

Background Reading for the PPWB Committee on Hydrology / Committee on Flow Forecasting Workshop 2019

The following provides some background information on the Master Agreement on Apportionment (MAA) and Prairie Provinces Water Board (PPWB) to consider in the context of this workshop's themes of resilience and climate change, with a focus on the Committee on Hydrology / Committee on Flow Forecasting Workshop (COH / COFF). The workshop aims to identify issues that may threaten the resilience of the MAA; knowing its history may inform this task.

The PPWB is a federal-provincial agency that oversees the sharing and protection of eastward flowing streams crossing the Alberta - Saskatchewan and Saskatchewan - Manitoba boundaries. In addition, the PPWB facilitates the integrated development and management of interprovincial streams and aquifers, works by consensus to prevent and resolve interprovincial water issues, and promotes cooperation between the governments of Canada and the three Prairie Provinces on a wide range of surface and groundwater matter.

Throughout its history, the MAA and the PPWB that was re-established under the agreement have been cited as shining examples of collaborative inter-jurisdictional water resource management. However, it did take thirty-nine years for the approach and structures of the MAA to be honed into the agreement that we have today.

History of the PPWB pre-MAA:

The inter-provincial boundaries of the Prairie Provinces have no relationship to the watersheds shared by those provinces. Prior to 1930, the Government of Canada retained the authority to manage water and to issue water rights on the prairies. The enactment of the Natural Resource Transfer Acts in 1930 created the situation where three equal entities were competing for the same resource.

In preparation for this situation, a "Western Water Board Agreement" was prepared for the "purpose of regulation and control of the water in the lakes, rivers and streams of the Provinces of Alberta, Saskatchewan, Manitoba and the Northwest Territories in such a way that each of these provinces and territories shall have its fair and reasonable use and disposition of these waters." The Western Water Board Agreement was signed by the Premiers of the provinces but was not completed by Canada due to more pressing issues brought about by the depression. In 1937, the federal government initiated an attempt to complete the water board agreement. Saskatchewan and Manitoba approved the new proposal but Alberta refused to sign due to a dispute with Canada over rights related to hydropower development on the Bow River.

During World War II all governments were concentrated upon the war effort, but by mid-1940's domestic issues returned to the fore. On December 7, 1945 the Provinces of Alberta, Saskatchewan and Manitoba ratified the "Prairie Provinces Advisory Water Board Agreement". The Prairie Provinces Advisory Water Board (PPAWB) first met on April 1-2, 1946, and in February 1947, the PPAWB met with technical representatives of the federal government.

On July 28, 1948 the Federal and provincial governments completed the "Prairie Provinces Water Board Agreement" that created a five member board with the function "to recommend the best use to be made of interprovincial waters in relation to associated resources in Manitoba, Saskatchewan and Alberta and to recommend the allocation of water as between each such province of streams flowing from one into the other province."

The PPWB first confirmed allocations made prior to 1930 and then confirmed allocations made by the provinces prior to 1948. The PPWB conducted various studies related to such things as water availability, use prioritization and pollution, and proposed a comprehensive study of the Saskatchewan-Nelson River system. Despite advancements in these areas, the most difficult challenge the PPWB faced was related to reaching consensus on allocations for new or proposed projects. The South Saskatchewan River Project took front stage in this debate with both Alberta and Manitoba being concerned that a new allocation to Saskatchewan would prevent them from accessing water believed to be theirs. The PPWB records from 1948 through the mid-1960's suggest that the board was unable to reach agreement on how to effectively address new proposals for allocations to large projects. By the mid-1960's the PPWB was actively examining approaches for apportioning water on an ongoing basis.

The MAA

In October 1969, The MAA was completed and ratified by the parties who established the original agreement. The agreement outlines the jurisdictional obligations and entitlements of an equitable apportionment of eastward flowing inter-provincial streams. The term "equitable" is interpreted as relating to total flow volume, the timing of flow and the quality of waters crossing boundaries. The MAA reconstituted the PPWB as a five-member body with responsibility to monitor and report on the achievement of the terms of the agreement, to conduct studies and make recommendations to governments related to water resource management, and to provide a forum for dialogue on the cooperative management of shared waters. It also established a dispute resolution mechanism that, to date has never been used.

The agreements prior to the MAA established boards that either "adjudicated" or "advised" on water resource development. Under the MAA, upstream provinces develop how they wish provided that the terms of the agreement are met, and downstream provinces undertake long-term planning knowing the amount and quality of water they can expect.

The MAA was amended in 1992, to include a water quality agreement that became schedule E to the MAA. The schedule now establishes water quality objectives for 12 transboundary rivers and commits each of the parties to take all reasonable and practical measures to maintain or improve existing interprovincial water quality.

The MAA has five schedules, which form part of the Agreement:

- Schedules A and B are apportionment agreements between Alberta and Saskatchewan and Saskatchewan and Manitoba, respectively;
- Schedule C describes the composition, functions and duties of the PPWB;
- Schedule D provides a list of Orders-in Council for allocations of interprovincial waters before 1969; and,
- Schedule E is a Water Quality Agreement that describes the role of the PPWB in interprovincial water quality management and established Water Quality Objectives for 12 interprovincial river reaches.

The trust between the signatories to the MAA gained through years of successful cooperation through the PPWB is a pillar to its endurance. A commentary by the CD Howe Institute (2012) noted that the focus on minimum flow regimes in the MAA as it was first written allowed the parties to build this trust that allowed the agreement to extend into other areas such as water quality (schedule E), and groundwater (potential new schedule under development/ review).

The Board currently operates through its Executive Director, supported by four standing committees: the Committee on Hydrology, the Committee on Groundwater, the Committee on Water Quality and the Committee on Flow Forecasting.

Committee on Hydrology

The Committee on Hydrology (COH) was first established in 1973 and reports to and provides technical advice to the Board on hydrological issues. The COH studies questions related to the quantity of water in streams crossing provincial boundaries. The COH also reviews apportionable flow calculations for use in the Master Agreement's formula. The Committee also reports any unusual or emergency water quantity issues using the Contingency Plan. The Secretariat provides support as the COH is chaired by the Executive Director. The COH Secretary participates in the technical work and records Meeting Minutes. The Secretariat computes apportionable flows. Environment and Climate Change Canada presents the annual hydrometric and meteorological monitoring plan for recommendation by the COH and approval by the Board.

Some of the issues recently under study by the COH include:

- Apportionment of Lodge and Middle Creeks – how does Alberta work around managing water commitments to SK when storage of water on some reservoirs are not in their control (i.e. certain reservoirs are privately owned/operated)?
- The Apportionment Procedure Review: to examine the apportionable flow calculation methods and establish criteria to determine which interprovincial basins are subject to apportionment monitoring and the frequency of monitoring.
- Interpretation of Schedule A clause 4 – minimum net depletion for Alberta.
- Improving Lake/ Reservoir evaporation estimation methods and model parameters using eddy covariance techniques.
- ECCC's review of the federal-provincial hydrometric network.

The PPWB continues to renew and update the methods for determining apportioned flow volumes, and plans to propose a minor update to the interprovincial water quality objectives in 2020 followed by a more comprehensive update in 2025.

Committee on Flow Forecasting

The Committee on Flow Forecasting (COFF) was formed in 2015 to improve collaboration, coordination and communication between jurisdictions as well as federal agencies concerning flow forecasting.

The COFF provides technical advice to the Board on streamflow forecasting issues at interprovincial boundaries. The COFF deals with questions and studies related to flow forecasting methods, hydraulic and hydrologic basin forecast models, tools and techniques, inter-jurisdictional communications, provision and transmission of data, and other items of interprovincial interest involving streamflow forecasting. The Secretariat provides support as the COFF is chaired by the Executive Director. The COFF Secretary participates in the technical work and records Meeting Minutes.

The COFF Terms of Reference were finalized in 2015 and the work plan activities for 2016-2021 were finalized in 2016. Initial activities that the COFF is undertaking include a report on collaboration on spring runoff potential forecast modelling and investigation of harmonization opportunities, discussion of mechanisms for improved data and information sharing between agencies, opportunities for knowledge sharing, exploration of optimized modelling techniques and platforms, and improving linkages with Environment and Climate Change Canada and Agriculture and Agri-Food Canada.

Strategic Plan

In 2012 (updated 2017), the PPWB specified goals to achieve the core MAA mandate in a Strategic Plan. As part of this exercise, it identified certain challenges facing the PPWB, including:

- Authorities over water are shared amongst governments;
- Actions in one government may affect other governments;
- The volume and timing of flows in streams that originate in the Prairies are highly variable throughout the year and from year to year;
- Water use and consumption in southern Alberta is a large percentage of available supply;
- Population and economic activity are increasing;
- Climate variability will affect timing and volume of available water;
- Monitoring must be rationalized within existing budgets;
- Threats to surface water and groundwater quality are increasing; and,
- Knowledge and understanding of transboundary aquifers is limited.

Accomplishments of the MAA

Ensuring the equitable sharing of interprovincial waters. The MAA provides ground rules for the parties. Each province manages its water to maximize benefits. An upstream province can develop its water resources how they wish so long as the terms of the agreement are met. Downstream provinces can, in turn undertake long-term planning knowing the amount and quality of the water that can be expected.

Protecting Water Users. The MAA also points to water quality as one of the areas of PPWB responsibility. The PPWB monitors water quality at 12 transboundary river reaches to determine compliance to PPWB Interprovincial Water Quality Objectives established to protect downstream users. The water quality objectives improve the understanding of how and why excursions occur and provide meaningful information to water managers in each province so that water quality will continue to meet objectives established for the protection of human uses and the aquatic environment.

Preventing Conflict: The MAA provides a dispute resolution mechanism, which allows transboundary water issues to be addressed cooperatively to avoid disputes. Without this, there would not be a willingness of all parties to cooperate instead there would be conflicts and litigation. Orderly planning and project development would be difficult, and there would be pressures for the federal government to intervene and mediate in transboundary water issues. The PPWB assesses potential transboundary impacts of new projects and provides a forum, which would otherwise not exist, to discuss and resolve transboundary issues.

Groundwater Management. Approximately 90% of the region's rural population is dependent on groundwater. There are numerous aquifers that cross interprovincial boundaries. These aquifers are directly affected by how each jurisdiction protects and regulates these aquifers.

In order to address transboundary groundwater quantity and quality, the use of transboundary groundwater and the condition of transboundary aquifers, the PPWB is proceeding towards the creation of a specific groundwater agreement to be added as Schedule F to the MAA. The proposed Agreement is expected to be implemented in the near future.

Conclusion

The MAA turns 50 years old in 2019 and continues to provide cooperation and respect in transboundary water management between the parties involved. It has often been referred to as a model for dealing with interjurisdictional issues. The 1985 Inquiry on Federal Water Policy stated that "***The most significant interjurisdictional water arrangement in Canada is the (Master) Agreement on Apportionment.***" The agreement has formed the basis for the draft agreement for sharing the Mackenzie River Basin. On the international scene, the MAA has been presented as a successful model in the Canadian context to the multilateral discussions on water resources as part of the Middle East peace process.

The strength of the MAA has held for fifty years, but that is no reason to believe that it can be effective forever. The resilience of the MAA into the future has been a topic of study for the PPWB since 2007. The current focus of investigation is on the viability of the "equitable apportionment" approach as our climate, hydrologic, ecologic and water demand regimes change. The structure or resilience of the MAA may also be tested as the role of Indigenous communities in water management decision making evolves.