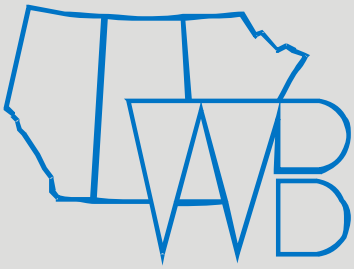
ANNUAL REPORT • 2010

CANADA • ALBERTA • SASKATCHEWAN • MANITOBA

PRAIRIE PROVINCES WATER BOARD



PRAIRIE PROVINCES WATER BOARD

ANNUAL REPORT

FOR THE FISCAL YEAR

APRIL 1, 2010 TO MARCH 31, 2011

ISSN 0704-8726

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LETTER OF TRANSMITTAL

November 14, 2011

Honourable Peter Kent
Minister of the Environment
Ottawa, Ontario

Honourable Diana McQueen
Minister of Alberta Environment and Water
Edmonton, Alberta

Honourable Gerry Ritz
Minister of Agriculture & Agri-Food
Ottawa, Ontario

Honourable Christine Melnick
Minister of Manitoba Water Stewardship
Winnipeg, Manitoba

Honourable Dustin Duncan
Minister Responsible for Saskatchewan Watershed Authority
Regina, Saskatchewan

Honourable Ministers:

On behalf of the members of the Prairie Provinces Water Board, it is my pleasure to submit herewith the Annual Report of the Prairie Provinces Water Board for the fiscal year from April 1, 2010 to March 31, 2011.

Yours truly

Mike Norton
Chair
Prairie Provinces Water Board

MESSAGE FROM THE CHAIR

The Prairie Provinces Water Board (PPWB) Strategic Plan, approved in 2006, continued to guide the work of the Board during 2010 - 2011. This Strategic Plan is targeted towards monitoring whether the commitments made in the *Master Agreement on Apportionment* (*MAA*) have been met by the Signatory Parties.

External influences on Board activities were notably:

- a growing interest in the relationship between climate variability, climate change, and water resources;
- the need for involvement of upstream jurisdictions in resolving water quality issues in Lake Winnipeg; and
- extreme flooding and high water levels and flows this year.

The 2008-2013 multi-year costed work plan continued to guide the work of the Board in 2010-2011 and provided a solid foundation for resource allocation over a five-year period. In 2010-2011, the Board initiated discussions to renew this work plan for the next five years.

In September 2010, the PPWB Secretariat presented an overview of the PPWB at a Partners FOR the Saskatchewan River Basin Symposium as part of their commitment to continue collaborating.

In March 2011, Saskatchewan hosted a joint meeting with the Board and Senior Executives from the Saskatchewan Watershed Authority and the Saskatchewan Ministry of the Environment. This meeting provided a forum to discuss interjurisdictional issues and inform senior executives and managers about PPWB activities, furthering Goal 6.

I thank Randal Cripps for his capable and energetic representation as the PPWB Chair in his role as the Environment Canada Member. I was appointed this role on an acting basis when Randal left Environment Canada in May 2011.

I thank Alan Parkinson for his able representation as the Acting Regular Member for Agriculture and Agri-Food Canada. In May 2011, David Phillips returned to his role as the Regular Member for Agriculture and Agri-Food Canada – Agri-Environment Services Branch.

The success of the Board is largely due to the work of the Secretariat and its three standing committees, including the Committee on Hydrology (COH), the Committee on Water Quality (COWQ), and the Committee on Groundwater (COG). Secretariat support is housed within Environment Canada. The Executive Director manages the Secretariat staff and chairs the three standing committees. Committee members consist of representatives from all of the parties. It is their work that helps to ensure that the Board and the parties can meet their obligations under the *MAA*. The Board appreciates their professional conduct and dedication to the PPWB.

Mike Norton
Chair

MESSAGE FROM THE EXECUTIVE DIRECTOR

During 2010 - 2011, the work of the PPWB Secretariat and three standing committees focused on achieving the seven goals outlined in the PPWB Strategic Plan and activities listed in the 2008 – 2013 Work Plan.

During 2010, agreed interprovincial apportionment of flows on all eastward flowing streams was achieved for all PPWB river reaches

The PPWB began work to evaluate whether the *MAA* is resilient to climate change. A workshop was held in September 2010 to identify potential water supply scenarios. The Committee on Hydrology (COH) was tasked to develop flow arrays that could be used to assess resiliency.

The COH continued work, begun in 2005, on its modernization of computational infrastructure that are used to calculate apportionable flows. Optimal Solutions Ltd, the software contractor, began work in May 2008 and presented an initial version of the River Basin Assessment Tool to the Secretariat and made a presentation to the COH in March 2010. The Secretariat and COH members have tested the new software platform and compared results with the FORTRAN programs used historically. Further work is needed to improve the functionality of the River Basin Assessment Tool. The COH also continued their review of the apportionment methods used on the North Saskatchewan River, as part of the ten-year rotational review.

The PPWB published the South Saskatchewan River Natural Flow and Apportionment: Irrigation Return Flows 2001-2005 Phase I" Report No. 170 that was authored by Environment Canada – Water Survey of Canada.

The Committee on Groundwater (COG) continued to develop concepts of a groundwater schedule (Schedule F) that will be added to the *MAA.* An Impact Analysis Statement was completed to assess groundwater uses and stressors, existing groundwater agreements, and potential approaches.

The Committee on Water Quality (COWQ) continued work on a comprehensive review of the PPWB water quality objectives, as required by the *MAA.* The development of nutrient objectives remained a priority.

Brian Yee left Environment Canada in December 2010. Brian was with the PPWB Secretariat since April 2006, and was the Acting Executive Director from May to November 2007 and the COH/COG Secretary since 2008. I thank him for his dedication and excellent work. Vir Khanna was appointed on an acting basis as the Senior Engineering Advisor.

The Board continued its role in helping to ensure coordination of water management and planning that may have transboundary implications. As an example, through the PPWB Chair and Executive Director, the Board represented the provinces of Saskatchewan and Alberta on the Federal – Provincial Lake Winnipeg Basin Coordination Committee. Similarly, the Board continued to provide a forum for sharing information on developments with interprovincial implications, including impacts of drainage projects in Saskatchewan on Manitoba and the Montana-Alberta Water Management Initiative.

Mike Renouf
Executive Director

SUMMARY OF PERFORMANCE RESULTS

During 2010 - 2011, apportionment responsibilities of the Board were met through the following activities:

- reviewing and approving the apportionment monitoring network comprised of hydrometric and meteorological stations;
- monitoring apportionment of Cold Lake, North Saskatchewan River, South Saskatchewan River below the Red Deer River, Battle Creek, Lodge Creek, Middle Creek, Churchill River, Saskatchewan River, Red Deer River (Saskatchewan), Qu'Appelle River, Assiniboine River, and Pipestone Creek;
- continuing work on the modernization of the natural and apportionable flow computation software programs;
- developing a process to review apportionment methods in basins on a ten-year rotation period, and starting the review of the North Saskatchewan River;
- and completing the PPWB Report No. 170, "South Saskatchewan Natural Flow and Apportionment: Irrigation Return Flows 2001-2005 Phase I".

Apportionment requirements were met on all streams.

In 2010, water quality objectives were adhered to an average of 94% of 2,768 samples on the 11 *MAA* river reaches.

The Committee on Water Quality (COWQ) continued the comprehensive review of water quality objectives, with nutrient objectives being a top priority.

The 2011 water quality monitoring program was reviewed and approved by the Board in October 2010.

An Impact Analysis Statement was completed in February 2011 to document the rationalization, concepts and principles of a possible groundwater Schedule to be added to the *MAA*.

Through reporting procedures outlined in the PPWB Event Contingency Plan, Board members were informed in March 2011 of unusual flow conditions on a tributary of Middle Creek. The downstream jurisdiction was not affected.

During the year, the PPWB discussed the following projects and initiatives of joint interest to the jurisdictions:

- water quality in Lake Winnipeg;
- downstream impacts of drainage in Saskatchewan upon Manitoba;
- Montana-Alberta St. Mary and Milk River Water Management Initiative; and
- potential collaborative opportunities with the Partners FOR the Saskatchewan River Basin.

The PPWB member agencies were informed about PPWB activities through:

- Board and Committee Minutes, Quarterly and Annual Reports, brochures/fact sheets, technical reports, and the PPWB website;
- presentations to senior managers of PPWB agencies;
- and a joint meeting with the Saskatchewan Watershed Authority and Saskatchewan Ministry of the Environment on March 24, 2011.

Internal communication was enhanced through regular meetings between Board members and their respective Committee members.

The PPWB website (www.ppwb.ca) became operational in August 2010.

1. INTRODUCTION

This report summarizes the activities of the Prairie Provinces Water Board (PPWB), its Secretariat, and three standing committees that supported PPWB activities for the period April 1, 2010 to March 31, 2011.

The PPWB administers the *MAA*, signed on October 30, 1969 by Canada and the Provinces of Alberta, Saskatchewan, and Manitoba.

The Agreement provides for an equitable sharing of available waters for all eastward flowing streams that cross interprovincial boundaries, including interprovincial lakes. It also serves to protect interprovincial aquifers and surface water quality. Schedules to the Agreement describe the role of the Board, stipulate how the water shall be apportioned, and set water quality objectives for the water passing from Alberta to Saskatchewan and from Saskatchewan to Manitoba.

The Board consists of three provincial members, representing the Provinces of Alberta, Saskatchewan, and Manitoba and two federal members, representing Environment Canada and Agriculture and Agri-Food Canada.

PPWB activities are jointly funded by the provinces and the federal government, with the provinces each contributing one-sixth and the federal government contributing one-half of the annual budget. In accordance with the terms of the *MAA*, the federal government pays for the costs of surface water quantity and quality monitoring. Environment Canada conducts this monitoring on behalf of the Government of Canada. The Board approves the annual budget and costed work plan.

Section 2 of this Annual Report presents the performance results for each of the Goals in the Strategic Plan and 2010-2011 activities in the Work Plan.

Section 3 of this Annual Report reports on administration activities and financial expenditures for the year 2010 - 2011.

Appendices provide detailed information on the PPWB. Appendix I illustrates where monitoring is conducted to assess whether jurisdictions have met their requirements in the *MAA*. Appendix II presents 2010 apportionable flow data. Appendices III and IV present the water quality parameters that were monitored by Environment Canada and the 2010 Excursion Report. Appendix V provides the organization chart and Appendix VI lists agency representatives on the boards and committees. Appendix VII provides the Financial Expenditure Statement. Finally, Appendix VIII describes the history of the PPWB.

2. PERFORMANCE RESULTS

All activities in the 2008-2013 PPWB work plan target achieving the seven goals in the PPWB's Strategic Plan. Progress made in 2010-2011 is discussed below for each of these goals.

GOAL 1: Agreed Interprovincial Apportionment of Water Is Achieved

The PPWB's Strategic Goal 1 is to achieve interprovincial apportionment of water that was agreed to in the 1969 *MAA's* Schedule A and Schedule B.

Apportionment Monitoring of Rivers

The *MAA* states that all eastward flowing streams are subject to apportionment. Currently, the Board conducts apportionment monitoring of Cold Lake, North Saskatchewan River, South Saskatchewan River below the Red Deer River, Battle Creek, Lodge Creek, and Middle Creek on the Alberta-Saskatchewan border; and Churchill River, Saskatchewan River, Red Deer River, Qu'Appelle River, Assiniboine River, and Pipestone Creek on the Saskatchewan-Manitoba border.

Water Quantity Monitoring

The PPWB is required to assess and report on whether apportionment requirements were met. Environment Canada conducts the water quantity monitoring in accordance with the terms of the *MAA*. In 2010-2011, the PPWB Secretariat calculated apportionable flows using monitoring data from 89 hydrometric stations, 19 meteorological stations and other meteorological and water use data (see Appendix I).

In October 2010, the Board reviewed and approved the monitoring stations lists for 2011 - 2012. No changes were made from the previous year.

Flows Reported in 2010-2011

Flow reporting was done for each quarter in the calendar years 2010 and 2011. Quarterly reports presented interim recorded and apportionable flows for the South Saskatchewan River, and Middle and Lodge Creeks and from January to September for Cold Lake.

Appendix II presents the monthly and total 2010 final apportionment results. All apportionment requirements were met in the calendar year of 2010. For all apportioned rivers and creeks, recorded flows were higher than the amounts that Alberta was obligated to deliver to Saskatchewan. The combined daily recorded flows for the South Saskatchewan and Red Deer Rivers at the Alberta-Saskatchewan border exceeded the minimum flow requirement of 42.5 m^3 / sec (1,500 cfs).

Saskatchewan also delivered higher recorded flows on all rivers and creeks than the amounts they were obligated to deliver to Manitoba.

Figures 1 and 2 show the flow amounts for the entire record of apportionment data. The black bar shows the amount of apportionable flows that were required to be delivered by Alberta to Saskatchewan (Figure 1) and by Saskatchewan to Manitoba (Figure 2). The white bar shows the flow surplus amounts that were delivered in excess of required flows. The red bar indicates amounts of required flows that were not delivered (deficits).

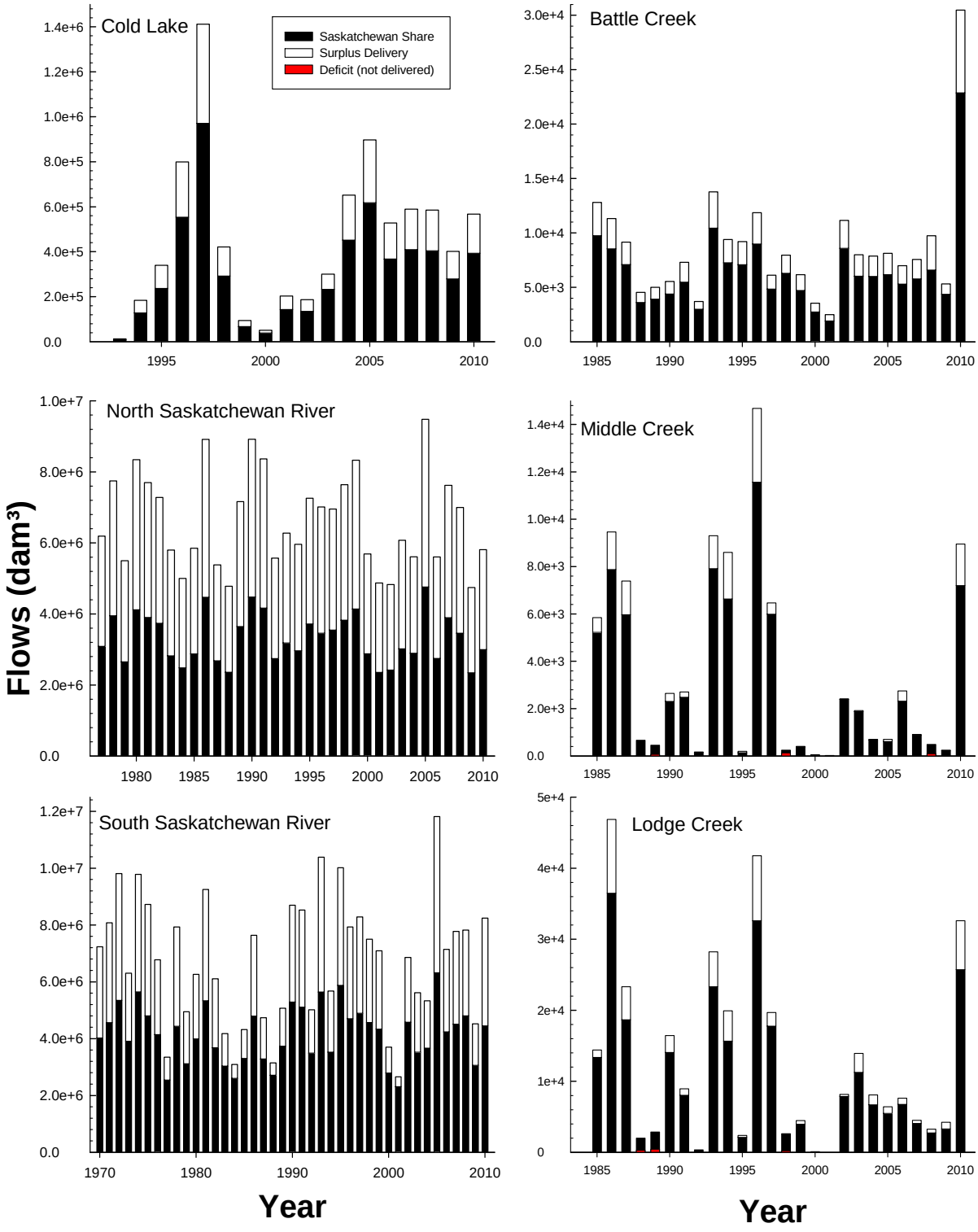


Figure 1. Historic River Flows on the Alberta-Saskatchewan Border

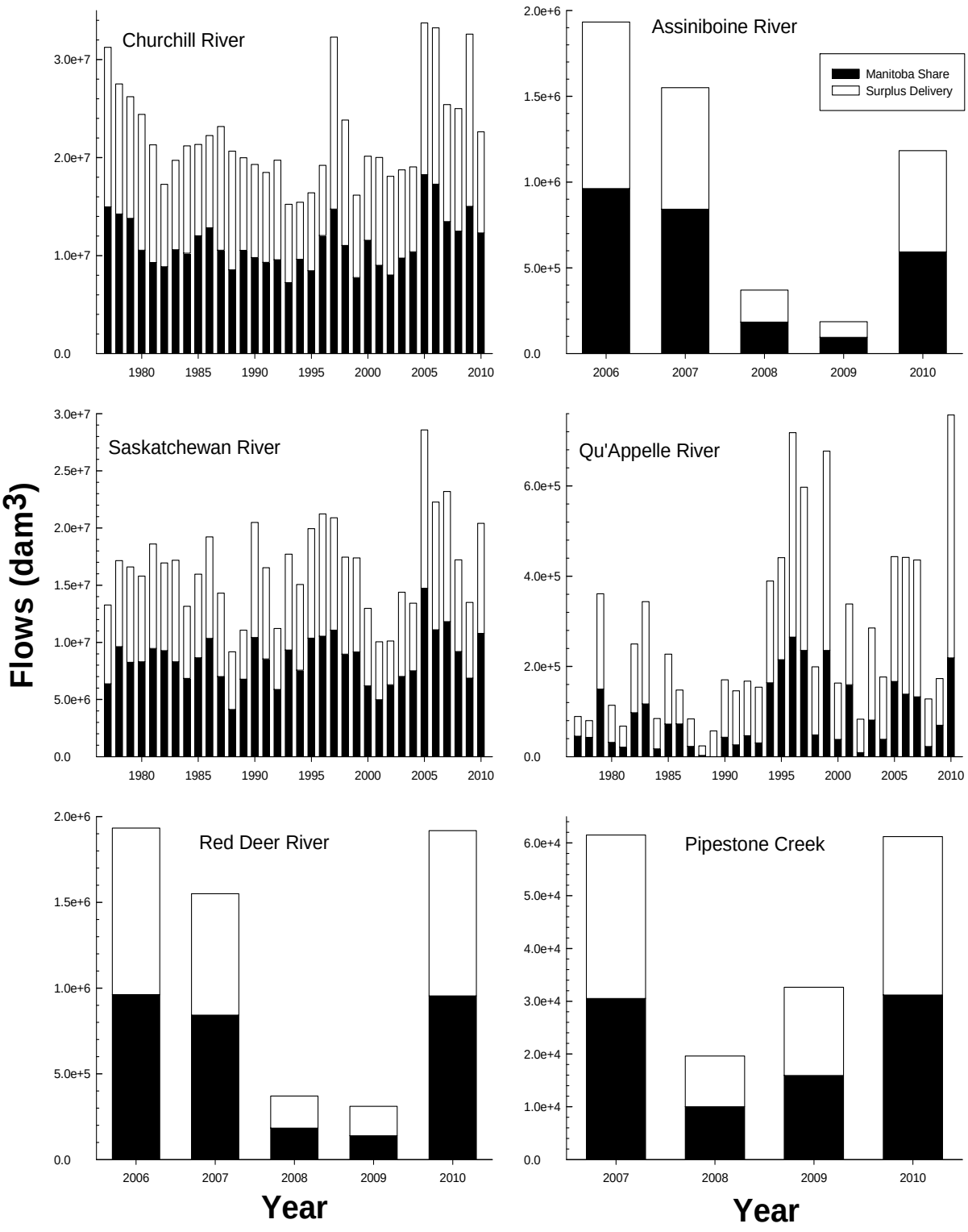


Figure 2. Historic River Flows on the Saskatchewan-Manitoba Border

For rivers with surplus flows, the combined black (provincial share) and white (surplus) stacked bars show the total recorded flows. For rivers with deficit flows, the combined black and white areas indicate recorded flow as the amounts of flow deficits are subtracted from the provincial share. The required provincial share is the combined areas of the black and red bars.

Figures 1 and 2 illustrate that the vast majority of delivery requirements were met throughout the entire data records. Large surpluses are fairly common for many of the rivers. The amounts of flows vary considerably over the years. Because flows vary so much, scientific notation[1] is used on the y-axis to show the magnitude of differences of flows across rivers.

Only two streams have experienced deficits throughout the data records: Middle and Lodge Creeks. For Middle Creek, five minor deficits were found in 1988, 1989, 1998, 2000 and 2008. Deficits were, however, so small in 1988 and 2000 that they can not be seen on Figure 1. For Lodge Creek, five minor deficits were found in 1988, 1989, 1992, 1998 and 2000. Deficits were too small to be seen on Figure 1 in 1992 and 2000. Alberta and Saskatchewan worked cooperatively to address these deficits as they occurred.

Improving Apportionment Methods

The Committee on Hydrology (COH) is engaged in a review of apportionment methods and associated documentation to ensure apportionment monitoring and calculations are accurate.

[1] The number following the e in the Scientific Notation shows how many zeros should be placed before the decimal place.

Reviewing Streams and Basins

Apportionment monitoring of an eastward flowing watercourse is generally initiated when water use in the upstream jurisdiction increases to a level where the downstream jurisdiction's entitlement may not be met without active management.

The 1993 COH report "Strategies for Apportionment Monitoring of Small Interprovincial Streams" (PPWB Report No. 122), evaluated and ranked interprovincial streams on their potential requirement for apportionment monitoring using the following criteria.

- the number of times an apportionment deficit has, or could have, occurred in the past;
- the present level of use and forecasted future demands in both upstream and downstream provinces;
- the existence of storage projects in the upstream province; and
- the perception of basin residents towards the reality of an apportionment problem.

Since 1993, the COH has reviewed these watercourses occasionally and made recommendations to the Board on whether watercourses should be monitored for apportionment. In March 2011, the Board suggested adding a review of the need for apportionment for all basins to the renewed 5-year Work Plan. Criteria should be developed to guide the level of effort spent on basins.

The Board agreed in 2008 that the COH will review apportionment computational procedures on a ten-year rotational basis for all basins that are currently being apportioned. The 2010 - 2011 Work Plan included the development of the process used to evaluate

apportionment computation methods and continued review of the North Saskatchewan River. The objective is to review two basins per year using this new decision criteria and process.

Modernizing Apportionment Software

The PPWB Secretariat uses approximately 50 FORTRAN programs to compute interprovincial apportionable flows. The COH is modernizing these computational programs and data management techniques. In 2006-2007, "Phase 1, Charter and Requirements Documents", was completed under contract. From 2007 to 2010, work continued to develop a new software platform. Optimal Solutions Ltd, the contractor, began work in May 2008, and presented the new software, the River Basin Assessment Tool (RBAT) to the Secretariat and at a COH meeting in March 2010.

The Secretariat and COH Members have been engaged in reviewing this new platform and calibrating the results of RBAT to the FORTRAN program outputs that have been used historically. The cost of this contract is a significant component of the 2010 - 2011 PPWB budget. The review concluded that the functionality of the RBAT needs to be improved by adding a flow-weighted routing capability, and improving the data architecture and user interface. The Board approved the additional future expenses associated with these improvements.

South Saskatchewan River Irrigation Return Flows Study

The PPWB approved the "South Saskatchewan River Natural Flow and Apportionment: Irrigation Return Flows 2001-2005 Phase I" Report No. 170. This report was prepared for the COH by Environment Canada's Water Survey of Canada – Calgary Office. The intent of this report is to assess whether irrigation return flow data from Alberta Irrigation Districts can be used by the PPWB to compute apportionable flows at the borders.

Return flow data were reviewed from the 13 Irrigation Districts of southern Alberta. The adequacy of the data's accuracy and timelines was also reviewed. Overall, return flow from all the sources comprises about five percent of the South Saskatchewan River apportionable flow at the Alberta-Saskatchewan border.

The COH is evaluating the implementation recommendations to the Board on how to address irrigation return flows in apportionment methods. The COH proposed to draft another report, Phase 1B, to complete the evaluation. The timing of future work for Phase 2 will depend upon the results of this evaluation and the availability of funding.

GOAL 2: Interprovincial Groundwater Aquifers are Protected and Used Sustainably

The PPWB's Strategic Goal 2 protects groundwater quantity and quality and sustainable use of transboundary aquifers.

The *MAA* currently has a general statement to refer any transboundary groundwater issues to the Board for their review and recommendation. No issues or concerns were identified in 2010-2011.

Groundwater Schedule

In October 2007, the Board directed the Committee on Groundwater (COG) to focus on the development of a possible groundwater schedule to the *MAA.* The Schedule is expected to be completed by March 2012.

A task group was established in 2008 to organize a workshop that was held on January 13-15, 2009. The workshop's objective was to review concepts and principles on which a groundwater schedule could be based. The results of the workshop were discussed with the Board at a joint meeting in March 2009.

In 2009-2010, the COG developed a number of potential concepts and principles based on the discussions held at the workshop and with the Board. These concepts and principles were incorporated into an Impact Analysis Statement that was submitted to the Board in March 2011. This report also analyzed groundwater uses and stressors, existing groundwater agreements and rationale for the need for a groundwater agreement. At their March 2011 Meeting, the Board requested that the COG complete an environmental scan to understand the status and current and future pressures on the transboundary aquifers. The Board is considering the next steps in the development of the possible groundwater Schedule F.

Reporting of Transboundary Withdrawals

Provincial COG members have contacted their respective water rights offices to inform them of the need to report groundwater projects with significant withdrawals to the neighbouring province. No transboundary groundwater withdrawal projects were brought to the attention of the PPWB in 2010 - 2011.

Water Wells Database

The COG has undertaken a number of projects over the years to evaluate transboundary aquifers or other groundwater issues that are relevant for the PPWB. A contract was completed by March 2010 to compile a water well database that includes historical water levels and other information for wells within each of the Prairie Provinces. Future work will evaluate these results.

GOAL 3: Agreed Interprovincial Water Quality Objectives Are Achieved

The PPWB's Strategic Goal 3 is to achieve agreed interprovincial water quality objectives that are included in Schedule E of the *MAA* for a number of key watercourses at the Alberta-Saskatchewan and Saskatchewan-Manitoba borders.

Water Quality Monitoring

The *MAA*'s water quality monitoring locations are shown in Appendix I. The *MAA*'s water quality monitoring parameters are shown in Appendix III.

In 2010, in accordance with the terms of the *MAA*, Environment Canada conducted water quality monitoring at all 11 sites as requested by the PPWB. Samples were taken on 117 events in accordance with the approved 2010 monitoring plan, except for the Carrot River that was not sampled in February because of safety concerns. Because of equipment problems, the frequency of bacterial sampling was also reduced on a number of rivers including the Carrot River, Saskatchewan River, Red Deer River S/M and the Assiniboine River. Four water quality samples were obtained from a 12th site, Cold River, collecting baseline data to develop site-specific objectives in the comprehensive review of objectives.

Adherence or Excursions to Water Quality Objectives

The *MAA* delineates river-specific water quality objectives for individual parameters based on values that protect human drinking, agricultural and recreational uses and the aquatic environment.

A total of 2,768 water quality samples were compared to the *MAA* objectives to determine whether any excursions to the objectives occurred in 2010. Metals samples for the Assiniboine River in October 2010 and the Saskatchewan River in January 2010 were, however, excluded because of concerns with laboratory analytical results. If there are any excursions of concern, the Committee on Water Quality (COWQ) prepares a work plan to assess the cause and the potential to mitigate. The work plan is then carried out by the provincial agencies.

The PPWB Water Quality Excursion Report for 2010 is shown in Appendix IV. This report was recommended by the COWQ and approved by the Board in November 2011. Results are summarized.

In 2010, the PPWB objectives were adhered to an average of 94 % of samples (Figure 3). Only the Battle, Carrot and Qu'Appelle Rivers had adherence rates of less than 90%.

Annual adherence rates of rivers have varied only slightly since 2003. The Red Deer River in Alberta and Qu'Appelle River had the largest ranges in adherence rates (9.1% and 7.2% differences across years respectively). Compared to 2009, one river slightly improved its adherence rates, one remained the same and nine had slight decreases. These variations in adherence rates can occur naturally and can be influenced by a number of factors including climate variability, flow, sediment loading, groundwater and point or non-point inputs into the river.

In 2010, 17 parameters had excursions to the PPWB objectives. Similar to previous years, total phosphorous, dissolved manganese, sodium and total dissolved solids contributed to 62% of the total excursions.

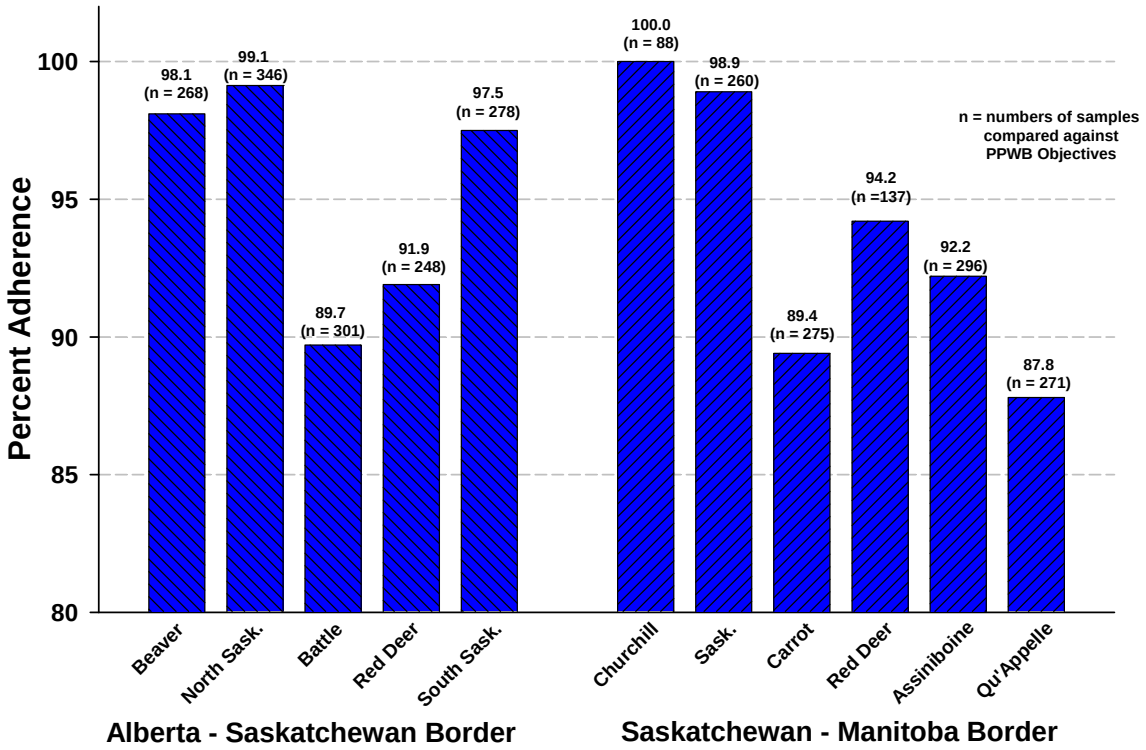


Figure 3: 2010 Percent Adherence to PPWB Objectives

Reviewing and Improving Water Quality Objectives

Work continued in 2010 - 2011 on the comprehensive review of the PPWB water quality objectives. A framework for the approach to water quality objectives review was developed by the COWQ and approved by the Board in March 2008. In 2009-2010, COWQ identified that all water uses were relevant for all PPWB rivers. The list of parameters requiring objectives was evaluated and is expected to be finalized next year. A list of existing objectives was compiled in April 2010. Expected excursions rates were assessed by graphing the historic data against these existing objectives.

The development of nutrient objectives is the highest priority. Progress was made in developing the background approach that will be applied to revise existing or develop new objectives for nutrients and possibly other parameters. Seasons were delineated for these parameters as background open and closed water objectives will be developed. Trends were analyzed for nutrient and other parameters to assess historic background levels.

A review was initiated to evaluate the effects of data gaps and changes in methods (and detection limits), flows, and sediment levels on metal levels.

Work will continue in 2011 – 2012 to review the water quality objectives. The COWQ is expected to recommend objectives to the Board in March 2012.

This on-going review will 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.

GOAL 4: Jurisdictions Are Informed About Emergency and Unusual Water Quantity and Quality Conditions

In the PPWB's Strategic Plan, Goal 4 is to inform jurisdictions of emergency and unusual water conditions, facilitating effective and cooperative interprovincial water management.

PPWB Contingency Plan

Historically, the PPWB Interprovincial Water Quality Contingency Plan has been an effective method of informing Board agencies of spills or unusual water quality conditions in interprovincial streams.

This plan had only considered spills that affected surface water quality but its scope was expanded in March 2010 to include emergency or unusual surface water quantity or groundwater quantity and quality events.

The revised Event Contingency Plan involves a "how to" guide to inform jurisdictions and evaluate potential impacts of emergency or unusual water conditions for surface and groundwater quantity and quality issues. An Event Notification Report was also updated and can be used to inform jurisdictions on the details of the event, allowing them to evaluate whether and what mitigation efforts are required to address the event and avoid impacts to neighbouring jurisdictions.

One unusual water quantity was reported in 2010-2011:

- Minor deficiencies were found on a small dam on a tributary of the Middle Creek on the Alberta side of the Alberta-Saskatchewan border. No downstream impacts occurred. The reservoir is not used in apportionment computations. The Board and COH members were informed of the event in case local landowners queried the jurisdictions.

GOAL 5: Conflicts over Interjurisdictional Water Issues are Avoided

The PPWB's Strategic Plan Goal 5 is to avoid conflicts and disagreements over interjurisdictional water issues. During the year, the PPWB discussed issues related to several existing projects of interest to different jurisdictions.

Lake Winnipeg Nutrient Issues

Lake Winnipeg is Canada's sixth-largest freshwater lake, and is fed by a vast international basin covering 960,000 square km, extending over four provinces and four states. Concern over nutrient loading in Lake Winnipeg has risen in recent years, with reports of increased frequency, duration, and intensity of algal blooms. The Province of Manitoba, Environment Canada and many other partners have been engaged in several large initiatives to address water quality issues in Lake Winnipeg.

The PPWB provides a forum to exchange information on these initiatives with the Provinces of Saskatchewan and Alberta to avoid conflicts before they arise. The Provinces of Alberta and Saskatchewan agreed to have the PPWB represent their interests with respect to input to the Federal-Provincial Lake Winnipeg Basin Committee. Canada and Manitoba signed a Memorandum of Understanding on September 2010 to continue their collaborative partnership into the long-term. An Implementation Steering Committee met In October 2010 to facilitate this partnership.

The Board was informed about activities conducted in relation to the Lake Winnipeg Basin Initiative, where the Government of Canada allocated $17.7 million for 2008-2012. This Initiative focuses on facilitating watershed governance; research, information and monitoring; and a stewardship fund for projects that reduce nutrient loads into the lake, improving water quality conditions.

The Board was also kept informed of Manitoba's Lake Winnipeg Action Plan, a commitment that started in 2003 to reduce nutrient loading to Lake Winnipeg. The multi-stakeholder Lake Winnipeg Stewardship Board was formed as part of Manitoba's provincial plan to protect Lake Winnipeg. The Board's mandate was to assist the Manitoba government in identifying actions required to reduce nutrient loading to Lake Winnipeg. Since 2003, the Board has provided over 135 recommendations to the Manitoba Government and implementation is underway to reduce nutrient loading.

Manitoba/Saskatchewan Drainage

In September 2008, the Minister of Manitoba Water Stewardship wrote to the Minister responsible for the Saskatchewan Watershed Authority requesting support for interprovincial meetings of staff responsible for licensing drainage works, investigating complaints, and enforcing against illegal drainage activities. Through discussion at the Board meeting in the fall 2008, bilateral meetings were organized by the Board members for Manitoba and Saskatchewan. A co-operative approach was agreed upon to understand and resolve bilateral drainage issues.

A bilateral Saskatchewan-Manitoba Task Force was created in 2009 to develop a strategy for dealing with drainage in Saskatchewan watersheds that may affect lands in Manitoba. A consultant was hired and prepared a report to assess the causes of erosion and potential erosion control mitigation.

The PPWB will continue to be updated by Manitoba and Saskatchewan on the Task Force's progress.

Saskatchewan had proposed an Emergency Drainage project in November 2010 to address flooding issues on Fishing Lake. The project involved enhancing outlet channel flows into the Assiniboine River that crosses the Manitoba border. The PPWB Board provided a forum to inform all member agencies of this project. Bilateral discussions between Saskatchewan and Manitoba cooperatively resolved potential transboundary issues.

Annual Report on Interprovincial Drainage Projects

The COH prepares an annual report on drainage projects approved in Saskatchewan that have the potential for downstream impacts in Manitoba.

The Board agreed that Alberta only needs to provide the PPWB with drainage project information if there is a specific project that could have an impact on Saskatchewan.

In 2009-2010, Saskatchewan licensed two drainage projects which drain into Manitoba. Alberta did not licence any projects in 2009-2010 that could have had impacts on Saskatchewan.

No projects were licensed by either Alberta or Saskatchewan in 2010-2011 that had the potential for transboundary impacts into downstream provinces.

Montana-Alberta St. Mary and Milk Rivers Water Management Initiative

The Alberta member informed the Board in 2008 of an initiative between Alberta and Montana related to the sharing of the waters in the St. Mary and Milk Rivers. The purpose of this initiative is to cooperatively explore and evaluate options for improving both Montana's and Alberta's access to the shared water of the St. Mary and Milk Rivers, and to make joint recommendations on preferred options to both governments for their consideration and approval.

This Alberta provincial-Montana state initiative also furthers the goals of the Governments of Canada and the USA which have an existing international treaty to share the waters of the St. Mary and Milk Rivers.

The Terms of Reference for the Joint Initiative Team does not include Alberta's sharing of water with Saskatchewan under the *MAA*. Nonetheless, the Alberta member will inform the Saskatchewan PPWB member of issues relevant to Saskatchewan.

In 2009-2010, the Joint Initiative Team developed a water management model of the St. Mary and Milk rivers to assess the benefits and impacts on water supplies in Alberta and Montana. In 2010-2011, this model was employed to examine a number of scenarios. Joint management recommendations are expected in the fall of 2011 from the Governments of Alberta and Montana.

Alberta has provided information updates for this initiative at each PPWB Meeting.

GOAL 6: Jurisdictions Are Informed About PPWB Activities

The PPWB's Strategic Goal 6 is to keep jurisdictions informed about PPWB activities. This transparency ensures that cost-shared activities are delivered efficiently and effectively and are consistent with the mandate of the PPWB.

The PPWB member agencies were informed about PPWB activities through various means, including the ongoing distribution of Board and Committee Minutes and Quarterly and Annual Reports, as well as through brochures and fact sheets, technical reports, and the PPWB website.

The PPWB website had been housed on the Environment Canada's website for a number of years. In 2009-2010, a project was initiated to move the website to an external host. The purpose of the PPWB website is to inform the public and interested parties of PPWB activities, and provide a means for Member Agencies to exchange information and facilitate the business of the PPWB. The Noblet Design Group was awarded a contract to develop the website with the PPWB Secretary. The website (www.ppwb.ca) was completed and became live in August 2010.

In 2010 - 2011, the Board continued the practice of inviting senior officials of the host agency to meet with the Board. The practice was begun in 2007 - 2008 as Board members recognized that the introduction of numerous new senior officials in all agencies, along with internal organizational restructuring, necessitated greater efforts to increase general awareness of the PPWB and agency responsibilities related to implementation of the *MAA*.

Senior managers and executives from the Saskatchewan Watershed Authority and the Saskatchewan Ministry of the Environment met with the Board during its March 2011 meeting in Moose Jaw. This meeting focused on updating the executives on PPWB activities, and discussing various issues of interjurisdictional interest, including Saskatchewan-Manitoba drainage, Lake Winnipeg activities, and the Montana-Alberta St. Mary and Milk Rivers Water Management Initiative.

This approach to increasing awareness of senior officials within PPWB agencies will continue in the future.

GOAL 7: Information, Knowledge and Research Are Shared Among Jurisdictions

The PPWB provides a forum to foster effective and cooperative water management on the Prairies. Goal 7 facilitates cooperation by exchanging information and knowledge amongst jurisdictions and participating in research projects of mutual interest and relevance to the PPWB mandate.

Resilience of the *MAA* to Climate Change

In March 2008, the PPWB initiated a project to assess how resilient the *MAA* is to predicted impacts of and adaptations to climate change. The Ministers had asked this question in their June 2007 Meeting and continued their discussion on how to assess resilience at their June 2008 Meeting.

A workshop was held in September 2010 to explore "What if" scenarios of potential circumstances to test the resilience of the agreement. Various potential climate impacts were considered including potential increased variability in future flows, flooding, multi-year hydrological droughts and increased water use. The workshop considered hydrological issues and associated surface and groundwater quality issues.

The COH was tasked by the Board to prepare the flow array scenarios that can be used to evaluate the resiliency of the *MAA*.

Partners FOR the Saskatchewan River Basin

The Ministers Meeting in June 2008 provided direction that the PPWB work cooperatively with external organizations. The PPWB proposed that a Joint Meeting with the Partners FOR the Saskatchewan River Basin would further this goal.

The Partners FOR the Saskatchewan River Basin is a multi-stakeholder group that facilitates cooperation amongst agencies and stewardship of the Saskatchewan River Basin that spans all of the Prairie Provinces. The group conducts a number of education outreach activities.

A Joint Meeting was held in October 2009 to consider how both organizations could work together. The PPWB committed to assist education efforts of the PFSRB and submitted an article on the PPWB to the PFSRB Spring 2010 newsletter (www.saskriverbasin.ca) and offered to give presentations on the PPWB to PFSRB members. The PPWB presented at a Partners FOR the Saskatchewan River Basin Symposium in September 2010.

3 . ADMINISTRATIVE AND FINANCIAL MANAGEMENT

As illustrated by the organization chart in Appendix V, the Board operates through its Executive Director and three technical Standing Committees (Committee on Hydrology, Committee on Groundwater, and Committee on Water Quality). The Board consists of senior officials engaged in the administration of water resources in the Provinces of Alberta, Saskatchewan, and Manitoba and senior officials from Environment Canada and Agriculture and Agri-Food Canada (Appendix VI). Committee members are managers and technical experts within each member agency. The Board is chaired by Environment Canada. The Committees are chaired by the Executive Director.

Secretariat support is provided to the PPWB through the Transboundary Waters Unit, Environment Canada at Room 300, 2365 Albert St., Regina, Saskatchewan. The portion of time each Secretariat staff person spends on PPWB activities is charged to the PPWB and cost-shared by the members. In addition, technical support is provided, as required, by other staff of Environment Canada and the three Prairie Provinces.

Brian Yee left Environment Canada in December 2010. Vir Khanna was appointed on an acting basis on January 3, 2011 as the Senior Engineering Advisor.

Four Board and seventeen Committee meetings were held throughout the 2010-2011 fiscal year. The Board invited executives and senior managers of the host agency to meet with the Board to foster improved internal awareness of PPWB operations and objectives. Invitations were also sent to Committee members residing in the province where the meeting is located, whereby improving communication and understanding between the Board and the Committees.

PPWB

- Meeting No. 95, October 5, 2010 – Conference Call
- Meeting No. 96, October 14, 2010 – Edmonton.
- Meeting No. 97, March 18, 2011 – Conference Call
- Meeting No. 98A, March 24, 2011 – Moose Jaw. Joint Meeting with Executives from Saskatchewan Watershed Authority and Saskatchewan Ministry of the Environment

COH

- Meeting No. 112, April 26, 2010 – Conference Call
- Meeting No. 113, September 23, 2010 – Regina
- Meeting No. 114, November 10, 2010 – Conference Call
- Meeting No. 115, January 6, 2011 – Conference Call
- Meeting No. 116, February 1-2, 2011 – Winnipeg

COWQ

- Meeting No. 100, April 1, 2010 – Conference Call
- Meeting No. 101, May 6, 2010 – Conference Call
- Meeting No. 102, May 20, 2010 – Conference Call
- Meeting No. 103, September 17, 2010 – Conference Call
- Meeting No. 104, October 12-13, 2010 – Edmonton
- Meeting No. 105, November 10, 2010 (Part A) and December 3, 2010 (Part B) – Conference Calls
- Meeting No. 106, January 26, 2011 (Part A) and February 7, 2011 (Part B) – Conference Calls
- Meeting No. 107, March 3, 2011 – Conference Call

COG

- Meeting No. 59, April 29, 2010 – Conference Call
- Meeting No. 60, February 22, 2011 – Conference Call

The Board approves the annual budget for the PPWB. The budget for 2010 - 2011 was $784,503 and final expenditures were $689,678 as shown in Appendix VII. Although good progress was made on contract work in 2010 - 2011, final expenditures were below the approved budget due to the flow modernization contract not being completed because of delays in the contracting process. Contract work to modernize flows will continue in 2011 - 2012. In addition, provincial and federal travel restrictions resulted in cancelling some workshops and face-to-face meetings, reducing the expenses of these planned activities.

The Board agreed at its regular meeting in March 2007 that, in the future, the Board's budget planning cycle must begin earlier in the year, with substantial discussion being held on the Board's budget during the regular October meeting. This discussion facilitated earlier input from the Board into the 2010-2011 budget process for the respective PPWB agencies.

A multi-year costed work planning process was also initiated in 2007 - 2008, and completed in 2008 - 2009. This approved work plan was adhered to in 2010 – 2011. The purpose of the work plan is to:

- to position the Board to anticipate and plan for future work priorities and resource requirements;

- guide the Board in its work over the next few years, ensuring that activities target fulfilling the Goals in the PPWB Strategic Plan and key deliverables in the PPWB Charter;

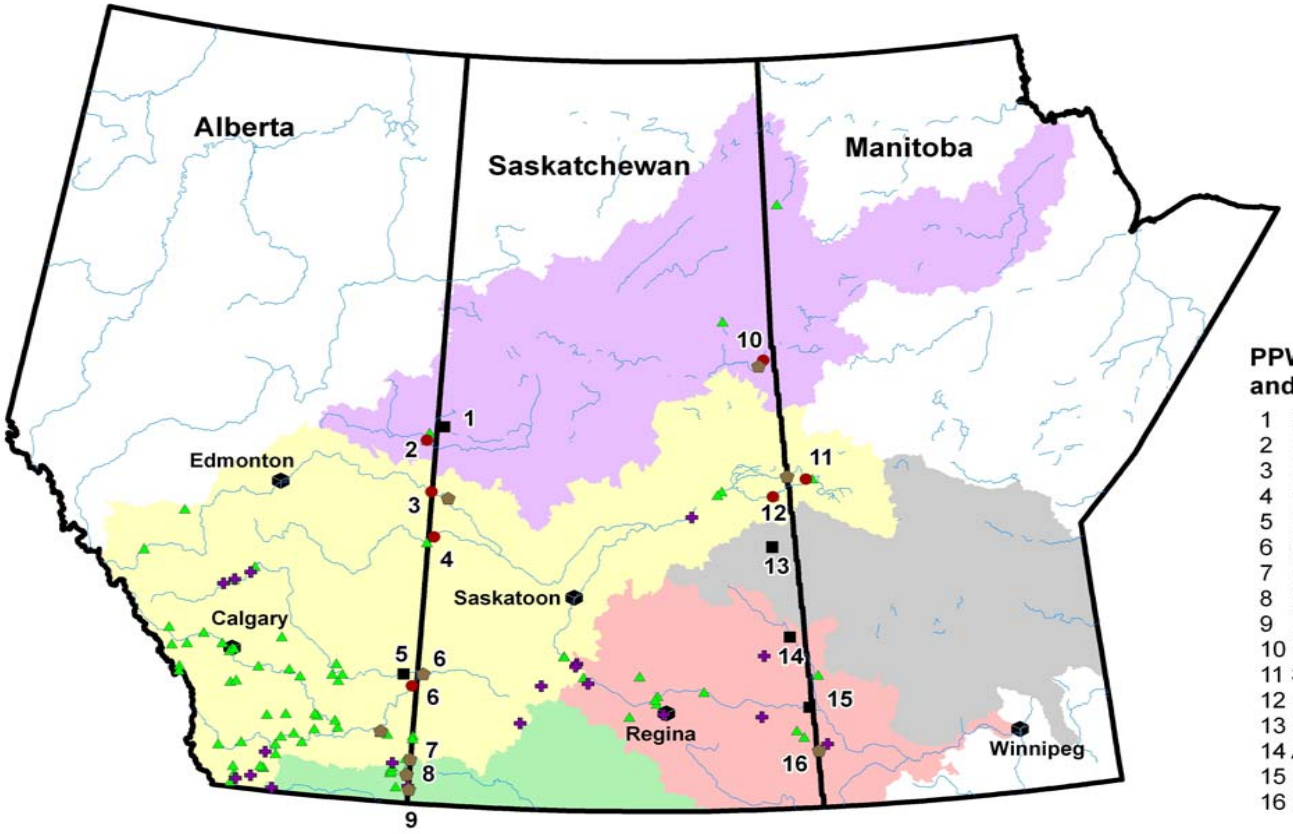
- feed into multi-year work plans for the three Standing Committees and the Secretariat; and

- provide the foundation for communication with Ministers and senior officials within each agency.

At the October 2010 meeting, the Board initiated discussions on the renewal of the five-year work plan. A process was developed during the March 2011 meeting on how to renew the multi-year work plan in the next fiscal year. The PPWB Charter and Strategic Plan were reviewed to evaluate whether current priorities were reflected. Strategic directions were also considered from provincial and federal water strategies, programs and activities. Detailed work activities will be identified by the Secretariat and Committees and reviewed and approved by the Board in the next fiscal year.

Further information on the history and administration of the PPWB can be found in Appendix VIII.

APPENDIX I: Approved PPWB Monitoring Stations for 2010 – 2011



PPWB Water Quantity and/or Quality Monitoring

1 Cold River
2 Beaver River
3 North Saskatchewan River
4 Battle River
5 Red Deer River A/S
6 South Saskatchewan River
7 Battle Creek
8 Middle Creek
9 Lodge Creek
10 Churchill River
11 Saskatchewan River
12 Carrot River
13 Red Deer River S/M
14 Assiniboine River
15 Qu'Appelle River
16 Pipestone Creek

Basins

- Assiniboine River
- Churchill River
- Lake Winnipeg
- Missouri River
- Saskatchewan River

Stations

- Hydrometric
- Meteorological
- Quality
- Apportionment
- Apportionment and Quality

APPENDIX II: 2010 Recorded and Apportionable Flows

APPENDIX IIA: Flows at the Alberta-Saskatchewan Border (in Cubic Decametres)

SOUTH SASKATCHEWAN RIVER – ALBERTA-SASKATCHEWAN BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	202 410	197 340	274 490	177 170	590 650	2 138 730	1 035 810	401 830	476 840	551 510	310 490	255 320	6 612 590
CONSUMPTIVE USE	440	290	0	57 940	48 020	5 290	178 240	160 810	65 030	9 890	420	170	526 540
CHANGE IN RESERVOIR STORAGE	-87 050	-79 160	-57 820	16 040	101 880	232 900	130 690	19 810	-21 500	-31 100	-61 410	-147 540	15 740
INTERBASIN TRANSFER*	0	0	0	4 170	15 460	39 780	24 080	16 050	16 150	8 040	0	0	123 730
APPORTIONABLE FLOW	123 990	117 300	207 880	204 630	784 900	2 398 770	1 330 710	648 550	544 650	544 380	265 870	192 010	7 363 640

* From Western Irrigation District

RED DEER RIVER – ALBERTA-SASKATCHEWAN BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	40 876	38 180	77 924	100 310	118 601	376 574	342 809	166 147	123 543	134 032	62 597	45 291	1 626 884
CONSUMPTIVE USE	0	0	0	0	2 780	1 450	2 270	2 450	2 250	0	0	0	11 200
CHANGE IN RESERVOIR STORAGE	-25 180	-24 610	-19 570	-7 480	34 870	54 060	17 980	16 190	510	1 290	-10 290	-19 440	18 330
INTERBASIN TRANSFER**	0	0	0	-4 170	-15 460	-39 780	-24 080	-16 050	-16 150	-8 040	0	0	-123 730
APPORTIONABLE FLOW	16 076	13 350	54 914	84 940	133 133	402 254	336 909	167 937	111 793	128 992	55 057	26 481	1 531 834

** From Eastern Irrigation District

SOUTH SASKATCHEWAN RIVER – BELOW JUNCTION WITH RED DEER RIVER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	243 000	236 000	352 000	277 000	709 000	2 515 000	1 379 000	568 000	600 000	686 000	373 000	301 000	8 239 000
APPORTIONABLE FLOW	140 000	131 000	263 000	290 000	918 000	2 801 000	1 668 000	816 000	656 000	673 000	321 000	218 000	8 895 000
SASKATCHEWAN SHARE (50%)	70 000	65 500	131 500	145 000	459 000	1 400 500	834 000	408 000	328 000	336 500	160 500	109 000	4 447 500
EXCESS (+) OR DEFICIT (-) DELIVERY	173 000	170 500	220 500	132 000	250 000	1 114 500	545 000	160 000	272 000	349 500	212 500	192 000	3 791 500
CUMULATIVE EXCESS OR DEFICIT	173 000	343 500	564 000	696 000	946 000	2 060 500	2 605 500	2 765 500	3 037 500	3 387 000	3 599 500	3 791 500	3 791 500

Recorded Flow is 93% of Apportionable Flow. Alberta is required to deliver 50% of Apportionable Flows. Apportionment of flow in the South Saskatchewan River is specified in Article 4, Schedule A of the *MAA*. Apportionable flow calculations are based on the methodology described in the report entitled "South Saskatchewan River Below Red Deer River – Natural Flow", April 1985 (PPWB Report No. 45). Flows have been routed and, as a result, the values presented in the table cannot be exactly balanced on a monthly basis.

NORTH SASKATCHEWAN RIVER - ALBERTA-SASKATCHEWAN BORDER (NEAR DEER CREEK)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	231 700	251 600	302 700	469 200	490 100	940 900	824 900	597 300	502 800	484 800	375 800	337 500	5 809 000
APPORTIONABLEFLOW	36 800	60 700	105 600	300 600	431 300	1 271 900	1 364 400	942 800	643 300	507 600	223 100	98 500	5 987 000

Recorded Flow is 97% of Apportionable Flow. Alberta is required to deliver 50% of Apportionable Flows.

BATTLE CREEK – ALBERTA-SASKATCHEWAN BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	0	68	584	2 751	7 256	8 850	4 165	2 791	2 382	1 618	0	0	30 464
APPORTIONABLE FLOW	0	68	601	2 855	7 267	8 765	4 133	2 792	2 401	1 618	0	0	30 499

Recorded Flow is 100% of Apportionable Flow. Alberta is required to deliver 75% of Apportionable Flows.

LODGE CREEK – ALBERTA-SASKATCHEWAN BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	0	0	369	3 784	11 341	16 100	776	160	42	63	0	0	32 600
APPORTIONABLE FLOW	0	0	793	4 519	12 084	16 107	543	160	42	63	0	0	34 300

Recorded Flow is 95% of Apportionable Flow. Alberta is required to deliver 75% of Apportionable Flows.

MIDDLE CREEK – ALBERTA-SASKATCHEWAN BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	0	0	85	1 475	3 527	3 659	110	40	33	25	0	0	8 950
APPORTIONABLE FLOW	0	0	101	1 774	3 979	3 528	80	96	34	11	0	0	9 600

Recorded Flow is 93% of Apportionable Flow. Alberta is required to deliver 75% of Apportionable Flows.

COLD LAKE – ALBERTA-SASKATCHEWAN BORDER (AT OUTLET OF COLD LAKE)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	15 900	16 000	19 600	27 600	49 000	71 100	91 300	81 800	62 200	56 800	40 900	34 700	567 000
APPORTIONABLE FLOW	18 200	16 500	20 000	28 100	49 400	71 600	91 600	82 200	62 600	57 300	41 300	35 100	574 000

Recorded Flow is 98.8% of Apportionable Flow. Alberta is required to deliver 68.4% of Apportionable Flows.

APPENDIX IIB: Flows at the Saskatchewan-Manitoba Border (in Cubic Decametres)

CHURCHILL RIVER – SASKATCHEWAN-MANITOBA BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
ESTIMATED FLOW	2 557 200	2 177 400	2 242 600	2 064 500	1 722 800	1 710 900	1 633 200	1 633 600	1 658 900	1 703 300	1 605 100	1 917 400	22 626 900
APPORTIONABLE FLOW	2 372 100	1 969 200	1 976 100	1 964 700	1 957 900	2 109 800	2 105 700	2 140 100	2 099 900	2 150 300	1 900 300	1 861 200	24 607 320

Estimated Flow includes Recorded Flow at Sandy Bay and estimated inflow from Sandy Bay to the Saskatchewan-Manitoba Border. Estimated flow is 92% of Apportionable Flow. Saskatchewan is required to deliver 50% of Apportionable Flows to Manitoba.

SASKATCHEWAN RIVER – SASKATCHEWAN-MANITOBA BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
ESTIMATED FLOW	902 000	999 000	1 277 000	2 061 000	1 432 000	2 062 000	2 945 000	2 131 000	1 819 000	1 985 000	1 586 000	1 208 000	20 406 000
APPORTIONABLE FLOW	433 000	665 000	1 320 000	2 195 000	1 878 000	3 171 000	3 452 000	2 242 000	1 899 000	2 010 000	1 337 000	972 000	21 574 000

Estimated Flow at the Saskatchewan-Manitoba border is computed using recorded flow of the Saskatchewan River at The Pas minus 1.31 times the recorded flow of Carrot River near Turnberry. Estimated Flow is 95% of Apportionable Flow. Saskatchewan is required to deliver 50% of Apportionable Flows to Manitoba.

CARROT RIVER – SASKATCHEWAN-MANITOBA BORDER (NEAR TURNBERRY)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	4 910	3 900	10 600		270 000	221 000	226 000	189 000	188 000	153 000	127 000	73 200	1 284 900

Some data were missing in April and are not included in the Total Recorded Flows.

QU'APPELLE RIVER – SASKATCHEWAN-MANITOBA BORDER (NEAR WELBY)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	14 600	15 600	15 800	44 600	45 500	64 600	115 000	82 500	108 000	105 000	88 400	57 400	757 000
APPORTIONABLE FLOW													438 172

Recorded flow is 173% of Apportionable Flow. Recorded Flow exceeded the Apportionable Flow by 319 800 dam^3 in 2010 because of diversions of 89 800 dam^3 from the South Saskatchewan River, as well as inaccuracies in estimating ungauged local inflows and actual water use in the basin. Saskatchewan is required to deliver 50% of Apportionable Flow to Manitoba.

RED DEER RIVER – SASKATCHEWAN-MANITOBA BORDER (NEAR ERWOOD)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
ESTIMATED FLOW	4 620	3 710	7 470	180 040	259 820	395 230	193 460	246 660	293 830	109 080	160 700	62 880	1 917 500
APPORTIONABLE FLOW	4 590	3 690	7 300	181 900	258 300	390 660	191 160	244 380	291 340	108 180	164 650	62 350	1 908 500

Estimated Flow was determined by using the ratio of Natural Flow at the interprovincial boundary and near Erwood multiplied by the Recorded Flow at Erwood. Estimated Flow is 100.5% of Apportionable Flow. Estimated Flow exceeded the Apportionable Flow by 9 000 dam3 in 2010 because agricultural drainage contributed an estimated 9 724 dam3 to the flow of the Red Deer River. Saskatchewan is required to deliver 50% of Apportionable Flow to Manitoba.

ASSINIBOINE RIVER – SASKATCHEWAN-MANITOBA BORDER (AT KAMSACK)

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	1 220	980	2 970	54 170	77 940	266 980	22 040	95 890	161 220	104 460	129 340	65 620	1 183 000
APPORTIONABLE FLOW	1 200	1 020	3 020	55 640	78 240	267 430	222 520	96 410	161 490	104 460	129 280	65 620	1 186 000

Recorded Flows are 99.7% of Apportionable Flows. Saskatchewan is required to deliver 50% of Apportionable Flows to Manitoba.

PIPESTONE CREEK – SASKATCHEWAN-MANITOBA BORDER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	302	195	1 630	10 800	5 010	14 800	11 000	2 080	2 550	4 200	6 440	2 180	61 200
APPORTIONABLE FLOW	414	309	2 700	10 200	5 150	15 820	9 790	1 810	2 830	830	10 390	2 210	62 400

Recorded Flows are 98% of Apportionable Flows. Saskatchewan is required to deliver 50% of Apportionable Flows to Manitoba.

NOTE: Flow numbers are rounded to the number of significant figures that reflect the precision of the input that were used in the calculations.

APPENDIX III

PPWB Water Quality Monitoring 2010 Parameter List

Water is collected monthly at all sites with the exception of Red Deer (SK/MB) (6x/yr), Churchill, and Cold Rivers (4x/yr)

ALKALINITY, phenol & total
ALUMINUM, diss. & total$^{\theta}$
AMMONIA, total$^{\theta}$.
ANTIMONY, diss. & total
ARSENIC, diss.$^{\theta}$ & total
BARIUM, diss. & total$^{\theta}$
BERYLLIUM, diss. & total
BICARBONATE, calc.
BISMUTH, diss. & total
BORON, diss.$^{\theta}$ & total
CADMIUM, diss. & total$^{\theta}$
CALCIUM, diss.
CARBON, diss organic
CARBON, part. organic
CARBON, total organic, calcd.
CARBONATE, calcd.
CHLORIDE, diss$^{\theta}$
CHROMIUM, diss. & total$^{\theta}$
COBALT, diss. & total$^{\theta}$
COLIFORMS FECAL$^{\theta}$ ♦
COLOUR TRUE
COPPER, diss. & total$^{\theta}$
E. COLI ♦
FLUORIDE, diss$^{\theta}$
FREE CO_2, calcd.
GALLIUM, diss. & total
HARDNESS NON-CARB. (CALCD.)
HARDNESS TOTAL (CALCD.) CACO3
IRON, diss.$^{\theta}$ & total
LANTHANUM, diss. & total
LEAD, diss. & total$^{\theta}$
LITHIUM, diss. & total
MAGNESIUM, diss.
MANGANESE, diss.$^{\theta}$ & total
MOLYBDENUM, diss. & total
NICKEL diss. & total$^{\theta}$
NITROGEN NO_3 & NO_2, diss$^{\theta}$.
NITROGEN. part.
NITROGEN, total calcd.
NITROGEN, diss.
OXYGEN, diss.$^{\theta}$
Ph$^{\theta}$
PHOSPHOROUS ortho, diss
PHOSPHOROUS, part. calcd.
PHOSPHOROUS, total$^{\theta}$
PHOSPHOROUS, diss.
POTASSIUM, diss.
RESIDUE FIXED NONFILTRABLE
RESIDUE NONFILTRABLE
RUBIDIUM, diss. & total
SELENIUM, diss.$^{\theta}$ & total
SILVER, diss. & total
SILICA,
SODIUM ADSORPTION RATIO, calcd.$^{\theta}$
SODIUM, diss.$^{\theta}$
SODIUM PERCENTAGE, calcd.
SPECIFIC CONDUCTANCE
STRONTIUM, diss. & total
SULPHATE, diss.$^{\theta}$
TEMPERATURE WATER
THALLIUM, diss. & total
TOTAL DISSOLVED SOLIDS, calcd.$^{\theta}$
TURBIDITY
URANIUM, diss. & total$^{\theta}$
VANADIUM, diss. & total$^{\theta}$
ZINC diss. & total$^{\theta}$

ACID HERBICIDES*$^{\theta}$
NEUTRAL HERBICIDES*
ORGANOCHLORINE INSECTICIDES*

θ Parameters with PPWB site-specific objectives

* Collected from the Cold, North Saskatchewan, South Saskatchewan, Assiniboine, and Carrot Rivers in 2010

♦ Collected between 6 -12 X/year at all sites but the Churchill and Cold Rivers

APPENDIX IV

PPWB EXCURSION REPORT

JANUARY – DECEMBER 2010

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Introduction

The 1969 *Master Agreement on Apportionment* (*MAA*) is administered by the Prairie Provinces Water Board (PPWB). Under Schedule E of this agreement, the PPWB is required to monitor the quality of the aquatic environment and to make annual comparisons with established PPWB water quality objectives. To ensure the water quality is protected, site-specific water quality objectives have been established at 11 major interprovincial eastward flowing river reaches (Table 1). Five of these reaches are along the Alberta-Saskatchewan border and six are along the Saskatchewan-Manitoba border (Figure 1). The objectives were established to protect various water uses including the protection of aquatic life, drinking water, recreation, agricultural uses (livestock watering and irrigation) and fish consumption.

Environment Canada collects and analyzes water quality samples from the 11 transboundary river reaches. Monitoring includes a range of physical, chemical and biological parameters at one site in each of the river reaches. These include nutrients, major ions, metals, fecal coliforms, physical characteristics and pesticides. The Committee on Water Quality (COWQ) annually reviews the results of the PPWB Water Quality Monitoring program, with emphasis on the comparisons to PPWB Water Quality Objectives. In 2010, Environment Canada undertook a total of 117 water sampling events from the 11 PPWB river sites. The 2010 monitoring program was completed as approved by the Board, with the exception of one sample event from of the Carrot River which was not sampled due to occupation health and safety concerns. The frequency of bacterial sampling was also reduced at four sites including the Carrot River, Saskatchewan River, Red Deer River and the Assiniboine River on the Saskatchewan/Manitoba border due to equipment problems.

Monitoring in 2010 was also undertaken on four separate occasions on the Cold River in 2010 as part of the approved monitoring plan. While there are no PPWB water quality objectives for the Cold River, site-specific objectives are being developed for this river as part of the current review of water quality objectives for PPWB. This review is expected to be completed by March 2012.

Raw data for excursions were distributed to the PPWB COWQ members on August 24, 2011 for their review. During this review, the metals data for the Assiniboine River in October 2010 and the metals data for the Saskatchewan River in January 2010 were identified as questionable. After discussions with the analytical laboratory, these data have been removed from the current analysis and are being reviewed in more detail for analytical accuracy. This report presents the 2010 adherences and excursions to the PPWB site-specific water quality objectives.

Results and Discussion

Overall Adherence to PPWB Water Quality Objectives

The overall adherence rate to the PPWB reach-specific water quality objectives in 2010 was on average 94%, over a total of 2,768 comparisons of water chemistry results to objectives. The adherence rates for the 11 rivers ranged from 87.8% for the Qu'Appelle River to 100% for the Churchill River (Figure 2). Of the 11 river reaches, 3 rivers had an overall adherence rate of less than 90%. These were the Battle River on the Alberta/ Saskatchewan border and the Carrot and Qu'Appelle Rivers on the Saskatchewan/ Manitoba border. These three rivers were the same rivers that had an adherence rate of less than 90% in 2009.

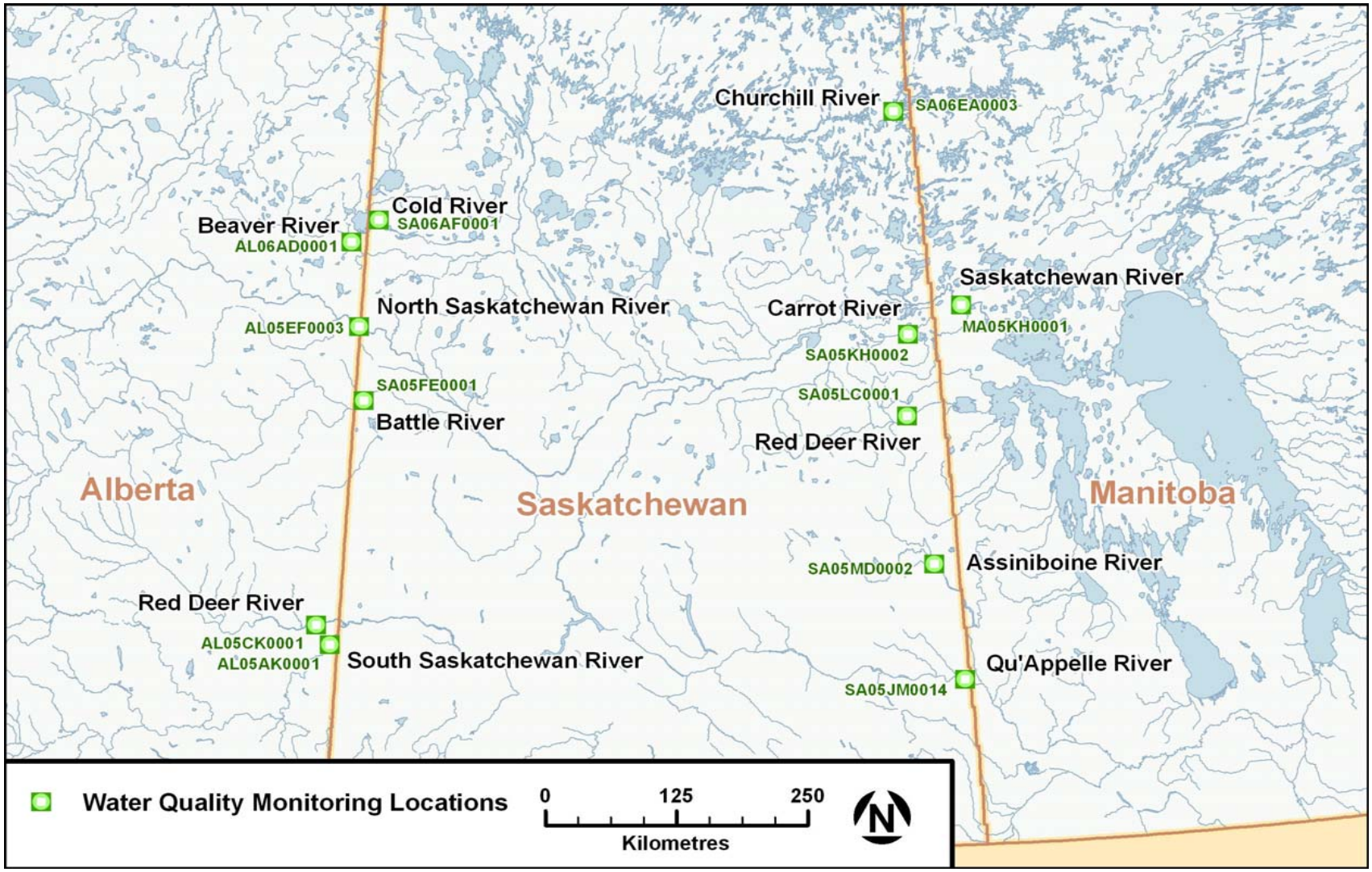


Figure 1 PPWB Water Quality Monitoring Locations

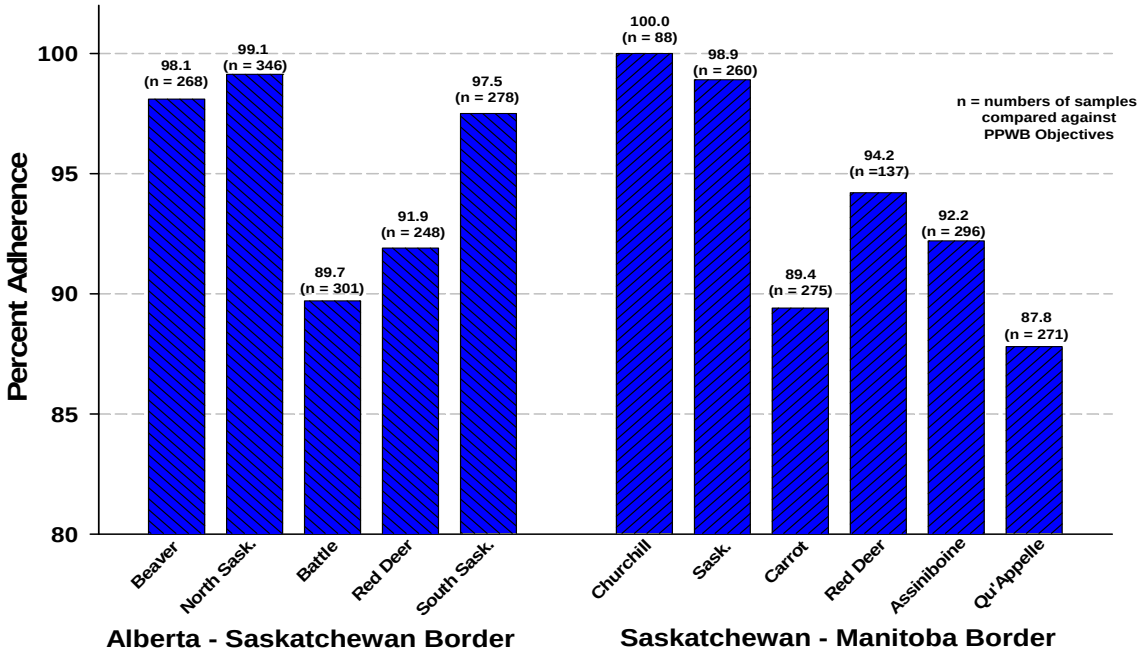


Figure 2 2010 Percent Adherence to PPWB Objectives

Comparison of the adherence rates from 2003 to 2010 shows four rivers (Beaver River, North Saskatchewan River, the South Saskatchewan River and Red Deer River (Manitoba/Saskatchewan) have shown little fluctuation in the adherence rates to site-specific objectives (ranges < 3%); five rivers (Battle, Churchill, Saskatchewan, Carrot and Assiniboine Rivers) have shown more variability, but less than a 5% range in adherence rates (Figure 3). Two of the eleven rivers (Red Deer River (Alberta/Saskatchewan) and the Qu'Appelle River) have shown greater variability in adherence rates with ranges of 9.1 and 7.2% respectively.

In comparison to 2009, the adherence rates in 2010 were generally lower. Nine rivers showed lower overall percent adherence rates to PPWB objectives, one river showed greater percent adherence to PPWB objectives, and one river remained the same. The nine rivers that showed a decrease in the percent adherence rates were the Beaver River (0.2%), North Saskatchewan River (0.6%), Battle River (0.2%), Red Deer River (Alberta/Saskatchewan) (2.0%), South Saskatchewan River (2.5%), Saskatchewan River (0.7 %), Carrot River (0.5%), Red Deer River Saskatchewan/Manitoba (4.5%), and the Assiniboine River (1.0%).

The river that showed a slight increase in the adherence rate between 2009 and 2010 was the Qu'Appelle River (0.7%). The Churchill River remained the same with a 100% adherence to PPWB objectives in 2009 and 2010. These variations in adherence rates are minor, can occur naturally and can be influenced by a number of factors including factors related to climate variability such as flow rates, sediment loading, and groundwater contributions as well as point and non-point inputs into the river. The overall adherence rates and the excursions by parameter are shown in Tables 2 and 3 for the Alberta/Saskatchewan border and the Manitoba/Saskatchewan border respectively.

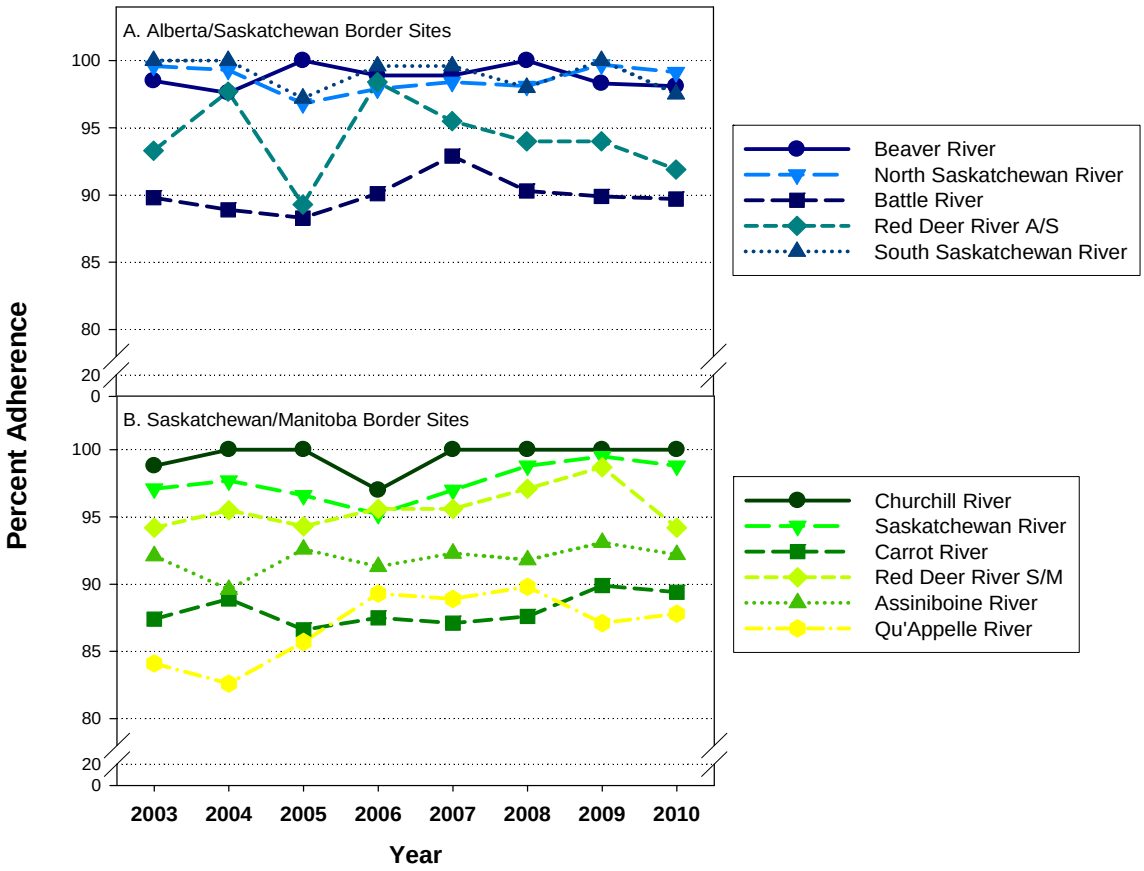


Figure 3 **2003 to 2010 Percent Adherence to PPWB Water Quality Objectives for the Alberta/Saskatchewan (A) and the Saskatchewan Manitoba (B) borders**

Parameter Specific Excursions in 2010

In 2010, a total of 17 parameters exhibited excursions to the PPWB site-specific water quality objectives. Of these 17 parameters, four parameters made up 62% of the total excursions (*i.e.,* number of excursions for a single parameter/total number of excursions for all parameters). These were total phosphorus (25.9%), dissolved manganese (16.7%), sodium (13.6%) and total dissolved solids (5.6%). Historically, these four parameters have also contributed to just over 74%, 61% and 73% of the total excursions in 2009, 2008 and 2007 respectively.

Excursions were also calculated on a parameter by parameter basis for all 11 river reaches to quantify which ones exceeded the water quality objectives (*i.e.* total number of excursions for a parameter / total number of comparisons for that parameter) (Table 4). The four parameters had an excursion rate >20%; total phosphorus (75%), manganese (23.5%), sodium (24.2%) and total dissolved solids (20.9%).

When comparing all the different monitoring sites, 11 parameters exceeded the water quality objectives at >20% of the sites (Table 4). These were in descending order total phosphorus (83.3%), dissolved oxygen 55.6%, dissolved manganese (54.5%), fecal

coliform, total dissolved solids, and aluminum (each with 50%), total copper and dissolved iron (each with 36.4%), sodium (33.3%), zinc and lead (each with 27.3%).

Of the 17 parameters that exceeded water quality objectives, 12 exceeded objectives at more than one site (Table 4). In particular, the total phosphorus objective was exceeded at 5 of the 6 sites. Currently, total phosphorus objectives have only been established at the Saskatchewan/Manitoba border. However, site-specific phosphorus objectives are being developed for all PPWB monitoring sites. Similarly, total dissolved solids exceeded the objective at 2 of the 4 sites on the Alberta/Saskatchewan border. Objectives have not been developed for the Saskatchewan/Manitoba border but the COWQ is currently trying to develop TDS objectives and these are anticipated to be finalized in March 2012.

The number of sites where dissolved oxygen objectives were not met increased to 5 sites in 2010 from 2 sites in 2009. The number of sites with fecal coliform excursions also increased in 2010 to 5 out of the 10 sites monitored for bacteria, in comparison to 2 out of 10 sites in 2009.

Protective Use Excursions in 2010

The PPWB has established site-specific water quality objectives to protect water for different uses including: protection of aquatic life, treatability of the water for drinking water, agricultural uses (irrigation and livestock watering), recreation and consumption of fish (Table 1). In this report, measured parameters were compared to the different water use objectives. Comparison to the consumption of fish objectives were not made because the long-term data are currently being compiled and reviewed. The fish tissue program is currently under review. Radioactive isotope data was also not collected from the six river reaches on the Saskatchewan/Manitoba border although the PPWB has established objectives for these parameters. However, these objectives are being reviewed to determine if they are still necessary.

Of the parameters with protection of aquatic life objectives, eight parameters exceeded water quality objectives including six metals; cadmium (total), chromium (total), copper (total), lead (total), nickel (total), and zinc (total). The other two parameters that did not meet the protection of aquatic life objectives were dissolved oxygen and total ammonia. For dissolved oxygen, four of the six rivers on the Saskatchewan/Manitoba border had an excursion in dissolved oxygen including the Carrot River, Red Deer River, Assiniboine River and Qu'Appelle River. Periodic excursions of dissolved oxygen objectives have occurred in previous years in these rivers. Dissolved oxygen excursions occurred in the open water season in the Qu'Appelle and Carrot Rivers, in the ice-covered season in the Red Deer River, and in the open water and ice-covered seasons in the Assiniboine River. Dissolved oxygen objectives were also not met on the Battle River on the Alberta/Saskatchewan border in July 2010. The total ammonia objective was exceeded in the Beaver River in January 2010 under ice conditions. Total ammonia exceedances are unusual and are not observed frequently at the PPWB transboundary sites. For the Beaver River, the total ammonia concentration was also relatively high in February (although the objective was not exceeded) suggesting that the January measurement was not an isolated event or a sampling/laboratory error. Elevated ammonia concentrations have occurred only once before in the historical record. In January 2010, elevated field pH also contributed to the exceedence of the ammonia objective for the protection of aquatic life objective. Ammonia objectives are calculated with temperature and pH (see Appendix 1).

Six parameters with objectives for the protection of irrigation and/or livestock watering uses were exceeded in 2010: aluminum, manganese, chloride, sodium, sulphate and fecal coliforms. For recreational water use, excursions of water quality objectives for total phosphorus and fecal coliform occurred in 2010. Fecal coliform bacteria exceeded a site-specific objective at 50% of the sites with an objective in 2010. The water quality objective for fecal coliform for the protection of recreational uses was exceeded on the North Saskatchewan River on the Alberta/Saskatchewan border and the Assiniboine River on the Saskatchewan/Manitoba Border. The water quality objective for fecal coliform for the protection of irrigation/livestock uses was exceeded on the Battle River, Red Deer River (Alberta/Saskatchewan) and the South Saskatchewan River. Exceedances of the fecal coliform objective occurred in 50% of the samples collected from the Red Deer River (Alberta/Saskatchewan) in 2010.

Treatability objectives for the protection of drinking water have been established at the PPWB river sites. Similar to 2009, water quality objectives for total dissolved solids, sulphate, iron and manganese were exceeded in 2010. Total dissolved solids, sulphate, iron and manganese can be elevated naturally due to background water chemistry conditions and groundwater inputs but can also be influenced by anthropogenic activities in the watershed.

Conclusion

Site-specific water quality objectives are set at the 11 PPWB river reaches to protect water uses specifically protection of aquatic life, agricultural uses, recreation, drinking water and consumption of fish. The reach-specific water quality objectives were adhered to on average 94% of the time in 2010.

In 2010, eight of the rivers monitored by PPWB had an adherence rate of over 90% to the water quality objectives. This indicates that overall water quality was suitable for most uses at most sites. Slightly lower adherence rates were reported for the Battle River, Carrot River, and the Qu'Appelle River. Water quality objectives are under review for all PPWB sites and future activities of the COWQ will include further investigation of exceedances to the objectives, as necessary.

Generally, each of the eleven rivers has shown little variation in their adherence rates in the last eight years. The largest overall fluctuations in adherence rates over the past eight years were observed on the Red Deer River Alberta/Saskatchewan and the Qu'Appelle River.

Water quality objectives were most frequently exceeded for total phosphorus, dissolved manganese, dissolved sodium and total dissolved solids based on the percentage of excursions. In total, water quality objectives were exceeded for seventeen parameters in 2010. Of these, twelve were exceeded at more than one site. Concentrations of total phosphorus, total dissolved solids, dissolved manganese and other parameters can be influenced by various natural and anthropogenic factors (*e.g.* seasonal runoff and flow, land use and point source effluents *etc.*). Water Quality objectives, long-term records of exceedances of the objectives and statistical trends in the data record are being reviewed by the COWQ as part of a comprehensive review of the water quality objectives.

Table 1 Summary of PPWB Water Quality Objectives by River Reach

PPWB SITE SPECIFIC OBJECTIVES: MASTER AGREEMENT SCHEDULE E

LOCATION		ALBERTA / SASKATCHEWAN BORDER				
SITE		BEAVER RIVER	NORTH SASK. RIVER	BATTLE RIVER	RED DEER RIVER A/S	SOUTH SASK. RIVER
PPWB REPORT SITE NUMBER		2	3	4	5	6
METALS	**UNITS**					
ALUMINUM (total)	mg/L	---	5	5	---	---
ARSENIC (diss)	mg/L	0.05	0.05	0.05	0.05	0.05
BARIUM (total)	mg/L	1	1	1	1	1
BORON (diss)	mg/L	5	5	5	5	5
CADMIUM (total)	mg/L	0.001	0.001	0.001	0.001	0.001
CHROMIUM (total)	mg/L	0.011	0.011	0.011	0.011	0.011
COBALT	mg/L	---	0.05	0.05	1	1
COPPER (total)	mg/L	0.004	0.004	0.004	0.004	0.01
CYANIDE (free)	mg/L	0.005	0.005	0.005	0.005	0.005
IRON (diss)	mg/L	1	0.3	0.3	0.3	1
LEAD (total)	mg/L	0.007	0.007	0.007	0.007	0.02
MANGANESE (diss)	mg/L	0.2	0.05	0.05	0.05	0.05
MERCURY (total)	ug/L	---	---	---	---	---
NICKEL (total)	mg/L	0.1	0.1	0.1	0.025	0.025
SELENIUM (diss)	mg/L	0.001	0.001	0.001	0.001	0.002
SILVER (total)	mg/L	0.0001	---	---	---	---
URANIUM	mg/L	0.02	0.02	0.02	---	---
VANADIUM (TOTAL)	mg/L	---	0.1	0.1	0.1	0.1
ZINC (total)	mg/L	0.03	0.03	0.03	0.03	0.05
NUTRIENTS						
AMMONIA (total)	mg/L	APPENDIX 1	APPENDIX 1	APPENDIX 1	APPENDIX 1	APPENDIX 1
NO2+NO3 (as N)	mg/L	10	10	10	10	10
PHOSPHORUS (total)	mg/L	---	---	---	---	---
MAJOR IONS						
CHLORIDE (diss.)	mg/L	100	100	100	---	---
FLUORIDE (diss)	mg/L	1.5	1.5	1.5	1.5	1.5
SODIUM (diss)	mg/L	100	100	100	---	---
SULPHATE (diss)	mg/L	500	500	500	500	500
TOTAL DISS. SOLIDS	mg/L	---	500	500	500	500
BIOTA						
FECAL COLIFORM	NO/dL	100/100ml	100/100ml	100/100ml	100/100ml	100/100ml
PHYSICALS						
pH	pH Units	6.5-9.0	6.5-9.0	6.5-9.0	---	---
OXYGEN (diss)	mg/L	OW 6.0	6.5	OW 6.0	---	---
SAR	mg/L	---	---	---	3	3
PESTICIDES/CONTAMI---NTS						
LINDANE	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001
2,4-D	mg/L	0.004	0.004	0.004	0.004	0.004
2,4,5-TP	mg/L	0.01	0.01	0.01	0.01	0.01
CHLORINE	mg/L	0.002	0.002	0.002	---	---
CHLOROPHENOLS (total)	mg/L	0.001	0.001	0.001	0.001	0.001
PCP	mg/L	0.0005	0.0005	0.0005	---	---
MERCURY IN FISH	ug/g TISSUE	0.5	0.5	0.5	0.5	0.5
PCB IN FISH	ug/g TISSUE	2	2	2	2	2
RADIOACTIVE						
CESIUM-137	Bq/L	---	---	---	---	---
IODINE-131	Bq/L	---	---	---	---	---
RADIUM-226	Bq/L	---	---	---	---	---
STRONTIUM-90	Bq/L	---	---	---	---	---
TRITIUM	Bq/L	---	---	---	---	---

Protection of Aquatic Life
Treatability
Irrigation/Livestock
Recreation
Fish Consumption

Notes:
= --- No PPWB Objectives
OW = Open Water Objectives

Table 1 Summary of PPWB Water Quality Objectives by River Reach (continued)

PPWB SITE SPECIFIC OBJECTIVES: MASTER AGREEMENT SCHEDULE E

LOCATION		SASKATCHEWAN / MANITOBA BORDER					
SITE		CHURCHILL RIVER	SASK. RIVER	CARROT RIVER	RED DEER RIVER S/M	ASSINIBOINE RIVER	QU'APPELLE RIVER
PPWB REPORT SITE NUMBER		7	8	9	10	11	12
METALS	**UNITS**						
ALUMINUM (total)	mg/L	---	---	---	---	---	---
ARSENIC (diss)	mg/L	0.05	0.05	0.05	0.05	0.05	0.05
BARIUM (total)	mg/L	1	1	1	1	1	1
BORON (diss)	mg/L	5	0.5	2	5	2	2
CADMIUM (total)	mg/L	0.00058	0.001	0.001	0.00058	0.001	0.001
CHROMIUM (total)	mg/L	0.011	0.011	0.011	0.011	0.011	0.011
COBALT	mg/L	---	---	---	---	---	---
COPPER (total)	mg/L	0.0057	0.01	0.01	0.01	0.01	0.01
CYANIDE (free)	mg/L	0.005	0.005	0.005	0.005	0.005	0.005
IRON (diss)	mg/L	0.3	0.3	0.3	0.3	0.3	0.3
LEAD (total)	mg/L	0.011	0.0061	0.015	0.0118	0.02	0.02
MANGANESE (diss)	mg/L	0.05	0.05	0.05	0.05	0.05	0.05
MERCURY (total)	ug/L	---	---	---	---	---	0.006
NICKEL (total)	mg/L	0.025	0.1	0.1	0.1	0.1	0.1
SELENIUM (diss)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
SILVER (total)	mg/L	---	---	---	---	---	---
URANIUM	mg/L	0.02	0.02	0.02	0.02	0.02	0.02
VANADIUM (TOTAL)	mg/L	---	---	---	---	---	---
ZINC (total)	mg/L	0.047	0.047	0.047	0.047	0.047	0.047
NUTRIENTS							
AMMONIA (total)	mg/L	APPENDIX 1	APPENDIX 1	APPENDIX 1	APPENDIX 1	APPENDIX 1	APPENDIX 1
NO2+NO3 (as N)	mg/L	10	10	10	10	10	10
PHOSPHORUS (total)	mg/L	0.05	0.05	0.05	0.05	0.05	---
MAJOR IONS							
CHLORIDE (diss.)	mg/L	250	68	100	100	100	100
FLUORIDE (diss)	mg/L	1.5	1	1	1	1	1
SODIUM (diss)	mg/L	300	100	100	100	100	100
SULPHATE (diss)	mg/L	500	250	500	500	500	500
TOTAL DISS. SOLIDS	mg/L	---	---	---	---	---	---
BIOTA							
FECAL COLIFORM	NO/dL	200/100ml	200/100ml	200/100ml	200/100ml	200/100ml	100/100ml
PHYSICALS							
pH	pH Units	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
OXYGEN (diss)	mg/L	6.5	6.5	OW 6.5	6	6	6
SAR	mg/L	---	---	---	---	---	---
PESTICIDES/CONTAMINANTS							
LINDANE	mg/L	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
2,4-D	mg/L	0.004	0.004	0.004	0.004	0.004	0.004
2,4,5-TP	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
CHLORINE	mg/L	0.002	0.002	0.002	0.002	0.002	0.002
CHLOROPHENOLS (total)	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
PCP	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
MERCURY IN FISH	ug/g TISSUE	0.2	0.2	0.5	0.5	0.5	0.5
PCB IN FISH	ug/g TISSUE	2	2	2	2	2	2
RADIOACTIVE							
CESIUM-137	Bq/L	50	50	50	50	50	50
IODINE-131	Bq/L	10	10	10	10	10	10
RADIUM-226	Bq/L	1	1	1	1	1	1
STRONTIUM-90	Bq/L	10	10	10	10	10	10
TRITIUM	Bq/L	40000	40000	40000	40000	40000	40000

Protection of Aquatic Life
Treatability
irrigation/Livestock
Recreation
Fish Consumption

Notes:
= --- No PPWB Objectives
OW = Open Water Objectives

Table 2 Summary of PPWB Excursions for the Alberta-Saskatchewan Border 2010

LOCATION		ALBERTA / SASKATCHEWAN BORDER				
SITE		BEAVER RIVER	NORTH SASK. RIVER	BATTLE RIVER	RED DEER RIVER A/S	SOUTH SASK. RIVER
PPWB REPORT SITE NUMBER		2	3	4	5	6
		number excursions (number of tests)				
METALS	**UNITS**					
ALUMINUM (total)	mg/L	---	0	1 (12)	---	---
ARSENIC (diss)	mg/L	0	0	0	0	0
BARIUM (total)	mg/L	0	0	0	0	0
BORON (diss)	mg/L	0	0	0	0	0
CADMIUM (total)	mg/L	0	0	0	0	1 (12)
CHROMIUM (total)	mg/L	0	0	0	2 (12)	1 (12)
COBALT	mg/L	---	0	0	0	0
COPPER (total)	mg/L	0	2 (12)	4 (12)	7 (12)	1 (12)
CYANIDE (free)	mg/L	ND	ND	ND	ND	ND
IRON (diss)	mg/L	1 (12)	0	2 (12)	0	0
LEAD (total)	mg/L	0	0	2 (12)	2 (12)	1 (12)
MANGANESE (diss)	mg/L	3 (12)	0	2 (12)	0	0
MERCURY (total)	*ug/L*	---	---	---	---	---
NICKEL (total)	mg/L	0	0	0	2 (12)	1 (12)
SELENIUM (diss)	mg/L	0	0	0	0	0
SILVER (total)	mg/L	0	---	---	---	---
URANIUM	mg/L	0	0	0	---	---
VANADIUM (TOTAL)	mg/L	---	0	0	0	0
ZINC (total)	mg/L	0	0	2 (12)	2 (12)	1 (12)
NUTRIENTS						
AMMONIA (total)	mg/L	1 (12)	0	0	0	0
NO2+NO3 (as N)	mg/L	0	0	0	0	0
PHOSPHORUS (total)	mg/L	---	---	---	---	---
MAJOR IONS						
CHLORIDE (diss.)	mg/L	0	0	0	---	---
FLUORIDE (diss)	mg/L	0	0	0	0	0
SODIUM (diss)	mg/L	0	0	8 (11)	---	---
SULPHATE (diss)	mg/L	0	0	0	0	0
TOTAL DISS. SOLIDS	mg/L	---	0	8 (11)	1 (12)	0
BIOTA						
FECAL COLIFORM	*NO/dL*	0	1 (11)	1 (12)	4 (8)	1 (8)
PHYSICALS						
pH	*pH Units*	0	0	0	---	---
OXYGEN (diss)	mg/L	0 (* 2 under ice)	0	1 (*3 under ice)	---	---
SAR	mg/L	---	---	---	0	0
PESTICIDES/CONTAMINANTS						
LINDANE	mg/L	ND	0	ND	ND	0
2,4-D	mg/L	ND	0	ND	ND	0
2,4,5-TP	mg/L	ND	0	ND	ND	0
CHLORINE	mg/L	ND	ND	ND	---	---
CHLOROPHENOLS (total)	mg/L	ND	ND	ND	ND	ND
PCP	mg/L	ND	ND	ND	---	---
MERCURY IN FISH	*ug/g MUSCLE TISSUE*	ND	ND	ND	ND	ND
PCB IN FISH	*ug/g MUSCLE TISSUE*	ND	ND	ND	ND	ND
RADIOACTIVE						
CESIUM-137	*Bq/L*	---	---	---	---	---
IODINE-131	*Bq/L*	---	---	---	---	---
RADIUM-226	*Bq/L*	---	---	---	---	---
STRONTIUM-90	*Bq/L*	---	---	---	---	---
TRITIUM	*Bq/L*	---	---	---	---	---
No. Excursion Comparisons		**268**	**346**	**301**	**248**	**278**
Total No. Excursions Observed		**5**	**3**	**31**	**20**	**7**
Sampling Frequency (no./year)		**12**	**12**	**12**	**12**	**12**
Overall Adherence Rate		**98.13**	**99.13**	**89.7**	**91.94**	**97.48**

"---" = no objective

ND = no data to compare to objective; PPWB approved monitoring plan for 2010 did not include these parameters

*** Low Dissolved Oxygen conditions recorded under ice cover**

[+] Fecal Coliform and/or Pesticide sampling frequency reduced to 8X per year during open water.

Table 3 Summary of PPWB Excursions for the Saskatchewan-Manitoba Border 2010

LOCATION		SASKATCHEWAN / MANITOBA BORDER					
SITE		CHURCHILL RIVER	SASK. RIVER	CARROT RIVER	RED DEER RIVER S/M	ASSINIBOINE RIVER	QU'APPELLE RIVER
PPWB REPORT SITE NUMBER		7	8	9	10	11	12
		number excursions (number of tests)					
METALS	**UNITS**						
ALUMINUM (total)	mg/L	---	---	---	---	---	---
ARSENIC (diss)	mg/L	0	0	0	0	0	0
BARIUM (total)	mg/L	0	0	0	0	0	0
BORON (diss)	mg/L	0	0	0	0	0	0
CADMIUM (total)	mg/L	0	0	0	0	0	0
CHROMIUM (total)	mg/L	0	0	0	0	0	0
COBALT	mg/L	---	---	---	---	---	---
COPPER (total)	mg/L	0	0	0	0	0	0
CYANIDE (free)	mg/L	ND	ND	ND	ND	ND	ND
IRON (diss)	mg/L	0	0	2 (11)	0	0	1 (12)
LEAD (total)	mg/L	0	0	0	0	0	0
MANGANESE (diss)	mg/L	0	0	9 (11)	2 (12)	7 (11)	4 (12)
MERCURY (total)	ug/L	---	---	---	---	---	ND
NICKEL (total)	mg/L	0	0	0	0	0	0
SELENIUM (diss)	mg/L	0	0	0	0	0	0
SILVER (total)	mg/L	---	---	---	---	---	---
URANIUM	mg/L	0	0	0	0	0	0
VANADIUM (TOTAL)	mg/L	---	---	---	---	---	---
ZINC (total)	mg/L	0	0	0	0	0	0
NUTRIENTS							
AMMONIA (total)	mg/L	0	0	0	0	0	0
NO2+NO3 (as N)	mg/L	0	0	0	0	0	0
PHOSPHORUS (total)	mg/L	0	3 (12)	10 (10)	5 (6)	12 (12)	12 (12)
MAJOR IONS							
CHLORIDE (diss.)	mg/L	0	0	2 (11)	0	0	0
FLUORIDE (diss)	mg/L	0	0	0	0	0	0
SODIUM (diss)	mg/L	0	0	2 (11)	0	0	12 (12)
SULPHATE (diss)	mg/L	0	0	0	0	0	3 (12)
TOTAL DISS. SOLIDS	mg/L	---	---	---	---	---	---
BIOTA							
FECAL COLIFORM	NO/dL	ND	0	0	0	1 (9)	0
PHYSICALS							
pH	pH Units	0	0	0	0	0	0
OXYGEN (diss)	mg/L	0	0	4 (8)(* + 2 under ice)	1 (6)	3 (11)	1 (11)
SAR	mg/L	---	---	---	---	---	---
PESTICIDES/CONTAMINANTS							
LINDANE	mg/L	ND	ND	0	ND	0	ND
2,4-D	mg/L	ND	ND	0	ND	0	ND
2,4,5-TP	mg/L	ND	ND	0	ND	0	ND
CHLORINE	mg/L	ND	ND	ND	ND	ND	ND
CHLOROPHENOLS (total)	mg/L	ND	ND	ND	ND	ND	ND
PCP	mg/L	ND	ND	ND	ND	ND	ND
MERCURY IN FISH	ug/g TISSUE	ND	ND	ND	ND	ND	ND
PCB IN FISH	ug/g TISSUE	ND	ND	ND	ND	ND	ND
RADIOACTIVE							
CESIUM-137	Bq/L	ND	ND	ND	ND	ND	ND
IODINE-131	Bq/L	ND	ND	ND	ND	ND	ND
RADIUM-226	Bq/L	ND	ND	ND	ND	ND	ND
STRONTIUM-90	Bq/L	ND	ND	ND	ND	ND	ND
TRITIUM	Bq/L	ND	ND	ND	ND	ND	ND
No. Excursion Comparisons		**88**	**260**	**275**	**137**	**296**	**271**
Total No. Excursions Observed		**0**	**3**	**29**	**8**	**23**	**33**
Sampling Frequency (no./year)		**4**	**12**	**11**	**6**	**12**	**12**
Overall Adherence Rate		**100.0**	**98.85**	**89.42**	**94.16**	**92.23**	**87.82**

"---" = no objective

ND = no data to compare to objective; PPWB approved monitoring plan for 2010 did not include these parameters

*** Low Dissolved Oxygen conditions recorded under ice cover**

[+] Fecal Coliform and/or Pesticide sampling frequency reduced to 8X per year during open water.

Table 4 Summary of PPWB 2010 Excursions by Parameter.

(Parameters and sites with % excursions > 20 are highlighted in grey. Blank cells are parameters with no excursions in 2010).

		EXCURSION SUMMARY			SITE SUMMARY	
Parameters	**Protective Uses**	TOTAL NUMBER EXCURSIONS (# SAMPLES)	% EXCURSIONS		NUMBER SITES WITH EXCURSIONS (# SITES)	% SITES WITH EXCURSIONS
METALS						
ALUMINUM (total)	**Irrigation/Livestock**	**1 (24)**	**4.17**		**1 (2)**	**50**
ARSENIC (diss)						
BARIUM (total)						
BORON (diss)						
CADMIUM (total)	**Protection of Aquatic Life**	**1 (115)**	**0.9**		**1 (11)**	**9.1**
CHROMIUM (total)	**Protection of Aquatic Life**	**3 (115)**	**2.6**		**2 (11)**	**18.2**
COBALT						
COPPER (total)	**Protection of Aquatic Life**	**14 (115)**	**12.2**		**4 (11)**	**36.4**
CYANIDE (free)						
IRON (diss)	**Treatability**	**6 (115)**	**5.2**		**4 (11)**	**36.4**
LEAD (total)	**Protection of Aquatic Life**	**5 (115)**	**4.4**		**3 (11)**	**27.3**
MANGANESE (diss)	**Treatability/Irr/Livestock**	**27 (115)**	**23.5**		**6 (11)**	**54.5**
MERCURY (total)						
NICKEL (total)	**Protection of Aquatic Life**	**3 (115)**	**2.6**		**2 (11)**	**18.2**
SELENIUM (diss)						
SILVER (total)						
URANIUM						
VANADIUM (TOTAL)						
ZINC (total)	**Protection of Aquatic Life**	**5 (115)**	**4.4**		**3 (11)**	**27.3**
NUTRIENTS						
AMMONIA (total)	**Protection of Aquatic Life**	**1 (116)**	**0.9**		**1 (12)**	**8.3**
NO2+NO3 (as N)						
PHOSPHORUS (total)	**Recreation**	**42 (56)**	**75.0**		**5 (6)**	**83.3**
MAJOR IONS						
CHLORIDE (diss.)	**Irrigation/Livestock**	**2 (91)**	**2.2**		**1 (9)**	**11.1**
FLUORIDE (diss)						
SODIUM (diss)	**Irrigation/Livestock**	**22 (91)**	**24.2**		**3 (9)**	**33.3**
SULPHATE (diss)	**Treatability/Irr/Livestock**	**3 (115)**	**2.6**		**1 (11)**	**9.1**
TOTAL DISS. SOLIDS	**Treatability**	**9 (43)**	**20.9**		**2 (4)**	**50.0**
BIOTA						
FECAL COLIFORM	**Irrigation/Livestock/Recreation**	**8 (88)**	**9.1**		**5 (10)**	**50.0**
PHYSICALS						
pH						
OXYGEN (diss)	**Protection of Aquatic Life**	**10 (81)**	**12.4**		**5 (9)**	**55.6**
SAR						
PESTICIDES/ CONTAMINANTS						
LINDANE						
2,4-D						
2,4,5-TP						
CHLORINE		*na*	*na*		*na*	*na*
CHLOROPHENOLS (total)		*na*	*na*		*na*	*na*
PCP		*na*	*na*		*na*	*na*
MERCURY IN FISH		*na*	*na*		*na*	*na*
PCB IN FISH		*na*	*na*		*na*	*na*
RADIOACTIVE						
CESIUM-137		*na*	*na*		*na*	*na*
IODINE-131		*na*	*na*		*na*	*na*
RADIUM-226		*na*	*na*		*na*	*na*
STRONTIUM-90		*na*	*na*		*na*	*na*
TRITIUM		*na*	*na*		*na*	*na*

Appendix 1

Total Ammonia Objectives Based on Temperature and pH

Total Ammonia Nitrogen (mg/L) **

The toxicity of ammonia relates primarily to the un-ionized form (NH_3). The concentration of un-ionized ammonia present in water increases with pH and temperature. The values below represent total ammonia-nitrogen concentrations (at various temperatures and pH levels) above which accompanying NH_3 concentrations may be harmful to aquatic life.

Total Ammonia (NH_3 + NH_4+)

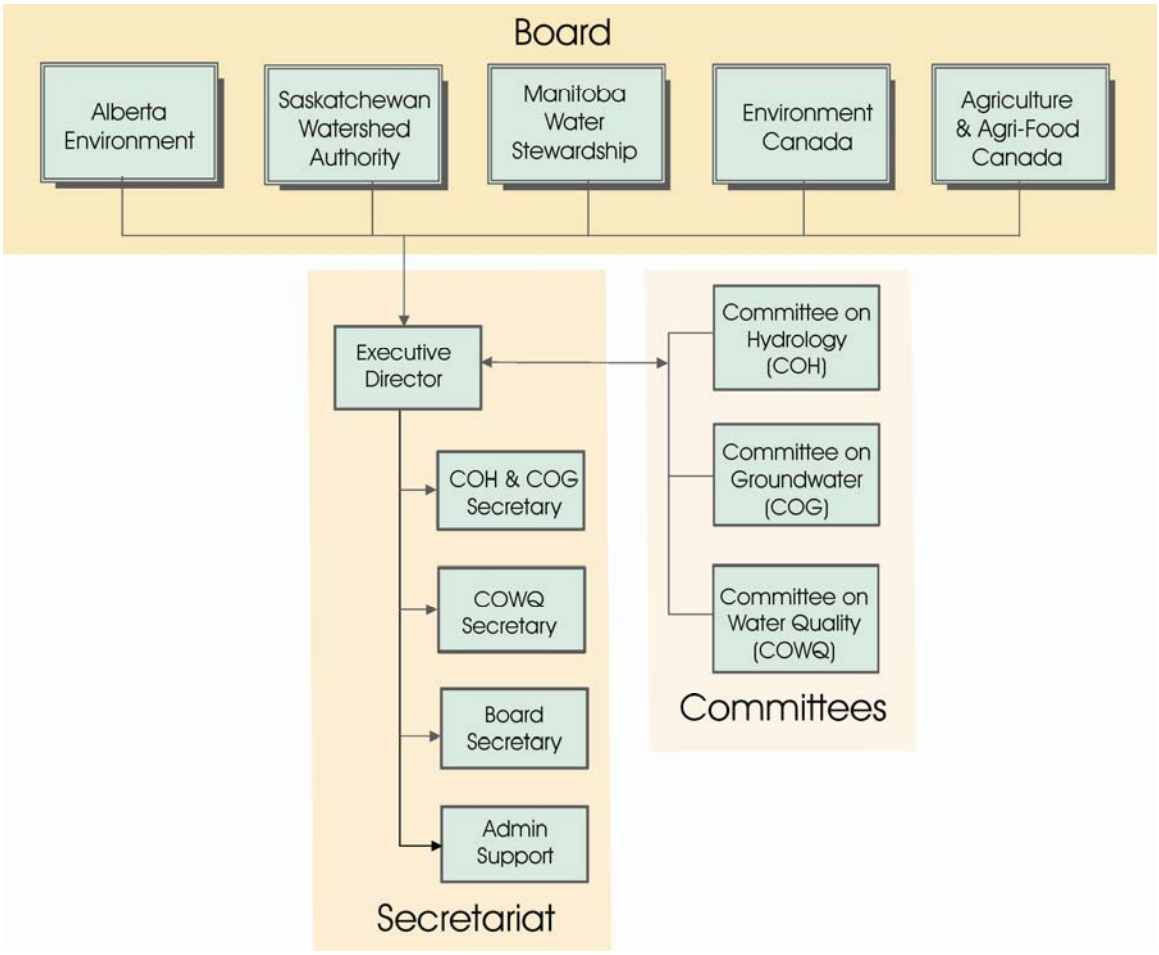
(Maximum levels expressed as N at various pH/temperature conditions)

Toxicity of Ammonia under varying Temperature and pH Conditions Water Temperature (°C) / pH (pH units)							
	0°	**5°**	**10°**	**15°**	**20°**	**25°**	**30°**
6.50	2.06	1.97	1.81	1.81	1.22	0.85	0.60
6.75	2.06	1.97	1.81	1.81	1.22	0.85	0.61
7.00	2.06	1.97	1.81	1.81	1.22	0.85	0.61
7.25	2.06	1.97	1.81	1.81	1.23	0.86	0.61
7.50	2.06	1.97	1.81	1.81	1.23	0.87	0.62
7.75	1.89	1.81	1.73	1.64	1.15	0.81	0.58
8.00	1.26	1.18	1.13	1.09	0.76	0.54	0.39
8.25	0.72	0.67	0.64	0.62	0.44	0.32	0.23
8.50	0.40	0.39	0.37	0.37	0.26	0.19	0.15
8.75	0.23	0.22	0.21	0.22	0.16	0.12	0.09
9.00	0.13	0.13	0.13	0.13	0.11	0.08	0.06

** Excerpt from the "Surface Water Quality Objectives", Water Quality Branch Saskatchewan Environment and Public Safety, November, 1988 (WQ 110)

APPENDIX V

PPWB Organizational Chart



APPENDIX VI

Board / Committee Membership 2010 - 2011

PRAIRIE PROVINCES WATER BOARD

Manitoba, Saskatchewan, Alberta and Canada agree to establish and there is hereby established a Board to be known as the Prairie Provinces Water Board to consist of five members to be appointed as follows:

(a) two members to be appointed by the Governor General in Council, one of whom shall be Chairman of the Board, on the recommendation of the Minister of Energy, Mines and Resources,

(b) one member to be appointed by the Lieutenant Governor in Council of each of the Provinces of Manitoba, Saskatchewan and Alberta.

Schedule C, Section 1
Master Agreement on Apportionment

PPWB BOARD MEMBERS

CHAIR

R. Cripps	Regional Director General Prairie and Northern Region Environment Canada

REGULAR BOARD MEMBERS

Alan Parkinson (May/10 to May/11)	Acting Director General Agri-Environmental Adaptation and Practice Change Agri-Environment Services Branch Agriculture and Agri-Food Canada
David Phillips (Jan to May/10)	Director General Agri-Environmental Adaptation and Practice Change Agri-Environment Services Branch Agriculture and Agri-Food Canada
R. P. Harrison	Lead Transboundary Secretariat Alberta Environment
S.D. Topping	Executive Director Regulatory and Operational Services Division Manitoba Water Stewardship
W.L. Dybvig	President Saskatchewan Watershed Authority

SECRETARIAT

EXECUTIVE DIRECTOR	M. Renouf	Transboundary Waters Unit Environment Canada
SECRETARY	M. Williamson	Transboundary Waters Unit Environment Canada

PPWB ALTERNATE BOARD MEMBERS

M. Norton	Director Strategic Integration and Partnerships Environment Canada
Rick Butts	Director General Agri-Environmental Knowledge, Innovation and Technology Agri-Environment Services Branch Agriculture and Agri-Food Canada
S. Figliuzzi (Apr/10 to Mar/11)	Section Head Transboundary Secretariat Alberta Environment
Brian Yee (Mar/11)	Transboundary Water Specialist Transboundary Secretariat Alberta Environment
D. Williamson	Assistant Deputy Minister Ecological Services Division Manitoba Water Stewardship

COMMITTEE ON HYDROLOGY

Terms of Reference: Mandate

At the request of, and under the direction of the PPWB, the Committee on Hydrology (COH) shall investigate, oversee, review, report and recommend on matters pertaining to hydrology of interprovincial or interjurisdictional basins.

The committee may consider such things as natural flow; forecasting; network design; collection, processing and transmission of data; basin studies and other items of interprovincial interest involving hydrology.

The COH will engage the Committee on Groundwater and the Committee on Water Quality on items of mutual interest or when the expertise of those committees will assist the COH.

PPWB Board Minute 92-65 (Oct. 7, 2009)

CHAIR	M. Renouf	Executive Director Prairie Provinces Water Board
MEMBERS	Vacant	Water Survey Division Environment Canada
	R. Woodvine	Agri-Environment Services Branch Agriculture and Agri-Food Canada
	B. Yee (Mar/11)	Transboundary Secretariat Alberta Environment
	S. Figliuzzi (Apr/10 to Mar/11)	Transboundary Secretariat Alberta Environment
	R.W. Harrison	Water Science and Management Branch Manitoba Water Stewardship
	D. Johnson	Basin Operations Saskatchewan Watershed Authority
	N. Taylor	Meteorological Service of Canada Environment Canada
SECRETARY		
	B. Yee Apr to Dec/10	Transboundary Waters Unit Environment Canada
	V. Khanna Jan to Mar/11	Transboundary Waters Unit Environment Canada

COMMITTEE ON WATER QUALITY

Terms of Reference: Mandate

Under the direction of the Prairie Provinces Water Board (PPWB), the Committee on Water Quality (COWQ) shall investigate, oversee, review, report, recommend and advise the Board on matters pertaining to the water quality and aquatic ecosystem integrity of interprovincial waters.

The responsibilities of the committee shall include directing, planning, and coordinating a water quality monitoring and trend assessment program by identifying monitoring requirements and overseeing transboundary monitoring and synoptic surveys. The committee shall promote an ecosystem approach to water quality management and the protection and enhancement of interprovincial waters by ensuring the compatibility of water quality guidelines, objectives, sampling and analytical protocols, monitoring approaches, quality assurance and data bases. It shall interpret data and identify, investigate and define existing and potential interprovincial water quality problems through the application of PPWB Water Quality Objectives, trend assessment and other approaches. The committee shall inform the Board and member agencies, through the PPWB contingency plan, of any spills or unusual water quality conditions that have the potential to adversely affect interprovincial streams. It shall assess the implications of these problems and may recommend remedial or preventative measures for avoiding and resolving water quality issues and if required, additional synoptic water quality monitoring.

The committee shall foster awareness and understanding of the importance of effective water quality management, encourage the use of "state of the art" procedures for evaluating water quality and identify research needs pertinent to water quality management on the prairies. The committee shall facilitate effective water quality management practices through integration of agency initiatives and the promotion of joint planning on interprovincial streams.

The COWQ will engage the Committee on Hydrology and the Committee on Groundwater on items of mutual interest or when the expertise of those committees will assist COWQ.

PPWB Board Minute 92-65 (Oct. 7, 2009)

CHAIR	M. Renouf	Executive Director Prairie Provinces Water Board
MEMBERS	D.B. Donald	Prairie and Northern Water Quality Monitoring Environment Canada
	N. Armstrong	Water Science and Management Branch Manitoba Water Stewardship
	T. Hanley	Watershed Monitoring and Assessment Saskatchewan Watershed Authority
	R. Casey	Water Policy Branch Alberta Environment
	B. Schutzman	Agri-Environment Services Branch Agriculture and Agri-Food Canada
SECRETARY	J. Sketchell	Transboundary Waters Unit Environment Canada

COMMITTEE ON GROUNDWATER

Terms of Reference: Mandate

Recognizing the inter-relationship between surface and groundwater, the Committee on Groundwater shall, at the request of, and under the direction of the Prairie Provinces Water Board, investigate, oversee, review, report, and recommend on matters pertaining to quantity and quality of groundwater at or near interprovincial boundaries.

Responsibilities of the committee may include: exchange of information; compilation and interpretation of existing data; recommendations on groundwater information and monitoring requirements; determination of implications of proposed projects which may impact the quantity and/or quality of waters at interprovincial boundaries; and other items of interjurisdictional interest involving groundwater.

The COG will engage the Committee on Hydrology and the Committee on Water Quality on items of mutual interest or when the expertise of those committees will assist the COG.

PPWB Board Minute 92-65 (Oct. 7, 2009)

CHAIR	M. Renouf	Executive Director Prairie Provinces Water Board
MEMBERS	G. van der Kamp	Groundwater Hydrology Water Science and Technology Directorate Environment Canada
	A. Cowen	Agri-Environment Services Branch Agriculture and Agri-Food Canada
	R. George	Water Policy Branch Alberta Environment
	N. Shaheen	Groundwater Management Saskatchewan Watershed Authority
	R. Betcher	Groundwater Management Section Water Sciences and Management Branch Manitoba Water Stewardship
SECRETARY		
	B. Yee Apr to Dec/10	Transboundary Waters Unit Environment Canada
	V. Khanna Jan to Mar/11	Transboundary Waters Unit Environment Canada

APPENDIX VII

Statement of Final Expenditures 2010 - 2011

	Budget 2010 - 2011	Expended March 31 2011
Salary Component		
Person Years	4.7	4.61
Total Salary & Benefits	$489,103	$481,532
O&M Component		
Students & Contracts		
Goal 1		
Cont. Improvement	$40,000	$51,605
Modernization	$100,000	$9,975
Goal 2		
Cont. Improvement	$20,000	$4,182
Goal 3		
Cont. Improvement	$100,000	$77,408
Goal 6		
Cont. Improvement	$0	$9,605
Goal 7		
Cont. Improvement	$10,000	$11,480
Sub-total Students & Contracts	$270,000	$164,255
Operating Expenses	$25,400	$43,891
Total O&M	$295,400	$208,146
Grand Total	$784,503	$689,678

Notes:

- Salary: Leslie Rankin appointed to replace Glenda Mason who retired. Vir Khanna replaced Brian Yee as Senior Engineering Advisor on Acting basis.
- Goal 1 Modernization Expense is for Optimal Solutions contract.
- Goal 2: Includes Travel Expense to UNESCO conference
- Goal 6. Costs include PPWB website development and hosting.
- Goal 7: Expenses include *MAA* resiliency workshop facilitation.
- All other Goal expenses are student salaries.

APPENDIX VIII

History of the PPWB

The Prairie Provinces Water Board was formed on July 28, 1948 when Canada and the Provinces of Alberta, Saskatchewan, and Manitoba signed the *Prairie Provinces Water Board Agreement*. This Agreement established a Board to recommend the best use of interprovincial waters, and to recommend allocations between provinces.

From 1948 to 1969, the Engineering Secretary to the Board was a Prairie Farm Rehabilitation Administration employee. The support staff for studies and office accommodation during these years was provided by the PFRA in Regina at no charge.

After some twenty years, changes in regional water management philosophies resulted in a need to modify the role of the Board. Consequently, the four governments entered into the *MAA* on October 30, 1969. This Agreement provided an apportionment formula for eastward flowing interprovincial streams, gave recognition to the problem of water quality, and reconstituted the Prairie Provinces Water Board.

The *MAA* has five schedules which form part of the Agreement. These Schedules are:

1. Schedule A. An apportionment agreement between Alberta and Saskatchewan.

2. Schedule B. An apportionment agreement between Saskatchewan and Manitoba.

3. Schedule C. The Prairie Provinces Water Board Agreement describes the composition, functions and duties of the Board.

4. Schedule D. A list of Orders-in-Council for allocations of interprovincial waters made before 1969.

5. Schedule E. A Water Quality Agreement describes the role of the PPWB in interprovincial water quality management and established Water Quality Objectives for 11 interprovincial river reaches. This Schedule became part of the Master Agreement in 1992.

Under Schedule C, the Prairie Provinces Water Board was reconstituted and was given the responsibility of administering the agreement. Schedule C also provided for the necessary board staff, accommodation, and supplies to be jointly financed by the four participating governments. Following the reconstitution of the PPWB, the members also agreed to the establishment of a semi-autonomous Board Secretariat.

The PPWB's change in administration policy was implemented when an Executive Director was appointed on July 1, 1972. The by-laws, rules, and procedures also became effective on this date.

On April 2, 1992, the *MAA* was amended to include a *Water Quality Agreement* that became Schedule E to

the Master Agreement. The Agreement sets water quality objectives at 11 interprovincial river reaches and commits each of the Parties to take reasonable and practical measures to maintain or improve existing water quality to mutually acceptable levels.

At the Board's March 1995 meeting, the Board agreed that full time Secretariat staff was no longer necessary and that functional support would be provided by staff of Environment Canada. The process of disbanding the PPWB Secretariat and integrating its functions into Environment Canada was completed during 1995-1996. The portion of time each Environment Canada staff person spends on PPWB activities is charged to the PPWB and cost-shared by the members.

The Board currently operates through its Executive Director, supported by three standing committees – the Committee on Hydrology, the Committee on Groundwater, and the Committee on Water Quality.

The Board approves an annual PPWB budget with one-half the operating budget being provided by Canada and one-sixth by each of the three provinces. The Government of Canada is responsible to conduct and pay for the costs of water quantity and quality monitoring.

In 2008, a costed multi-year Work Plan was approved by the Board to identify activities and projected budgets for 2008 – 2013. Activities in this Work Plan are directed to achieving the seven goals that were identified in the 2006 Strategic Plan that fulfill the vision, mission and key deliverables that are outlined in the 2006 Charter. Activities are targeted towards assessing whether the commitments made in the *MAA* have been met by the Signatory Parties (Government of Canada, and Provinces of Alberta, Saskatchewan and Manitoba).

In February 2009, the *MAA*, By-laws, and Rules and Procedures were published in an updated document that included all changes made to date.

Prairie Provinces Water Board
2365 Albert Street, Room 300
Regina, Saskatchewan
S4P 4K1

PPWB Web Site address:
http://www.pnr-rpn.ec.gc.ca/water/fa01/index.en.html