

ACR Aboriginal Programs Project Program Template

Program Area:	5.0	Resource Stewardship
Sub Program:	5.1	Strengthening the Knowledge Base
Template:	5.1.4	Assessment of Health of Rivers and Lakes in the Oil Sands Region
Sponsor(s):	<i>Regional Aquatic Monitoring Program (RAMP) - 31 member organizations including 5 First Nations, Athabasca Tribal Council, and Métis Locals #122 (Fort McKay) and #124 (Fort Chipewyan)</i>	

1. Objective

To integrate aquatic monitoring activities so that long-term trends, regional issues and potential cumulative effects related to oil sands development can be identified and addressed.

2. Description

The objectives of RAMP are to:

- Monitor aquatic environments in the oil sands region to detect and assess cumulative effects and regional trends
- Collect baseline data to characterize variability in the oil sands area
- Collect and compare data against which predictions contained in environmental impact assessments (EIAs) can be assessed
- Collect data that satisfies the monitoring required by regulatory approvals of oil sands developments
- Collect data that satisfies the monitoring requirements of company-specific community agreements with associated funding
- Recognize and incorporate traditional knowledge into monitoring and assessment activities
- Communicate monitoring and assessment activities, results and recommendations to communities in the Regional Municipality of Wood Buffalo, regulatory agencies and other interested parties
- Continually review and modify the program to incorporate monitoring results, technological advances, community concerns, and new or changed approval conditions
- Conduct a periodic peer review of the program's objectives against its results, and make recommendations for adjustments necessary for the program's success

Coordination of monitoring efforts results in the development of a more comprehensive and cost-

effective regional database that may be used by oil sands operators for their environmental management programs, compliance with environmental requirements in regulatory approvals, and assessments of proposed oil sands developments. It also helps other stakeholders interested in the health of aquatic environments in the Athabasca oil sands region.

3. Implementation

Some of the key elements for implementation and management of this program are:

- The RAMP regional study area (RSA) is defined by the boundaries of the Regional Municipality of Wood Buffalo, an area of 68,454 km² with a population of approximately 60,000. Within the RSA, a focus study area (FSA) is defined by the watersheds in which oil sands development is occurring or is planned. Much of the intensive monitoring activity is conducted within the RAMP FSA. The RAMP FSA is comprised of two major areas: one upstream (south) and the other downstream (north) of Fort McMurray.
- Sampling conducted by RAMP is focused on lakes and rivers in areas where oil sands development is occurring or is planned as well as downstream of any development. During 2004, RAMP monitoring focused on the following aquatic systems:
 - Athabasca River and the Athabasca River delta
 - Major tributaries of the Athabasca River, including the Clearwater, Christina, Hangingstone, Steepbank, Muskeg, MacKay, Eils, Tar, Calumet and Firebag rivers
 - Select minor tributaries of the Athabasca River such as MacLean Creek, Beaver Creek and Poplar Creek
 - Specific shallow lakes in the vicinity of current or planned oil sands development
 - A set of regional lakes important either from a fisheries perspective or known to be sensitive to acidifying emissions
- RAMP focuses on five key components of the aquatic ecosystem:
 - **Climate and hydrology.** This involves monitoring climatic variables (precipitation, air temperature, wind, etc.) and the volume of water flowing through selected rivers and creeks. The information is used to increase knowledge of how regional water bodies react to rain and snow, flooding, drought, and other irregular events.
 - **Benthic invertebrate communities.** These consist of aquatic organisms such as insects, snails, clams and worms that spend at least part of their lives in or on the bottom of rivers, lakes or wetlands. These organisms are an important food source for fish and thus are an important indicator of fish habitat quality. Generally, benthic communities in unpolluted waters consist of a large number of animals (high abundance) and a wide range of species (richness). Monitoring benthic communities provides a measure of the health of a lake or river.
 - **Water and sediment quality.** This component reflects habitat quality and potential exposure of fish and invertebrates to organic and inorganic chemicals.

Monitoring the physical and chemical characteristics of water and sediment (which includes mud, soil, sand and other materials that make up the bottoms of lakes and rivers) provides insights into how natural and human activities affect the health of aquatic ecosystems. Water quality measurements provide a snapshot of current conditions. Sediment quality measurements show how chemicals accumulate over time.

- **Fish populations.** These serve as an important monitoring tool because they are good ecological indicators and a valued resource. RAMP monitors fish populations in the Athabasca River as well as smaller rivers and streams flowing into the Athabasca to determine whether or not the fish are safe to eat or are being affected by oil sands development. The RAMP fish program monitors: the presence and abundance of fish species; fish habitat; fish health; and fish tissue chemistry.
- **Acid-sensitive lakes.** These water bodies are considered vulnerable to increasing acidity. Acid-forming compounds (such as oxides of sulphur and nitrogen released by industry) can cause lakes and streams to become more acidic, which can harm the health of resident fish, insects and plants. The goal of this monitoring activity is to identify early signs of acidification before the lakes and organisms have been harmed.

4. Timeframe for Results

RAMP was established in 1997 and has a continuing mandate to monitor aquatic ecosystems in the Wood Buffalo region. Data are collected and analyzed on an ongoing and scheduled basis. A technical report is prepared annually and posted on the RAMP website (www.ramp-alberta.org). Measurement endpoints or limits used in the analysis of current data will provide a basis for the analysis of future data collected.

5. Measurable Criteria

- Analysis for each RAMP component uses a set of specific measurement endpoints to evaluate aquatic ecosystem health and integrity. Endpoints may be compared against government guidelines for aquatic health, and/or subjected to statistical analyses for the purpose of determining whether or not significant changes have occurred over time or relative to undisturbed areas.
- RAMP recognizes its responsibility to create community awareness and encourage involvement of members of the public. Several initiatives are in place to meet this goal. In conjunction with the Wood Buffalo Environmental Association (WBEA) and the Cumulative Environmental Management Association (CEMA), RAMP holds open houses in smaller communities within the Regional Municipality of Wood Buffalo. Posters and information sheets have been developed and distributed to explain what RAMP does. An annual community report summarizing RAMP's work over the previous year is delivered to each home and business in the Region.

Three initiatives are in place that invite residents to participate in RAMP:

- **Fish abnormalities program.** Residents who catch an abnormal fish are asked to retain

the specimen and contact RAMP.

- **Fish tagging program.** Members of the public are invited to record and report information about any tagged fish that they catch.
- **River response network.** Residents are invited to report any non-spill related events and occurrences of foam, scum, turbidity or other events which may or may not be of natural origin.

6. Budget

Since 2003, RAMP has operated with an annual budget of \$1.8 million which is funded by companies active in oil sands development. These companies include: Syncrude Canada Ltd., Suncor Energy Inc., Albion Sands Energy Inc., Shell Canada Limited, Canadian Natural Resources Limited, Imperial Oil Resources, Petro-Canada, Opti Canada Inc./Nexen Inc., Husky Energy, Synenco Energy Inc., Deer Creek Energy Ltd., and Devon Canada Corporation.

7. Partners and Sponsors

Alberta Energy and Utilities Board, Alberta Environment, Alberta Pacific Forest Industries Inc., Alberta Sustainable Resource Development, Albion Sands Energy Inc., Athabasca Chipewyan First Nation, Athabasca Tribal Council, Canadian Natural Resources Limited, Chipewyan Prairie First Nation, Deer Creek Energy Ltd., Devon Canada Corporation, Husky Energy, Imperial Oil Resources, Environment Canada, Fisheries and Oceans Canada, Fort Chipewyan Métis Local #124, Fort McKay First Nation, Fort McKay Métis Local #122, Fort McMurray First Nation, Imperial Oil Resources, Mikisew Cree First Nation, Nexen Inc., Oil Sands Environmental Coalition, OPTI Canada Inc., Petro-Canada, Pembina Institute, Regional Municipality of Wood Buffalo, Shell Canada, Suncor Energy Inc., Syncrude Canada Ltd., Synenco Energy Inc

8. Experience with the Program

The governance structure and processes utilized by RAMP have contributed to its acceptance and successes. The steering committee, which sets goals and provides overall direction to the program, is made up of representatives from a wide range of stakeholder groups, including regulators, community groups, and industry funding partners. Each member brings different expertise, knowledge and perspective to the table. Collectively, the steering committee is committed to ensuring that recognized professionals, with significant expertise and experience in aquatic resources monitoring, facilitate the program.

9. General Applicability

While RAMP was designed to assess the impact of a specific industry on a unique watershed, the processes it uses and its multi-stakeholder approach to governance may be applicable to other watersheds that may be influenced by other types of industrial activity.

10. Additional Information or Support

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