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International Souris River Board  
Quilt Inn  
10722 Lake Loop Rd, Bottineau, ND  
1-701-263-6500  
June 26, 2019

### **Final Minutes**

#### **Board Members:**

Garland Erbele, Nicole Armstrong, Frank Durbian, Mark Lee, Dave Pattyson, Gregg Wiche, Debbie McMechan, Lorinda Haman, Jeff Woodward, John Fahlman, Scott Gangl, Ken Bottle, Shelly Wepler, Col. Samuel Calkins, Joe Goodwill, Bruce Davison.

**Via Conference Call:** Russell Boals.

**Regrets:** Allen Schlag, John-Mark Davies and David O'Connell.

#### **Attendees:**

Wayne Jenkinson, Mark Gabriel, Pierre Beland, Brian Caruso, Catherine Lee-Johnson, Jane Corwin, Steve Robinson, Lance Yohe, Robert Sisson, Darin Schepp, Heather Husband, Dorothy Lindeman, Dan Jonasson, Laura Ackerman, Laura Diamond, Kevin Wilson, Tim Ma, Corey Hein, Rebecca Seal-Soileau, Scott Jutila, Darrell Haman, Eric Cameron, Henry Murkin, Jim Olson, Girma Sahlu, Darrel Corkal, Angela Gregory, Rebecca Koch, Al Pietroniro, Wanda McFadyen, Jessica Howell, Brian Works, Tony Paglias, Chris Laveau, Joel Gallaway, Ryan Ackerman, Michael Bart, Tim Fay, Brad Kirbyson.

#### 1. Introduction and Opening Remarks.

Garland Erbele opened the meeting at 8:35 a.m. extending welcome wishes to all attendees including the new IJC Commissioners. Ms. Jane Corwin, IJC US-Co-Chair, then introduced the new IJC Commissioners; Lance Yohe (US), Robert Sisson (US) and the Canadian Co-Chair for the IJC; Dr. Pierre Beland. Ms. Corwin then gave her appreciation to the Board for the work they do, offering any assistance the IJC may be able to provide in achieving the Board's objectives. Mr. Beland mentioned that it is his first visit to the Souris River Basin and thanked the Board for the invitation to participate as it is his favorite aspect of serving for the IJC.

Garland thanked the commissioners for their participation and asked the Board members and other participants to introduce themselves.

2. Approval of Agenda.

The agenda was approved with no changes.

**Motion:** Lorinda Haman moved to accept the agenda. Mark Lee seconded the motion. Carried.

3. Approval of Minutes:

a. February 21, 2019, Brandon, MB Face-to-face Meeting Minutes

**Motion:** Frank Durbian moved to accept the minutes. Shelly Wepler seconded the motion. Carried.

4. Public Meeting Review

Garland Erbele noted that the ISRB held a joint meeting with the ISRSB, facilitated by the Public Advisory Group, the night previous. There were a number of good presentations explaining the respective groups involvement in the Souris Basin. Most of the public's questions and concerns revolved around the technical aspects including the computer models. There was also a discussion over the management of the river system that was educational for everyone.

5. Determination of Souris River Flows to May 31, 2019

Corey Hein presented the results of the natural flow computations by Environment and Climate Change Canada (ECCC). Corey H. outlined the results of natural flows determined by ECCC for the period ending May 31, 2019. The total diversion in the Souris Rivers basin was 31,378 dam<sup>3</sup> (25,449 acre-ft). Recorded flow at Sherwood was 29,234 dam<sup>3</sup> (23,710 acre-ft). The natural flow computed at Sherwood was 58,665 dam<sup>3</sup> (47,549 acre-ft). According to the computations, the US share at 40% was 23,470 dam<sup>3</sup> (19,035 acre-ft). The flow received by the US was 32,173 dam<sup>3</sup> (26,093 acre-ft), which constitutes a surplus delivery of 8,703 dam<sup>3</sup> (7,058 acre-ft). The annual flow requirement/apportionment at Long Creek station was met with a surplus of 2,194 dam<sup>3</sup> (1,779 acre-ft).

Tim Ma then provided a presentation of Environment and Climate Change Canada's (ECCC) role and responsibilities for the Souris River Apportionment. Using a network of 20 stream flow stations for estimating inflows and outflows to the reservoirs, seven water level stations to estimate the change in storage and two meteorological stations for estimating evaporation, the ECCC determines apportionment volumes using the standard procedures developed and approved by the ISRB in support of the 1959 Interim Measures. Data for municipal and minor project usage, and stream flow data is also provided by ECCC partners including the Water Security Agency (WSA), the United States Geological Survey (USGS) and Saskatchewan cities. The data is entered in the Natural Flow Spreadsheet, which is used to determine the Natural Flow and apportionment values. ECCC provides apportionment reports on May 31, August 31

and December 31. Interim natural flow calculations are used, when required, to guide the management of reservoir operations.

ECCC, in collaboration with the USGS, WSA and municipalities, is in the process of identifying methodologies to improve apportionment reporting. A transition from the spreadsheet to processing using a standard computer language is being considered, as well as using average water usages.

Tim Ma stated that on average, 80 percent of the natural flow has passed the Sherwood Gage by May 31<sup>st</sup>, noting that in general that flow volume percentage has been decreasing.

Garland Erbele noted that this year, according to the apportionment handout, the United States received approximately 8,700 acre-ft (10,727 dam<sup>3</sup>) more than what was required under the Agreement. He requested further clarification as to the reasoning behind the release of this additional water.

Corey Hein stated that calculations, performed a month in advance for the apportionment split, indicated that there would be a 50/50 apportionment split this year based on estimations of a less than 50,000 dam<sup>3</sup> (40,552 acre-ft) volume of natural flow at the Sherwood Crossing. The actual volume of natural flow at the Sherwood Crossing by May 31<sup>st</sup> was 58,665 dam<sup>3</sup> (47,549 acre-ft), which causes the apportionment to be a 60/40 split. This change from a 50/50 to 60/40 share accounts for the surplus water received from Saskatchewan.

Garland Erbele then asked what the greatest variable was when performing the calculations for the apportionment split and suggested that it's the determination of which side of the 50/50, 60/40 apportionment split the natural flow will fall.

Corey Hein agreed and mentioned that the numbers provided by May 31<sup>st</sup> are preliminary and contain a certain amount of variability that may change from the final approved numbers that will be shown in the December 31<sup>st</sup> Apportionment worksheet.

John Fahlman thanked Corey Hein and Tim Ma for the work that they do and noted that the opportunity exists to increase the accuracy of the preliminary numbers used in the determination of the natural flow computations, desiring that ECCC work with the USGS to increase the precision of the interim methods.

Corey Hein mentioned that he has already initiated contact with the USGS about increasing the frequency of the data available.

Shelly Wepler referred to the last chart in the presentation and voiced her concern that the average percentage of natural flow has been receding since the 1989 Agreement and asked if there were any known reasons for this trend.

Corey Hein answered that the chart only illustrates the May 31<sup>st</sup> computations, the first reporting period, and not the natural flow for the entire year, but that there does appear to be a downward trend during the spring runoff.

Jeff Woodward also commented that the Souris basin's variable extremes tend to skew the data giving less meaning to average values when compared to trends over time. Jeff W. further explained that this behavior suggests that it is necessary to investigate and determine if the procedures used for the determination of apportionment are correct rather than looking for a climate trend.

Jeff Woodward then asked if a formal change to the dates of apportionment reporting (May 31, August 31 and December 31) and if a higher frequency is necessary so that a mechanism exists for the WSA to be able to respond quicker and earlier if a deficit situation exists. More concrete interim natural flow calculations would be necessary to be able to make decisions prior to Board meetings.

Nicole Armstrong agreed that the scheduled reporting for the Natural Flows doesn't provide much room for timely responses to be made with what is actually occurring in the basin.

**Action:** The Hydrology Committee to investigate the Natural Flow reporting dates and make recommendations for adapting them to provide more guidance based on existing basin conditions for quicker responses to apportionment needs.

**Motion:** John Fahlman motioned to accept the natural flow computations made by ECCC. Gregg Wiche seconded. Carried.

## 6. Update from the Hydrology Committee

Ken Bottle mentioned that the Hydrology Committee held a meeting the night prior, before the public meeting. The Terms of Reference (TOR) for the Hydrology Committee was last reviewed in 2009 and a review of the TOR are currently on hold awaiting any potential changes brought about by the Plan of Study.

Ken Bottle noted that he has been the US Co-Chair for the previous four years and recommended that Darin Schepp be appointed the new US Co-Chair for the Hydrology Committee.

It is anticipated that there will be membership changes on both the US and Canadian membership of the Hydrology Committee prior to the next ISRB meeting.

The *Apportionment Procedures Manual* (APM) for the Souris River is currently on hold until the Plan of Study (POS) is complete.

The Hydrology Committee is considering adding a work task for the addition of supplemental language "to help coordinate and support the other ISRB committees in their tasks" in their TOR.

The Hydrology Committee would also like to add a task of coordinating with the Study Board for the addition of the Apportionment Procedures to the POS.

There has been confusion about the infographic to be generated between the Hydrology Committee and the Outreach and Communications Committee (OCC), there will be a slight pause in that project while the OCC finishes its formation.

Russell Boals provided a clarification on the infographic proposal, noting that the Outreach and Communications Committee, involving the IJC Communications people, will take the lead on the project.

The IWI Grant application for the APM will also be put on hold while the POS comes to completion.

Frank Durbian requested a clarification on the status of the APM.

Ken Bottle answered that the Hydrology Committee submitted a preliminary version of the APM, but it was then put on hold because of potential changes to the procedures that could arise from the POS.

Frank Durbian then asked about the importance of having the toolset of the APM defined during the interim while the Study Board is still active.

Ken Bottle responded that the history, which informs the process has been documented and the rationale for each of the steps. He noted that the procedures could potentially be modified by the findings of the POS.

Jeff Woodward added that the recent work on the APM provides a description of the current steps being performed for determination of natural flow and apportionment and the APM documents potential areas for improvement in the procedures that would require considerable investigation and hydrologic engineering. The APM has been delayed because of the available manpower to perform the work is currently sequestered by the POS.

Nicole Armstrong asked for a clarification regarding the Hydrology Committee's request concerning the addition of the APM to their workplan.

Ken Bottle mentioned that the Committee was unaware of the procedure necessary to coordinate with the Study Board to have an apportionment component added to their technical work.

Bruce Davidson responded that the IJC requested the Study Board to add apportionment to the work being completed, the revised Workplan added a sub-task focusing on how the study contributes to apportionment. Bruce D. noted that it will be helpful for the Study Board to consult with the Hydrology Committee to ensure that the requirements are being met.

**Action:** The Hydrology Committee and Outreach and Communications Committee coordinate and determine the necessity of generating a Souris Basin Hydrology Infographic and generate an IWI Proposal, if deemed necessary.

**Motion:** Mark Lee motioned to appoint Darin Schepp as the US Co-Chair for the Hydrology Committee. Frank Durbian seconded. Carried.

## 7. Review of 2019 Hydrologic Conditions and Operations, Summer Hydrologic Forecast and Planned Operations

### a. Saskatchewan

Jeff Woodward, WSA, gave a presentation that included the review of the 2018-19 hydrological conditions, observed runoff, spring 2019 forecast evaluation, current conditions and the operating plans of the reservoirs in Saskatchewan for the remainder of 2019.

In 2018 fall moisture conditions in the basin were near normal at freeze-up though subsurface deficits remained and wetland storages were low. According to the Water Security Agency (WSA) manual point snow surveys in March 2019, the snowpack was near to slightly above normal in the basin.

Winter Drawdown – WSA initiated the drawdown at Grant Devine Dam on November 2, 2018 at the rate of 0.84 m<sup>3</sup>/s (30 cfs) to bring the reservoirs down to the February 1<sup>st</sup> Normal Drawdown Level (NDL) over the winter months. Grant Devine Lake was 0.52 m above its

NDL at that time. The NDL was achieved on January 18, 2019 and the outflow was terminated. No outflow was required at Rafferty as levels were below the February 1<sup>st</sup> NDL at freeze-up.

Spring Runoff Summary – A forecast was issued on February 15 with below normal runoff expected across the basin, signaling non-flood operations. There was no need for additional drawdown.

Runoff generally began early in the basin on the 15<sup>th</sup> of March, 2019. All inflows to Boundary, Rafferty and Grant Devine Dam were stored and the Boundary to Rafferty Diversion works were not used. None of the Canadian Reservoirs reached their full supply level.

Given non-flood operations, and based on Sherwood natural flows, which were expected to be less than 50,000 dam<sup>3</sup>, the apportionment was assessed to be a 50/50 split.

There were significant diversions into storage at Nickle Lake, Roughbark Reservoir, Boundary Reservoir, Rafferty Reservoir, Moose Mountain Lake and Grant Devine Reservoir.

Grant Devine Reservoir made a release of about 11,200 dam<sup>3</sup> (9,084 acre-ft) from April 1 to May 20 to provide 50 percent of apportionable flow to North Dakota prior to June 1.

As mentioned previously, the volume of natural flow at the Sherwood Crossing by May 31 ended up being above the 50,000 dam<sup>3</sup> (40,552 acre-ft) threshold, shifting the apportionment into a 60/40 split. This caused Saskatchewan to have delivered a surplus of approximately 2,535 dam<sup>3</sup> (2,056 acre-ft) - (the surplus was reported to be 8,703 dam<sup>3</sup> (7,058 acre-ft) under agenda item 5.

Current Conditions – Precipitation maps indicated the April 5 to June 3, 2019 precipitation was well below normal across the basin, ranging from 60 to 80 percent of average.

2019 Reservoir Operation Plans – Jeff Woodward stated that based on the current dry conditions and the reservoirs in Canada being below Full Service Level (FSL), summer releases due to rainfall runoff are unlikely. It is also unlikely that a drawdown operation to reach NDL ahead of February 1, 2020 will be necessary, Rafferty is already below NDL. Evaporation will likely take Grant Devine Reservoir below NDL. Any additional releases in 2019 will likely be related to meeting apportionment or water user requests.

#### b. North Dakota

Steve Robinson, USGS, presented a summary of 2019 flow conditions for the US portion of the basin. The total volume of flow past the Long Creek at the Noonan gage through May 31, 2019 calendar year was 7,900 acre-ft (9,7414 dam<sup>3</sup>). This volume is about 53 percent of the median flow for the last 60 years. The peak discharge for the reporting period January 1 to May 31, 2019 was 470 ft<sup>3</sup>/s (13.31 m<sup>3</sup>/s) on March 25, which ranks 34<sup>th</sup> in 60 years of record.

The total volume of flow past the Souris River near Sherwood gage through May 31, 2019 calendar year was 23,700 acre-ft (29,222 dam<sup>3</sup>). The total flow is 47 percent of the median flow for the past 89 years. The peak discharge for the period January 1 to May 31, 2019 was about 717 ft<sup>3</sup>/s (20.31 m<sup>3</sup>/s) on March 25, which ranks 57<sup>th</sup> in 89 years of record.

Flow recorded at the Souris River near the Westhope gage, through May 31, 2019 calendar year was 69,300 acre-ft (85,447 dam<sup>3</sup>). The calendar year's total flow is about 60 percent of

the median flow for the last 90 years. The peak discharge for the period January 1 to May 31, 2019 was 803 ft<sup>3</sup>/s (22.74 m<sup>3</sup>/s) on April 18, which ranks 52<sup>th</sup> in 90 years of record.

The USGS will be installing a new gaging station on the Broadway Bridge in Minot, ND, in the next few months. This gage will be operated as a “real-time” gage, meaning instantaneous discharge readings will be available via the USGS website.

Laura Diamond United States National Weather Service (NWS) reported that the current conditions are dry in the ND portion of the basin. NWS forecast outlooks suggest that the conditions will not be changing in the near future.

c. US Fish and Wildlife Service (USFWS)

Frank Durbian presented a summary of refuge operations and flows to May 31, 2019. The total provisional inflow measured at Sherwood for the first five months of the year was 23,733 acre-ft (29,263 dam<sup>3</sup>). This was only 29 percent of the historic January-May inflow, which was 81,842 acre-ft (100,911 dam<sup>3</sup>) for the period 1938 through 2019.

Total Upper Souris Refuge pool volume increased an estimated 8,310 acre-ft (10,246 dam<sup>3</sup>) during the first five months. The total provisional outflow measured at Foxholm on the south end of the Upper Souris Refuge for the first five months of 2019 was 17,851 acre-ft (22,010 dam<sup>3</sup>). This was only 26 percent of the historic record for the January-May outflow, which was 69,992 acre-ft (86,300 dam<sup>3</sup>) for the period 1938-2019. Lake Darling elevation increased 0.786 ft (0.24 m) from 1596.05 ft (486.48 m) on January 1 to 1596.83 ft (486.71 m) on May 31. The lake elevation on June 1<sup>st</sup> 2019 was 1596.83 ft (486.71 m).

The total provisional flow measured from the Souris River to the J. Clark Salyer National Wildlife Refuge (NWR) from January 1 through May 31 was 52,435 acre-ft (64,652 dam<sup>3</sup>). This was 49 percent of the historic January-May inflow, which was 106,334 acre-ft (131,110 dam<sup>3</sup>) for the period of 1938-2019. Total Pool volume on May 31 was 40,737 acre-ft (50,229 dam<sup>3</sup>). This was 7,954 acre-ft (9,807 dam<sup>3</sup>) above the January 1 volume of 32,783 acre-ft (40,421 dam<sup>3</sup>). Approximately 68,555 acre-ft (84,528 dam<sup>3</sup>) was passed to Manitoba during the five-month period.

Lake Darling operations for the remainder of 2019 are planned to maintain an approximately 25 ft<sup>3</sup>/s (0.71 m<sup>3</sup>/s) release to sustain a “live flow” downstream and to accommodate water management needs at J. Clark Salyer NWR. A continued drop in reservoir elevation is expected throughout the summer because of extremely dry local conditions and zero inflows to the lake.

J. Clark Salyer NWR operations for the remainder of 2019 include adjusting pool levels to maximize wildlife habitat quality and availability. Adjustments will be made to compensate for inflow conditions while meeting the 20 ft<sup>3</sup>/s (0.57 m<sup>3</sup>/s) required flow into Canada.

Debbie McMechan asked if 25 ft<sup>3</sup>/s (0.71 m<sup>3</sup>/s) was the required minimum flow into Manitoba.

Frank Durbian answered that 20 ft<sup>3</sup>/s (0.57 m<sup>3</sup>/s) is the required flow into Manitoba, but Lake Darling releases 25 ft<sup>3</sup>/s (0.71 m<sup>3</sup>/s) to ensure that the minimum is being met.

Commissioner Robert Sisson asked if the refuges have experienced any issues with Phragmites.

Frank Durbian responded that the refuges do have Phragmites, but so far it appears that they are all native Phragmites and they do not seem to be displacing any other native plant species. Typically, they are seen in the southern areas of the refuges as the northern reaches are not conducive to their establishment.

Garland Erbele asked if there were any Purple loosestrife issues.

Frank Durbian answered that there is no Purple loosestrife on the refuges and that their main issue has always been with Hybrid Cattails.

#### d. Manitoba

Mark Lee presented a summary of the hydrologic conditions for the Souris River in Manitoba. Antecedent moisture conditions were normal to below normal in Manitoba's portion of the basin. Snow accumulation had been below normal until later in the winter. February snow accumulation in North Dakota significantly raised the forecasted flood peaks. Flow entering Manitoba were maintained at approximately 0.3 m<sup>3</sup>/s (10.6 ft<sup>3</sup>/s) throughout the winter. A favorable drawn out snowmelt dissipated the risk for flooding on the main stem of the Souris River. The Souris River at Wawanesa peaked at 55.5 m<sup>3</sup>/s (1,960 ft<sup>3</sup>/s) on March 31<sup>st</sup>, which is considered to be a 1-in-2-year flow event, very close to the median for flood peaks on record.

The river steadily receded after the spring peak and over the last week has had consistent flow at the lower end of normal from recent rains. The Souris River at Wawanesa has a current flow of approximately 4.0 m<sup>3</sup>/s (141 ft<sup>3</sup>/s).

The Canadian Drought Monitor had classified the Manitoba portion of the basin as a moderate (D1) drought at the end of May, similar to conditions last year. There has been below normal to normal precipitation over the growing season and May/June rains have been welcomed to the area with a desire for more. Manitoba Agriculture recently reported that farm water supplies are currently adequate, but will need recharging to last the grazing season.

Mark Lee mentioned that prior to 2017 the Souris River at Wawanesa gage had consistently depicted a flow in the much above normal category for the spring runoff, but since 2017 has been trending in the normal range.

Wayne Jenkinson asked Mark Lee and the rest of the Board about their thoughts about the utility of the National Oceanic Atmospheric Administration's (NOAA) Advanced Hydrologic Prediction Service (AHPS) as a forecasting tool. Wayne Jenkinson explained that in the spring of the year the NOAA AHPS had predicted a 99 percent chance of major flooding on the Red River of the North, which never materialized. The IJC was considering utilizing NOAA AHPS for issues across the transboundary in making risk estimations for gages exceeding major flooding.

Mark Lee answered that while they did eventually end up over predicting the flooding that was received in the Red River Basin, there was significant cause for concern regarding the flooding potential at the time when the NOAA AHPS was making their predictions. The weather conditions that actually occurred during the time of the spring melt were near perfect for having the best possible outcomes for a runoff event.

Wayne Jenkinson then asked of the weather conditions that did occur during the spring melt were that unlikely that they weren't considered in NOAA AHPS's modeling efforts.



Mark Lee answered that the conditions were extremely favorable and extremely unlikely.

Laura Diamond (NWS) concurred that it was a highly unlikely extremely favorable runoff event.

#### 8. Update from the Flow Forecasting Liaison Committee (FFLC)

Laura Diamond provided an update on the activities of the FFLC.

With the relatively complaisant spring for 2019, the FFLC has had minimal formal activity. Keeping with the terms of the Canada-US Agreement on Water Supply and Flood Control in the Souris River Basin, four forecasts were produced by the FFLC thus far in 2019 (February 1, February 15, March 1 and March 15). The runoff was underway by April 1, so no further forecasts were performed at that time, but a report was circulated to the group via email over concerns of the apportionment not being met. Those concerns led to a flow measurement being taken at Sherwood in coordination with the WSA, ECCC and USGS, facilitated through the FFLC to determine a better estimate of the flow volume that had already passed the gage through the observed period. The WSA used the estimation to determine necessary releases from Grant Devine Dam in order to eliminate the possible apportionment deficit. June 1 was the preferred date to make up that deficit by the partners on the North Dakota side.

Updates on WSA's operational plans are communicated through the FFLC via email. If basin conditions make it necessary for the Committee to become more active, the FFLC will respond as defined by the FFLC Communications Plan.

There have been no changes to the FFLC membership since what was presented at the February meeting. The FFLC also does not have any scheduled tasks in their workplan due to their involvement with the POS.

#### 9. Aquatic Invasive Species in North Dakota

Jessica Howell of the North Dakota Game and Fish Department (NDGF) provided an overview of North Dakota's Aquatic Nuisance Species Program (ANS).

In 2018, there were no new ANS detected or established. NDGF focused on maintaining the desirable elements of their existing ANS program while revising their public outreach and overall management plan. They performed a record number of boater surveys and sampled 180 bodies of water for ANS.

The Aquatic Invasive Species Committee began an update to the State ANS Management Plan in 2017 that went through two rounds of edits and was approved by the Committee in November of 2018 and signed by North Dakota Governor Burgum in December of the same year. The Committee keeps active by hosting two meetings annually and contributes efforts on a national scale while keeping up to date with research by attending regional and national conferences.

Education and outreach are large components of ND's effort towards the prevention of the spread of ANS. Advertisements and public notices through printed and digital media have been found to be a large factor in the determent of ANS transmission. The NDGF also performed 1,167 boater interactions to assess the public knowledge of ANS and to ensure that the information is getting released. Other prevention and control efforts consist of permitting weed

harvesters, inspecting and certifying bait importers, equipment permitting, training and inspecting at fishing tournaments and constructing carp berms.

NDGF ANS Sampling and Monitoring program for 2018, in addition to the earlier mentioned 180 ND waterbodies sampled, consisted of 27 waterbodies and the USFWS fish hatcheries sampled specifically for early detection of Zebra mussels. Also, the Bureau of Reclamation sampled four waterbodies and the USACE sampled 12 locations on Lake Sakakawea, on the Missouri River, for Zebra mussels as well. Priority monthly sampling from May through September was performed in Lake Audubon, Lake Sakakawea, Lake Oahe and Lake Patterson as well. Two Silver carp were captured below LaMoure Dam on the James River, one male and one female. It was determined that there was a failed reproductive event based on their physical condition and estimated population and it is hoped that they will die off. There is continual seasonal monthly monitoring of the Red River of the North Zebra mussel population at Fargo, Grand Forks and Drayton Dam to determine peak veliger densities.

In June of 2019, Zebra mussels were found and confirmed established in Lake Ashtabula on the Sheyenne River. Stakeholders and the public were notified and future efforts will include additional sampling and securing fish hatchery production.

Tim Ma asked if anything could be done to remove an established population of Zebra mussels from a body of water.

Jessica Howell answered that there have only been two known successful eradications of Zebra mussels. The first one used concentrated amounts of Pot Ash. The second involved drawing an entire lake dry over a season. Neither solutions are an option for a reservoir supplied by a significant river.

Tim Ma also asked if Zebra mussel populations ever reach an equilibrium in growth or if they just continue to populate.

Jessica Howell answered that Zebra mussels do eventually reach an equilibrium for their own population, but they continue to have impacts on other species. When Zebra mussels first encounter a new habitat their population typically continues to balloon for a period of about five years when they exceed the carrying capacity of the habitat and the population will then crash. This cycle will then continue on for a period of time until the population eventually reaches an equilibrium.

Laura Ackerman asked for the locations in Montana where Zebra mussels had been found.

Jessica Howell responded that Montana had two findings in the fall of 2016, Tiber Reservoir and Canyon Ferry Lake, both on the Missouri River. The discovery at Canyon Ferry Lake were of suspect organisms that were inconclusive as being Zebra mussel veligers. The discovery at Tiber Reservoir were definite veligers, but after intensive sampling there hasn't been any additional findings of veligers or adult Zebra mussels.

Nicole Armstrong asked if there were requirements for boaters leaving a known Zebra mussel infested body of water.

Jessica Howell answered that complete disinfection is not required, but that ND State Laws require all vegetation to be removed from equipment and watercraft and the removal of drain plugs prior to the transporting of the watercraft. ND also makes the transport of any ANS in itself illegal to ensure compliance with the laws.

Nicole Armstrong then asked if there was consideration of the strengthening of legislation for the requirement of disinfection of any equipment that has the potential to transport ANS.

Jessica Howell responded that it was not in consideration at this time. The majority of the general public's use of the waters in ND isn't conducive to the attachment of ANS to their equipment, which is why the regulations have mainly been concentrated on vegetation removal and the deterring of transporting the water itself.

Garland Erbele noted that one of the side effects of Zebra mussels is an increased clarity of the body of water that they have infested and asked if this may generate a positive response from other ANS, such as Curly-leaf pondweed.

Jessica Howell responded that it certainly can and that Lake Ashtabula does have an established population of Curly-leaf pondweed. The increased clarity also provides for a greater potential in frequency and intensity for blue-green algae blooms.

Wayne Jenkinson asked about the impacts of seaplanes, with little to no ability to isolate themselves and clean prior to traveling from one jurisdiction to another.

Jessica Howell answered that she has limited experience with seaplanes, however the NDGF ANS has worked with the ND Seaplane Pilots Association and through discussions with them it was realized that the National Seaplane Pilots Association already provides excellent information for Seaplane pilots. The NDGF ANS has been directing that information to the ND chapter. Procedures to minimize the potential for transferring ANS to other jurisdictions include preflight checks involving the movement of various flaps to prevent aquatic vegetation from being carried on the fuselage and pumping out floats either on land and drying, or into a container and bleaching.

#### 10. Update from the Aquatic Ecosystem Health Committee (AEHC)

- a. Report on activities of the AEHC including USGS analyses update for ISRSB Performance Indicators.

Heather Husband reported on the activities of AEHC in 2019.

The Committee held a conference call on January 17, 2018, to discuss data, and the path forward for the next report. However, the work was suspended for development of the dissolved oxygen (DO) monitoring IWI project.

The DO monitoring proposal was submitted to the IJC last October and was approved for funding in December. The purpose of the project is to analyze DO data for diurnal and seasonal variations and to determine possible correlations to flow.

Continuous DO/temperature monitoring sensors were installed at three sites along the Souris/Mouse River; Sherwood, Minot and Westhope, ND. The sites were co-located with USGS gaging stations to provide discharge information for later analysis. The sites were selected to represent water leaving Saskatchewan, water modified by Lake Darling, and water entering Manitoba.

Joel Galloway (USGS) presented the first month and a half of provisional data that has been collected by the monitors. It was noted that even in the short amount of data, patterns are

already beginning to emerge and there was a period of low flow that influenced the DO. The real-time data is available at the USGS gage station sites.

Heather Husband then reported that beginning in December, the AEHC assisted the ISRSB Resource Agency Advisory Group (RAAG) with the development of performance indicators for water quality that will go into the model to create alternatives for the POS. Data was compiled on a limited number of parameters for the Sherwood, Minot, and Westhope sites and was analyzed by the USGS's QWTrend model to look for possible relationships between the parameter concentration and flow, season, and time. Thirteen potential correlations were reduced to 5 or 6 through this process.

The work involving the RAAG has led the AEHC to determine that a basin wide trend analysis of water quality over time will be necessary to provide a deeper look into what is actually happening in the Basin. The AEHC is in the process of submitting an IWI Grant to facilitate this study and it is expected to be sent in the fall.

Work is still progressing on a Water Quality Index, but IWI proposals have taken priority.

b. Report on any changes to the current water quality monitoring plan.

There were no changes.

11. Compliance with Water Quality Objectives (WQO) for 2019

a. Report on data concerns and proposed changes to the AEHC section of the Annual Report.

Heather Husband presented a summary of the water quality monitoring program for the Sherwood and Westhope sites:

The USGS collected eight regular water quality samples from the Souris River near Sherwood in 2018. However, one of the samples was lost in transit to the lab, so seven samples are used in the calculations. In addition, a joint sampling event with ECCC occurred at the Sherwood site in September.

Heather Husband stated it was interesting to note that a large portion of the parameters had their lowest concentrations for the April 25 samples and the highest concentrations for the September or October samples. Also, many of those below with exceedances to WQOs had lower minimum and maximum values than last year and previous years, but higher median values. Only six parameters overall exceeded WQOs in 2018.

Sherwood-USGS/ND Department of Environmental Quality (NDDOEQ)

- **Total Phosphorus** exceeded the WQO of 0.10 mg/L for all samples in 2018. The Total Phosphorus concentrations at Sherwood ranged from 0.130 mg/L on January 4 to 0.390 mg/L on September 5.
- **Sodium** exceeded the WQO of 100 mg/L for 6 of 7 samples in 2018. The concentrations ranged from 59.7 mg/L on April 25 to 254 mg/L on October 2.

- **Sulfate** exceeded the WQO of 450 mg/L on 2 occasions in 2018. The minimum concentration was 160 mg/L on April 25 and the maximum concentration was 556 mg/L on September 5.
- **Total Dissolved Solids** exceeded the WQO of 1000 mg/L on 2 occasions in 2018. The highest concentration was 1260 mg/L on September 5, and the lowest concentration was 380 mg/L on April 25.
- **Total Iron** exceeded the WQO of 300 µg/L in 6 of 7 samples in 2018. Concentrations ranged from a minimum of 168 µg/L on January 4 to a maximum of 2120 µg/L on June 12.
- **pH** exceeded the upper WQO of 8.5 pH units twice in 2018, but only just over the objective. Maximum values of 8.6 occurred on September 5 and October 2. The minimum value of 7.60 occurred April 25.
- **Dissolved Oxygen** concentrations were above the minimum 5 mg/L WQO in all samples.
- **E-coli** values for 2018 ranged from less than 97 colony forming units/100 mL on September 5 to 230 colony forming units/100 mL on May 15. There were no exceedances of the single-sample objective of 400 colonies /100 ml. The geomean for April to September (5 months) was 168.46 CFU/100 mL, which is slightly above the seasonal geomean objective of 126 CFU/100 mL.
- **Organics**
  - Pesticide samples were collected six times by the ND Department of Agriculture on the Souris River at Sherwood May through October 2018. Atrazine was detected in all samples, but with reportable values in only four of six samples. The concentrations ranged in value from 0.0079 µg/L to 0.043 µg/L. 2,4-D was also detected in all samples, with reportable values in five of the six samples. Concentrations ranged from 0.009 µg/L to 0.27 µg/L. Bromoxynil and MCPA, detected in some samples (see Table 1). All detections were well below WQOs.
  - Other pesticide detections, for parameters without WQOs, were also noted. A few just had detections, but not at concentrations that were above reportable limits. These included the list below, with parenthesis to indicate their uses:
    - Diuron (unwanted vegetation, non-crops, forage crops)
    - Fluroxypyr (multi use herbicide)
    - Imazethapyr (soybeans)
    - Propiconazole (fungicide)
    - Saflufenacil (soybeans and corn)
    - Pyrasulfotole (cereal crops)
  - These pesticides were detected at reportable values, though still well below any concentration of concern:

- Bentazon – six detections, used for beans and peas with specific instructions to not apply directly to water or wetlands.
- Tebuconazole – four detections, used as a fungicide
- Tebuthiuron – five detections, used on non-cropland, right of ways, industrial sites, and to kill woody vegetation
- In addition to the Atrazine mentioned above, several of the metabolites of Atrazine were also detected. It is important to monitor these as they can persist for longer in the water. These included Deethyl Atrazine, Deisopropyl Atrazine, and Hydroxy Atrazine.
  - No neonicotinoids were detected at this site

### Westhope –ECCC

ECCC collected eight (8) regular water quality samples from the Souris River near Westhope in 2018. As well, a joint sampling event with the USGS occurred at the Sherwood site in September.

- **Total Phosphorus** exceeded the WQO of 0.10 mg/L for all samples in 2018. The Total Phosphorus values at Westhope ranged from 1.070 mg/L on April 10 to 0.251 mg/L on June 8.
- **Sodium** exceeded the WQO of 100 mg/L for all samples in 2018. The results ranged from 115 mg/L on June 8 to 693 mg/L on February 20.
- **Sulphate** exceeded the WQO of 450 mg/L on 4 occasions in 2018. The minimum value was 326 mg/L on April 12 and the maximum concentration was 1880 mg/L on February 20.
- **Total Dissolved Solids** exceeded the WQO of 1000 mg/L four times in 2018. The highest value, 3638 mg/L occurred on January 10, and the lowest value was 783 mg/L on July 5.
- **Total Iron** exceeded the WQO of 300 µg/L in all 8 samples in 2018. Concentrations ranged from a minimum of 620 mg/L on May 1 to a maximum of 5490 µg/L on January 10.
- **pH** exceeded the upper WQO of 8.5 pH units three times in 2018. The maximum value of 9.06 occurred on September 5. The minimum value of 7.60 occurred twice, on January 10 and April 10. There were no exceedances of the lower objective of pH 6.5.
- **Dissolved Oxygen** concentrations were below the minimum 5 mg/L WQO in two samples, January 10 and February 20, 2018.
- **Fecal coliform** values for 2018 ranged from less than 2 on April 10, to 190 on September 5. The WQO of 200 colonies/100 mL in one sample was not exceeded.
- **E-coli** values for 2018 ranged from less than 2 on April 10 to 140 colonies per 100 mL on September 5. There were no exceedances of the single-sample objective of

400 colonies /100 ml. The geomean for April to September (5 months) was 19.99. This was well below the geomean objective of 126.

- **Chloride** exceeded the WQO of 100 mg/L twice in 2018, on January 10 and February 20. The maximum value of 163 mg/L occurred on February 20<sup>th</sup>, and the minimum of 30.1 on June 8.
- **Total Boron** exceeded the WQO of 0.50 mg/L once in 2018, with a maximum value of 532 µg/L on February 20. The minimum value of 146 occurred on May 1.
- **Organics**
  - Pesticide samples were collected on the Souris River at Westhope in the April through September sampling events for 2018. 2,4-D and Atrazine were detected in all samples. Bromoxynil, Dicamba, MCPA, and Picloram were detected in some samples.
  - No pesticide variables exceeded their objectives.
  - Neonicotinoid testing will begin in 2019 with 13 different strains being tested

Nicole Armstrong noted that the Phosphorus spikes at Westhope, ND, during the winter of 2018 occurred at the same time that there were Total Suspended Solid spikes and asked if it was possible that the person capturing the sample may have hit the bottom of the river bed.

Dorothy Lindeman answered that the three samples were captured in a row and that it was an experienced technician, so while that is possible, it is more likely that there was some anchor ice or disturbance under the ice.

Nicole Armstrong mentioned that she was wondering if the ground wasn't disturbed because the sample values seem unusually high.

Dorothy Lindeman noted that she originally created a graph with the entire sampling record before reducing it to the shown 2013 to 2019 date ranges and compared to some of the earlier samples the values in question are actually quite small.

Nicole Armstrong then asked if the Phosphorus samples were captured during low flow events.

Dorothy Lindeman answered that frequently the high valued samples are captured during winter, under river ice.

It was speculated that it could possibly be Phosphorus releasing from sediment and noted that the chemical signal was reminiscent of stagnant water.

Mark Gabriel asked if the values were considered high relative to the WQOs or if they were considered high overall.

Dorothy Lindeman answered that they are high relative to the WQO, but have actually are lower values compared to samples taken earlier in the period of record.

Garland Erbele noted that those high values were collected at the same time that low DO values were collected and that there could be some correlation there.

Joel Galloway added that the values we are getting makes it all the more important for the IWI Water Quality Study being proposed. There are several potential conditions during various

times of the year that could provide the setting for the exceedances found in the samples and gaining more insight into those causes can be beneficial towards eventually determining their effects.

Looking at the Sodium and Sulphate values for Westhope, Heather Husband asked the USFWS if there was any construction being performed at J. Clark Salyer in mid to late summer of 2017.

Frank Durbian answered that there wasn't any construction at the refuge at that time and then asked if there was a correlation between ice thickness to water thickness that could have an effect on the samples.

Dorothy Lindeman answered that that can have a considerable influence on the samples found under the ice.

Heather Husband asked Joel Galloway if the USGS measured ice thickness at the gages.

Joel Galloway answered that there is data on ice thickness available.

b. Report on Atrazine information.

As of 2014, Atrazine was the second most widely used herbicide in the US, with 76 million pounds applied each year. The most commonly detected pesticide was Atrazine in the 2014-16 ND Department of Agriculture pesticides report.

Atrazine is widely used for the control of broadleaf and grassy weeds in corn, sorghum, rangeland, sugarcane, macadamia orchards, pineapple, turf grass, asparagus, grass crops and roses. Corn sorghum and certain other plants are not susceptible, they absorb and metabolize Atrazine without its toxic effects.

Atrazine degrades slowly and has a half-life of two or more years. Breakdown is negligible in neutral or somewhat alkaline waters. Atrazine is moderately long-lived in temperate climate soils. It persists for up to a full season under average field conditions and even longer under some circumstances.

Atrazine continues to be found in a high percentage of samples, explainable by large-scale use and chemical properties. Use has also likely increased due to an increase in glyphosate resistant weeds. On the USGS Pesticide National Synthesis Project estimated annual agricultural pesticide use map for 2016, the estimated use of Atrazine in the US portion of the Souris Basin was less than 3.14 pounds per square mile.

Atrazine was banned in the European Union (EU) in 2004 due to health concerns and persistent contamination of groundwater. It was considered to be a *Priority A* chemical for potential groundwater contamination by the US Environmental Protection Agency (EPA) and was ranked highest of 83 pesticides in the Agriculture Canada priority scheme for potential groundwater contaminants.

Atrazine does not appear to bioaccumulate to any great degree in the food chain. Health effects of Atrazine may include endocrine-disruption, manifesting as demasculinization and hermaphroditism in frogs, and possible effects on human growth and reproduction. There is little information about the potential for any link between Atrazine and Cancer.



The current WQO for Atrazine in the Souris River is 2 µg/L. Atrazine has been detectable in 64 percent of samples at the Sherwood site and in 69 percent of samples at the Westhope site up to 2018. No exceedances of the WQO have been detected in historic or recent water quality sampling.

c. Report on Neonicotinoid information.

Neonicotinoids are neuro-active insecticides chemically similar to nicotine. Imidacloprid is the most widely used insecticide in the world. The second most common neonicotinoid in the Souris River basin is clothianidin.

Compared to organophosphate and carbamate insecticides, neonicotinoids cause less toxicity in birds and mammals than insects. Some breakdown products are also toxic to insects. Neonicotinoids are highly water-soluble, persistent in the environment and systemic (the pesticides migrate into all parts of the treated plant).

Neonicotinoid use has been linked in a range of studies to adverse ecological effects that include bee deaths and loss of birds due to a reduction in insect populations. In 2013 the EU and a few non-EU countries restricted the use of certain neonicotinoids, and in 2018 the EU banned the three main neonicotinoids; Clothianidin, Imidacloprid and Thiamethoxam, for all outdoor uses. Several states in the US have also restricted the usage of neonicotinoids out of concern for pollinators and bees.

On the USGS Pesticide National Synthesis Project estimated annual agricultural pesticide use map for 2016, there was no estimated use of Imidacloprid in the Souris Basin. The ND Department of Agriculture pesticide monitoring program began analyzing for Imidacloprid in 2008 and 2009. Clothianidin was added in 2013 and since 2013, Clothianidin, Imidacloprid and Thiamethoxam have been regular analytes in the monitoring program.

Compared to Atrazine and 2,4-D, neonicotinoids were not frequently detected, only once in the last five years. Any detections were at very low levels. The EPA has recently lowered the aquatic life benchmark for all neonicotinoids because of recent research on Clothianidin and Imidacloprid. Clothianidin changed from 1.1ppb to 0.05ppb and Imidacloprid changed from 1.05ppb to 0.01ppb.

The Sherwood site began including Neonicotinoids as analytes in sampling for the 2019 sampling year. The Westhope site will begin monitoring for 13 neonicotinoids also in the 2019 sampling year.

Scott Gangl asked if the EPA aquatic life benchmark reductions were based on actual research.

Heather Husband answered that the benchmark reductions were mainly based on research being performed in the central states.

Scott Gangl then asked if it was based on aquatic insects or if it was other invertebrates as well.

Frank Durbian answered that the research was based on invertebrates including aquatic insects.

Commissioner Pierre Beland noted that in some of his previous water quality work there was never a focus on Boron and asked if it was something that they missed or why it was a WQO for this basin.

Heather Husband answered that the Boron WQO was added in response to some of the historical coal and other industrial activities in the basin.

Jeff Woodward added that he expects that Boron was added because of the coal mining and reclamation activities that used to be prevalent in the Souris River basin, but has since dropped off.

Commissioner Robert Sisson took a moment to thank Colonel Samuel Calkins for his service and congratulated him on his retirement.

Garland Erbele thanked the IJC Commissioners for their attendance.

## 12. Update on the Communications and Outreach Committee (COC)

Russell Boals reported that the Committee membership has not been formalized as most of the proposed members are active with the POS, Public Advisory Group (PAG) and RAAG. The formalization is expected to occur once those activities are concluded.

The IJC website has updated creating micro-sites for each river board. Russell Boals and the Co-Secretaries have participated in training on how to maintain the Souris Board micro-site in July and have access to the micro-site. If any of the Board or Committee members go to the site and see areas that need to be updated or information that needs to be added, pass those requests to the Co-Secretaries.

The Committee has also been participating directly with the POS in the creation of communication items such as a fact sheet on the understanding of the Agreement and a number of fact sheets related to the Souris Board. They also have been involved in the creation of public announcements and notifications.

The COC has been discussing the infographics for the Hydrology Committee and is coordinating with the POS in order to build upon the effort that has already been made. The COC plans to work with the IJC's communications section for the development of the infographics. The final product could be generated through the Study Board or an IWI Proposal.

Garland Erbele asked if the IJC micro-sites were up and running or if they were still work in progress.

Russell Boals responded that the micro-site was up and running and contains basic information about the Board. It needs Board member interaction to determine additions and changes.

## 13. Update on Water Management Projects

### a. Update on the Northwest Area Water Supply (NAWS)

Darin Schepp reported that the DC Appellate ruled in North Dakota's favor on May 3, 2019.

An internal 30 percent design review of the Biota Water Treatment Plant Design was held in March and a Value Engineering Workshop was held in June. The project should be ready to bid early next year.

Work is currently underway for constructing a new primary treatment building in Minot, ND to replace the aging softening basins, chemical storage and the feed systems. A new lab and IT facilities are also currently being constructed.

Other components of the project are in various stages; distribution pipeline construction is progressing and the design for the Snake Creek Pumping Plant modifications has begun.

Nicole Armstrong added that Manitoba was included in the Adaptive Management Team for the NAWS Project moving forward. The first meeting for that team is scheduled to occur late August or early September of this year.

#### b. United States and Canadian Dam Safety Work

Jeff Woodward provided a review of the completed Hatch Engineering Study that revised the Probable Maximum Flood (PMF) and its implications on the development of reservoir operating plans for Rafferty and Grant Devine Dams. The 2011 flood resulted from summer rains and as a result caused the WSA to re-visit the PMF design of both Rafferty and Grant Devine spillways. The end result was the production of draft Operating Plans that shift the emphasis from winter to summer events, which cause some potential deviations from the Agreement.

Communications were then initiated with the US in order to find a path forward, which is complicated by the POS. The approach is to use the POS to investigate alternatives that may handle the summer rainfall events, but there is still a need for the individual dam operators to discuss dam safety. The Operating Plans cannot be finalized without having discussions with the US, and dam safety has become a topic of interest.

Michael Bart (USACE) reports that the USACE has been in discussions with the WSA on the topic of dam safety for more than a couple of years. There is an unusual agency situation with the operation and project funding for Lake Darling between the USFWS and the USACE. The USACE recently began researching, analysing and modeling an updated inflow design flood (IDF) and PMF for Lake Darling. The target date to have some preliminary results is early 2020. It was noted that Lake Darling was only designed to pass 70 percent of the PMF and not its entirety, because the incremental damage past that point is already at its maximum.

The potential deviations from the Agreement caused by the draft Operating Plans are in preliminary discussions and the potential ramifications are yet to be determined. The Board will be involved when solutions are developed and the implications the findings of the Hatch Engineering studies have for Lake Darling.

Col. Samuel Calkins notes that this is one situation where the role of the IJC is critical in having established communications and coordination between the committees instead of having to take on an issue like this between newly formed groups. He asked if all of the right people are being involved with this issue or if there are any others that should be considered.

Michael Bart responded that discussions have been initiated between the IJC, USACE, the USFWS and others to determine who the right people are that need to be involved and that

through the course of this continuing discussion the proper individuals will be identified. The issue is a legal and technical one.

Col. Samuel Calkins asked if the technology and methods used to derive the PMF and design flows have changed in the past 30 years or if the 2011 flood was so unexpected that it wasn't considered by the engineers when they were doing the calculations in 1989.

Michael Bart answered that 2011 was one data point, but there was also a significant rain event in 2014 in Manitoba. These events have warranted consideration and if site specific IDF's are more appropriate for Lake Darling, as it was for the Canadian Dams.

Jeff Woodward added that the procedures used to derive the PMF and design flows have changed with time and with the additional data collected, since when the original PMF was derived, have significantly increased the PMF. There is also a different approach to the risk management of the reservoirs that needs to be considered. The actual design flows didn't change that drastically, but they did highlight shortcomings in the designs.

Garland Erbele noted that the ND State Water Commission is currently re-evaluating the PMF for the State of North Dakota, which may provide some fresh data points for the topic. This study had its kickoff meeting in May and has a timeline of 2 years.

Garland Erbele then asked if the design standards between Canada and the United States are similar or if there are differences.

Michael Bart answered that it is unknown at this point and there could be issues.

#### c. Other planned developments

Jeff Woodward mentioned that Nickle Lake had water supply issues the year prior, which since then have been resolved.

The City of Estevan is planning on changing its water supply from Boundary Reservoir to Rafferty Reservoir. It is a better supply in both quality and quantity.

The Canadian Federal Government's desire to phase out Coal Power Production by 2030 will have an effect on both Boundary and Rafferty Reservoirs, but the results of an ongoing carbon sequestration project may offset the phasing out of these plants by the 2030 deadline.

In 2021 and 2024 Sask Power will be decommissioning two of its power plants however this action will not have any significant changes to water allocation.

Garland Erbele mentioned that North Dakota is making similar efforts to look at carbon capture for enhanced oil recovery.

Dan Jonasson provided a quick update on the Enhanced Mouse River Flood Protection Project. The first three phases in Minot, ND, are making progress, Phase II and III should be completed this fall. Phase I is projected to be completed next year. Work is continuing on advancing the design of other phases.

ND Legislature allocated \$82.5 million in the next biennium to keep the project moving forward throughout the basin. In Burlington, ND, there is a bridge replacement project underway and bids are expected by the fall for the flood protection portion.

#### 14. International Watershed Initiative Projects (IWI)

Mark Gabriel reported that the IWI three-year Dissolved Oxygen monitoring project started last May. The aim of the project is to determine how flow effects DO levels in the river.

There is a second project in the process of being submitted to the IWI that is proposing to study water quality trends over time in a larger scale across the basin. There is a similar study currently underway for the International Red River Board. This proposal will most likely be submitted in the fall.

The Board is encouraged to submit more IWI proposals.

Re-appointments of Board members is also necessary and with the new IJC Commissioners this is now possible. Board members may be asked to submit updated biographies and other information for the process.

Wayne Jenkinson mentioned that the dates between October 21 through to the 26 have been scheduled for the Semi-Annual Meeting in Ottawa, CA.

The IWI Project Report is due in 2020. Opinions of the Boards on how the IWI project is going, successes and challenges, will be necessary for the report. The Co-chairs will be contacted to provide information.

Randi Morri is leaving the IJC.

Canadian liaisons for the IJC will be changing for the boards.

Wayne Jenkinson also mentioned that when the ISRSB has completed its tasks there will be a number of items that will be handed off to the ISRB. While it is important that the Board continue on with the work done by the ISRSB, emphasis is placed on continuing the engagement with the Native American tribes and keeping them involved with the work of the Board.

Mark Gabriel suggested that a sub-committee focused on Indigenous Engagement may be a successful path forward in retaining the ISRSB's work on establishing those communications.

#### 15. International Souris River Study Board Update (ISRSB)

##### a. Update from the 1989 Agreement Core Committee

Rebecca Seal-Soileau provided a refresher to the Board about Annex A and B that provide the outline for how the reservoirs are to be operated for both flood and drought conditions. Over time it has been determined that some of the language in the Annexes is outdated and confusing. Meetings of the Core Committee has been delayed due to personnel changes and basin conditions in some area. Ken Bottle is taking over the group from Liz Nelson. The Committee plans to meet in the next month to review the latest round of revisions in order to be able to present a draft to the Board in November.

John Fahlman added that considerations had been made to update the language of the Annexes prior to the beginning of the Plan of Study. It was found that some of the language contained too much ambiguity and determined that work needed to be done on the document while some of the original witnesses to its creation were still present to maintain the original intent of the document.

**Action:** The Core Committee is to present the latest draft of Annex A to the Board prior to the next meeting.

b. International Souris River Study Board Progress Update

Michael Bart and Al Pietroniro provided a presentation on the Souris River Plan of Study. The primary study objectives are to review the operating rules in the 1989 Agreement, including Annex A and B, build a model of the reservoir system, and model alternatives with considerations towards input from stakeholders; PAG, RAAG and the Study Board.

The study team is taking a phased approach to the alternative modeling. Currently the Study Board is in Phase 3 of the 5.

- Phase 1 – Stakeholder engagement and brainstorming flow scenarios
- Phase 2 – Single variable screening (HEC-ResSim)
- Phase 3 – Sensitivity analyses of fundamental variables (HEC-ResSim, Stochastic)
- Phase 4 – Creating/refining alternatives (HEC-ResSim, Stochastic)
- Phase 5 – Detailed evaluation (HEC-ResSim, Stochastic, Climate Change, HEC-RAS)

A model of the river beginning at the Canadian Reservoirs and ending at Westhope, ND was developed using HEC-Reservoir System Simulation (HEC-ResSim). The operating rules from the 1989 Agreement for the Canadian reservoirs were established, and any other real-world operations or constraints, then applied to the entire period of record from 1930 to 2017. The modeling includes Grant Devine Lake, Boundary Reservoir, Rafferty Reservoir, the Boundary-Rafferty diversion and pipeline, Lake Darling, the Eaton Irrigation Project and J. Clark Salyer National Wildlife Refuge.

The model outputs included daily reservoir elevation time series and daily flow time series at control points. R scripts are then used to score those model outputs using Performance Indicators (PIs).

The ISRSB then held various forms of public engagement in Manitoba, Saskatchewan and North Dakota: Meetings and engagement with Tribes, First Nations and Metis; public meetings in February and June of 2018, and February and June of 2019. PAG/RAAG webinars in January and March of 2019, PAG/RAAG workshops in June 2018, March, April and a future one in July of 2019. There was also a public questionnaire sent out.

The PAG/RAAG workshops gathered input on the PIs and Flow Alternatives to investigate various scenarios. Those alternatives were ranked and a selection criterion was offered.

Some of the Stakeholder's concerns included a desire for flexibility and adaptive management in reservoir operations, improved communications between operators and the general public, continued engagement between decision makers and stakeholders, continued engagement with Tribes, First Nations and Metis, water quality, the impacts of climatecChange, and the impacts of artificial drainage.

Evaluation tools were developed in close coordination with the RAAG using input from the PAG. The tools were established on the relationship between river flow or reservoir elevation

and its categorical impacts to people or the environment. The resulting PIs that were developed are based on eight study themes: Flood Control, Water Supply, Agriculture, Environmental, Erosion, Recreation, Cultural, and Water Quality.

There are an additional 13 subjects to the 21 river reaches that received the standardized methodology for assessment using PIs. Attempts were made to make them as quantitative as possible, but the data is limited for some of the themes that needs to be considered in their use to evaluate alternatives. It was also noted that additional input and considerations will most likely be provided as the study moves forward. The alternative evaluation is presented as a normalized PI value on a baseline, indicating a positive or negative effect on different areas of concern based on that individual alternative.

The ISRSB asked the Board to consider what legacy models and outcomes from the project will be carried forward by the ISRB (e.g.: forecasting, modeling, First Nations engagement, etc.). Tools that have been developed that can be used for future studies include: reconstructed hydrology dataset, stochastic hydrology dataset, climate changed hydrology dataset, PIs, HEC-ResSim model, MESH model and HEC-RAS model. Additional reports that may be of use are a forecasting review and an artificial drainage review.

The Study Board also gave the ISRB some post study considerations to deliberate:

- First Nation engagement after the Study
- Will the forecasting review task activities impact the FFLC
- Does the dam safety analysis impact the Study Board's work
- How will the water quality review impact the AEHC
- What will the ISRB receive from the Study Board as an outcome of the Climate Change analysis
- Will there be data monitoring programs to fill in data gaps for future analysis
- Will modeling tools become long-term resources for the ISRB
- How will adaptive management recommendations impact the ISRB's activities (and do they)
- What is the schedule for involvement for the ISRB in the review process

The Study will soon be entering Phase 4 and will have a strong indication of what the recommendations will be. It is necessary for the ISRB to be involved in the review process prior to the Study Board entering Phase 5. It is expected that the end of Phase 4 will occur towards the end of 2019.

The Study Board recommended that the ISRB hold a meeting in November of 2019 to discuss the post study considerations mentioned above, and the indications provided by Phase 4, so that they may provide input to the Study Board prior to entering Phase 5.

Commissioner Jane Corwin mentioned how critical it is for the Board to be as engaged as possible with the study. Any recommendations that are implemented that may have impact on an entity or individual will result in them coming back to the Board with questions and concerns regarding why those decisions were made. The more considerations made by the

Board towards all of the interests of the basin during this development phase will greatly reduce the potential of any stakeholders being left out of the process and concerns that their best interests were not being met.

**Action:** The ISRB to hold a Board Meeting November 13-14, 2019, in Regina, SK.

16. Other Business

None

17. New Business

None

18. Next Meeting

The next face-to-face meeting is scheduled to be held on November 13, 2019, (afternoon); and November 14, 2019 (morning) in Regina, SK.

**Action:** Winnipeg will coordinate the hosting of the next face-to-face meeting.

The next face-to-face Spring Meeting in 2020 is scheduled to be held on February 20, 2020, (afternoon and public); and February 21, 2020 (morning) in Minot, ND, in conjunction with the Assiniboine River Basin Initiative Conference.

**Action:** The ND SWC will coordinate the hosting of the next face-to-face Spring Meeting in 2020.

23. Adjournment

The meeting was adjourned at 3:08 p.m. on June 26, 2019 (Bottineau/Lake Metigoshe, ND).



**International Souris River Board**  
**ACTION ITEMS – progress updated June 26, 2019**

<b>PERSONS OR COMMITTEE RESPONSIBLE</b>	<b>TOPIC</b>	<b>MINUTE</b>	<b>ACTION</b>	<b>STATUS As of June 26, 2019</b>
Joel Galloway	Discrepancies of results of water quality sampling	February 24, 2016	Joel Galloway will investigate the reason for the discrepancies of the results of the joint water quality sampling between Canada and the USGS	Ongoing
Pascal Badiou	DU Nutrient Project	February 24, 2016	Pascal Badiou to present the results of the DU Nutrient Project to the Board	Ongoing
Mark Gabriel	IJC - Review Water Quality Objectives	February 24, 2016	Mark Gabriel will present the results from his review of the Souris River Water Quality Objectives	Completed
ISRB Secretaries	IJC Climate Change Framework	February 23, 2017	Secretaries to add to the agenda for discussion at the June 2017 Board meeting	Completed
ISRB Secretaries	North Dakota Water Quality Project	February 23, 2017	Secretaries to add to the agenda for discussion at the June 2017 Board meeting	Completed
Souris River Study Committee	Plan of Study (POS) report	February 23, 2017	The Souris River Basin Study Committee to present its draft report at the June 2017 Board meeting	Completed
Public Working Committee	Public meetings	February 23, 2017	David Pattyson, Shelly Wepler, Debbie McMechan, and Wanda McFadyen to work on public outreach. Co-Chairs will send an email to the IJC about the creation of the Committee	Closed
Mark Lee	Whitewater Lake EA	June 27, 2017	Mark Lee to send an electronic copy of the EA for the Whitewater Lake Project in Manitoba	Ongoing
Nicole Armstrong	Picloram Exceedances	June 27, 2017	Nicole Armstrong to check and report back the Picloram Exceedances in May, June, and July	Ongoing
John Fahlman	Water Management Projects	June 27, 2017	John Fahlman to send a 1-page summary about capital projects in Saskatchewan to the secretaries	Ongoing
Russell Boals	Terms of Reference for the Communications Committee	June 27, 2017	Russell Boals will prepare the Terms of Reference (TOR) for the Communications Committee	Completed
ND SWC	Winter 2018 Board Meeting	June 27, 2017	ND SWC will coordinate and host the winter 2018 Board meeting in Bismarck in North Dakota	Completed
Board Secretaries	Apportionment Procedures Manual	June 26, 2018	Board Secretaries to distribute the Apportionment Procedures Manual to Board members with deadline for comments.	Ongoing
Curtis Hallborg	FFLC membership update	June 26, 2018	Curtis Hallborg to provide a new membership list of the FFLC to the Secretaries.	Ongoing
COH	Apply for an IWI funding for the Procedures Manual	June 26, 2018	The COH will consider applying for IWI funding for the Procedures Manual	Ongoing

**International Souris River Board**  
**ACTION ITEMS – progress updated June 26, 2019**

<b>PERSONS OR COMMITTEE RESPONSIBLE</b>	<b>TOPIC</b>	<b>MINUTE</b>	<b>ACTION</b>	<b>STATUS As of June 26, 2019</b>
COH	Apply for an IWI funding for the Communications Infographics	June 26, 2018	The COH has been requested to apply for IWI funding for Communications Infographics	Closed
Board Secretaries	Souris River Study Board Update Presentation	June 26, 2018	Secretaries will distribute the Souris River Study Board update to the Board	Completed
1989 Core Committee	Draft of Revised Annex “A”	June 26, 2018	Core Committee will resubmit the draft of the revised Annex “A” of the 1989 Souris River International Agreement to the Board with a deadline of July 31, 2018.	Ongoing
Board Secretaries	Dam Safety	June 26, 2018	Secretaries to reserve a place for an update on Canadian Dam Safety Work on the following Board agendas.	Completed
Communication Committee	Indigenous participation	June 26, 2018	Amend Role and Responsibility “a” to include Indigenous People to increase awareness.	Completed
All Committees	Work Plan	June 26, 2018	All committees to review the draft ISRB Work Plan, update their current progress prior to the IJC Appearance in October.	Completed
Manitoba Sustainable Development (MSD)	Hosting next meeting	June 26, 2018	Manitoba Sustainable Development will coordinate hosting the next Board meeting (February 21-22, 2019) in Brandon.	Completed
AEHC	Additional Water Quality monitoring including herbicides	February 21, 2019	AEHC will put an information package together for the next meeting to request more herbicide monitoring	Completed
Communication Committee	Support COH’s IWI Project Proposal	February 21, 2019	The Communication Committee will package the COH IWI proposal for submission the IJC funding	Ongoing
Lez Nelson	Updated Annex “A”	February 21, 2019	Les Nelson to provide a status Report and an update on the revisions to Annex “A” – 1989 Agreement	Ongoing
ND SWC	Next Board meeting	February 21, 2019	ND SWC will coordinate and hosts the next Public and Board meetings in Bottineau, ND	Completed
COH	Natural flow reporting dates	June 26, 2019	COH to investigate the natural flow reporting dates and make recommendations for adoption	Ongoing
COH & Outreach and Communication	Coordinate and determine Infographics for the Souris	June 26, 2019	COH and OCC coordinate and determine the necessity of generating a Souris Basin Hydrology Infographics and generate an IWI Proposal if deemed necessary.	Ongoing
Core Committee	Present the latest draft Annex “A” to the Board	June 26, 2019	The Core Committee is to present the latest draft of Annex “A” to the Board prior to the next meeting	Ongoing
ISRB	Next meeting	June 26, 2019	The ISRB to hold a Board meeting November 13-14, 2019 in Regina, SK.	Ongoing

**International Souris River Board**  
**ACTION ITEMS – progress updated June 26, 2019**

<b>PERSONS OR COMMITTEE RESPONSIBLE</b>	<b>TOPIC</b>	<b>MINUTE</b>	<b>ACTION</b>	<b>STATUS As of June 26, 2019</b>
Saskatchewan Water Security Agency	Hosting Joint Workshop of ISRB and ISRSB	June 26, 2019	Saskatchewan Water Security Agency will coordinate the hosting of the ISRB and ISRSB Joint Workshop in November 2019 I Regina, SK.	Ongoing
North Dakota State Water Commission	Hosting of next meeting	June 26, 2019	ND SWC will coordinate the next face-to-face Winter Meeting in Minot, ND in February 2020	Ongoing

Note: When two or more meetings are referenced to an item; that indicates a carry-forward of an action item from previous meetings.