Principle #1: Relevant

Elements:

1. The information and reporting system needs to address key objectives (e.g., as expressed from a variety of sources including provincial strategies, regulations and reporting requirements for industry; regional land use plans; local communities and First Nations).
2. The information and reporting system must support a business management decision process and be responsive to the needs of decision-makers so that the information and reporting is used to make timely and well informed decisions.
3. Reporting should capture both transient events and trends to address both the long and short term needs of the various stakeholders.
4. The information and reporting system needs to support local, regional and national assessment and reporting of ecosystem effects.

Principle #2: Credible

Elements:

5. Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices with appropriate quality assurance measures applied and subject to periodic peer review.
6. Information, including monitoring, needs to be reviewed and verified. Information gathering, analysis and reporting should be standardized with consideration that a certified framework such as ISO or CSA be used or adapted where appropriate.
7. A collaborative structure providing oversight involving government, industry, First Nations, academia and non-government organizations will enhance credibility of an information and reporting system.

Principle #3: Understandable

Elements:

8. Complex science-based information needs to be interpretable, and interpreted, so that the public and decision-makers understand its meaning (e.g., using "plain language" rather than scientific terms; using a risk-based approach where the likelihood and consequences of adverse environmental impacts are considered). This results in the need for multiple information formats including raw data, science-based analyses and plain language analyses.
9. The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g. not all impacts in the oil sands region are due to oil sands development, rather other sources of effects may be causing the impacts). This will involve developing linkages between the information and reporting system and existing and ongoing research into causal relationships.

Principle #4: Transparent

Elements:

10. The public information and reporting system must be transparent with respect to data collection methods, data collected, and models used for evaluation, and make all this information and reporting readily accessible at little or no cost to the public.
11. A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report should be published periodically (e.g., complete cycle for all sectors every 3 to 5 years, with specific sectors reporting each year on a rotation). A collaborative structure led by the Government of Alberta (such as described in element #7 above) that oversees the development of the report as well as peer review

to ensure the report is based on sound science will enhance its credibility. The report should document ecosystem changes and management efforts to avoid, mitigate or lessen impacts.

Principle #5: Robust

Elements:

12. The information and reporting system should be independent with stable, long-term funding.
13. A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent. It is important that any improvements made do not unduly compromise the ability to compare current data to baselines (or even year to year) as this would affect the ability to document change over time.

Task for Participants

- Take 10 minutes to review the Principles, Elements and Logic Model
- Are you in alignment with the revised Principles?
- Do the supporting Elements make sense?
- Is something critical missing, need to be revised or added?
- Does the Logic Model provide some clarity? Does it raise any questions?

Draft Logic Model for the Information and Reporting System

A Logic Model is a tool that presents the relationships among various elements of a plan, initiative, organization, etc. We have prepared a draft Logic Model based on the Principles and Elements that were developed during this Dialogue (see Appendix 4 of this report).

This draft Logic Model therefore captures the features that would be required of an operating entity that will support and deliver on the Principles discussed above.

Critical Questions

Based on the Principles and Elements, the Progress Report proposed some critical questions intended to help guide us into considering specific models for delivering an adequate and effective information and reporting system. We will not read or assess these in detail; rather take about 10 minutes to review them to see if on balance you can accept them and move forward with the Dialogue. The Critical Questions can help guide your evaluation and description of various scenarios in the afternoon so it is important that there is general alignment.

1. What should the key operational objectives of an adequate monitoring and reporting system be?

2. What are the key strategic outputs (deliverables) from monitoring? What other outputs (or performance measures of success) are important to you?
3. What key information (types) would you need to receive to have the confidence that the resource is being responsibly managed?
4. Is there something special that needs to be done with respect to monitoring in the oil sands that is different than what should normally be monitored elsewhere in Alberta?
5. How should the information and reporting system be paid for to ensure durability and independence?
6. How should the information and reporting system be governed?
7. If you were to start from scratch, what key operational elements would you build into a single, integrated information and reporting system?
8. Can we adapt the slate of existing programs (in part or in whole) to become components of a single, integrated system? If so, how?
9. What do you feel are key implementation steps over the next 5 years to help ensure that an adequate monitoring system is in place for the oil sands region?
10. Are there any other questions, concerns or suggestions regarding an operational system?

Task for Participants

- Take 10 minutes to review the Critical Questions.
- Are you in alignment with the Questions?
- Is a key question missing?
- If not in alignment, what Critical Questions do you feel need to be revised or added?

SESSION 4: EXISTING MONITORING PROGRAMS – THE CURRENT STATUS AND PUBLIC PERCEPTION

Purpose

The purpose of this session is to:

- To provide participants with a brief overview of current status of existing monitoring programs in the oil sands region based on an inventory and characterization of programs undertaken by Eric Lott under contract with OSRIN.
- To improve participant understanding of the 'base case' when considering three scenarios to improve the information and reporting system at break-out sessions in the afternoon.

- To provide participants an opportunity to note any additional programs that may have been inadvertently missed.
- To inform the participants about what the "general public" currently thinks about monitoring and reporting in the Oil Sands Region, based on a survey conducted under contract to OSRIN by Cambridge Strategies.

SESSION 5: SETTING UP THE BREAK-OUT SESSIONS

Purpose

The purpose of this session is:

- To outline the tasks and recording procedures expected of participants during the subsequent three break-out sessions where three scenarios that improve on our existing information and reporting system will be described and evaluated.
- To define the three scenarios to be evaluated so that participants are on the 'same page'.

Key Tasks for each Break-Out Session

Describe each scenario***:***

> *Each scenario should be described as it addresses each Key Principle. A template will be provided for each session that provides a 'straw dog' description of each scenario considering the Elements under various Principles. The 'straw dog' is intended to provide each break-out group with initial ideas to react to, accept/reject/modify, and to add other ideas that come to mind.*

Evaluate each scenario***:***

> *Each described scenario should be evaluated against each of the Key Principles using the following suggested rating system:*

5	Completely or nearly completely satisfies Principle (>90%)
4	Substantially satisfies Principle (66-90%)
3	Somewhat Satisfies Principle (35-65%)
2	Addresses Principle partially (11-34%)
1	Addresses Principle inadequately (1-10%)
0	Does not satisfy Principle at all (0%)

Identify key issues that need to be addressed in order to implement each scenario. A list of no more than the top 10 issues is sufficient.

Address the Critical Questions as time permits.

Defining the Three Scenarios We Will Develop

The following table provides suggested definition (or attributes) for each of the three scenarios:

Scenario Name	Definition (or attributes)
Enhanced Base	Base case with respect to monitoring and data collection • Reliable, stable funding so existing monitoring can continue • Enhanced interpretation of information (context) • Improved reporting and communication • Improved access to data • In sum, no new funds for additional monitoring, but some additional resources to more effectively use the data that is being collected.
Enhanced and Integrated Base	As above for Enhanced Base **plus**: • Integrated operations and reporting (e.g., amalgamating monitoring programs, common governance, other ideas) • Some additional funds are available, but only as required to achieve adequate integration
World Class	Same as Enhanced Base (may or may not involve integrated operations), but otherwise it is not constrained. Case may contain: • Improved science to add meaning to information collected and explore casual relationships • Fill gaps where key information is missing and new monitoring is needed • Improve the reliability of data being gather (e.g., more sample plots and/or more frequent data gathering) • Other ideas • In sum, additional funds for monitoring where it can be justified as well as additional resources to effectively use and report on the data being collected.

A Working Principle:

- On one hand each break-out group is encouraged to examine these suggested definitions and make refinements where needed.
- On the other hand, as much as possible, it is important that each break-out group have a shared sense of what each scenario means so that we are comparing 'apples with apples' during the plenary sessions when the results from each break out group are being reported out.

With above in mind, each of the groups will be able to both expand on the above attributes and add additional ones they feel are critical.

Task for Participants

- Are you in alignment with the key tasks for each break-out session?
- Is there something critical that is missing or needs to be change?
- Are the general definitions (or attributes) provided for each scenario sufficient to enable you to move forward?
- Is there something that needs to be changed regarding the scenarios for the break-out sessions to be able to work effectively?

SESSION 6: DEVELOPMENT OF AN 'ENHANCED BASE' SCENARIO

Purpose

The purpose of this session is to:

- develop the 'enhanced base' scenario beginning with a proposed straw-dog model,
- evaluate the scenario against the key principles,
- identify key issues that need to be addressed in order to implement the scenario, and as time permits,
- address the critical questions previously identified

Progress Report Statements and Challenge Paper Feedback

The Workbook provided statements regarding Principles from the Synthesis of Feedback in Appendix 7 of this report. The materials were extensive and are not repeated here.

The following template is provided that provides a 'straw dog' description of this scenario considering the Elements under various Principles. The 'straw dog' is intended to provide you with initial ideas to react to, accept/reject/modify, and to add other ideas that come to mind.

Definition (or attribute)	**Enhanced Base 'Straw-dog' description (based on the Principles and Elements)**	**Comment**
Reliable, stable funding so existing monitoring can continue	The information and reporting system should be independent with stable, long-term funding.	Where would this funding come from? What are some of the issues or barriers to making this happen?

Definition (or attribute)	Enhanced Base 'Straw-dog' description (based on the Principles and Elements)	Comment
Improved reporting and communication	A fully integrated *State of the Environment Report for the Oil Sands Region* synthesis report is published periodically (e.g., complete cycle for all sectors every 3 to 5 years, with specific sectors reporting each year on a rotation).	What are some of the issues or barriers to making this happen?
Improved access to data	The public information and reporting system must be transparent with respect to data collection methods, data collected, and models used for evaluation, and make all this information and reporting readily accessible at little or no cost to the public.	What are some of the issues or barriers to making this happen?
Enhanced interpretation of information (context)	The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g. not all impacts in the oil sands region are due to oil sands development, rather other sources of effects may be causing the impacts).	What are some of the issues or barriers to making this happen?

Task 6a for Participants:

In BREAK OUT groups, discuss this straw-dog with the intent to improve it, change it, or replace it as necessary. The only key requirement is that you must use the Principles to justify any component of your model.

After the group further describes the 'enhanced base' scenario, now rate it against the key principles using template below. One approach is to seek alignment from the group on the rating while another approach is to average the ratings received from each group member. Use 0 to 5 rating scale described above.

Principle see 3.3 for description of each Principle	**Rating** 0 to 5 rating scale
Relevant (e.g., responsive, addresses key objectives, supports decisions)	
Credible (e.g., science-based, consistent methodology, standardized reporting, verifiable, independent and objective, collaborative)	
Understandable (e.g., increases public awareness, causal relations understood)	
Transparent (e.g., publicly available data, methodology and reports, timely reporting)	
Robust (e.g., durable, continuously-improving)	
Total Score	

Task 6b for Participants: Report to Plenary

Each break-out group is to share:

- their description of the 'enhanced base' scenario,
- evaluation of their described scenario against the key principles,
- identification of key issues that need to be addressed in order to implement the scenario, and if time permitted,
- any critical questions in 3.4 they were able to address.

SESSION 7: DEVELOPMENT OF AN 'ENHANCED BASE PLUS INTEGRATION' SCENARIO

Purpose

The purpose of this session is to:

- to develop the 'enhanced and integrated base' scenario,
- evaluate the described scenario against the key principles,
- identify key issues that need to be addressed in order to implement the scenario, and as time permits,
- address the critical questions previously identified

Progress Report Statements and Challenge Paper Feedback

The Workbook provided statements regarding Principles from the Synthesis of Feedback in Appendix 7 of this report. The materials were extensive and are not repeated here.

The following template is provided that provides a 'straw dog' description of the 'enhanced base plus integration' scenario considering the Elements under various Principles. The 'straw dog' is intended to provide you with initial ideas to react to, accept/reject/modify, and to add other ideas that come to mind.

Definition (or attribute)	**Enhanced Base Plus Integration 'Straw-dog' description (based on the Principles and Elements)**	**Comment**
Integrated operations and reporting (e.g., amalgamating monitoring programs, common governance, other ideas)	A collaborative structure providing oversight involving government, industry, First Nations, academia and non-government organizations will enhance credibility of an information and reporting system.	What are some of the issues or barriers to making this happen?

Task 7a for Participants:

In BREAK OUT groups, discuss this straw-dog with the intent to improve it, change it, or replace it as necessary. The only key requirement is that you must use the Principles to justify any component of your model.

After the group further describes this 'enhanced base plus integration' scenario, now rate it against the key principles using template below. One approach is to seek alignment from the group on the rating while another approach is to average the ratings received from each group member. Use 0 to 5 rating scale described above and the rating table from Task 6.

Task 7b for Participants: Report to Plenary

Each break-out group is to share:

- their description of the 'enhanced base plus integration' scenario,
- evaluation of their described scenario against the key principles,
- identification of key issues that need to be addressed in order to implement the scenario, and if time permitted,

- any critical questions in 3.4 they were able to address.

SESSION 8: DEVELOPMENT OF AN 'WORLD CLASS' SCENARIO

Purpose

The purpose of this session is to:

- to develop the 'world class' scenario,
- evaluate the described scenario against the key principles,
- identify key issues that need to be addressed in order to implement the scenario, and as time permits,
- address the critical questions previously identified

Progress Report Statements and Challenge Paper Feedback

The Workbook provided statements regarding Principles from the Synthesis of Feedback in Appendix 7 of this report. The materials were extensive and are not repeated here.

The following template is provided that provides a 'straw dog' description of the 'world class' scenario considering the Elements under various Principles. The 'straw dog' is intended to provide you with initial ideas to react to, accept/reject/modify, and to add other ideas that come to mind.

Definition (or attribute)	**World Class 'Straw-dog' description (based on the Principles and Elements)**	**Comment**
Improved science to add meaning to information collected and explore casual relationships	The causal relationships of ecosystem effects need to be understood so that information and reporting is directed to appropriate decision-makers and to avoid misinforming the public (e.g., not all impacts in the oil sands region are due to oil sands development, rather other sources of effects may be causing the impacts). This will involve developing linkages between the information and reporting system and existing and ongoing research into causal relationships.	What are some of the issues or barriers to making this happen?

Definition (or attribute)	World Class 'Straw-dog' description (based on the Principles and Elements)	Comment
Fill gaps where key information is missing and new monitoring is needed	The information and reporting system needs to address key objectives (e.g., as expressed from a variety of sources including provincial strategies, regulations and reporting requirements for industry; regional land use plans; local communities and First Nations). The information and reporting system needs to support local, regional and national assessment and reporting of ecosystem effects.	What are some of the issues or barriers to making this happen?
Improve the reliability of data being gather (e.g., more sample plots and/or more frequent data gathering)	Information and reporting about ecosystem effects in the oil sands region needs to be science-based and employ recognized best practices with appropriate quality assurance measures applied and subject to periodic peer review. Information, including monitoring, needs to be reviewed and verified. Information gathering, analysis and reporting should be standardized with consideration that a certified framework such as ISO or CSA be used or adapted where appropriate.	What are some of the issues or barriers to making this happen?
Other ideas	A high quality information and reporting system will employ the principles of continuous improvement to ensure that it remains relevant, credible, understandable and transparent. It is important that any improvements made do not unduly compromise the ability to compare current data to baselines (or even year to year) as this would affect the ability to document change over time.	What are some of the issues or barriers to making this happen?

Task 8a for Participants:

In BREAK OUT groups, discuss this straw-dog with the intent to improve it, change it, or replace it as necessary. The only key requirement is that you must use the Principles to justify any component of your model.

After the group further describes this 'World Class' scenario, now rate it against the key principles using template below. One approach is to seek alignment from the group on the rating while another approach is to average the ratings received from each group member. Use 0 to 5 rating scale described above and the rating table from task 6.

Task 8b for Participants: Report to Plenary

Each break-out group is to share:

- their description of the 'World Class scenario',
- evaluation of their described scenario against the key principles,
- identification of key issues that need to be addressed in order to implement the scenario, and if time permitted,
- any critical questions in 3.4 they were able to address.

NEXT STEPS, TIMELINES AND ON-GOING DIALOGUE

Purpose

The purpose of this session is:

- To note that the workshop material will be available on the OSRIN website including a Workshop Synopsis.
- To describe where the Dialogue is heading post-workshop including how Dialogue participants will be involved, can provide input, and key documents OSRIN intends to prepare.

Dialogue Outputs

The intention is to make all of the Challenge Dialogue documents available on the OSRIN website including the Challenge Paper, Consolidated Feedback, Progress Report, Workshop Workbook, and a Workshop Synopsis. The Workshop Synopsis will be prepared soon. It will summarize key outcomes from the workshop based on the flip charts, notes, and other material (e.g., made available by break-out groups) and taken by OSRIN staff and the consultants.

A draft of the Workshop Synopsis will be sent to all Workshop Participants for review and comment prior to it being sent to other Dialogue participants. A draft is expected to be distributed in July.

OSRIN Final Report

As noted in the Progress Report, all of the Feedback from the Dialogue, including the Workshop results, will inform the development of a Final Report from OSRIN about an adequate and effective information and reporting system for the oils sands region. OSRIN will also consider the results from the Inventory and Characterization of Monitoring Programs, results from an independent survey of Albertans and other information when developing the Report.

This Final Report is expected in the Fall 2010 and will also be posted on OSRIN's website and distributed to all Dialogue participants and also to key individuals and organizations including government for consideration.

APPENDIX 1: PARTIAL LIST OF ECOSYSTEMS EFFECTS MONITORING PROGRAMS IN THE OIL SANDS REGION

Currently a series of independent monitoring programs are in place in the oil sands region. These programs are operated by different organizations and funded by a variety of sources in industry and government:

- Water quantity and quality are monitored regionally by the Regional Aquatic Monitoring Program (RAMP), which is funded largely by the oil sands industry. www.ramp-alberta.org/RAMP.aspx
- Air quality and pollutant deposition is monitored by a series of stations operated by the Wood Buffalo Environmental Association (WBEA). WBEA also monitors acid deposition. WBEA's largest program is in Terrestrial Environmental Effects Monitoring (TEEM). www.wbea.org
- Impacts of development on plants and animals are tracked by the government and industry funded Alberta Biodiversity Monitoring Institute (ABMI). This program is currently of limited scope. www.abmi.ca/abmi/home/home.jsp
- Alberta Environment maintains its own aquatic monitoring system which encompasses part of the oil sands region, and through its Integrated Monitoring, Evaluation, and Reporting Framework (IMERF) intends to facilitate better integration. Work underway with IMERF and the development of an Oil Sands Information Portal are intended to improve access to information.
- Other potential monitoring information sources include the federal government (e.g., National Pollutant Release Inventory, National Forest Inventory, State of Environment reporting, and State of Forests reporting), Alberta State of Environment reporting and its approach to Regional Strategic Environmental Assessment. The extent of these programs needs to be determined.
- CONRAD through the Wildlife Habitat Effectiveness and Connectivity Program. www.conrad.ab
- PADEMP – Peace Athabasca Delta Environmental Monitoring Program (considering regional impacts in the Delta).
- AENV Oil Sands branch monitoring initiatives that fall under various management frameworks. These are related to IMERF but are being developed independently: groundwater, surface water, air, reclamation and disturbance.
- Sustainable Resource Development in partnership with several oil sands developers have initiated a Terrestrial Monitoring Joint Working Group. The purpose of the group is to design a regional monitoring system that will contribute to standardized and systematic approach with ABMI as the foundation for the integrated monitoring program.

- Considerable monitoring is undertaken by oil sands companies that are reported to government (such as CAPP).
- The Cumulative Environmental Management Association (CEMA) has mandate to study the cumulative effects of industrial development in the Wood Buffalo region, and currently is being expanded to review impacts of the IFN Phase 2 Framework. www.cemaonline.ca/
- The Fort McKay Industrial Relations Corporation (IRC) is very interested in monitoring and taking a collaborative approach and is undertaking activities aimed to be credible locally and to a broader audience.

APPENDIX 2: OSRIN/CAMBRIDGE STRATEGIES SURVEY OF ALBERTANS' VALUES REGARDING OIL SANDS DEVELOPMENT

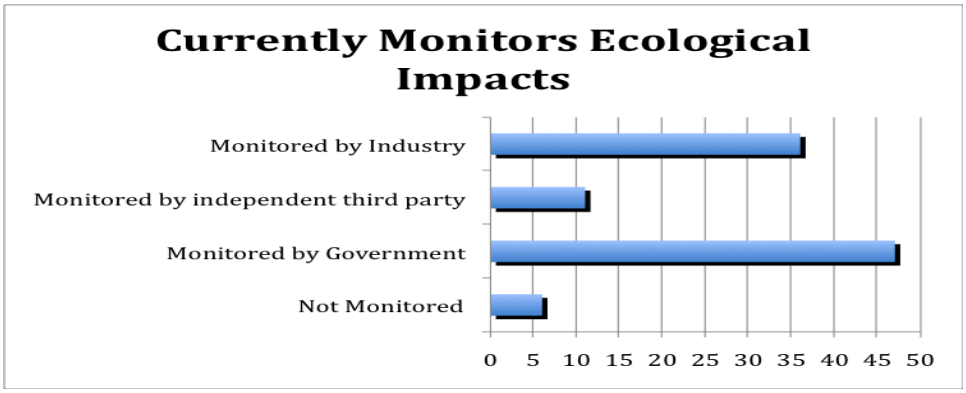
In partnership with Cambridge Strategies, OSRIN has conducted a survey to determine the value-based drivers of oil sands development that are most important to Albertans. The results of the survey will provide insights into ways that both the government of Alberta and the industry can better serve the needs and wants of Albertans.

The survey was conducted on line during the period May 6 - 11, 2010. The survey consisted of conjoint trade-off options among various value-driven perceptions related to oil sands development. In addition, respondents were asked to respond to a series of attitudinal questions related to oil sands development. The total sample size was 1032 randomly selected Alberta adults. With a sample of this size, the aggregate results are considered accurate to within +/-3.0 percentage points nineteen times out of twenty, to what they would have been had the entire adult population of Alberta been included in the survey.

According to the survey, monitoring of ecological impacts was among the three most important factors. Preliminary analysis of the results allows the following observations.

Perception

Nearly 50% of respondents believe that Government monitors ecologic impacts of oil sands development.



Preference

However, respondents expressed a strong preference for an independent third party having the role of monitoring ecological impacts. Preference for government as monitor was only slightly less, with the preference for industry having that role significantly less. Interestingly there was still substantial preference for industry as monitor.

APPENDIX 3: BC FOREST AND RANGE EVALUATION PROGRAM (FREP)

This appendix is provided as case study material that might be useful when describing the scenarios.

This appendix is abstracted from the FREP website. Further information is available at www.for.gov.bc.ca/hfp/frep/

Vision: Sustainability of Forest and Range Resources Through Science and Stewardship

Our vision is to be recognized worldwide as an effective monitoring program providing benefits to generations of British Columbians through informing decision-making to achieve sustainable forest management.

FREP Mission Statement

To be a world leader in resource stewardship monitoring and effectiveness evaluations; providing the science-based information needed for decision-making and continuous improvement of British Columbia's forest and range practices, policies and legislation.

Note: In September 2006, FREP became the first B.C. Government program to achieve NQI (National Quality Institute) Level One organizational certification. Level Two certification was achieved in October 2007.

FREP Background

British Columbians desire sustainable use of the forests they hold in trust for future generations. Sustainable use can be defined in many ways. For the purpose of the **Forest and Range Evaluation Program** (FREP), sustainable use means:

- *managing* forests to meet present needs without compromising the needs of future generations;
- providing *stewardship* of forests based on an ethic of respect for the land;
- *balancing* economic, productive, spiritual, ecological and recreational values of forests to meet the economic, social and cultural needs of the Province's people and communities;
- *conserving* the resource values identified under the *Forest and Range Practices Act* (FRPA) and regulations, namely, biodiversity, cultural heritage, soil, water, fish, forage and associated plant communities, timber, recreation, resource features, visual quality and wildlife.

The *Forest and Range Practices Act* (FRPA) and regulations introduce the transition to a results-based forest practices framework in British Columbia. For more information on FRPA and its regulations, resource values, objectives, etc., see http://www.for.gov.bc.ca/code/.

Under this new approach to forest management, the forest industry is responsible for developing results and strategies, or using specified defaults, for the sustainable management of resources. The role of government is to ensure compliance with established results and strategies and other practice requirements, and evaluate the effectiveness of forest and range practices in achieving management objectives.

FREP has been put in place as a multi-agency program to evaluate whether practices under FRPA are meeting not only the intent of current FRPA objectives, but also to determine whether the practices and the legislation itself, are meeting government's broader intent for the sustainable use of resources.

The FREP Objective

FREP is a long-term commitment by government to:

- Assess the effectiveness of the *Forest and Range Practices Act* (FRPA) in achieving stewardship of the eleven resource values identified under FRPA;
- Identify issues regarding the implementation of forest policies, practices and legislation as they affect the resource values identified under FRPA;
- Implement continuous improvement of forest management.

This will be accomplished by:

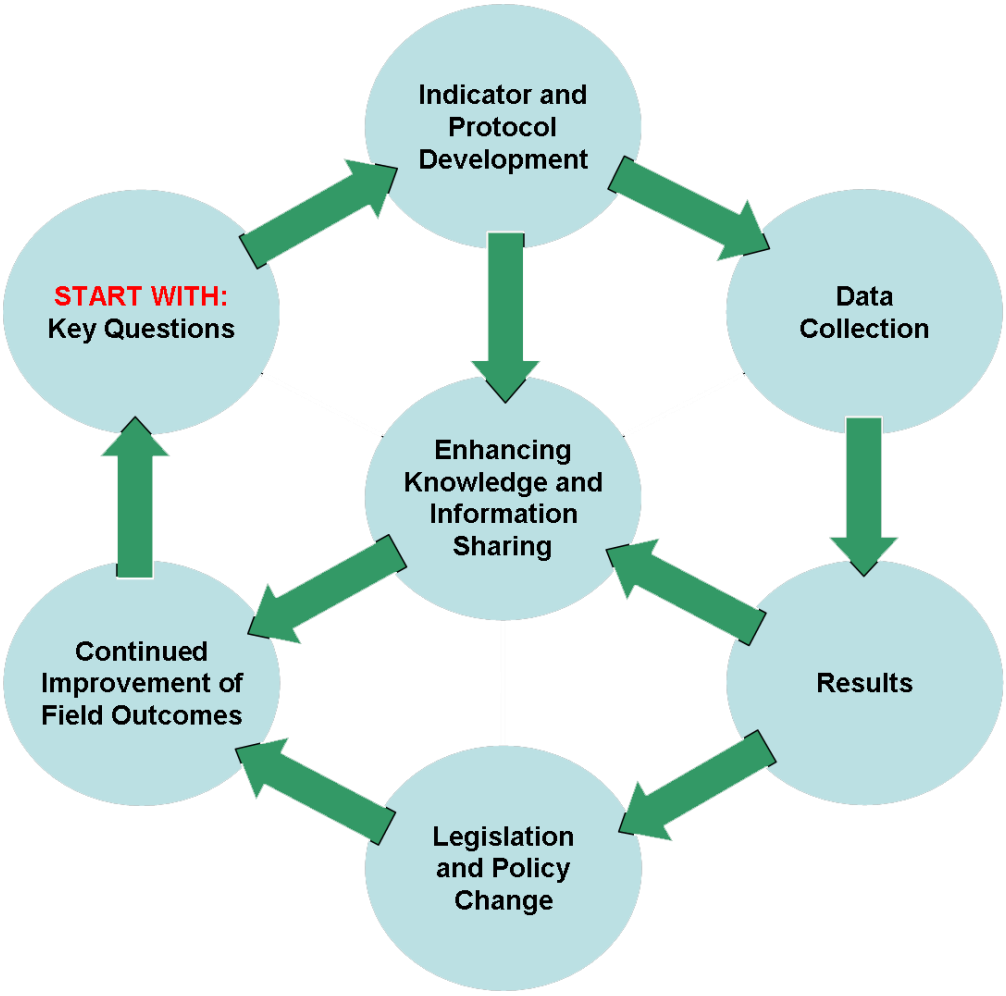
- Evaluating the status or trends of resource and ecosystem values and determining causal factors;
- Determining whether resource values are being managed in a sustainable manner through proven or alternative forest practices;
- Recommending options for changes to forest and range policies, practices and legislation, where required.

More information about FREP and an overview of how the program is structured and how all the FREP components fit together can be found in the publication FREP Monitoring and Evaluation Strategy, available from this site's publication library.

The FREP Cycle

FREP is a partnership involving Ministry of Forests and Range Forest Practices Branch, District and Regional staff, Research Branch, Resource Tenures & Engineering Branch, Field Services Division, and the Ministry of Environment. The results of Resource Stewardship Monitoring (RSM) and effectiveness evaluations will be peer reviewed and presented in extension reports to government officials, the public and other stakeholders.

The *Forest and Range Practices Act* is intended to maintain high environmental standards, and promote innovation and cost-effective forest resource management. It is the mandate of the Ministry of Forests and Range, Forest Practices Branch to ensure that scientifically based and peer-reviewed protocols are developed through collaborative efforts with existing scientifically based evaluation initiatives and stakeholder involvement. The intent is to determine if government-stated objectives for FRPA resource values are being achieved.



What is Effectiveness Evaluation?

Definition

Effectiveness evaluations are management tools used to assess whether policies or practices meet their intents, based on evidence of their outcomes.

These evaluations may be used along with other adaptive management strategies to improve management actions. They often use results from monitoring projects, but can also incorporate studies and research that do not strictly involve monitoring.

The *Forest and Range Evaluation Program* (FREP) has the mandate to conduct effectiveness evaluations in the province of British Columbia. Most effectiveness evaluations will be conducted by the *FREP Resource Value Teams*. Seven high priority resource evaluation questions were selected from a total of 34 resource evaluation questions submitted by the 11 Resource Value Teams. Effectiveness evaluation projects will be conducted, but not limited to, these priority questions. Additional effectiveness evaluation projects will be conducted by

the FREP working group as requested by the program sponsor. Licensees may also conduct effectiveness evaluations on their own practices as laid out in their Forest Stewardship Plans (FSPs).

All reports and data from these effectiveness evaluations will be housed on this web site on a voluntary basis. Data from these evaluations may be very useful in identifying where improvements can be made to practices or changes to legislation and policy to meet the objectives set out by government.

The Government of British Columbia is committed to continuous improvement of forest management. This commitment includes maintaining a forest policy and practices evaluation framework and conducting evaluations of the effectiveness and efficiency of the legislation, policies and practices that impact forest stewardship in the province and are key to sustainable forest management.

In the natural resource sector, we are more familiar with evaluating programs and projects, than we are with assessing the effectiveness of policies and recommending improvements. Therefore it's important to state clearly what effectiveness evaluations are and how they will be used to help us improve forest management and maintain environmental values.

Effectiveness evaluations are management tools used to assess whether specific policies and practices are actually meeting anticipated outcomes, that is are they effective? These evaluations may be used along with other adaptive management strategies to improve management actions. They often use results from effectiveness monitoring projects, but can also incorporate studies and research that do not strictly involve monitoring. Later in this module we'll look at different types of monitoring and the information they provide in more detail.

Why Conduct Effectiveness Evaluations?

Effectiveness evaluations are conducted to:

- facilitate continuous improvement of policy design and implementation;
- contribute to ensuring policy, program or project objectives are defined and achieved;
- improve forest practices;
- enable funding requests and decisions to be made on reliable, objective information;
- increase accountability for resources allocated and spent;
- demonstrate due diligence and professionalism;
- identify our organizational strengths and weaknesses; and
- meet responsibilities including the Quality Assurance Framework.

Benefits

Effectiveness evaluations will provide the BC Government with reliable data about the effectiveness of legislation, policy and practices as well as provide an opportunity for recommendations for improvements. The evaluation process will assist policy makers to respond to determine issues such as:

- Are international standards being met?
- Are objectives and outcomes being met?
- Are resource values being maintained?
- Is public trust being upheld?

Challenges

Implementing an effectiveness evaluation program that will provide the information required to continuously improve forest practices legislation will not be an easy task. Some of the challenges facing us include:

- Policy, objectives and terms of reference need to be developed;
- Monitoring framework needs to be developed;
- Resources need to be located;
- Data must be managed;
- Data must be analyzed, interpreted and results must be presented;
- Cooperative, long-term commitments between government and other stakeholders must be established;
- Collaborative projects must be managed effectively;
- Training must be developed and skills acquired;
- Mechanisms must be developed that recognize and support effectiveness evaluations; and
- Management styles must change from emphasizing prescriptive approaches and standardized rules to monitoring results and adapting management actions.

APPENDIX 10: Workshop Summary Report

PURPOSE

The purpose of this Workshop Synopsis report is:

- To provide Workshop and Dialogue participants with a synopsis of the outputs, findings and discussion highlights from the workshop.
- To serve as reference material that OSRIN and other Dialogue participants can draw on when seeking to improve the information and reporting system.
- To continue to inform those interested in the Information and Reporting System Dialogue even if they were not able to attend the workshop.

INTRODUCTION

Twenty-five (25) people with a diversity of interests and backgrounds related to information and reporting system for the region subject to oil sands development attended a workshop held on June 18th, 2010 at the University of Alberta in Edmonton. Workshop attendee affiliations were diverse including government, industry, academia, consultants and non-government organizations (see Appendix 1).

Chris Powter and Stephen Moran, from OSRIN, welcomed workshop attendees and then outlined the general purpose of the workshop. For context, it was noted that there exists a perception of (negative) ecological impacts resulting from oil sands development. The question addressed in the workshop was: "How do we establish a system that provides adequate information so that we can better assess the nature and significance of the impacts?" Consequently, discussions at the workshop were intended to help define the potential for future work on an information and reporting system where OSRIN might play a supportive role.

The workshop began with brief introductory comments on affiliation, background, and interest in the dialogue by each participant (see Appendix 1). For the remainder of the workshop we looked at some scenarios and assessing the general benefits and costs of improving the information and reporting system.

OSRIN has captured the key themes and outputs from the Dialogue including the Workshop, with this report summarizing the key thoughts and commentary from the Workshop. The intent is to produce a final report that identifies options for improving the information and reporting system. The report is intended to provide advice to government and other organizations that can help lead to improvements in the information and reporting system.

SESSION 1: SETTING THE STAGE FOR THE WORKSHOP

Doug James, Project Facilitator, went over the suggested rules of the road for nurturing collaboration; use of 'alignment' tool for quick, quality team decision-making; and proposed use of 'dialogue' over 'debate' at the workshop. Workshop attendees were aligned with these suggestions.

Key Challenge

The Key Challenge for the Dialogue proposed in Workshop Workbook was:

> *To describe key principles and elements of an adequate and effective information and reporting system that would provide Albertan's (and the World) with assurance that ecosystem effects due to development in the oil sands region are known and reported and, along with socio-economic information, support meaningful decision-making and responsible management of the resource during its entire life cycle.*

Workshop Discussion:

Several comments ensued including:

- Concern with word 'adequate' as setting too low a bar (with some preferring the term 'world class'); and
- Confusion with what terms 'are known', 'meaningful', and 'resource during its entire life cycle' are meant to convey.

The proposed revised Key Challenge emanating from the Workshop was:

> *To describe key principles and elements of an information and reporting system that would provide Albertan's (and the World) with assurance that ecosystem effects due to development in the oil sands region are reported and evaluated and, along with socio-economic information, support decision-making and responsible management of the land.*

There was alignment that 'land' is used above in the general sense to include land, water and air. It was also noted that although there should be a single 'system', that will be different tiers of information that may be managed by different organizations. When asked, a representative from OSRIN noted that OSRIN has no interest in owning or operating the system, but just wants to have an effective system in place.

Although other concerns were noted, such as not using term 'oil sands region' (as it seems to erroneously imply oil sands development alone is occurring), there was general alignment that at this point in the Workshop we should move on to other topics.

Expected Outcomes

There was general alignment with the five expected outcomes for the Dialogue and the Workshop as noted in the Workshop Workbook.

SESSION 2: FEEDBACK FROM CHALLENGE PAPER & PROGRESS REPORT

Background Statements

There were seven revised Background Statements provided in the Workshop Workbook. The original Background Statements in Challenge Paper were revised in consideration of Dialogue feedback as reflected in the Progress Report.

Workshop Discussion:

1) Background Statement # 5 in the Workbook stated:

   To date the public debate on the question of potential ecosystem effects related to oil sands development has been neither balanced nor informed. Perspectives include:
   - *Scientific studies are in fact adequate but access and transparency to that information has not been adequate,*
   - *Scientific studies that are available have not been adequately used or understood to inform the debate, and*
   - *Most historical 'scientific studies' were not designed to assess ecosystem effects: if an ecosystem-scale information system is desired then it will need to be built.*

   Several suggestions to improve this Statement were provided including adding: 'Scientific studies and performance measures…', and deleting second part of third bullet (after colon).

2) It was suggested that this or a new Statement needs to address 'scale', for example, the significance of some values changes depending on the scale. It was also noted that we are moving from lease-specific impact assessments to regional scale and cumulative impact assessments, and that historical studies in general are not regional in scale. That said, concern was expressed that select local impacts need to be reported; for example if they are significant locally but not in the context of region, there will be negative reactions to not reporting local impacts.

3) It was also suggested that any environmental evaluation be in context of social and economic impacts and that this should be added as a Background Statement, and that a frame of reference to compare monitoring against was needed.

Assumptions

There were 21 revised Assumptions provided in the Workshop Workbook. The original Assumptions in Challenge Paper were revised to in consideration of Dialogue feedback as reflected in the Progress Report.

Workshop Discussion:

1) The notion that the variety of ecosystem effects are not known or are poorly known in the region subject to oil sands development needs to be captured in an assumption.

2) It was suggested that Assumption #1 is from a government document and should be regarded more as a statement of fact, and therefore considered a Background Statement.

3) Assumption #10 in Workbook was worded as follows:

   Raw scientific data alone are often not useful to the public and decision-makers due to a variety of issues:

   - *Inadequate context (how does this piece of information fit into the picture?),*
   - *Communication difficulties (use of scientific jargon, interpretation of statistical data, etc.)*
   - *Lack of ease of access (where only reported to government and not readily available to the public).*

   It was suggested that 'operational data' is also important (i.e., reword as: 'Raw scientific and operational data ...'), and that there are other examples of difficult to access information for third bullet such as conference proceedings.

4) Thresholds, goals and objectives are needed to inform the information and reporting system and these would stem from the documents such as the Oil Sands Strategic Plan and the Lower Athabasca Regional Plan. This notion needs to be added as an assumption.

SESSION 3: SEEKING ALIGNMENT ON KEY PRINCIPLES

In order to keep the Workshop on time with respect to agenda sessions, the discussion focused on Principle and Elements. The draft logic model and critical questions provided in the Workshop Workbook can be used as reference material that to inform the group discussions later in the day.

Principles and Elements

There were 5 Principles and 13 supporting Elements provided in the Workshop Workbook. The wording of some of the original Elements in Challenge Paper was revised in consideration of Dialogue feedback as reflected in the Progress Report. The proposed Principles were:

1. Relevant (e.g., responsive, addresses key objectives, supports decisions)
2. Credible (e.g., science-based, consistent methodology, standardized reporting, verifiable, independent and objective, collaborative)
3. Understandable (e.g., increases public awareness, causal relations understood)
4. Transparent (e.g., publicly available data, methodology and reports, timely reporting)
5. Robust (e.g., durable, continuously-improving)

Workshop Discussion:

1. There was some discussion whether the 'Transparent' principle was achievable (particularly as worded in element #10 in the Workbook) – that perhaps 'trustworthy' is better term to use. It was noted that sometimes government is a barrier to timely availability of information as they want to ensure it is precisely right before its release. It

was suggested that 'best known' or 'best available' information be captured in the wording of the 'Transparent' and/or 'Credible' principles so that it is clear that we do not have to wait for 100% scientifically verifiable data before it is made publicly available. Caveats to data can make clear the degree to which the information has been verified. It was noted that, in the case of the economy, interim GDP reports are provided before the 'final' GDP report is prepared, and that a similar approach can be taken with environmental information. There is a also need to balance communicating information in a timely manner where on one hand undue alarm is not created (where information is provided without proper context) and on the other hand data is withheld (until full context can be provided) where the organization is then accused of hiding information. After some discussion, there was general alignment that the 'Transparent' principle is important to retain with some of the above considerations captured in the supporting elements.

2. One of the elements (i.e., element #11) under the 'Transparent' principle proposed that a 'State of the Environment Report for the Oil Sands Region' be published periodically. A comment noted that it may be difficult to define what the regional boundary should in fact be.
3. One of the elements (i.e., element #13) under the 'Robust' principle proposed that the information and reporting system continuously improves. It was suggested that the system also be flexible, for example, to address the key objectives (in element #1) that can change over time.

SESSION 4: EXISTING MONITORING PROGRAMS

Representatives from several existing monitoring programs provided an overview of the current state of that program.

Existing Environmental Effects Monitoring Programs

Eric Lott gave a summary of his current scoping study under contract with OSRIN inventorying and characterizing existing environmental effects monitoring programs in the oil sands area. The focus of the study was to assess current monitoring work that is readily available to the public and did not try to address monitoring programs that are not publicly available.

Although still a work in progress, both a "Summary" and "General Chronology" of Environmental Effects Monitoring Program documents were distributed at the workshop. The documents address the programs undertaken by the:

- Wood Buffalo Environmental Association (WBEA)
- Regional Aquatics Monitoring Program (RAMP)
- Alberta Biodiversity Monitoring Institute (ABMI)
- Cumulative Environmental Management Association (CEMA)

It was noted that while CEMA does not undertake monitoring, it helps direct research efforts and validates work conducted by others.

The 'Summary" document includes the purpose of each organization, the organizational (or governance) structure, the media covered (e.g., WBEA – air; RAMP – water; ABMI – biodiversity), the status of the work (e.g., RAMP – water quantity and quality, sediment quality, fish habitat and populations but currently not groundwater), monitoring questions being addressed, the monitoring approach undertaken (e.g., ABMI uses permanent sites distributed over a grid across Alberta), and key outputs (products) and desired outcomes.

Eric noted that WBEA and RAMP are oil sands focused whereas ABMI is province-wide in scope. The data collected by WBEA and ABMI is readily accessible but the RAMP data needs to be purchased by companies as it has been a means to help cover program costs. That said, public requests for RAMP data have normally been fulfilled. All the programs have gone through both peer and program reviews.

The scoping study includes other programs such as the National Forest Inventory (NFI) and monitoring undertaken by Environment Canada. The ABMI collects the data for the NFI in Alberta.

Although not currently publicly available, it was noted that considerable project-specific monitoring is being undertaken by industry. Companies are required to collect information as part of the approval process including collection of baseline data in support of environmental impact assessments (EIAs), annual reports as approval condition that are normally not submitted to government but need to be available in case of audit, and compliance-based data that government requires to help ensure regulatory conditions have been met.

Alberta Environment is developing an Oil Sands Information Portal which may provide public access to some of this industry collected data.

Integrated Monitoring, Evaluation and Reporting Framework (IMERF)

Susan Johnstone with Alberta Environment provided a brief update on the IMERF project. The project started about a year ago in response to issues similar to those raised that prompted this Dialogue. IMERF is intended to be a principle-based framework where both spatial and temporal integration is envisioned. A key driver is to help ensure key information is available to support decisions made by Alberta Environment. Part of the data management will be a quality classification. Alberta Environment prepared a draft Framework in October 2009. The intent is that in general the data would be publicly available although some information may be withheld should it be necessary to address the protection of privacy. Overall, IMERF's goals and background are very similar to those noted by OSRIN in support of this Dialogue.

Regional Aquatics Monitoring Program (RAMP)

Fred Kuzmic provided an update on RAMP. RAMP was initiated in 1997 with a multi-stakeholder oversight including industry and government, and initially also First Nations. RAMP is primarily funded by industry with focus on lakes and rivers. Baseline conditions are monitored in order to ascertain the natural range of variability. Conditions with development are monitored to ascertain trends and to compare them with EIA predictions. A community

component of RAMP assesses fish. Consultants are hired to run RAMP and technical committees are formed to help ensure proper scientific design. In 2004, a peer review was completed and RAMP is addressing issues raised. The design and rationale for the program is provided in a comprehensive 600 page document. Another peer review is currently underway.

One of the recommendations from the current review might be that RAMP data be made more publicly available (the concern in the past was that companies who are not contributing financially to RAMP would get free access to use the data which could undermine the financial support needed for the program).

About $4 million is spent each year on fish, benthic/invertebrate, sediment, water quantity and quality, and acid-sensitive lake work. Companies can choose to be a part of RAMP, and pay for the data collected to support their operations, or can opt to do their own data collection. RAMP is currently not a legal entity but going that route is under consideration.

Responsible Actions: A Plan for Alberta's Oil Sands

Jennifer McGill, Oil Sands Secretariat, summarized some of the follow-up activities stemming from the 2009 report Responsible Actions: A Plan for Alberta's Oil Sands. One of the challenges was how to measure 'being responsible': what data should be collected and how should stakeholders be involved? Twenty-two national and international programs were reviewed that addressed social, economic and environmental indicators. Via review with stakeholders, 31 indicators were initially identified. About 80% of the indicators have existing data. The secretariat is currently in the process of validating the indicators and gathering information regarding them. In Fall 2010 they expect to have baseline data collected publicly available. A challenge being address is how "to connect the dots regarding the indictors and supporting data in order to tell a story". The intent is to provide a regional perspective and to have access to the information via GeoDiscover Alberta.

OSRIN/Cambridge Strategies Survey

Stephen Moran provided a summary of purpose and status of this survey of Albertans' values regarding Oil Sands development, which is also outlined in Appendix 3 of the Workshop Workbook. The survey was conducted to determine the value-based drivers of oil sands development that are most important to Albertans and the results are currently being compiled. The results will provide insights into ways that both the government of Alberta and the industry can better serve the needs and wants of Albertans. The survey in part replicates one conducted a few years earlier and thus will be able to assess changes in Albertans' values over time.

Alberta Biodiversity Monitoring Institute (ABMI)

Jim Herbers, ABMI, provided a brief update on ABMI as it relates to oil sands area. Monitoring efforts in northeast Alberta have been rationalized with approvals under the Environmental Protection and Enhancement Act (EPEA). The information collected helps support a company's environmental impact assessments (EIAs). Regarding this effort, developing a vision on how the data could be more broadly used might improve the transparency considerations with approvals.

Cumulative Environmental Management Association (CEMA)

Fred Kuzmic provided an update on CEMA. CEMA is involved in data collection but monitoring. CEMA includes a Traditional Environmental Knowledge (TEK) component, and a strong communications aspect. The Board overseeing CEMA is representational with 4 from industry, 4 from government, 4 from First Nations and 4 from NGOs. Currently, there is not really a cumulative impact program in place. Industry invests about $19 million per year collectively to CEMA, RAMP, WBEI and related programs. It was noted that it is hard to get data from CEMA but that CEMA recognizes this and is trying to deal with it.

SESSION 5: SETTING UP THE GROUP SESSIONS

Given time constraints, two group sessions (instead of three) were structured for the Workshop:

- One dealing with the both the 'enhanced' and 'integrated' scenario (sessions 6 and 7 combined); and
- One dealing with the 'world class' scenario (session 8).

There was general alignment with the key tasks for group discussions as outlined in the Workshop Workbook.

SESSION 6/7: DESCRIBING AN 'ENHANCED' AND 'INTEGRATED' SCENARIO

From the Workbook, workshop participants were provided with the following definition (or attributes) for this scenario to assist their group discussions:

Scenario Name	Definition (or attributes)
Enhanced Base	Base case with respect to monitoring and data collection • Reliable, stable funding so existing monitoring can continue • Enhanced interpretation of information (context) • Improved reporting and communication • Improved access to data • In sum, no new funds for additional monitoring, but some additional resources to more effectively use the data that is being collected.
Integrated Base	As above for Enhanced Base plus: • Integrated operations and reporting (e.g., amalgamating monitoring programs, common governance, other ideas) • Some additional funds are available, but only as required to achieve adequate integration

The feedback from table group discussions are summarized below based on flip chart notes and presentation highlights at the workshop.

Table Group A

Integrated reporting:

- System is only as strong as its weakest link with respect to credibility
- Integration considerations include reporting, funding, continuous improvement, and governance (e.g., a corporation involved in information and reporting)
- Oversight is needed to integrate and amalgamate when it makes sense but don't unnecessarily integrate where it does not make sense
- There are probably more gaps in information than inefficiencies with current system
- Regarding organization and governance, do you combine information and reporting programs or do you preserve the existing entities; what would be role and mandate of an overarching body; separate by cores/media (air, land, water, biodiversity).
- Monitoring and reporting should be at media level including assembly of information and communication
- Need to be responsive to who needs information and when it is needed
- The functions of data collection, evaluation, synthesis, communication and application need to made clear with critical separations made between data providers and use of data to support decision making
- To address public perceptions, it is important that data providers are at arms length and that the client (data user) does not effect in kind of information being collected and reported
- Monitoring programs can support both regulatory requirements and non-regulatory best practices
- Government needs to have independent arms-length monitoring that is separate from government regulatory bodies
- Monitoring design should be with the province in mind that can be more detailed to fit the operational needs of northeast Alberta where oil sands development is occurring
- The structure should allow for 80% core (province-wide) monitoring and 20% customized (to region) monitoring
- The program should be substantiated (defended) from two perspectives: national/global and regional/site scales
- The investigative science part that leads to cause effect evaluations should be a separate arm of government from those undertaking core and customized monitoring
- Important to separate benchmark indicators and thresholds

Issues:

- We are not using the data we are currently capturing

- Lack of benchmarks
- Collection of key indicators

Table Group B

Funding:

- Adequate funding needed for existing monitoring programs
- Consider a mandatory levy to provide a fair funding system as 'price of doing business'

Reporting and communication:

- Who is going to do this? (government, industry, third party?)
- Who is it for? What questions need answering?
- There tends to be a bias against reporting with data collection specialists
- Need to be careful regarding how data is packaged without 'spin'
- Performance standards and indicators needed to report against
- More data likely being collected than being used (are data sometimes collected for the sake of data collection? Are significant amounts of data unused?)
- Need to invest time in design up front to address statistical validity, scale, etc.
- Need for data standards to encourage appropriate use
- System needs to be flexible with acknowledgment that requirements may change to address use of data in the future

Integration:

- How do we integrate data from different sources?
- Potential to integrate monitoring program operations
- High priority should be given to an Alberta State of the Environment report that includes areas covered by oil sands operations with annual reporting
- One report such as this can help coordinate reporting on results of various monitoring programs
- Administrative integration of monitoring programs another consideration

Access to data:

- Potential problems with misuse of metadata underscores need for quality control so that data is not taken or used out of context
- Also issue with proprietary data and ability to use and access this information
- The claims of government and industry regarding environmental performance need to be backed up with data
- Information technology infrastructure has not kept pace with the amounts of data being collected
- There is sometimes a 'run around' with respect to getting information from companies and government for data which makes it difficult for the public to access data

- Ombudsman for data requests should be considered
- Self-service access to data should be goal so current concerns from government about costs of meeting data requests are addressed (e.g., a common portal to all oil sands environmental information where all project documentation is available on-line). This requires changing expectations of public access to data.
- CEMA dataset library should be considered

Enhanced interpretation:

- Questions cross environmental media
- There is need to monitor groundwater
- An index of environmental integrity should be considered where its state can be assessed (e.g., good, fair and poor)
- There should be ability to undertake environmental forecasting where trends show some indicators are improving, some with no significant change, and some deteriorating
- Should those providing information do the forecasting or should the date be made available to enable stakeholders to do it?
- Providing context is more important than enhanced interpretation
- Are there gaps? Assessment of regulation reports? Right information being provided? Further work required to evaluate this.

Table Group C

Funding:

- Need stable funding – either guaranteed funds to invest in information and reporting (e.g., legislatively requires this), or assured product to sell that produces stable income
- Funding source is critical and must be available in a timely manner; stable funding raises credibility; stability also allows forward planning and better supports effective decision-making
- Industry pays for monitoring which currently is applied as a royalty offset so in effect the public does pay
- Concern about long-term funding; need value review to ensure good value for investment
- Should be core monitoring where everyone pays, and additional monitoring that individuals fund
- Barriers to stable funding include:
    - Funding fear, that dollars spent not efficient or effective
    - Concern that may not encourage program review of merit/use/value of information collected
    - May be different monitoring needs. Needs for different purposes; should pay for universal regulations but not specialized (operator or site) requirements

SOE report/data access:

- Has to be more than a glossy public relations exercise
- Need (a legislative) Act to ensure this gets produced
- Needs to allow option for users top ask intelligent questions
- Should be mix of short fact sheets and detailed supporting report
- Are there new ways of conveying information than a 'report'
- Should be interactive
- SOE applications should be tailored to personal interests
- All layers of 'nested' data/information should be available
- Don't assume data not wanted; some people just need to know that the data are available
- Need four layers in data portal: (1) general interest e.g., anyone in the world might want to know; (2) local interest e.g., resident of Alberta might want to know; (3) student interest (e.g., undergraduate or graduate student might want to inquire about); and (4) detailed data itself where someone can do their own analysis
- The above four layers is based on common request received
- The above said, why enhance and integrate the current baseline approach to information and reporting when we need world class system
- Barriers:
    - Lots of information out there, and lots of questions need to be addressed
    - Information providers tend to be inherently conservative in that the fear releasing data if it is not 'perfect; let less than perfect data be released with appropriate caveats (e.g., what the level of confidence is and why)
    - It is a given that someone will misuse the data/information; don't let data abusers be reason for withholding information

Other:

- Important to document why the program is designed that way it is (and why modified over time) for corporate memory and public confidence
- There is benefit in cumulative effects monitoring as you learn things not expected

Interpretation:

- Current quality of information is variable
- Do some core (basic) interpretations but allow others to interpret based on availability of raw data
- Need in-house capability to do interpreting
- Need mechanism to ensure impartial interpretation e.g. give an impartial third party group the funding to interpret who do not have a conflict of interest
- Barriers:
    - Complexity of ecosystems

- Funding/resources/capability issues

Governance/integration:

- There is issue of integration across various users of information as well as integration across various media (land, water, air)
- Monitoring design may be different for valid reasons
- Purpose/objectives of monitoring are different which can be barrier to integration
- Integration of monitoring and reporting should involve communities
- Legacy programs – need for continuity and public confidence which suggests program should carry on; only stop if confident the information will not be needed
- External integration at high level with FN/stakeholder involvement providing oversight but not involved in detail or design; science by committee is bad
- May be an external integrator might see things in the weeds that information providers don't see
- Need an extension arm as exists for Agriculture

Rating of the "Enhanced and Integrated" Scenario

In the plenary, attendees were asked to think about the enhanced and integrate scenario that have generally emerged from the descriptions provided by the table groups using the 5 principles (as described in Session 3) and the following suggested rating system (as provided in Session 5 of the Workshop Workbook):

5 Completely or nearly completely satisfies Principle (>90%)
4 Substantially satisfies Principle (66-90%)
3 Somewhat Satisfies Principle (35-65%)
2 Addresses Principle partially (11-34%)
1 Addresses Principle inadequately (1-10%)
0 Does not satisfy Principle at all (0%)

The following table shows the number of participants supporting each of the ratings:

Principle/Rating	**0**	**1**	**2**	**3**	**4**	**5**
Relevant	0	0	0	7	7	1
Credible	0	0	0	6	7	1
Understandable	0	0	3	10	2	0
Transparent	0	0	2	6	6	0
Robust	0	0	5	6	4	0

The weight average rating of this scenario for each principle is:

Relevant	3.6
Credible	3.6
Understandable	3.0
Transparent	3.4
Robust	3.0

SESSION 8: DESCRIBING A 'WORLD CLASS' SCENARIO

From the Workbook, workshop participants were provided with the following definition (or attributes) for this scenario to assist their group discussions:

Scenario Name	Definition (or attributes)
World Class	Same as Enhanced Base (may or may not involve integrated operations), but otherwise it is not constrained. Case may contain: • Improved science to add meaning to information collected and explore casual relationships • Fill gaps where key information is missing and new monitoring is needed • Improve the reliability of data being gather (e.g. more sample plots and/or more frequent data gathering) • Other ideas • In sum, additional funds for monitoring where it can be justified as well as additional resources to effectively use and report on the data being collected.

The feedback from table group discussions are summarized below based on flip chart notes and presentation highlights at the workshop.

Table Group A

Integration necessary

- Provides logistical and operational efficiency
- Allows reporting of media interactions (correlative aspect)
- Media not independent – need to be looking for holistic relationships

Transition to world class system

- Sign on to core 5 principles (noted in Session 3)
- Agree to business (scope of) funding
- Differentiate between monitoring and decision-making – keep them separate
- Although independent from decision-makers, the monitoring program needs to respond to client needs such as decision-makers regarding they types of information needed (arms-length data providers with clear linkages to decision-making so that the interface between information and decision-making is actively managed; similar to researchers who need to be responsive to their customers/clients)

- Need significant political leadership to make this happen

Options to Consider:

Model 1: An integrating body reports on information collected by existing monitoring programs (e.g. ABMI, WBEA, RAMP)

Model 2: One single organization runs entire information and reporting system for all media

Table Group B

General

- A commitment and structure is needed at a high level to make this happen (e.g., federal and provincial government buy-in at the deputy minister level)
- An independent entity is needed to deliver a world class system
- The entity should be responsible for all kinds of monitoring except the regulatory monitoring that industry does
- Multi-stakeholder oversight should be provided (with board structure)
- Endowment based funding can finance system
- Need assessment and gap analysis beyond province to address questions being raised by people outside of province
- Should include assessment of GHGs
- Real time automated data should be provided with less people involved in data handling
- The raw data should be available on-line
- Active interpretation of data needed
- There should be a university affiliation and extensive network built so that best global practices are applied in a world-class information and reporting system
- There should be a research arm
- A '24 hour a day/7 days' a week approach to responding to emerging issues
- Health linkages should be part of system
- Causal relationships needed to be evaluated (identify, confirm)
- A problem solving investigative branch of the entity is needed
- The entity should provide 'one-stop shopping' with respect to information and reporting for ecosystems for entire province (not just area subject to oil sands development) –with initial focus on the 'oil sands area'
- The entity should be considered a 'centre of excellence'
- The entity would inform regulatory agencies, companies and public when issues arise (e.g., raise 'red flags' where agreed to thresholds have been breached), and report on actions

- The entity can set monitoring standards for other activities such as environmental impact assessments
- Delegated authority for monitoring under legislation/regulation are vehicle to make this happen
- The entity should in fact be 'all things to everyone' in that it can respond to various questions raised at different scales of interest/concern
- To help offset costs, a fee for service work can be charged
- Entity needs to be arm's length and provide credible data; be independent with external recognition or certification
- Strategic partnerships with existing monitoring programs (such as ABMI), industry (such as via CAPP), and NGOs (e.g., Alberta Conservation Association, Pembina Institute) are needed

Table Group C

General

- Need to carefully design a world class system; getting it right will likely take more than a year
- Oversight review committee (e.g., industry/government) needed to help steer system
- Concern will be fear of losing current programs
- Challenge will be securing needed dollars to deliver a world-class system
- Gap is lack of historic benchmarks; need to find proxies
- System needs to be designed to address different 'scales' of question: at provincial and national level, and a regional level
- The benefits of providing proactive information need to be made clear (e.g., the value with improved science-based knowledge) with new tools and knowledge being provided to enhance our ability to interpret data, and different qualification of people doing the work
- Ability to answer questions proactively (earlier) rather than reactively (after it is raised) is clear benefit
- There needs to be appropriate training system in place
- If we collect more or different data, we need to know why (rationale)
- Reporting frequency should be current for some components such as air quality and water flow, but less important for other components such as soil and vegetation
- Does ISO world class monitoring structure exists that we can consider or use?
- Access experts outside but transfer knowledge to Alberta
- An institute could be formed that provides oversight, research capability, and that does the monitoring; test monitoring techniques (research arm) before making operational

- The institute or university should be self-contained where system design, synthesis, quality assurance/quality control, interpretation, evaluation and release of information using newest technology available can be effectively delivered
- A technical (peer review) committed can assist

Rating of the "World Class" Scenario

In the plenary, attendees were asked to think about the world class scenario that have generally emerged from the descriptions provided by the table groups using the 5 principles (as described in Session 3) and the following suggested rating system (as provided in Session 5 of the Workshop Workbook). The consensus was that the World Class Scenario would rate between 4 and 5 for each principle, and would therefore be significant improvement over the augmented system in Section 7 or that which exists now.

SESSION 9: NEXT STEPS, TIMELINES AND ON-GOING DIALOGUE

The intention is to make all of the Challenge Dialogue documents available on the OSRIN website including the Challenge Paper, Consolidated Feedback, Progress Report, Workshop Workbook, and the Workshop Synopsis.

All of the Feedback from the Dialogue will inform the development of a Final Report from OSRIN about an adequate and effective information and reporting system for the oils sands region. OSRIN will also consider the results from the Inventory and Characterization of Monitoring Programs, results from an independent survey of Albertans and other information when developing the Report.

This Final Report is expected in the Fall 2010 and will also be posted on OSRIN's website and distributed to all Dialogue participants and also to key individuals and organizations including government for consideration.

SESSION 10: WORKSHOP WRAP-UP

Stephen Moran and Chris Powter, OSRIN, thanked the participants for their valued input over the course of the Dialogue and at this Workshop.

Doug James also thanked attendees for their active and constructive participation at the workshop. He asked participants to please complete an evaluation sheet where you how well we met the expected outcomes of the workshop and the Dialogue overall can be rated. Appendix 2 provides a summary of the feedback from the completed evaluation sheets.

APPENDIX 1: WORKSHOP ATTENDEES

Caroline Bampfylde	Alberta Environment
Neil Barker	Alberta Sustainable Resource Development
David Chanasyk	University of Alberta
Simon Dyer	Pembina Institute
Julia Foght	University of Alberta
Ken Foster	Consultant
Paul Griss	Boldon Group
Chris Hale	Energy Resources Conservation Board
Jim Herbers	Alberta Biodiversity Monitoring Institute
Jonathan Hornung	Suncor
Doug James	Congruent Strategies
Susan Johnstone	Alberta Environment
Keith Jones	R. Keith Jones & Associates
Fred Kuzmic	Shell Canada Energy
Eric Lott	EO Consulting
Jennifer McGill	Oil Sands Secretariat
Stephan Moran	Oil Sands Research and Information Network
Chris Powter	Oil Sands Research and Information Network
Jim Sheick	Alberta Biodiversity Monitoring Institute
Sherry Sian	Canadian Association of Petroleum Producers
Caroline Simpson	Oil Sands Research and Information Network
Harry Stelfox	Stelfox Wildland Consulting
Justin Straker	Consultant
Terje Vold	Terje Vold & Associates Consulting
Linda Zimmerling	Alberta Sustainable Resource Development

APPENDIX 2: EVALUATION OF EXPECTED OUTCOMES

As the workshop wrapped up on a late Friday afternoon, with many participants having to catch transportation back home, only a few participants remained as the evaluation sheets were being handed out. Six participants completed the evaluation sheets.

The following is the rating system used in the evaluation sheets for each expected outcome:

- 4 stars **** expected outcome exceeded
- 3 stars *** expected outcome met
- 2 stars ** expected outcome partially met
- 1 star * expected outcome not met but some useful conversations occurred

The following is the average score given for each of the five expected outcomes:

Expected Outcome	Outcome Description	Average Rating	Comments
1	Gain an improved understanding and appreciation of the diverse perspectives regarding an effective public information and reporting system for environmental impacts	3.7	Good feedback from all participants, thoughtful participation, and very relevant to my work
2	Gain an improved understanding of existing information and reporting systems currently in place in the oil sands region	3.3	More monitoring ongoing in province Missing AENV and other government monitoring This was great
3	Develop a clear understanding and alignment about the key principles and elements required for an adequate public information and reporting system for the oil sands region	3.2	I think the value was less in the principles and more about the conversation around them Likely need to send revised ones out and see if any concerns
4	Develop a draft model of an adequate effective and credible environmental and ecosystem information and reporting system consistent with the principles and elements accepted at the	3.0	Certainly this was a stretch goal I think we're getting there. Very good representation in terms of knowledge and experience Substantially more work needed for

	workshop		implementation Great ideas
5	Identify information and reporting gaps that need to be addressed and warrant additional focus	2.6	Not sure this was a focus of the day but concerns were interacted