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Overall Monitoring Approach

Over the years, numerous methods to environmental monitoring have been developed and proposed. However, most methods can be categorized under two general approaches:

- Stressor-based assessment
- Effects-based assessment

RAMP incorporates a combination of both stressor- and effects-based monitoring approaches.

Stressors are any factors (e.g., chemicals, temperature, water flow, nutrients, food availability) that either currently exist in the environment and may be influenced by oil sands development, or may be introduced to the environment through development. Using this approach, the potential impact of development is assessed by predicting whether the identified stressors will influence the integrity of the aquatic environment. For RAMP, potential impacts related to these stressors can be monitored to establish the range of natural variability and assess potential changes related to development. Some examples of stressor-based elements of RAMP include monitoring of water quality, sediment quality and hydrology.

Although stressor-based impact assessments and monitoring have been successful, there is a risk that not all potential stressors can be identified and evaluated. More recently, an effects-based approach has been advocated for impact assessments and subsequent monitoring efforts. **Effects-based** monitoring focuses on sensitive biological indicators—such as benthic invertebrate communities or fish populations—that reflect the overall condition of the aquatic environment and integrate the potential effects of complex and varied stressors over time. By combining both monitoring approaches, RAMP strives to achieve a more holistic understanding of potential effects on the aquatic environment related to oil sands development.



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