

International St. Mary and Milk Rivers Study  
Board Progress Report

October 6

2023

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## Executive Summary

The International St. Mary – Milk Rivers Study was initiated on Nov. 10, 2021 with the appointment of a 6-person, bi-national study board and 6-page Directive to the study board (ISSMRSB). The study had been proposed a few years earlier by the Accredited Officers for the St. Mary and Milk Rivers (AOs). Earlier in 2021, the AOs study plan had been endorsed in a letter from governments to the IJC.

Since then, the Study Board developed a workplan that was approved by the IJC and received comments from the public and the Independent Review Group (IRG) developed by the IJC to provide independent review of the study as it proceeds. The workplan describes a comprehensive governance structure, a variety of advisory groups described by the IJC Directive, plans for Indigenous and public engagement, as well as detailed information about how the study will be conducted.

The Study Board has met on average about two times a month since the board was formed and has begun implementing the work plan including the implementation of all of the required advisors and technical groups.

With the help of IJC Communications staff, the Board has actively engaged the public through in-person meetings, a webinar, and documents on the Board's Web page. Several key members of the Board have recently completed training to update content on its Web page to better inform the public. Key documents that are posted include, in part, board fact sheets, newsletters, and minutes from the Board meetings.

Indigenous engagement is a key aspect of the study in the original study proposal and the IJC's Directive. The Board has identified Indigenous Engagement Leads to actively work on identifying Indigenous Nations to be part of the Government Forum, Indigenous Advisory Group members, and Indigenous observers to be part of Technical Working Groups. In addition, they've worked with IJC staff to link the Board with Indigenous Peoples by scheduling in-person meetings and engaging with local tribal colleges.

Six Technical Working Groups (TWGs) have been formed to conduct the studies required for the Board's work. Each TWG has Co-Chairs, members, observers, and advisors. In addition, individual Board members were assigned to observe and support each TWG. As described by the workplan, the work of the TWGs will be guided by the study's Technical Leads and the Options Formulation and Evaluation Group.

Most recently, almost all TWGs have provided a more detailed workplan, state of knowledge reports, and budget plans to the Study Board. The Board has used this information to provide an updated and much more detailed workplan for the overall study. The Board will continue to engage the IJC, the Public, Indigenous Nations, and other advisory groups of the ongoing efforts of the project. These partnerships and communication remain critical to a successful project and will continue to move the overall study towards meeting the goals and objectives.

## Background

The St. Mary and Milk River basins stretch across regions within the state of Montana, as well as the provinces of Alberta and Saskatchewan. Irrigation practices have been in operation in these basins for well over a century. Historically, the challenge of irrigating land in an area prone to recurring droughts had given rise to divergent interests and strategies between Canada and the United States concerning water supply. These conflicting goals for utilizing the limited water resources eventually necessitated the inclusion of water allocation provisions within Article VI of the Boundary Waters Treaty, which applies to these watershed areas.

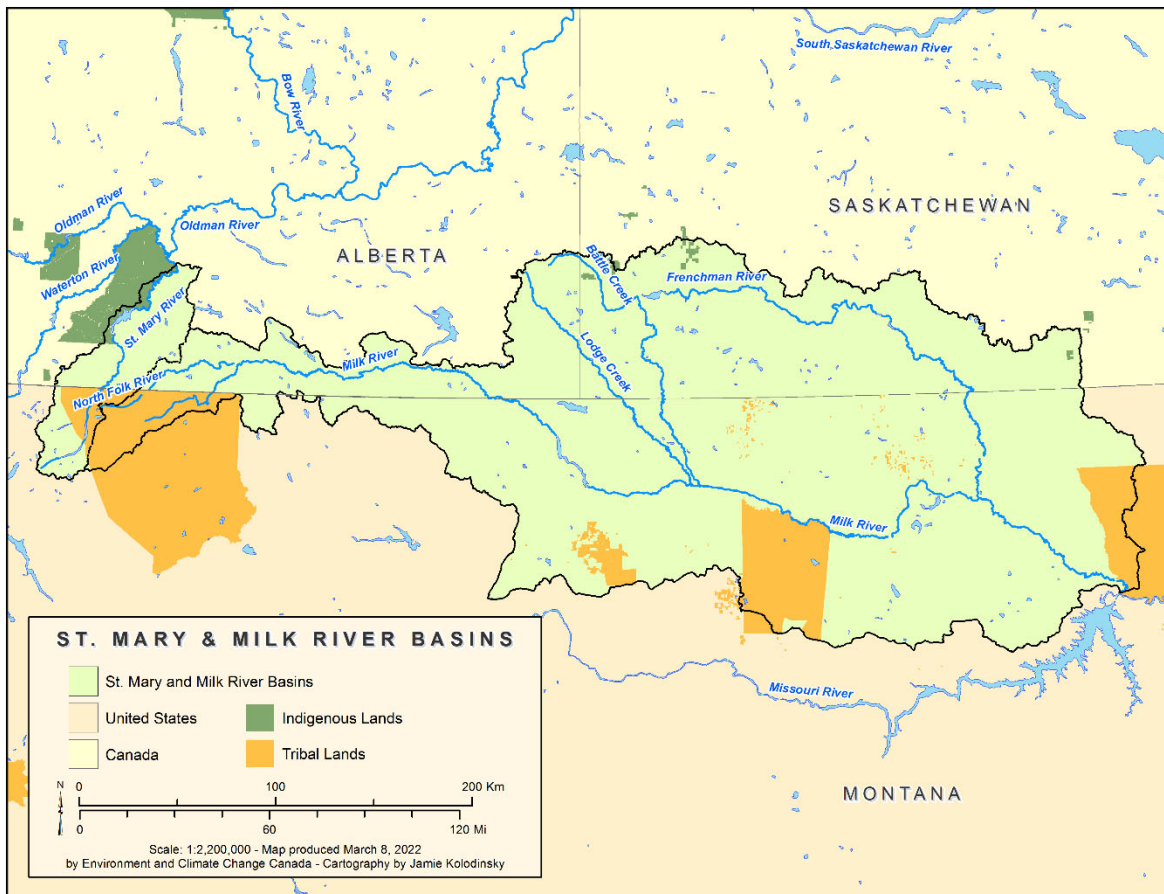


Figure 1. The St. Mary and Milk River basins in Alberta, Saskatchewan, and Montana.

In spite of the Treaty, difficulties regarding the equitable distribution of water resources between the United States and Canada have persisted, especially in light of evolving patterns in water utilization, shifting climate conditions, and variations in seasonal water availability. Possible adjustments to the current apportionment procedures and possible infrastructure developments and changes, were identified by the Accredited Officers (AOs) between 2017 and 2019. It was believed that these suggested structural and/or non-structural measures could potentially enhance the capacity of each country to utilize its allotted share of the water more effectively and promote its beneficial use.

In June 2021, governments indicated their support for the IJC to carry-out the AOs proposed study for improved beneficial use and sharing and report back the results within 4 years. In Nov. 2021, the IJC created the 6-member International St. Mary and Milk River Study Board to conduct the study. The Board began meeting in mid-December and has met about twice a month since then.

The IJC's November 10, 2021 Directive establishing the Study asked the Study Board to provide the Commission with a final report, including all the Board's findings, conclusions, and recommendations by June 13, 2025.

While the IJC was in the process of appointing Board members and laying the groundwork for the Study Board, IJC Commissioners and staff, in collaboration with the AOs, commenced the process of engaging with Indigenous Nations in the basin. The IJC and the AOs initiated the planning of diverse approaches to engage the many Indigenous populations residing in these basins.

Within the IJC's Directive to the ISMMRSB, the Commission requested that the Study Board submit an annual report in the Fall of 2022, and each fall thereafter. This report fulfills that requirement.

## Study Progress

The Study is part of an extensive four-year work program, during which the Study Board, along with its committees, advisory teams, and working groups, is actively engaged in research and consultation efforts. The Study Board approved the updated workplan in April 2023. The update includes updated information on the work of the Technical Working Groups (TWGs) and Advisory Groups. Guided by the Operations Formulation and Evaluation Group (OFEG), the TWGs are conducting assessments of how options, and combinations of options, would affect water availability, socio-economic systems, and aquatic ecosystems. This work includes the formulation of State of Knowledge reports that summarize the findings of each TWG. Additionally, initial Performance Indicators (PI) were identified, and a proof-of-concept study was presented to the board for selection of water management models used for the study. The Public Advisory Group (PAG) and Indigenous Advisory Group (IAG) are disseminating study findings and providing ongoing feedback throughout the process.

### **Chronological Key Milestones include:**

Oct. 2022

- OFEG TWG Workshop (Calgary)
- Milk River Public Town Hall
- Shelby Public Town Hall & board meetings

Feb. 2023

- IAG informational virtual meeting held
- International Records Meeting (AOs) (Helena, MT)

Mar. 2023

- Study Board had a virtual meeting with IAG
- A proof of concept was developed to demonstrate the sequences of steps to be taken to complete the overall study and evaluate the two main water management models under consideration

Apr. 2023

- Study Board approval of updated workplan ([here](#)). Update includes more information on the work of the TWGs and Advisory Groups
- Proof of concept presented to board and resulted in selection of water management models (one US and one Canadian) that will be used for the entire study
- Study Board appeared before Commissioners to give an update on their work to date
- TWGs produced State of Knowledge reports to assist in understanding baseline conditions in the basin

May 2023

- PAG members met in-person in Havre, Montana, to discuss ideas and plan for future public engagement
- Study Board hosted a Public Townhall in Havre Montana, to update the public on the study's progress, work plan and timeline of studies into 2024, as well as to solicit public feedback on future engagement
- In-person Study Board meeting in Havre, Montana

Jul. 2023

- IAG virtual meeting

Sep. 2023

- IAG meeting in person at Fort Belknap Indian Community to discuss and provide input on the work of the TWGs
- Climate and Hydrology TWG hydrothon (Calgary)

## 1. Study Governance

The study and governance structure has been fully implemented. The Study Board is comprised of three members from Canada and three members from the United States. These members have been engaged with the study and are responsible for providing oversight to the study. These individuals have actively participated in the workplan development and are tasked with overseeing its progress. The Study Board members are experts on water resources, water apportionment, irrigation, and ecology. With the exception of the co-chairs, they have no previous experience working on issues in the St. Mary and Milk Rivers. Two Study Managers, one from Canada (Beau Hawkings, ECCC from Canada) and one from the United States (Josh Valder, USGS, from the USA), continue to work and assist the Study Board in delivering on its

mission. One personnel change was made this past year where Brian Loving (USGS, United States) has taken the place of Joanna Thamke (USGS, United States) as the alternate co-chair on the Study Board. The board accepted Joanna’s resignation and accepted Brian as a replacement.

## 2. Advisory Groups

The IJC, in collaboration with the Study Board, has established a Public Advisory Group (PAG), as per the IJC’s directive. The PAG comprises individuals who have a variety of interests in the basin, including municipal supply, irrigation, indigenous practices, recreation, and more.

<b>Members from Canada</b> <i>(Alphabetical order)</i>	
1	<b>Shannon Frank</b> Oldman River Watershed Council, Alberta, Canada
2	<b>Ken Miller</b> Milk River Watershed Council of Canada, Alberta, Canada
3	<b>Roger Pederson</b> Saskatchewan Irrigation Projects Association, SK, Canada
4	<b>Richard Phillips (Co-Chair)</b> Alberta Irrigation Districts Association, Alberta, Canada
5	<b>Jason Schneider</b> Rural Municipalities of Alberta, Alberta, Canada
6	<b>Audrey Van Son – Turner</b> Milk River Water Users Association, Alberta, Canada
<b>Members from the United States</b> <i>(Alphabetical order)</i>	
7	<b>Greg Jergeson</b> Blaine County Conservation District, Montana, United States
8	<b>Marko Manoukian</b> Phillips County, Montana, United States
9	<b>Bob Nelson</b> Montana Walleyes Unlimited, Montana, United States
10	<b>Jennifer Patrick</b> Milk River Joint Board of Control, Montana, United States
11	<b>Jeff Pattison</b> Milk River Watershed Alliance, Montana, United States
12	<b>David Peterson (Co-Chair)</b> City of Havre Public Works Department, Montana, United States

Table 1. Membership of the Public Advisory Group to the ISMMRSB

The PAG met in-person in May 2023 in Havre, Montana, and will be meeting in-person again in Great Falls, Montana, in October/November 2023 to discuss and provide further input on the

work of the Technical Working Groups. The PAG has now selected Co-Chairs for the group from each country (David Peterson, US, and Richard Phillips, Canada). The current Communications Committee serves as the conduit of information between the PAG and the Board. Currently, two Study Board members along with the two Study Managers make up the Communications Committee. Until and after Co-Chairs are selected, Communication committee members, including IJC communications committee members, will observe PAG meetings and will serve to pass information between the PAG and the Board.

The Study Board was directed by the IJC to establish an Indigenous Advisory Group (IAG). Working through Indigenous Engagement Leads (Sheree Watson, US and Clayton Desjarlais, Canada) and IJC staff, the Board has identified the members of the IAG, who are listed in Table 2. The IAG met virtually and in-person in September 2023 at Fort Belknap Indian Community to discuss and provide input on the work of the Technical Working Groups. Although the study originally envisioned an IAG that would largely mirror the PAG (i.e. having an equal number of members appointed from each side of the border, with co-chairs, a formal terms of reference, etc.), this group has taken a less structured approach. In addition to the five members appointed over the past year, interested observers have also been welcomed to participate in meetings, contributing insights and communicating study information to their home nations and organizations.

<b>Indigenous Advisory Group Members</b>	
1	<b>Mr. Randy Perez</b> Fort Belknap Indian Community
2	<b>Ms. Gheri Hall</b> Amskapi Piikani (Blackfeet Nation)
3	<b>Mr. Daniel Pocha</b> Little Shell Tribe of Chippewa Indians of Montana
4	<b>Ms. Dyan Youpee</b> Fort Peck Tribes
5	<b>Mr. Richard Aisaican</b> Cowessess First Nation

<b>Indigenous Engagement Leads</b>	
<b>Canada</b>	<b>United States</b>
Mr. Clayton Desjarlais	Dr. Sheree Watson

Table 2. Membership of the Indigenous Advisory Group to the ISMMRSB and the Indigenous Engagement Leads

In addition to seeking advice from the Public and Indigenous Advisory Groups, the IJC, with the aid of the Board has established a Government Forum to provide feedback to the Board from the



Indigenous, State, Provincial, and Federal governments. The Forum includes management leads from agencies with water resource responsibilities directly related to the Study. Members of the Forum have been formally appointed by the Commission along with the Special Liaisons between the Government Forum and the Study Board and Commission.

Within the United States	
Government entity	Representative
Fort Belknap Indian Community	Ms. Kristal Hawley-Fox <i>Water Resource Director</i>
Montana Department of Natural Resources and Conservation	Ms. Anna Pakenham Stevenson <i>Administrator of the Water Resources Division</i>
U.S. Bureau of Reclamation	Mr. Ryan Newman <i>Area Manager, Montana Area Office</i>
Amskapi Piikani (Blackfoot Nation)	Mr. Gerald 'Jerry' Lunak <i>Water Resource Director</i>

Within Canada	
Government entity	Representative
Alberta Ministry of Environment and Parks	Ms. Carcey Hincz <i>Executive Director of Environmental Knowledge and Prediction</i>
Environment and Climate Change Canada	Dr. Wayne Jenkinson <i>Executive Director for ECCC's National Hydrological Services</i>
Saskatchewan Water Security Agency	Mr. Jeff Woodward <i>Director of Hydrology and Groundwater Services</i>
Kainai Nation (Blood Tribe)	Mr. Mike Oka <i>Consultation Manager</i>

Special Liaisons to the Forum	
Canada	United States
Dr. Frederick Wrona	Mr. John Tubbs

Table 3. Members of the Government Forum of the ISMMRSB and Special Liaisons to the Forum

Organizing additional Government Forum meetings has proven challenging since the last progress report. This issue stems from scheduling conflicts among forum members, making it tough to find suitable meeting times. However, the Government Special Liaisons co-chairs have been active in meeting with the members bi-laterally to ensure the concerns and progress from the study are being communicated. We fully expect and can confirm that Government Liaison Forum members will participate in the Great Falls meeting in November.

### 3. Public Engagement

As described in the Board's workplan, a Communications Committee for the study has been established with members including IJC Communications staff, the two Study Managers and one Board member from each country. This group will guide the Board's communications efforts as the study moves forward. To date, the Board's communications efforts have been guided by the IJC Communications staff and their help is appreciated.

A summary of public engagement includes the following:

- Milk River Public Town Hall in October 2022
- Shelby Public Town Hall in October 2022
- PAG Meeting and Public Town Hall in Havre, Montana in May 2023
- In-person meetings and engagement in Great Falls, Montana in October/November 2023

Also, there have been multiple media requests regarding the Board's activities. These requests included articles about the refurbishing of the St. Mary Diversion Dam, climate change impacts on water flows, as well as other questions regarding aging infrastructure in the basin.

#### **Notable Accomplishments: PAG and Public Engagement**

Public Advisory Group members met in-person in May 2023 in Havre, Montana to update the public on the study's progress, work plan and timeline of studies into 2024, as well as to solicit public feedback on future engagement. There will be a meeting in Fall 2023 to discuss and provide input on the work of the TWGs.

PAG and Board members have been actively engaged with the Communications Committee, the data management team, and a team that has been established to guide final study reporting. Their oversight helps refine organization messaging and reinforces accountability and transparency, which leads to informed decision-making and stakeholder trust.

The inaugural semi-annual Newsletter, released in June 2023 to disseminate updates about the Study, proved to be a resounding success. It garnered substantial interest and engagement, amassing nearly 1,400 initial views and attracting the attention of the media, resulting in four media requests. This enthusiastic response underscores the public's keen interest in staying informed about the Study's progress and highlights the effective communication efforts undertaken to achieve this goal.

## 4. Indigenous Engagement

### Overview

The location of Indigenous Nations in the watershed and their connection to the waters of the St. Mary and Milk Rivers appears to be a significant influence on overall level of engagement with the study. Those having land and community sites directly adjacent to the rivers have been the most engaged, namely the Kainai (Blood Tribe), Blackfeet, Fort Belknap Indian Community, and the Fort Peck Tribes. Many of those located in the upstream reaches, including the eastern and southern tributaries of the Milk River, have shown less interest to date in getting involved. However, all 14 of the Indigenous Nations in the basin have been contacted and had an opportunity to engage with the Study and communication such as newsletters or public meetings will continue to be offered to these communities.

### Indigenous Advisory Group

Although the study originally envisioned an Indigenous Advisory Group that would largely mirror the Public Advisory Group (i.e., having an equal number of members appointed from each side of the border, with co-chairs, and a formal term of reference, etc.), this group has taken a less-structured path to date. In addition to the five members appointed over the past year, interested observers have also been welcomed to participate in meetings, contributing insights and communicating study information to their home nations and organizations.

Since October 2022, the Indigenous Advisory Group has on four occasions:

February 8, 2023: (Virtual) This meeting offered an overview of the study, key subject areas, polling questions to invite comments, questions, and input on connection to the rivers and interest in participating in the study.

March 24, 2023: (Virtual) Meeting with the study board, offering the chance for study board members and advisory group members to spend time learning about each other.

July 12, 2023: (Virtual) More in-depth introduction to the technical working groups, and how performance indicators are being developed and the role they will play in the study.

September 19, 2023: (*Hybrid, hosted by Aaniih Nakoda College in Fort Belknap*) Information and listening session led by USGS staff, focussing on performance indicators and their role in the study.

### Participation of Indigenous experts in the study's technical working groups

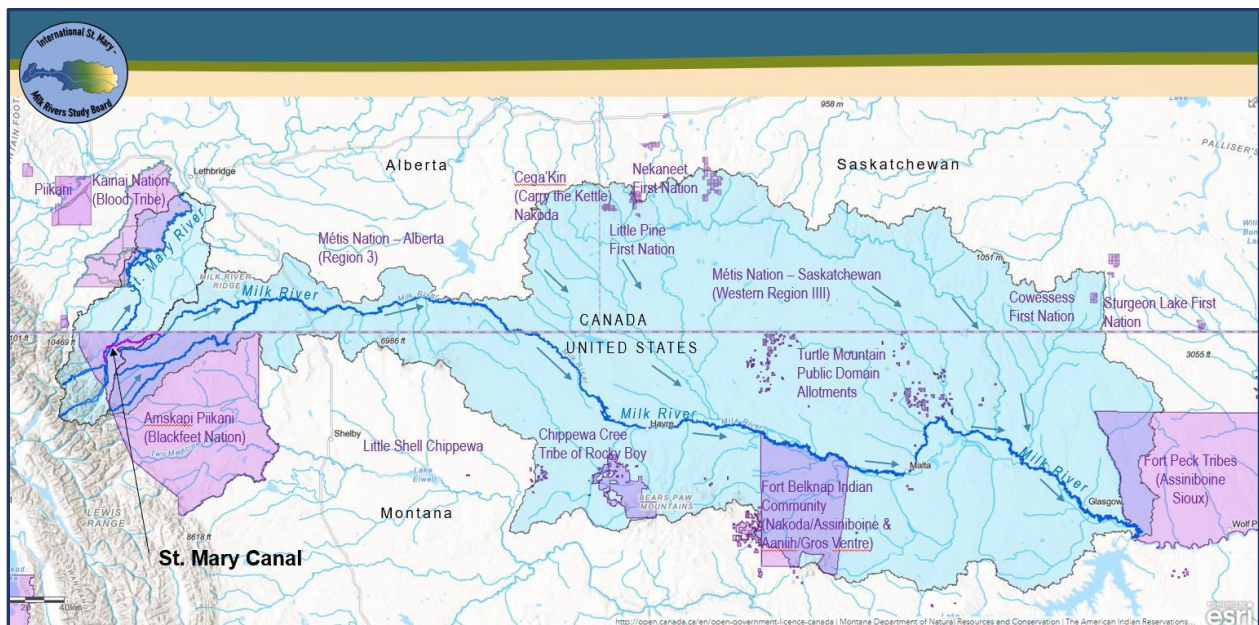
Since late 2022, 4 of 6 TWGs have Indigenous experts contributing to their work: representatives from the Blackfeet Nation are participating in the Climate & Hydrology TWG (Hydrologist), Aquatic Ecosystems (Fisheries Biologist), and Socio-Economic Analysis (Climate Change Coordinator). In addition, two Tribal College faculty from Aaniiih Nakoda College from the Fort Belknap Indian Community are serving on the Climate & Hydrology (Hydrologist), and Aquatic Ecosystems TWG (Environmental Science).

## Data and research

We are working with the Institutional Review Boards (IRB) associated with the Tribal College and Universities (TCUs) at the Blackfeet Nation, and Fort Belknap Indian Community (FBIC). Blackfeet Community College (BCC) currently has a recommended procedure and protocols for research involving their Indigenous knowledge and people. Aaniiih Nakoda College (FBIC) also has an IRB when working with research that has been collected in the FBIC. Data sharing has become a part of the Study because Indigenous members from these communities are involved in TWGs in which they are contributing their knowledge and data as fits the technical work being done in the Study.

## Communications outreach

Indigenous Advisory Group members and observers have received study updates in the form of newsletters, fact sheets, and surveys. All 14 of the Indigenous Nations in the basin will continue to be offered study updates and communications products produced throughout the study.



## 5. Workplan

The ISMMRSB initial study framework dated February 10, 2022 (updated June 29, 2022 and April 07, 2023) has been submitted by the ISMMRSB to the International Joint Commission as the official ISMMRSB Work Plan. This plan describes the detailed scope of the study’s work in accordance with the November 10, 2021 Directive to the Study Board and anticipated outcomes of the study. These outcomes will include detailed findings, and recommendations for the IJC’s consideration upon study completion in Autumn 2025.

While executing this Work Plan, the Study Board aims to incorporate a wide range of viewpoints and considerations. The goal is to explore various options and combinations of strategies that enhance access to apportioned waters for each country, all while acknowledging the treaty complexities and taking into account the threats posed by climate change. The approved Work Plan also encompasses an evaluation of insights gained over the past century, since the issuance of the 1921 Order. The structure and outcomes of the Study are devised to strive for mutually advantageous solutions benefiting both the US and Canada.

## 6. Technical Tasks and Working Groups

As outlined in the Study Workplan, six TWGs have been established to conduct the required technical work for the study. Each TWG is composed of Co-Chairs, members, advisors, and observers. The Co-Chairs for each TWG are listed in Table 4. The Technical Working Groups (TWGs) are under the supervision and direction of the Options Formulation and Evaluation Group, which is headed by the Alternate Co-Chairs for the study, Malcolm Conly representing Canada and Brian Loving representing the US. They are supported by the study's Technical Leads, Bruce Davison from ECCC and Cheryl Miller from USGS.

<b>Technical Working Group</b>	<b>Co-Chair</b>	<b>Affiliation</b>	<b>Board Member Leads</b>
Climate and Hydrology	Mr. Anil Gupta	Alberta Env. and Parks	Dr. Al Pietroniro Mr. Mark Anderson
	Ms. Kathy Chase	USGS	
Infrastructure Options	Mr. Paul Elser	Alberta Env. and Parks	Mr. Malcolm Conly
	Mr. Chris Gomer	U.S. Bureau of Reclamation	
Water Apportionment and Administrative Options	Ms. Carmen de la Chevrotière	Alberta Env. and Parks	Ms. Sue Lowry Mr. John Kilpatrick
	Mr. Paul Azevedo	Montana Dept. of Nat. Res. and Conservation	

Water Management Modeling	Mr. Tom Tang	Alberta Env. and Parks	Mr. Evan Friesenhan
	Mr. Larry Dolan	Montana Dept. of Nat. Res. and Conservation (retired)	
Socio-Economic Analysis	Mr. Bob Halliday	ECCC (retired)	Mr. Laurie Tollefson
	Dr. Susan Gilbertz	Montana State Univ. Billings	
Aquatic Ecosystems	Ms. Nancy Glozier	ECCC	Dr. Dena McMartin
	Dr. Clint Muhlfeld	USGS	

Table 4. Technical Working Groups and Co-Chairs for the ISMMRSB.

### **Water Management Modelling TWG**

The Water Management Modelling (WMM) TWG is setting up and configuring the water management models to evaluate structural and administrative options for the study. The group is responsible for identifying, refining, and running water management models of the St. Mary and Milk River systems to evaluate storage and conveyance infrastructure options.

The WMM TWG has described and analyzed available water management models for the basins, their status, and how the models have been used for recent analyses. The group has also reviewed input data required by the models and their status and availability.

### **Climate and Hydrology TWG**

The Climate and Hydrology (CH) TWG is testing different hydrological models to determine which ones match the observed, historical hydrology. This TWG is also using available future climate data in these models to assess the climate future and robustness of any structural or non-structural options proposed.

The CH TWG has reviewed and classified hydrological models for clarification and guidance for model selection. The group has also reviewed models currently running in the basins, including ones from the US Bureau of Reclamation and Environment and Climate Change Canada, as well as analyzed natural flows in the basin. The CH TWG has successfully completed a comprehensive gap analysis, identifying both challenges and opportunities in their work. This analysis covers various aspects, including hydro-meteorological data, process comprehension, model benchmarking, and the incorporation of future climate data.

### **Infrastructure Options TWG**

The Infrastructure Options (IO) TWG has been evaluating past work done in the basin to evaluate options to modify the way water is stored, conveyed, or accounted for. They have selected options they feel would be the best to test in the water management models.

The IO TWG has also provided an overview of Indian Water Rights Settlements and how they may affect infrastructure management and water allocation in the basins, including the Fort Belknap Indian Community Water Compact and the Blackfeet Water Rights Settlement.

### **Water Apportionment and Administrative Options TWG**

The Water Apportionment and Administrative Options (WAAO) TWG has been evaluating previous work in the basin that were focused on options to change the way accounting procedures are carried out in the basin. The team has chosen specific options that they believe are most suitable for testing within the water management models. Moreover, they have compiled information from prior studies and published reports associated with the SMMR Study, providing insights into past water apportionment practices in the basins. The WAAO TWG has also summarized the general findings from the AO's review of options.

### **Socio-Economic Analysis TWG**

The Socio-Economic Analysis (SEA) TWG is investigating the social and economic systems in the basin and working to develop Performance Indicators to analyze various structural and non-structural scenarios being considered by the Study.

The group has described the water right's laws within Canada and the United States and how they may affect water use and allocations in each country. Water rights in Montana, Alberta, and Saskatchewan all originate in Western water law but differ in areas such as the existence of federal and Indian reserved rights in Montana. Additionally, the group has analyzed the documented historic water users in the basins, where irrigated agriculture is the most significant water use, but in the Milk River basin in particular, water supplies are insufficient to meet permitted or licensed needs due to unreliable water flows. Moving forward, the SEA TWG will achieve a better understanding of public concerns throughout the basin and the institutional response to those concerns due to the lack of socioeconomic studies within the basin.

### **Aquatic Ecosystems TWG**

The Aquatic Ecosystems (AE) TWG is currently researching aquatic species in the basin, with the TWG providing an increased focus on native bull trout for Performance Indicator development. The aim is to understand the potential impacts of changes in water flow on specific species.

The AE TWG State of Knowledge Report (SOK) is currently being written, based on an annotated bibliography that has been produced for aquatic species in the basin. This report will provide foundational information by creating a document describing species of interest, and current research and monitoring data on aquatic ecosystems of the St Mary and Milk River basins, including water quality and quantity, habitat, benthic invertebrates, and fishes. Additionally, this SOK will also describe the regulations that are enacted by the U.S., Canada, Montana, Alberta, and Saskatchewan to protect aquatic species. This initial State of Knowledge report is expected to be completed in November 2023.

A second report will be written later to expand general knowledge around dam, reservoir, canal, and irrigation impacts on the aquatic ecosystems. The State of Knowledge and subsequent reports will provide a foundation for a gap analysis that will inform future funding considerations.

More specifically to bull trout, the AETWG has been using long-term monitoring data to assess the effects of water apportionment and future climate change scenarios on aquatic ecosystems in the St. Mary and Milk River systems. Recent work has focused on developing integrated population models for threatened bull trout to understand how changes in streamflow affect the production and resilience of transboundary populations in the St. Mary system. These river-specific streamflow-fish production rule curves will be completed in 2023, providing the study with fundamental relationships to understand the impacts of alternative management strategies on critical populations and habitats under current and future conditions.

### **Accredited Officers TWG**

The Accredited Officers (AO) TWG has compiled information on historical apportionment in the basins and are analyzing ways to improve the estimation of natural flow in the St. Mary and Milk River system. The group has continued to work on improving consumptive use estimates in the Milk River basin by investigating an application of remote sensing.

“When initially established, the Accredited Officers Technical Working Groups worked on specific studies and items that were listed in the Terms of Reference. The SMRTWG has developed and become more involved with initiating and undertaking more general work items and concerns/issues that arise with the management and sharing of the waters. The SMRTWG has evolved into an advisory group to the Field Representatives, providing invaluable investigations and insight for them.” - [from AO TWG State of Knowledge Report]

In addition to the work assignments to the TWGs established for the study, the Accredited Officers have also asked their long-standing St. Mary – Milk Rivers Technical Working Group to help out the study by providing historical and background information that they can more easily compile than the Board’s TWGs.

### **Operations Formulation and Evaluation Group**

The Operations Formulation and Evaluation Group (OFEG) has continued to spearhead technical work by organizing the work of the TWGs.

The Operations Formulation and Evaluation Group (OFEG) identified key characteristics required for studies that investigate water resource options in its January 2023 State of Knowledge Report and cited examples of how other studies have approached the tasks of developing and analyzing scenarios to seek improved options addressing complex water resource management problems, including performance indicators and visualization tools. These tools will be used to evaluate different scenarios and options that are being modeled by showing how they



affect different ways the water is used in the basin. The visualization tools will be used by OFEG to communicate differences in options to the Study Board to help the ISMMRSB make their final recommendations

OFEG is leading the effort to develop performance indicators (PIs). Performance indicators will play an important role in helping the study team predict, measure, and communicate the benefits and impacts of the different options being examined. PIs are the quantification of water management goals of the Treaty, needs of water users, and other water needs in the basin. Each of the TWGs has spent time reviewing existing information about the basin to ensure they have a good foundation for their work. Input from advisory groups, public meetings, and stakeholders is also critical to the development of PIs to support the development of recommendations that are focused on the needs of the St. Mary and Milk Rivers.

OFEG has worked with the WMM TWG to produce a [document](#) that provides a more fulsome description of the inputs required by the water management models. This shortcoming was initially identified by the Independent Review Group.

OFEG has continued to spearhead technical work by organizing and coordinating efforts of TWGs to ensure study progress information transfer. OFEG has described and discussed technical work with the Study Board, as well as the PAG and IAG. OFEG has worked to create or refine memos accompanying the progress of technical aspects of the project.

OFEG has continued to support the data management of the project by providing support and oversight to the Data Management team and working with all TWGs to ensure their data and data management needs are met, such as acquiring access to a Study GitHub site.

### **Notable Accomplishments: TWGs and OFEG**

- A large effort that was finalized during late April was the completion of a “Proof of Concept” which allowed a first run of models to be set up with two different alternative scenarios. The Proof of Concept demonstrated how the full project work will flow and identified challenges for the remainder of the study. Hypothetical performance indicators were developed to illustrate to the Board and advisory groups how they will be developed and what role they will play in the study. Based on the initial model setups, the design and coding for the full study was launched.
- A variety of infrastructure and administrative scenarios were selected based, primarily, on past efforts with the JIT. The IO TWG, WAAO TWG, and others assembled a draft list of scenarios and with board concurrence, were given to the WMM TWG to begin coding efforts. The Board discussed modeling options that should be prioritized by the WMM TWG for an initial round of modeling with historical data, and those recommendations along with input from WMM TWG, and a revised set of options have been started.
- Work has begun on creating and defining performance indicators and the coding to develop the visualization has begun. An initial set of PIs was developed by OFEG with input from the Study Co-Chairs. These initial indicators are being used as the starting place for the iterative process of determining the most critical PIs for decision-making

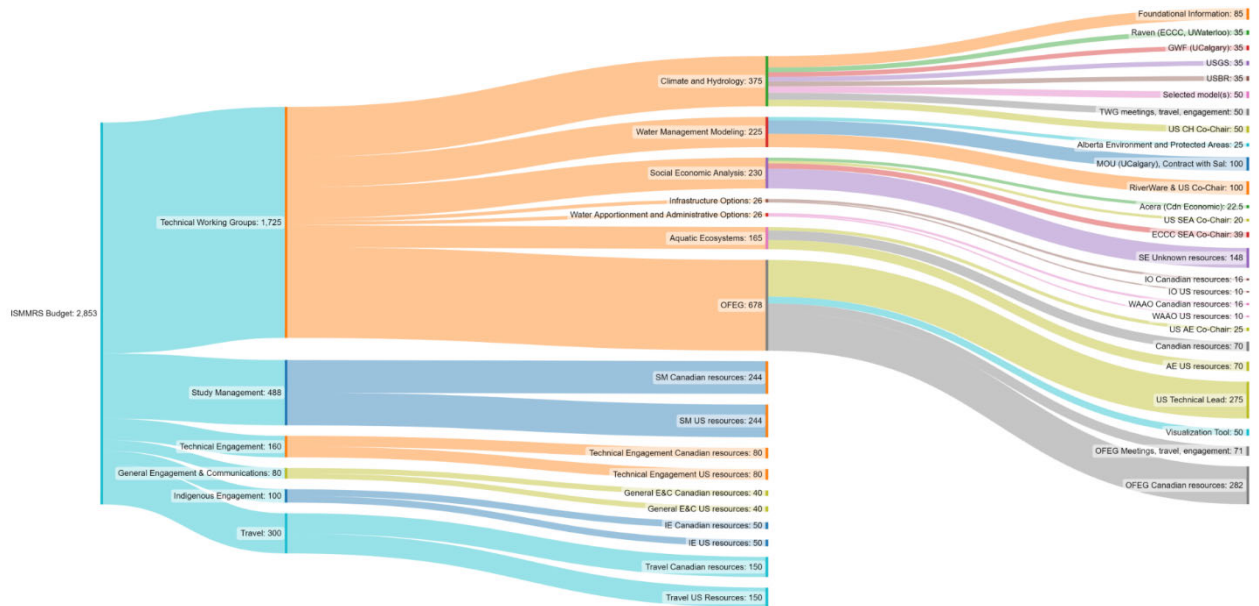
and for creating the analytical methods to produce outcomes. A list of initial PIs can be found [here](#).

- The performance indicators currently being used to create visualizations describe how the actual flows compare to entitlements received at three border crossings. Once the coding and display of these performance indicators are complete, it will take much less time to develop the visualization of other performance indicators when model outputs are available. The next version of the PIs will incorporate comments recently received from the IAG and the PAG. Currently, the SEA and AE TWGs are helping to refine the initial PIs to more accurately reflect water needs important to their area of expertise.
- The Climate and Hydrology (CH) TWG evaluated and determined the natural flow data set that will be the historical data used in CH models and WMM models. This evaluation was described in a memo and was agreed upon by the entire CH TWG.
- The CH TWG held a multi-day session to evaluate commonly used hydrologic models to determine the most appropriate to use for the study. They are working to select model(s) to calibrate and validate historical data, and then plan to use the same model(s) to describe the hydrology of future climate scenarios.

## Budget and Timelines

The Study Managers have worked with the IJC Engineering Liaisons to establish a tracking mechanism for study funding and expenditures. Spending is being tracked for both the Canadian and US sides through a joint workbook, which is periodically revisited and discussed by the Study Managers and IJC staff. Further discussion of the study budget and spending with the Board occurs bi-weekly as a standing agenda item during each Study Board meeting. Numerous contracts have been established and efforts continue to keep the technical work properly resourced with study funds.

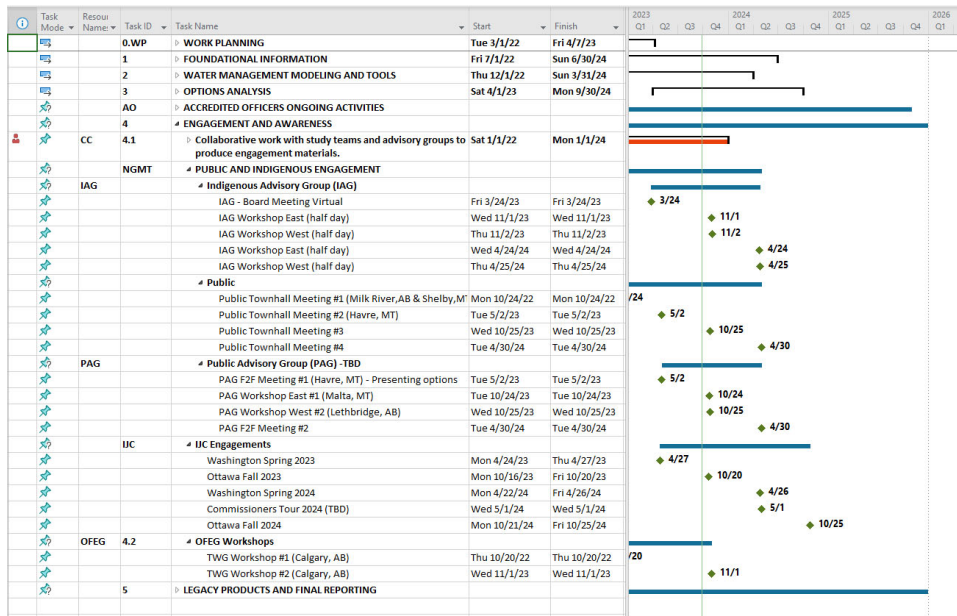
An overview of the study budget is provided in the figure below.



These details were included in the April 2023 version of the study workplan.

The timeline is being tracked in the Microsoft Planner App and Microsoft Project software. The tasks being tracked are based on the Board approved Results Based Management (RBM) framework, which details the responsibilities, dependencies, timelines and outputs expected for each task. While these tools are being updated for ease of tracking the progress of the study, the primary focus of the OFEG and TWGs has been on the critical path items, which are to finalize the model inputs, the models themselves, the initial scenarios to be run, and scenario performance indicators (PIs). The scenario PIs being developed are based on the needs of the Accredited Officers, and the knowledge of the aquatic ecosystem and the socio-economic TWGs.

The Gantt chart based on the current RBM tasks illustrates how the efforts were expected to unfold as of January 2023. The completion of some of these tasks is behind schedule and the OFEG is in the process of evaluating and synthesizing the information to determine the seriousness of the associated delayed outputs. It should be noted that while tasks were noted in the RBM matrix as sequential, many are being accomplished concurrently which is, in part, creating a delay in completion.



## Summary of Emerging Issues/Challenges

Resourcing relies heavily on contributions from other government departments, as well as retirees who do not necessarily have the same schedule or priorities as other study participants. These events impact predicted timeframes for project deliverables and may delay the completion of the proposed work within originally proposed timelines.

The Board understands that the budget and timelines for the study are tight. Detailed and active study management is ongoing and will continue to be required to meet timelines and stay within budget.

Also, the involvement of Indigenous communities hinges on in-person interaction which has been a challenge with Canadian budgetary limitations. These limitations have led to a reduction in travel expenditure, even though the significance and worth of in-person meetings are widely acknowledged.

A final challenge will be continuing outreach efforts for the public and stakeholders highlighting the complexities of water apportionment in these watersheds and the options being explored by the Board to add flexibility and resilience in the face of these complexities and climate change. Again, we feel the structure of our engagement groups, and the study itself will lead to success in this area.

## Next Steps

The SMMR project is halfway through the timeline of the study as illustrated in Figure 5. The Study continues to plan engagements that are meaningful to the Board, the IJC, and the public to

address critical questions and technical questions. Progress continues to be made with engagements all throughout the basin.



Figure 5. Study timeline

Previous technical engagements and milestones from May through December 2023 are illustrated in figure 6. The TWGs have supposed each of these engagements through updates, summaries, and highlights to provide the most current progress and plans.

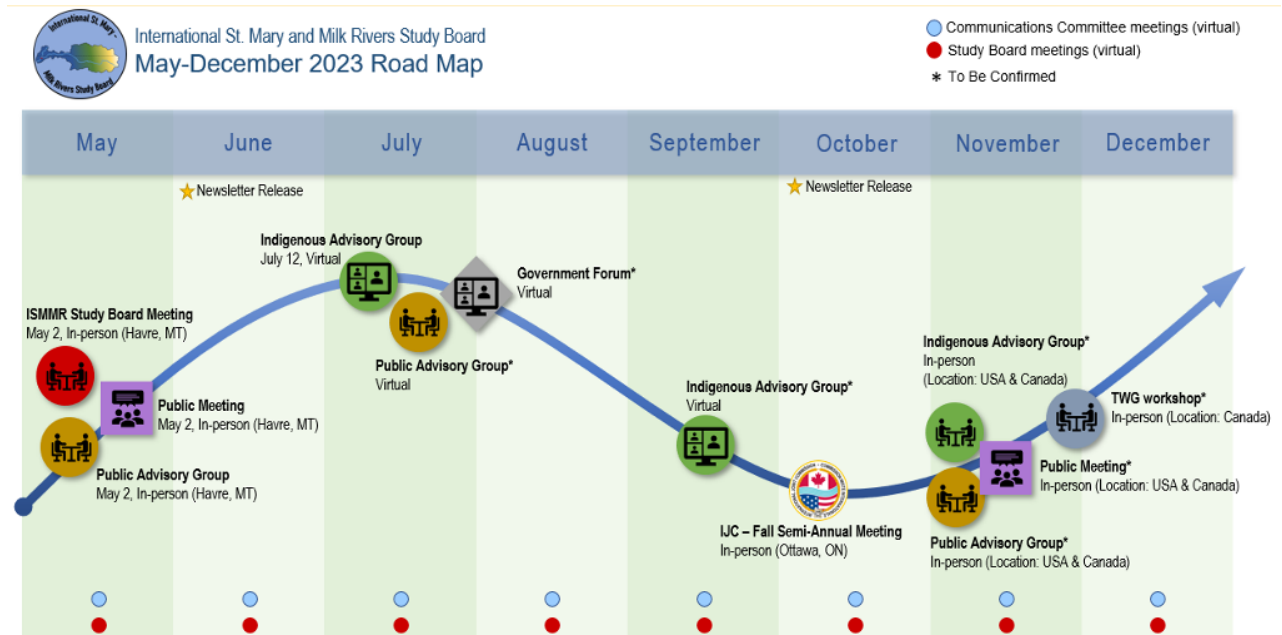


Figure 6. Technical milestones and engagements from May through December in 2023.

Future plans, engagement activities, and study updates are being planned for the calendar year 2024 and will be highlighted in an upcoming newsletter. The plans are to continue to provide opportunities to engage every other month. Updates will be continuously provided by the TWGs, the advisory boards, and the study board as milestones are accomplished.

### Issues Requiring IJC direction

None at this time.