

3 SURFACE WATER QUALITY MANAGEMENT FRAMEWORK

3.1 Introduction

Healthy fish populations and good water quality in lakes and rivers are integral to the pursuit of traditional aboriginal activities. Clean and abundant fresh water, not just in the Athabasca mainstem, but also in the tributaries, fens and bogs, support Fort McKay community members' ability to access and engage in water-related activities across the landscape of their traditional territory. The practice of traditional activities, such as navigation and fishing, is a constitutionally-protected aboriginal right³ (Nowlan and Bakker 2010).

3.2 Constitutional Rights Related to Water

Fort McKay understands that the Lower Athabasca Regional Plan (LARP) is the Alberta government's reference point for concerns about cumulative effects in the region. Alberta appears to assume that, by planning to protect the environment, Constitutional rights are inherently protected. A critical examination of this assumption indicates that Constitutional rights were not considered in the development of the LARP Surface Water Quality Management Framework (SWQMF; the "Framework"). In fact, the words "aboriginal", "treaty" and "rights" are not mentioned at all in the Framework (AESRD 2012). Our review of the Framework indicates that, not only does it fail to protect Constitutional rights, but also it is not designed to detect cumulative changes to water quality in much of the lower Athabasca River.

Despite the *Report of Commissioners for Treaty No. 8*, which states that the people "would be as free to hunt and fish after the treaty as they would be if they never entered into it,"⁴ Fort McKay members are not free to hunt and fish where they historically were able to in their traditional territory. Three key reasons are (1) that large tracts of land are inaccessible to them owing to the presence of oil sands projects, (2) that they fear the health effects of consuming large-bodied fish that might have escalating levels of contaminants in their tissues, and (3) that rivers, streams and/or their watersheds are being mined out (e.g. large portion of the Muskeg River). In essence, the people do not trust that fish in the Athabasca River and its tributaries are safe to eat, so they must travel further away to pursue this traditional activity.

3.2.1 Surface Water Quality Management Framework

The Framework focuses on the Athabasca River from upstream of Fort McMurray (at Grand Rapids) to the Athabasca River Delta, and sets water quality triggers and limits for 38 indicators measured at the Old Fort monitoring station (AESRD 2012). The intent of the Framework is to "proactively manage cumulative effects to surface water quality in the Lower Athabasca Region." It is a policy document that complements but does not "replace existing policies, legislation, regulations and management tools."

³ Aboriginal rights are those rights held by aboriginal peoples that relate to activities that are an element of a practice, custom, or tradition, integral to that aboriginal group's distinctive culture.

⁴ http://www.treaty8.ca/documents/Treaty8_1899.pdf

The overall objective of the Framework is to “ensure that water quality changes resulting from human development do not compromise the protection of aquatic life and other water uses.” It is expected to fill a key gap for management of cumulative changes in water quality within the lower Athabasca River. To track such changes in water quality in the Athabasca River, AESRD has established the following:

- Historical water quality baseline records (data from the Old Fort monitoring station for 1988 to 2008)
- Water quality triggers (points at which a significant change from baseline can be detected⁵)
- Water quality limits (based on guidelines⁶ established by Alberta or the Canadian Council of Ministers for the Environment)

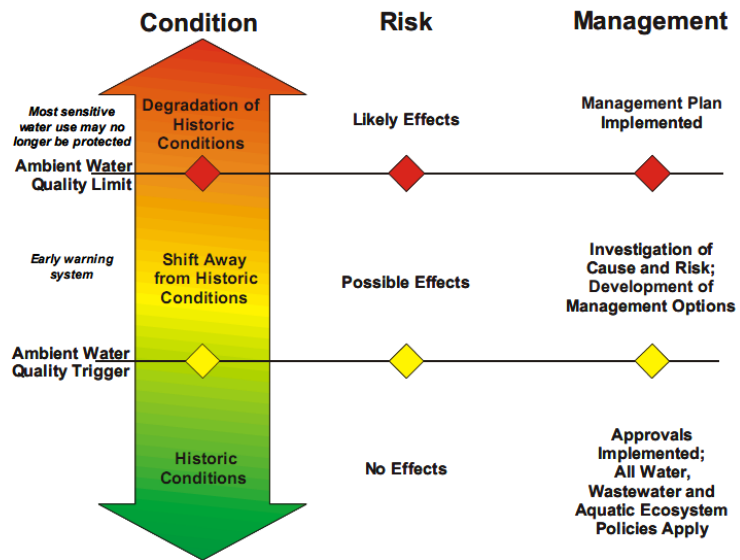


Figure 3-1: Schematic of the Water Quality Components of the LAR WMF

As shown in the diagram to the right, three colour-coded water quality conditions were established to depict the level of risk based on results obtained. The plan is to monitor and manage water quality within the “yellow” early warning condition to avoid approaching the “red” degraded water quality condition. All monitoring occurs at the Old Fort monitoring station, approximately 150 km downstream of Fort McKay. A management response is required if triggers or limits are exceeded at this remote station.

3.3 Analysis of Surface Water Quality Management Framework

3.3.1 Overview

Fort McKay made comments on the approach, sampling program, monitoring locations and reporting during the development of the Framework. While we agreed with the approach to limits and triggers, we had immediate concerns with the very long distance downstream of the single monitoring station that would activate a management response if triggers or limits were exceeded. One of Fort McKay’s **key requests** was that at least one additional monitoring station be located closer to the community and downstream of development to permit evaluation of cumulative effects. This request was denied by Alberta.

⁵ Triggers are intended as warning signals. They are based on change from historical ambient concentrations.

⁶ Limits based on guidelines should protect existing and future water uses (industrial, agricultural, recreational and aesthetics, drinking water, and aquatic life).

Other requests from Fort McKay that were not incorporated in the Framework were as follows:

- Location and Timing – Combined with adding sites to the Framework, implement the comparison of monitoring results to the data from other organizations (JOSM/AEMERA or industry). For example, comparison of data from JOSM sites M5 (Athabasca above Mackay R), M6 (Athabasca below Mackay R) or M7 (Athabasca below Ells R) would be particularly relevant.
- Implement the harmonization of the surface water and groundwater frameworks to make it easier to link any surface water-groundwater interactions (see Groundwater position paper).
- Implement the inclusion of sediment sampling and semi-permeable membrane device (SPMD) sampling, especially for oil sands-related contaminants that bind to particulates, such as polycyclic aromatic hydrocarbons (PAHs).
- Provide details about how government would identify sources and *promptly* rectify any issues. With the time lag for analysis, reporting and management response, it is not practicable to connect effect with cause or to mitigate any impacts in a timely fashion.

These are among the requests discussed below to support Fort McKay's submission, which requests that Alberta honour its commitment to meaningfully consult and accommodate on Constitutional rights.

3.3.2 Location and Timing of Data Collection and Reporting

Fort McKay's position is that use of the single monitoring station at Old Fort, which is 150 km downstream of Fort McKay and most industrial development, is insufficient to detect cumulative effects for much of the lower Athabasca River. AESRD is aware that numerous inflowing tributaries from undeveloped landscapes will dilute any contaminated inflows from industrial development further upstream, where cumulative effects are more likely to be detected. It is possible that many triggers, and possibly guideline-linked limits, have been or will be exceeded just downstream of current industrial development. This is especially true where reportable "incidents" or unexpected discharges occur. The recommendation by Fort McKay *and others* to include other monitoring stations further upstream (as reported in consultation summaries: AESRD 2011a, 2011b) was not adopted by Alberta.

Fort McKay requires assurance that the environment is protected, that governments and other responsible organizations are monitoring the water in a scientifically-defensible manner, and that monitoring results are provided in a time frame that allows effective mitigation. Mitigation that follows years after an incident or unexpected release might be ecologically irrelevant, depending on the severity and longevity of the exceedances. JOSM/AEMERA are monitoring the Athabasca River at several other locations, providing a wealth of historical water quality data to develop triggers and limits for these relevant upstream locations. Because industry-related contaminants are much diluted at Old Fort relative to locations near the main sources of seepage and other industrial inputs, the current framework is inadequate to protect against water quality impacts on lands traditionally accessed by Fort McKay community members, including waters that flow through the community and reserve. A number of active water quality stations on the Athabasca River could easily be incorporated in the LARP monitoring program.

Not only is monitoring required under the LARP sparse geographically, but also the current frequency of monitoring is insufficient to capture potential unplanned releases. If there were a tailings spill or other incident, the timing of sampling at Old Fort might result in the Province

missing the plume. Furthermore, the current time requirement regarding the reporting of results is such a long interval that if contaminants were detected in the plume, it might take years for this to be publicly disclosed. Based on the results published for up to 2012 (as of October 2014), the timeline for reporting and evaluation currently lags two years behind sampling. This means that the reaction time for a management decision could be delayed for up to three years, at which time the source of contamination might be either long gone or potentially increased.

Given the time lags for data release, the triggers can hardly be considered the “early warning system” they are indicated to be in the Framework for the lower Athabasca River⁷ (AESRD 2014a, 2014b). Responsible environmental protection assumes water quality reporting, evaluation and management response will proceed much more quickly than it currently does. Experience with the Regional Aquatics Monitoring Program indicates that the production of timely annual reports on quality-controlled regional river aquatics data is entirely feasible.

3.3.3 Surface Water Linked to Groundwater Monitoring

Fort McKay previously suggested that surface water and groundwater sampling and reporting should be integrated and not considered as detached and isolated monitoring programs. Near-surface groundwater, including potential tailings pond seepage, is closely linked with surface waters. Any monitoring reports should attempt to harmonize the results of near-surface groundwater and surface water quality wherever possible. Related to the point above about the location of water sampling sites, a surface water sampling site would be best located near-downstream of groundwater sampling sites. This is particularly important when such sites include wells screened in aquifers (i.e. open to the aquifer) that are believed to be linked to nearby surface water. Fort McKay expects surface-water groundwater interactions be a component of the cumulative effects assessment within the LARP (refer to Groundwater position paper).

3.3.4 Trigger and Limit Parameter and Collection Media Gaps

Two key oil sands-related groups of compounds are not monitored under the LARP at Old Fort: naphthenic acids (NAs) and polycyclic aromatic hydrocarbons and compounds (PAHs, PACs). Alberta indicates that the reason is that “important science gaps exist” with respect to quantifying these substances in water (AESRD 2012), yet NAs are routinely monitored by RAMP, JOSM, and even at other AESRD sites on the Athabasca River, and, PAHs could readily be quantified in sediments or SPMDs, which are also not included in sampling at Old Fort.

To highlight that sampling for these key parameters is possible, note that AESRD completes monthly sampling for NAs using the best available methods at all three AESRD stations on the lower Athabasca River (at Fort McMurray, Firebag, and Old Fort; AESRD 2012). Moreover, monthly sampling for PAHs has also been implemented at all three stations, and complementary approaches, such as the use of SPMDs, have been explored to address the frequent non-detects for these indicators in water samples. Despite this, the findings of this relevant monitoring program remain sequestered from the rest of the data accumulated under the LARP at Old Fort. *Customary good science would suggest that where other supporting information is available, it should be considered, yet this is not the case with the LARP program.*

⁷ http://esrd.alberta.ca/focus/cumulative-effects/cumulative-effects-management/management-frameworks/documents/LARP_FactSheet_SurfaceWaterQuality.pdf

AESRD stated in 2012 that “once a reliable dataset for NAs and PAHs has been compiled for the Athabasca River stations at Old Fort and upstream of the Firebag, triggers will be developed.” In the meantime, AESRD states that it will continue to evaluate the incoming PAH and NA data and will work to fill the science and data gaps that currently limit the inclusion of these parameters in this Framework. Fort McKay requests an immediate update and re-evaluation of inclusion of triggers and limits for these substances in the LARP monitoring program.

3.4 Proposed Changes

In order to effectively manage surface water quality to support the pursuit of Constitutional rights, we recommend that Alberta undertakes the following: Provide a summary of management actions taken following the LARP trigger exceedances that occurred in 2012; Provide to Fort McKay more current laboratory results for Old Fort (e.g. 2013, 2014), including an explanation of what it might take to obtain reports sooner than they are currently provided. Provide a description of potential specific mitigation actions that might reasonably be expected should serious exceedances be detected in the Athabasca River by any regional monitoring program (JOSM/AEMERA) or through LARP. Include in LARP additional stations closer to development (including key Athabasca River tributaries), locations where surface water might be influenced by degraded groundwater, tailings seepage, or can be integrated with existing groundwater monitoring; such stations are likely readily available and operational now; Consider and discuss with Fort McKay the benefits of JOSM/AEMERA and AESRD’s current water quality, sediment quality, and SPMD results for the Athabasca River closer to development, together with the LARP’s more distant sampling at Old Fort. Some of these other programs have similar reporting and sampling frequencies, which makes comparisons particularly appropriate. Include oil sands-associated chemicals, such as naphthenic acids, on the list of trigger and limit substances for water quality. Add sediment quality monitoring and SPMD sampling (including triggers and limits) at the Old Fort station and at any relevant upstream stations (e.g. M5, M6, M7). These media would provide detectable levels of oil sands-associated substances, such as PAHs and PACs. Implement some “real-time” monitoring system dataloggers at Old Fort and at any upstream stations.⁸

This section highlights some of the key issues that might strengthen a surface water quality monitoring framework for the lower Athabasca River. While it is commendable that efforts have been made to manage cumulative effects in the region, a more comprehensive and scientifically robust plan that includes adopting the suggestions provided here would demonstrate that the Province has given meaningful consideration to First Nations who are affected, and is committed to effective measures to protect water resources in the oil sands region.

3.5 References

Alberta Environment and Sustainable Resource Development. 2011a. Phase 3 Stakeholder Consultation Summary – Lower Athabasca Regional Plan. Edmonton, Alberta. 26 pp. Online at: <https://landuse.alberta.ca/LandUse%20Documents/Phase%203%20Stakeholder%20Consultation%20Summary%20Lower%20Athabasca%20Regional%20Plan%20-%202011-08.pdf>

⁸ Physical water quality monitoring data (at 30-minute time intervals) from M9 (Athabasca River 27 Baseline above Old Fort) for the period of July to October 2013 are available for pH, specific conductivity, water temperature, dissolved oxygen, turbidity, and water depth. These parameters are also available for the period between March and July 2012 near the outlet of three tributaries in the Lower Athabasca watershed: the Ells River (EL1); the Firebag River (FIRWSC); and the Steepbank River (STBWSC).

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